

Sub-Plan A: Conservation program and implementation

Cumberland Plain Conservation Plan
2022



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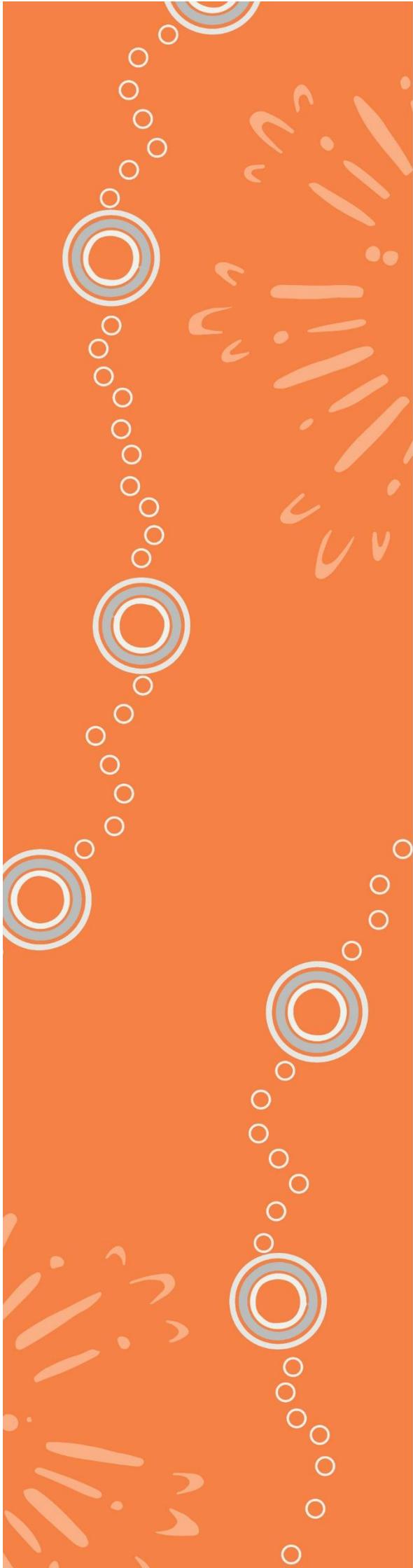
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Cover: A family enjoying the Australian Botanic Garden at Mount Annan

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Acknowledgement of Country

The development of the Cumberland Plain Conservation Plan acknowledges more than 60,000 years of continuous Aboriginal connection to the land that makes up NSW.

This plan recognises that, as part of the world's oldest living culture, traditional Aboriginal and Torres Strait Islander owners and custodians of the Australian continent share a unique bond to Country – a bond forged through thousands of years of travelling across lands and waterways for ceremony, religion, trading and seasonal migration.

Aboriginal peoples maintain a strong belief that if we care for Country, it will care for us. The area covered by the Cumberland Plain Conservation Plan is cared for by 3 Aboriginal groups: the Darug, Dharawal and Gundungurra. Others, such as the Eora, Darkinjung, Wiradguri and Yuin maintain trade or other obligatory care relationships with the area. The Deerubbin, Gandangara and Tharawal Local Aboriginal Land Councils also have local land holdings and responsibilities towards Aboriginal peoples living in the area.

This significant connection to Country has played an important part in shaping this plan.

For Traditional Owners, Country takes in everything within the physical, cultural and spiritual landscape – landforms, waters, air, trees, rocks, plants, animals, foods, medicines, minerals, stories and special places. It includes cultural practice, kinship, knowledge, songs, stories and art, as well as spiritual beings and people: past, present and future.

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Executive summary

The Cumberland Plain Conservation Plan (CPCP) identifies strategically important biodiversity areas within the Cumberland subregion to offset the biodiversity impacts of future urban development while ensuring the Western Parkland City is a vibrant, green and liveable city.

The CPCP has been developed to meet requirements for strategic biodiversity certification under the *Biodiversity Conservation Act 2016* (NSW) (BC Act) and strategic assessment under the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act).

The CPCP defines this as 'strategic conservation planning'. Strategic conservation planning involves identifying the biodiversity values of the area, understanding and assessing the potential impacts of future growth on these values, and developing a conservation program that can achieve biodiversity outcomes now and into the future.

The CPCP is one of the largest strategic conservation planning exercises ever undertaken in Australia. Sub-Plan A provides the framework for implementing the plan's conservation program. It details the conservation program, its commitments and the actions that will be needed to realise the vision of the CPCP which is to 'support Western Sydney's biodiversity and growth' to 2056 and beyond.

The conservation program will establish an enhanced network of conservation land in the CPCP Area to improve ecological resilience and function at a landscape scale and in perpetuity.

The conservation program will meet commitments for 5 core categories:

- avoiding and minimising biodiversity impacts as the first step for strategic conservation planning in Western Sydney
- mitigating indirect and prescribed impacts from future development on biodiversity values through planning controls and environmental management systems
- establishing new conservation land as offsets in regionally strategic locations to protect the area's threatened ecological communities, species and their habitats in perpetuity, while providing opportunities for ecological restoration
- managing landscape-scale threats to biodiversity by addressing weeds, pest animals, fire, disease and climate change
- building knowledge and capacity across Western Sydney's community and stakeholders through engagement, research and capacity building.

The conservation program will be implemented over the life of the CPCP through a series of planned and managed actions governed by an implementation and assurance framework.

Three reserve areas have been identified as being critical to the protection of BC Act- and EPBC Act-listed threatened ecological communities (TECs) and threatened species, and to enhancing the ecological connectivity across the landscape to protect biodiversity. These are the Georges River Koala Reserve, announced as part of the CPCP, and 2 additional public reserves under investigation for feasibility:

- Gulguer Reserve Investigation Area
- Confluence Reserve Investigation Area.

Other areas within the strategic conservation area have been identified for further investigation as future reserves to provide greater landscape connectivity. This includes Bargo in the south-west of the Cumberland subregion. This area includes a significant proportion of Crown land and includes koala habitat protected under the CPCP.

The NSW Government has committed \$114 million to deliver priority conservation actions over the first 5 years of the CPCP. This includes a land purchase program to support the establishment of the Georges River Koala Reserve and to establish and expand other reserves, commencing the restoration of koala habitat in priority areas including the Georges River Koala Reserve, and installing crossings and fences in key areas to protect koalas and facilitate their safe movement.

It also includes partnership actions such as working with the Biodiversity Conservation Trust to encourage landholders to establish new biodiversity stewardship agreements in areas such as Razorback. The Razorback area is dominated by Cumberland Plain Woodland and is home to other threatened ecological communities targeted for offsets under the CPCP. The Razorback area has unique characteristics that present opportunities for conservation and for landholders to benefit financially by establishing biodiversity stewardship agreements.

Creating biodiversity stewardship sites and new public reserves in these priority areas will help deliver the plan's core commitment to protect 5,325 hectares of target native vegetation communities within a conservation land.

Up-front funding will support the NSW Koala Strategy. It will be used to begin annual monitoring of koalas in south-western Sydney and to partner with the NSW Aboriginal Land Council to deliver a grant program for Western Sydney Local Aboriginal Land Councils to provide cultural and conservation opportunities.

The implementation and assurance framework will include regular review through an evaluation program using the principles of adaptive management. This will ensure the strategic conservation outcomes are achieved, the biodiversity and social benefits are delivered in perpetuity, and biodiversity offsets align with the staging of development.

The evaluation program will involve collecting information, tracking progress and reporting on intended outcomes. The NSW Government is committed to regularly examining its programs to ensure they are effectively achieving their intended outcomes. The evaluation program will be finalised in close consultation with key delivery partners and will be updated throughout the life of the CPCP.

Implementation of the CPCP will require collaboration and support across the multitude of stakeholders in Western Sydney and all levels of government. The Department of Planning and Environment has primary responsibility for implementing the CPCP and will work closely with key government and non-government partners to deliver the plan's conservation program.

The department's Environment and Heritage Group is the regulator for the strategic biodiversity certification (under the BC Act). We expect the Environment and Heritage Group will continue to perform a role as the regulator for the life of the CPCP.

Transport for NSW, a project partner for the CPCP, administers the major transport corridors program. An executive implementation committee with executive-level representatives from key government agencies has been established to oversee implementation of the CPCP.

Cumberland Plain Conservation Plan

Supporting Western Sydney's Biodiversity and Growth

26 commitments



National parks
and other reserves
to protect
biodiversity
and create new
green spaces



**Biodiversity
stewardship
sites** to protect
important
biodiversity



**Ecological
restoration**
will improve
and enhance
connectivity



Research
to support
evidence-based
decisions



**An informed
and engaged
community**



**Managing
landscape
scale threats**

Introduction



Shale sandstone transition forest at Noorumba Reserve

Introduction

Strategic conservation planning in Western Sydney

Strategic conservation planning is a landscape-scale approach to assessing and protecting biodiversity up-front in planning for large-scale development. This approach has been used to develop the Cumberland Plain Conservation Plan (referred to here as CPCP).

The CPCP covers much of the Cumberland subregion, which is home to a rich variety of plants, animals and their habitats. These include the largest koala population in Sydney – the Southern Sydney koala population, the Cumberland Plain land snail, foraging habitat for the swift parrot and significant plants such as the nodding geebung and spiked rice-flower.

The CPCP will identify and protect important biodiversity in the new urban development areas (referred to in the CPCP as ‘nominated areas’) of the Western Parkland City. It will also support conservation outside those areas through creating new national parks and public reserves or adding to existing ones, investing in biodiversity stewardship sites on privately owned land, and undertaking ecological restoration of the Cumberland subregion’s native vegetation communities.

These actions will offset impacts on biodiversity from developing Western Sydney’s 4 nominated areas and major transport corridors over the next 4 decades (see Figure 2). At the same time, they will help to improve ecological resilience and function in the Cumberland subregion in perpetuity. Improving ecological resilience and function by understanding the environment at the landscape scale is the best way to safeguard Western Sydney’s natural environment over the long term and in a changing climate.

The CPCP provides more information on the scope of development in Western Sydney and its linkages with other NSW Government plans and strategies. These include the [Greater Sydney Region Plan—A metropolis of three cities](#) (GSC 2018), [Western City District Plan](#) (GSC 2018b) and [Future Transport Strategy 2056 \(PDF 54.9 MB\)](#) (Transport for NSW, 2018).

The benefits of strategic conservation planning

Strategic conservation planning provides an opportunity to undertake a landscape-scale assessment of biodiversity. Landscape-scale assessments can look at the direct, indirect and cumulative impacts of a series of developments across a landscape. They take place ahead of a proposed, usually large-scale, development or series of developments. Project-specific site assessments, on the other hand, look at individual actions or are in response to an existing proposal.

Using a landscape approach early in the process enables decision-makers to identify and protect the most important habitat for species population viability and connectivity at a regional scale. It allows areas to be identified that can be developed without the need for further biodiversity assessment, provided development occurs in accordance with an approved plan.

Purpose of Sub-Plan A

Sub-Plan A: Conservation Program and Implementation sits alongside Sub-Plan B: Koalas to support the implementation of the Cumberland Plain Conservation Plan (see Figure 1).

Sub-Plan A sets out the framework for the conservation program. It details how conservation will be implemented over the life of the CPCP to 2056 through a series of considered and managed actions to achieve the plan’s objective, outcomes and vision. The objective is to ‘deliver biodiversity outcomes and support the ecological function of the Cumberland subregion while improving

liveability and supporting urban development in Western Sydney’. The program logic to deliver the plan’s objective is described in Figure 1.

The conservation program will deliver commitments to protect threatened ecological communities, species and their habitats. It will also improve overall ecological resilience and function to provide an enduring conservation legacy for the people of Western Sydney.

The conservation program seeks to meet legislative requirements under the *Biodiversity Conservation Act 2016* (NSW) (BC Act) and the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act). These requirements are to avoid, minimise, mitigate and offset the impacts of development under the CPCP on:

1. NSW biodiversity values, which are protected under the BC Act
2. matters of national environmental significance (MNES) and other matters protected under the EPBC Act, including impacts to Commonwealth land.

Commitments and actions included in the conservation program have been informed by the Cumberland Plain Assessment Report, which assessed the direct, indirect, prescribed and cumulative impacts on biodiversity and other relevant EPBC Act matters as a result of developing the Western Sydney nominated areas and major transport corridors described in the CPCP. The report also assesses the adequacy of the CPCP to address impacts and meet legislative requirements. Findings were iteratively reviewed and incorporated into Sub-Plan A as required.

Sub-Plan A also outlines the framework for the evaluation program. This program will enable the NSW Government and delivery partners to track and review projects over time to ensure outcomes are met. It will provide assurance that the outcomes and commitments are being met, and that delivery partners are clear about how to appropriately measure and report on requirements in a coordinated manner. A detailed evaluation program will be finalised in consultation with key delivery partners and will be updated throughout the life of the CPCP.

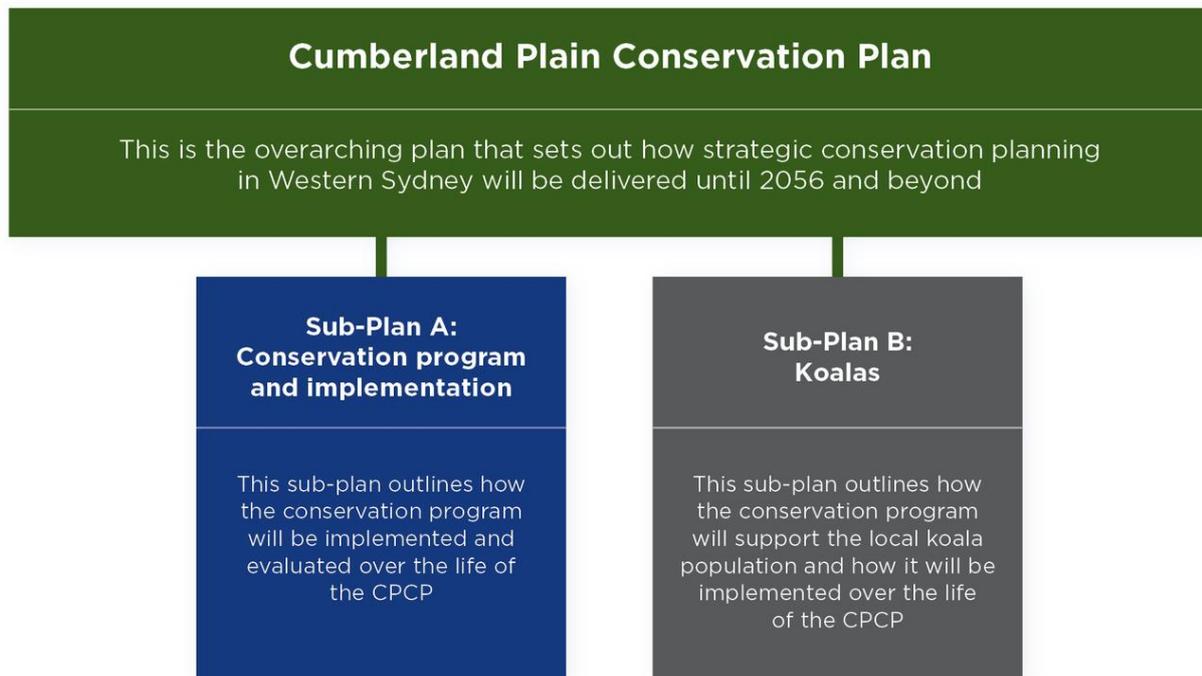


Figure 1. Cumberland Plain Conservation Plan and sub-plans

Community and stakeholder engagement

The CPCP will benefit generations of people in Western Sydney and beyond, and community and stakeholder engagement is an important part of strategic conservation planning.

Since 2018, the department has been consulting with key stakeholders to develop the CPCP. These consultations have included local councils, landholders, industry groups, environmental groups, local Aboriginal land councils, Aboriginal groups and members of the community. We have engaged with the community and stakeholders at events such as targeted meetings, workshops and community drop-in sessions.

The early engagement period uncovered a strong desire in the community to protect biodiversity, waterways and wetlands, with publicly accessible reserves being the preferred method to protect biodiversity in perpetuity. The community response highlighted the importance of preserving accessible open spaces for recreation and native vegetation corridors for wildlife movement and migration. Developers supported the certainty provided by the department's biodiversity approvals for nominated areas, which facilitates future development. A report summarising the feedback from early engagement can be downloaded from the planning portal.

Public exhibition of the draft CPCP ran for 9 weeks from 26 August to 2 November 2020 and met the requirements for public consultation under the BC Act and EPBC Act. The purpose of public exhibition was to raise awareness, seek feedback and support the finalisation of the plan.

The department prepared reports following both the early engagement and public exhibition period summarising key issues and themes raised by the community and stakeholders. The report explains the changes made to the CPCP as a result of feedback during the exhibition period. The What We Heard report is available to download from the department's website. The NSW Government is committed to ongoing community engagement. We will be developing a communication and engagement strategy to support implementation of the CPCP. This will be reviewed every 5 years and updated accordingly (Commitment 25, Action 7).

Structure of Sub-Plan A

Sub-Plan A is divided into 4 parts:

1. The **conservation framework** identifies the underlying logic to achieve the plan's vision, objective, outcomes, commitments and actions, and the information that informed the development of the conservation program.
2. The **conservation program** details the commitments and actions we will take to achieve the outcomes of the CPCP, including the methods used to identify conservation priorities.
3. The **implementation and assurance framework** outlines how the conservation program will be implemented, including overall governance of the CPCP, the roles and responsibilities for delivery and assurance mechanisms.
4. The **evaluation program** outlines how the success of the CPCP will be measured through monitoring, evaluating, reporting and adaptive management.

Conservation Framework



The Spotted-tailed Quoll is a threatened species found in Western Sydney

Conservation framework

The conservation framework underpins the design of the CPCP's conservation program. It identifies:

- the biodiversity values of the CPCP Area
- the program logic to achieve the vision of the CPCP
- how commitments have been developed according to an 'avoid, minimise, mitigate and offset' hierarchy, and the principles underpinning the conservation program.

The CPCP Area

The CPCP covers an area that extends from north of Windsor to Picton in the south and from the Hawkesbury–Nepean River in the west to the Georges River near Liverpool in the east (see Figure 2). It covers approximately 200,000 hectares and includes the majority of the Cumberland Interim Biogeographic Regionalisation for Australia (IBRA) subregion and some minor areas of the Cataract and Wollemi IBRA subregions.

Two main water catchments drain the CPCP Area: Botany Bay and the Hawkesbury–Nepean River. Together with the Georges River sub-catchment and Wianamatta (South Creek) sub-catchment, they form a broad branch-shaped drainage pattern, with an extensive network of tributaries extending out from large floodplains and across the area.

The CPCP covers parts of 8 local government areas:

- Wollondilly Shire
- Camden
- Campbelltown City
- Liverpool City
- Fairfield City
- Penrith City
- Blacktown City
- Hawkesbury City.

It also includes 3 local Aboriginal land councils:

- Deerubbin
- Tharawal
- Gandangara.

The CPCP includes 4 nominated areas in Western Sydney identified under the [Greater Sydney Region Plan](#) and approximately 100 kilometres of major transport corridors. These have been strategically biodiversity certified and/or strategically assessed under the CPCP. The nominated areas will be a key focus for urban development over the coming decades and will be centres of economic activity in Western Sydney. They are:

- [Greater Macarthur Growth Area](#)
- Greater Penrith to Eastern Creek Investigation Area
- [Western Sydney Aerotropolis](#)
- [Wilton Growth Area](#).

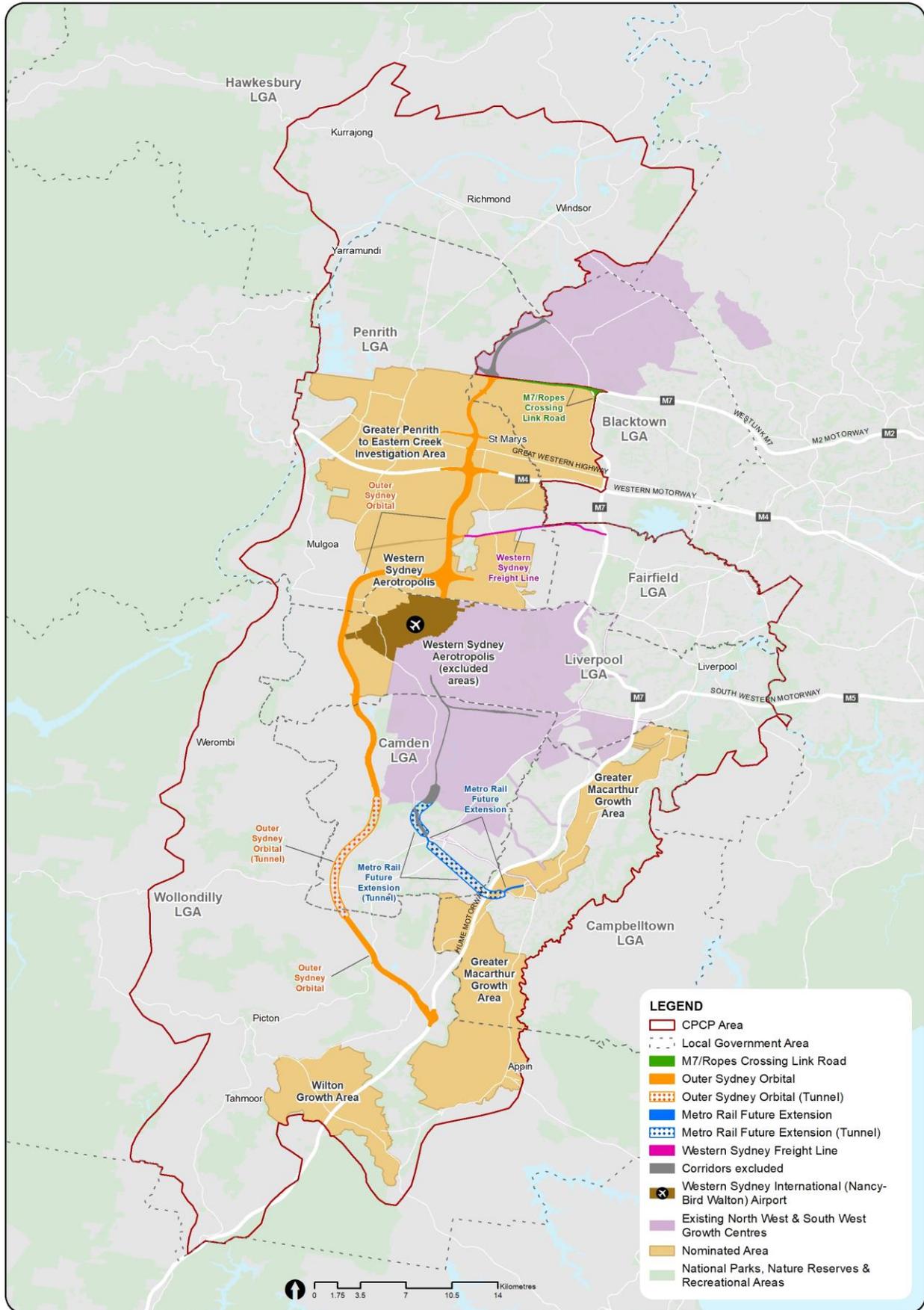


Figure 2. The nominated areas for future growth and major transport corridors

Key major transport corridors to service this new growth have been identified in Future Transport Strategy 2056. The 4 major corridors included in the CPCP are:

- potential future extension of Sydney Metro Greater West, south from Western Sydney Aerotropolis to Macarthur (except for those areas in the South West Growth Area)
- the Western Sydney Freight Line corridor
- Outer Sydney Orbital between Box Hill and the Hume Motorway near Menangle
- M7/Ropes Crossing Link Road.

Existing land uses are mainly freehold land zoned rural and residential, with greater than 75% of the remaining native vegetation in the Cumberland subregion in private ownership (DECCW 2010). Around 10% of the native vegetation in the CPCP Area is protected within a reserve or through a biodiversity covenant (DPIE 2018).

Conservation values

Threatened species and communities

The native vegetation in the CPCP Area is diverse and unique. It supports a variety of flora and fauna, including more than 100 threatened or migratory fauna and flora species that are listed under NSW and/or federal legislation.

Historical and ongoing land-use pressures have had a significant impact on the area's biodiversity, particularly for many birds and mammals. The area is now a highly fragmented landscape – the connectivity of the threatened ecological communities and habitat needed for species movement has been lost or reduced.

As at 2010, only 13% of the pre-1750 extent of the Cumberland subregion's vegetation remains intact, with an additional 12% occurring as scattered trees (DECCW 2010). The remaining vegetation communities are mainly represented by grassy woodlands and open forests, with around 40 plant community types¹ (PCTs) identified (DPIE 2018).

Of the 40 PCTs in the area, approximately 30 are associated with BC Act- or EBPC Act-listed threatened ecological communities (TECs) or are classified as over-cleared vegetation types (greater than 70% cleared compared with the notional original extent) (Open Lines 2020).

Areas of remaining native vegetation are often of high conservation value as they may contain the only remaining habitat for species and ecological communities that occur only in the Cumberland subregion (Open Lines 2020).

Landscape connectivity

Landscape connectivity is important for biodiversity as it allows the linkage of habitats, species, communities and ecological processes. For example, connectivity supports species movement, which is important to escape predators but also to reduce inbreeding. It also enables the movement of pollen and seeds as well as maintaining diversity to enable resilience to adverse climatic or fire conditions. Once a landscape is fragmented, it is more prone to additional degradation. As development increases, remnant vegetation becomes more fragmented and the risk of local extinctions increases.

¹ Plant community types are the standard operational classification hierarchy for native vegetation in NSW. Once plant community types are mapped, the potential extent and location of each threatened ecological community can be inferred through this relationship.

Connectivity in the Cumberland subregion is already compromised. Once clearing levels exceed 70% of the landscape, biodiversity loss from fragmentation increases (DECCW 2010). This threshold has been surpassed in the Cumberland subregion.

We can reduce and reverse the loss by enhancing connections. Extending existing reserves and biodiversity stewardship sites and establishing new protected areas will build these connections. Active management and maintenance of the protected areas and their surroundings reduces threats such as pests and weeds.

Meeting the plan's vision

The **vision** of the CPCP is to 'support Western Sydney's biodiversity and growth'.

Its **objective** is 'to deliver biodiversity outcomes and support the ecological function of the Cumberland Plain, improving liveability and facilitating urban development in Western Sydney'.

The CPCP program logic describes the relationship between the vision, objective, outcomes, commitments and actions (see Figure 3). The logic includes 8 environmental, social and economic outcomes to benefit biodiversity and the local community (Figure 4).

The **conservation program** has been developed to ensure the delivery of the CPCP outcomes. The commitments and actions will address biodiversity impacts from projected growth while delivering biodiversity and social outcomes in perpetuity. We do this by establishing and protecting conservation land to offset biodiversity impacts, managing landscape-scale threats to enhance ecological resilience, and supporting research and community engagement initiatives.

The vision is ambitious, so a robust and flexible process for securing biodiversity offsets over time will be established to endure for the life of the CPCP to 2056. This will ensure the conservation program stays on track to meet its commitments and outcomes.

The **implementation and assurance framework** consists of:

- clear governance arrangements, supported by an evaluation program
- a reconciliation accounting process to track development impacts and offsets secured
- conservation land selection steps to guide the selection and acquisition of offsets
- adaptive management steps to be implemented through the NSW planning system if offsets are not in line with development impacts.

The **evaluation program** will include monitoring, evaluation and reporting to ensure the CPCP stays on track and the commitments and outcomes are achieved. The effectiveness and appropriateness of actions in helping to achieve specific outcomes will be monitored, reported on and evaluated. Evaluation results can then be used to support adaptive management and governance to ensure continuous improvement in implementing the CPCP.

The full package of **commitments and actions** is detailed in 'Appendix A. Commitments and actions'.

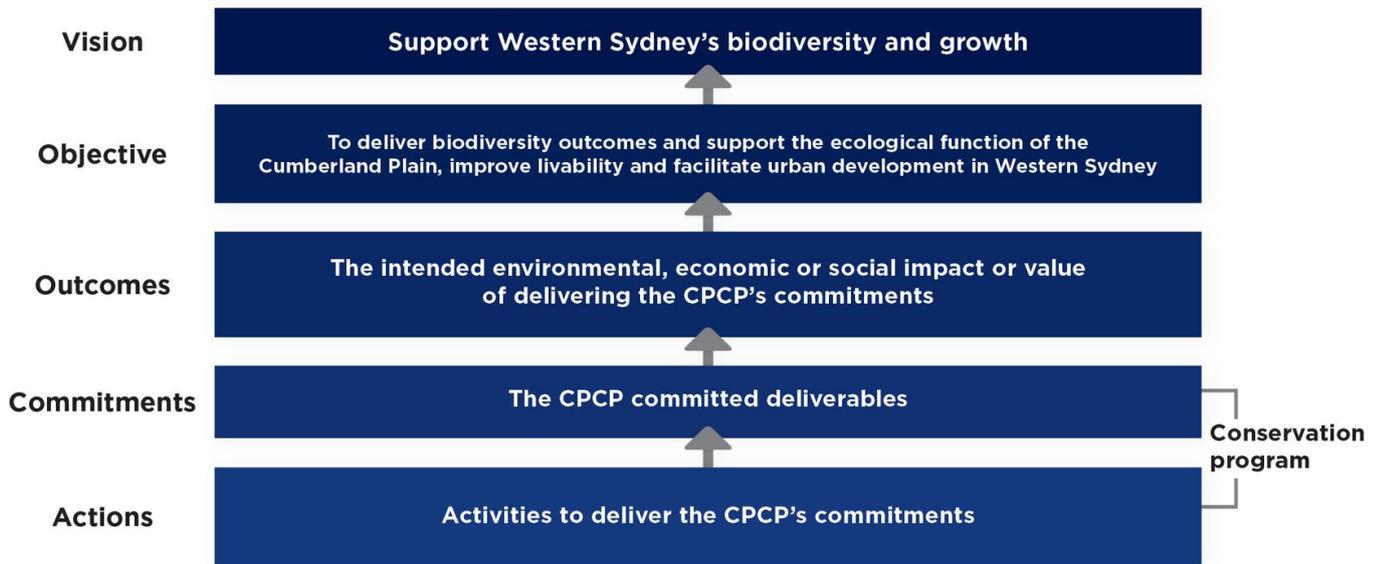


Figure 3. Program logic to achieve the vision

Outcomes

Environmental



1. The extent and condition of native vegetation and threatened ecological communities, increases and improves in the strategic conservation area in the Cumberland subregion.
2. Populations of targeted threatened species persist and the condition of suitable habitat improves in the strategic conservation area in the Cumberland subregion.
3. Condition of protected koala habitat is improved, connectivity between koala sub-populations is maintained, threats to koalas are managed and the koala population in South Western Sydney persists and thrives.
4. Areas of high biodiversity value in the nominated areas are protected and threats to species and ecological communities from increased urbanisation is managed.

Social



1. The CPCP supports increased public access to green space to improve opportunities for recreation, wellbeing and social connection in the Cumberland subregion.
2. The CPCP supports increased stakeholder awareness and participation in relation to biodiversity conservation in the Cumberland subregion.
3. The CPCP supports economic participation for Aboriginal people, promotes Aboriginal culture and knowledge, and helps enable Traditional Custodians and Aboriginal people to maintain a distinctive cultural, spiritual, physical and economic relationship with land and waters in Western Sydney.

Economic



1. Streamlined regulatory process including faster biodiversity and planning approvals for development in nominated areas.

Figure 4. Long-term outcomes for the CPCP

Avoiding and minimising impacts on biodiversity

Avoiding and minimising impacts on biodiversity values is an important part of strategic conservation planning and is required under both NSW and federal legislation. It is a critical step in protecting remaining biodiversity and reducing the cumulative impacts of proposed development on the natural environment.

In developing the CPCP, we have identified areas of high biodiversity value in the 4 nominated areas relevant to the plan. These areas were identified by applying avoidance criteria. Avoidance criteria included, among other things, intact vegetation, primary koala corridors and threatened species habitat. The avoidance criteria are listed in Appendix B. Avoidance criteria

Strategic conservation planning

The strategic conservation planning process used the avoidance criteria to locate and design certified-urban capable land² in the nominated areas to avoid and minimise impacts from future development on areas of high biodiversity value.

The certified-urban capable land is where future urban development is likely to occur in each nominated area. The certified-urban capable land will receive strategic biodiversity certification under the BC Act and approvals for 3 classes of actions (urban and industrial, infrastructure and intensive plant agriculture) under the EPBC Act.

The area avoided through the strategic conservation planning process is defined in the CPCP as the 'avoided land'. Future development in these areas will be subject to development controls (described in the section 'Avoiding and minimising impacts' on page 29) in addition to any existing and future applicable NSW legislation.

Impacts on biodiversity

The avoidance criteria ('Appendix B. Avoidance criteria') and related actions seek to avoid and minimise direct impacts on land with high biodiversity values (land that includes one or more of the avoidance criteria). However, there will be unavoidable impacts on biodiversity due to the planned growth in Western Sydney.

In line with legislative and regulatory requirements, we carried out assessments of the impacts of the proposed development on matters protected under the BC Act and EPBC Act. The assessment met the BC Act requirement that it be performed by a person accredited to use the Biodiversity Assessment Method (BAM). Impacts on matters protected under the EPBC Act, including matters of national environmental significance and Commonwealth land, were assessed in accordance with the terms of reference for the strategic assessment agreed to under the EPBC Act.

The Cumberland Plain Assessment Report examined the direct, indirect, prescribed and cumulative impacts of the proposed development, and determined whether it could cause serious and irreversible impacts.

That assessment found that urban development and proposed transport corridors could have a direct impact on 1,753.6 hectares of native vegetation communities. This includes 8 threatened ecological communities (TECs) listed under the BC Act and 6 TECs listed under the EPBC Act.

² Certified-urban capable land refers to the areas within the nominated areas where the NSW Government has streamlined the delivery of priority housing and infrastructure through the biodiversity certification process.

While there is some overlap, TEC lists are maintained at both the federal and state level and have differences in the criteria used and approach to listings.

In addition, potential habitat for 49 threatened species (24 fauna species and 25 flora species) may be directly impacted by development. As for TECs, the lists for threatened species are made at both federal and state level. Of the 49 threatened species, 48 species are listed under the BC Act, 28 species are listed under the EPBC Act and 27 species listed under both pieces of legislation.

Of these 49 threatened species, 17 have been identified as being at risk of residual adverse impacts from the direct impacts of development under the CPCP. These species have a direct species offset target included in the commitments and are defined in the plan as 'target species'. This is explained further in 'Protecting threatened flora and fauna' on page 63).

Substantial impacts on other matters of national environmental significance, including on migratory species, Ramsar wetlands or World Heritage or National Heritage areas, are unlikely. There are 12 Commonwealth land sites in the CPCP Area. The risks from development under the CPCP to the environment on Commonwealth land has been assessed as low for each of the 12 sites.

Section 10.2 of the Biodiversity Assessment Method requires an assessment of whether development to be certified under the BC Act will result in serious and irreversible impacts to any NSW listed TECs or species. Serious and irreversible impacts have been assessed in the Cumberland Plain Assessment Report (Chapter 25), with the outcomes of this assessment informing the conservation program.

Development facilitated by the CPCP could also result in indirect and prescribed impacts, including changes to hydrology and water quality, disruption of habitat connectivity, altered fire regimes, the spread of disease, and vehicle strikes involving fauna. Actions to mitigate specific indirect and prescribed impacts on threatened ecological communities, species and their habitats are further discussed in 'Mitigating indirect and prescribed impacts' (on page 38) and listed in 'Appendix E. Species and TEC-specific mitigation measures'.

Table 1 gives a summary of impacts on protected matters.

'Appendix C. EPBC Act and BC Act matters to be offset through the CPCP' lists the impacted threatened ecological communities and threatened species in detail, including target species and BC Act matters determined to be serious and irreversible impact entities.

The Cumberland Plain Assessment Report provides a complete overview of the data, methods and findings of the impact assessments carried out under NSW and federal legislation.

Table 1. Summary of impacts on biodiversity

Value or protected matter	Impact
Total impacts to native vegetation	1,753.6 hectares
Threatened ecological communities	8 under BC Act 6 under the EPBC Act
Threatened species	25 flora species 24 fauna species
Most impacted threatened ecological communities	Cumberland Plain Woodland (PCT 849/850) Shale Sandstone Transition Forest (PCT 1395) River-Flat Eucalypt Forest (PCT 835)
Target ³ species	<p>Flora species:</p> <p><i>Cynanchum elegans</i> <i>Dillwynia tenuifolia</i> <i>Grevillea juniperina subsp. juniperina</i> <i>Hibbertia fumana</i> <i>Hibbertia puberula</i> <i>Marsdenia viridiflora subsp. viridiflora</i> <i>Persoonia nutans</i> <i>Pimelea spicata</i> <i>Pultenaea parviflora</i> <i>Pultenaea pedunculata</i></p> <p>Fauna species:</p> <p><i>Haliaeetus leucogaster</i> <i>Hieraaetus morphnoides</i> <i>Lathamus discolor</i> <i>Lophoictinia isura</i> <i>Meridolum corneovirens</i> <i>Myotis Macropus</i> <i>Phascolarctos cinereus</i></p>
Vegetation in the avoided land across all nominated areas	3,610 hectares
Area of avoided land across all the nominated areas	4,510 hectares

³ EPBC Act- and BC Act-listed species identified as being at risk of residual adverse impacts from the direct impacts of development under the CPCP

Addressing impacts

Strategic conservation planning enables a landscape-scale approach to conserving protected biodiversity. This approach provides a wider range of actions to offset impacts on biodiversity values compared to standard (site-by-site) development assessment processes.

The conservation program includes a set of commitments and actions to avoid, minimise, mitigate and offset the development impacts identified in the Cumberland Plain Assessment Report. Several inputs informed the commitments and actions (Figure 5) including the plan outcomes, an offset target method to determine potential risk to biodiversity values from future development in Western Sydney (see 'Box 1. Offset target methods'), and the guiding principles and policies of agencies with regulatory responsibility for the CPCP (see 'Box 2. Guidelines for strategic biodiversity offset programs').

Commitments are framed around an 'avoid, minimise, mitigate and offset' hierarchy, as required under legislation. The conservation program section outlines these commitments in more detail.

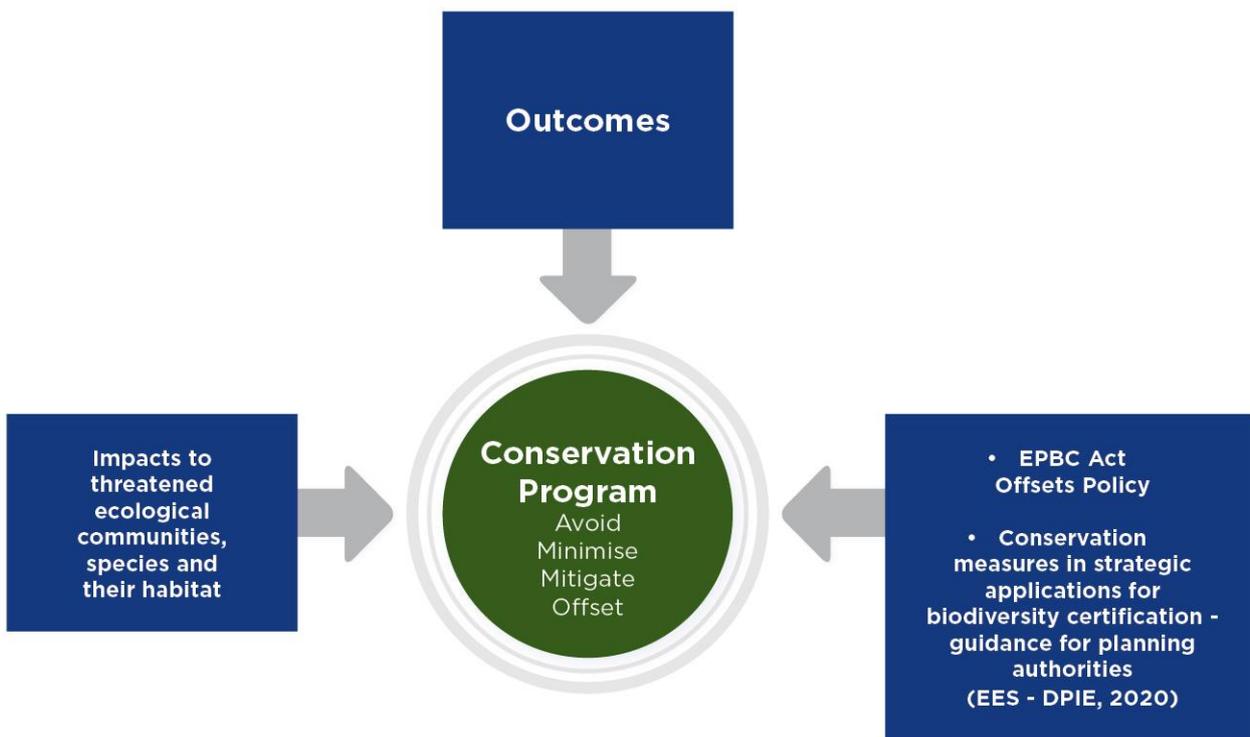


Figure 5. Inputs used to develop the conservation program

Box 1. Offset target methods

The offset target method for **threatened ecological communities** (TECs) determined offset targets based on the area impacted, in hectares, of each TEC, and was driven by 2 key principles:

1. impacts on higher conservation status matters require more offsets than lower status matters
2. impacts on higher condition matters require more offsets than lower condition matters.

Species offset targets were developed for each EPBC Act- and BC Act-listed species likely to be at risk of residual adverse impacts from the direct impacts of development under the CPCP. The method determined:

1. the level of risk for EPBC Act-listed species as determined by the assessment report
2. a set of criteria for BC Act-listed species to address risk of residual adverse impacts.

The Cumberland Plain Assessment Report provided more detail on these 2 methods.

Box 2. Guidelines for strategic biodiversity offset programs

Conservation measures in strategic applications for biodiversity – guidance for planning authorities (EES-DPIE, 2020):

The guidelines for planning authorities provide a set of guiding principles for demonstrating that the conservation measures proposed in an application for strategic biodiversity certification adequately address impacts on biodiversity values under section 8.7 of the BC Act.

Principle 1: Potential serious and irreversible impacts on biodiversity values are avoided and minimised.

Principle 2: The proposed conservation measures address the biodiversity values being impacted.

Principle 3: Conservation measures prioritise preservation of important conservation values.

Principle 4: Conservation measures improve biodiversity values and landscape function in the long term.

Principle 5: Conservation measures are additional to existing conservation requirements.

Principle 6: Development controls that conserve or enhance the natural environment must be new or represent a significant upgrade.

Principle 7: Any proposed new national parks are consistent with the comprehensive, adequate and representative reserve system scientific framework.

Principle 8: The implementation of conservation measures is timely and certain.

EPBC Act environmental offsets policy

This policy provides up-front guidance on the role of offsets in environmental impact assessments, and how the Australian Government's Department of Climate Change, Energy, the Environment and Water considers the suitability of a proposed offset. It aims to improve environmental outcomes through the consistent application of best-practice offset principles, provide more certainty and transparency, and encourage advanced planning of offsets.

Conservation Program



Castlereagh Scribbly Gum Woodland is a threatened ecological community found in the north of the CPCP area

Conservation program

A strategic conservation planning approach has been used to inform the development of the conservation program. This included identifying biodiversity values in the CPCP Area and identifying where conservation funding should be targeted for the greatest strategic benefit.

We used a conservation prioritisation process (see 'The Conservation Priorities Method' on page 25) to identify and map areas of important biodiversity value and potential conservation land that could best support an ecologically functioning, connected landscape and which can offset impacts according to the legislative requirements of the EPBC Act and the BC Act.

The output of this process determined the strategic conservation area, which includes areas of regional biodiversity significance identified to have the greatest potential to deliver long-term conservation outcomes for biodiversity within the Cumberland subregion.

The conservation program will focus on protecting conservation land from within or adjacent the strategic conservation area as a priority. Conservation land will include new national parks or additions to national parks, public reserves and biodiversity stewardship sites on private and public land. Direct purchase and retiring of species and ecosystem credits from the Biodiversity Offsets Scheme will also contribute to the CPCP offset targets. Ecological restoration of cleared or degraded habitat will play an important role in conservation land, expanding the area of native vegetation, creating new habitat for threatened species and maximising ecological connectivity. This is particularly important for the fragmented landscape that exists in the CPCP Area and for over-cleared vegetation types such as Cumberland Plain Woodland.

The core commitment of the CPCP is to secure in perpetuity through conservation land a minimum of 5,325 hectares of native vegetation. This will comprise threatened ecological communities impacted by development under the plan (Commitment 8). The target has been calculated to offset biodiversity impacts from development as required under legislation (see also 'Box 2. Guidelines for strategic biodiversity offset programs'). The resulting area of conservation land, either protected or established through the CPCP, will be much greater than this, as we expect that more than double that amount of land may be required to meet the offset target for native vegetation.

New reserves or additions to existing reserves will include land for open space and recreational use that is compatible with the reserve type. Conservation land may also include areas of native vegetation that do not directly meet conservation targets but will be protected collectively with the plan's target threatened ecological communities. The Georges River Koala Reserve, to be established as a priority, will also protect a significant amount of important koala habitat, well in excess of the plan's offset target for koalas.

Conservation land will be established through the 'Conserving flora, fauna and associated habitat' category of commitments. This category of commitments will account for at least 90% of conservation program funding over the life of the CPCP.

The NSW Government has committed \$114 million to deliver priority conservation actions during the first 5 years of the CPCP. This will fund a range of on-ground actions and partnerships which are summarised in Figure 6.

Actions include a land purchase program to support the establishment of the Georges River Koala Reserve and to establish and expand other reserves, beginning restoration of koala habitat in priority areas including the Georges River Koala Reserve, and installing crossings and fences in key areas to protect koalas and facilitate their safe movement.

Partnership actions will include working with the Biodiversity Conservation Trust to encourage landholders to establish new biodiversity stewardship agreements in areas such as Razorback.

The Razorback area is dominated by Cumberland Plain Woodland and other threatened ecological communities that are needed to be offset through the plan. The area has unique characteristics that present opportunities for conservation and for landholders to benefit financially by establishing biodiversity stewardship agreements.

Up-front funding is also being used to support the NSW Koala Strategy. The funds will be used to begin annual monitoring of koalas in south-western Sydney and to partner with the NSW Aboriginal Land Council to deliver a grant program for Western Sydney local Aboriginal land councils to provide cultural and conservation opportunities.

Over the life of the CPCP, the conservation program will deliver additional commitments related to threatened ecological communities, species and their habitats. Actions under these commitments, such as increasing knowledge of and compliance with biodiversity protections, research, and threat management, will address the declining trend in biodiversity and manage current and emerging landscape-scale threats over the coming decades.

Climate change is likely to introduce additional threats and exacerbate ecosystem stressors such as fire, disease, pests and weeds. The conservation program will invest in climate change adaptation strategies for threatened ecological communities, species and their habitats in the Cumberland subregion. Commitments include funding for research to identify the most at-risk species and ecological communities and identifying priority locations such as climate refugia to support their persistence and adaptation.

The unprecedented bushfires over the summer of 2019–20 burnt 5.3 million hectares (6.7% of NSW), including 2.7 million hectares in national parks (37% of the national park estate) and more than 80% of the Greater Blue Mountains World Heritage Area (DPIE 2020).

An initial assessment has been made of the significance of these fires to the plan's conservation program. The fires had limited impact on the area's endemic species, or those species highly dependent on the Cumberland subregion (more than 80% of total records in the Cumberland subregion). But they were a reminder that the threat of bushfires to the areas' native species and communities will be exacerbated as the climate becomes hotter, drier and more susceptible to extreme weather events and natural hazards.

The conservation program will invest in measures to address the continuing risk of bushfires to the area's native species. This is further described in the section 'Managing bushfire risk' on page 70.

\$114 million over 5 years for:	
On ground actions	Partnership actions
 <p>Initiate the establishment of the Georges River Koala Reserve using government-owned land as first priority</p>	 <p>Establish a Biodiversity Stewardship Program in partnership with the Biodiversity Conservation Trust to encourage landholders to establish new biodiversity stewardship agreements and to purchase biodiversity credits to protect threatened species and vegetation</p>
 <p>Instigate a land purchase program to support the establishment of the Georges River Koala Reserve and to establish and expand other reserves</p>	 <p>Partner with the NSW Aboriginal Land Council to deliver a grant program for Western Sydney LALCs to provide conservation and cultural outcomes</p>
 <p>Install koala exclusion fencing in priority areas such as adjacent to fauna crossings to protect koalas from threats in the urban landscape</p>	 <p>Commence annual monitoring of koalas in South Western Sydney through the NSW Koala Strategy and conduct research on topics including disease, stress and population demographics as well as supporting training for veterinarians and koala carers</p>
 <p>Commence restoration of koala habitat including up to 80 hectares of koala habitat in priority areas including the Georges River Koala Reserve</p>	 <p>Partner with Western Sydney University to develop and implement a 35-year research strategy, including identifying research priority projects for the first four years</p>
 <p>Construct two fauna crossings for Appin Road at Ousedale and Kings Fall Bridge</p>	 <p>Partner with the Royal Botanic Gardens & Domain Trust to deliver seed sourcing and seed banking guidance, to inform the CPCP restoration program</p>

Figure 6. Priority conservation actions in the first 5 years of the CPCP

Commitments

The conservation program includes commitments that have been divided into 5 categories (see Figure 7). These commitments sit within the plan's conservation framework to achieve the vision, objective and 8 outcomes. They will be implemented over the life of the CPCP to 2056 through a series of planned and managed actions that have been set over varying timeframes according to their priority and feasibility.

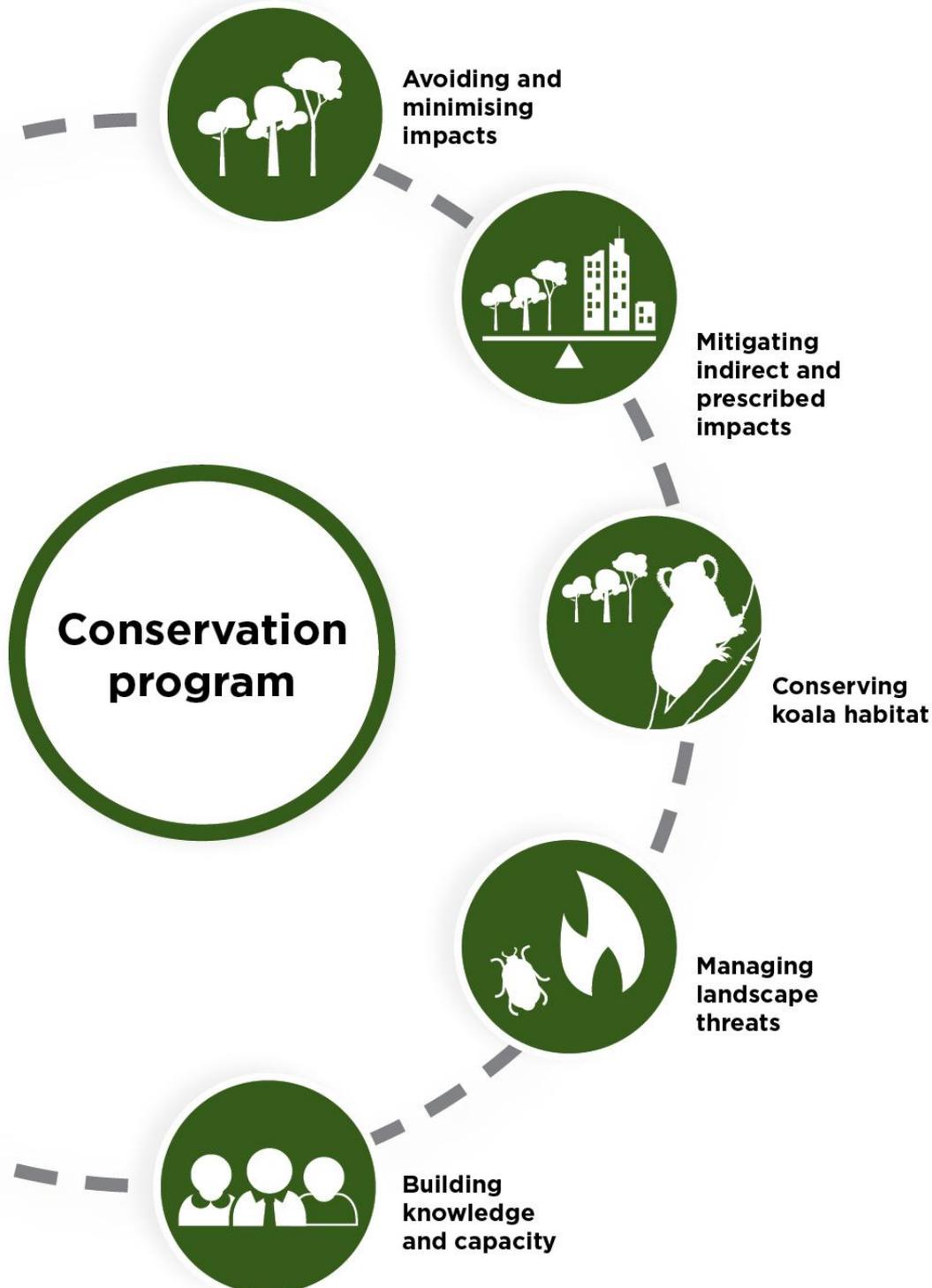


Figure 7. The conservation program

'Appendix A. Commitments and actions' presents the full package of commitments and actions to be implemented through the CPCP. This includes additional commitments that relate to development requirements and governance and reporting.

The sections from page 29 provide further information on the conservation program under each of the 5 commitment categories. Priority conservation actions will be delivered in the first 5 years of the CPCP.

Implementation

The 'Implementation and assurance' section on page 83 details the implementation and assurance framework, including governance arrangements, assurance mechanisms for securing biodiversity offsets, the evaluation program, and roles and responsibilities for implementing commitments and actions.

The evaluation program will track progress of the conservation program over the life of the plan. It will collect and monitor data to consistently evaluate the impact of actions and inform adaptive management decisions where required to ensure the success of the CPCP.

The evaluation program includes the reporting framework, which includes annual updates and a 5-yearly independent report, both to be publicly available.

The Conservation Priorities Method

The Conservation Priorities Method is a systematic and repeatable method for determining and prioritising conservation land (see Table 2). It combines detailed spatial information about biodiversity values with an analysis of planning and land-use constraint data to assess the feasibility of implementing conservation land as commitments under the CPCP. A brief technical explanation of the method is given in 'Appendix D. Conservation Priorities Method'.

Application of the method produces a map of the strategic conservation area, representing habitat that is of regional significance to biodiversity and that provides the best opportunities to deliver biodiversity outcomes and support the Cumberland subregion's ecological function. This includes priority areas that have the potential to directly offset impacts on threatened ecological communities, species and their habitats from development in the nominated areas and major transport corridors.

The strategic conservation area

Approximately 27,200 hectares has been identified and mapped as strategic conservation area (see Figure 8). This area contains native vegetation classified into plant community types, including habitat for 49 threatened flora and fauna species and 8 BC Act- and/or EPBC Act-listed threatened ecological communities impacted by development under the CPCP.

Some areas have been excluded from the strategic conservation area. This is where land is already protected as a national park or reserve under the NSW National Parks system or is an existing or known future offset site (such as the Orchard Hills Defence site). Other areas with biodiversity potential may have been excluded due to implementation constraints, such as small lot sizes or land uses that may not be compatible with conservation.

Table 2 Conservation Priorities Method – overview

Stage	Priorities
Stage 1: Ecological assessment	<p>The first stage identifies areas of highest biodiversity value based on vegetation patch size, legislative status and condition within the CPCP Area.</p> <p>This stage includes Phase '0', an exclusion process that identifies constraints not likely to support conservation, either due to the site already being protected or because the current (or proposed) land use is not consistent with a biodiversity offset outcome. This process reduces the amount of land of high biodiversity value available for conservation under the CPCP.</p> <p>Offset requirements are determined with the help of a matrix that applies an offset ratio to all impacted entities based on their conservation status and condition. In accordance with the matrix, the offset ratio increases both as conservation significance increases and as the condition of vegetation improves.</p>
Stage 2: Complementary assessments	<p>Stage 2 identifies complementary information such as restoration potential, proximity to protected land or the level of constraints (from low to high) of the land for implementing potential conservation lands.</p>
Stage 3: Conservation priorities assessment and offset selection method	<p>This stage identifies suitable conservation areas based on the outputs of stages 1 and 2 and uses an offset area selection approach (noting that the selection of suitable offset areas is done from the 'ground up'; that is, from plant community types and threatened species habitat to the landscape scale).</p>
Stage 4: Ground-truthing program	<p>Suitable conservation areas are 'ground-truthed' to confirm their validity and robustness and to identify the biodiversity values present. Areas confirmed to have relevant biodiversity values and are deemed suitable as offset sites will be prioritised under the conservation program.</p> <p>The next stage for these sites will be to develop comprehensive implementation proposals in collaboration with delivery partners and affected stakeholders.</p>

The strategic conservation area will be used to identify and prioritise suitable conservation land as offsets for biodiversity impacts over the life of the CPCP. The selection of suitable offset sites will be guided by the conservation land selection steps. These steps prioritise direct offsets from within the strategic conservation area and reflect geographical and ecological priorities to meet the offset requirements.

In some cases, sites may be selected from outside the strategic conservation area, but within the Cumberland subregion as a first step. This could include, for example, the purchase of biodiversity credits from existing biodiversity stewardship sites if those areas are contiguous with the strategic conservation area and would otherwise meet the criteria for a priority area.

Suitable areas may be protected as a future reserve or biodiversity stewardship site or enhanced through ecological restoration to deliver the offset targets.

Not all of the mapped strategic conservation area will be established as conservation land by the CPCP. However, we estimate that more than double the amount of land may be needed to meet our offset target of 5,325 hectares of native vegetation. This larger area includes non-target vegetation communities, cleared areas to accommodate recreational and visitor facilities, and land required to meet boundary configurations necessary for efficient management of a public reserve or national park.

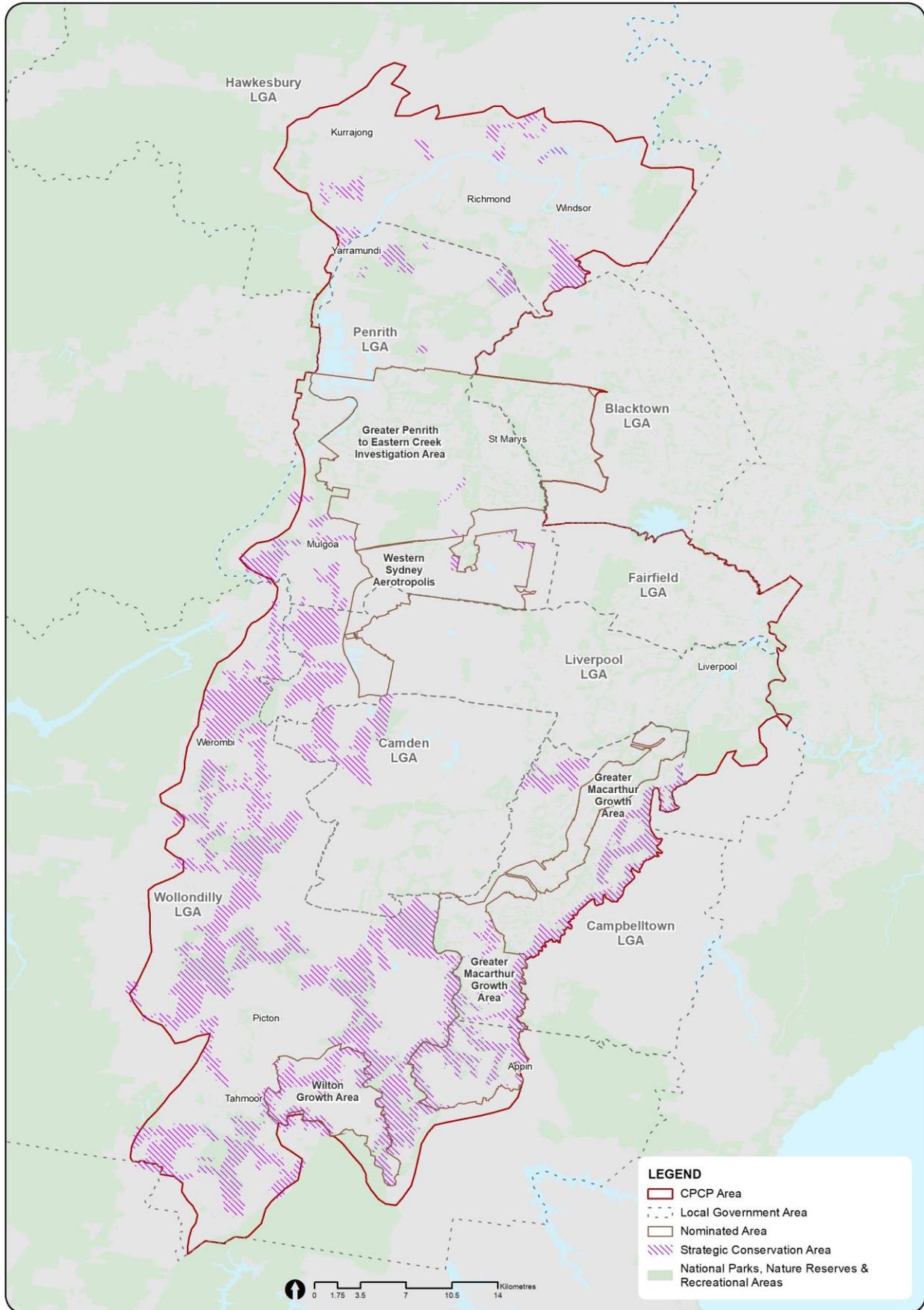


Figure 8. The strategic conservation area

Conservation land will be purchased on a voluntary basis, in consultation with landowners. Compulsory acquisition will only be used in limited circumstances to acquire land that is critical for creating a proposed conservation reserve when voluntary purchase has not been successful. More details about this and how sites will be identified is provided in the sections on 'Expanding the reserve system to protect biodiversity in Western Sydney' on page 43, 'Biodiversity stewardship sites on public or private land' on page 52, and in 'Establishing conservation land as offsets' on page 91.

Identifying conservation land from the strategic conservation area will continue over the life of the CPCP to ensure that potential sites are appropriate, can be implemented, and are based on the best available information and data. This includes a review of the strategic conservation area mapping in line with the 5-yearly independent reviews.

The strategic conservation area is also being recommended for inclusion in the Biodiversity Values Map (Commitment 8, Action 3). The map is prepared by the department under Part 7 of the BC Act. It identifies land with high biodiversity value that is sensitive to impacts from development and clearing. The map is one of the triggers for determining whether the Biodiversity Offsets Scheme applies to a proposal for clearing or development. Including the strategic conservation area in the Biodiversity Values map ensures proposals for development that involve clearing of native vegetation or would result in a prescribed impact are avoided and minimised and subject to assessment and approval under the BC Act.

Data sources and iterations

The Conservation Priorities Method used different datasets to generate the strategic conservation area. These included the best available vegetation mapping and other NSW and Australian Government datasets. New threatened species data was generated using several tools, including on-ground surveys, habitat mapping, distribution modelling and knowledge-based models.

The method was independently peer reviewed, as required by the [Terms of Reference for the Strategic Impact Assessment Report for the Cumberland Plain Conservation Plan \(PDF 53.4 MB\)](#). The review, which can be found in the Cumberland Plain Assessment Report, determined that the Conservation Priorities Method was robust and that datasets were appropriate, consistently applied across the CPCP Area, and comprised the most up-to-date information on biodiversity values, development and land use. Ongoing application of the method, using up-to-date information on biodiversity, constraints and opportunities, can continue to deliver robust data to support the development of detailed implementation planning, decision-making and prioritisation for conserving biodiversity and restoring ecosystems in Western Sydney.



Avoiding and minimising impacts

Highlights

- Identify 4,510 hectares of high biodiversity land in the nominated areas to be avoided from development through up-front strategic conservation planning, which includes 3,610 hectares of native vegetation
- Align precinct planning in each of the nominated areas with the CPCP certified areas (certified-urban capable land) and areas of high biodiversity value to be avoided from development (avoided land)
- Apply planning controls to the avoided land to minimise future impacts on biodiversity in these areas

Avoiding impacts on biodiversity in nominated areas

Avoided land describes the area that has been avoided from the certified-urban capable land in the nominated areas due to its high biodiversity value. Avoiding impacts on biodiversity arising from development is the first step in minimising impacts required under NSW and Commonwealth biodiversity legislation. The 'avoidance criteria' used to identify areas of high biodiversity value are listed in Appendix B. Avoidance criteria.

Across the 4 areas this amounts to 4,510 hectares of land, made up of BC Act and EPBC Act threatened ecological communities and some riparian corridors. Avoided land also includes some non-vegetated land such as small wetlands and waterbodies, land that is strategically important to protect or enhance corridors, or small enclosed clearings that are surrounded by native vegetation.

Figure 9 to 12 are maps that identify the land categories in each nominated area.

These include:

- the 'avoided land'
- the 'certified-urban capable land', which will be subject to strategic biodiversity certification for development under Part 8 of the NSW BC Act and strategic assessment approval under the Commonwealth EPBC Act
- the 'certified-major transport corridors', which will be subject to strategic biodiversity certification for development under Part 8 of the NSW BC Act and strategic assessment approval under the Commonwealth EPBC Act
- the 'excluded land', which are areas excluded from the CPCP approval

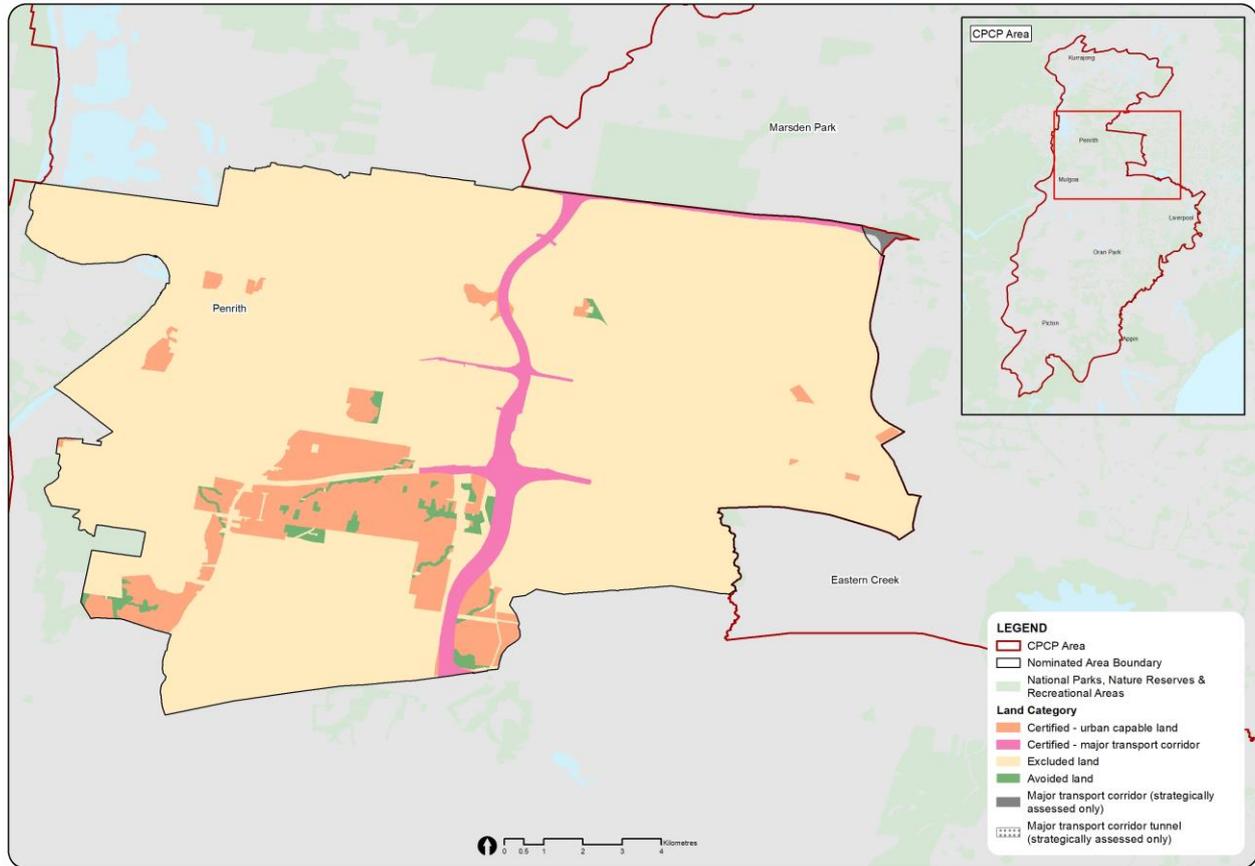


Figure 9. Greater Penrith to Eastern Creek Investigation Area land categories

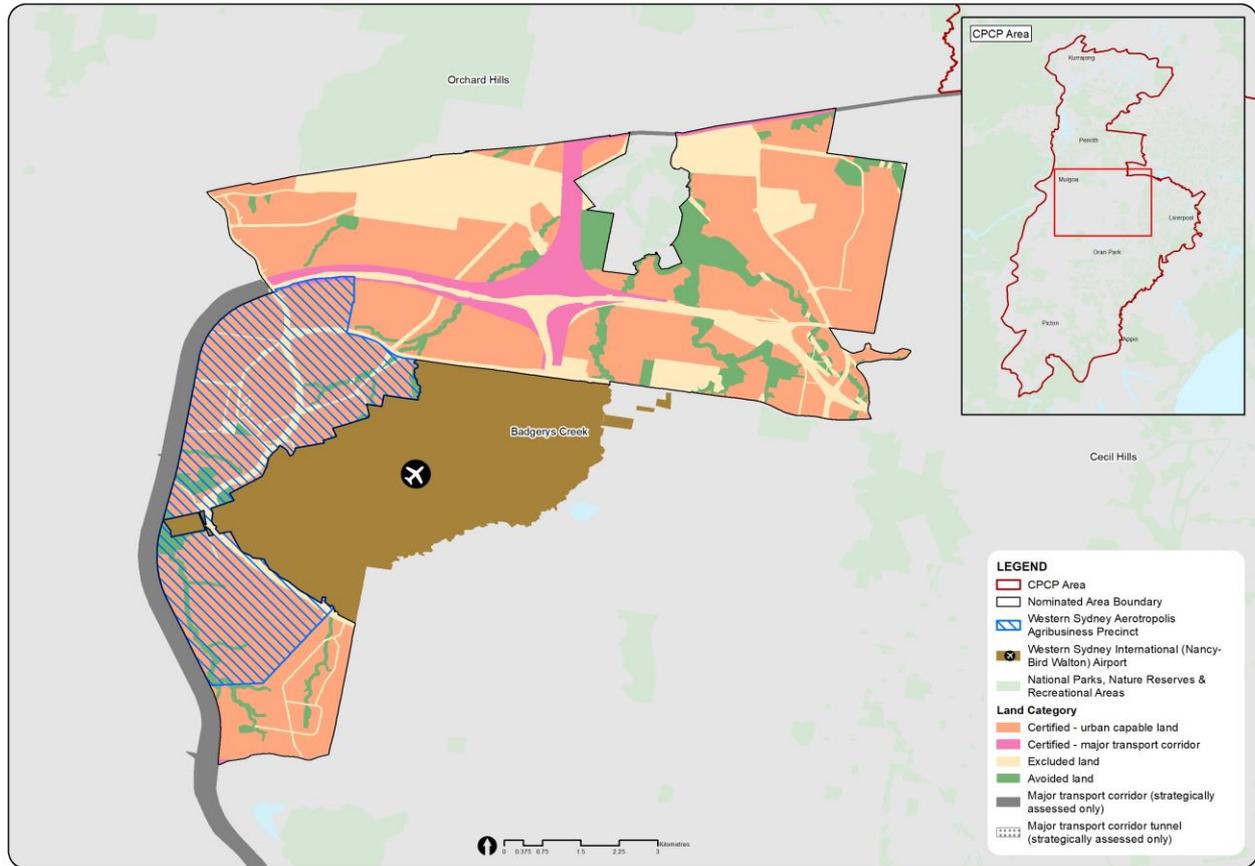


Figure 10. Western Sydney Aerotropolis land categories

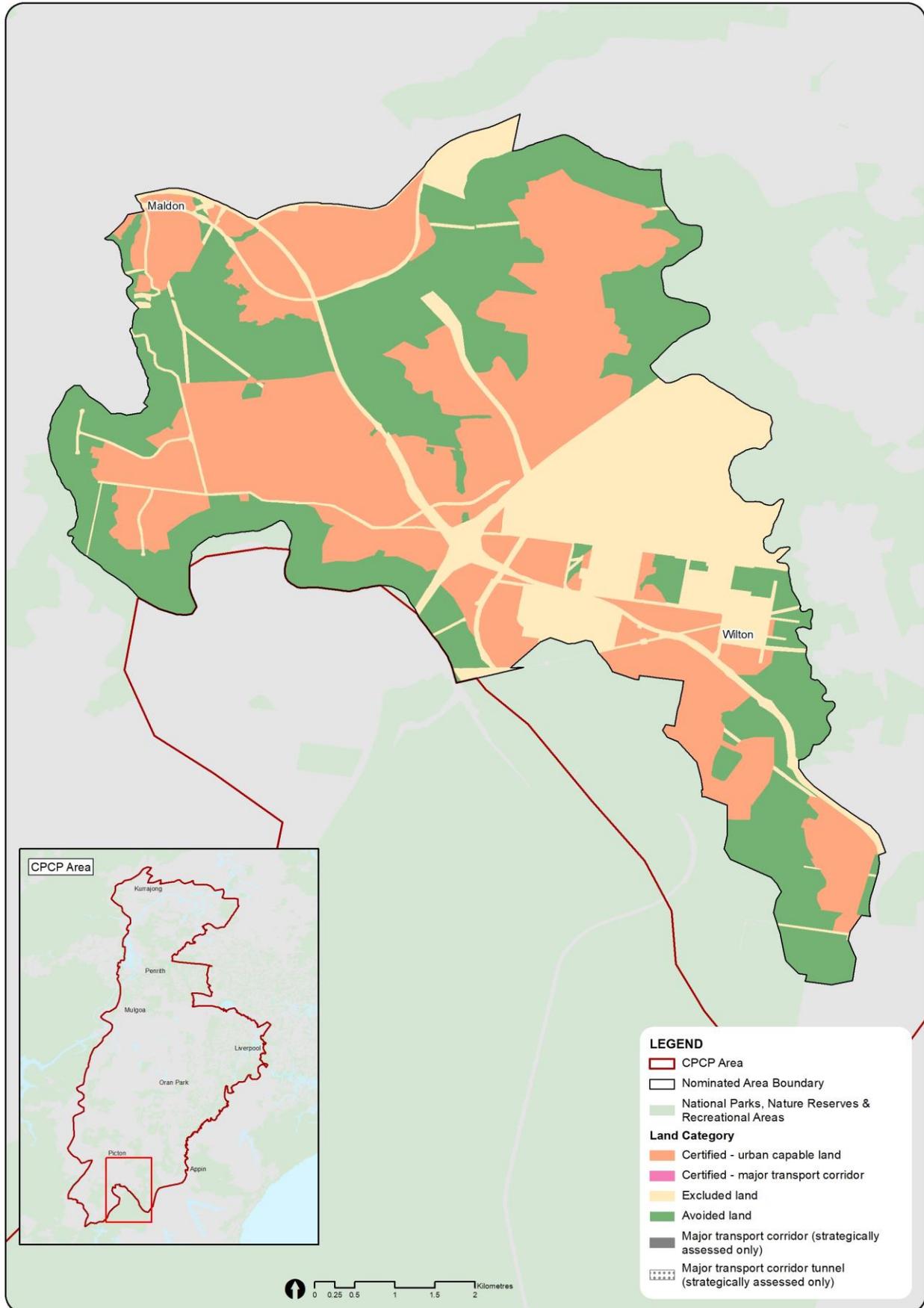


Figure 11. Wilton Growth Area land categories

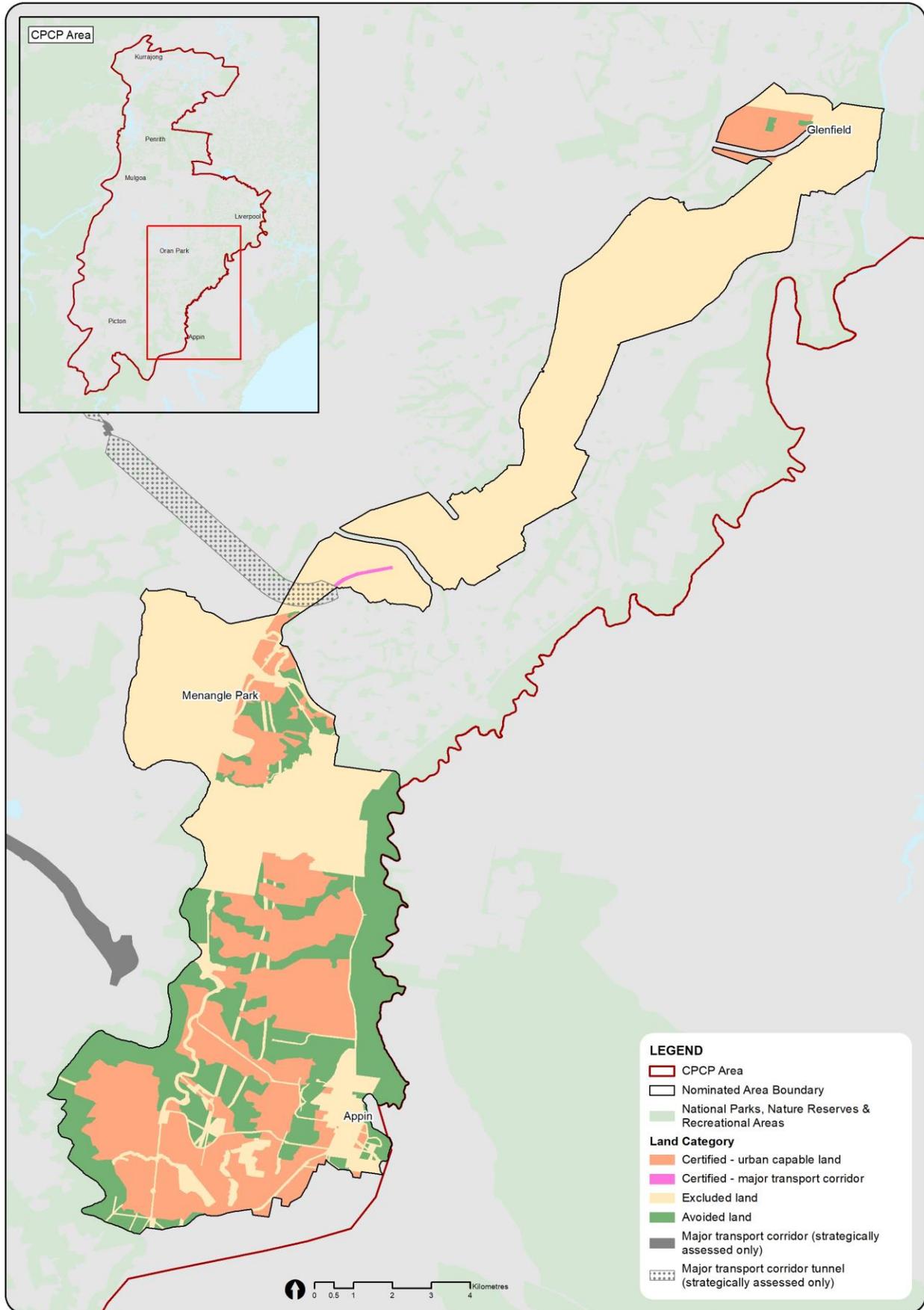


Figure 12. Greater Macarthur Growth Area land categories

Planning controls for avoided land

To protect land with biodiversity values (the avoided land), the CPCP will be supported by:

- planning controls to avoid and minimise impacts on land identified as avoided land, including:
 - a requirement for consent to clear native vegetation
 - a requirement for an authority to consider the impact on biodiversity values before granting development consent for development on avoided land
 - a requirement for an authority to consider the impact of subdivision on the continued protection of threatened ecological communities, threatened species and their habitats
- a ministerial direction under section 9.1 of the NSW *Environmental Planning and Assessment Act 1979* to protect areas identified as having biodiversity value.

The department will introduce the planning controls through a new chapter in the *State Environmental Planning Policy (Biodiversity and Conservation) 2021* (hereafter referred to as Biodiversity and Conservation SEPP). The purpose of the controls is to ensure development in the nominated areas is consistent with the BC Act, the EPBC Act and the commitments and actions of the CPCP.

The planning controls will protect important biodiversity on avoided land identified in the CPCP but will not change existing land use zones or the current permitted land uses. The controls will require development consent for any clearing of native vegetation on avoided land and for a consent authority to consider the impact of a proposed development on the biodiversity values of the avoided land before granting development consent.

A ministerial direction made under section 9.1 of the Environmental Planning and Assessment Act will also be introduced for avoided land. It aims to protect land with high biodiversity value from the impacts of development. The ministerial direction will require a planning proposal to demonstrate that it protects or enhances biodiversity, including native vegetation, threatened ecological communities, threatened species and their habitats, koala habitat and corridors, and matters of national environmental significance. The ministerial direction will also prevent rezoning of avoided land to urban development zones.

Land owned or under claim by a local Aboriginal land council is an exception, as development controls will not apply to this land.

Aligning precinct planning with certified areas

Structure plans or equivalent strategic plans will guide the development of precinct plans for each nominated area. Detailed precinct plans will identify land uses and associated development and infrastructure while considering local issues. Considerations include locating new homes and employment centres close to public transport, shops and services, and retaining and enhancing a community's character.

A ministerial direction made under section 9.1 of the Environmental Planning and Assessment Act will support the rezoning of avoided land in the nominated areas to environment protection zones, a public recreation zone or a special purpose zone. It will prevent rezoning of avoided land to an urban development zone to ensure urban development is contained to the certified-urban capable land. Structure plans and precinct plans will be consistent with the conservation outcomes of the CPCP and reflect the avoided land and certified-urban capable land boundaries of the CPCP.

Asset protection zones

An Asset Protection Zone is a buffer zone between a bushfire hazard and buildings or other infrastructure that needs to be protected. It is managed to minimise fuel loads and reduce potential radiant heat levels, flames, localised smoke and ember attack. The appropriate distance is based on vegetation type, slope and the nature of the development and is determined by the [Rural Fire Service's Standards for Asset Protection \(PDF 471 KB\)](#).

Due to the impacts of managing the land to reduce fire hazards, the planning controls in the Biodiversity and Conservation SEPP require that Asset Protection Zones are located within the certified-urban capable land in the nominated areas. As part of the subdivision design, the Asset Protection Zone may include perimeter roads or parks and recreational areas. While part of the urbanised landscape, the Asset Protection Zone can act as a buffer to the important vegetation that has been avoided from development.

Essential infrastructure development

The certified-urban capable land provides for suitable urban development areas identified through the strategic conservation planning process. However, planning for essential infrastructure is at different stages for each of the 4 nominated areas. This means there may be a need for further essential infrastructure development outside of the certified-urban capable land and within the areas identified as avoided land to support the establishment of the new urban areas over the next 4 decades and beyond.

The CPCP provides for EPBC Act approval of essential infrastructure in the avoided land up to impact thresholds detailed in Table 3. Impact thresholds have been derived from the remaining area of EPBC Act-listed threatened ecological communities within the avoided land of each nominated area and represent 2% of their remaining extent.

Table 3 Cumulative impact thresholds for EPBC Act-listed threatened ecological communities

Threatened ecological community (EPBC Act)	Greater Macarthur	Greater Penrith to Eastern Creek	Western Sydney Aerotropolis	Wilton
Coastal Swamp Oak (<i>Casuarina glauca</i>) Forest	Not present	0.10 hectares	0.50 hectares	Not present
Cooks River/Castlereagh Ironbark Forest in the Sydney Basin Bioregion	Not present	0.0047 hectares	0.50 hectares	Not present
Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest	0.70 hectares	1 hectare	0.60 hectares	Not present
River-flat Eucalypt Forest	0.30 hectares	0.80 hectares	1.80 hectares	Not present
Shale Sandstone Transition Forest in the Sydney Basin Bioregion	23.80 hectares	Not present	Not present	16.50 hectares
Western Sydney Dry Rainforest and Moist Woodland on Shale	0.30 hectares	Not present	Not present	Not present

Development in the avoided land will need to comply with the Cumberland Plain Conservation Plan Guidelines for Infrastructure Development, which includes specific requirements from 'Appendix E. Species and TEC-specific mitigation measures' of this document and 'Appendix A. Accessing EPBC approval for essential infrastructure development in the avoided land' of the CPCP. This includes requirements to avoid, minimise, mitigate and offset impacts to matters of national environmental significance. Future development in the avoided land must also obtain all relevant NSW approvals.

Proponents or public authorities who access the strategic assessment approval under Part 10 of the EPBC Act must follow the notification and reporting requirements in the strategic conservation planning chapter of the Biodiversity and Conservation SEPP or the *Environmental Planning and Assessment Regulation 2000*.

The department will be responsible for notifying proponents of essential infrastructure of their obligations under the CPCP and must monitor the impacts of development or activities in the avoided land and compliance with the avoidance, mitigation and offset commitments as required under commitments 2, 2.1 and 2.2 (Actions 4 and 5).

Future modifications to the certified-urban capable land

The department may undertake a formal modification to the CPCP biodiversity certification once it is approved to account for any minor errors or inconsistencies for future areas that has development potential (the certified-urban capable land) at a site scale (Commitment 1, Action 5).

Adjustments to the boundaries of the certified-urban capable land will only be made in circumstances where:

- minor adjustments are identified at the site level
- updates are consistent with the avoidance criteria and supported by a Biodiversity Assessment Method-accredited assessor
- residual impacts to biodiversity, including matters of national environmental significance, are mitigated and offset in accordance with the Biodiversity Assessment Method (or equivalent) and EPBC Act Environmental Offsets Policy 2012 for any EPBC Act matters not covered by the Biodiversity Assessment Method.

Avoidance within major transport corridors

The major transport infrastructure included in the CPCP is yet to be constructed and final construction alignments for the corridors are not yet certain. Additional avoidance in these corridors could be achieved as designs for the transport corridors are determined over the life of the CPCP.

The CPCP requires Transport for NSW to avoid and minimise impacts to biodiversity, including matters of national environmental significance, in developing the 4 major transport corridors.

This includes:

- applying avoidance criteria within certified-major transport corridors or applying the BC Act Biodiversity Assessment Method (or equivalent) within major transport corridors (strategically assessed only) for each major transport project, with specific consideration to the matters identified in Commitment 3
- considering the biodiversity benefits of avoiding threatened ecological communities, species and their habitat as well as the costs of offsets in evaluating route options (for example, by using multi-criteria analysis)
- locating Asset Protection Zones, if required, within the major transport corridors

- minimising impacts as far as possible using design refinements to reduce overall impact where they cannot feasibly or practically be avoided.

Transport for NSW must report to the department and executive implementation committee on development impacts through a clearing reconciliation report (for certified-major transport corridors) or through the NSW state significant infrastructure or NSW state-significant development approval (or equivalent) for each transport project in the corridors (strategically assessed only).

The department will use this information to track impacts through the reconciliation accounting process. The impacts to biodiversity (including matters of national environmental significance) will be reported on and published regularly through annual updates and five yearly reviews.



Mitigating indirect and prescribed impacts

Highlights

Use best-practice standards to mitigate indirect and prescribed impacts from urban development, infrastructure, intensive plant agriculture and major transport corridors on threatened ecological communities, species and their habitats by:

- developing a set of development controls for the nominated areas (implemented through state-led development control plans (DCPs) and the Cumberland Plain Conservation Plan Mitigation Measures Guidelines)
- providing support to councils and other proponents in applying development controls and sharing knowledge, maps and data
- installing koala-exclusion fencing between important koala habitat and urban land to safely support the movement of koalas within Greater Macarthur Growth Area and Wilton Growth Area and along Appin Road
- implementing impact mitigation measures in accordance with specific measures to address risk to threatened ecological communities, species, habitat and other features, in accordance with 'Appendix E. Species and TEC-specific mitigation measures'.

The development of the nominated areas and major transport corridors will have indirect or prescribed impacts in addition to the direct impacts to biodiversity from clearing native vegetation. Indirect impacts are defined as those occurring beyond vegetation clearing and changes in land-use patterns.

Prescribed impacts are impacts on biodiversity values that do not comprise direct clearing of native vegetation and are listed in clause 6.1 of the *Biodiversity Conservation Regulation 2017* (NSW).

Understanding and addressing indirect and prescribed impacts resulting from the development identified in the CPCP is a requirement under the EPBC Act and the BC Act.

The Cumberland Plain Assessment Report has assessed these potential impacts on threatened ecological communities, species and habitat, including serious and irreversible impacts entities (refer to Chapter 15 of the assessment report for indirect impacts, Chapter 24 for prescribed impacts and Chapter 25 for the serious and irreversible impacts assessment).

Mitigation measures are needed to address the range of indirect impacts associated with increased urbanisation and growth. Increased urbanisation in Western Sydney poses a suite of threats to local flora and fauna species, including habitat loss, fragmentation, increased disturbance, increased exposure to domestic animal attacks, vehicle strikes and exposure to chemical pollution.

Development requirements to mitigate potential impacts on biodiversity

The CPCP sets out measures to mitigate indirect and prescribed impacts to biodiversity. These mitigation measures address indirect and prescribed impacts to specific threatened ecological communities (TECs) and threatened species identified by the Cumberland Plain Assessment Report. 'Appendix E. Species and TEC-specific mitigation measures' of this document lists these mitigation measures and identifies which development they apply to, mechanisms for

implementation, the biodiversity matter affected and relevant nominated areas or location they apply to.

Mitigation measures will apply to certified-urban capable land and certified-major transport corridors within the nominated areas to address indirect impacts from development to biodiversity in or adjacent to certified land. These will be implemented as development requirements through the planning system by applying:

- a Development Control Plan (DCP) template to guide state-led DCPs for nominated areas
- the Cumberland Plain Conservation Plan Mitigation Measures Guidelines for nominated areas that do not have a state-led DCP in place – Greater Macarthur Growth Area and Greater Penrith to Eastern Creek Investigation Area.

Development applications in certified-urban capable land or certified-major transport corridors will be required to address the CPCP mitigation measures.

Two broad types of development controls will be implemented through state-led DCPs to protect biodiversity values and address the mitigation measures:

- general environmental controls that will benefit the environment, including biodiversity values (described in Chapter 15 of the Cumberland Plain Assessment Report)
- specific controls that apply to specific species and TEC-specific locations or broader nominated areas (described in 'Appendix E. Species and TEC-specific mitigation measures')

The Mitigation Measures Guidelines applies the same mitigation measures to address indirect impacts to threatened ecological communities and species that would otherwise be implemented through state-led DCPs in accordance with 'Appendix E. Species and TEC-specific mitigation measures'. It does not include general environmental controls included in the DCP template.

In addition, the department will:

- audit growth area DCPs to ensure the Cumberland Plain Conservation Plan DCP template development controls are incorporated in accordance with the DCP requirements for each growth area (Commitment 5, Action 4)
- monitor the implementation of the development controls through approval conditions by the relevant consent authority and, if monitoring finds that development controls are not being implemented, review and redraft new controls to update relevant state DCPs and re-educating councils to ensure stronger consideration of the controls through their assessment process (Commitment 5, Action 5)
- provide ongoing support to councils in the application of DCP controls within the nominated areas, including sharing knowledge, maps and data (Commitment 5, Action 3).

'Case study 1. DCP controls for Wilton Growth Area' provides an overview of this process.

Case study 1. DCP controls for Wilton Growth Area

Mitigation measures were developed for risk and threats to biodiversity in Wilton using a scientifically grounded, species-based method. These were drafted as development controls and included in the Cumberland Plain Conservation Plan DCP Template to address threatened ecological communities, species and their habitats in the Wilton Growth Area.

Method

Threatened species and ecological communities in Wilton were identified using the [Biodiversity Assessment Method](#). This work included on-ground surveys by ecologists, predictive habitat modelling and a process of expert review.

Threats and management measures for each species occurring in Wilton were sourced from [NSW BioNet](#), a scientific, peer-reviewed platform supported by the NSW Government. Using this data, a list of common threats was prepared, eliminating repeated threats and combining those with similar management measures.

The list of threats and management measures were then synthesised into objectives and specific development controls for Wilton. The proposed objectives and development controls were assessed in the threat matrix, showing how they mitigate biodiversity threats and providing an evidence-based process to ensure the threats identified have been addressed.

Development controls to address risks and threats

Biodiversity controls have been developed and directly integrated into the precinct planning process for Wilton Growth Area through the draft Wilton Growth Area DCP. These controls inform the protection of biodiversity and address species and threatened ecological communities. They cover both direct and indirect threats to biodiversity in Wilton Growth Area.

These Wilton-specific objectives and controls were reviewed by council and are designed to improve biodiversity outcomes, guide neighbourhood planning and minimise indirect and prescribed impacts in the Wilton Growth Area.

Mitigation measures for infrastructure activities

The department will introduce the Cumberland Plain Conservation Plan Guidelines for Infrastructure Development, which includes mitigation measures for indirect and prescribed impacts to biodiversity from infrastructure activities (including essential infrastructure) assessed under Part 5.1 of the Environment Planning and Assessment Act 1979, in accordance with 'Appendix E. Species and TEC-specific mitigation measures' and for some Part 4 activities that are essential infrastructure in the avoided land.

These will include for example, minimising the spread of weeds and other pathogens and minimising human disturbance to certain threatened species populations.

Minimising impacts to threatened species on public land

The Cumberland Plain Assessment Report has recommended the following actions to manage disturbance and indirect impacts to threatened species on public land (Commitment 5; Action 8):

- Ensure walking tracks and management trails in Wianamatta Regional Park are located in a way that avoids and minimises exposure of *Persoonia nutans* to human disturbance.
- Ensure land management in potential habitat for *Pimelea spicata*, particularly mowing and slashing activities and weed management activities involving the use of herbicides, will minimise risks and maintain the species.

- Work with NSW DPI – Fisheries to address the risk of illegal and incidental recreational fishing capture along stretches of known habitat for Macquarie perch in Erskine Creek, Glenbrook Creek, Georges River and Cordeaux River.
- Install signs and/or interpretive displays at appropriate sites in areas used for recreational fishing along Erskine Creek, Glenbrook Creek, Georges River and Cordeaux River to help with identification of Macquarie perch and promote awareness of threats.

The department will consult with the relevant public land manager at these sites to minimise disturbance and impacts to these threatened species in accordance with Appendix E of the CPCP.

Mitigating impacts on the Southern Sydney koala population

Koalas are one of Australia's most iconic animals. However, their number and distribution has significantly declined in recent years. The Southern Sydney koala population is one of 2 known populations in the Cumberland subregion. It occurs within and near the Wilton and Greater Macarthur growth areas.

As land use changes in Western Sydney and the area becomes more urbanised, these koalas will be exposed to increasing threats, including habitat loss and fragmentation, domestic dog attacks, drowning in swimming pools, vehicle strikes, fire and climate change.

Koala-exclusion fencing will be installed between koala habitat protected under the CPCP and new urban release areas where practical. This will separate koala habitat from certified-urban capable land and protect koalas from the increased threats. In some circumstances, exclusion fencing may not be suitable due to the land's topography, the existence of waterways or creeks, or the land being a heritage-listed area.

The koala-specific development controls are included in 'Appendix E. Species and TEC-specific mitigation measures', which lists mitigation measures to be adopted in nominated areas or precinct-specific DCPs where koalas are present. Precinct design requirements to address koala management will be included in the relevant development control plans for Wilton Growth Area and the Mitigation Measures Guideline for Greater Macarthur Growth Area.

Further detail on mitigation measures to protect koalas is given in Sub-Plan B.

Mitigating impacts from major transport corridors

Constructing and operating major transport corridors could have indirect and prescribed impacts on biodiversity. Mitigation or safeguard measures are detailed during the environmental impact assessment and undertaken during construction and operation.

Transport for NSW will assess the impacts on biodiversity and other environmental values based on detailed design and implement mitigation measures in accordance with published, best-practice guidelines. This includes Transport for NSW's [Biodiversity Guidelines 2011 \(PDF 8.07 MB\)](#).

Transport for NSW must also undertake ongoing monitoring of high-value environmental areas and review and adjust mitigation measures (where practical) in response to monitoring outcomes.

The Cumberland Plain Assessment Report made specific recommendations to manage and mitigate indirect and prescribed impacts from the operation and construction of major transport corridors. These are listed in 'Appendix E. Species and TEC-specific mitigation measures'.

Transport for NSW will report to the department and executive implementation committee on mitigation measures proposed to manage impacts of each major transport corridor project, including proposed techniques, timing, frequency and responsibility for implementing each measure (Commitment 6, Action 2).



Conserving flora, fauna and associated habitat

Highlights

- Protect a minimum of 5,325 hectares of target threatened ecological communities within a conservation land, including ecological restoration, to conserve biodiversity values in perpetuity
- Up to 11,900 hectares of land could be protected through the conservation program to achieve the native vegetation offset target
- Establish the Georges River Koala Reserve by protecting and managing up to 1,830 hectares of important koala habitat (including through ecological restoration) along the south-eastern edge of the Cumberland subregion
- Undertake ecological restoration of cleared or degraded habitat to extend habitat for over-cleared vegetation types and enhance landscape connectivity

This category of commitments focuses on securing conservation land to protect biodiversity in perpetuity through a network of protected private and public actively managed bushland across the Cumberland subregion.

Conservation land will comprise new national parks and/or additions to existing ones, council- or community-based biodiversity reserves, and biodiversity stewardship sites on public or private land. The commitments will account for at least 90% of conservation program funds over the life of the CPCP.

New national parks and reserves will ensure the largest and most intact remnants of vegetation are protected in perpetuity. At the same time, conserving biodiversity on private land through stewardship agreements can expand the range of natural values that are protected. Developing a network of protected areas through small and large 'stepping-stone' reserves and stewardship sites can provide buffers and corridors to improve landscape connectivity and build resilience to the impacts of climate change.

The department has identified 3 reserve areas as being critical to the protection of BC Act- and EPBC Act-listed TECs and species, and to enhance ecological connectivity across the landscape to protect biodiversity. These are the Georges River Koala Reserve, announced as an immediate priority of the CPCP, and 2 additional public reserves under investigation:

- Gulguer Reserve Investigation Area
- Confluence Reserve Investigation Area.

The CPCP will prioritise funding for purchasing land within these 3 reserve areas in the first 5 years of the plan. Lots identified for early transfer to NSW National Parks and Wildlife Service in the Georges River Koala Reserve will be gazetted within 2 years of approval.

In addition, the department will work with the Biodiversity Conservation Trust to encourage landholders to establish new biodiversity stewardship agreements in areas such as Razorback. The Razorback area is dominated by Cumberland Plain Woodland in addition to other threatened ecological communities targeted for offsets under the CPCP. The Razorback area has unique

characteristics that present opportunities for conservation and for landholders to benefit financially by establishing biodiversity stewardship agreements.

Over the long-term, the conservation program will purchase land in other suitable reserve sites, invest in biodiversity stewardship sites on public or private land across the strategic conservation area, and prioritise ecological restoration of native vegetation and habitat for over-cleared vegetation types to meet offset targets.

Ecological restoration will play a critical role in improving biodiversity outcomes by enhancing connectivity between remnant habitat patches and replacing some areas of over-cleared vegetation communities through reconstruction of cleared or severely degraded land in the strategic conservation area.

Protecting conservation land in the strategic conservation area is integral to achieving the long-term environmental outcomes of the CPCP. Larger remnants of vegetation communities are better able to support resilient populations of species and enhance connectivity. They are also less susceptible to 'edge effects', catastrophic events and the expected impacts of climate change (DECCW 2010). Evidence indicates that biodiversity loss significantly increases once habitat fragmentation by clearing exceeds 70% of the landscape. This threshold is already surpassed in the Cumberland subregion (DECCW 2010).

Direct purchase of credits from existing or new biodiversity stewardship sites outside of the strategic conservation area will also contribute to offset targets for threatened ecological communities or target species. This ensures that all landholders with a biodiversity stewardship agreement in place can benefit from the CPCP.

Aside from their biodiversity value, conservation land provides social and wellbeing benefits to local communities by increasing access to nature and green spaces, protecting heritage sites and contributing to the local economy through jobs and tourism. A clear imperative for the CPCP is to increase the network of protected areas and enhance ecological connectivity across the landscape.

The department is developing a 'conservation land implementation strategy' to meet the commitment to secure 5,325 hectares of target threatened ecological communities (Commitment 8, Action 1). The strategy will guide the selection, land purchase and implementation of conservation land by the CPCP over the life of the plan. More detail on the strategy is provided on page 99.

The next 3 sections outline the approach to establishing and delivering conservation land through:

- new reserves or additions to existing ones
- biodiversity stewardship sites
- ecological restoration of native vegetation and habitat.

Expanding the reserve system to protect biodiversity in Western Sydney

Over the life of the CPCP, it is intended that around half of the plan's offset target of 5,325 hectares of target threatened ecological communities could be protected and managed as part of an expanded reserve system (national parks system, council reserves and community reserves). To meet this offset target, much larger additions will be made to the reserve system. This is because purchased land will include areas of non-target plant community types, as well as cleared land that may be used to develop compatible recreational and visitor facilities in public reserves and to meet the size and boundary configurations necessary for a reserve or national park.

Reserves can take many forms in NSW. Table 4 outlines the different types of reserves being considered as part of the conservation program.

Table 4 Types of reserves proposed in the conservation program

Reserve type	Description	Manager
National park	A permanently reserved area that contains significant or representative ecosystems, landforms or natural phenomena, or places of cultural significance ⁴ . Visitors are provided for with regard to the areas' natural and cultural values.	NSW National Parks and Wildlife Service (NPWS)
Nature reserve	A permanently reserved area conserved for its unique or representative ecosystems, species, communities or other natural values Typically, it has limited public access and facilities.	NPWS
State conservation area	A permanently reserved area that contains significant or representative ecosystems, landforms or natural phenomena, or places of cultural significance Mining activities may be approved.	NPWS
Regional park	A permanently reserved area in a natural or modified landscape. Public recreation and enjoyment are encouraged. A trust may be appointed to manage a regional park under the <i>National Parks and Wildlife Act 1974</i> (NSW).	NPWS or appointed Trust (e.g. Western Sydney Parklands)
Council reserve	An area of land categorised as a 'natural area' within the 'community' classification of public land and recognised as an area of local conservation significance that can complement and enhance the formal national parks system Councils are generally responsible for funding the upkeep and management under the <i>Local Government Act 1993</i> and the <i>Crown Lands Management Act 2016</i> .	Council
Community-based reserve	A growing subset of the National Reserve System, standard mechanisms include either the donation of land or covenanting properties in a secure method that meets National Reserve System standards The community group responsible for the land sources funds to manage it, including through grants and sponsorships.	Community

Reserve implementation

Land tenure across the area covered by the CPCP is mostly freehold, meaning land will be purchased for reserves from private landholders on a voluntary basis over time. Areas that are best protected through the national parks system will likely have a long implementation phase to allow voluntary purchase. Smaller reserves, or additions to existing reserves, may be easier to establish. The complexity of the establishment process will depend on how many lots and landholders are involved in negotiations for each proposed reserve.

The 3 reserve areas described earlier have been identified as priorities for the CPCP due to their ecological values and contribution to landscape connectivity. New reserve proposals will be developed in consultation with the NSW National Parks and Wildlife Service and local councils, and through public engagement where possible. Reserve sites will be selected from the strategic

⁴ Under the *National Parks and Wildlife Act 1974* national parks, nature reserves, state conservation areas and regional parks can only be revoked via an act of parliament.

conservation area, as these contain large remnants of native vegetation with good connectivity or are areas with the potential to enhance connectivity on low- to medium-constraint land. Reserve design principles from the [NSW National Parks Establishment Plan 2008-2018 \(PDF 1.54 MB\)](#) (NPWS 2008) and the [Strategy for Australia's National Reserve System 2009-2030 \(PDF 7.49 MB\)](#) (NRMCC 2009) will also influence reserve proposals.

New reserves may also be managed by local councils or community organisations or jointly managed with local Aboriginal land councils. Council reserves and smaller community-managed reserves will be identified in consultation with the relevant delivery partner. These reserves are more suitable in areas that:

- provide a buffer to adjacent urban development
- provide habitat for iconic species (such as primary, secondary and tertiary koala corridors)
- present a strong opportunity to provide connectivity
- are not aligned with the size and boundary configuration needed for a larger reserve.

The most appropriate long-term land manager of a given reserve will be determined with support from the National Parks and Wildlife Service and, if relevant, the local council. Designating a reserve type under the national parks system is considered in the final stages of the gazettal process and is led by the NSW National Parks and Wildlife Service in consultation with relevant NSW Government agencies.

The department will work with the NSW National Parks and Wildlife Service and local Aboriginal land councils to investigate opportunities for Aboriginal communities to jointly manage new conservation reserves established through the CPCP (Commitment 21, Action 2).

Biodiversity stewardship agreements will be established on land purchased by the Office of Strategic Lands where possible. The land will then be transferred (together with the biodiversity stewardship agreements, title covenants and ongoing annual management payments) to a suitable long-term public land management authority such as the National Parks and Wildlife Service, local government, the Western Sydney Parklands Trust or an appropriate community-based organisation. This will ensure funding for ongoing active management of reserve sites is secured in perpetuity. The reserve establishment process is demonstrated in Figure 13.

Land purchase

The Office of Strategic Lands is responsible for purchasing land for future reserves established through the CPCP. The Office of Strategic Lands purchases land for a range of NSW Government programs for various purposes including biodiversity, open spaces and new infrastructure. A formal agreement between the department and the Office of Strategic Lands will outline the arrangements that will govern land purchases, including roles and responsibilities, processes for implementation and progress reporting (Commitment 8, Action 6).

A land purchase strategy is being developed to guide decision-making and the processes that will be used to purchase land for conservation (Commitment 8, Action 1). As part of this, the department will establish a community engagement program with landholders in the strategic conservation area to identify landholders interested in selling land. (Commitment 11, Action 3).

All properties identified for purchase by the Office of Strategic Lands will be acquired through voluntary agreement wherever possible (market purchase, property acquisition by agreement or active acquisition).

Compulsory acquisition may be used in limited circumstances and only when the adaptive management steps for offsets have been triggered (see ‘Establishing conservation land as offsets’ on page 91). If compulsory acquisition is considered, the land will be identified in the Biodiversity and Conservation SEPP. This will not happen until at least year 5 of the CPCP.

Land for purchase will be identified every 5 years or as funding becomes available in accordance with the conservation land implementation strategy. In these cases, consultation with landholders and key stakeholders will be undertaken before a final decision is made.

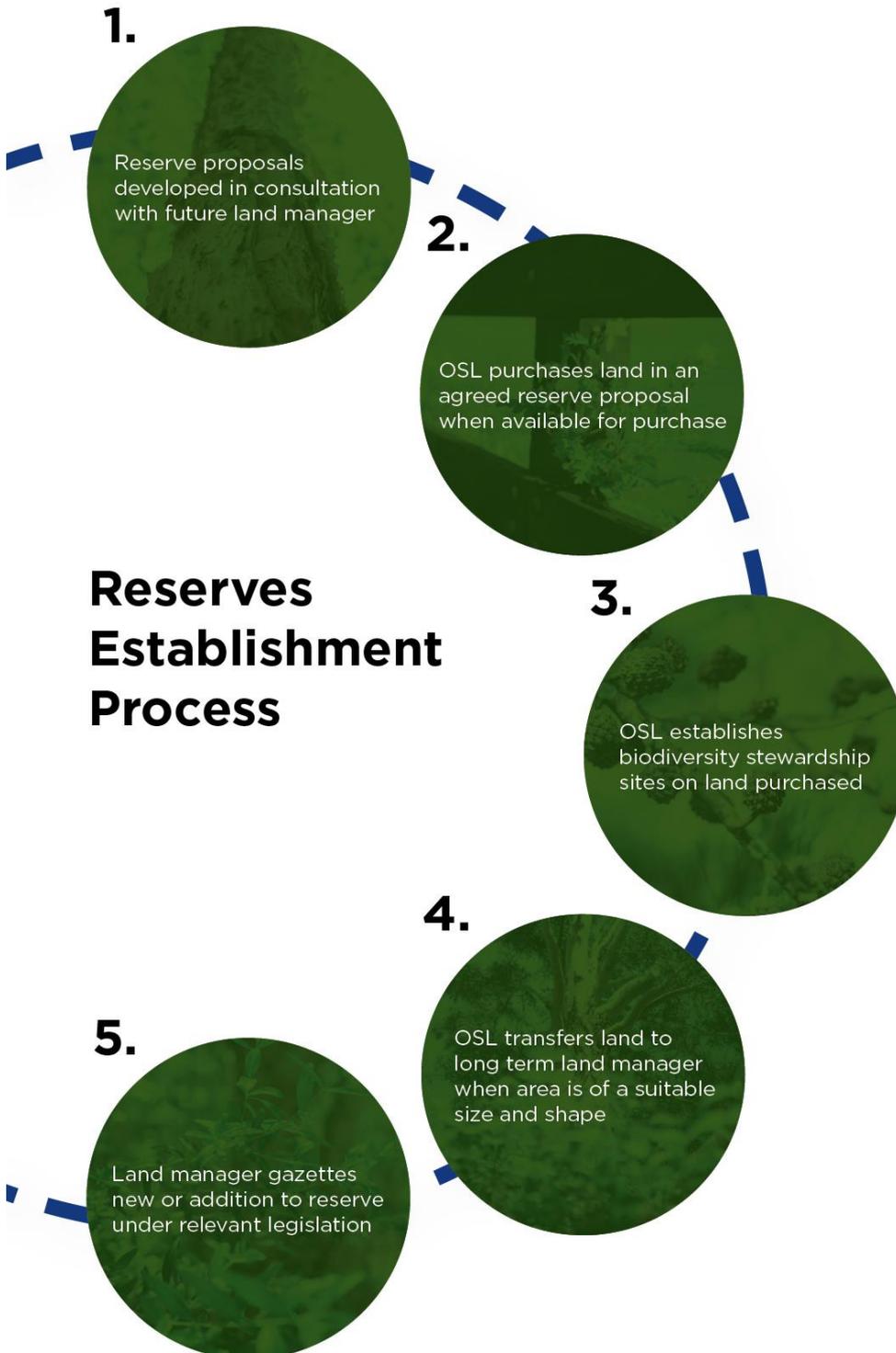


Figure 13. Process for establishing reserves through the Office of Strategic Lands

Staging the reserve program

An immediate priority of the CPCP will be to secure Stage 1 of the Georges River Koala Reserve proposal, a key commitment to protect one of the area's most iconic species. Lots identified for early transfer to National Parks and Wildlife Service will be reserved as the first step in establishing the Georges River Koala Reserve by year 2 of the CPCP (Commitment 10, Action 1). The remaining areas of Stage 1 (a and b) will be reserved by year 10 (Commitment 10, Action 2). The reservation of Stage 1 will conserve approximately 1,105 hectares of koala habitat protected under the CPCP between Appin and Kentlyn to secure the north–south koala corridor (see 'Case study 2. Georges River Koala Reserve').

Stage 2 will form additions to the reserve over time. Stage 2 will comprise up to 725 hectares of additional land between Kentlyn and Long Point as future additions to the reserve by year 20 (Commitment 10, Action 3). Sub-Plan B provides more detail about establishing the koala reserve.

In addition to the Georges River Koala Reserve, other priority sites include the Gulguer Reserve Investigation Area and the Confluence Investigation Area. Investigating the feasibility of future reserves in these areas and investing in their protection will be a priority for the first 5 years of the CPCP. The Gulguer Reserve Investigation Area covers around 1,850 hectares of land in the southwest of the Cumberland subregion. The Confluence Reserve Investigation Area could protect up to 580 hectares in the north of the subregion. Other areas within the strategic conservation area have been identified for further investigation as future reserves to provide greater landscape connectivity, such as Bargo in the south-west of the CPCP Area.

Every effort will be made to secure a large proportion of the biodiversity offsets early in the life of the plan. However, the complete process to establish and gazette the entirety of these new reserves under the *National Parks and Wildlife Services Act 1974* may take up to year 20 due to the legislative processes required.

The department is preparing a 'conservation land implementation strategy' to guide the selection of reserve sites over the life of the CPCP (Commitment 8, Action 1). For larger reserve proposals, the executive implementation committee will work with key delivery partners, including the National Parks and Wildlife Service, Office of Strategic Lands and local councils to identify and prioritise potential reserve sites, identify a staging approach for each reserve site, and engage with landholders and the community. This will be undertaken in a way that is consistent with the conservation land implementation strategy. The department will also begin purchasing smaller parcels of land from suitable sites as they become available, if consistent with the strategy.

The department and key delivery partners (Office of Strategic Lands and National Parks and Wildlife Service) are developing formal agreements to guide the creation of reserves and ensure the CPCP meets its commitments to secure and protect biodiversity in Western Sydney.

Annual review of progress in meeting the offset targets will occur through a reconciliation accounting process (see 'Reconciliation of offsets and impacts' on page 99). This will guide future efforts and strategy for land purchases.

Should Aboriginal land claims exist on potential sites within a reserve proposal, these will not be considered for inclusion in the reserve until the claim is resolved.

Case study 2. Georges River Koala Reserve

The conservation program will establish the Georges River Koala Reserve, the most important north–south koala movement corridor along the Georges River between Appin and Long Point. The reserve will facilitate movement of koalas between Campbelltown and the Southern Highlands and promote the genetic diversity of the species. The establishment of the Georges River reserve was recognised in the [Advice on the protection of the Campbelltown koala population](#) (OSC 2020) as essential to the persistence of the Southern Sydney koala population. The reserve will protect and manage up to 1,830 hectares of koala habitat (including ecological restoration of cleared or degraded land), which is more than twice the required offset target for important koala habitat. The reserve will also give local communities accessible public space for recreation such as walking, education opportunities, and may provide opportunities for koala-based tourism.

Implementation

Stage 1 of the reserve includes approximately 1,105 hectares of land. Preliminary lots of Stage 1a will be reserved under the *National Parks and Wildlife Act 1974* (NSW) by year 2 of the CPCP, with the completion of Stage 1 expected to be established and reserved by year 10. This land is along the upper Georges River between Appin and Kentlyn. The Office of Strategic Lands currently owns around 60% of the land within the proposed Stage 1 of the reserve and is in the process of creating biodiversity stewardship sites on these parcels of land where possible. Once agreements are in place, the department will purchase and retire the biodiversity offset credits generated to fund the ongoing management of the reserve.

Further land purchases are needed to establish the remaining sections of Stage 1. These lands, particularly along the western side of Appin Road, will be the focus of ecological restoration work to strengthen and widen the corridor. Consultation with affected landholders will occur through the early years of the CPCP.

Stage 2 will comprise up to 725 hectares of additional land between Kentlyn and Long Point, which will be incorporated into the reserve by 2040. Office of Strategic Lands has significant land holdings in this area; however, further land purchase is required to complete the corridor. Some of this land is owned by local councils and local Aboriginal land councils. The department will consult with these stakeholders, including providing information on how biodiversity stewardship agreements could be established on some or all of their lands.

Maximising connectivity across the landscape

The landscape covered by the CPCP is highly fragmented. However, it remains an important area for many threatened and iconic species, including the koala, woodland birds and a range of other flora and fauna. Maximising connectivity across the landscape will improve biodiversity outcomes as it will allow linkages between habitats, species, communities and ecological processes to be formed. This can improve genetic diversity and the persistence and viability of threatened ecological communities and species.

Building connectivity is particularly important in over-cleared landscapes. Improving landscape connectivity in these areas enhances ecosystem resilience, providing a means to withstand ecological shocks such as drought, bushfire, floods, disease and anthropogenic climate change. It also provides connections to habitat refugia, which will become more important for plant and animal species as habitat conditions respond to climate change.

A viable network of protected areas on public and private land in Western Sydney will require:

- large remnants to continue to sustain populations of Cumberland subregion species
- enough connectivity to allow fauna and seed movement between habitat patches
- refuge areas where species can avoid the worst consequences of major, unplanned events such as drought, fire or flood
- restoration to enhance key habitat components and connect the best remaining remnants.

Securing key corridors across the landscape

The Conservation Priorities Method (see 'Appendix D. Conservation Priorities Method') identified areas that represent large remnants of native vegetation with good connectivity or areas with the potential to enhance connectivity on low- to medium-constraint land. The output of the method – the 'strategic conservation area' – covers approximately 27,200 hectares or 14% of the CPCP Area.

The strategic conservation area presents opportunities for securing connectivity across multiple scales by connecting core areas of remnant native vegetation. It also connects core areas within the CPCP Area to adjacent, large, protected areas such as the Blue Mountains national parks and Sydney catchment lands. In addition, the strategic conservation area identifies and prioritises the conservation of species-specific movement corridors, such as the north–south and east–west koala movement corridors in south-western Sydney.

The highest priority for reservation as a national park would be large parcels of land in critical areas for key habitat restoration or connectivity. Other areas critical for building a viable conservation network may be suitable as either additions to the existing reserve network or conserved through biodiversity stewardship agreements. The conservation mechanism through which land is conserved will depend on the size of the lots, willingness of landholders to sell, or other significant challenges to protecting the land for conservation.

The Georges River Koala Reserve is a key commitment of the CPCP to secure the north–south koala movement corridor along the Georges River. The other 2 reserve investigation areas provide valuable opportunities to enhance connectivity in critical areas.

The Gulguer Reserve Investigation Area could provide an east–west corridor between existing protected lands in the Warragamba area. It aims to extend Gulguer Nature Reserve and Bents Basin State Conservation Area and connect them with the Burragorang State Conservation Area. This extended reserve would create an important biodiversity corridor and increase public access to green spaces that are currently heavily used.

The establishment of the Confluence Reserve, which would be located adjacent to the Windsor Downs Nature Reserve, would support the east–west corridor in the existing Londonderry reserve network, which additionally includes Agnes Banks, Wianamatta, and Castlereagh nature reserves. This proposal entails restoring at least 370 hectares of cleared land, including land with the potential to restore the River-flat Eucalyptus Forest ecological community, which has been recently listed as critically endangered under the EPBC Act. This would make Confluence Reserve the largest restoration project within the CPCP.

Figure 14 shows the location of the 3 reserve proposals and their connectivity with already protected land (either in the NSW national parks system or protected under a NSW State Environment Planning Policy).

Other areas within the strategic conservation area will be identified for further investigation as future reserves to provide greater landscape connectivity. This includes the Bargo area which includes large areas of Crown land and includes koala habitat protected under the CPCP.

Additional corridors will be identified from the strategic conservation area during implementation as part of the conservation land implementation strategy. These may include east–west corridors such as the Nepean River, and north–south corridors such as Razorback Range (see 'Case study 3. Nepean corridor and Razorback Range') and Allens Creek. In these areas, the conservation program will seek to establish smaller reserves or encourage landholders to enter into biodiversity stewardship agreements to protect and manage that land in perpetuity.

Case study 3. Nepean corridor and Razorback Range

The Nepean River riparian corridor and the Razorback Range have significant areas of remnant native vegetation. They contain the main areas of vegetation in the southern part of the CPCP Area and provide a vegetated link. They combine the forested areas in the catchment lands, the military reserve and Dharawal National Park between the CPCP and the coastal escarpment across to the elevated landscapes of the southern Blue Mountains around Warragamba Dam.

The Nepean corridor follows the gorge of the Nepean River and includes the shale-enriched upper slopes, steep sandstone cliffs, scarps, talus slope low in the valley and the rocky, pool-and-rapids riverine channel itself. The corridor supports a diverse range of open forest communities. The varied landscape provides widely diverse habitats in a range of open forest communities and has steep sandstone slopes that provide crevices and caves.

Razorback Range is a steep-sided, shale-dominated landscape. The slopes have enriched soils and often form to quite a depth. The sheltered southern side has sharp-sided gullies that form closed forests and in wetter spots hold small pockets of Western Sydney Dry Rainforest. The elevated landscape provides relief from the higher temperatures of the lowlands to the north, and the landform itself (being one of the higher parts of the landscape inland from the coast) intercepts the south-easterly winds that carry moisture from the coast, resulting in a localised area of orogenic rainfall. This helps to maintain the moisture in the soil, the water available for wildlife and the ability of the vegetation to tolerate longer dry periods.

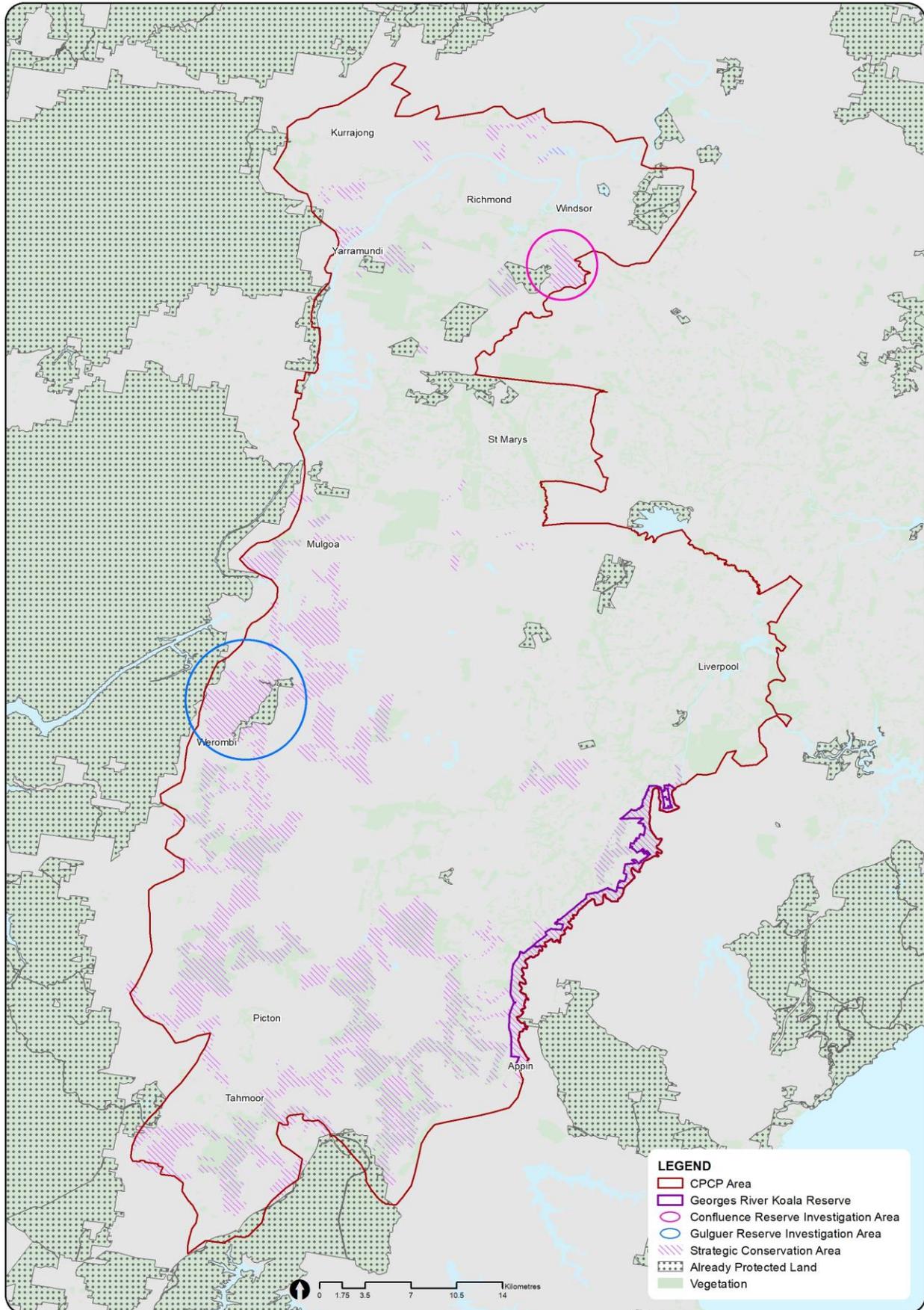


Figure 14. The proposed reserve investigation areas within the strategic conservation area

Biodiversity stewardship sites on public or private land

A biodiversity stewardship agreement is a cooperative agreement between a landholder and the NSW Government. The landholder voluntarily enters into the agreement and manages the biodiversity stewardship site in accordance with an agreed management plan. A biodiversity stewardship agreement is registered on the title of the property and provides in-perpetuity protection of the site's biodiversity values, with a secure, ongoing funding source. The agreement doesn't have to cover all land within a property. Some land can be set aside as an agreement site to be protected while regular activities can continue on the remainder.

Stewardship agreements are an important mechanism to support Western Sydney's biodiversity and growth over the long term. More than 75% of the remaining native vegetation within the Cumberland subregion is privately owned (Open Lines 2020).

Establishing biodiversity stewardship sites on private land is particularly useful when the land is characterised by fragmented patterns of ownership (such as the landscape covered by the CPCP). Managing conservation land as stewardship sites can offer opportunities to expand the range of natural values that are protected while providing buffers and corridors to already protected areas.

Stewardship agreements can also give landholders an opportunity to generate an income through trading biodiversity credits. Credits are generated by the expected improvement in biodiversity under management at the site.

Biodiversity stewardship sites can also be established on public land, for example on smaller parcels of council-owned land, where that land is continually managed under a biodiversity stewardship agreement.

Over the life of the CPCP, the NSW Government expects around half of the 5,325 hectares targeted will be protected and actively managed through stewardship agreements not intended for a future reserve. Like with reserves, stewardship sites will be selected from the strategic conservation area, or directly adjacent, as a priority.

Implementation of biodiversity stewardship sites

The department has established a formal agreement with the Biodiversity Conservation Trust to manage the biodiversity stewardship program. The Biodiversity Conservation Trust is the NSW Government agency established under the BC Act to deliver offsets. The biodiversity stewardship program is a key component of the CPCP which will contribute to in-perpetuity protection of habitat for threatened species and ecological communities.

Unlike reserves, it will not be necessary to purchase land to establish stewardship sites. Landholders wishing to enter into an agreement can generate biodiversity credits and earn an income from trading these credits. A biodiversity stewardship agreement does not need to cover all land held by a landholder. They can set aside a portion of their property to manage for biodiversity. The process for establishing a stewardship agreement is demonstrated in Figure 15.

If a landholder wants to establish a stewardship site, the land is first assessed by an accredited biodiversity assessor. If approved, a biodiversity stewardship agreement is registered on the land title and accompanied by a management plan setting out the agreed initial and recurrent management actions.

The biodiversity stewardship program will provide up-front funding for business cases and biodiversity assessments to support landholders entering into biodiversity stewardship agreements, where this investment can be recouped through the later sale of biodiversity credits to the department (Commitment 8, Action 7).

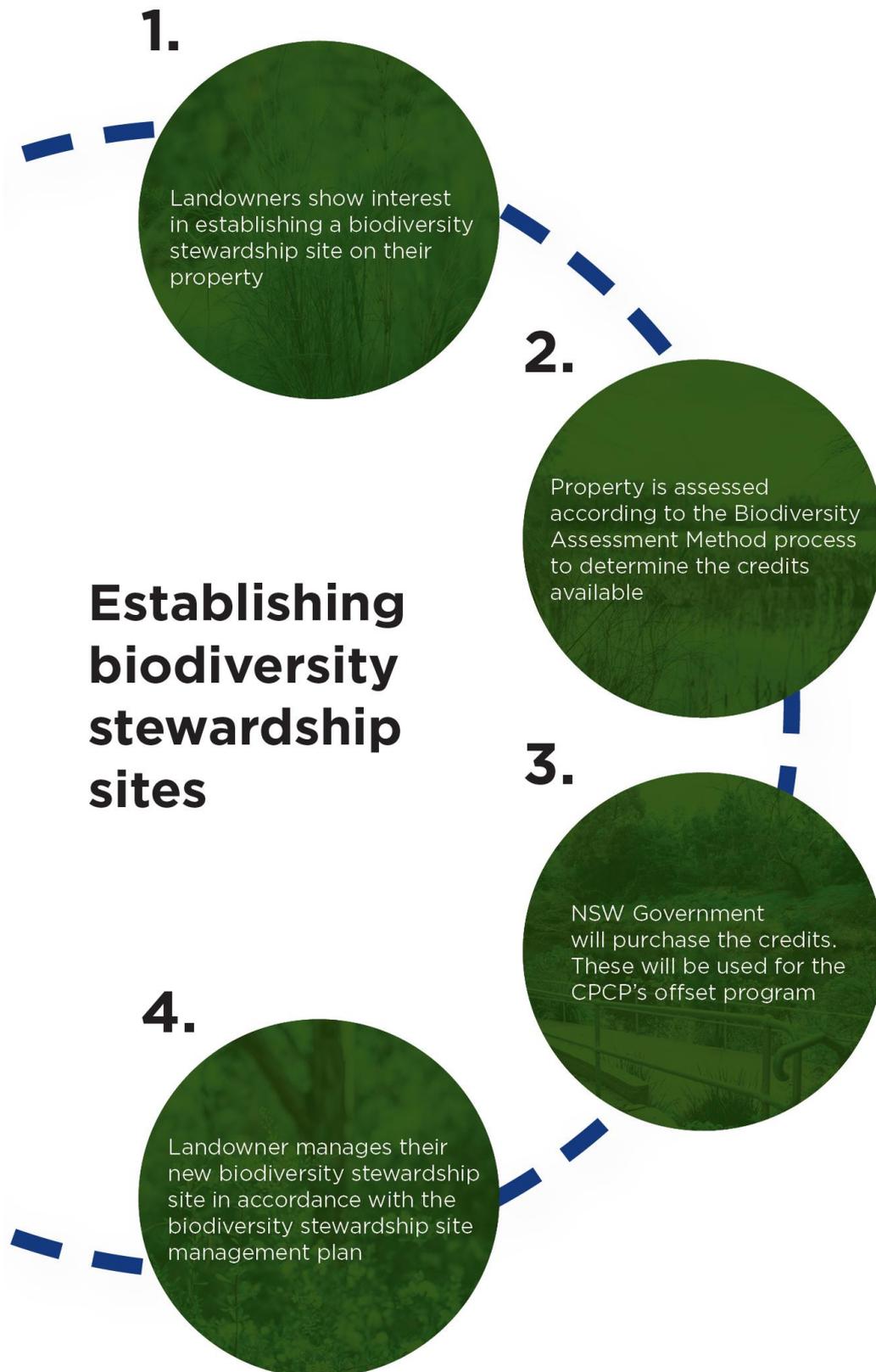


Figure 15. The process of establishing a biodiversity stewardship agreement

Landholders with agreements in place must conduct annual monitoring and reporting to demonstrate how they have used annual payments to manage the land in accordance with the management plan. The Biodiversity Conservation Trust can also provide advice to landholders on how to manage their land in accordance with the management plan if necessary. All landholders receive annual management payments that fund the cost of management work on their stewardship sites.

The department and the Biodiversity Conservation Trust are establishing a community engagement program to promote the opportunities and benefits of stewardship sites to landholders in the strategic conservation area (Commitment 20, Action 5).

The CPCP allows for flexibility in reaching biodiversity offset targets through the conservation land selection steps. This includes the opportunity to establish biodiversity stewardship sites or purchase credits from outside the strategic conservation area when offset sites within the strategic conservation area are not available. The conservation land selection steps and overarching implementation principles are further detailed in 'Establishing conservation land as offsets' on page 91.

As the delivery partner for the biodiversity stewardship program, the Biodiversity Conservation Trust will work with landholders to protect target vegetation and habitat through biodiversity stewardship agreements, in line with the principles, selection steps and offset requirements set out in the CPCP, and the conservation land implementation strategy.

As a priority of the program, the Biodiversity Conservation Trust will encourage landholders to establish new biodiversity stewardship agreements within or adjacent the strategic conservation area, including in areas such as Razorback. The Razorback area is dominated by Cumberland Plain Woodland in addition to other threatened ecological communities targeted for offsets by the CPCP. The Razorback area has unique characteristics that present opportunities for conservation and for landholders to benefit financially by establishing biodiversity stewardship agreements (see 'Case study 4. The Razorback area').

Many properties suitable for biodiversity stewardship within the strategic conservation area contain both target and non-target ecological communities. To ensure the CPCP can meet its offset targets while also contributing to landscape connectivity, some non-target credits may be purchased through the biodiversity stewardship program, particularly where the purchase of these credits is needed to support the financial viability of a proposed stewardship site.

Periodic review of the plan's progress will inform future efforts and strategy for selecting and establishing stewardship sites.

Case study 4. The Razorback area

The Razorback area is located north of Picton and south of Theresa Park, with Orangeville and Spring Creek to the west, and Camden Park to the east (see Figure 16). The area has several features that make it appealing for conservation through stewardship sites, such as:

- its proximity to already protected land, including the Blue Mountains World Heritage Area and Burratorang State Conservation Area
- its suitability for an east–west corridor linking important koala habitat to protected land
- its suitability for a north–south corridor linking Gulguer and Tahmoor
- its suitability for BIO Map cores and corridors
- it contains several medium to large biobanking sites.

There is an opportunity to connect vegetation patches in the landscape in the Razorback area, providing a broader regional corridor. Establishing stewardship agreements in this area would strengthen the east–west corridor and reinforce a link to primary and secondary koala habitat in the south-east of the CPCP Area. Several threatened fauna species have been identified within the area, including the koala, Cumberland Plain land snail and the swift parrot.

This area is away from the proposed urban development and is not a priority area for planned growth. The land includes a high proportion of private ownership, which presents opportunities for landholders to benefit financially. The primary land uses in the area are grazing of native vegetation and modified pasture, limited cropping, and for residential and farming infrastructure.

Vegetation

Several important flora species are present in this area, including *Pimelea spicata* and *Cynanchum elegans*. The area is dominated by Moist Shale Woodland (PCT 830), Cumberland Plain Woodland (PCT 850) and Western Sydney Dry Rainforest (PCT 877). Smaller areas of PCT 835 (equivalent to River-Flat Eucalypt Forest), a threatened ecological community newly listed as critically endangered under the EPBC Act, are present along the mapped drainage lines in the Razorback area.

Restoration opportunities

The site contains significant restoration opportunities for River-Flat Eucalypt Forest (PCT 835), Cumberland Plain Woodland (PCT 850) and Shale Sandstone Transition Forest (PCT 1395).

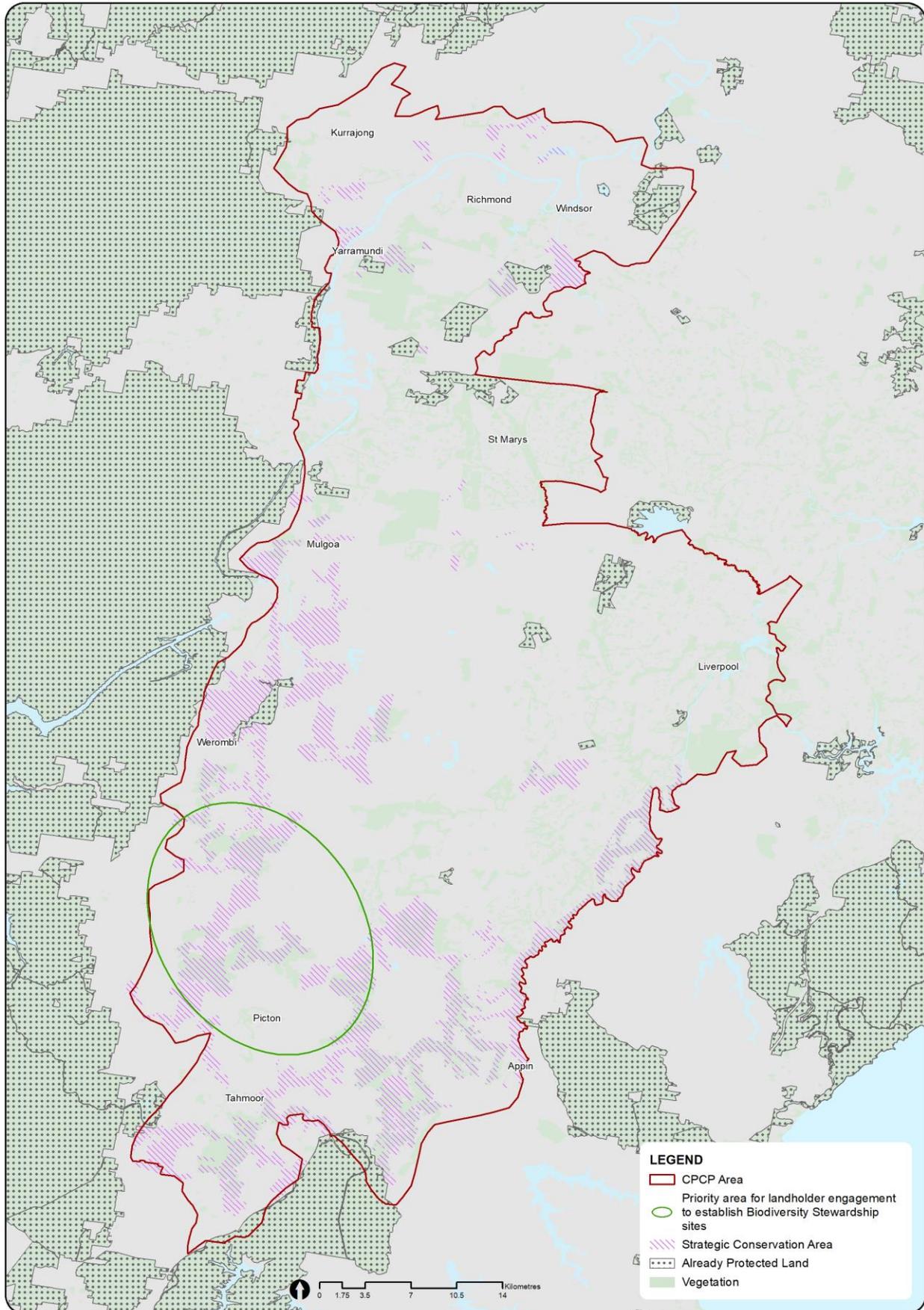


Figure 16. Opportunities for biodiversity stewardship agreements in the Razorback area

Ecological restoration opportunities

Historically, vegetation in Western Sydney has been cleared for agriculture and more intensive land uses. This has resulted in extensive fragmentation of the remaining native vegetation, reduced connectivity and overall loss of ecological resilience.

Approximately 13% of the pre-1750 extent of native vegetation in the Cumberland subregion remains intact and in good condition. An additional 12% has heavily degraded communities (for example, scattered trees) in disturbed areas (DECCW 2010).

Ecological restoration can play a critical role in improving connectivity between remnant habitat patches, expanding the areas of remnant habitat and replacing some areas of over-cleared vegetation communities.

The Society for Ecological Restoration defines 'ecological restoration' as 'the process of assisting the recovery of an ecosystem that has been degraded, damaged or destroyed'. In practice, ecological restoration can encompass all actions to restore biodiversity structure and function, ranging from ecological maintenance to reconstruction (see Figure 17).

Significant effort has been made using restoration techniques to improve the extent and condition of native vegetation in the Cumberland subregion (DECCW 2010). Restoration efforts have focused both on individual sites (see 'Box 5: Conservation land selection steps') and across connected corridors (see 'Case study 6. Cumberland Stepping Stones Program 2016–17').

The conservation program will build on the efforts and techniques already developed to prioritise and fund on-ground actions that actively restore the vegetation communities on conservation land established through the CPCP. This includes, establishing a restoration working group to guide the implementation of restoration activities including preparing a restoration implementation strategy. The strategy will establish best-practice principles and methodologies to:

- identify the range of restoration activities and what will be undertaken through the CPCP
- ensure the long-term sustainability of restoration considers the genetic diversity of what is established
- identify considerations for restoration potential and constraints of land
- provide reference to guidelines for restoration, including the NSW Biodiversity Conservation Trust guidelines for restoring native vegetation undertaken in a biodiversity stewardship site
- develop a seed-procurement approach
- reference research needs being considered through the research program implementation strategy (Commitment 22, Action 1).

The conservation program will also invest in restoration research. A key focus of the CPCP research program (Commitment 22, Action 2) will be research that:

- increases knowledge of the adaptive capacity of plant, animal and microbial organisms used in active restoration of ecological communities of the sub-region
- improves restoration outcomes, including ecosystem function and resilience, for threatened ecological communities of the sub-region.

In the first 5 years we will partner with the Royal Botanic Gardens & Domain Trust to deliver seed sourcing and seed banking guidance based on species and region-specific research. This will be used to inform the restoration program (Commitment 19, Action 2).

Low effort

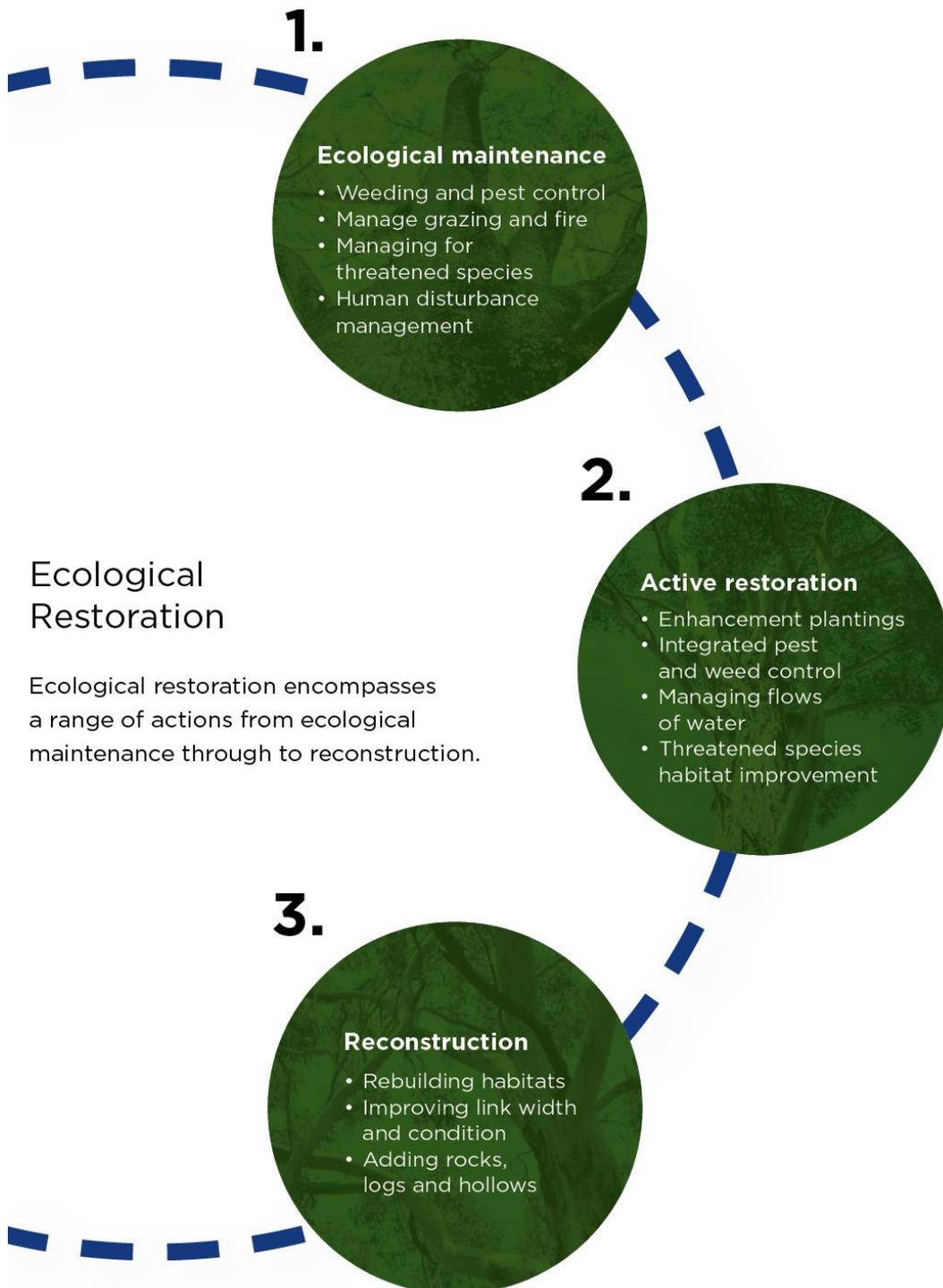


Figure 17. The range of restoration approaches and opportunities

The conservation program will invest in active restoration of more degraded sites, with actions ranging from assisted regeneration to reconstruction, with the aim of setting sites on a trajectory to benchmark diversity, structure and function. Ecological reconstruction is defined in the CPCP as restoration of areas within the strategic conservation area that are identified as either cleared or degraded, but with the potential to bring back to a recognisable target threatened ecological community or to enhance landscape connectivity.

Figure 18 identifies cleared or degraded land in the south-east of the CPCP Area, including the Georges River Koala Reserve, that has potential for ecological restoration (reconstruction).

The CPCP has defined the term 'reconstruction' to monitor and track ecological restoration efforts to meet the plan's native vegetation targets.

Reconstruction efforts will focus on:

- target threatened ecological communities where there is a shortfall in established conservation land
- expanding the habitat area for targeted threatened species
- enhancing connectivity with neighbouring reserves and neighbouring areas of high biodiversity value.

Where reconstruction of target threatened ecological communities occurs, a maximum of 25% of the plan's cumulative offset target for native vegetation (up to 1,330 hectares) can be counted and reconciled as an offset.

Ecological restoration projects (including reconstruction) will be limited to conservation land established through the CPCP.

Case study 5. Scheyville National Park restoration trial site

Scheyville National Park, located in the Hawkesbury LGA, contains areas with threatened ecological communities, species and their habitats. It also includes large areas that were previously cleared for agriculture and other uses. Scheyville National Park is the site of one of several restoration trials being undertaken in partnership with Greening Australia (and in this case the National Parks and Wildlife Service) to direct-seed Cumberland Plain groundcover flora to reconstruct plant communities in a highly fragmented landscape.

Soil preparation and seed sowing

Initial preparation involved herbicide treatments to remove weed biomass. At many sites, the upper layer of topsoil has elevated nutrient levels due to past agricultural uses. To allow the native seed to compete effectively with weeds, the surface layer was scraped off using earthmoving machinery to achieve a more natural nutrient balance. This also helps remove the weed seed load in the topsoil layer. Carbon can also be added to the soil to help achieve a more natural carbon–nitrogen balance.

Weed management can be a major problem in groundcover restoration, but as native species are adapted to fire, burning can be a key management tool. The Scheyville site was dominated by weeds such as African lovegrass prior to restoration.

Tree planting or natural regeneration of trees generally needs to be delayed until the native groundcover has been established so that fire can be suppressed during the tree establishment phase.

Greening Australia's Richmond seed production area

This restoration trial relied on establishing the Greening Australia seed production facility at Richmond because the amount of seed (quantity and species diversity) required for the project was not available via wild collection or commercial suppliers. Seed is collected in small quantities from remnant wild populations of ground cover plants and cultivated at the facility to produce enough seed to increase groundcover in restoration projects. Seed sources from wild populations are now extremely limited and restoration of large-scale native grassland and grassy woodland requires additional seed production capacity at facilities like the one at Richmond.

Case study 6. Cumberland Stepping Stones Program 2016–17

The [Cumberland Stepping Stones Program](#), including its evaluation stage, ran for 12 months in 2016–17. The focus was to create connectivity and actively engage the community in environmental restoration. The project involved 6 local government areas in Western Sydney (Blue Mountains, Penrith, Blacktown, Hawkesbury, Fairfield and Liverpool) and targeted 4 key participant groups: schools, corporate volunteers, community Bush Care groups and private landholders. The conservation program was implemented by Greening Australia and supported by \$2.9 million from the Australian Government. Three regional corridors were targeted:

- Eastern Creek, with the aim of improving connectivity in the north–south corridor to link high-quality remnant Cumberland Plain Woodland
- Ropes Creek and Wianamatta (South Creek), providing an east–west corridor across the Cumberland Plain to link the Cumberland Plain Woodland and the Greater Blue Mountains World Heritage Area
- Scheyville to Wianamatta Corridor, supporting connectivity of the northern Cumberland Plain Woodland by enhancing connections with lowland areas.

Over a 12-month period, 43 sites were planted out using around 75,000 native tube stock. Some 3,000 people were engaged in the conservation program (Dollin 2017).

Issues and outcomes

The intensive tree planting reflected the Australian Government's 20 million trees objective. This objective, in combination with the focus on community engagement, tends to promote close tree planting rather than an open woodland environment, which would be a better reflection of the Cumberland Plain environment before European settlement. The short timeframe also means that groundcover and undergrowth condition are largely overlooked.

The Cumberland Stepping Stones project had some success in terms of education and community engagement. It highlights the need to plan and implement biodiversity conservation programs over longer timeframes. The objective of creating greater connectivity in the landscape by augmenting corridors remains valid. However, more holistic targets will be needed to achieve ecosystem recovery.

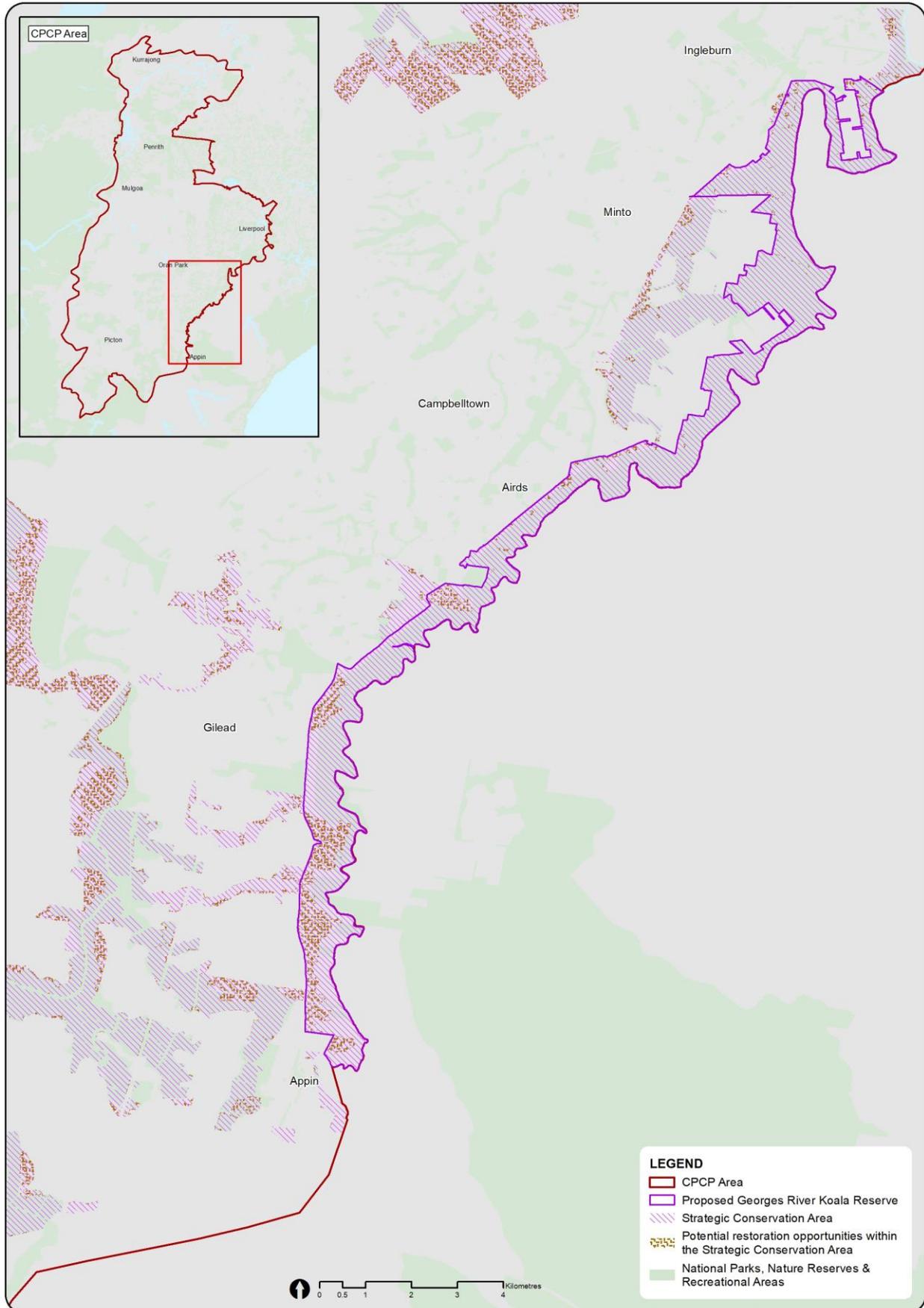


Figure 18. Potential restoration of cleared or degraded areas in the CPCP

Ecological restoration implementation

Conservation land established through a biodiversity stewardship agreement will need to comply with the required management actions for a stewardship site. Required or active restoration management actions will be determined by the Biodiversity Conservation Trust in accordance with its [Restoring Native Vegetation guidelines \(PDF 764 KB\)](#). Activities will include native vegetation management (restoring or rehabilitating native vegetation, retaining and managing regrowth and nutrient control), pest animal control and weed management.

The management plan for a biodiversity stewardship agreement sets out the 'required management actions' that should be undertaken to maintain or improve the biodiversity values of the site. Active restoration management actions are in addition to the required management actions and can be used to create additional biodiversity credits.

The Office of Strategic Lands will be a critical delivery partner where land is to be purchased for conservation as a future reserve, including for restoration. We intend to establish biodiversity stewardship agreements over new parcels of land purchased by the Office of Strategic Lands under the land purchase program where possible. Annual payments from retiring biodiversity credits will be used to undertake required management actions, and active restoration where required. Alternatively, land management actions will be funded through infrastructure contributions.

The Biodiversity Conservation Trust conducts annual monitoring and reporting to demonstrate how annual payments have been used to manage the land in accordance with the management plan. The Biodiversity Conservation Trust will also undertake monitoring in accordance with its Ecological Monitoring Module. This will include baseline and ongoing monitoring of structural and functional attributes, species composition and secondary responses by fauna.

Where an ecological restoration project (including reconstruction) will commence on conservation land prior to a biodiversity stewardship agreement, monitoring the restoration site over time will be critical to determine whether goals are being met. The information can inform future management decisions. The objective for restoration of these sites aligns with the broader restoration objective of the CPCP to set sites on a trajectory to benchmark diversity, structure and function and eventually achieve a self-sustaining ecosystem.

There is often a significant time lag between starting a project and seeing an improvement in biodiversity outcomes. The department will invest in actions to encourage landowners to enter into biodiversity stewardship agreements that include active restoration of degraded or cleared portions of their property if this could give an ecological (and financial) benefit. This will be achieved through the community engagement program that will be developed for landowners in the strategic conservation area (Commitment 11, Action 3).

Any large-scale ecological restoration projects will be undertaken on public land when there is security of tenure in perpetuity. This will include existing public land and land that is purchased through the CPCP.

Restoration within the Georges River Koala Reserve will be a priority for the first 5 years of the plan. Around 80 hectares of former grazing land will be revegetated. The focus will be on providing koala habitat and include food trees, shelter and connectivity to the crossings at the Ousedale corridor and Kings Falls Bridge. The soils in the reserve area have high fertility and support preferred koala food trees such as *Eucalyptus moluccana* (grey box), *E. punctata* (grey gum) and *E. crebra* (narrow-leaved ironbark).

Restoration works will be planned and delivered with our delivery partners and will include long-term research and monitoring sites to contribute to adaptive management for long-term conservation of flora and fauna species on the Cumberland Plain.

Other reserves that are a priority for establishment or investigation in the first 5 years will also provide opportunities for restoration. The Gulguer Reserve Investigation Area could provide at least 490 hectares of cleared land for ecological reconstruction, and the Confluence Reserve Investigation Area could provide at least 370 hectares. Key target plant community types and threatened ecological communities listed under both the BC Act and the EPBC Act occur in these areas, offering significant opportunities to achieve offset targets.

We envisage that a large component of the on-ground restoration work will start in the first 10 years of the plan (depending on land purchases or securing stewardship agreements). However, ecological restoration activities and identification of new opportunities for restoration will occur throughout the life of the plan. The CPCP will also fund research into improved techniques for restoring threatened ecological communities, to inform future restoration projects.

Protecting threatened flora and fauna

The area covered by the CPCP is home to around 100 threatened flora and fauna species. Of those, 49 species protected under either the BC Act, EPBC Act or both may be impacted by the urban and transport development facilitated by the plan (Open Lines 2020).

Of those 49 species, 17 species have been identified as target species for the CPCP. These are species where residual adverse risks from development through the plan were assessed as being high. We took a risk-based approach due to the inherent level of uncertainty in the baseline data both for species habitat and species records.

The determination of what species required offsets was based on:

- for EPBC Act-listed species – individual assessments of the level of risk of residual adverse impacts from the direct impacts of development under the CPCP for each species, provided in in the Cumberland Plain Assessment Report
- for BC Act-listed species – a set of criteria that aimed to address the risk of residual adverse direct impacts.

BC Act-listed species needing offsets were considered to be candidate species credit species with direct impacts from development to:

- more than 5% of records in the nominated areas
or
- more than 5% of potential habitat in the nominated areas
or
- greater than 1% of potential habitat in the nominated areas for entities subject to serious and irreversible impacts or endemic or largely endemic species.

The 17 target species are identified in Commitment 9 (see 'Appendix A. Commitments and actions').

For 15 of these species, a specified number of offset locations is used as the target. An 'offset location' is a site where one or more populations and habitat of the species has been confirmed through surveys or an expert report as being present. Offset location sites may be a reserve or a biodiversity stewardship site.

For a biodiversity stewardship site, this means credits representing a reasonable proportion of habitat and/or number of individuals of a local population of the threatened species are purchased and retired against the offset targets.

For 2 species considered at risk, the swift parrot and the koala, offset targets for habitat were considered more appropriate. For the swift parrot, the offset target is an area of 'potential foraging habitat', including a smaller subset of important habitat as defined under the Biodiversity Assessment Method. For the koala, the offset target is an area of important habitat (primary, secondary and tertiary corridors as defined in the Cumberland Plain Assessment Report.

Meeting species targets

The process of achieving the species targets will be guided by the conservation land selection steps. These steps prioritise the acquisition of species credits by establishing conservation land, but also allow the direct purchase of species credits from within the Cumberland subregion or across NSW. In certain circumstances where direct acquisition of land-based offsets cannot be secured, the program will allow the implementation of a conservation action if it will directly benefit the impacted species. This is further detailed in the section 'Establishing conservation land as offsets' on page 91.

In addition to meeting the specific offset targets for the 17 target threatened species, the potential habitat for all 49 of the CPCP threatened species will be protected by securing the threatened ecological community offset targets within a conservation land. In many cases, species potential habitat and areas of threatened ecological communities will overlap. The reconciliation accounting process will track the plan's progress in securing potential habitat for all threatened species listed in Appendix C. EPBC Act and BC Act matters to be offset through the CPCP. This will ensure potential habitat for all threatened species addressed by the CPCP is represented in the conservation land.

The conservation program will undertake surveys or rapid assessment of the strategic conservation area prior to establishing a biodiversity stewardship site or reserve to confirm the presence of populations and amounts of likely or known habitat (in hectares).

The department will work with future managers of conservation land established through the CPCP to identify species-specific management measures that can be incorporated into management plans to further protect those species.

The evaluation program will monitor progress towards achieving offset targets. To establish baseline monitoring data, we will assess and record the habitat attributes of where target species have been located to define areas of known habitat for target species within the strategic conservation area, and incorporate into the evaluation program (Commitment 9, Action 1).

The program is detailed in the 'Evaluation program' section starting on page 106.

Species-specific commitments for koalas

The conservation program includes specific commitments and actions to protect the Southern Sydney koala population. These are detailed in Sub-Plan B.

Planning controls for the strategic conservation area

The CPCP is supported by a range of planning controls under the NSW *Environmental Planning and Assessment Act 1979* that protect identified high-value biodiversity in Western Sydney and support the delivery of the Cumberland Plain Conservation Plan.

The new strategic conservation planning chapter of the Biodiversity and Conservation SEPP includes development controls that will minimise the impacts of future development on land in the strategic conservation area to deliver biodiversity outcomes and support the ecological function of the Cumberland subregion.

The CPCP will be supported by:

- planning controls to minimise impacts on land identified as strategic conservation area, including by:
 - requiring consent to clear native vegetation
 - requiring consent authorities to consider the impact of proposed development on regionally significant biodiversity
 - identifying the importance of the site for landscape connectivity or ecological restoration
 - considering the impact of subdivision on the continued protection of threatened ecological communities, threatened species and their habitats
- a ministerial direction under section 9.1 of the Environmental Planning and Assessment Act to protect areas identified as having strategic biodiversity value.

These planning controls will apply across the strategic conservation area, except for land owned or under claim by local Aboriginal land councils. Land owned by Deerubbin Local Aboriginal Land Council has been excluded from the strategic conservation area at its request.

Integration with local strategic planning statements

To complement the above measures, the department will work with local councils to integrate strategic conservation area mapping into local and regional planning. This will be done through local strategic planning statements, which guide the local plan-making process (Commitment 14, Action 3).

This could involve providing:

- input to guide land use planning for biodiversity conservation
- input for draft biodiversity conservation planning priorities
- input to guide local governments as they establish Biodiversity Stewardship Agreements
- data from the CPCP to councils for adoption in biodiversity strategies, plans and planning for habitat corridors.



Managing landscape threats

Highlights

- Coordinate landscape-scale conservation programs to manage the threats of weeds, pest animals and disease
- Manage fire in strategic locations to help maintain biodiversity
- Support conservation programs to help threatened ecological communities and species adapt to the impacts of climate change

The landscape covered by the CPCP is highly fragmented and has been subject to a multitude of development pressures over time. It is also one of the fastest-growing regions in Australia (DECCW 2010), with 4 nominated areas planned to support future housing and employment needs in Western Sydney.

Increased urbanisation brings increased threats to biodiversity, such as habitat loss, weed invasion, pest animals and disease. Reducing and managing threats to the area's biodiversity in a strategic and coordinated manner will play a critical role in achieving the plan's objective to improve ecological function and resilience over the long term. It will be particularly important to focus efforts on conservation land to ensure management is active, targeted and holistic.

Key threatening processes

A threatening process can be defined as a process that threatens or may threaten the survival, abundance or evolutionary development of a native species or ecological community. Threatening processes drive the extinction of native flora and fauna and their ecological communities and are therefore covered by the BC Act and EPBC Act.

A total of 43 key threatening processes are listed under NSW and federal legislation in the area covered by the CPCP (as determined through a search of the Australian Government Species Profile and Threats Database and a search of threats listed under the BC Act). Some of these are widespread and affect a broad range of protected species and ecological communities. Others tend to be site-specific or are specific to certain animal or plant species.

The Cumberland Plain Assessment Report identified weeds, pest animals, fire, disease and climate change as presenting the most significant threat to the persistence of threatened species and threatened ecological communities in the Cumberland subregion.

The following sections outline the approach to implementing a threat management program for these key threatening processes and outline priority actions to be taken.

Developing an appropriate threat management program

The CPCP proposes to implement key strategic priorities that will most benefit biodiversity at a landscape scale. The approach to threat management has considered the following factors.

Scope and scale of threat identifies the extent and magnitude of threats that affect species and threatened ecological communities, targeting threats that pose the greatest risk to biodiversity and where management responses may be the most effective.

Synergies and interdependencies identify threats affecting multiple species that can gain synergistic benefits from targeted management responses. Understanding linkages and interdependencies between threats and the impact on biodiversity is critical to ensuring effective management responses and ameliorating unintended consequences.

Planning for long-term change considers how increased urbanisation to the year 2056 will exacerbate existing threats and potentially bring about new threats to species and ecological communities. Anthropogenic climate change has the potential to bring about landscape-scale changes that can compound or introduce new threats to biodiversity.

Managing and controlling the extent of weeds

Native vegetation in the Cumberland subregion is particularly vulnerable to weed invasion because of the grassy understorey, relatively fertile soils and past agricultural uses (DECCW 2010). As a result, many weeds, such as African olive (*Olea europea* subsp. *cuspidata*), African lovegrass (*Eragrostis curvula*) and bridal creeper (*Myrsiphyllum asparagoides*) are well established in south-western and western Sydney. Invading weeds displace native plants, affecting the regeneration of communities (Benson 1992), which can then cause a structural change in habitat and affect the ongoing presence of native species.

Escaped garden plants (either from cultivation or dumping) are an emerging threat associated with increased urbanisation. For these potential weeds, it is imperative to address their presence early to reduce the increased magnitude of cost once they are well established across the landscape.

Weeds not likely to affect a broad range of species, or that have such a low level of environmental harm that they can be managed through regular weeding at managed sites, will not be targeted through this program.

Implementing a coordinated weed management program

The conservation program will focus on reducing key weed species in conservation land established through the CPCP. It will target weeds that have the most impact, such as exotic vines and scramblers; African olive (see 'Case study 7. Managing African olive in Mount Annan'); African boxthorn; bitou bush and boneseed; exotic perennial grasses; and other readily dispersed or persistent escaped garden plants.

In the first year of the plan the department will join the Sydney Weeds Network to inform the implementation of weed control activities including the preparation of a weed control strategy for the CPCP.

The weed control strategy will establish a coordinated weed control program in the Cumberland subregion, that:

- identifies priority weed species and priority locations for weed control to maximise benefits to biodiversity in the strategic conservation area
- identifies the training, extension and resource needs to address threats
- provides guidance on weed control methods
- identifies roles, responsibilities, delivery partners and other stakeholders
- provides guidance on funding decisions under the weed control program
- is consistent with existing weed control programs, reserve or biodiversity stewardship agreement management requirements.

Priority weeds near conservation land should also be targeted for treatment to improve the landscape-level outcomes and limit the opportunity for re-infestation. Particular weed species may

also be targeted outside priority areas when these species have a high capacity to spread or are likely to re-infest areas where these species are under control.

The importance of efforts to improve the extent and condition of native vegetation outside conservation land or to establish buffers, corridors and other ecological linkages between them is also recognised. This work could make a valuable contribution to the conservation land and assist in conserving biodiversity more generally.

To accommodate this, the CPCP will fund grants to organisations to help deliver actions in the weed control strategy, including Bushcare and Landcare groups and local Aboriginal land councils to reduce weeds on public land and Aboriginal-owned land adjoining or near conservation land (Commitment 15, Action 5)

The approach to weed control for biodiversity stewardship sites established by the CPCP will be consistent with the weed management requirements for other biodiversity stewardship sites.

Case study 7. Managing African olive in Mount Annan

African olive is native to eastern Africa and was introduced to Australia as a hedging plant and rootstock for the common olive (*Olea europaea* subsp. *europaea*) in early colonial times (Australian Association of Bush Regenerators (AABR) 2011).

Camden was an introduction site for the future woody weed. It established in hilly areas in this vicinity, including at Razorback Range, becoming a major weed by the mid-1970s. By the 1980s, it was established in the Australian Botanic Garden Mount Annan (Department of Primary Industries (DPI) 2010). Its distribution in the gardens expanded from 20 hectares in 1985 to 80 hectares by the late 2000s. Currently, the Camden–Campbelltown area ‘is the most established centre of African olive occurrence in Australia’ (DPI 2010, p. 3). African olive is listed as a key threatening process in the Cumberland Plain (Australian Government Threatened Species Scientific Committee, 2009).

Mount Annan site

The Mount Annan botanical garden covers 416 hectares and is located west of the Greater Macarthur Growth Area. It is home to threatened ecological communities including Cumberland Plain Woodland. The site is impacted by up to 75 hectares of African olive forest and 31 hectares of understorey invasion in woodlands. Around 37 hectares of timbered bushland on the site is considered free of African olive.

Management outcomes

Mount Annan has successfully reduced some of the extent and impact of African olive, working on several mitigation and abatement strategies with partners such as Greening Australia (AABR 2011). Targeted actions include site-specific herbicide spraying and plant removal. The spread has also been controlled using selective herbicide on 10 hectares and follow-up spraying on 2.3 hectares of previously cleared sites.

Geographical information system and global positioning system information on native trees emerging from the African olive canopy in densely forested areas was mapped for the site. These areas were then treated within a 10-metre radius to facilitate natural seedling regeneration for at least 28 trees over 1 hectare. Weed control activities also extended beyond the site to maximise the synergies of conservation efforts with surrounding areas.

Overall, several abatement actions have succeeded on the site, increasing the quality of habitat and corridors for species at a regional scale.

Managing emergent pest animal species

Pest animals have numerous adverse effects on native flora and fauna, including predation, overgrazing and competition. Control of pest animals is generally undertaken in accordance with a regional strategic pest animal plan prepared by Local Land Services. In the Greater Sydney Local Land Services, which covers the entire area of the CPCP, there are 9 priority species identified: wild dogs, feral pigs, red foxes, wild rabbits, wild deer, cats, feral goats, Indian mynas and common carp (LLS 2018).

All landholders have a duty under the *Biosecurity Act 2015* (Cth) to 'prevent, eradicate, contain and/or manage pest animals. Control of pest animals can be undertaken in several ways. In larger landholdings, typical methods include poisons (including targeted baiting), shooting and trapping. However, in peri-urban and urban areas, control measures related to pet safety are restricted.

The Menangle Fox Control Group (see 'Case Study 8') is an example of a successful capacity-building program for fox management. It is coordinated across agencies and its learnings can be implemented through the pest control activities of the CPCP.

Case study 8. Capacity-building program for fox management

The fox (*Vulpes vulpes*) is a feral animal species with significant impacts on biodiversity in Western Sydney and other regions throughout Australia. Predation by foxes is a key threatening process under the BC Act and the EPBC Act. The species was introduced into Australia in the 1800s and established in the wild by the 1870s (Department of the Environment, Water, Heritage and the Arts 2008). Foxes are a threat to small- to medium-sized mammals (for example, the spotted-tailed quoll) and ground nesting birds (for example, bush stone-curlew). Not only do foxes have a direct impact on native fauna through predation, they can also carry disease (Greater Sydney LLS n.d.).

Menangle Fox Control Group

The GSLLS launched the Menangle Fox Control Group in 2016 in partnership with Barragal Landcare Group, NSW DPI, Campbelltown City Council, Camden Council and Wollondilly Council (Campbelltown City Council n.d.). The group is funded under the National Landcare Program and operates between Gilead and Camden. It includes training and educational activities to help managers and landowners implement fox-control and risk-reduction measures on their land.

Program implementation

Participants in the Menangle Fox Control Group can use FeralScan or FoxScan websites or applications to record fox occurrences and impacts, and to implement control activities (GSLLS n.d.). Accredited landholders can be trained to lay bait on their land at little or no cost. Menangle Fox Control Group shares cameras to capture images of foxes and cages for trapping and assists with trap training and licensing.

Learnings

The Menangle Fox Control Group framework can be adopted or extrapolated into threat management actions for the CPCP. The plan could also use the existing FeralScan application to integrate information with landholders outside the area covered by the CPCP.

Implementing a coordinated pest management program

Coordinated control activities will be implemented within the conservation land and across the CPCP Area to work towards eradicating pest animals in the Cumberland subregion.

One of the priority actions in year 1 of the CPCP is to assess the extent and threat that existing pest species pose to the strategic conservation area. Based on this assessment, a pest animal control strategy will be developed to:

- identify pest control priorities, including priority pest species and priority locations for pest control to maximise benefits to biodiversity in the strategic conservation area
- identify the training, extension and resource needs to address threats
- provide guidance on pest control methods
- identify roles, responsibilities, delivery partners and other stakeholders
- provide guidance on funding arrangements under the pest control program
- be consistent with existing pest control programs, reserve or biodiversity stewardship agreement management requirements

The pest animal control strategy will outline the use of specific pest control techniques that will reduce the risk of secondary poisoning from Pindone or second-generation rodenticides in accordance with the mitigation measures established in the CPCP.

The likely delivery partners for pest animal management are Local Land Services, local government, Office of Strategic Lands and Biodiversity Conservation Trust. The CPCP will provide funds to organisations to help deliver actions in the pest animal control strategy, including Greater Sydney Local Land Care Services, Bushcare and Landcare groups, and local Aboriginal land councils (Commitment 16, Action 5). For managed conservation land adjacent to urban areas, the control measures identified in the pest animal control strategy will be built into a management plan for the site. This will be prepared in consultation with local government, Local Land Services and the landholder. The public will be notified about any planned pest control actions.

The approach to pest animal control for biodiversity stewardship sites established under the CPCP will be consistent with the pest animal control requirements for other biodiversity stewardship sites. In these cases, the Biodiversity Conservation Trust will be responsible for ensuring that landholders comply with pest control measures on stewardship sites. Stewardship sites not in peri-urban or urban areas could be subject to a wider array of control measures, which will be identified in the management plan for the site.

Reserves managed by National Parks and Wildlife Services, or Office of Strategic Lands in the interim, will also comply with pest control measures specified in the management plan. The department will enter into written agreements with delivery partners to ensure the pest animal control program is implemented as agreed (Commitment 16, Action 4). Coordination of pest control actions outside the conservation land will occur through existing processes including through Local Land Services and local government.

Managing bushfire risk

Fire is a natural element of the ecology of most vegetation communities in the Cumberland subregion. Prior to European settlement, Aboriginal communities used fire to shape the landscape and create areas of open woodland that enhanced hunting opportunities or promoted the growth of seeding plants that were a food source (Benson 1990).

The fire regime changed significantly after European settlement, and managing risks to life and property became the central objective. This remains a key objective, but fire management planning also needs to consider ecosystem processes and biodiversity outcomes.

Fire frequency, the temperature, the season, prior and subsequent weather conditions, and proximity to unburnt refuge areas can all influence an ecosystem's response to fire. Many species regenerate quickly from rootstock or trunks, while fire kills other plant species. Local eucalypt species are particularly adapted to fire. Shorter-lived species that are killed by fire need a minimum fire-free period between burns to build up their seed reserves. Having shorter periods between fires eliminates these species from the plant community.

The absence of fire eliminates fire-dependent species, while frequent burning largely eliminates species that regenerate by reseeding. Both management regimes have the effect of reducing the biodiversity of the plant community, with the flow-on effect of a reduced range of food sources and habitat for fauna.

NSW bushfires in 2019–20

In 2019–20, bushfires in NSW were unprecedented in their extent and intensity. As of 3 February 2020, the fires had burnt 5.4 million hectares of land in the state (approximately 7% of NSW), including 2.7 million hectares in national parks (37% of the national park estate) and more than 80% of the Greater Blue Mountains World Heritage Area (Department of Planning, Industry and Environment, 2020).

The fires destroyed large areas of habitat and populations of some species potentially impacted by development under the CPCP. Because of the unprecedented extent and intensity of the fires, their effect on some species is uncertain, including whether they will recover.

An assessment, based on available information, has been made of the implications of the fires for the CPCP. It aimed to:

- identify any species significantly impacted by the fires that could also be affected by development through the CPCP
- determine whether the fires increase the significance of the plan's impacts on species.

The assessment identified several species and threatened ecological communities (TECs) significantly impacted by the fires that are also subject to impacts under the CPCP. These matters were:

- *Petauroides volans* (greater glider)
- *Petaurus australis* (yellow-bellied glider)
- *Calyptorhynchus lathami* (glossy black-cockatoo)
- *Dasyurus maculatus* (SE pop) (spotted-tailed quoll)
- *Callocephalon fimbriatum* (gang-gang cockatoo)
- *Hoplocephalus bungaroides* (broad-headed snake)
- *Scoteanax rueppellii* (greater broad-nosed bat)
- *Grevillea parviflora* subsp. *parviflora* (small-flower grevillea)
- *Pomaderris brunnea* (brown pomaderris)
- *Persoonia bargoensis* (Bargo geebung)
- *Heleioporus australiacus* (giant burrowing frog)
- *Acacia bynoeana* (Bynoe's wattle)
- *Eucalyptus benthamii* (Camden white gum)

- *Commersonia prostrata* (dwarf kerrawang)
- *Myotis macropus* (southern myotis)
- *Anthochaera phrygia* (regent honeyeater)
- *Pteropus poliocephalus* (grey-headed flying fox)
- *Phascolarctos cinereus* (koala)
- Castlereagh Scribbly Gum and Agnes Banks woodlands of the Sydney basin bioregion
- Coastal Swamp Oak (*Casuarina glauca*) Forest of NSW and south-east Queensland ecological community
- Turpentine-Ironbark Forest of the Sydney basin bioregion.

For these matters, the assessment considered the risks posed by the CPCP in the context of the impacts of the fires and whether any additional measures were needed to help address the impacts of the fires. The assessment is provided at Supporting Document G of the Cumberland Plain Assessment Report. Overall, the CPCP is considered to adequately address impacts to these species and TECs in the context of the fires.

This recent experience and climate modelling of future trends indicate that the bushfire season has extended, generally starting earlier and finishing later than in the past. This will have an impact on opportunities to undertake controlled burns to protect life and property and to manage the ecosystem.

Implementing a bushfire management program

The CPCP commits to managing fire in strategic locations in the Cumberland subregion to support the maintenance of biodiversity values on conservation land within the CPCP Area (Commitment 17).

To do this, we will consult key agency and delivery partners, such as the Rural Fire Service, National Parks and Wildlife Service and the Environment, Energy and Science group within the department, to identify fire management priorities, including fire-sensitive species and ecological communities (Commitment 17, Action 1).

The approach to fire management and ecological burning on biodiversity stewardship sites established through the CPCP will be consistent with the requirements for other biodiversity stewardship sites.

Aboriginal knowledge holders will be consulted so that their fire management techniques can be applied to conservation land (Commitment 17, Action 2).

A fire management strategy for the strategic conservation area will be developed to:

- identify priority locations for fire management to maximise benefits to the strategic conservation area
- identify priority fire-sensitive species and ecological communities
- provide guidance on fire management to maintain and promote biodiversity values, particularly for fire-sensitive species and ecological communities
- identify roles and responsibilities and coordinate delivery partners
- identify criteria to guide decisions on funding fire management under the plan.

Managing bushfire threats to life and property will remain the responsibility of NSW Fire and Rescue and the Rural Fire Service.

Managing key diseases

Diseases such as exotic fungal infections, viruses and other pathogens can weaken and kill native species. Diseases that are listed as key threatening processes in the area covered by the CPCP include:

- *Phytophthora cinnamomi* root fungus
- amphibian chytrid fungus (chytridiomycosis)
- *psittacine circoviral* beak and feather disease.

Increasing urbanisation of the area could exacerbate the occurrence of these diseases. There are uncertainties about the plant species and communities that are likely to be more heavily impacted by *Phytophthora* infection. But it is understood that increased human recreational use of forested and riparian areas increases the spread of the disease.

The potential for dispersing chytridiomycosis in wild frog populations increases with urbanisation of the landscape matrix around streams. This comes from growing potential for human interaction, more water flow (urban run-off) and reduced optimal habitat.

Psittacine circoviral (beak and feather) disease affects threatened species and populations in the parrot and cockatoo families, and pet birds are more likely to transfer it to wild bird populations. As urbanisation increases, the chances of disease transmission to wild birds increases.

While not strictly a disease, psyllid and bell miner-associated dieback in eucalypts is a widespread threat in much of the shale soils within the CPCP Area. It is also more likely to occur close to streams. Bell miners are establishing colonies at sites with thickening vegetation, particularly where African olives are producing a mesic or closed-forest form of woody community.

Implementing a disease management program

Two key actions in the CPCP will seek to address and manage the spread of disease and its impact on biodiversity in the Cumberland subregion.

The department will consult with researchers, government agencies and other delivery partners to identify relevant programs that contribute to managing disease and dieback in the Cumberland subregion. Key threats that will be targeted include:

- *Phytophthora cinnamomi* root fungus
- amphibian chytrid fungus
- *psittacine circoviral* beak and feather disease
- psyllid and bell miner-associated dieback in eucalypts.

The department will enter into written agreements with delivery partners to implement priority disease control programs, and present reporting by partners to the department and to the executive implementation committee.

Providing support for climate change adaptation

Climate change is emerging as a serious threat to native species and ecosystems and is expected to be an ongoing challenge to their effective conservation in Western Sydney. Currently, Western Sydney experiences an average of 10 to 20 hot days a year (where the maximum temperature is above 35 °C). By 2039, Western Sydney is projected to experience an additional 5–10 hot days a year. By 2070, this is expected to rise to an additional 10–20 hot days (OEH 2018). These hotter temperatures combined with changes to bushfire and rainfall patterns are likely to place additional pressure on Western Sydney's biodiversity.

The main changes expected include increased daytime maximum, mean and overnight minimum temperatures, reduced rainfall frequency, and decreased rainfall totals. Other changes include a likely increase in the frequency and intensity of fires and a reduced capacity to undertake fire management through hazard reduction as suitable conditions become less extensive or frequent.

Individual species' responses to changing conditions, including their breeding response, recruitment of breeding adults and use of migration paths, will become increasingly important for their persistence.

Establishing conservation land to maximise connectivity and manage key threats will provide the best opportunity for threatened ecological communities, species and their habitats to withstand future variability associated with anthropogenic climate change. As long-term climatic changes become more prevalent, conserving the connectivity of structural and high-altitude habitats will become more important to allow the movement and migration of species.

Implementing climate change adaptation measures

The CPCP will support existing or new programs to help threatened ecological communities, species and their habitats adapt to the impacts of climate change in the Cumberland subregion (Commitment 19). To do this, the conservation program will take a multi-pronged approach that will include:

- filling knowledge gaps on climate change adaptation measures for biodiversity by:
 - funding research to identify the most at-risk species and ecological communities in the Cumberland subregion
 - identifying priority locations, such as climate refugia, in the subregion to support persistence and adaptation of species and ecological communities that are at risk from climate impacts
- updating the strategic conservation area with new areas, to support adaptation of biodiversity to climate impacts and incorporating these into the conservation land implementation strategy.

To support the climate change program the department will partner with the Royal Botanic Gardens Greater Sydney to develop seed-sourcing guidelines for 10 keystone Cumberland Plain Woodland species and define the species-specific seed transfer zones for these species.



Building knowledge and capacity

Highlights

- Partner with local government to support biodiversity education in Western Sydney.
- Partner with Aboriginal groups and community to help maintain a distinctive cultural, spiritual, physical and economic relationships with their land and waters in Western Sydney
- Invest in threatened species research over the life of the CPCP.
- Develop a compliance program to support biodiversity outcomes over the life of the CPCP.

The CPCP is underpinned by a range of supporting actions to enhance conservation outcomes by increasing the capacity of the community to participate in biodiversity conservation.

Activities such as education, training and extension services will increase awareness of biodiversity and encourage participation in conservation activities. Research will enhance our knowledge of threatened species and how we can better manage and understand biodiversity values.

Partnering with Aboriginal groups and community in Western Sydney to help maintain their distinctive cultural, spiritual, physical and economic relationships with their land and waters aligns with the objectives of ensuring that planning and land use improve ecological resilience, and meet social, economic and liveability needs.

Together, these commitments and actions will help to inform the adaptive management needed to achieve the conservation vision for Western Sydney.

Community education and engagement

The CPCP will provide opportunities for the residents of Western Sydney to learn more about biodiversity and engage in conservation programs and activities (Commitment 20).

An effective education and engagement program will contribute to the overall success of the CPCP by increasing residents' understanding and appreciation of their surrounding environment and its importance to native flora and fauna, as well as local Aboriginal culture.

The department will prepare an education and engagement implementation strategy to guide the education and engagement program (Commitment 20, Action 1).

This will include:

- appointing 3 full-time community engagement officers to work with councils in the CPCP Area
- funding local councils and community groups to help deliver an education and engagement program that is consistent with the education and engagement implementation strategy
- raising awareness of the Southern Sydney koala population and encourage community participation in koala conservation in Western Sydney

Activities funded by the CPCP to engage residents on biodiversity could include:

- engaging with local schools to provide biodiversity education
- hosting community activities such as tree planting and nature walks
- developing a mobile education trailer as a shared resource for councils in the CPCP Area
- promoting citizen science programs to encourage participation in nature-related science (see 'Case study 9. Citizen science programs in Western Sydney')
- raising awareness of the cultural significance of biodiversity to Aboriginal people.

An additional action of the CPCP to support community awareness of biodiversity is partnering with councils and other landholders to install signs and interpretive displays at identified conservation land to raise awareness of the biodiversity values of a site (Commitment 20, Action 6).

Long-term benefits that may flow from residents increasing their understanding of the environment and its biodiversity include greater involvement in ecological restoration activities, more awareness of the value of native species in gardens, more interest and involvement in citizen science programs, and reduced rubbish dumping and damage from inappropriate recreational activities.

Case study 9. Citizen science programs in Western Sydney

Citizen science programs can be valuable sources of information about biodiversity that sit outside formal research programs. Through its biodiversity education officers, the CPCP will promote established citizen science monitoring programs such as those run by the Australian Museum and Birdlife Australia. These programs are building valuable databases of information about biodiversity in Sydney and beyond, while encouraging participants to connect with their local environment.

Australian Museum

The Australian Museum manages some of Australia's most well-known citizen science projects. Established projects relevant to Western Sydney include:

- FrogID, a national project aiming to learn more about Australian frogs
- WingTags, which is helping to understand the movement and habits of Sydney's white cockatoo and ibis populations
- Streamwatch, which enables community groups to monitor their local waterways
- Hollows as Homes, which is building a database of hollows available for wildlife in Sydney.

Birdlife Australia

Birds in Backyards is a long-running research, education and conservation program provided by Birdlife Australia. It encourages citizen scientists to collect bird data through various programs including:

- quarterly bird surveys that collect information on the distribution and abundance of birds living where people live
- the annual Aussie Backyard Bird Count, which takes place in October, providing data on trends in common bird communities from year to year.

Extension services to property owners and land managers

Extension is the practice of transferring information, knowledge or skills that can assist individuals, families, communities, organisations or businesses to improve their economic, social and environmental outcomes, and create positive change. The CPCP will provide for extension services to community groups, councils, local Aboriginal land councils and landholders to support biodiversity conservation on public and private land. 'Box 3. How extension services will help improve biodiversity outcomes' lists intended biodiversity outcomes that can be achieved with an effective extension program.

Examples of extension services or programs that will be implemented under the CPCP include:

- working with the Biodiversity Conservation Trust to engage with landholders in the strategic conservation area and promote the opportunities and benefits of biodiversity stewardship sites (Commitment 20, Action 5)
- running community workshops on managing weeds, feral animals and other threatening processes in partnership with Local Land Services, councils, local Aboriginal land councils (through the weed control strategy and pest animal strategy)
- training community groups in the Cumberland subregion in best-practice bush regeneration and ecological restoration techniques, consistent with the restoration implementation strategy (in partnership with restoration providers).

Box 3. How extension services will help improve biodiversity outcomes

Extension services can:

- encourage local Aboriginal land councils and private landholders to enter into conservation agreements, increasing the area of land under private biodiversity stewardship
- improve the quality of biodiversity habitats by better managing threats on public and private land
- increase restoration efforts by coordinating the approach across the landscape
- improve the skills and knowledge of restoration volunteers to achieve better biodiversity outcomes.

Engaging and partnering with Aboriginal communities

The development of the CPCP acknowledges more than 60,000 years of continuous Aboriginal connection to the land that makes up NSW. Aboriginal people hold profound knowledge, understanding, obligation and custodianship of the landscape, often referred to as 'connection to Country'.

Through connection to Country, Aboriginal people have developed systems of knowledge and an understanding of ecology and biodiversity that represent a living symbiotic relationship with the land and waters of their traditional homelands. These systems include biodiversity, climate, land, culture and people. Aboriginal understanding and respect for the land aligns with the plan's objectives of ensuring planning and land use improve ecological resilience and meet social, economic and liveability needs.

The lands covered by the CPCP are cared for by 3 Aboriginal groups: the Darug, Dharawal and Gundungurra. Others, such as Eora, Darkinjung, Wiradjuri and Yuin, maintain trade or other obligatory care relationships with the area.

Local Aboriginal land councils constituted under the NSW *Aboriginal Land Rights Act 1983* are major landowners within the CPCP Area. They include the Tharawal, Deerubbin and Gandangara Local Aboriginal Land Councils. They are responsible for achieving the social, cultural and economic aspirations of Aboriginal people through those holdings.

The CPCP commits to ongoing engagement with Aboriginal communities in Western Sydney to help maintain their distinctive cultural, spiritual, physical and economic relationships with their land and waters in Western Sydney (Commitment 21). To deliver this, the department will partner with Western Sydney's Aboriginal community such as Traditional Custodians, local Aboriginal land councils and other interested Aboriginal people to support the implementation of the CPCP by collaboratively developing the Caring for Country – Aboriginal Outcomes Strategy for the Cumberland Plain Conservation Plan 2022-2032 (Commitment 21, Action 2). This decision was based on early engagement with Western Sydney's Aboriginal community during 2019 and 2020.

Caring for Country – Aboriginal Outcomes Strategy for the Cumberland Plain Conservation Plan 2022-2032

To implement the strategy, we propose to establish an Aboriginal advisory group. It will actively engage and empower Aboriginal groups and communities to help deliver the strategy and the CPCP. (Commitment 21, Action 3).

The Aboriginal outcomes strategy will support economic participation for Aboriginal people and provide cultural outcomes under the CPCP to ensure Aboriginal people are at the forefront of implementation (Commitment 21, Action 4). The strategy will support co-design of specific actions together with Aboriginal groups and community in Western Sydney to:

- recognise, celebrate and promote Aboriginal culture and heritage, with a focus on natural areas and protecting biodiversity
- recognise and embed the knowledge and connection that Aboriginal people have with Country into the implementation of the CPCP
- enable traditional custodians and interested Aboriginal groups to care for Country on new conservation land
- grow Aboriginal businesses and employment in the environmental sector.

During 2021, the department engaged with Traditional Custodians, local Aboriginal land councils, local communities, and Aboriginal businesses and service providers in Western Sydney to understand the opportunities and priorities for the Aboriginal engagement and implementation strategy. Potential actions based on early engagement undertaken in 2019 and 2020 are listed in 'Box 4. Themes considered for the Aboriginal outcomes strategy'. This engagement was used to discuss and further develop and refine these themes and potential actions to develop the strategy.

Build capacity in local Aboriginal land councils

As part of the priority actions to be delivered in the first 5 years of the CPCP, the NSW government is funding a \$1 million grants program to build capacity in the 3 local Aboriginal land councils in the CPCP Area: Deerubbin, Tharawal and Gandangara.

The program will support and empower local Aboriginal land councils to assess and manage biodiversity, culture and heritage on their lands. It will also build capacity within the land councils to deliver natural resource management services and cultural services that will support delivery of the CPCP.

Box 4. Themes considered for the Aboriginal outcomes strategy

Theme 1: Partnering and working with Western Sydney's Aboriginal community

- Build partnerships with NSW Aboriginal Land Council and local Aboriginal land councils and other interested Aboriginal groups and organisations
- Establish an Aboriginal advisory group to provide ongoing advice on the delivery of the Aboriginal engagement and implementation strategy and the CPCP
- Establish communication networks to engage with Aboriginal communities, organisations and individuals to support the delivery of the strategy and CPCP

Theme 2: Celebrating Aboriginal culture and heritage

- Engage with the Aboriginal community to consider culturally appropriate names of conservation reserves, suburbs and streets
- Fund an education program including education officers to provide ongoing biodiversity, cultural awareness and engagement activities at schools and in the community
- Fund projects to recognise Aboriginal culture in new conservation land under the CPCP and other important natural areas
- Deliver research to better understand how traditional land management practices can support conservation outcomes in Western Sydney

Theme 3: Caring for Country

- Fund the up-front costs of biodiversity assessment and provide training and support to encourage local Aboriginal land councils to establish biodiversity stewardship sites on their land
- Support the speedy resolution of Aboriginal land claims under the NSW *Aboriginal Land Rights Act 1983*
- Investigate and implement opportunities for joint management of new conservation areas under the plan and fund Aboriginal ranger positions to support the ongoing management of these reserves
- Work closely with Traditional Custodians and knowledge holders so traditional fire management techniques can be applied to conservation land

Theme 4: Grow Aboriginal businesses and employment in the environmental sector

- Provide start-up funding, training and advice to build capacity in Aboriginal businesses to ensure a minimum of 5% of expenditure under the plan is awarded to Aboriginal-owned businesses
- Investigate and fund initiatives that support Aboriginal employment and training pathways in the environmental sector

Research to support threatened species

There is a considerable amount of research on the ecology of the Cumberland subregion. However, many knowledge gaps still need to be filled if we want to manage and improve biodiversity over the long term in the CPCP Area. The CPCP will invest in research priorities that will support its implementation and help deliver the plan's outcomes (Commitment 22).

An ongoing research program will underpin the adaptive management needed to improve biodiversity outcomes over the life of the CPCP.

The program may include:

- research on the vulnerability of threatened species and ecological communities to climate change
- research that increases knowledge of the adaptive capacity of plant, animal and microbial organisms used in active restoration of ecological communities of the sub-region
- research that improves restoration outcomes, including ecosystem function and resilience, for threatened ecological communities of the subregion
- research on ecological connectivity and landscape function at site, local and regional scales to enhance conservation outcomes
- research into changing community attitudes and behaviour to biodiversity and conservation values including factors influencing those and how they evolve and change
- research into the connections between land management, biodiversity and Aboriginal culture and practices in Western Sydney as proposed by the Aboriginal outcomes strategy (Commitment 21).

Knowledge and data gathered through these research programs will directly support the implementation of each of the key conservation commitments. It will also help to improve ecological knowledge about the area's threatened species and ecosystems and our ability to monitor plant, animal and community responses to our efforts.

Research priorities

Threatened species ecology and distribution

The CPCP will include research that targets threatened species in the Cumberland subregion. This program will likely be implemented through the Saving our Species program. The species selected for research will include those that the impact assessment process has judged as likely to be affected by future urban development in the nominated areas.

The program will look to improve understanding of habitat requirements, the geographic distribution of species and particular responses to changing land use and climate.

Research to support restoration success

Research is needed to support large-scale restoration projects so that on-ground techniques for establishing new habitat, including maintenance and monitoring of these areas, are successful.

Greening Australia is leading the way in developing successful restoration techniques for native grassland and woodland. The techniques it has developed over recent years could transform ecological restoration on a national scale. It has established a diverse seed bank on the grounds of Western Sydney University that is overcoming some of the supply and diversity difficulties experienced when undertaking restoration.

The CPCP will provide funding for continued research into effective techniques, as well as resources for restoring native forest and woodland ecosystems in the Cumberland subregion.

Response to climate change

Research is required to improve the understanding of adaptation and survival of biodiversity under future climate change scenarios in the Cumberland subregion. Climate change may also negatively interact with land management and restoration activities aimed at improving biodiversity.

Research agencies are already carrying out many relevant research programs (see 'Case study 10. Snapshot of a current climate change research project'). The CPCP is not seeking to replicate these programs but will adopt findings that are relevant to the threatened ecological communities of the Cumberland subregion.

Changing community attitudes and behaviours

Research will be conducted into how to change attitudes and behaviours of the Western Sydney community toward biodiversity and conservation values. The CPCP seeks to achieve holistic conservation outcomes. Getting the community and residents of Western Sydney to value and protect their local native flora and fauna, as well as local Aboriginal culture, is vital to the success of the CPCP.

This research will be aligned with the plan's education and engagement program, and with programs run by delivery partners such as local councils and the community engagement program run by the Biodiversity Conservation Trust to inform landholders within the strategic conservation area about local biodiversity values on their land.

The CPCP will fund training and technical resources needed by wildlife carers and veterinarians through the NSW Koala Strategy. Funding will improve access to resources, veterinary services, transport and facilities. Investment will additionally raise awareness of the Southern Sydney koala population and encourage community participation in koala conservation in Western Sydney. Further details of these projects can be found in Sub-Plan B.

Case study 10. Snapshot of a current climate change research project

Western Sydney University's Hawkesbury campus at Richmond supports one of the largest stands of critically endangered Cumberland Plain Woodland in Western Sydney. The university has several world-class experimental facilities in this woodland that are part of the Terrestrial Ecosystem Research Network. This network links research facilities across Australia that seek to understand how key ecosystems will respond to future environmental change.

In 2012, the Environmental Trust Research Program awarded the CSIRO Climate Adaptation Flagship program a grant to look at the role of green infrastructure in climate adaptation in Western Sydney. As Western Sydney grows, there is a risk that more people will be exposed to extreme heat and will be heavily reliant on the quality of urban development. This project quantified the role of green infrastructure in climate adaptation for extreme heat, identifying the function of urban form, and testing scenarios for future urban planning and design.

Implementation and Assurance



Corporate tree planting day in Western Sydney Parklands

Implementation and assurance

This section outlines key components of the implementation and assurance framework of the Cumberland Plain Conservation Plan, including:

- governance arrangements
- funding arrangements
- the roles and responsibilities of key delivery partners
- the approach to securing offsets over the life of the CPCP, including the assurance mechanisms.

Implementation and assurance framework

The CPCP implementation and assurance framework (Figure 19) has been designed to ensure success of the conservation program, reassuring the many stakeholders in the Cumberland subregion that commitments will be met.

The framework provides the foundation for the vision, objectives, intended outcomes and commitments of the CPCP, and for its coordinated implementation.



Figure 19. Implementation and Assurance Framework for the CPCP

Governance

The CPCP governance structure identifies accountable parties and sets a framework for each party’s role, responsibilities and reporting requirements. The overarching governance structure is shown in Figure 20.

The NSW Minister for Planning and Homes is the CPCP approval holder for strategic biodiversity certification (BC Act) and likely the approval holder for strategic assessment under Part 10 of the EPBC Act (although this will be determined at time of class of action approval). The department will play a multifaceted role, maintaining responsibility for implementing the CPCP and in coordinating delivery partners, who will be responsible for the day-to-day running of their associated projects and programs.

The planning for urban development is administered by the department. The major transport corridors program is administered by Transport for NSW, a major project partner for strategic conservation planning. An executive implementation committee with executive-level representatives from key government agencies will be established to oversee implementation of the CPCP.

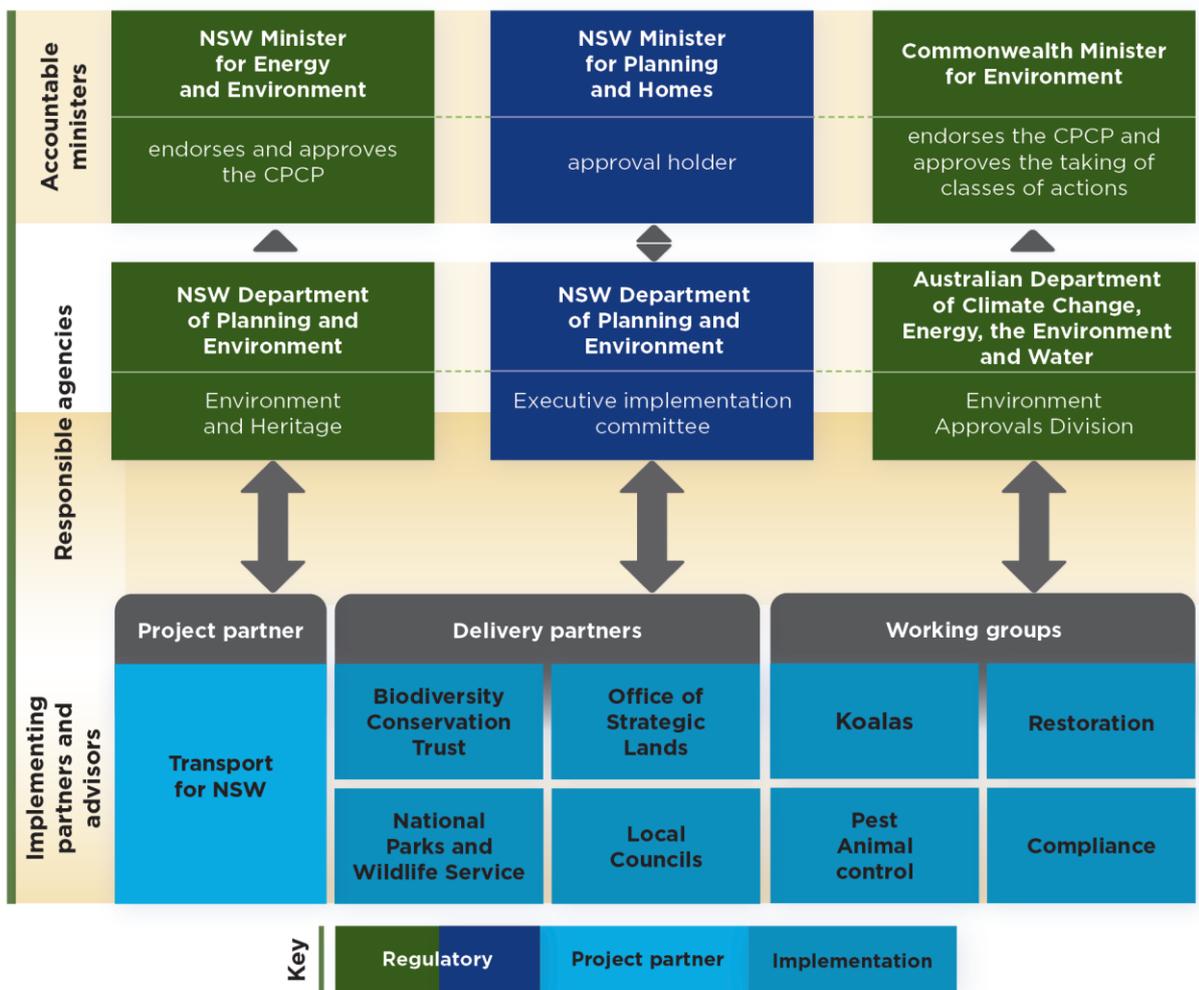


Figure 20. Detailed governance arrangements

Governance of the CPCP will be supported by regulation and defined roles and responsibilities. Regulatory measures include relevant provisions in the EPBC Act and BC Act and any conditions of consent under strategic biodiversity certification (BC Act) or class of action approval (EPBC Act).

The following sections provide further detail on governance and implementation arrangements including:

- roles and responsibilities
- funding
- delivery partners
- compliance
- delivering conservation land as offsets.

Roles and responsibilities

Many stakeholders have an interest in the Cumberland subregion. The Western Sydney community and Australian, NSW and local governments all have expectations that the CPCP will be delivered effectively and efficiently.

Delivery and community partners will be finalised as the needs of the conservation program emerge, and as agreements are made during implementation.

Department of Planning and Environment

The department is responsible for implementing the CPCP and meeting regulatory requirements.

Once approved, the department will have a multifaceted role in implementing the plan. Our responsibilities will include:

- coordinating the CPCP actions, including through the executive implementation committee and any associated sub-groups and committees
- coordinating delivery partners, including setting implementation and reporting requirements
- ensuring reports from contractors and other agencies feed into the monitoring, evaluation and reporting framework
- managing contracts and grants
- meeting legislative and regulatory requirements and reporting requirements
- reporting to the relevant Commonwealth and state ministers responsible for the environment and for planning
- preparing regular progress reports for publication
- identifying potential or actual compliance breaches and notifying the appropriate regulatory authority.

We will work with multiple government and non-government stakeholders to ensure efficient and effective coordination of the CPCP. Service level agreements or memorandums of understanding are being established with key agency and delivery partners to achieve commitments. We will also be responsible for reporting to approval bodies, the relevant NSW and Commonwealth ministers, and the public on the progress of the CPCP.

The department's Environment and Heritage Group (EHG) is the regulator for the purposes of the strategic biodiversity certification (under the BC Act). We expect that EHG will continue to perform a role as the regulator throughout the life of the plan.

The department has been working closely with the Deerubbin Local Aboriginal Land Council as a major landholder in the north of the CPCP Area. Preparatory work has commenced for a formal

modification (subject to compliance with legislative requirements) of the strategic biodiversity certification under the BC Act to include lands proposed by Deerubbin Local Aboriginal Land Council. We can submit this modification once the CPCP approval is in place (Commitment 1, Action 6).

Agency partners

Planning, implementing and managing major transport infrastructure is a significant component of development facilitated through the CPCP. The department will continue to work closely with Transport for NSW to ensure the infrastructure needs of local communities are adequately considered and that biodiversity values are not compromised.

Executive implementation committee

An executive implementation committee will be established as the central governance committee to monitor and measure the commitments and outcomes of the CPCP. It will be the key point of oversight to determine the appropriate course of action on matters raised, or whether issues need to be escalated for ministerial attention. The executive implementation committee will comprise executive-level representatives from agencies with regulatory responsibility for the plan, including relevant groups within the department such as EHG (as regulator), the Australian Department of Climate Change, Energy, the Environment and Water (as regulator) and Transport for NSW (as project partner).

In addition, working groups will be formed where appropriate. These groups will focus on specific implementation areas such as koalas, restoration, pest animal control and compliance and will report to the executive implementation committee.

Funding

Funding is needed to implement the conservation program over the life of the CPCP. The NSW Government has already committed \$114 million in the first 5 years to implement the priority actions within the conservation program.

The department is responsible for implementing the CPCP over its life to 2056. This includes ensuring funding is available to implement the conservation program and that actions are tracked, reported and accounted for. The government is providing up-front funding to support priority actions, and program costs will be recovered over time through infrastructure contributions collected from residential, commercial and industrial developers in the 4 Western Sydney nominated areas.

As a partner to the CPCP, Transport for NSW is responsible for funding a proportion of the conservation program in line with its offset obligations for the 4 major transport corridors. Transport for NSW has already committed \$20 million toward implementation and will provide further funding ahead of its works. Funding provided to the department will be in accordance with a formal agreement established between Transport for NSW and the department.

The department will regularly review resourcing requirements to ensure it can adapt to changing circumstances and ensure the CPCP succeeds in delivering its conservation program over the long term.

Delivery partners

The conservation program is wide-reaching yet targeted to meet the commitments and outcomes of the CPCP. Its implementation will be supported by forming partnerships with key delivery agencies and organisations. Delivery partners have been identified for the full suite of commitments and actions specified in this Sub-Plan. Table 5 to Table 7 give more details about the proposed roles and responsibilities of the various delivery partners.

Formal agreements will be developed with key delivery partners to implement key parts of the CPCP. These include with the Biodiversity Conservation Trust to deliver biodiversity stewardship agreements, National Parks and Wildlife Service to establish and manage reserves, and Office of Strategic Lands to purchase land for reserves.

Community groups, Landcare groups and the education sector will also be engaged to deliver community engagement initiatives, extension services, threat management and possibly monitoring and on-ground ecological assessments. These partnerships will be developed and finalised during implementation.

Table 5 Delivery partners for conservation land

Delivery partners	Role
NSW National Parks and Wildlife Service	Long-term manager of new reserves and national parks created under the <i>National Parks and Wildlife Act 1974</i> (NSW)
Office of Strategic Lands	Key delivery partner for land acquisition for reserves
Biodiversity Conservation Trust	Will deliver the biodiversity stewardship program
Local councils	Will play a role in establishing council reserves and ensuring conservation is embedded in local planning controls. This includes following section 9.1 directions in considering any planning proposals submitted to them.
Community organisations	Could manage smaller parcels of conservation land
Private landholders	Enter into biodiversity stewardship agreements to manage conservation on their land

Table 6 Potential delivery partners – managing threats to biodiversity

Delivery partners	Role
Office of Strategic Lands	Managing weeds: obtain stewardship agreements and implement weed management actions Managing emergent pest species: control pests on conservation land until they are transferred to long-term land managers
Private landholders	Managing weeds: control weeds as part of their stewardship agreement Managing pests: manage identified pest species on their sites
Councils (both general councils and the county council)	Managing weeds: control weeds in areas near conservation land Managing emergent pest species: control pest animals on council land Climate change: integrate connectivity considerations and measures to manage the effects of urban heat islands in designs of precincts and the urban matrix
Private land managers	Managing emergent pest species: control pest animals on their lands with support and advice from Local Land Services

Delivery partners	Role
Local Land Services	Managing weeds: implementing weed control efforts outside conservation land Managing emergent pest species: coordinate landscape-scale pest control programs across multiple land tenures Climate change: coordinate grants to restore areas near and adjacent to reserves and stewardship sites
Landcare and Bushcare groups	Managing landscape threats: assist in implementing efforts to control weeds, pest animals, disease and monitoring change in condition of vegetation
Biodiversity Conservation Trust	Managing weeds, bushfire risk and emergent pest species: has a compliance role in ensuring that fire, weeds and feral pests on stewardship sites are managed and monitored in accordance with site management plans
National Parks and Wildlife Service	Managing bushfire risk: undertake controlled burning on the NSW National Parks estate and implement the majority of the fire management program to reduce its threat to biodiversity Managing emergent pest species: control pests in conservation land that are gazetted as national parks or other reserves Managing weeds: control weeds in gazetted conservation land
Fire and Rescue NSW	Managing bushfire risk: provide fire and rescue services across NSW
NSW Rural Fire Service	Managing bushfire risk: provide volunteer fire and emergency services
Research organisations	Climate change: undertake a research program into the impacts of climate change on threatened and susceptible biodiversity areas

Table 7 Proposed education and engagement partners

Partnership type	Potential partners
Environment and conservation groups	Landcare and Bushcare groups Wildlife organisations
Aboriginal organisations	Deerubin Aboriginal Local Land Council Gandangara Local Aboriginal Land Council Tharawal Local Aboriginal Land Council
Education	Universities Research agencies Department of Education TAFE
State and local government	Councils Biodiversity Conservation Trust Office of Strategic Lands Local Land Services Royal Botanic Gardens and Centennial Park Trust

Local councils as delivery partners

Local councils are important partners in the effective and efficient implementation of the CPCP. Their contribution to delivering the CPCP is integral to the delivery and fulfilment of the plan's commitments.

Role in implementing local planning controls

As consent authorities for local development, local councils assess development applications, ensuring consistency with the CPCP requirements for development. In addition, they ensure conservation is embedded in local planning controls, including following section 9.1 directions in considering any planning proposals submitted to them.

The strategic conservation planning chapter in the Biodiversity and Conservation SEPP sets out planning controls to protect important biodiversity. The department will provide ongoing support to local councils in the application of planning controls, including sharing knowledge, maps and data (Commitment 5, Action 3). We have already provided integrated data sets for the strategic conservation area to councils for use in local and regional planning, including local strategic planning statements (LSPS).

Local councils, as infrastructure providers, are the determining authority for infrastructure development assessed under Part 5 of the NSW *Environmental Planning and Assessment Act 1979*. The department is introducing the Cumberland Plain Conservation Plan Guidelines for Infrastructure Development that will provide requirements for infrastructure development to meet the CPCP approvals. The department will also provide support and guidance for councils on the implementation of these guidelines.

Role in implementing the conservation program

Councils are key delivery partners for several of the conservation program commitments. These include, managing landscape threats such as weeds, pest animals and disease, and building knowledge and capacity for biodiversity conservation in Western Sydney's communities.

Specific commitments and actions listed in the CPCP include:

- a pest animal control strategy (Commitment 16, Action 2)
- a priority disease control program (Commitment 18, Action 1)
- climate adaptation programs (Commitment 19)
- an education and engagement implementation strategy and programs (Commitment 20).

The department will provide funding to councils to deliver actions in the implementation strategies through mechanisms such as funding agreements with individual councils or contestable grants programs for all councils in the CPCP Area.

Local councils could also establish reserves or biodiversity stewardship sites on council-owned land, allowing access to in-perpetuity funding to manage biodiversity in new reserves. Funding through the CPCP could also be used to install signs and interpretive displays at new or established conservation land to raise awareness of the biodiversity values of a site (Commitment 20, Action 6). This could be for reserves on council-owned land and reserves within a council's local government area.

Engaging with councils

The department has an ongoing commitment to work with local councils and communities to successfully implement the CPCP. Extensive early engagement with councils occurred through 2019, including 2 workshops for staff from all 8 councils included in the CPCP and 5 community drop-in sessions where the department met individually with stakeholders from local councils.

We engaged with local councils prior to public exhibition in 2020 through dedicated briefings with staff from all 8 councils. The department will continue to engage with councils through the life of the plan to share knowledge and data, and provide support as required.

Compliance

An effective compliance program will ensure that federal and state legislative and regulatory requirements are met and that the CPCP complies with relevant planning instruments.

Roles and responsibilities for compliance fall across all levels of government and multiple agencies. The implementation and assurance framework and evaluation program set out the key arrangements to ensure all activities covered by the CPCP are effectively carried out, monitored and reported.

Compliance working group

We will establish a compliance and implementation working group comprising representatives from the department, councils and other relevant stakeholders (Commitment 26, Action 1). Under the guidance of this working group, we will prepare a compliance strategy that will:

- identify relevant compliance mechanisms
- set out compliance monitoring and auditing priorities and processes
- set out a decision-making framework for taking compliance action
- set out procedures and protocols for taking compliance action
- identify roles and responsibilities for compliance (Commitment 26, Action 2).

This strategy will provide continuity for the coordination of roles and responsibilities, set out compliance monitoring and auditing priorities and processes, such as monitoring clearing of vegetation and complying with EPBC Act requirements for matters of national environmental significance.

Compliance officers

Local councils will play a key compliance role in ensuring that the conservation measures are implemented. The CPCP commits funding for 6 council-based compliance officers to ensure compliance with the conservation program (Commitment 26, Action 3). These officers will work closely with council rangers to monitor illegal dumping and vegetation clearing. The department will share knowledge, maps and data and provide ongoing support and training to council staff to assist local councils carry out compliance activities (Commitment 26, action 4).

Compliance officers will help coordinate investigations and remediation activities in conservation areas and in buffer zones, asset protection zones and other areas. They will seek to identify threatening activities that may affect conservation outcomes and will have the authority to impose warnings and fines on transgressors where the law is broken.

Monitoring and reporting on compliance with the CPCP

Development in nominated areas and major transport corridors must be undertaken in accordance with the CPCP and any conditions of approval.

Development will be staged over the life of the CPCP, and in some cases may require further assessment and approval through applicable NSW legislation.

Monitoring compliance with regulatory approvals under the EPBC Act and BC Act will be carried out to ensure that development is consistent with the endorsed CPCP (EPBC Act approval) and certification order (BC Act approval) (Commitment 1, Action 2).

The department will be responsible for monitoring and auditing and for reporting to the executing implementation committee.

Compliance reporting will be an important part of the evaluation program to ensure potential compliance breaches are adequately managed. Compliance reporting will be included in all facets of the reporting framework. This includes regular reporting to the executive implementation committee, yearly updates and an independent 5-yearly review. Reports will be published and provided to local council for review and investigation (Commitment 26, Action 5).

The department will prepare reports every two-and-a-half years on any identified breaches with CPCP commitments and approval conditions, such as auditing development consent conditions and environmental management plans (Commitment 26, action 6). This will form part of the ongoing process review.

Establishing conservation land as offsets

The CPCP introduces several methods to oversee, track and establish conservation land as biodiversity offsets over the life of the plan. They are:

- a series of steps and principles to guide the selection of conservation land, while providing some flexibility in delivery
- a reconciliation accounting process to reconcile offsets with development impacts throughout the life of the CPCP to 2056
- adaptive management steps to align the securing of biodiversity offsets with development.

These methods have been developed to address risk and the inherent uncertainty in delivering a conservation program of this scale over a several decades.

Implementing these methods will ensure the conservation targets for threatened ecological communities, and threatened flora and fauna are met over the large time scale and geographical area of the conservation program. These methods will be subject to the independent 5-yearly review to ensure that they continue to be effective in delivering the commitments and outcomes.

The delivery of conservation land as offsets under the CPCP will be guided by a series of principles and selection steps that also provide flexibility and assurance for a strategic conservation outcome in the Cumberland subregion. These principles and selection steps are outlined in the following sections.

Conservation land principles

These are the overarching principles to guide implementation decisions for purchasing conservation land through the CPCP reserve program or establishing biodiversity stewardship sites through the biodiversity stewardship program. This includes decisions by the executive implementation committee, the department and the conservation land delivery partners.

Regular reviews of program implementation will consider how offset sites delivered through the respective biodiversity stewardship agreements and reserve programs are meeting the following principles:

- Conservation land protects the large patches of vegetation that are in better or the best available condition, recognising the importance of new sites to contribute to the protected area network.
- Conservation land works efficiently together at site, local and regional scales to enhance ecological connectivity and landscape function in the long term and in a changing climate.
- Work on conservation land includes active ecological restoration of degraded areas of the landscape to provide a biodiversity gain and ecological reconstruction of target TECs where there is a shortfall based on reconciliation accounting. Effort should focus on protecting and restoring corridors, enhancing ecological connectivity and providing vegetative buffers to core patches of intact vegetation.
- Conservation land protects and manages habitat for impacted threatened species and TECs in accordance with commitments and actions (direct offsets).
- The selection of new reserves takes into consideration species adaptation needs in a changing climate, including consideration of changing distribution patterns and habitat requirements.
- Biodiversity resilience is improved through seeking to establish conservation land early in implementation, including purchasing available reserve sites, purchasing and retiring existing biodiversity credits or through securing new biodiversity stewardship agreements with willing landowners.
- Data underpinning the strategic conservation area is reviewed every 5 years to ensure that decision-making is supported by up-to-date and accurate information.
- The implementation of conservation land will keep pace with the rate of development and demonstrates value for money.

Conservation land selection steps

The conservation land selection steps will be used to identify, select and secure offsets through the reserve or biodiversity stewardship site program or to direct the purchase and retiring of biodiversity credits.

Some of the offset targets may be challenging to meet as many of the targeted ecological communities and species have limited extent or habitat remaining in the Cumberland subregion. The CPCP allows flexibility in reaching those targets through the conservation land selection steps (see 'Box 5: Conservation land selection steps').

The order of the conservation land selection steps reflects geographical and ecological priorities to meet offset targets and prioritise connectivity across the landscape. Under a scenario where offsets can't be secured from within the strategic conservation area, or in cases where like-for-like species and threatened ecological community offsets are unlikely to be secured, the selection steps allow for offsets to be secured from outside the strategic conservation area, or alternate offsets from outside or within the CPCP Area (see Figure 21).

These selection steps, in addition to the offset requirements for alternate offsets (see 'Box 7. Offset requirements for target TECs and target species') have been developed according to the limitations provided in the Biodiversity Conservation Regulation 2016 (NSW) but refined to prioritise the biodiversity and connectivity of the Cumberland subregion. Many of the threatened ecological communities targeted as offsets by the plan are already restricted to within the Cumberland subregion and its immediate surrounds. Retaining presence of species in the Cumberland or adjacent subregions is also prioritised.

Flexibility to secure offsets for threatened ecological communities outside of the CPCP Area, or as alternate offsets, is capped to a maximum of 20% of the overall offset target for native vegetation over the life of the CPCP and only after appropriate steps have been taken to secure a like-for-like offset.

In addition to the meeting offset targets for threatened ecological communities, the department will seek to acquire direct species credits in accordance with the selection steps and offset requirements for target species (see 'Box 7. Offset requirements for target TECs and target species'). This will ensure that offsets can be secured for threatened species as a priority if habitat does not become available as a new conservation land. A ruleset for moving through the target species offset requirements has been developed for where more than one offset location is required for a target species (see Figure 22). Where multiple offset locations are required for a species, the sequencing of flexibility steps commences 5 years later for each successive offset location requirement.

We are establishing formal agreements with delivery partners to secure offsets and will be responsible for ensuring delivery partners meet these requirements. The Biodiversity Conservation Trust will follow these steps when implementing the biodiversity stewardship program. We must also follow these steps when developing reserve proposals with future land managers.

These steps will be assessed as part of the 5-yearly review for implementing the CPCP and updated if found not effective in delivering the conservation program objective and targets.

Box 5: Conservation land selection steps

- 1a. Secure target threatened ecological community (target TECs⁵) offsets from within priority areas of the strategic conservation area (see 'Box 6: Criteria to identify priority sites within the strategic conservation area'), or sites contiguous with the priority areas which otherwise meet the criteria for priority areas, with a preference for (in order):
 - i. target TECs with the greatest impact, based on the 2019 impact assessment (Cumberland Plain Woodland, Shale Sandstone Transition Forest, River-Flat Eucalypt Forest)
 - ii. target TECs that have the highest percentage cleared status (as identified in the NSW BioNet Vegetation Classification database for the corresponding PCTs)
 - iii. target TECs and species habitat where there is a shortfall in offsets against development impacts, based on offset reconciliation accounting:
 - this includes the selection of cleared or degraded sites that can be restored to a target TEC or species habitat with an offset shortfall
 - iv. areas that provide potential habitat for the target species or for the following EPBC Act-listed key species:
 - grey headed flying fox
 - regent honeyeater
 - green and golden bell frog
 - v. areas with additional conservation benefits (that is, connectivity; riparian habitat; refugia for threatened species; and adjacency to existing protected areas).
- 1b. Secure species offset locations or area of habitat for target species⁶ according to the offset requirements in 'Box 7. Offset requirements for target TECs and target species'
2. Secure target TEC offsets from elsewhere within the strategic conservation area following the same ecological criteria specified in step 1 of these selection steps.

(The following steps only apply to the biodiversity stewardship program and are subject to the CPCP offset requirements in 'Box 7. Offset requirements for target TECs and target species')

3. Secure offsets for target TECs outside the strategic conservation area but within the Cumberland subregion or adjacent subregions
4. Secure offsets for target TECs anywhere else they occur in NSW, following the ecological criteria identified in step 1(a)(i-v) of these selection steps
5. Secure alternate native vegetation (i.e. vegetation not consistent with like-for-like offsets for target TECs) according to the offset requirements (see Box 7. Offset requirements for target TECs and target species).

⁵ Target TECs are threatened ecological communities with a direct offset target in the CPCP

⁶ Target species are threatened species with a direct offset target in the CPCP

Box 6: Criteria to identify priority sites within the strategic conservation area

Priority areas will be determined during implementation and will include:

- presence of target native vegetation
- presence of larger areas of remnant native vegetation
- areas where habitat for multiple species overlap
- presence of important species populations⁷
- presence of habitat for species most impacted by development
- areas avoided for biodiversity within the nominated areas
- areas owned by Office of Strategic Lands, the NSW Government or local government
- areas adjacent to existing conservation land (for example, biodiversity stewardship agreement sites and reserves for biodiversity purposes such as national parks)
- land that enables connectivity through the landscape.

⁷ 'important population' is defined as per Commonwealth EPBC Act MNES Significant Impact Guidelines 1.1

Box 7. Offset requirements for target TECs and target species

Threatened ecological communities

Alternate native vegetation can only be used as an offset once appropriate action has been taken to obtain offsets for target TECs following steps 1 to 4 of the conservation land selection steps (including all like-for-like⁸ credits that make up the relevant TEC)

Where using alternative native vegetation as an offset, the alternate native vegetation used must be part of a TEC and preference should be for plant community types of the same Class first, then of same Formation, to those in the target TEC.

A maximum of 20% of the cumulative offset targets for TECs can be secured outside of the Cumberland subregion over the life of the CPCP or as alternate offsets (either within CPCP Area or outside).

Geographic preference should first be the Cumberland and adjacent subregions – then the Sydney Basin bioregion – then anywhere in NSW

Threatened species

Step 1. Direct acquisition of offsets for target species from start of CPCP implementation (year 1) from within the Cumberland subregion or adjacent sub regions

Critically endangered and endangered species



Direct purchase of offsets for the same target species can be secured from anywhere in NSW



Implementation of conservation actions for the critically endangered target species also permitted



Implementation of conservation actions for endangered target species also permitted

Vulnerable species



Direct purchase of offsets for the same target species can be secured from anywhere in NSW



Implementation of conservation actions also permitted

If at year 30, the conservation program is still not on track to meet target species offsets, direct purchase of offsets for any species of the same kingdom and of the same or higher threat status within the Cumberland or adjacent subregions is permitted.

⁸ Like-for-like is defined under the Biodiversity Regulation 2016 (NSW) and seeks to ensure biodiversity impacts are offset with biodiversity that is very similar to the biodiversity that is being impacted.

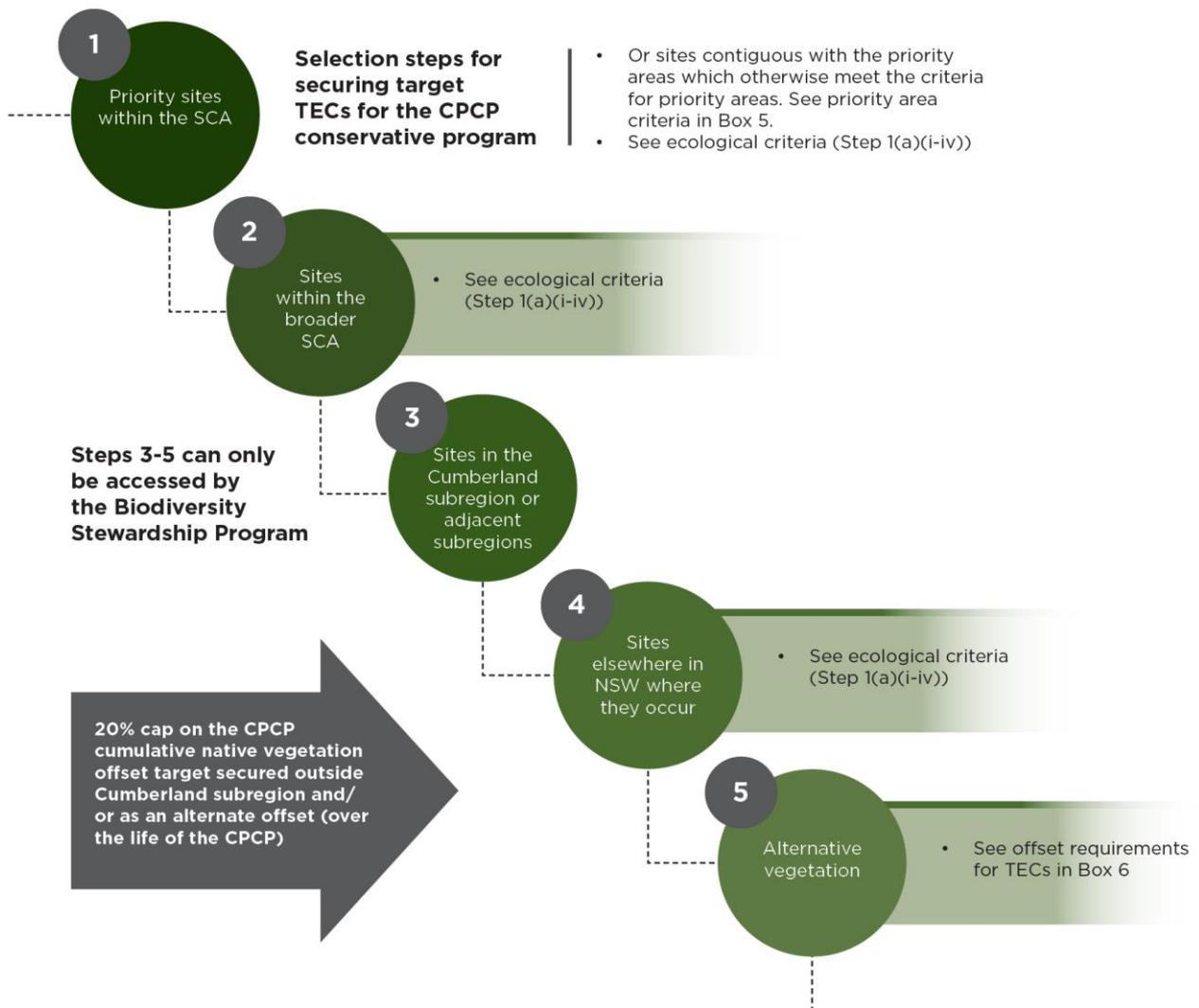


Figure 21. Selection steps for securing target TECs

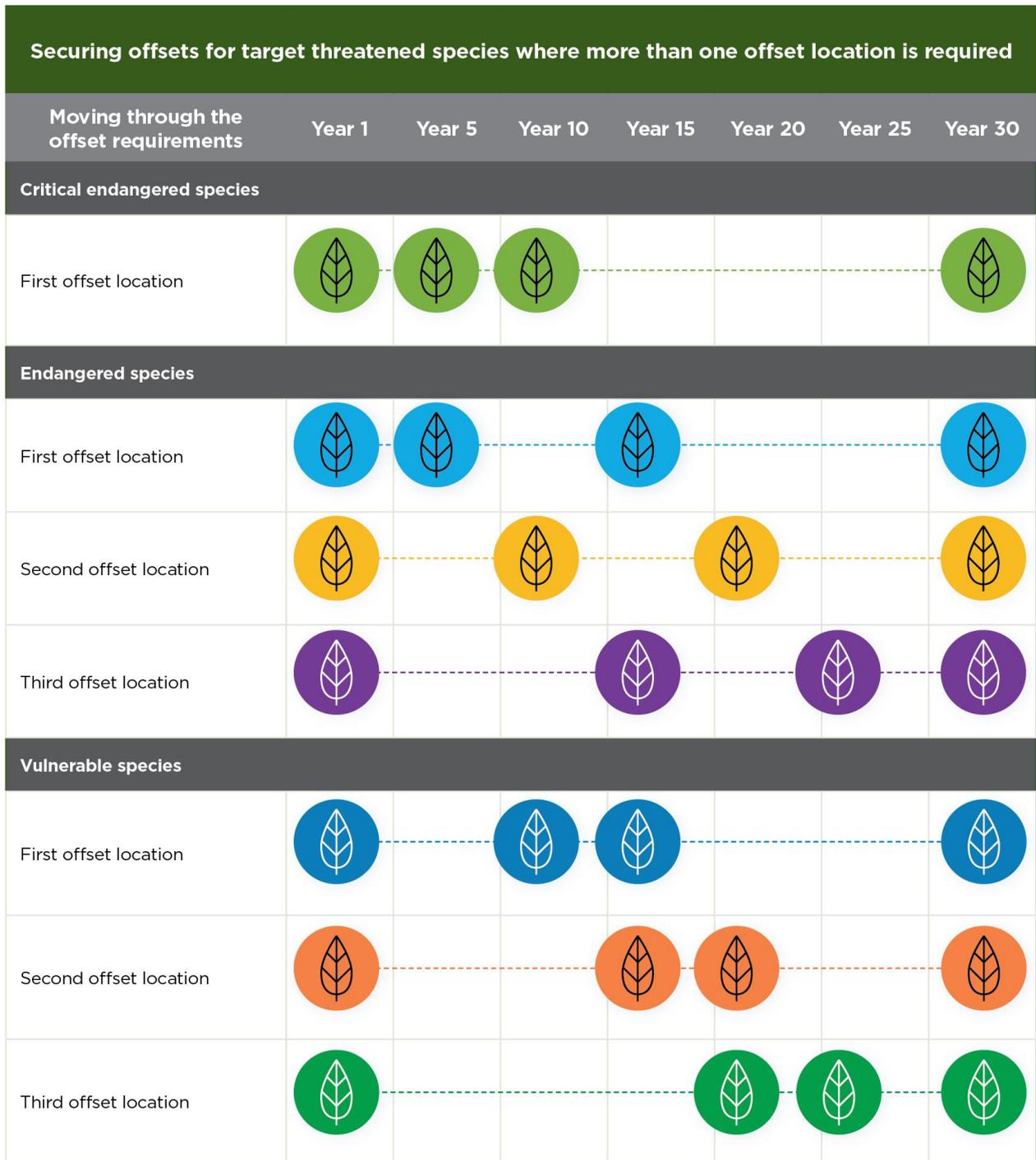


Figure 22. Securing offsets for target species where more than one offset location is required

Conservation land implementation strategy

The department is developing a conservation land implementation strategy that will guide the process of selecting, purchasing and establishing new conservation lands to meet offset requirements (Commitment 8, Action 1).

The implementation strategy will be finalised in year one of the CPCP and will include:

- priorities for selecting conservation land (the conservation lands selection steps)
- interim targets and proposed timeframes for establishing conservation land through either the reserve or biodiversity stewardship program
- proposed mechanisms for securing priority conservation lands
- suitable land managers for priority conservation lands
- the process for purchasing land for new reserves
- the process for establishing new stewardship sites
- how the department will reconcile offsets and impacts over the life of the CPCP.

Reconciliation of offsets and impacts

The evaluation program will monitor and report on the plan's progress in delivering offsets and will include an ongoing reconciliation accounting process to reconcile the establishment of conservation land through reserves or direct purchase of credits with development impacts throughout the life of the CPCP to 2056.

The reconciliation accounting process will provide a reliable mechanism to facilitate reporting on targets and commitments and inform the selection of offsets sites. It will also be used to determine when adaptive management steps may be required if development impacts are exceeding the delivery of conservation land.

Reconciliation outputs will be provided to the executive implementation committee to support decision making and will inform evaluation and reporting on the CPCP outcomes and commitments. Quarterly updates will be provided to the executive implementation committee.

Collecting data on offsets

In accordance with 'Conservation measures in strategic applications for biodiversity certification - guidance for planning authorities', (EES-DPIE, 2020), the department has assessed biodiversity impacts, measured in credits, to inform the offset targets for the CPCP. The methods used to determine these offset targets are described in the section 'Addressing impacts' on page 18.

The department proposes purchasing and retiring biodiversity credits from biodiversity stewardship sites and creating or extending reserves to offset the impacts of development. Biodiversity assessments will be undertaken as part of the process of creating biodiversity stewardship sites, or through other assessment methods where land is not secured under a stewardship agreement.

Additional offsets secured through the CPCP will include direct purchase of species credits where appropriate and supporting management actions such as threat management, community education and research. Offsets for impacts on EPBC Act-listed threatened ecological communities from major transport corridors (strategically assessed only) may be secured through a NSW state-significant infrastructure approval (or equivalent). In these cases, Transport for NSW will advise the department and executive implementation committee on how these offsets are secured, and these will be reconciled through the reconciliation accounting system.

The reconciliation accounting process will track the progress of the plan in achieving its offset targets for species and threatened ecological communities. While not required to specifically meet

the offset commitments, monitoring the acquisition and retiring of credits will also form part of evaluating progress towards the Biodiversity Certification Assessment Report (BCAR) ecosystem credit balance.

If offsets are not being adequately secured for target threatened ecological communities and threatened species, it will trigger a response to prioritise those offsets through the reserve, biodiversity stewardship program or through undertaking ecological restoration (reconstruction) (see Step 1a(iii) of 'Box 5: Conservation land selection steps').

Collecting data on impacts

Monitoring impacts is critical to understanding how the conservation program is tracking against its offset targets and will be a key mechanism to ensure that offsets are secured commensurate with the approved development impacts.

The reconciliation accounting process will track approved impacts through monitoring the delivery of development in the certified-urban capable land and through monitoring the development of transport projects in the 4 major transport corridors.

Residential, commercial and infrastructure data will be collated from the department's existing [Metropolitan Housing Monitor](#) and newly established [Greater Sydney Urban Development Program dashboard](#), which gather and publicly report live data on a range of development indicators including the estimated dwelling potential, number of lots sold and available, and the number of completed dwellings in released and rezoned precincts. Similarly, transport infrastructure development will be tracked by Transport for NSW and reported regularly to the department.

The CPCP also facilitates EPBC Act approval of essential infrastructure development in the avoided land up to a certain impact threshold. Approved impact thresholds for EPBC Act-listed TECs are detailed in Table 3.

Public authorities and other proponents of essential infrastructure development will be required to notify the department of any planned essential infrastructure development in the avoided land, which can then be tracked against these impact thresholds through the evaluation program. These impacts have not been considered as part of the offset targets and conservation program and are not required for the reconciliation accounting process. However, proponents will need to notify the department on how offsets to EPBC Act matters will be met through the relevant NSW approval.

In addition to the site-scale collection of impact data, the department will monitor annual clearing and changes in vegetation extent across the nominated areas, including the certified-urban capable land, certified major transport corridors and the avoided land. This data will be captured through remote sensing methods.

Vegetation change analysis in certified-urban capable land will be tracked annually to supplement site-scale clearing data for EPBC Act- and BC Act-listed ecological communities. Vegetation change analysis in the avoided land will contribute to compliance monitoring and identification of illegal clearing and will supplement site-scale data from essential infrastructure.

While the CPCP is introducing planning controls for protecting biodiversity in the avoided land, inevitably further development will take place, for example arterial roads and mass transit infrastructure to support urban growth. Annual vegetation change analysis will also identify these areas of clearing and will contribute to reporting on avoided land.

Impact data will be collectively incorporated into the evaluation program to inform decision-making in relation to program delivery (for example offsets prioritisation), tracking progress against commitments and triggering adaptive management for offsets if required.

Adaptive management steps for offsets

Adaptive management may be required in the case that offsets are not tracking in line with development impacts. Adaptive management steps have been developed to provide certainty on how this would occur.

The adaptive management steps will be triggered for consideration by the executive implementation committee when the total area of target TECs within a conservation land is less than 80% of the total offset liability to that time.

Determining the adaptive management offset liability

The amount of offset liability needed to trigger the adaptive management steps will be determined using a ratio of 3.5:1 applied to the total area in hectares of target native vegetation cleared in certified-urban capable land in certified-major transport corridors. This applies an average impact to offsets ratio for tracking purposes to assist with decisions on adaptive management. This ratio will be reviewed for its effectiveness as part of regular reviews of the CPCP.

The offset liability ratio has been determined based on the offset target method, which applied a higher ratio to impacted native vegetation of higher condition or threat status to determine the amount of offset target for each protected matter (see 'Box 1. Offset target methods'). The offset liability ratio differs in that it applies an average ratio across all the impacts.

Importantly, this would give a total amount of native vegetation (in hectares) to be offset – not an amount for each impacted TEC or species. This method aligns with the strategic nature of delivering the conservation program, while ensuring that the executive implementation committee can maintain oversight on whether the CPCP is on track in delivering offsets and apply adaptive management when required.

The amount of target native vegetation within a conservation land versus the offset liability to that time will be determined through the reconciliation accounting process.

The department, with the oversight of the executive implementation committee, will retain responsibility for implementing the adaptive management steps. The steps that will be considered and implemented until a balance has been achieved are:

1. property acquisition by agreement
2. compulsory acquisition of property
3. land use planning responses to development.

Purchasing land

Land identified as suitable for conservation could be prioritised for acquisition if offsets are not meeting the staged delivery of housing and infrastructure. A land purchase strategy is being developed to ensure transparency and fairness for landholders, and to ultimately deliver the offsets required under the CPCP (Commitment 8, Action 8).

Generally, the land purchase program will be phased and involve voluntary acquisition measures, reflecting the long-term duration of the CPCP. If acquisition is triggered through the adaptive management steps described above, a more targeted approach may be used – such as through 'property acquisition by agreement' or through compulsory acquisition. The department would consult with members of the community and key stakeholders before any decision on compulsory acquisition was made. 'Box 8. Proposed land purchase mechanisms' describes the various methods of land purchases and acquisition being considered under the CPCP.

Box 8. Proposed land purchase mechanisms

All of the mechanisms below will be subject to due diligence checks, including independent valuation advice.

Open market purchase

Land that is on the market for sale and has been identified as a suitable purchase for the CPCP can be purchased on a voluntary basis through a negotiated sale with the landholder. The Office of Strategic Lands will make an offer to purchase based on the market value of the land.

Active purchase

The Office of Strategic Lands may actively engage with landowners and express an interest to purchase their land, for example by sending letters to landowners or by doorknocking. If a landowner decided to sell, negotiations with the Office of Strategic Lands would begin.

Property acquisition by agreement

Where land is identified for acquisition, the Office of Strategic Lands would contact the landowner and organise a meeting to explain the process, along with the landowner's rights and obligations. The Office of Strategic Lands would then arrange due diligence advice, including a valuation of the land and encourage the landowner to seek their own independent advice.

Once the Office of Strategic Lands makes an offer of purchase to the landowner, a minimum 6-month period to reach an agreement would begin.

Compulsory acquisition

Compulsory acquisition is a legislative process under the *Land Acquisition (Just Terms Compensation) Act 1991* (NSW). The Act sets out the process the relevant acquisition authority must follow when it is necessary to compulsorily acquire land. The process provides the means for resolving disputes around the amount of compensation payable to the landowner.

Land use planning responses relating to development

Based on the department's advice, the executive implementation committee may choose to recommend further actions to meet the offset liability, including recommending development be temporarily constrained (a pause point). This advice would be provided to the Minister for Planning (as the CPCP approval holder).

The Minister for Planning, based on the committee's advice, can pause development through the planning system by delaying the release of additional precincts (if zoning has not yet occurred) or applying regulatory or legislative mechanisms to temporarily stop development applications from being assessed (if zoning has occurred)

It should be noted that the independent 5-yearly review may also make recommendations in relation to the progress of development delivery and the conservation program independent of the executive implementation committee.

Timing for adaptive management steps for offsets

Adaptive management steps will not be considered in the first 5 years to allow time for the initial set up and implementation of the CPCP. However, in the case that offsets are significantly lagging within the first 5 years, the executive implementation committee can decide to initiate them earlier, if there is an agreed reason to do so.

Where the area of target native vegetation within a conservation land contains less than 80% of the offset liability after year 5, the executive implementation committee would be triggered to consider

adaptive management steps, commencing with voluntary acquisition (property acquisition by agreement).

There would be at least another three years before the final adaptive management step (land use planning responses) would be considered if target native vegetation within a conservation land is still less than 80% of the offset liability. This step would be considered no earlier than year 8.

Land use planning responses will be in place until the conservation land program can contribute to a minimum of 80% of the offset liability to that time.

The adaptive management steps (starting from 1 to 3) are reconsidered on a 3-yearly basis from the time the conservation land program reaches 80% of its liability.

Figure 23 provides an overview of the adaptive management for offsets process and timing.

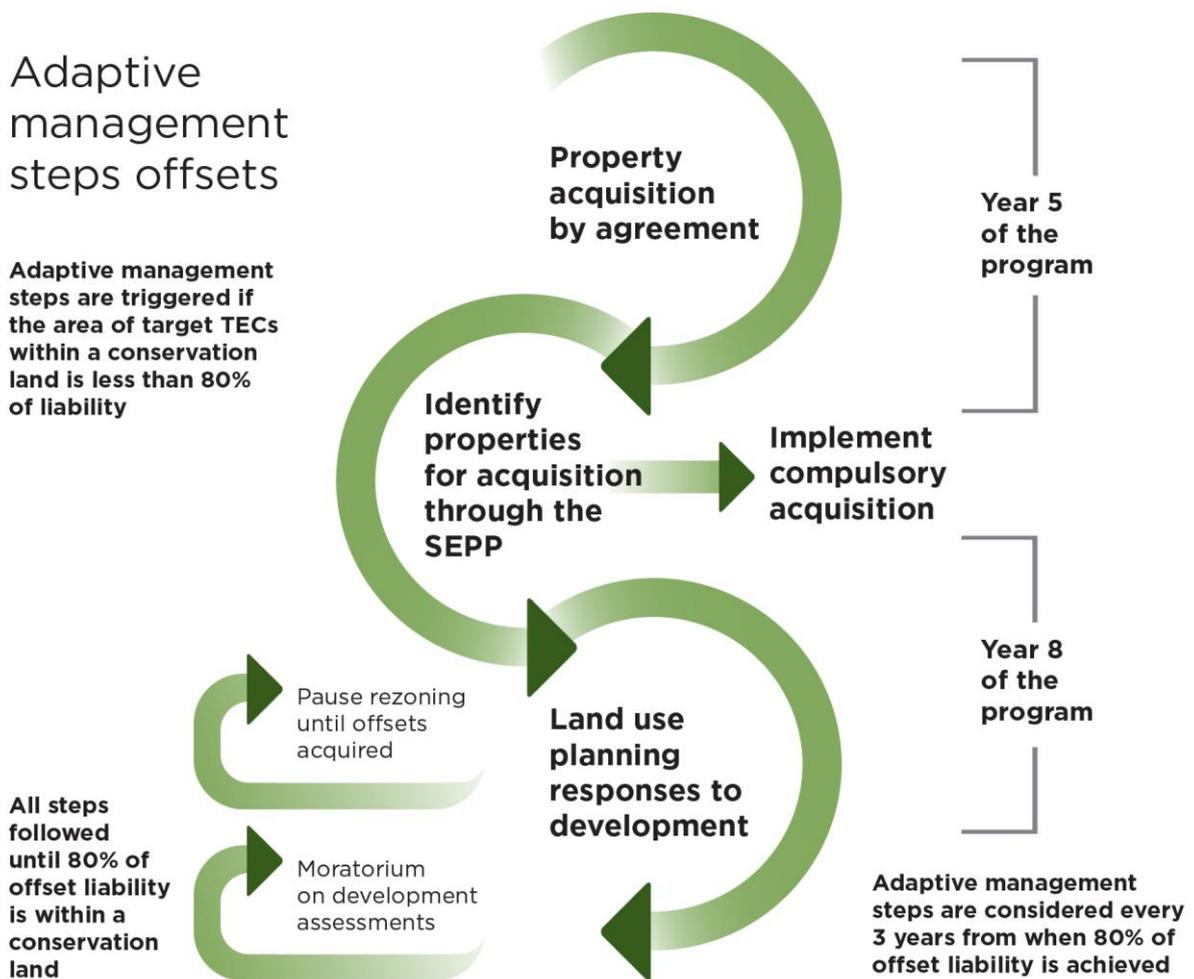


Figure 23. Adaptive management steps for offsets

The role of the Office of Strategic Lands

The Office of Strategic Lands' primary role is administering the Planning Ministerial Corporation and managing the Sydney Region Development Fund. The Office of Strategic Lands' functions include purchasing land and transferring it to other state and local government agencies to achieve public benefit outcomes, such as conservation and open space.

The Office of Strategic Lands will be the primary delivery partner for purchasing land for new reserves or adding to existing reserves. An agreement has been established with Office of Strategic Lands outlining their role in negotiating with landholders and purchasing land identified for reserves during implementation of the CPCP.

Methods of land purchase

The land purchase model proposes a mix of mechanisms. These are outlined in 'Box 5: Conservation land selection steps'. The purchase of all properties by the plan will be through voluntary agreement (market purchase or active acquisition) unless the adaptive management steps for offsets are triggered. Where the department considers a more targeted approach, the community and key stakeholders would be consulted before a decision was made.

Other key delivery partners

The National Parks and Wildlife Service and other potential reserve managers, such as local councils, local Aboriginal land councils and community-based nature organisations, are critical partners in the long-term management reserves and properties suitable for purchase.

Evaluation Program



A tagged koala released through the Wollondilly Koala project

Evaluation program

About the evaluation program

Implementing the CPCP will require regular monitoring against the environmental, social and economic outcomes, evaluation to inform the use of adaptive management and public reporting to government and the community on progress in delivering the conservation program and achieving its outcomes.

Formal agreements such as memorandums of understanding will be established with delivery partners and include requirements relating to the evaluation program including monitoring (data collection, management and sharing arrangements) and reporting.

The outputs of the evaluation program will be used to inform the executive implementation committee, adaptively manage delivery of the CPCP and provide data for reporting on the plan.

The evaluation program will be finalised in consultation with key stakeholders. It will be used to inform decisions made by the executive implementation committee over the life of the CPCP (Commitment 25, Action 1). Figure 24 outlines the key aspects of the evaluation program.



Figure 24. The evaluation program

Monitoring

The evaluation program will collect, assess and store relevant data to evaluate and report on the progress of the CPCP.

The department will first collect benchmark data that will be used to evaluate the effectiveness of the CPCP over time. The benchmark data will be collected through:

- remote sensing imagery and analysis
- existing habitat modelling for matters of national environmental significance and threatened species
- on-ground Biodiversity Assessment Method vegetation surveys
- targeted threatened species surveys
- rapid assessments
- literature reviews
- expert reports
- existing information from NSW Government websites such as [NSW BioNet](#) and the SEED portal (NSW Government, 2020).

Throughout the life of the evaluation program, the department will assess specific locations, target threatened species and ecological communities and species habitat components (including connectivity) to ensure the CPCP is delivering its commitments, actions and outcomes. Future assessment of biodiversity as part of the evaluation program will include:

- remote sensing methods
- conducting Biodiversity Assessment Method through business-as-usual monitoring practices for biodiversity stewardship agreements/reserves
- conducting other types of on-ground assessment
- updating species habitat predictive modelling
- establishing agreements with delivery partners to provide relevant data.

This data will be compared to the baseline data, and progress towards the various outcomes will be tracked over the life of the plan.

Evaluation

The effectiveness of the actions in achieving the environmental, social and economic outcomes will be evaluated on an ongoing basis to meet reporting requirements and for transparency and accountability with the approval agencies, stakeholders and the community. It will also inform any necessary adaptive management decisions for the implementation of the conservation program.

Evaluation will be guided by a detailed monitoring and evaluation framework that will include:

- key performance indicators and metrics
- key evaluation questions
- corresponding data collection requirements.

The department has started scoping and developing the evaluation program and will engage with key stakeholders during development. The program will be developed to meet the NSW Government guidelines for program evaluation.

Reporting

The NSW Government is committed to publicly available and regular assurance reporting. This will include a progress update each year, an independent review of the CPCP every 5 years and regular finer-scale program and project reporting from the relevant delivery partners. We will develop reporting templates so that reports from delivery partners are consistent. This will streamline the data collation and reporting processes and feed directly into the adaptive management process.

Annual update

The department will provide an annual update on the plan's commitments and actions, with feedback from the evaluation questions and report on the conservation program's revenue and expenditure (Commitment 25, Action 4).

In addition, we will more frequently collate finer-scale program and project reporting from the relevant delivery partners to support adaptive management over the life of the CPCP. This will be provided to the executive implementation committee (see Commitment 4, Action 1). Final reporting requirements and timeframes will be confirmed with when the CPCP is approved.

Independent review

The NSW Government will commission a comprehensive, independent review on the status of the CPCP and its outcomes every 5 years over the life of the plan. This report will be submitted to the NSW Minister for Planning and Homes and provided to the NSW Minister for the Environment and the Commonwealth Minister for the Environment. The report, as well as the annual updates, will be made available on the [department's website](#) and remain available for the life of the CPCP (Commitment 25, Action 5).

Mid-term process review

An internal process review will be conducted at the mid-term point in between independent reviews, every 2.5 years, over the life of the CPCP. This report will be provided to key delivery partners and stakeholders (Commitment 25, Action 6).

Adaptive management

Adaptive management is critical to effectively achieving the outcomes of the CPCP. It will help us to manage uncertainty across the 200,000-hectares covered by the plan and throughout the life of the plan to 2056.

Strong risk management and implementation planning will manage most conservation program risks. However, not all changes can be accurately forecast. Uncertainties include:

- economic and social variables
- unpredicted climate variation
- the changing conservation status of individual species or plant communities
- local events such as fires, floods and disease
- changes in administration
- new technology
- the roles and responsibilities of delivery agencies and key stakeholders.

The evaluation program will identify these large-scale risks up front and continually monitor changes. The end-of-program outcomes and commitments of the conservation program will be fixed, but the actions may be adaptively managed over time to respond to changes such as those outlined above.

Adaptive management will use the data sourced through monitoring and the findings of program evaluation to determine whether actions need to be revised to more effectively achieve the plan's commitments and outcomes. Importantly, where evaluation suggests a commitment is not tracking as planned, it will trigger a review and potential modification to the required action or implementation of the action.

Ongoing tracking of the activities led by delivery partners will be managed as part of the evaluation program. Where the evaluation program indicates a commitment or outcome is not tracking in the desired way, this will trigger a review of the program or project activity in greater detail. This will be carried out by the relevant delivery agency for that particular project or program, in partnership with the department.

Adaptive management of the plan's actions could be made in cases where:

- targets are not being met
- the conservation program logic does not adequately translate into the desired outcomes
- external factors arise that affect the assumptions, logic or delivery of the CPCP.

Adaptive management will be applied across the entire conservation program. Possible remediation actions to address shortfalls in achieving plan outcomes or to remedy implementation challenges are outlined below. However, this list is indicative only and any adaptive management measures required will be informed by the evaluation program.

Remediation actions to address shortfalls in offsets could include:

- encouraging uptake of conservation land by:
 - incentivising landowners to enter into biodiversity stewardship agreements
 - engaging with the community and landowners
 - working with delivery partners to strengthen the effectiveness of the biodiversity stewardship agreement and reserve programs
- investing in active restoration technologies and projects
- managing for new and emerging threats to biodiversity
- undertaking research to better understand how species and communities respond to change, and implement relevant management practices
- reviewing data needs and update conservation priority mapping as required.

Appendices



Cumberland Plain Land Snail is a threatened species that is endemic to Western Sydney

Appendix A. Commitments and actions

Development actions

General

Commitment 1

Development will be undertaken in accordance with the CPCP and any conditions of approval. This applies to the following classes of actions:

- urban and industrial
- infrastructure
- intensive plant agriculture
- major transport corridors.

Actions

1. Integrate the CPCP into the planning delivery framework for the nominated areas through mechanisms including an environmental planning instrument with development controls, a ministerial direction under section 9.1 of the *Environmental Planning and Assessment Act 1979*, and Cumberland Plain Conservation Plan Guidelines for Infrastructure Development (Commitments 2, 4, 6, 7, 13, 14) **(Before start of CPCP)**.
2. Monitor the implementation of urban and industrial development, infrastructure, major transport and intensive plant agriculture through the plan's evaluation program to ensure development is consistent with the CPCP. This includes the plans:
 - a. commitments for avoiding, minimising, mitigating and offsetting impacts
 - b. reporting and compliance requirements
 - c. class of action approvals (EPBC Act); strategic biodiversity certification order (BC Act).**(Life of CPCP)**
3. Require proponents of essential infrastructure to notify the department of any development or activity in avoided land, including how the Cumberland Plain Conservation Plan Guidelines for Infrastructure Development have been addressed **(Life of CPCP)**.
4. Implement the Cumberland Plain Conservation Plan Guidelines for Infrastructure Development, including Appendix A of the CPCP by:
 - a. notifying proponents of essential infrastructure of their obligations under the EPBC Act, including when development does not have Part 10 EPBC Act approval under the CPCP
 - b. monitoring the impacts of development on the avoided land
 - c. monitoring compliance with the avoidance, mitigation and offset commitments of the plan, relevant to these guidelines
 - d. providing annual updates to the Australian Government Department of Climate Change, Energy, the Environment and Water share information and data as required to assist councils and infrastructure providers to implement these guidelines
 - e. undertaking monitoring and audit of infrastructure construction and operation as required, to ensure adequate mitigation measures are being applied.**(Life of CPCP)**
5. Undertake a formal modification to the strategic biodiversity certification if required to adjust the boundaries of the certified-urban capable land in circumstances where:

- a. minor adjustments are identified at the site level
- b. updates are consistent with the avoidance criteria and supported by a BAM-accredited assessor
- c. residual impacts to biodiversity, including matters of national environmental significance, are mitigated and offset in accordance with the BAM (or equivalent) and EPBC Act Environmental Offsets Policy, 2012 for any EPBC Act matters not covered by the BAM.

(Years 1 to 10)

6. Progress and submit (subject to compliance with legislative requirements) a modification of the strategic biodiversity certification under the *Biodiversity Conservation Act 2016* to include lands proposed by Deerubbin Local Aboriginal Land Council **(Year 1)**.

Conservation program

Avoid and minimise impacts

Commitment 2

Avoid and minimise impacts of up to 4,510 hectares of high biodiversity value area (the avoided land) through strategic conservation planning in the nominated areas.

Commitment 2.1

Limit cumulative direct impacts⁹ over the life of the CPCP from essential infrastructure to the following EPBC Act-listed threatened ecological community in the avoided land¹⁰:

- Shale Sandstone Transition Forest
- Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest
- River-Flat Eucalypt Forest
- Coastal Swamp Oak (*Casuarina glauca*) Forest
- Cooks River Castlereagh Ironbark Forest Western Sydney Dry Rainforest and Moist Woodland on Shale.

Commitment 2.2

Prioritise the avoidance of impacts from essential infrastructure on the avoided land to:

- known populations¹¹ of the following threatened flora species:
 - *Grevillea parviflora* subsp. *parviflora* (small-flower grevillea)
 - *Persoonia bargoensis* (Bargo geebung)
 - *Persoonia nutans* (nodding geebung)
 - *Genoplesium baueri* (yellow gnat-orchid)
 - *Pimelea spicata* (spiked rice-flower)
 - *Pultanea parviflora*
- protected koala habitat¹² within the Wilton and Greater Macarthur growth areas to maintain the function of koala movement corridors.

⁹ Impact thresholds for each threatened ecological community in the avoided land are listed in Table 3.

¹⁰ Distributions of these TECs are mapped in the *Cumberland Plain Assessment Report* and will require confirmation of extent through survey or assessment

¹¹ Known populations are mapped in the *Cumberland Plain Assessment Report* and will require confirmation of extent through survey or assessment

¹² Protected koala habitat is mapped in the *Cumberland Plain Assessment Report* and the department's spatial viewer

Actions

1. Introduce an environmental planning instrument to apply development controls to protect important biodiversity on avoided land under the CPCP (**Before start of CPCP**).
2. Issue a ministerial direction under section 9.1 of the NSW *Environmental Planning and Assessment Act 1979* to restrict rezoning of avoided land from its current zone to a zone that permits a more intensive land use (**Before start of CPCP**).
3. Introduce the Cumberland Plain Conservation Plan Guidelines for Infrastructure Development to manage impacts on biodiversity from infrastructure development, including essential infrastructure development, on avoided land in the nominated areas (**Before start of CPCP**).
4. Monitor the impacts of development on the avoided land through the plan's reconciliation accounting process (**Life of CPCP as precincts designed**).
5. Notify proponents of essential infrastructure of their obligations under the EPBC Act, including when development does not have Part 10 EPBC Act approval under the CPCP (**Life of CPCP as precincts designed**).
6. Locate Asset Protection Zones wholly within certified urban-capable land (**Life of CPCP as precincts designed**).

Commitment 3

Avoid and minimise impacts to threatened ecological communities, species and their habitat within certified-major transport corridors through detailed planning and design. This includes:

- avoiding areas of potential habitat connectivity within riparian corridors where possible, particularly for the following species¹³:
 - eastern pygmy possum
 - green and golden bell-frog
 - spotted-tailed quoll
 - squirrel glider
 - yellow-bellied glider
- avoiding known flora populations¹⁴ within the Outer Sydney Orbital and M7/Ropes Crossing Link Road corridors where possible, particularly:
 - *Dillwynia tenuifolia*
 - *Grevillea juniperina subs. juniperina*
 - *Pultanea parviflora*
 - *Persoonia nutans*
- for the Outer Sydney Orbital, minimising where possible the placement of waterway crossing structures within riparian corridors, changes to waterway alignments, and bulk earthworks on adjacent floodplain areas.

Actions

1. To avoid and minimise impacts to threatened ecological communities, species and their habitats, Transport for NSW will apply the CPCP avoidance criteria during the strategic planning phase of each transport project, with specific consideration to the matters identified in Commitment 3 (**Life of CPCP**).

¹³ Potential habitat for fauna species are mapped in the *Cumberland Plain Assessment Report*

¹⁴ Known flora populations are mapped in the *Cumberland Plain Assessment Report*

2. Include the biodiversity benefits of avoiding threatened ecological communities, species and their habitats as well as the costs of offsets into the evaluation of the route options (for example using multi-criteria analysis) **(Life of CPCP)**.
3. Locate Asset Protection Zones, if required, within the certified-major transport corridor **(Life of CPCP)**.
4. Where an action cannot feasibly or practically avoid impacts on an area of high environmental value, these impacts should be minimised as far as possible using design refinements to reduce overall impact **(Life of CPCP)**.
5. Transport for NSW will provide to the department a clearing reconciliation report within 60 days of the completion of clearing for each major transport corridor project. The report will provide information on vegetation cleared, resulting direct impacts to threatened species habitat and threatened ecological communities, and a demonstration of how the CPCP avoidance criteria were applied. The report will be used to:
 - a. inform the plan's reconciliation accounting process to track impacts
 - b. determine Transport for NSWs actual offsets liability, which will be reconciled against Transport for NSWs schedule of estimated forward payments for amounts outstanding or overpaid.**(Life of CPCP)**
6. Ensure that proponents of any Third Party Activities not included in the Western Sydney major transport corridors class of action are aware that they must consider the need for referral under the EPBC Act for actions likely to have a significant impact on matters of national environmental significance **(Life of CPCP)**.
7. Impacts to biodiversity (including to matters of national environmental significance) in the major transport corridors will be published through the CPCP annual updates and 5-yearly reviews **(Life of CPCP)**.

Commitment 4

Avoid and minimise impacts on threatened ecological communities, species and their habitat within major transport corridors (strategically assessed only), including the Outer Sydney Orbital and Metro Rail Future Extension tunnel sections, in accordance with the:

- major transport corridors class of action description, including the NSW state-significant infrastructure or NSW state-significant development approvals process (or equivalent)
- Biodiversity Assessment Method (BC Act) (or equivalent).

Commitment 4.1

Avoid and minimise impacts to known flora populations¹⁵ within the Outer Sydney Orbital and M7/Ropes Crossing Link Road corridors, including:

- *Dilwynia tenuifolia*
- *Grevillea juniperina* subs. *Juniperina*
- *Pultanea parviflora*
- *Cynanchum elegans*.

Commitment 4.2

Avoid and minimise impacts where possible within and adjacent to the tunnel sections, including:

¹⁵ Known flora populations are mapped in the Cumberland Plain Assessment Report and will require confirmation of presence through survey or assessment.

1. known populations and habitat¹⁶ of:
 - *Eucalyptus benthamii*
 - *Pomaderris brunnea*
 - *Pimelea spicata*
 - *Cumberland Plain Land Snail*
2. known populations and habitat, and threatened ecological communities¹⁷ within:
 - Mater Dei BioBank site within the Outer Sydney Orbital footprint near Camden
 - registered property agreement site within the Outer Sydney Orbital footprint at Camden Airport
 - Metro offset site within the footprints for the Outer Sydney Orbital and Metro Rail Future Extension near Harrington Park
 - Nepean River and associated riparian corridor within the Outer Sydney Orbital footprint
 - Camden Golf Club at Narellan adjacent to the footprint for the Metro Rail Future Extension
 - Mount Annan Botanic Gardens within the footprint for the Metro Rail Future Extension.

Commitment 4.3

Avoid and minimise impacts where possible to environmental values within Commonwealth land sites¹⁸, including known populations and habitat and threatened ecological communities, and existing infrastructure and services, at:

- Camden Airport
- Western Sydney University (Campbelltown Campus)
- 12 Werombi Road, Grasmere NSW.

Actions

1. To avoid and minimise impacts to threatened ecological communities, species and their habitat, Transport for NSW will:
 - a. undertake surveys to confirm biodiversity values, including matters of national environmental significance during the strategic planning phase of each transport project
 - b. include the biodiversity benefits of avoiding threatened ecological communities, species and their habitats as well as the costs of offsets into the evaluation of the route options (for example using multi-criteria analysis)
 - c. avoid and minimise impacts to biodiversity values, including matters of national environmental significance, in accordance with the Biodiversity Assessment Method (or equivalent) and with specific consideration to the protected matters identified in commitments 4.1, 4.2 and 4.3 during the environmental impact assessment phase of each transport project
 - d. offset impacts to biodiversity values, including matters of national environmental significance, in accordance with the Biodiversity Assessment Method (or equivalent)

¹⁶ Known populations and habitat of listed species are mapped in the Cumberland Plain Assessment Report and will require confirmation of extent through survey or assessment. The assessment report includes a specific map as part of the assessment of tunnels (See the Cumberland Plain Assessment Report, Chapter 36.6).

¹⁷ Known populations and habitat of listed species and distribution of listed TECs are mapped in the Cumberland Plain Assessment Report and will require confirmation of extent through survey or assessment. The report includes a specific map as part of the assessment of tunnels (See the Cumberland Plain Assessment Report, Chapter 36.6)

¹⁸ The Cumberland Plain Assessment Report includes a specific map as part of the assessment of tunnels (See the Cumberland Plain Assessment Report, Chapter 36.6)

and EPBC Act Environmental Offsets Policy 2012 for any EPBC Act matters not covered by the BAM

- e. report to the department and executive implementation committee on vegetation cleared and adjustments to transport corridor boundaries identified through the NSW state-significant infrastructure or NSW state-significant development approval (or equivalent) for each transport project. This will include: reporting on avoidance achieved within the mapped or protected corridors identified in the CPCP; additional impacts outside of mapped corridors for EPBC Act-listed species, populations or ecological communities; and offsets to be secured under the NSW SSI or NSW SSD approval and EPBC Act Environmental Offsets Policy 2012, where relevant.

(Life of CPCP)

2. The department will use this information to track impacts and adjust Transport for NSW's offset liabilities through the plan's reconciliation accounting process, in agreement with Transport for NSW **(Life of CPCP)**.
3. Transport-related impacts to biodiversity (including MNES) will be published through the CPCP annual updates and five yearly reviews **(Life of CPCP)**.

Mitigate indirect and prescribed impacts

Commitment 5

Mitigate indirect and prescribed impacts from urban and industrial development; infrastructure; and intensive plant agriculture on threatened ecological communities, species and their habitat. This includes meeting specific mitigation requirements for threatened ecological communities, species and their habitat in accordance with Appendix E of the CPCP

Actions

1. Incorporate development controls in the state-led development control plans where they apply to relevant nominated areas, setting out development controls that need to be addressed by neighbourhood plans and development applications to mitigate indirect and prescribed impacts on threatened species. This includes:
 - a. specific controls that apply to the nominated areas to mitigate indirect and prescribed impacts on specific threatened species or ecological communities or other environmentally sensitive areas in accordance with Appendix E of the CPCP
 - b. a common set of development controls to mitigate indirect and prescribed impacts across the 4 nominated areas that inform general biodiversity protection as listed in Chapter 15 of the Cumberland Plain Assessment Report.

(Before start of CPCP)

2. Introduce the Cumberland Plain Conservation Plan Mitigation Measures Guidelines consistent with Appendix E of the CPCP to address indirect impacts in Greater Macarthur Growth Area and Greater Penrith to Eastern Creek Investigation Area **(Year 1)**.
3. Provide ongoing support to local councils and other proponents in the application of development control plans and the Mitigation Measures Guidelines within the nominated areas, including the sharing of knowledge, maps and data **(Life of CPCP)**.
4. Audit growth area development control plans for the nominated areas where they apply to ensure the Cumberland Plain Conservation Plan DCP template development controls are incorporated in accordance with the development control plan requirements for each growth area **(Life of CPCP)**.
5. Monitor the implementation of the development controls through approval conditions by the relevant consent authority. If monitoring finds that development controls are not being

effectively implemented, review and redraft new controls to update relevant state development control plans and the Mitigation Measures Guidelines and re-educate councils to ensure stronger consideration of the controls through their assessment process (**Life of CPCP**).

6. Introduce the Cumberland Plain Conservation Plan Guidelines for Infrastructure Development to be addressed by a public authority or other proponents of essential infrastructure, including mitigation measures for indirect and prescribed impacts to biodiversity from infrastructure activities in accordance with Appendix E of the CPCP (**Year 1**).
7. Implement mitigation measures based on the outcomes of environmental assessment of detailed designs in accordance with the requirements of the NSW approval process, as well as published, best-practice guidelines (**Life of CPCP**).
8. Consult with the relevant public land manager to minimise disturbance and impacts to threatened species in accordance with Appendix E, including:
 - a. ensuring walking tracks and management trails in Wianamatta Regional Park are located in a way that avoids and minimises exposure of *Persoonia nutans* to human disturbance
 - b. ensuring land management in potential habitat for *Pimelea spicata*, particularly mowing and slashing activities and weed management activities involving the use of herbicides, will minimise risks and maintain the species
 - c. work with NSW DPI – Fisheries to address the risk of illegal and incidental recreational fishing capture along stretches of known habitat for Macquarie Perch in Erskine Creek, Glenbrook Creek, Georges River and Cordeaux River
 - d. installing signs and/or interpretive displays at appropriate sites in areas used for recreational fishing along Erskine Creek, Glenbrook Creek, Georges River and Cordeaux River to assist with identification of Macquarie perch and awareness of threats.

(Years 1 to 5)

Commitment 6

Mitigate indirect and prescribed impacts on threatened ecological communities, species and their habitat within major transport corridors, including the Outer Sydney Orbital and Metro Rail Future Extension tunnel sections, in accordance with the:

- major transport corridors class of action description, including the NSW state-significant infrastructure or NSW state-significant development approvals process (or equivalent) for certified-major transport corridors
- major transport corridors class of action description and the Biodiversity Assessment Method (BC Act) (or equivalent) for major transport corridors (strategically assessed only)
- specific mitigation measures to address impacts on biodiversity values prescribed in Appendix E.

Actions

1. To mitigate indirect and prescribed impacts on threatened species and their habitat, Transport for NSW will across all major transport corridors:
 - a. assess the impacts on biodiversity values for major transport corridors (strategically assessed only) and other environmental values (for certified- and strategically assessed-only major transport corridors) based on detailed design
 - b. implement specific mitigation measures prescribed in Appendix E and identify and implement additional mitigation measures based on the outcomes of environmental

assessment of detailed designs in accordance with the requirements of the NSW state-significant infrastructure or NSW state-significant development approvals process (or equivalent), as well as published, best practice guidelines, including but not limited to, the [RMS Biodiversity Guidelines \(PDF 8.07 MB\)](#)

- c. apply further mitigation according to the Biodiversity Assessment Method (BC Act) (or equivalent) for major transport corridors (strategically assessed only), including the tunnels sections
- d. identify potential design options for major watercourse crossings to reduce disruption to connectivity and design options to reduce the risk of fauna vehicle strikes
- e. establish baseline monitoring data and undertake ongoing monitoring of high-value environmental areas, and review and adjust mitigation measures (where practical) in response to monitoring outcomes, in accordance with the requirements of the state-significant infrastructure (or equivalent) approval.

(Life of CPCP)

2. Transport for NSW will report to the department and executive implementation committee on mitigation measures proposed to manage impacts of each major transport corridor project, including proposed techniques, timing, frequency and responsibility for implementing each measure **(Life of CPCP)**.

Commitment 7

Mitigate indirect and prescribed impacts from urban, industrial, infrastructure development on the Southern Sydney koala population to best-practice standards and in line with advice from the Office of the NSW Chief Scientist & Engineer, and in accordance with Appendix E of the CPCP.

Actions

1. Install koala-exclusion fencing, including gates and grids, between koala habitat that can safely support koalas and urban land within the Greater Macarthur Growth Area and Wilton Growth Area, except where exclusion fencing is not feasible or necessary due to slope, heritage or water courses.
 - a. Manage impacts to fences by locating koala-exclusion fencing at least 3 metres from any trees where practical (measured from canopy).
 - b. Apply koala specific mitigation actions in accordance with Appendix E.
 - c. Where fencing must cross existing or planned linear infrastructure such as gas and electricity transmission, consider appropriate access treatments such as gates to ensure the integrity of the koala exclusion fencing.
 - d. Fence off koala corridors that are too narrow to safely support koalas and relocate koalas out of the unsafe corridors if needed. (Commitment 12 Action 1f).
 - e. Address the requirements of the Cumberland Plain Conservation Plan Guidelines for Infrastructure Development as essential infrastructure for EPBC Act approval in the avoided land.

(Life of CPCP)

2. Complete a feasibility study on the koala-exclusion fencing to help inform the design, locations and construction of the fencing and identify fencing priorities for the first 5 years **(Year 1)**.
3. Install koala-exclusion fencing along the western alignment of the Georges River Koala Reserve where existing urban development is a threat to the koala population **(Years 1 to 20)**.
4. Install koala-exclusion fencing, in the vicinity of koala habitat, along both sides of Appin Road between Rosemeadow and Appin to mitigate koala vehicle strikes at roadkill hotspots. Fencing

along Appin Road will be in addition to planned fencing works to be delivered by Transport for NSW (**Years 1 to 5**).

5. Undertake targeted stakeholder and community engagement to support the delivery of koala-exclusion fencing (**Years 1 to 3**).
6. Establish a koala working group with representation from relevant government agencies to support implementation of the koala commitments and actions. The working group will support implementation of the koala sub-plan, by providing advice to inform:
 - a. alignment, staging, and design of the koala exclusion fencing and fauna crossing, including advice about providing appropriate koala movement corridors
 - b. priority locations and approach for koala habitat restoration
 - c. monitoring and evaluation of the plan's koala commitments, including providing advice to support adaptive management based on monitoring and evaluation data
 - d. community and stakeholder engagement for the koala conservation commitments and actions
 - e. research and management actions relating to koalas.

(Before start of CPCP)

7. Work with local councils, National Parks and Wildlife Service and Office of Strategic Lands to ensure the threats posed by dogs on all public land that is identified as koala habitat protected under the CPCP, are managed:
 - a. For land that is not publicly accessible, this will include the installation of signs and/or fences.
 - b. For land managed as a reserve or for recreation, this will be achieved by incorporating requirements in a relevant plan of management.

(Life of CPCP)

8. Provide safe fauna crossings, based on current best practice design, across Appin Road and other linear infrastructure by:
 - a. installing a koala underpass under Appin Road, near the intersection with Brian Road to support east–west koala movement from the Georges River to the Nepean River
 - b. augmenting the existing Kings Falls Bridge at the Georges River by constructing a bench adjacent to the bridge abutments to allow dry passage for koalas (and other fauna) under Appin Road, supporting north–south koala movement from the Georges River Koala Reserve to the southern koala habitat
 - c. investigating options for enhancing koala movement across the Upper Canal
 - d. addressing the requirements of the Cumberland Plain Conservation Plan Guidelines for Infrastructure Development, as essential infrastructure for EPBC Act approval in the avoided land.

(Years 1 to 5)

Conserving flora, fauna and habitat

Commitment 8

Protect a minimum of 5,325 hectares of native vegetation¹⁹ in the Cumberland subregion to conserve biodiversity values in perpetuity in accordance with the conservation land selection steps, which may require up to 11,900 hectares of conservation land.

Commitment 8.1

This target includes minimum areas of the following EPBC Act-listed threatened ecological communities:

- 675 hectares of Shale Sandstone Transition Forest
- 665 hectares of Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest
- 570 hectares of River-flat eucalypt forest of eastern Australia
- 125 hectares of Cooks River Castlereagh Ironbark Forest
- 20 hectares of Coastal Swamp Oak Forest
- 0.2 hectares of Western Sydney Dry Rainforest and Moist Woodland on Shale.

Commitment 8.2

This target includes minimum areas of the following BC Act-listed threatened ecological communities:

- 2,885 hectares of Cumberland Plain Woodland
- 1,455 hectares of Shale Sandstone Transition Forest
- 505 hectares of River-Flat Eucalypt Forest
- 285 hectares of Shale Gravel Transition Forest
- 115 hectares of Cooks River Castlereagh Ironbark Forest
- 70 hectares of Swamp Oak Floodplain Forest
- 10 hectares of Freshwater Wetlands on Coastal Floodplains
- 0.2 hectares of Moist Shale Woodland.

Actions

1. Prepare a conservation land implementation strategy to guide the establishment of land for conservation, including:
 - a. priorities for selecting and purchasing land
 - b. targets and proposed timeframes for establishing new conservation land
 - c. proposed land-based conservation type for each area of priority conservation land (reserve or biodiversity stewardship agreement)
 - d. suitable land managers for each area of priority conservation land
 - e. a process to secure alternative areas where targets and timing cannot be met.

(Year 1)

¹⁹ While there is overlap between the TEC targets listed in commitments 8.1 and 8.2, there are differences in the listings between EPBC Act-listed and BC Act-listed TECs, such as differences in approach and criteria. Therefore, the BC Act-listed TECs in commitment 8.2 incorporate targets for EPBC Act-listed TECs.

2. Enter into written agreements with delivery partners to set out the arrangements for conservation land under the plan, including:
 - a. roles and responsibilities
 - b. processes for implementation
 - c. land management arrangements, including prior to purchase
 - d. funding arrangements
 - e. progress reporting.

(Year 1)
3. Seek to include the strategic conservation area (excluding cleared areas) in the Biodiversity Values Map **(Year 1)**.
4. Undertake surveys within the strategic conservation area or other avoided land prior to protecting the land to confirm plant community extent and condition and update vegetation mapping if necessary **(Life of CPCP)**.
5. Protect and manage land containing targeted plant communities within the strategic conservation area by:
 - a. establishing reserves under relevant legislation including the *National Parks and Wildlife Act 1974*, *Crown Land Management Act 2016*, and *Local Government Act 1993*
 - b. establishing biodiversity stewardship agreements under the BC Act
 - c. purchasing and retiring biodiversity credits under the Biodiversity Offsets Scheme.

(Life of CPCP)
6. Track the progress of meeting threatened ecological community targets (in hectares) through the reconciliation accounting process (Commitment 25 Action 2) **(Life of CPCP)**.
7. Provide up-front funding for business cases and Biodiversity Assessment Method assessments to support landholders entering into biodiversity stewardship agreements where this investment can be recouped through the later sale of biodiversity credits **(Life of CPCP)**.
8. Define a land purchase strategy that will guide decision-making and processes to be used when purchasing land for conservation through the CPCP **(Before start of CPCP)**.
9. Purchase land within the strategic conservation area to commence establishing reserves through the CPCP with priority given to land listed for sale and land in the Georges River Koala Reserve **(Life of CPCP)**.
10. Introduce an acquisition clause in an environmental planning instrument to land identified for future reserves under the CPCP as funds become available through the program **(Life of CPCP)**.
11. Work with local councils and other land managers to ensure that reserves established through the CPCP provide for increased public access, including the provision of compatible low biodiversity impact recreation activities **(Life of CPCP)**.

Commitment 9

Protect threatened species likely to be at risk of residual adverse impacts from development under the CPCP (target species) in accordance with the plan's conservation land selection steps. This includes securing offsets to protect known locations for the following target threatened species.

Flora species:

- 2 offset locations for *Cynanchum elegans*
- 3 offset locations for *Dillwynia tenuifolia*
- 3 offset locations for *Grevillea juniperina* subsp. *juniperina*
- 1 offset location for *Hibbertia fumana*

- 1 offset location for *Hibbertia puberola*
- 2 offset locations for *Marsdenia viridiflora* subsp. *viridiflora*
- 2 offset locations for *Persoonia nutans*
- 3 offset locations for *Pimelea spicata*
- 2 offset locations for *Pultenaea parviflora*
- 2 offset locations for *Pultenaea pedunculata*

Fauna species:

- 1 offset location for *Haliaeetus leucogaster*
- 1 offset location for *Hieraaetus morphnoides*
- 1 offset location for *Lophoictinia isura*
- 3 offset locations for *Meridolum corneovirens*
- 1 offset locations for *Myotis macropus*

This includes securing habitat for the following target threatened fauna species:

- 4,410 hectares of potential foraging habitat for *Lathamus discolor* (including 100 hectares of *Lathamus discolor* important habitat as defined under the BAM)
- 705 hectares of important habitat²⁰ for *Phascolarctos cinereus* as defined in the Cumberland Plain Assessment Report.

Actions

1. Assess and record the habitat attributes of where target species have been located and use the information to establish baseline monitoring data for areas of known habitat for target species and incorporate into the evaluation program (Commitment 25) (**Year 1**).
2. Protect offset locations and species habitat for the target threatened species through establishing reserves or biodiversity stewardship sites or through the direct purchase of species credits in the Cumberland subregion or across NSW (**Life of CPCP**).
3. Achieve the plan's species targets by applying the conservation land selection steps (**Life of CPCP**).
4. Identify species-specific management measures for areas of known habitat for target species in consultation with future land managers of reserves established through the CPCP and incorporate these into management plans for the land (**Life of CPCP**).
5. Track progress in meeting species offset targets through the reconciliation accounting process (Commitment 25 Action 2) (**Life of CPCP**).

Commitment 10

Establish a reserve to protect the north–south koala movement corridor along the Georges River between Appin and Long Point.

Actions

1. Transfer and reserve lots identified for early transfer to National Parks and Wildlife Service as the first stage in establishing Georges River Koala Reserve (**Years 1 to 2**).

²⁰ Important koala habitat is the term used to describe primary, secondary and tertiary corridors, as defined in the Cumberland Plain Assessment Report. It is the area that is critical to the long-term viability of koalas (primary corridors) as well as the areas (if enhanced) that would support the population (secondary and tertiary corridors).

2. Reserve additional areas of the Georges River Koala Reserve between Appin and Kentlyn using NSW government land as a priority and by purchasing additional land (Stages 1a and 1b) (**Years 1 to 10**).
3. Reserve additional areas of the Georges River Koala Reserve between Kentlyn and Long Point using NSW government land as a priority and by purchasing additional land (Stage 2) (**Years 1 to 20**).
4. Restore up to 80 hectares of cleared land for koala habitat in priority areas including the Georges River Koala Reserve to strengthen the north–south koala corridor (**Years 1 to 5**).
5. Restore additional koala habitat within the Georges River Koala Reserve to strengthen the north–south koala movement corridor (**Years 6 to 25**).
6. Work with National Parks and Wildlife Service, Office of Strategic Lands and other key stakeholders to prepare a concept plan for the Georges River Koala Reserve (**Year 1**).

Commitment 11

Establish at least 2 new reserves in addition to the Georges River Koala Reserve that will protect threatened communities, species and habitats that are targeted for protection through the CPCP.

Actions

1. Investigate a new reserve that will provide an ecological connection between Gulguer Nature Reserve, Bents Basin State Conservation Area and Burragorang State Conservation Area (**Year 1**).
2. Investigate a new reserve on Wianamatta (South Creek) that will allow for the restoration of up to 370 hectares of threatened ecological communities (**Year 1**).
3. Establish a community engagement program with landholders in the reserve investigation areas to provide information and seek expressions of interest for land purchase to support establishment of new reserves (**Years 1 to 10**).
4. Establish biodiversity stewardship agreements appropriate to land purchased for a future reserve to commence management of the site (**Life of CPCP**).
5. Gazette at least 2 new reserves in addition to the Georges River Koala Reserve by Year 20 of the CPCP (**Year 1 to 20**).

Commitment 12

Protect koala corridors in the Cumberland subregion, including those along the Nepean River, Georges River, Cataract River and Ousedale Creek.

Actions

1. Apply development controls to koala habitat protected under the CPCP and ensure safe, functional corridors for koala movement (consistent with advice from the Office of the NSW Chief Scientist & Engineer) including:
 - a. the north–south koala corridor along the Georges River (Commitment 10)
 - b. the north–south koala corridor along the Nepean and Cataract rivers
 - c. the east–west corridor along Ousedale Creek between the Georges River and Nepean River
 - d. Elladale Creek and Simpsons Creek as an area of functional koala habitat
 - e. the north–south koala corridor along Allens Creek

- f. excluding koalas from east–west corridors that do not meet the minimum requirements for a functional koala corridor (Corridor C: Nepean Creek to Beulah, and Corridor D: Mally Creek to Georges River)

(Before start of CPCP).

2. Restore koala habitat in the Georges River and Ousedale Creek corridors to ensure they meet requirements for safe and functional koala movement corridors, consistent with advice from the Office of the NSW Chief Scientist & Engineer (Commitment 13) **(Life of CPCP)**.

Commitment 13

Deliver and support ecological restoration activities in conservation land including ecological reconstruction of up to a maximum of 25% of the plan’s offset target for native vegetation (Commitment 8).

Actions

1. Establish a restoration working group to guide the implementation of restoration activities under the CPCP including the preparation of a restoration implementation strategy and supporting technical guidance where relevant **(Year 1)**.
2. Develop a restoration implementation strategy in consultation with the restoration working group and other key stakeholders to establish best practice principles and methodologies, to:
 - a. identify the range of restoration activities and what will be undertaken under the CPCP
 - b. ensure the long-term sustainability of restoration considers genetic diversity in what is established
 - c. identify considerations for restoration potential and constraints of land
 - d. provide reference to guidelines for restoration, including the NSW Biodiversity Conservation Trust guidelines for restoring native vegetation undertaken in a biodiversity stewardship site
 - e. develop a seed-procurement approach
 - f. reference research needs being considered through the research program implementation strategy (Commitment 22, Action 1).
 - g. enter into written agreements with delivery partners and engage specialist providers where necessary to implement the restoration actions.

(Year 1)

3. Deliver ecological restoration (including reconstruction) to restore koala habitat in the Georges River Koala Reserve and other priority locations in the strategic conservation area including along Ousedale Creek and around Appin **(Year 1 onwards)**.
4. Incorporate adaptive management principles into restoration actions including pilot sites to trial and develop restoration methodologies and applying new research as appropriate **(Life of CPCP)**.
5. Deliver up to a maximum of 1,330 hectares of ecological reconstruction on conservation land targeting the following threatened ecological communities:
 - a. Cooks River Castlereagh Ironbark Forest
 - b. Cumberland Plain Woodland
 - c. River-flat Eucalypt Forest
 - d. Shale Gravel Transition Forest
 - e. Swamp Oak Forest.

(Life of CPCP)

Commitment 14

Minimise impacts from development on biodiversity values in the strategic conservation area.

Actions

1. Introduce a State Environmental Planning Policy to apply development controls to the strategic conservation area to require consideration of impacts on biodiversity values when consent authorities assess development applications (**Before start of CPCP**).
2. Issue a ministerial direction under section 9.1 of the *Environmental Planning and Assessment Act 1979* (NSW) to require consistency with the objectives of the strategic conservation area when a planning authority prepares a planning proposal or reviews local environmental plans within the strategic conservation area (**Before start of CPCP**).
3. Work with local councils to integrate mapping of the strategic conservation area into local and regional planning through local strategic planning statements, which guide the local plan-making process (**Life of CPCP**).

Managing landscape threats

Commitment 15

Manage priority weeds in strategic locations in the Cumberland subregion to reduce threats to land secured within the strategic conservation area.

Actions

1. Participate in the Sydney Weeds Network to inform the implementation of weed control activities under the CPCP including the preparation of a weed control strategy (**Year 1**).
2. Prepare a weed control strategy in consultation with the Sydney Weeds Network to establish a coordinated weed control program in the Cumberland subregion that:
 - a. identifies priority weed species and priority locations for weed control to maximise benefits to biodiversity in the strategic conservation area
 - b. identifies the training, extension and resource needs to address threats
 - c. provides guidance on weed control methods
 - d. identifies roles, responsibilities, delivery partners and other stakeholders
 - e. provides guidance on funding decisions under the weed control program
 - f. is consistent with existing weed control programs, reserve or biodiversity stewardship agreement management requirements.

(**Year 2**)
3. Enter into written agreements with delivery partners to implement the weed control strategy (**Year 2**).
4. Integrate weed control actions for conservation land into reserve management plans (**Life of CPCP**).
5. Fund organisations to help deliver actions in the weed control strategy for example Bushcare and Landcare groups, and local Aboriginal land councils (**Year 3 onwards**).

Commitment 16

Manage priority pest animals in strategic locations in the Cumberland subregion to reduce threats to land protected within the strategic conservation area.

Actions

1. Establish a pest animal control working group to guide the implementation of pest animal control activities under the CPCP including preparation of a pest animal control implementation strategy (**Year 1**).
2. Prepare a pest animal control strategy to guide the implementation of the pest control program, that:
 - a. identifies pest control priorities, including priority pest species and priority locations for pest control to maximise benefits to biodiversity in the strategic conservation area
 - b. identifies the training, extension and resource needs to address threats
 - c. provides guidance on pest control methods
 - d. identifies roles, responsibilities delivery partners and other stakeholders
 - e. provides guidance on funding arrangements under the pest control program
 - f. is consistent with existing pest control programs, reserve or biodiversity stewardship agreement management requirements.

(Year 2)

3. Ensure that the pest animal control strategy specifies the use of pest control techniques that will reduce the risk of secondary poisoning from Pindone or second-generation rodenticides in accordance with Appendix E (**Year 2**).
4. Enter into written agreements with delivery partners to implement the pest animal control program (**Year 2**).
5. Fund organisations to help deliver actions in the pest animal control strategy, for example Greater Sydney Local Land Care Services, Bushcare and Landcare groups, and local Aboriginal land councils (**Year 3 onwards**).

Commitment 17

Manage fire in strategic locations in the Cumberland subregion to support the maintenance of biodiversity values on conservation land.

Actions

1. Consult with the NSW Rural Fire Service, NSW National Parks and Wildlife Service, and the department (Environment, Energy and Science group) to identify fire management priorities, including fire-sensitive species and ecological communities (**Year 2**).
2. Partner with Aboriginal knowledge holders and organisations to learn about Indigenous fire management techniques and consider how this knowledge may be applied to manage and protect conservation land (**Year 2**).
3. Prepare a fire management strategy that:
 - a. identifies priority locations for fire management to maximise benefits to biodiversity in the strategic conservation area
 - b. identifies priority fire-sensitive species and ecological communities
 - c. provides guidance on fire management to maintain and promote biodiversity values, particularly among fire-sensitive species and ecological communities
 - d. identifies roles and responsibilities and co-ordinates delivery partners

e. provides criteria to guide decisions on funding of fire management under the CPCP.

(Year 2)

4. Enter into written agreements with delivery partners to implement the fire management strategy **(Year 2)**.
5. Integrate fire management actions for conservation land identified in the fire management strategy in stewardship agreements and reserve management plans **(Year 3 onwards)**.

Commitment 18

Support new or existing programs to control key diseases affecting threatened species and ecological communities in the Cumberland subregion.

Actions

1. Consult with researchers, government agencies and other delivery partners to identify programs that contribute to the management of disease and dieback in the Cumberland subregion including consideration of the following key threatening processes:
 - a. *Phytophthora cinnamomi* root fungus
 - b. amphibian chytrid fungus
 - c. psittacine circoviral beak and feather disease
 - d. psyllid and bell miner-associated dieback in eucalypts.**(Year 6 onwards)**
2. Enter into written agreements with delivery partners to implement priority disease control programs **(Year 6 onwards)**.
3. Require regular reporting by delivery partners on the disease control program outcomes to the department and to the executive implementation committee **(Year 6 onwards)**.

Commitment 19

Support existing or new programs to help threatened species and ecological communities adapt to the impacts of climate change in the CPCP Area.

Actions

1. Consider funding research on climate change adaptation in developing the research program implementation strategy (Commitment 22, Action 1) **(Year 1)**.
2. Partner with the Royal Botanic Gardens Greater Sydney to develop seed sourcing guidelines for ten keystone Cumberland Plain Woodland species and define the species-specific seed transfer zones for these species **(Years 1 to 3)**.
3. Update the strategic conservation area if new priority locations are identified through research that will support biodiversity adaptation to climate impacts and incorporate these new areas into the conservation land implementation strategy (Commitment 8) **(Every 5 years)**.

Building knowledge and capacity

Commitment 20

Provide opportunities for the residents of Western Sydney to learn about and actively participate in biodiversity conservation including koala conservation.

Actions

1. Prepare an education and engagement implementation strategy to guide implementation of the education and engagement program that:
 - a. identifies priority topics for education
 - b. identifies intended audiences
 - c. proposes implementation mechanisms
 - d. outlines governance arrangements for implementing the program.

(Year 4)

2. Establish 3 full-time community engagement officers to work across the local councils in the CPCP Area to:
 - a. undertake activities according to the education and engagement implementation strategy and monitor its implementation
 - b. support biodiversity programs that are consistent with the objectives of the CPCP
 - c. coordinate activities and pop-up events
 - d. coordinate grants to local councils and community groups for projects that meet criteria developed in the strategy.

(Year 5)

3. Fund local councils and community groups to help deliver an education and engagement program that is consistent with the education and engagement implementation strategy, with indicative activities that include:
 - a. engaging with local schools to provide biodiversity education
 - b. hosting community activities such as tree planting and nature walks
 - c. developing a mobile education trailer as a shared resource for local councils in the CPCP Area
 - d. promoting new and existing citizen science programs to encourage participation in nature-related science
 - e. raising awareness of the cultural significance of biodiversity to Aboriginal people.

(Year 5 onwards)

4. Invest in the NSW Koala Strategy to raise awareness of the Southern Sydney koala population and encourage community participation in koala conservation in Western Sydney
(Year 1 onwards).
5. In partnership with the Biodiversity Conservation Trust, establish a community engagement program to educate landholders within the strategic conservation area and promote the opportunities and benefits of biodiversity stewardship sites **(Year 1).**
6. Work with councils and other landholders to install signs and interpretive displays at identified conservation land to raise awareness of the biodiversity values of a site **(Life of CPCP).**

Commitment 21

Partner with Aboriginal groups and community to help maintain a distinctive cultural, spiritual, physical and economic relationships with their land and waters in Western Sydney

Actions

1. Fund a grants program to build capacity in the 3 local Aboriginal land councils in the CPCP Area to fund land management and biodiversity works, and culture and heritage projects on Aboriginal-owned lands and other important areas (**Years 1 to 2**).
2. Partner with Traditional Custodians, local Aboriginal land councils and other interested Aboriginal people in Western Sydney to collaboratively develop the Caring for Country – Aboriginal Outcomes Strategy for the Cumberland Plain Conservation Plan 2022-2032 (**Year 1**).
3. Partner with Western Sydney’s Aboriginal communities to implement the CPCP and the Caring for Country – Aboriginal Outcomes Strategy for the Cumberland Plain Conservation Plan 2022-2032 through:
 - a. establishing partnerships, including the co-design of actions under the strategy, with Traditional Custodians, local Aboriginal land councils, Aboriginal businesses and other interested Aboriginal groups
 - b. establishing an Aboriginal advisory group to provide advice on the delivery of the Aboriginal outcomes strategy and the CPCP
 - c. actively engage and empower Aboriginal groups and community to enable participation in decision-making to deliver the Aboriginal outcomes strategy and the CPCP.

(**Years 2 to 11**)
4. Implement the Caring for Country – Aboriginal Outcomes Strategy for the Cumberland Plain Conservation Plan 2022-2032 to support economic participation for Aboriginal people and cultural outcomes under the CPCP to:
 - a. recognise, celebrate and promote Aboriginal culture and heritage in Western Sydney with a focus on natural areas and protecting biodiversity
 - b. recognise and embed the knowledge and connection that Aboriginal people have with Country into the implementation of the CPCP
 - c. enable Traditional Custodians and interested Aboriginal groups to care for Country on new conservation land
 - d. grow Aboriginal businesses and employment in the environmental sector.

(**Years 2 to 11**)

Commitment 22

Invest in research priorities that will support the implementation of the CPCP and help to deliver the plan’s outcomes.

Actions

1. Develop a research program implementation strategy to guide delivery of a 35-year research program that will help achieve the plan’s outcomes in Western Sydney, including identifying research priorities for the first 4 years of the program (**Year 1**).
2. Deliver a research program in accordance with the research program implementation strategy. The research program may include:

- a. research on the vulnerability of threatened species and ecological communities to climate change
- b. research that increases knowledge of the adaptive capacity of plant, animal and microbial organisms used in active restoration of ecological communities of the sub-region
- c. research that improves restoration outcomes, including ecosystem function and resilience, for threatened ecological communities of the sub-region
- d. research on ecological connectivity and landscape function at site, local and regional scales to enhance conservation outcomes
- e. research into changing community attitudes and behaviour to biodiversity and conservation values including factors influencing those and how they evolve and change
- f. research into the connections between land management, biodiversity and Aboriginal culture and practices in Western Sydney as proposed by the Aboriginal outcomes strategy (Commitment 21).

(Year 2 onwards)

3. Support NSW Government programs for threatened species research in Western Sydney including:
 - a. research on threatened species impacted by the CPCP in the Cumberland subregion through the Saving our Species program
 - b. research that increases knowledge of population demographics, life-history and ecology of the Southern Sydney koala population as part of the NSW Koala Strategy's NSW Koala Research Plan.

(Year 2 onwards)

Commitment 23

Support rehabilitation measures to help maintain koala health and welfare.

Actions

1. Invest in the NSW Koala Strategy and other potential partners to implement the koala health and welfare program in south-western Sydney, with key deliverables that include:
 - a. monitoring koalas, key threats, and the effectiveness of mitigation measures as part of the NSW Koala Strategy Monitoring Framework
 - b. designating the koalas in south-western Sydney as one of the dedicated monitoring sites for the NSW Koala Strategy
 - c. providing enhanced training in wildlife treatment for veterinarians
 - d. providing grants for community wildlife organisations for resources and carer recruitment and training
 - e. establishing health and welfare programs to support koalas from threats including vehicle strike, fire, disease and climate change.

(Year 1 onwards)

2. Koalas that are captured and/or handled as part of a monitoring program will be vaccinated against chlamydia and have a tissue sample taken for genetic analysis, with the tissue samples lodged with the NSW Koala Biobank **(Year 1 onwards)**.

Governance and reporting

General

Commitment 24

Establish governance arrangements including roles, responsibilities and funding to ensure the efficient and effective implementation of the CPCP.

Actions

1. Establish a multi-agency executive implementation committee to act as a central governance steering committee for the CPCP (**Year 1**).
2. Enter into written agreements with delivery partners, including Transport for NSW as project partner responsible for delivering the major transport corridors, to support the implementation of specific commitments and actions (**Year 1**).
3. Establish working groups to advise the executive implementation committee and oversee implementation of specific commitments and actions (commitments 7, 13, 16 and 26) (**Year 1**).
4. Establish arrangements to fund delivery of the plan's commitments and actions through contributions from residential, commercial and industrial developers in the nominated areas (**Year 1**).
5. Ensure that at least 90% of conservation program funding is spent on establishing and restoring conservation land or purchasing biodiversity credits consistent with the conservation land selection steps (**Life of CPCP**).

Commitment 25

Implement an evaluation program for the CPCP that sets out requirements for monitoring, evaluation, reporting and adaptive management.

Actions

1. Finalise the evaluation program in consultation with key stakeholders, including:
 - a. establishing governance arrangements for the evaluation program
 - b. establishing a monitoring and data collection methodology
 - c. finalising evaluation questions including scope and frequency
 - d. developing a method for evaluation outputs to support adaptive management
 - e. establishing the reconciliation accounting process to track progress of the plan's commitments and actions
 - f. developing templates for reporting quarterly to the executive implementation steering committee and annual updates over the life of the CPCP.
 - g. establishing processes to support independent 5-yearly reviews of the CPCP
 (**Year 1**)
2. Track progress in meeting conservation targets (in hectares) through the reconciliation accounting process (**Life of CPCP**).
3. Implement adaptive management steps for offsets if the reconciliation accounting process determines that the plan's offsets are not keeping track with development (**Life of CPCP**).
4. Publish annual updates on implementation of the CPCP (**Life of CPCP**).

5. Undertake independent 5-yearly reviews of the progress of the CPCP, including progress towards meeting commitments and achieving outcomes, and publish a review report (**Life of CPCP**).
6. Undertake internal process reviews at the mid-term point (2.5 years) between independent reviews and provide a report to key delivery partners and stakeholders (**Life of CPCP**).
7. Develop an overarching communication and engagement strategy to support implementation of the CPCP. Review the strategy every 5 years and update it accordingly (**Year 1 then life of CPCP**).

Commitment 26

Implement a compliance program to ensure compliance with the CPCP and conditions of approval.

Actions

1. Establish a compliance and implementation working group comprising the department, local councils and other relevant stakeholders to guide the implementation of compliance activities under the CPCP including preparation of a compliance strategy (**Year 1**).
2. Prepare a compliance strategy under guidance of the working group to:
 - a. identify relevant compliance mechanisms
 - b. set out compliance monitoring and auditing priorities and processes
 - c. set out a decision-making framework for taking compliance action
 - d. set out procedures and protocols for taking compliance action
 - e. identify roles and responsibilities for compliance.(**Year 1**)
3. Provide funding to employ 6 full-time compliance officers to work with local councils to carry out compliance activities in the CPCP Area (**Year 2 onwards**).
4. Share knowledge, maps and data and provide ongoing support and training to council staff to help local councils carry out implementation and compliance activities (**Life of CPCP**).
5. Publish a compliance report as part of the yearly update on implementation of the CPCP and provide it to local councils for review and investigation (**Life of CPCP**).
6. Prepare reports every two-and-a-half years on any identified breaches with plan commitments and approval conditions, such as auditing development consent conditions and environmental management plans (**Life of CPCP**).

Appendix B. Avoidance criteria

Avoidance of biodiversity values

Strategic conservation planning is a landscape-scale approach to assessing and protecting biodiversity up-front in planning for large-scale development. The department has used this approach to locate and design the certified-urban capable land for nominated areas in the CPCP. It will also be used by Transport for NSW to design the infrastructure alignments within each of the major transport corridors.

This process aims to avoid and minimise impacts on biodiversity values and has been undertaken consistent with:

- section 8 of the Biodiversity Assessment Method (BAM)
- the 'Conservation measures in strategic applications for biodiversity certification - guidance for planning authorities' (EES-DPIE, 2020)
- the strategic assessment terms of reference.

Avoiding and minimising impacts on biodiversity values is an important part of the planning and assessment process. It is a critical step in limiting the effects of the proposed development and reducing the need for the conservation program to offset those impacts. It also provides opportunities to protect important areas of remaining biodiversity by applying the conservation program's commitments and actions – such as biodiversity stewardship agreements – on avoided land.

It is also fundamental to demonstrating that the commitments and actions proposed for strategic biodiversity certification adequately address the impacts of the proposed development under section 8.7 of the BC Act (see Part 7 of the Act). Documenting the process is a requirement of the terms of reference for strategic assessment under EPBC Act.

Definition of avoidance

Land that has been avoided from development up-front through the strategic conservation planning process under the CPCP is referred to as 'avoided land'. The process used to determine the location of avoided land referred to as 'avoidance'.

Land has been avoided under the CPCP where it has identified biodiversity value in line with the avoidance criteria, including the presence of threatened ecological communities, plant community types or threatened species and (see 'Box 9: Avoidance criteria').

Under the BAM, avoidance refers to land that is suitable for development and included in the biodiversity certification process but has been avoided because of its biodiversity value. Land not impacted because it is not suitable for development, even where it has been avoided for its biodiversity value, is not considered to have been avoided under the BAM.

In accordance with the BAM, the Cumberland Plain Assessment Report determines avoidance outcomes for specific biodiversity values on the basis of the amount of land avoided because of its biodiversity value. It does not consider land avoided from the certification process for other purposes.

This includes land considered unsuitable for urban development because it is:

- a riparian buffer, consistent with the *Water Management Act 2000* (NSW)
- state-protected land with a slope of more than 18 degrees

- existing protected land, including reserves and offset sites
- Commonwealth land, such as the Defence Establishment Orchard Hills
- land zoned for public recreation (Zone RE 1 under the standard instrument prescribed by the Standard Instrument (Local Environmental Plans) Order 2006).

As such, the Cumberland Plain Assessment Report describes and quantifies both ‘avoided for biodiversity values’ as per the BAM and ‘avoided for other purposes’ land considered unsuitable for development.

For the purposes of the Cumberland Plain Conservation Plan, land avoided from development and not subject to biodiversity certification is defined in the CPCP as the ‘avoided land’. This area includes land that has high biodiversity value and that was identified by applying the avoidance criteria (described below). This area could also include some land of high biodiversity value that is not considered suitable for development under the BAM (such as steep slopes and some riparian corridors).

Development of avoidance criteria

Criteria were developed to help identify priorities for avoiding biodiversity values (see ‘Box 9: Avoidance criteria’). These criteria provided detailed guidance, consistent with guidance provided in the BAM, to inform decisions about the location and design of the urban capable land. These decisions were made in a series of workshops attended by the department’s precinct planners and ecologists. Applying the avoidance criteria identified land within the nominated areas of high biodiversity value.

The avoidance criteria identified priorities for avoidance within 3 main categories:

- threatened ecological communities (TECs) and plant community types (PCTs)
- threatened species
- ecological processes.

Applying the avoidance criteria results in avoided land that includes non-vegetated areas such as small wetlands and waterbodies, land that is strategically important to protect or enhance corridors, or small enclosed clearings that are surrounded by native vegetation.

Calculating avoidance outcomes

The following method is used to calculate avoidance outcomes for specific biodiversity values – for example, a threatened ecological community (TEC), within the nominated areas:

- Step 1. Determine the total existing area of each biodiversity value, in hectares.
- Step 2. Determine the total area impacted by urban development for each biodiversity value.
- Step 3. Determine the total area impacted by transport for each biodiversity value.
- Step 4. Determine the area of each biodiversity value within land unsuitable for urban development.
- Step 5. Determine the area avoided because of its biodiversity value, by subtracting the sum of the amounts from steps 2, 3 and 4 from the amount in Step 1.

During public exhibition, some landholders provided site-specific information and requested a review of the avoided land mapping. The department made changes where land met one or more of the following change criteria:

- creeks and water features mapped incorrectly, to be updated to match the topography and vegetation indicating movement of water through the landscape
- on-site data collected by accredited assessors supported updating the boundaries
- there was no net change to impact of threatened ecological communities, serious and irreversible impacts entities or vegetation in an intact condition state
- there was no impact on an identified landscape corridor
- authorised clearing had occurred (the relevant council reviews cleared areas and determines if the clearing was permitted – the urban-capable land boundary was not changed if the clearing was unauthorised).

In addition, based on new advice from the NSW Chief Scientist & Engineer (May 2021), land avoided from development in areas adjacent to mapped koala corridors was increased where needed to meet the average minimum corridor width recommended in the advice. Further information on the method applied can be found in Biosis 2021.

Box 9: Avoidance criteria

(a) TECs and PCTs

1. Critically endangered ecological communities (CEECs) or PCTs $\geq 90\%$ cleared in large patches and in good condition, or serious and irreversible impact entities (TECs)
2. EECs or PCTs $\geq 70\%$ to $< 90\%$ cleared in large patches and in good condition
3. PCTs $\geq 50\%$ to $< 70\%$ cleared in large patches and in good condition
4. PCTs $< 50\%$ cleared in large patches and in good condition

(b) Threatened species

1. Known habitat (as indicated by BioNet records or recent survey data) for critically endangered species, serious and irreversible impacts entities (species), Saving Our Species (SOS) species polygons (where species-specific habitat is present), or large populations of threatened species (relative to typical size for that species), or known primary koala habitat
2. Known habitat (as indicated by BioNet records or recent survey data) for endangered species or known secondary koala habitat
3. Known habitat (as indicated by BioNet records or recent survey data) for vulnerable species

(c) Ecological processes

1. Land identified as priority conservation land, BIO Map core areas, or important local habitat corridors for key species including koalas
2. Land identified as BIO Map regional corridors or as areas that provide significant opportunities to support important local habitat corridors for key species, including koalas
3. Areas identified on the Biodiversity Values Map

(d) Boundary rationalisation

Consider removing:

- small nodes or isolated patches of features identified in (a), (b) or (c) if future land use change will lead to significant edge effects and low viability over the timeframe identified, and there is no feasible opportunity to enhance connectivity and extent
- corridors that do not link important areas of habitat, including 'blind corridors'.

Appendix C. EPBC Act and BC Act matters to be offset through the CPCP

Table 1 Plant community types (PCTs) and threatened ecological communities

PCT no.	PCT name	TEC name (BC Act)	NSW legislative status	BC Act impact (ha)	TEC name (EPBC Act)	EPBC legislative status	EPBC impact(ha)
724	Broad-leaved ironbark – grey box – <i>Melaleuca decora</i> grassy open forest on clay/gravel soils of the Cumberland Plain, Sydney Basin Bioregion	Shale Gravel Transition Forest	Endangered	108.3	Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest	Critically endangered	180.3
849	Grey box – forest red gum – grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion	Cumberland Plain Woodland ²²	Critically endangered	677.2	Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest	Critically endangered	Included in above row
850	Grey box – forest red gum – grassy woodland on shale of the southern Cumberland Plain, Sydney Basin Bioregion	Cumberland Plain Woodland ²²	Critically endangered	254.3	Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest	Critically endangered	Included in above row
725	Broad-leaved ironbark – <i>Melaleuca decora</i> – shrubby open forest on clay soils of the Cumberland Plain, Sydney Basin Bioregion	Cooks River Castlereagh Ironbark Forest ²²	Endangered	37.6	Cooks River/ Castlereagh Ironbark Forest	Critically endangered	30.9
781	Coastal freshwater lagoons of the Sydney Basin Bioregion and South East Corner Bioregion	Freshwater Wetlands	Endangered	4.2	no equivalent listing	Not listed	0.0

PCT no.	PCT name	TEC name (BC Act)	NSW legislative status	BC Act impact (ha)	TEC name (EPBC Act)	EPBC legislative status	EPBC impact(ha)
835	Forest red gum – rough-barked apple – grassy woodland on alluvial flats of the Cumberland Plain, Sydney Basin Bioregion	River-flat Eucalypt Forest	Endangered	185.9	River-flat Eucalypt Forest ²¹	Critically endangered	159.2
830	Forest red gum – grey box – shrubby woodland on shale of the southern Cumberland Plain, Sydney Basin Bioregion	Moist Shale Woodlands	Endangered	0.0	Western Sydney Dry Rainforest and Moist Woodland on Shale	Critically endangered	0.0
1395	Narrow-leaved ironbark – broad-leaved ironbark – grey gum – open forest of the edges of the Cumberland Plain, Sydney Basin Bioregion	Shale Sandstone Transition Forest ²²	Critically endangered	459.8	Shale Sandstone Transition Forest in the Sydney Basin Bioregion	Critically endangered	180.7
1800	Swamp oak – open forest on river flats of the Cumberland Plain and Hunter valley	Swamp Oak Forest	Endangered	26.2	Coastal Swamp Oak (<i>Casuarina glauca</i>) Forest of NSW and south-east Queensland ecological community	Endangered	8.0
TOTALS	-	-	-	1,753.6	-	-	559.1

²¹ The 'River-flat eucalypt forest on coastal floodplains of NSW' was designated as a critically endangered threatened ecological community under the EPBC Act in December 2020.

²² These TECs are identified in the Cumberland Plain Assessment Report as serious and irreversible impact entities in accordance with the BAM

Table 2 Threatened species

No.	Species name	Common name	Credit class (BC Act)	Type	EPBC Status	BC Status
1	<i>Acacia bynoeana</i>	Bynoe's Wattle, Tiny Wattle	Species	Shrub	Vulnerable	Endangered
2	<i>Acacia pubescens</i>	Downy Wattle, Hairy Stemmed Wattle	Species	Shrub	Vulnerable	Vulnerable
3	<i>Allocasuarina glareicola</i> ²⁴	-	Species	Shrub	Endangered	Endangered
4	<i>Anthochaera phrygia</i>	Regent Honeyeater	Species/Ecosystem	Bird	Critically endangered	Critically endangered
5	<i>Botaurus poiciloptilus</i>	Australasian Bittern	Ecosystem	Bird	Endangered	Endangered
6	<i>Callocephalon fimbriatum</i>	Gang-gang Cockatoo	Species/Ecosystem	Bird	Not listed	Vulnerable
7	<i>Calyptorhynchus lathami</i>	Glossy Black-Cockatoo	Species/Ecosystem	Bird	Not listed	Vulnerable
8	<i>Cercartetus nanus</i>	Eastern Pygmy-possum	Species	Mammal	Not listed	Vulnerable
9	<i>Chalinolobus dwyeri</i> ²⁴	Large-eared pied bat, large pied bat	Species	Mammal	Vulnerable	Vulnerable
10	<i>Cynanchum elegans</i> ²⁵	White-flowered wax plant	Species	Epiphytes and climbers	Endangered	Endangered
11	<i>Dasyurus maculatus</i> (SE mainland population)	Spotted-tail quoll, spot-tailed quoll, tiger quoll (southeastern mainland population)	Ecosystem	Mammal	Endangered	Vulnerable
12	<i>Dillwynia tenuifolia</i> ²⁵	-	Species	Shrub	Not listed	Vulnerable
13	<i>Epacris purpurascens</i> var. <i>purpurascens</i>	-	Species	Shrub	Not listed	Vulnerable
14	<i>Eucalyptus benthamii</i>	Camden white gum, Nepean river gum	Species	Tree	Vulnerable	Vulnerable
15	<i>Grevillea juniperina</i> subsp. <i>Juniperina</i> ²⁵	Juniper-leaved grevillea	Species	Shrub	Not listed	Vulnerable
16	<i>Grevillea parviflora</i> subsp. <i>parviflora</i>	Small-flower grevillea	Species	Shrub	Vulnerable	Vulnerable

No.	Species name	Common name	Credit class (BC Act)	Type	EPBC Status	BC Status
17	<i>Haliaeetus leucogaster</i> ²³	White-bellied sea-eagle	Species/Ecosystem	Bird	Not listed	Vulnerable
18	<i>Heleioporus australiacus</i>	Giant burrowing frog	Species	Amphibian	Vulnerable	Vulnerable
19	<i>Hibbertia fumana</i> ²³	-	Species	Shrub	Not listed	Critically endangered
20	<i>Hibbertia puberula</i> ²⁵	-	Species	Shrub	Not listed	Endangered
21	<i>Hieraaetus morphnoides</i> ²³	Little eagle	Species/Ecosystem	Bird	Not listed	Vulnerable
22	<i>Lathamus discolor</i>	Swift parrot	Species/Ecosystem	Bird	Critically Endangered	Endangered
23	<i>Litoria aurea</i> ²⁴	Green and golden bell frog	Species	Amphibian	Vulnerable	Endangered
24	<i>Lophoictinia isura</i> ²³	Square-tailed kite	Species/Ecosystem	Bird	Not listed	Vulnerable
25	<i>Marsdenia viridiflora</i> subsp. <i>Viridiflora</i> ²⁵ – endangered population	<i>Marsdenia viridiflora</i> subsp. <i>viridiflora</i> – endangered population	Species	Epiphytes and climbers	Not listed	Endangered
26	<i>Maundia triglochinosoides</i>	-	Species	Herbs and forbs	Not listed	Vulnerable
27	<i>Melaleuca deanei</i>	Deane's melaleuca	Species	Shrub	Vulnerable	Vulnerable
28	<i>Meridolum corneovirens</i> ²⁵	Cumberland Plain land snail	Species	Invertebrate	Not listed	Endangered
29	<i>Micromyrtus minutiflora</i> ²⁴	-	Species	Shrub	Vulnerable	Endangered
30	<i>Myotis Macropus</i> ²⁵	Southern myotis	Species	Mammal	Not listed	Vulnerable
31	<i>Ninox strenua</i>	Powerful owl	Species/Ecosystem	Bird	Not listed	Vulnerable
32	<i>Persicaria elatior</i>	Tall knotweed	Species	Herbs and forbs	Not listed	Vulnerable
33	<i>Persoonia bargoensis</i>	Bargo geebung	Species	Shrub	Vulnerable	Endangered
34	<i>Persoonia hirsuta</i>	Hairy geebung, hairy persoonia	Species	Shrub	Endangered	Endangered
35	<i>Persoonia nutans</i> ²⁵	Nodding geebung	Species	Shrub	Endangered	Endangered

²³ These species are identified as both target species in the CPCP and serious and irreversible impact entities in the Cumberland Plain Assessment Report

No.	Species name	Common name	Credit class (BC Act)	Type	EPBC Status	BC Status
36	<i>Petauroides volans</i>	Greater glider	Species	Mammal	Vulnerable	Not listed
37	<i>Petaurus norfolcensis</i>	Squirrel glider	Species	Mammal	Not listed	Vulnerable
38	<i>Phascolarctos cinereus</i>	Koala	Species/Ecosystem	Mammal	Endangered	Vulnerable
39	<i>Pimelea curviflora</i> var. <i>curviflora</i>	-	Species	Shrub	Vulnerable	Vulnerable
40	<i>Pimelea spicata</i> ²⁵	Spiked rice-flower	Species	Shrub	Endangered	Endangered
41	<i>Pomaderris brunnea</i>	Rufous pomaderris	Species	Shrub	Vulnerable	Endangered
42	<i>Pommerhelix duralensis</i>	Dural land snail	Species	Invertebrate	Endangered	Endangered
43	<i>Pseudophryne australis</i> ²⁴	Red-crowned toadlet	Species	Amphibian	Not listed	Vulnerable
44	<i>Pteropus poliocephalus</i>	Grey-headed flying fox	Species/Ecosystem	Mammal	Vulnerable	Vulnerable
45	<i>Pterostylis saxicola</i>	Sydney plains greenhood	Species	Orchid	Endangered	Endangered
46	<i>Pultenaea parviflora</i> ²⁵	-	Species	Shrub	Vulnerable	Endangered
47	<i>Pultenaea pedunculata</i> ²⁵	Matted bush-pea	Species	Shrub	Not listed	Endangered
48	<i>Rostratula australis</i>	Australian painted snipe	Ecosystem	Bird	Endangered	Endangered
49	<i>Tyto novaehollandiae</i>	Masked owl	Species/Ecosystem	Bird	Not listed	Vulnerable

²⁴ These species are identified in the Cumberland Plain Assessment Report as serious and irreversible impact entities in accordance with the BAM

²⁵ These species are identified as target species in the CPCP with a direct offset

Appendix D. Conservation Priorities Method

Context

The Conservation Priorities Method is a systematic and repeatable method for determining and prioritising conservation lands for the Cumberland Plain Conservation Plan. It combines detailed spatial information about biodiversity values with an analysis of constraints and opportunities. This assists with identifying an optimal mix of potential conservation lands to offset future impacts from development to biodiversity in Western Sydney.

The method is a modelling approach based on numerous datasets. The Department of Planning, and Environment can refine outputs from the method through:

- alignment with the CPCP drivers (see 'Appendix D1 – Alignment with biodiversity certification drivers for offsetting under the CPCP')
- consultation with other agencies and the public
- ground-truthing
- the results from a detailed evaluation and reporting process on vegetation extent in the study area.

The method is initiated after the impacts of the CPCP have been determined. Details of the impacts under the CPCP are found in the Cumberland Plain Assessment Report. A summary of the total impacts and offset targets is provided in 'Appendix D2 – Impact assessment results and offset target method'.

Conservation Priorities Method – Stages

This method applies a series of geographic information system-based models to assess the area covered by the CPCP and identify conservation priorities, generating several outputs. The models use multi-criteria analysis techniques and ground-truthing processes to rank conservation priorities.

The method has 4 stages.

Stage 1 – Ecological assessment

This stage identifies the areas of highest biodiversity value by running the:

- a. core vegetation model
- b. Phase 0 exclusion model
- c. fusion analysis model.

Stage 2 – Complementary assessments

Stage 2 identifies complementary information such as restoration potential, proximity to protected land or the level of constraints (from low to high) of the land for implementing potential conservation lands. It includes:

- a. feature indicators models – restoration and proximity to protected land
- b. a constraints model.

Stage 3 – Conservation priorities assessment and offset selection

This stage identifies areas suitable for offsets. It includes:

- a. alignment with biodiversity certification drivers for offsetting under the CPCP
- b. a selection approach for potential offset areas
- c. the selection output.

Stage 4 – Ground-truthing program

The ground-truthing program includes:

- a. a desktop assessment and aerial verification, and refinement of the offset unit information
- b. an 'over-the-fence', on-ground rapid assessment and refinement of offset unit information
- c. the development of implementation proposals for each offset unit.

The method ensures that the proposed conservation lands reflect the highest priority areas for protection of the most important conservation values.

Data used throughout the process will be updated and all models re-run every 5 years over the life of the CPCP to identify changes in constraints and new opportunities for offsetting. Collaboration with various partners (such as local councils and government departments) will help keep the data up to date and identifying potential data gaps, including additional sites that may be suitable for conservation but were not identified through the model.

Stage 1 – Ecological assessment

A. Core vegetation model

The ecological assessment aims to identify native vegetation remaining in the CPCP Area (and surrounding areas, including the Cumberland subregion) and rank it according to specific criteria.

The core vegetation model assesses all vegetation in the CPCP Area. It uses 2 main data inputs:

- patch size and listing status, including the size of vegetation patches and state legislative status or % of clearing of non-listed plant community types (PCTs)
- vegetation condition.

Each category in the model was allocated a predetermined score based on the combination of inputs for the 2 layers.

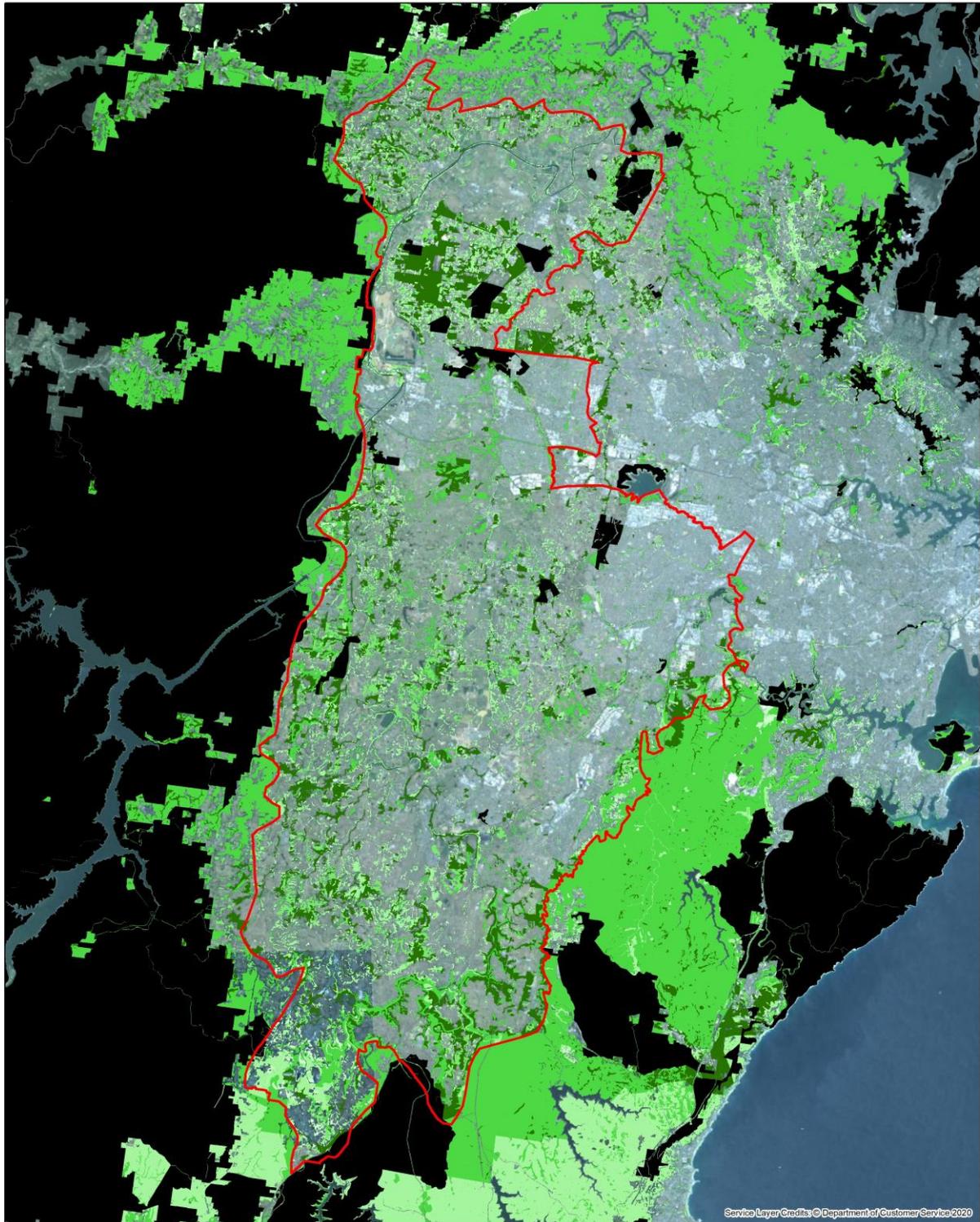
Larger patches of the most cleared or highly threatened vegetation in the best condition were allocated the highest score. The potential maximum score is obtained by vegetation patches greater than 100 hectares, which are listed as critically endangered ecological communities and are in good condition. The minimum score is allocated to vegetation with a patch size of less than 5 hectares, a BAM tier for PCTs of less than 50% cleared, and vegetation in poor condition.

Figure 25 shows the core vegetation model's criteria that vegetation was scored against.

Figure 26 shows the output of the core vegetation scoring.

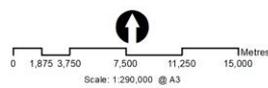


Figure 25. Core vegetation model



- Legend**
- CPCP Area
 - National Parks Estate
- Core vegetation with condition**
- 75 - 100
 - 100 - 116
 - 116 - 128
 - 128 - 147
 - 147 - 170

Cumberland Plain Conservation Plan
Core vegetation model



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Figure 26. Core vegetation model spatial output

B. Phase 0 exclusion model

The Phase 0 exclusion model identifies land that would be unlikely to support offsets because the site is already protected or because the current (or proposed) land use is not consistent with a biodiversity outcome. Lands identified under this model are considered to have too many impediments to be included as conservation land under the CPCP.

The Phase 0 exclusion model is applied to the results of the previous core vegetation output. The resulting layer indicates how much land identified in the core vegetation model remains potentially available for offset. It is anticipated that this Phase 0 exclusion layer will be updated from time to time as impediments change in the landscape.

Land that is removed in this exclusion model may still be identified for conservation due to the selection criteria listed in Stage 3 for connectivity purposes.

Figure 27 shows the Phase 0 exclusion model criteria that removed land from consideration.

Figure 28 shows the remaining core vegetation in the CPCP Area after the Phase 0 exclusion model was applied.

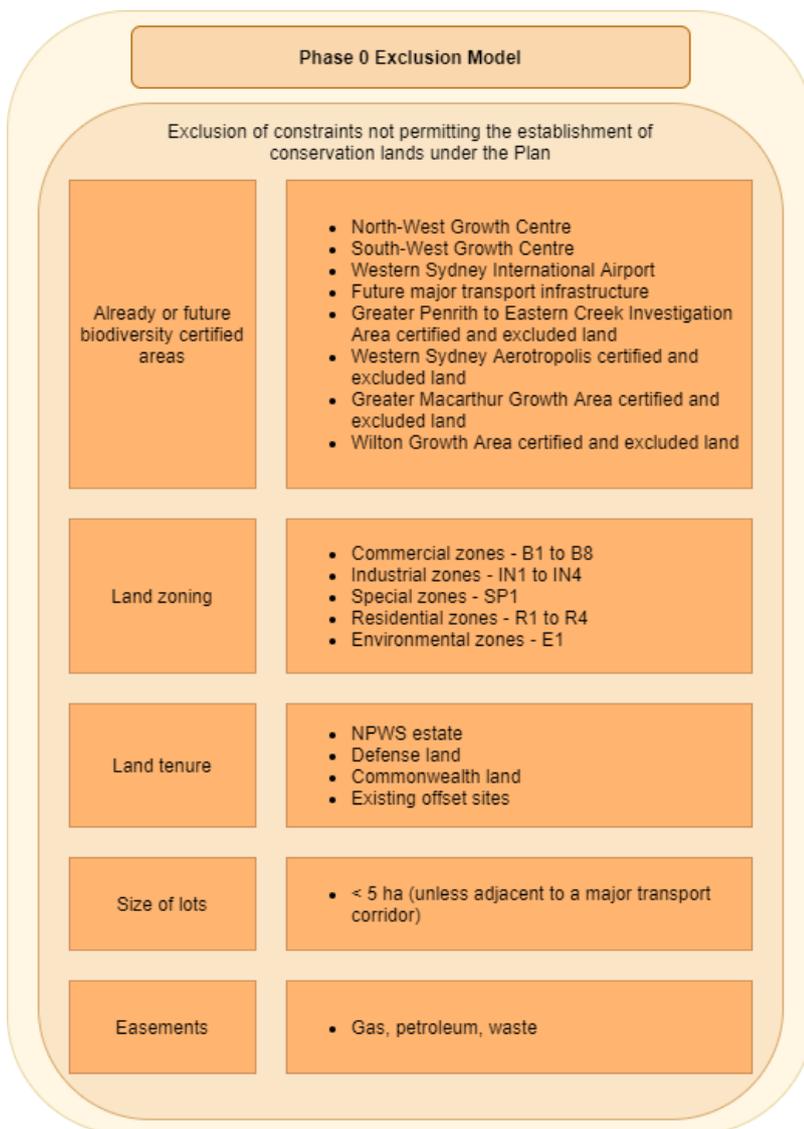
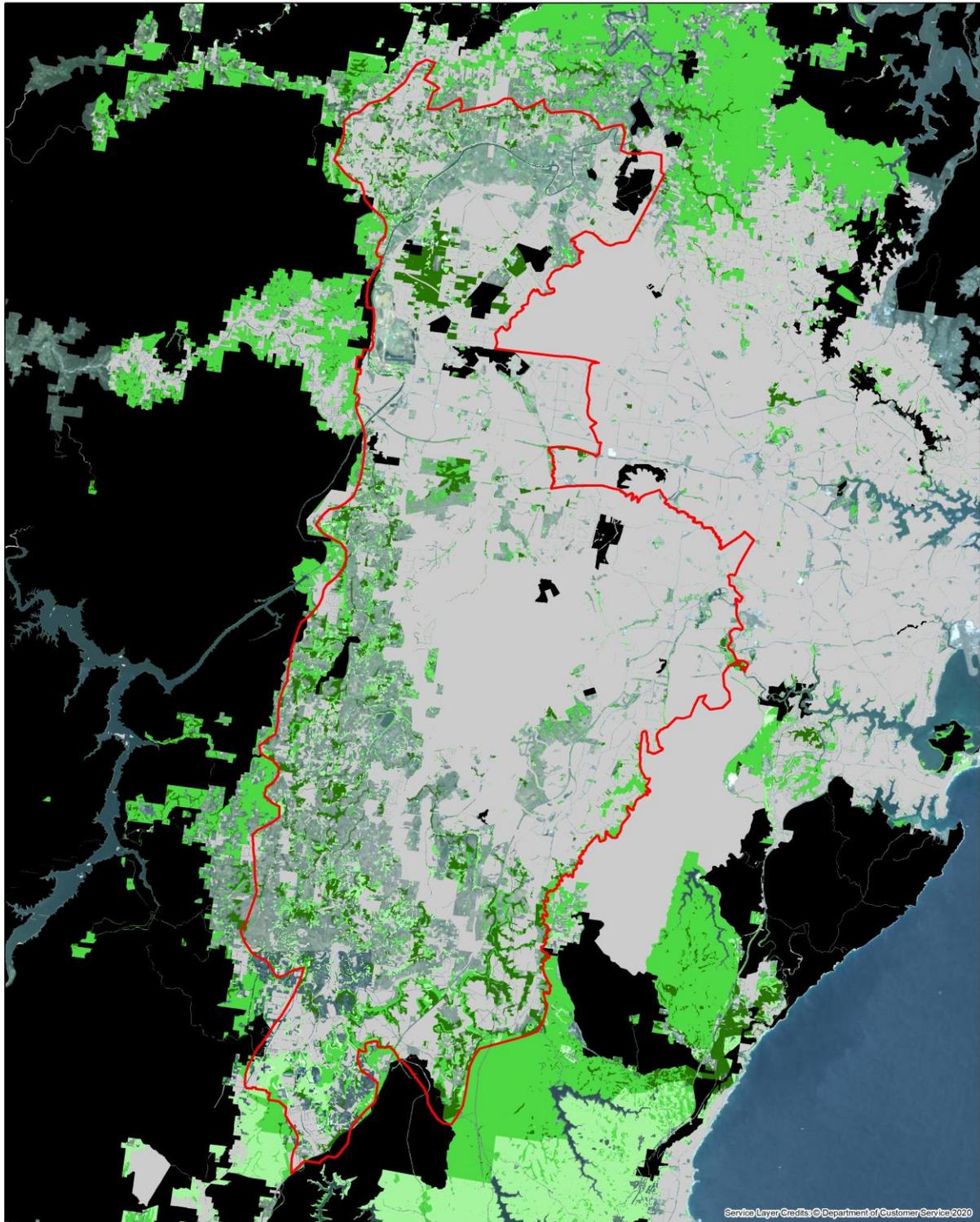


Figure 27. Phase 0 exclusion model



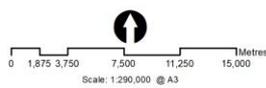
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Legend

- CPCP Area
 - National Parks Estate
 - Phase 0 exclusion model
- Core vegetation with condition**
- 75 - 100
 - 100 - 116
 - 116 - 128
 - 128 - 147
 - 147 - 170

Cumberland Plain Conservation Plan

Core vegetation model and Phase 0 exclusion model



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Figure 28. Phase 0 exclusion model spatial output

C. Fusion analysis

Overview of the fusion analysis model

The core vegetation and Phase 0 exclusion models described in the previous section have been used to identify the native vegetation remaining in the landscape with the highest value as potential offsets for the CPCP. An additional model, known as the fusion analysis, assesses this remaining vegetation in conjunction with the offset targets to identify the highest-scoring vegetation patches that can contribute to the offset requirements.

Essentially, fusion analysis identifies the largest patches of the best condition PCTs in the CPCP Area that can contribute to the offset targets.

Figure 29 shows how the fusion analysis model is fed by the core vegetation and exclusion models alongside the plan's offset targets.

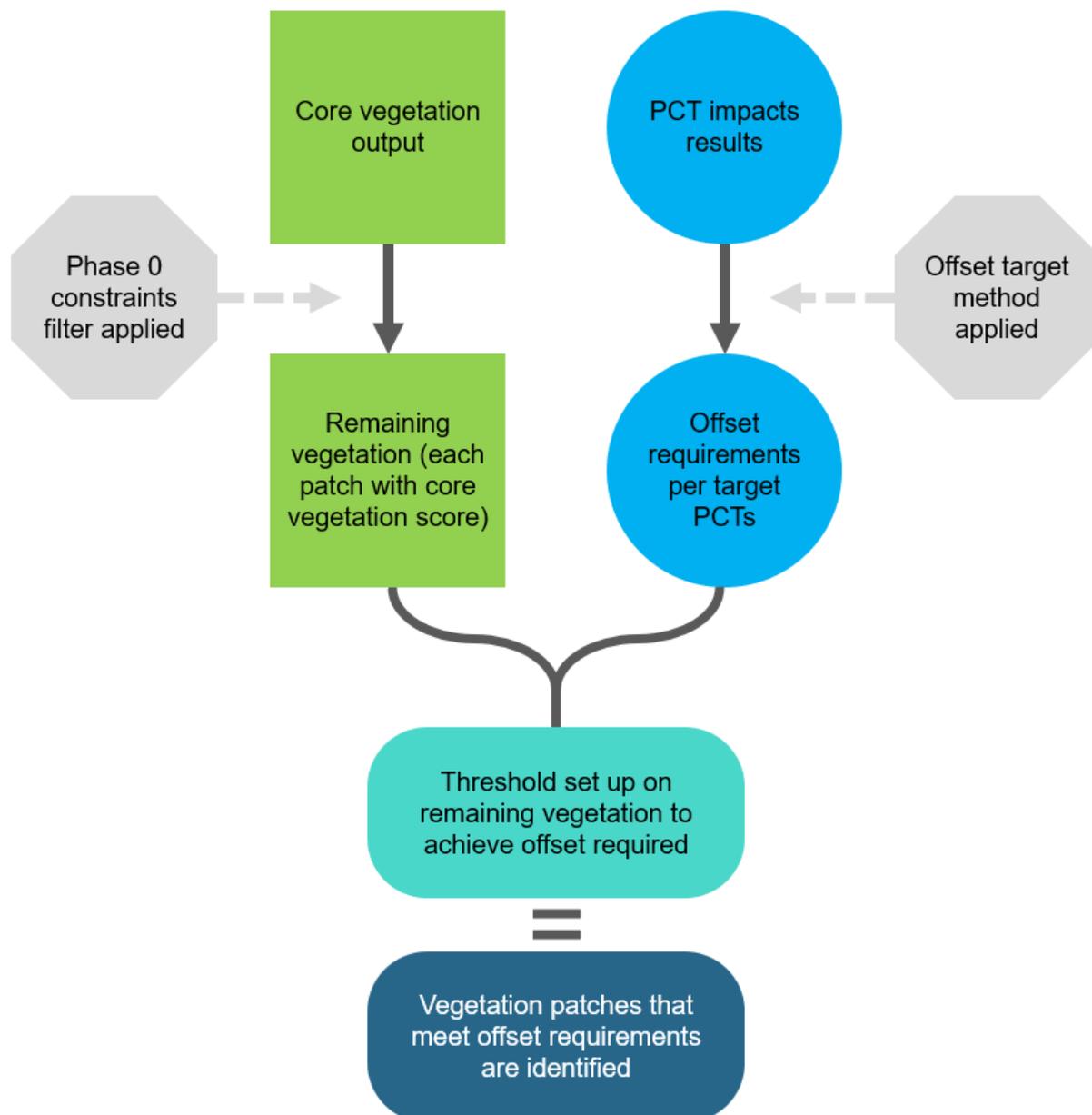


Figure 29. Fusion analysis model

Thresholds against PCT targets

The fusion analysis identifies specific model thresholds for each target PCT based on:

- the calculated impacts
- the required offset target
- the potential land available for each target PCT after applying the Phase 0 exclusion model.

The fusion analysis is designed to identify how much of each PCT is required to offset predicted impacts, with the threshold for each PCT set independently. The threshold is the predicted offset required and the amount of each PCT remaining in the landscape after applying the Phase 0 exclusion model. For some target PCTs, the threshold is high because only the best available vegetation is needed to offset impacts. This may be due to the PCT having a low target (that is, not much impact) or a significant amount of the specific PCT is available in the landscape.

For some target PCTs, the required threshold is low because most (or all) of the available PCT are needed to offset the proposed impact. Thresholds for non-target PCTs are set based on the top 50% of results for that PCT.

The offset targets are explained in the Cumberland Plain Assessment Report, with extracts of the total impacts and offset ratios found in this document in 'Appendix D2 – Impact assessment results and offset target method'.

Example of fusion analysis

Table 8 shows an example of fusion analysis being applied to a target PCT to identify the best available vegetation patches in the landscape that can contribute to the offset targets.

For this example, PCT 724 (Shale Gravel Transition Forest) is used with an offset target of 150 hectares. The steps of the fusion analysis are:

1. vegetation patches are sorted by the highest score received from the core vegetation model
2. vegetation is removed from the selection by the exclusion model
3. the remaining available vegetation area is counted until the offset target of 150 hectares is met or exceeded, using the highest scoring vegetation first.

Output of the fusion analysis

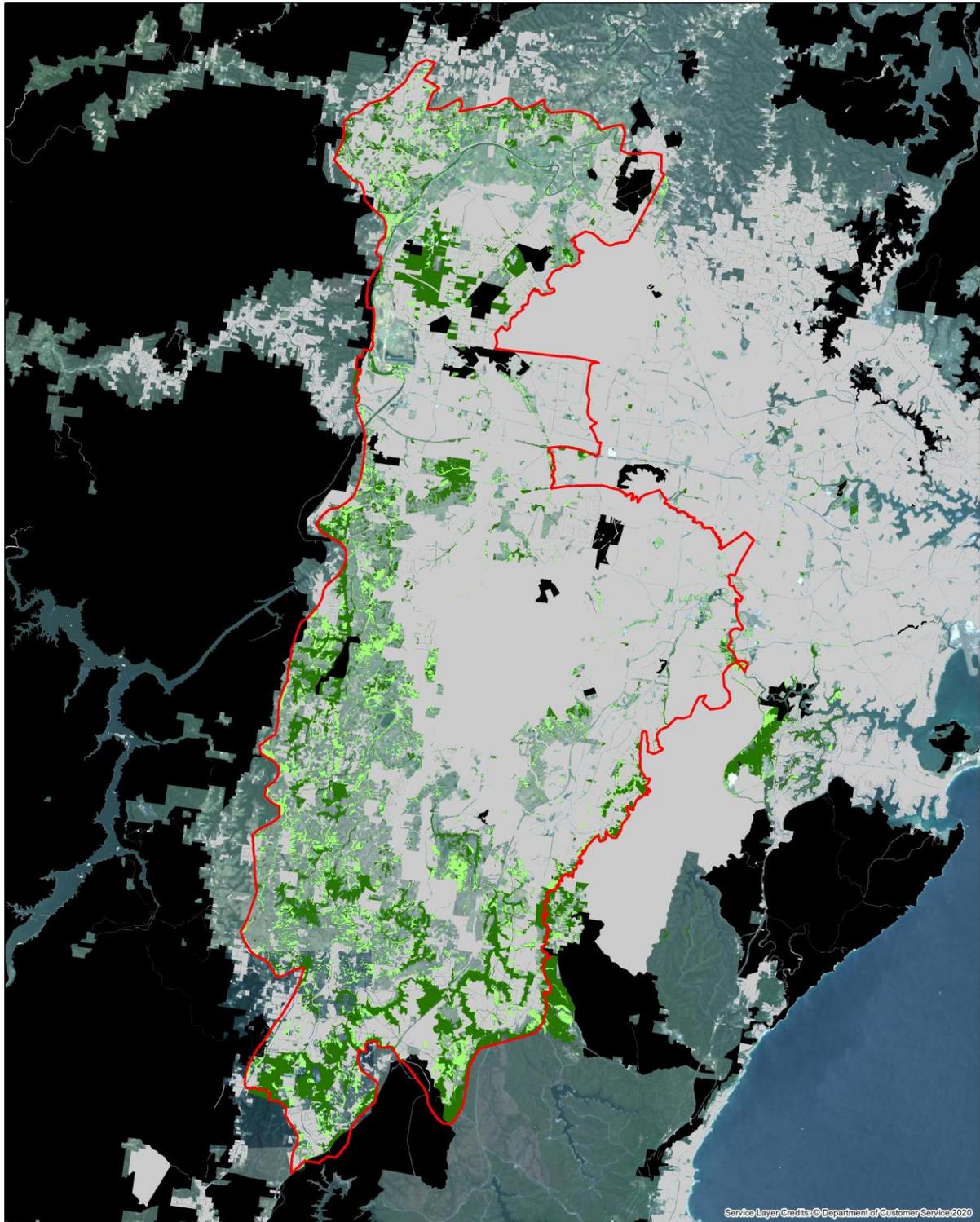
The output of fusion analysis identifies all vegetation remaining in the CPCP Area, and differentiates:

- targeted PCTs patches that can contribute to offset impacts under the CPCP
- targeted PCTs patches that are not needed to offset impacts under the CPCP (that is, residual PCTs)
- non-target PCTs in top 50% of model results
- non-target PCTs in bottom 50% of model results

Figure 30 shows the output of fusion analysis where vegetation patches are above or below the threshold that could meet the offset targets.

Table 8. Example of a fusion model analysis for target PCT Shale Gravel Transition Forest

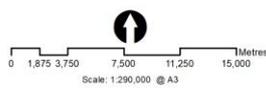
Core vegetation model score (ha)	Area of vegetation per model score (ha)	Phase 0 exclusion land (ha)	Remaining available vegetation (ha)	Cumulative vegetation area (ha)	Contributes to target?
215	1,031.0	970.8	60.1	60.1	Yes
197.5	175.7	160	15.7	75.8	Yes
180	332.1	267.6	64.4	140.2	Yes
174	68.1	62.4	5.8	146	Yes
168	15.7	13.7	2	148	Yes
162.5	147.3	133.3	14	162	Yes
156.5	249.3	178.5	70.8	232.8	No
150.5	240.3	217.6	22.7	255.5	No
139	329.4	245.5	84	339.5	No
133	266.8	240.9	25.9	365.4	No
115.5	230.8	178.4	52.4	417.8	No



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- Legend**
- CPCP Area
 - National Parks Estate
 - Phase 0 exclusion model
- Fusion method**
- Above threshold
 - Below threshold

Cumberland Plain Conservation Plan
Fusion method output and Phase 0 exclusion model



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Figure 30. Fusion model spatial output

Stage 2 – Complementary assessments

Complementary assessments are used to help inform the strategic conservation area in Stage 3.

A. Feature indicators models

The Stage 1 output is complemented by a number of separate feature indicator models. These models add additional information and context to the ecological assessment by:

- modelling the proximity of the existing core vegetation to existing 'protected' land (protected in perpetuity such as reserves under the National Parks and Wildlife Service and temporarily protected by government ownership or projects)
- modelling the potential PCTs expected to restore on cleared land (pre-1750s PCT layer)

Figure 31 shows the model criteria that were used to better understand the connectivity potential and restoration potential of the landscape.

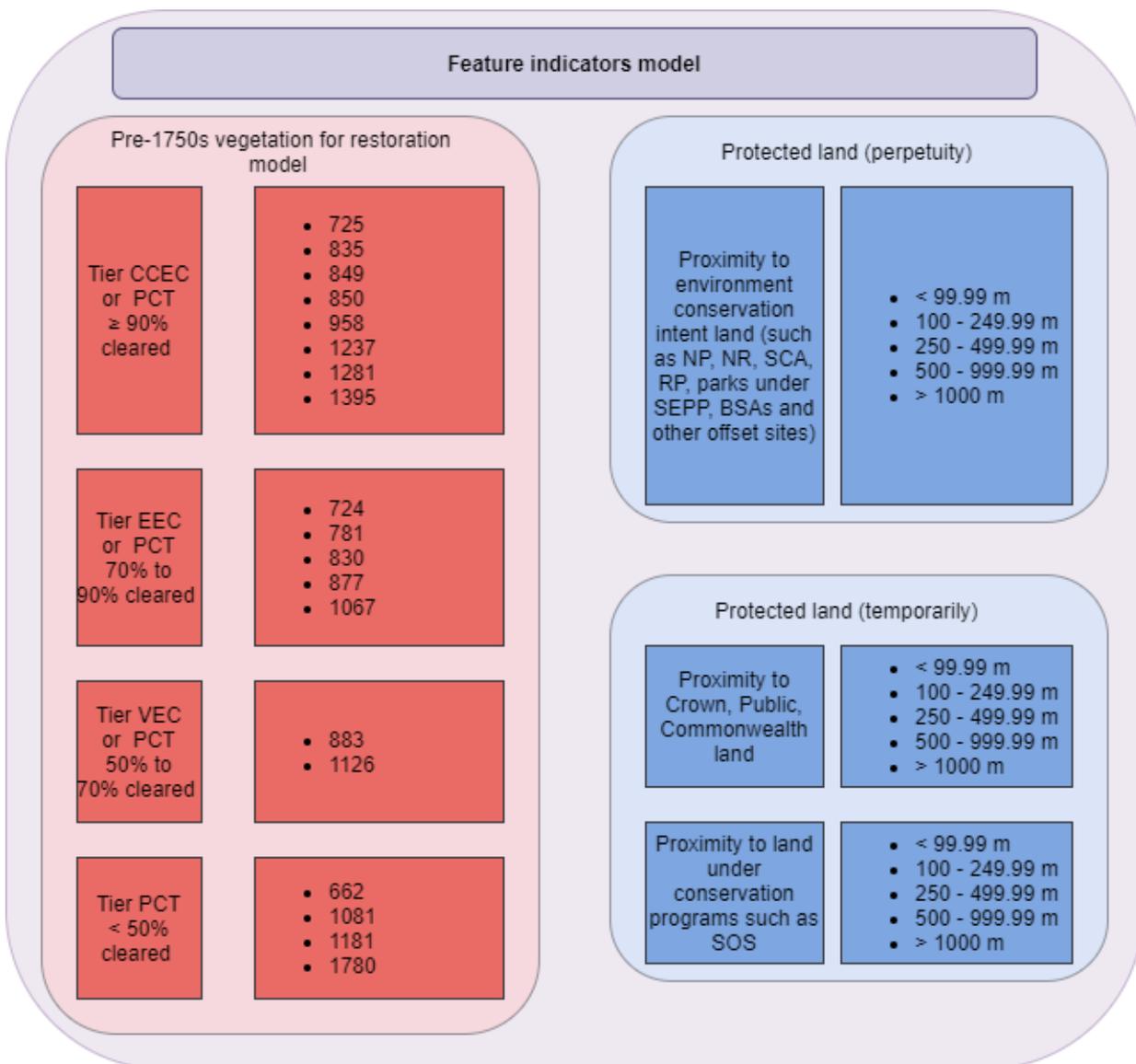


Figure 31. Feature indicators models

B. Constraints model

All vegetation remaining in the landscape available for potential offset (after the exclusion model) is assessed separately under the constraints model. The constraints model identifies limitations that could challenge the implementation of conservation measures and the establishment of conservation lands.

In identifying these constraints, conservation lands can be chosen in locations that provide the best opportunity to improve biodiversity values and landscape function in the long term. Just like the feature indicators models, the constraints model produces a separate output that is used to provide additional information to help prioritise land for conservation.

Each lot with vegetation remaining in the landscape is scored against criteria shown in Figure 32 below. The criteria have been applied to entire lots and not just the vegetated area within the lots.

Figure 32 shows the constraint criteria that could challenge the establishment of conservation lands.

Figure 33 shows the spatial output of the constraints model on vegetated lots in the CPCP Area.

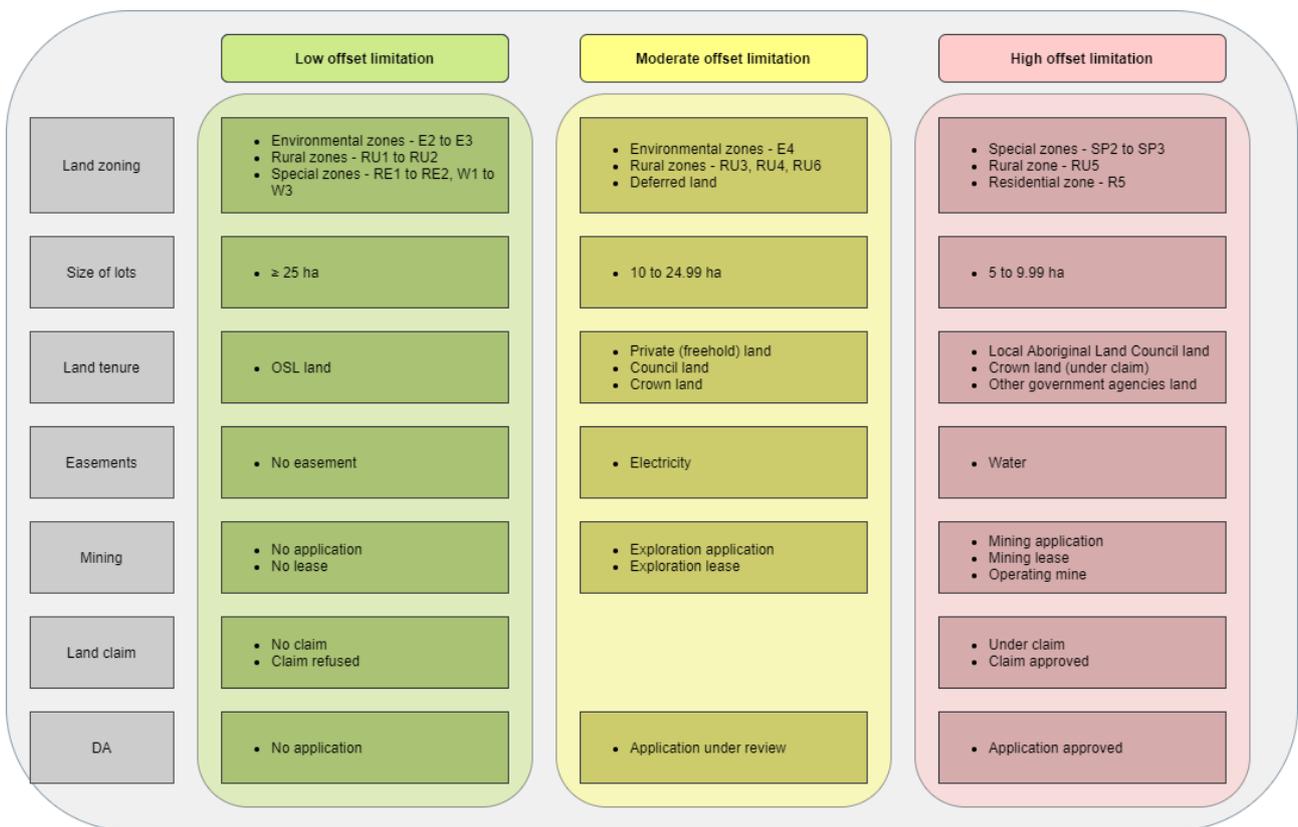
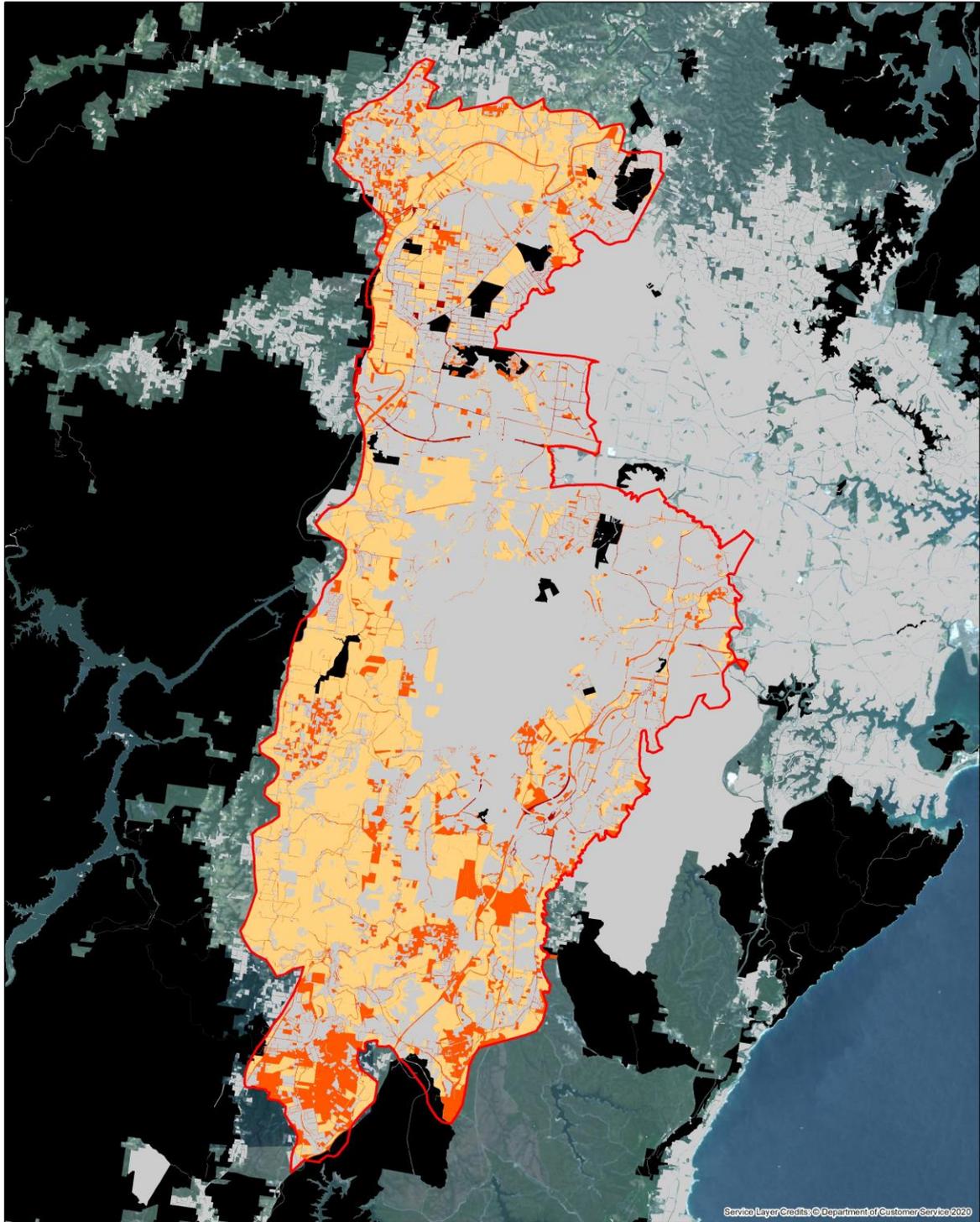


Figure 32. Constraints model



- Legend**
- CPCP Area
 - National Parks Estate
 - Phase 0 exclusion model
- Constraints model**
- High
 - Mod
 - Low

Cumberland Plain Conservation Plan
Phase 0 exclusion model and constraints model

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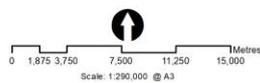


Figure 33. Constraints spatial model output

Stage 3 – Conservation priorities and offset selection

Priority areas for conservation can now be selected because the method has determined:

- the best available vegetation that can contribute to the CPCP targets
- land that is suitable for potential restoration or is in close proximity to protected land
- the level of constraint present.

A. Alignment with biodiversity certification drivers for offsetting under the CPCP

The method has been informed by several resources, including state and federal biodiversity certification guidance (referred to as ‘the CPCP drivers’), to deliver landscape-scale biodiversity conservation outcomes. The CPCP drivers are:

- the objective of the CPCP
- the *Biodiversity Conservation Act 2016* (NSW) (the BC Act)
- the department’s ‘Conservation measures in strategic applications for biodiversity certification: Guidance for planning authorities’
- the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (the EPBC Act)
- the ‘Environment Protection and Biodiversity Conservation Act 1999 Environmental Offsets Policy’.

The CPCP drivers, and in particular the principles of both the BC Act and EPBC Act, have been used alongside the outputs from the method so far to help select conservation lands under the CPCP.

Further information on the CPCP drivers is found at ‘Appendix D1 – Alignment with biodiversity certification drivers for offsetting under the CPCP’.

B. Selection approach for potential offset areas

Suitable offset areas are selected from the ground up – from PCTs, TECs, threatened species potential habitat, target species confirmed locations and other matters of national environmental significance to the landscape scale.

The following criteria are considered and used to select potential offset areas:

- (a) large patches of target PCTs above the fusion threshold
- (b) target PCTs below the fusion threshold that are adjacent to (a)
- (c) non-target PCTs above the fusion threshold that are adjacent to (a) and (b)
- (d) protected koala habitat as defined by the CPCP
- (e) areas that include high densities of threatened species potential habitat
- (f) important matters of national environmental significance sites, including known habitat for threatened species
- (g) sites that offer an opportunity for ecological restoration as a significant contributor to connectivity or that are required for target PCTs with an offset shortfall
- (h) sites that provide connectivity between larger patches.

Potential offset areas were then refined based on a number of refinement criteria, including the removal of:

- small and isolated patches – these areas are difficult to manage and unlikely to be viable in the long term

- areas with high offset limitations that were not previously removed by the exclusion model in Stage 1.

C. The model's output

The application of the method provides viable locations for offsetting impacts to biodiversity under the CPCP. The selected areas are known as the strategic conservation area, which represents approximately 27,200 hectares (14% of the CPCP Area). The strategic conservation area shown in Figure 34, identifies large remnants of native vegetation with good connectivity, or areas with the potential to enhance connectivity, on low- to medium-constraint land.

The method's priority-setting processes will be used to focus on conserving land to meet the total offset target of 5,325 hectares. Areas within the strategic conservation area will be prioritised for further investigation and will be known as the conservation priority area.

The conservation priority area will be divided into offset units and categorised as either potential reserves or biodiversity stewardship sites.

The remainder of the strategic conservation area will be divided into backup units' that can be re-prioritised if an offset unit becomes unavailable.

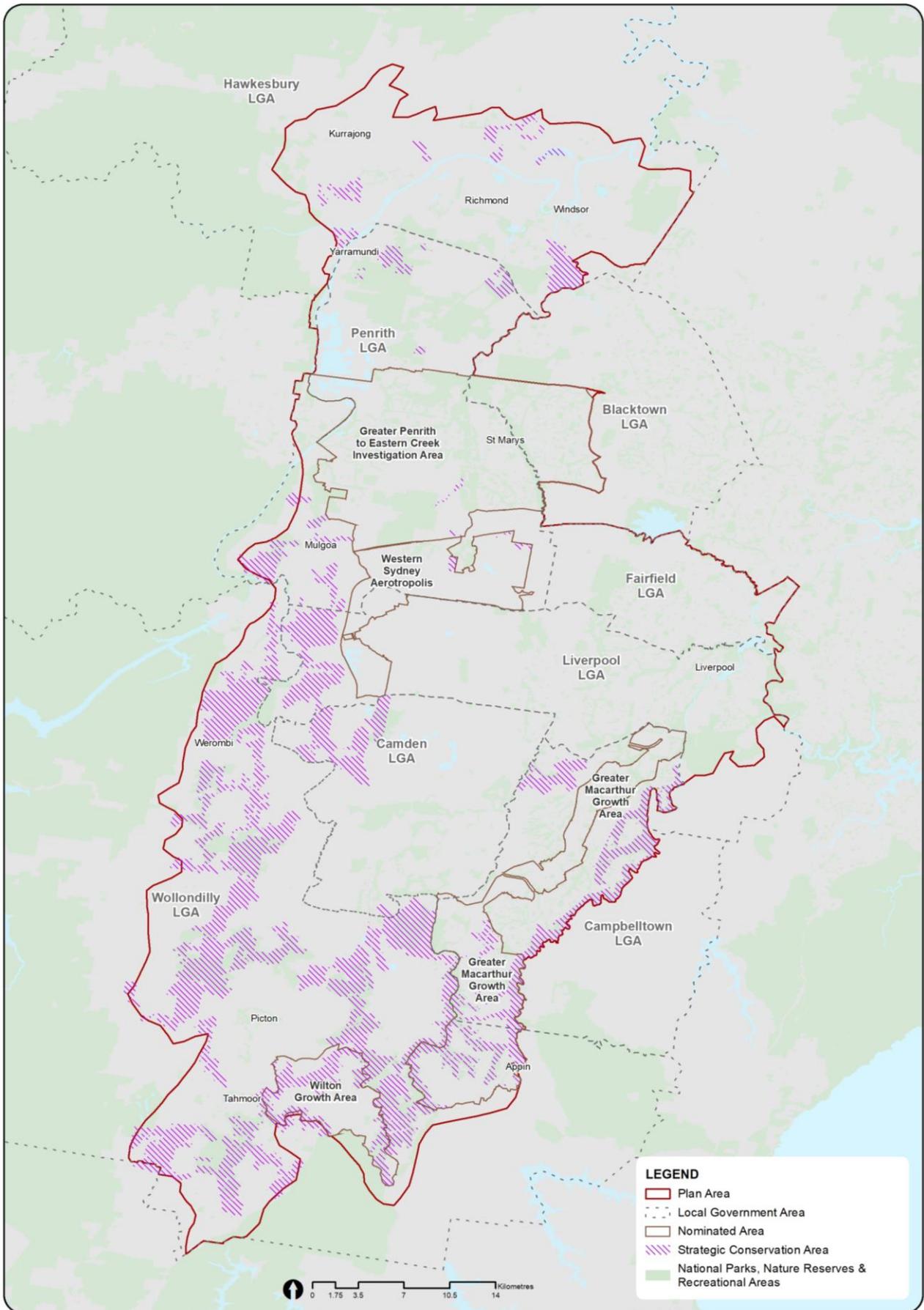


Figure 34. Strategic conservation area spatial output

Stage 4 – Ground-truthing program

Each offset unit will undergo a ground-truthing process to confirm the validity and robustness of the area as a biodiversity offset and the biodiversity values present. Those areas confirmed to have the required biodiversity values and complementary attributes (such as connectivity and restoration potential) will be prioritised as targets for conservation land and further developed into implementation proposals.

The ground-truthing process involves ‘over-the-fence style’ assessments. Therefore, the results of the ground-truthing are indicative only and will be updated when on-ground assessments are conducted.

A. Desktop assessment and aerial verification to refine offset units

All offset units will undergo the following desktop and aerial assessments prior to an on-ground rapid assessment:

- **Update vegetation mapping** (extent and condition). Based on recent aerial photos, areas of regrowth are added to the vegetation mapping for each offset unit, with areas of clearing removed from the layer. Obvious changes in condition (that is, where vegetation had been thinned) are also recorded.
- **Identify areas for restoration** (extent and condition). Based on the vegetation condition, the effort required to manage and restore areas are estimated and categorised as either ‘Active management (intensive weed control)’, ‘Active management (restoration)’, ‘Active management (thinned/scattered condition)’ or ‘Passive management (intact/thinned condition)’.
- **Identify management issues**. Areas of weed infestation or other management issues (for example, dumping) are identified using recent aerial photos.
- **Identify roads and easements**. Layers obtained from NSW Spatial Services (cadastre, water, roads, and easements) are used to identify areas within potential offset sites with constraints that may limit vegetation management or restoration activities. These areas are mapped separately to ensure management and restoration efforts are not over-estimated
- **Adjust boundaries**. Boundaries are adjusted for each offset unit, and areas added or removed, based on management requirements and issues identified.

A desktop assessment will also be conducted on backup units, including adjusting boundaries, and identifying roads and restorations. Should a backup unit be upgraded to an offset unit, more detailed ground-truthing will be conducted. The results of this assessment will be presented to delivery partners for feedback.

B. ‘Over-the-fence’ on-ground rapid assessment to refine offset units

All offset units undergo an on-ground, ‘over-the-fence’ rapid assessment. A team led by a BAM-accredited assessor will visit various sites and collect ecological data using a fit-for-purpose Rapid Assessment Method (RAM) digital form.

The form was created through Survey123, an ArcGIS app from Esri. It allows inputting of information during the on-ground assessment and uploading to ArcGIS Online.

The results are downloaded as a geodatabase, and subsequently integrated into the strategic conservation area layer.

8:24 4G

Over_the_fence_rapid_Assessment

▷ Apparent suitability of neighbouring/adjacent land use

▷ Apparent suitability for protection of the site

▽ Vegetation

NSW Vegetation Formations on the site

Complete if known

Dry sclerophyll (shrub/grass) Dry sclerophyll (shrubby)

Forested wetland Freshwater wetland

Grassland Grassy woodland

Heathland Rainforest

Wet sclerophyll (grassy) Wet sclerophyll (shrubby)

Non-native vegetation Comments

Dominant/common Canopy Species and estimated cover

✓

Figure 35. RAM digital form extract

The results of this on-ground rapid assessment will lead to:

- updated vegetation mapping – areas of native vegetation are updated, based on the results of the field assessment. The PCTs allocated to vegetation polygons are updated where field observations support this. Areas of proposed restoration are also assigned PCTs
- boundary adjustments – where ground-truthing identified new issues, the boundaries of the offset units are changed, with areas added or removed.

Figure 35 shows a snapshot of the digital form that is used to complete the rapid assessments.

Figure 36 shows a snapshot of the data that is collected in the rapid assessments.

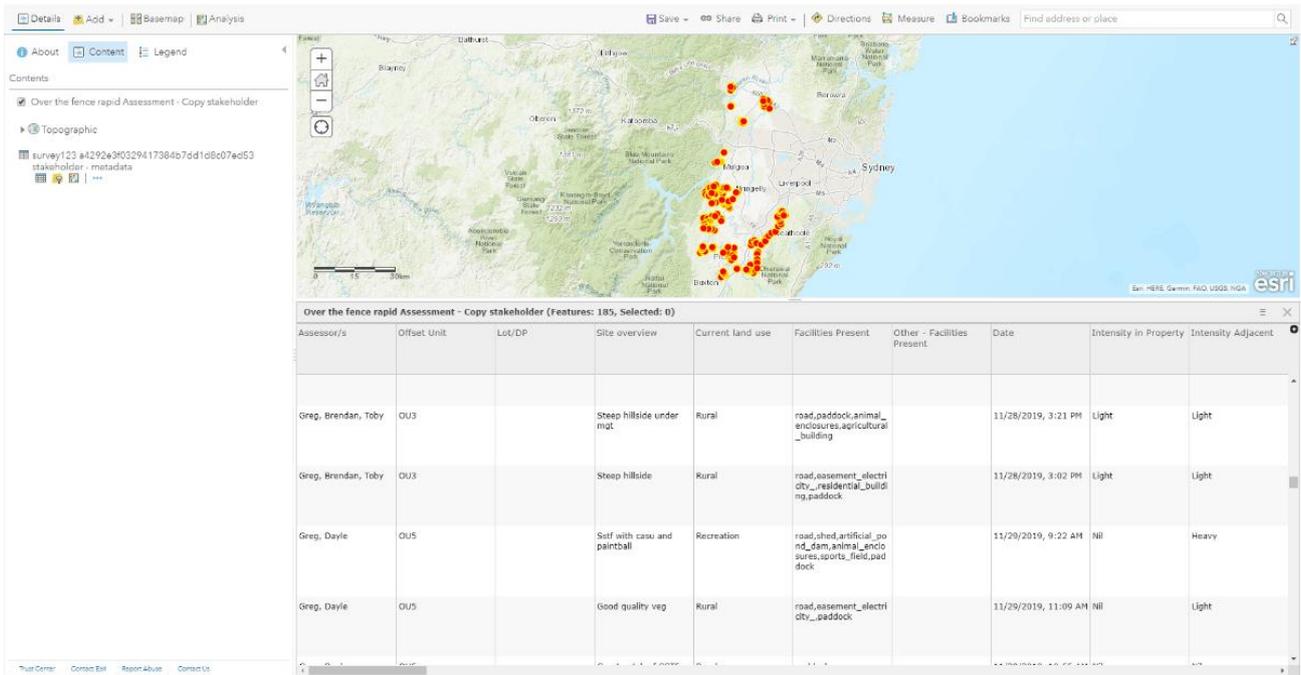


Figure 36. RAM data overview

C. Development of implementation profiles for each offset unit

Each offset unit is developed into a high-level implementation profile in collaboration with delivery partners.

The profiles:

- identify how the unit contributes to the CPCP offset program
- describe how the unit is part of a connected landscape
- describe how the unit supports the overarching goal of the offset program to achieve a strategic outcome.

The profiles include the following information:

- key strengths and challenges summary
- significant geography and management history of the site
- planning and environmental report (including restoration opportunities)
- selection rational and benefits to a strategic conservation outcome
- prioritised lots for purchase within the offset unit.

Appendix D1 – Alignment with biodiversity certification drivers for offsetting under the CPCP

The method has been informed by several resources including state and federal strategic biodiversity certification and assessment guidance (referred to as ‘the CPCP drivers’) to deliver landscape-scale biodiversity conservation outcomes. The CPCP drivers are:

- the objective of the CPCP
- the *Biodiversity Conservation Act 2016* (NSW) (the BC Act)
- the department’s ‘Conservation measures in strategic applications for biodiversity certification: Guidance for planning authorities’
- the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (the EPBC Act)
- the ‘Environment Protection and Biodiversity Conservation Act 1999 Environmental Offsets Policy’

The CPCP drivers, and in particular the principles of both the BC Act and EPBC Act, have been used alongside the outputs from the method so far to help select potential conservation land under the CPCP.

Information on the CPCP objectives can be found under ‘Meeting the CPCP vision’ in the Cumberland Plain Conservation Plan.

Information relating to the BC Act and EPBC Act and their related policies is given in the following sections.

Conservation measures in strategic applications for biodiversity certification: guidance for planning authorities’

The guidance for planning authorities (Environment, Energy and Science group, 2020) has been the primary driver used to inform the method.

It provides a set of guiding principles for demonstrating that the conservation measures proposed in an application for strategic biodiversity certification adequately address impacts on biodiversity values under section 8.7 of the BC Act.

- Principle 1: Potential serious and irreversible impacts on biodiversity values are avoided and minimised
- Principle 2: The proposed conservation measures address the biodiversity values being impacted
- Principle 3: Conservation measures prioritise preservation of important conservation values
- Principle 4: Conservation measures improve biodiversity values and landscape function in the long term
- Principle 5: Conservation measures are additional to existing conservation requirements
- Principle 6: Development controls proposed as conservation measures conserve or enhance the natural environment
- Principle 7: Any proposed new national parks are consistent with the comprehensive, adequate, and representative reserve system scientific framework
- Principle 8: The implementation of conservation measures is timely and certain

The method has been designed so that at each stage, planning authorities make the principles a key consideration when addressing biodiversity impacts on a landscape scale.

It ensures that the proposed conservation lands address the biodiversity values being impacted while maintaining and enhancing prioritised areas of important conservation values across Western Sydney. As a result, conservation lands will protect and improve biodiversity values on a landscape scale, and secure and enhance connectivity and ecosystem function in Western Sydney.

Strategic application of offsetting legislation requirements

The BC Act and EPBC Act have offset requirements to ensure biodiversity values are protected across the landscape. However, offset rules do not apply to biodiversity certification conferred as a result of a strategic application. Regardless, the department relies on the rules to guide the CPCP offset package and they are integrated into the method.

The EPBC Act also has an associated 'Environment Protection and Biodiversity Conservation Act 1999 Environmental Offsets Policy' (Department of Sustainability, Environment, Water, Population and Communities, 2012). This policy document helps apply the EPBC Act's offset requirements including for strategic assessments and has also been used to inform the method.

Appendix D2 – Impact assessment results and offset target method

Impact assessment results

The impact assessment results identify which PCTs, threatened species and the habitats of other matters of national environmental significance are impacted, and the quantum of the impact in hectares. This data helps ensure that the proposed conservation lands adequately address the biodiversity values being impacted.

The impacted PCTs, TECs, matters of national environmental significance and species habitat are identified as 'targets' and are the focus for offsetting under the CPCP. This focus ensures the integration of adequate representation of impacted entities into the offset program.

Table 9 shows the threatened ecological communities impacted under the CPCP. Part 2, Part 5, and Part 7 of the Cumberland Plain Assessment Report provides more detail.

Table 9. Threatened ecological communities impacted by the CPCP

PCT number	PCT name	TEC name	BC status	Impact (ha)
724	Broad-leaved Ironbark - Grey Box - <i>Melaleuca decora</i> grassy open forest on clay/gravel soils of the Cumberland Plain, Sydney Basin bioregion	<i>Shale Gravel Transition Forest</i>	Endangered	108.3
725	Broad-leaved Ironbark - <i>Melaleuca decora</i> shrubby open forest on clay soils of the Cumberland Plain, Sydney Basin bioregion	<i>Cooks River/Castlereagh Ironbark Forest</i>	Endangered	37.6
781	Coastal freshwater lagoons of the Sydney Basin Bioregion and South East corner bioregion	<i>Freshwater Wetlands on Coastal Floodplains</i>	Endangered	4.2
830	Forest Red Gum - Grey Box shrubby woodland on shale of the southern Cumberland Plain, Sydney Basin bioregion	<i>Moist Shale Woodland</i>	Endangered	0.0
835	Forest Red Gum - Rough-barked Apple grassy woodland on alluvial flats of the Cumberland Plain, Sydney Basin bioregion	<i>River-Flat Eucalypt Forest</i>	Endangered	185.9
849	Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin bioregion	<i>Cumberland Plain Woodland</i>	Critically endangered	677.2
850	Grey Box - Forest Red Gum grassy woodland on shale of the southern Cumberland Plain, Sydney Basin bioregion	<i>Cumberland Plain Woodland</i>	Critically endangered	254.3
1395	Narrow-leaved Ironbark - Broad-leaved Ironbark - Grey Gum open forest of the edges of the Cumberland Plain, Sydney Basin bioregion	<i>Shale Sandstone Transition Forest</i>	Critically endangered	459.8
1800	Swamp Oak open forest on riverflats of the Cumberland Plain and Hunter Valley	<i>Swamp Oak Floodplain Forest</i>	Endangered	26.2

Offset target method

As described in Part 2 and Part 7 of the Cumberland Plain Assessment Report, an offset target method is used to determine the offset requirements for each impacted PCT (also called target PCTs), TEC and threatened species' potential habitat. The department uses the following method to quantify (in hectares) the amount of land-based conservation required to offset the impacts under the CPCP. This method is based on prioritising the most important conservation values and is consistent with the BAM's approach to:

- conservation status – impacts to higher conservation status entities require more offsets than entities of a lower conservation status
- condition – impacts to higher-quality areas require more offsets than lower-quality areas.

The following tables explicitly recognise that conservation measures will be delivered strategically, and that this approach will provide a landscape-scale ecological benefit.

The offset target method for threatened ecological communities and species listed under the BC Act and EPBC Act is used to calculate the area needed to offset the impacts from development for each PCT (in hectares) and species' potential habitat (in hectares). This ensures that the proposed conservation lands adequately address the biodiversity values being impacted.

Table 10. Vegetation offset target method (ratio – hectares)

Conservation significance	DNG/ Scattered	Thinned	Intact
Not Threatened Ecological Community	1	1.5	2
Vulnerable Ecological Community	2	2.5	3
Endangered Ecological Community	2.5	3	4
Critically Endangered Ecological Community	3	4	5

Table 11. Threatened species offset target method (ratio - hectares)

Conservation significance	DNG/ Scattered	Thinned	Intact
Vulnerable	2	2.5	3
Endangered	2.5	3	4
Critically Endangered	3	4	5

Offset targets

The total offset for targeted PCTs is 5,920 hectares, based on the impacts assessed under the CPCP (see Table 12). The CPCP proposes to secure 90% of this target within conservation lands, which represents **5,325 hectares**.

The offset target has been reduced by 10% to apply that component of the conservation program's funding to supporting actions that are necessary for the successful implementation of the CPCP. These supporting actions include extending services for landowners, compliance, managing landscape-scale threats to biodiversity, research, and community engagement to deliver the outcomes of the CPCP.

Most of the offsetting for species habitat will be done through the conservation lands identified to offset PCTs. It is proposed, for most species, that this is done by protecting potential habitat rather than the confirmed presence of the species.

For specific 'target species', likely to be at risk of residual adverse direct impacts, the protection of known habitats across several locations will be required to meet the offset targets.

The list of the target species for the CPCP can be found in Part 2 and Part 7 of the Cumberland Plain Assessment Report.

Table 12. Threatened ecological communities impacted by the CPCP with 90% targets

PCT number	PCT name	TEC name	BC status	Total impact - ha	Total target 90% - ha
724	Broad-leaved ironbark - grey box - <i>Melaleuca decora</i> grassy open forest on clay/gravel soils of the Cumberland Plain, Sydney Basin bioregion	Shale Gravel Transition Forest	Endangered	108.3	285
725	Broad-leaved ironbark - <i>Melaleuca decora</i> shrubby open forest on clay soils of the Cumberland Plain, Sydney Basin bioregion	Cooks River/Castlereagh Ironbark Forest	Endangered	37.6	115
781	Coastal freshwater lagoons of the Sydney Basin Bioregion and South-east corner bioregion	Freshwater Wetlands on Coastal Floodplains	Endangered	4.2	10
830	Forest Red Gum - Grey Box shrubby woodland on shale of the southern Cumberland Plain, Sydney Basin bioregion	Moist Shale Woodland	Endangered	0.0	0.2*
835	Forest Red Gum - Rough-barked Apple grassy woodland on alluvial flats of the Cumberland Plain, Sydney Basin bioregion	River-Flat Eucalypt Forest	Endangered	185.9	505
849	Grey box - forest red gum grassy woodland on flats of the Cumberland Plain, Sydney Basin bioregion	Cumberland Plain Woodland	Critically Endangered	677.2	2,150
850	Grey box - forest red gum grassy woodland on shale of the southern Cumberland Plain, Sydney Basin bioregion	Cumberland Plain Woodland	Critically Endangered	254.3	735
1395	Narrow-leaved ironbark - broad-leaved ironbark - grey gum open forest of the edges of the Cumberland Plain, Sydney Basin bioregion	Shale Sandstone Transition Forest	Critically Endangered	459.8	1,455
1800	Swamp Oak open forest on river flats of the Cumberland Plain and Hunter Valley	Swamp Oak Floodplain Forest	Endangered	26.2	70
Total				1,753.6	5,325

Appendix E. Species and TEC-specific mitigation measures

In the following tables:

- GPEC = Greater Penrith to Eastern Creek Investigation Area
- WSA = Western Sydney Aerotropolis
- GMAC = Greater Macarthur Growth Area
- WTN = Wilton Growth Area
- CPCP = Cumberland Plain Conservation Plan

Urban and industrial, infrastructure and intensive plant agriculture

Mitigation measures to address residual risks to threatened fauna

Table 13. Habitat features and connectivity – Threatened fauna risk mitigation

Development	Mitigation measure	Rationale for measure	Species	Commitment	Implementation mechanism	GPEC	WSA	GMAC	WTN	Other location
<ul style="list-style-type: none"> • Urban & industrial • Infrastructure (including essential infrastructure) • Intensive plant agriculture 	Retain large trees (including dead trees but excluding noxious weeds) (≥50cm DBH) during precinct planning where possible and avoid impacts of soil within the dripline of these trees during construction.	<p>Large trees within urban landscapes are likely to be important for the persistence of several species within the subregion. Microbats benefit directly through roosting opportunities and indirectly through foraging opportunities.</p> <p>Flying foxes and nectivorous birds benefit directly through foraging opportunities (high volumes of nectar). Owls and raptors benefit indirectly through large trees providing habitat for prey species.</p>	<p>Microbats: southern myotis, little bent-winged bat, eastern coastal free-tailed bat, large bent-winged bat, yellow-bellied sheath-tail bat, eastern false pipistrelle, greater broad-nosed bat</p> <p>Flying foxes and nectivorous birds: grey-headed flying fox, regent honeyeater, swift parrot, little lorikeet, painted honeyeater, black-chinned honeyeater</p> <p>Owls and raptors: barking owl, powerful owl, masked owl, little eagle, white-bellied sea eagle, square-tailed kite, spotted harrier</p>	5	DCP template Mitigation Measures Guideline CPCP Guidelines for Infrastructure Development	Yes	Yes	Yes	Yes	NA
<ul style="list-style-type: none"> • Urban & industrial • Infrastructure (including essential infrastructure) • Intensive plant agriculture 	Retain areas of high density proteaceae shrubs where possible, particularly along riparian corridors.	Proteaceae shrubs such as banksias are a favoured foraging resource for the species and the species is likely to use riparian corridors as habitat or for moving between other areas of suitable habitat.	eastern pygmy-possum	5	DCP template Mitigation Measures Guideline CPCP Guidelines for Infrastructure Development	Yes	Yes	Yes	Yes	NA

Development	Mitigation measure	Rationale for measure	Species	Commitment	Implementation mechanism	GPEC	WSA	GMAC	WTN	Other location
<ul style="list-style-type: none"> • Urban & industrial • Infrastructure (including essential infrastructure) • Intensive plant agriculture 	Undertake pre-construction surveys prior to removal or disturbance (seasonally dependent, before torpor) to human made structures to ensure any roosting habitat for microbat species including mine shafts, storm water tunnels, old or derelict buildings, bridges and culverts, are retained where possible.	Minimises the potential impacts of urban development to human-made structures that may be used by microbats for roosting or breeding	eastern coastal free-tailed bat, little bent-winged bat, large bent-winged bat, southern myotis, yellow-bellied sheath-tail-bat	5	DCP template Mitigation Measures Guideline CPCP Guidelines for Infrastructure Development	Yes	Yes	Yes	Yes	NA
<ul style="list-style-type: none"> • Urban & industrial 	Design subdivision layout including perimeter roads and asset protection zones should reduce impacts on and protect areas of koala habitat.	Minimises the potential impacts of precinct operation to koala habitat	koala	7	DCP template Mitigation Measures Guideline	NA	NA	Yes	Yes	NA
<ul style="list-style-type: none"> • Urban & industrial 	Do not plant koala feed trees, as listed in <i>Koala SEPP Schedule 2 Koala use tree species</i> in open space and recreation areas.	Koala feed trees and/or endangered ecological communities are contained to open space and recreational areas in precinct design in certified urban-capable land	koala	7	DCP template Mitigation Measures Guideline	NA	NA	Yes	Yes	NA

Table 14. Pest/domestic animal – Threatened fauna risk mitigation

Development	Mitigation measure	Rationale for measure	Species	Commitment	Implementation mechanism	GPEC	WSA	GMAC	WTN	Other location
<ul style="list-style-type: none"> • Urban & industrial • Infrastructure (including essential infrastructure) • Intensive plant agriculture 	Modify pest control techniques implemented during construction and operation of the development and under the pest control strategy to reduce the risk of secondary poisoning (e.g. from Pindone or second-generation rodenticides).	Risk of pest control measures causing secondary poisoning of raptors	white-bellied sea-eagle, little eagle, square-tailed kite, spotted harrier	5 and 16	Nominated areas: DCP template Mitigation Measures Guideline CPCP Guidelines for Infrastructure Development Strategic conservation area: Pest animal implementation strategy	Yes	Yes	Yes	Yes	Strategic conservation area
<ul style="list-style-type: none"> • Urban & industrial 	Where permitted and appropriate, contain domestic cats and dogs in new residential areas during operation of the development at the urban/bushland interface consistent with relevant Council guidelines.	Increased numbers of domestic cats and dogs associated with urban development increases the threat of predation to native animals	eastern pygmy-possum, spotted-tailed quoll	5	DCP template Mitigation Measures Guideline	No	No	Yes	Yes	NA
<ul style="list-style-type: none"> • Urban & industrial 	Dog-proof fenced areas are to be designated within open space and public recreation areas	Provides protection to fauna, including koala, up-front in precinct design for public spaces	koala	7	DCP template Mitigation Measures Guideline	NA	NA	Yes	Yes	NA
<ul style="list-style-type: none"> • Urban & industrial 	Dog-proof fencing is a design requirement for each residential lot in accordance with Council requirements	Provides protection to fauna, including, koala up-front in precinct design for residential areas	koala	7	DCP template Mitigation Measures Guideline	NA	NA	Yes	Yes	NA

Table 15. Human disturbance - Threatened fauna risk mitigation

Development	Mitigation measure	Rationale for measure	Species	Commitment	Implementation mechanism	GPEC	WSA	GMAC	WTN	Other location
<ul style="list-style-type: none"> Urban & Industrial Infrastructure (including essential infrastructure) Intensive plant agriculture 	<p>Establish a 100 m minimum setback for development around flying fox camps.</p> <p>The setback area should be maintained free of flying fox roosting habitat.</p>	Minimises disturbance to known populations	grey-headed flying fox	5	DCP template Mitigation Measures Guideline CPCP Guidelines for Infrastructure Development	Yes	Yes	Yes	Yes	NA
<ul style="list-style-type: none"> Urban & industrial Infrastructure (including essential infrastructure) Intensive plant Agriculture 	<p>Raptor nests require a 500 m circular setback from nest locations in undisturbed bushland or 250 m for nests adjacent to existing development.</p> <p>Owl nests require a 100 m circular setback from nest locations</p>	Minimises disturbance to known populations	little eagle, white-bellied sea eagle, square-tailed kite, spotted harrier, barking owl, powerful owl, masked owl.	5	DCP template Mitigation Measures Guideline CPCP Guidelines for Infrastructure Development	Yes	Yes	Yes	Yes	NA
<ul style="list-style-type: none"> Urban 	<p>Work with NSW DPI – Fisheries to address risk of illegal and incidental recreational fishing capture along stretches of known habitat for Macquarie perch in Erskine Creek, Glenbrook Creek, Georges River and Cordeaux River.</p> <p>Consult with relevant resource managers on installing signs/ interpretive displays at appropriate sites used to access fishing locations at Erskine Creek, Glenbrook Creek, Georges River and Cordeaux River to help with identification and awareness of threats</p>	Minimises the risk of increased recreational fishing affecting the species due to larger urban populations associated with urban development	Macquarie perch	5	Consultation with NSW DPI – Fisheries, local councils and other public agencies	No	No	No	No	Erskine Creek Glenbrook Creek Georges River Cordeaux River

Development	Mitigation measure	Rationale for measure	Species	Commitment	Implementation mechanism	GPEC	WSA	GMAC	WTN	Other location
<ul style="list-style-type: none"> • Urban & industrial • Infrastructure (including essential infrastructure) 	Undertake site assessment and pre-clearance survey prior to removal of vegetation and undertake koala survey and implement translocation plan if required.	At pre-construction phase of development, translocation plan and koala survey protects any koala on site	koala	7	DCP template Mitigation Measures Guideline CPCP Guidelines for Infrastructure Development	NA	NA	Yes	Yes	NA
<ul style="list-style-type: none"> • Urban & industrial • Infrastructure (including essential infrastructure) 	Erect temporary protective fencing around areas identified for conservation on or adjoining the site at pre-construction phase to ensure adequate protection is in place during construction.	At the pre-construction phase of development, temporary protective fencing prevents koala entering the construction site	koala	7	DCP template Mitigation Measures Guideline CPCP Guidelines for Infrastructure Development	NA	NA	Yes	Yes	NA
<ul style="list-style-type: none"> • Infrastructure (including essential infrastructure) 	Where planned linear infrastructure such as gas and electricity transmission crosses existing koala-exclusion fencing, consider appropriate access treatments such as gates to ensure integrity of koala-exclusion fencing.	Minimises indirect impacts to koala populations due to urban development. This action is consistent with a critical action for this species under Chief Scientist & Engineer's Koala Report (2020)	koala	7	CPCP Guidelines for Infrastructure Development	NA	NA	Yes	Yes	NA
<ul style="list-style-type: none"> • Infrastructure (including essential infrastructure) 	Where public road infrastructure crosses koala corridors, ensure: <ul style="list-style-type: none"> • exclusion fencing is in place to prevent koalas from entering the road • suitable koala connectivity structures are installed to protect corridor integrity. 	As per critical actions for this species under the Chief Scientist & Engineer's Koala Report (2020), maintains connectivity in koala corridors and separation of koalas from landscape threats including traffic.	koala	7	CPCP Guidelines for Infrastructure Development	NA	NA	Yes	Yes	NA

Development	Mitigation measure	Rationale for measure	Species	Commitment	Implementation mechanism	GPEC	WSA	GMAC	WTN	Other location
<ul style="list-style-type: none"> • Urban & industrial • Infrastructure (including essential infrastructure) 	Implement a tree-felling protocol to avoid impacts to koalas in trees that are to be cleared.	Protects koalas when clearing a site by identifying trees that have koalas in them	koala	7	DCP template Mitigation Measures Guideline CPCP Guidelines for Infrastructure Development	NA	NA	Yes	Yes	NA
<ul style="list-style-type: none"> • Urban & industrial • Infrastructure (including essential infrastructure) 	Manage roadside vegetation adjacent to koala habitat areas to minimise height of ground cover and increase visibility of any roadside fauna. Mow turfed areas, mechanically trim low ground covers.	Visibility of koala in roadside vegetation is enhanced along motorways and roadsides for koalas crossing roadways	koala	7	DCP template Mitigation Measures Guideline	NA	NA	Yes	Yes	NA
<ul style="list-style-type: none"> • Urban & industrial • Infrastructure (including essential infrastructure) 	Have an onsite ecologist present throughout the duration of pre-clearance surveys and clearing works.	Protects koalas in trees identified to be cleared on site	koala	7	DCP template Mitigation Measures Guideline CPCP Guidelines for Infrastructure Development	NA	NA	Yes	Yes	NA

Development	Mitigation measure	Rationale for measure	Species	Commitment	Implementation mechanism	GPEC	WSA	GMAC	WTN	Other location
<ul style="list-style-type: none"> • Urban & industrial • Infrastructure (including essential infrastructure) 	<p>Implement the following traffic-calming measures for all development not subject to wildlife- and koala-exclusion fencing.</p> <p>Apply speed limit restrictions on local roads for areas adjacent to open space and land identified as avoided under CPCP.</p> <p>Signpost perimeter roads and roads adjacent to wildlife habitat areas in accordance with Austroads, RMS technical guidelines, council guidelines and relevant Australian standards.</p> <p>Install traffic-calming devices such as speed humps and audible surfacing along perimeter roads adjacent to wildlife habitat.</p>	Protects koalas adjacent to or along motorways, roads and development	koala	7	DCP template Mitigation Measures Guideline CPCP Guidelines for Infrastructure Development	NA	NA	Yes	Yes	NA
<ul style="list-style-type: none"> • Urban & industrial • Infrastructure (including essential infrastructure) 	Install koala-friendly road design structures such as underpasses, fauna bridges and overpasses consistent with any approval conditions. Consider and apply RMS Biodiversity Guidelines.	Protects koalas along motorways and roads	koala	7	DCP template Mitigation Measures Guideline CPCP Guidelines for Infrastructure Development	NA	NA	Yes	Yes	NA

Table 16. Disease – Threatened fauna risk mitigation

Development	Mitigation measure	Rationale for measure	Species	Commitment	Implementation mechanism	GPEC	WSA	GMAC	WTN	Other location
<ul style="list-style-type: none"> Urban & industrial Infrastructure (including essential infrastructure) Intensive plant agriculture 	Incorporate best-practice site hygiene protocols to manage the potential spread of pathogens, such as <i>Phytophthora</i> and myrtle rust within or adjacent to potential habitat for relevant species.	Minimises the spread of pathogens due to construction activities adjacent to potential habitat for the species	greater glider	5	DCP template Mitigation Measures Guideline CPCP Guidelines for Infrastructure Development	Yes	Yes	Yes	Yes	NA
<ul style="list-style-type: none"> Urban & industrial Infrastructure (including essential infrastructure) 	Strictly enforce vehicle wash down points for machinery, equipment and tyres prior to entering and leaving the construction site. Use hygiene procedures in instances where vegetation pathogens known to affect koala trees may be spread	Minimises the risk of the spread of pathogens due to construction activities adjacent to potential habitat for the species	koala	7	DCP template Mitigation Measures Guideline CPCP Guidelines for Infrastructure Development	NA	NA	Yes	Yes	NA
<ul style="list-style-type: none"> Urban & industrial Infrastructure (including essential infrastructure) 	Make sure all vehicles, machinery, maintenance equipment, tyres and work boots are free of mud, soil and vegetation prior to entering and leaving a development construction site.	Minimises the spread of pathogens and disease during the construction and/or operation phase of a development	koala	7	DCP Template Mitigation Measures Guideline CPCP Guidelines for Infrastructure Development	NA	NA	Yes	Yes	NA

Table 17. Other – Threatened fauna risk mitigation

Development	Mitigation measure	Rationale for measure	Species	Commitment	Implementation mechanism	GPEC	WSA	GMAC	WTN	Other location
<ul style="list-style-type: none"> Urban & industrial 	Consult with relevant land managers to implement critical actions for Cumberland Plain land snail under the Save our Species program (EES, 2020) on public land adjacent to urban development during construction and operation of the development, taking into account relevant guidance in the weed control implementation strategy and the fire management strategy.	Minimises indirect impacts to Cumberland Plain land snail adjacent to urban capable land	<p>Cumberland Plain land snail</p> <p>Key indirect impacts/threats to be managed are:</p> <ul style="list-style-type: none"> weed invasion inappropriate fire regimes removal of fallen logs for firewood and slashing of habitat 	5	<p>Consultation with local councils and other public agencies</p> <p>Weed control implementation strategy</p> <p>Fire management strategy</p>	Yes	Yes	Yes	Yes	NA
<ul style="list-style-type: none"> Urban & industrial Infrastructure (including essential infrastructure) Intensive plant agriculture 	Implement 'open structure design' when designing structures such as roads adjacent to known populations of Cumberland Plain land snail where possible, consistent with the critical actions for this species under the Save our Species program (EES 2020)	Prevents creation of isolated patches of habitat in the nominated areas consistent with a critical action for this species under the Save our Species program (EES 2020)	Cumberland Plain land snail	5	DCP template Mitigation Measures Guideline	Yes	Yes	Yes	Yes	NA
<ul style="list-style-type: none"> Urban & industrial 	Signpost areas adjoining koala habitat with signage indicating koalas are in the area, the permitted/prohibited activities, and associated penalties that apply for non-compliance.	Promotes permitted activities and educates public in areas adjoining koala habitat	koala	7	DCP template Mitigation Measures Guideline	NA	NA	Yes	Yes	NA

Mitigation measures to address residual risks to flora

Table 18. Weed invasion – Threatened flora risk mitigation

Development	Mitigation measure	Rationale for measure	Species	Commitment	Implementation mechanism	GPEC	WSA	GMAC	WTN	Other location
<ul style="list-style-type: none"> • Urban & industrial • Infrastructure (including essential infrastructure) • Intensive plant agriculture 	Manage weeds for flora populations and habitat adjacent to urban and infrastructure development during construction and operation of the development, considering relevant guidance in the weed control implementation strategy.	Minimises indirect impacts to flora populations and habitat adjacent to major infrastructure corridors	<i>Dillwynia tenuifolia</i> <i>Pultenaea parviflora</i> <i>Persoonia nutans</i>	5 and16	DCP template Mitigation Measures Guideline CPCP Guidelines for Infrastructure Development Weed control implementation strategy	Yes	Yes	No	No	NA
As above	As above	As above	<i>Pultenaea pedunculata</i>	5 and16	As above	No	No	Yes	No	NA
As above	As above	As above	<i>Grevillea parviflora</i> subsp. <i>parviflora</i> (important pop. no. 104)	5 and16	As above	No	No	No	Yes	NA

Table 19. Altered fire regime – Threatened flora risk mitigation

Development	Mitigation measure	Rationale for measure	Species	Commitment	Implementation mechanism	GPEC	WSA	GMAC	WTN	Other location
• Urban & industrial	Consult with managers of land containing known populations or habitat for relevant species to mitigate indirect impacts from fire during construction and operation of the development, considering guidance in the fire management strategy	Minimises indirect impacts to flora populations and habitat adjacent to urban-capable land	<i>Dillwynia tenuifolia</i> <i>Grevillea juniperina</i> subsp. <i>juniperina</i> <i>Pultenaea parviflora</i>	5 and 18	Consultation with local councils and other public agencies Fire management strategy	Yes	Yes	No	No	NA
As above	As above	As above	<i>Persoonia nutans</i>	5 and 18	As above	Yes	No	No	No	NA
As above	As above	As above	<i>Pultenaea pedunculata</i>	5 and 18	As above	No	No	Yes	No	NA
As above	As above	As above	<i>Grevillea parviflora</i> subsp. <i>parviflora</i> (important pop. no. 104)	5 and 18	As above	No	No	No	Yes	NA
As above	As above	As above	<i>Persoonia bargoensis</i>	5 and 18	As above	No	No	Yes	Yes	NA

Table 20. Human disturbance – Threatened flora risk mitigation

Development	Mitigation measure	Rationale for measure	Species	Commitment	Implementation mechanism	GPEC	WSA	GMAC	WTN	Other location
<ul style="list-style-type: none"> • Urban & industrial • Infrastructure (including essential infrastructure) • Intensive plant agriculture 	<p>Consult with land managers of land containing known populations or habitat for relevant species to mitigate indirect impacts from human disturbance during construction and operation of the development, including controlling public access, managing maintenance activities such as mowing and slashing, and managing rubbish dumping.</p> <p>Additionally, for <i>Pimelea spicata</i> ensure weed management activities involving the use of herbicides will minimise risks and maintain the species</p>	Minimises indirect impacts to flora populations and habitat adjacent to urban-capable land	<i>Dillwynia tenuifolia</i> <i>Grevillea juniperina</i> subsp. <i>Juniperina</i> <i>Pultenaea parviflora</i>	5 and 5.3	Consultation with local councils and other public agencies	Yes	Yes	No	No	NA
As above	As above	As above	<i>Persoonia nutans</i>	5 and 5.3	As above	Yes	No	No	No	NA
As above	As above	As above	<i>Grevillea parviflora</i> subsp. <i>parviflora</i> (important pop. no. 104)	5 and 5.3	As above	No	No	No	Yes	NA
As above	As above	As above	<i>Pultenaea pedunculata</i> <i>Genoplesium baueri</i> (important pop. 21)	5 and 5.3	As above	No	No	Yes	No	NA
As above	As above	As above	<i>Persoonia bargoensis</i> <i>Melaleuca deanei</i> <i>Pterostylis saxicola</i>	5 and 5.3	As above	NA	NA	Yes	Yes	NA
As above	As above	As above	<i>Pimelea spicata</i>	5 and 5.3	As above	Yes	Yes	Yes	Yes	NA

Development	Mitigation measure	Rationale for measure	Species	Commitment	Implementation mechanism	GPEC	WSA	GMAC	WTN	Other location
<ul style="list-style-type: none"> Urban & industrial Infrastructure 	Undertake fire hazard management within the asset protection zone at this location to protect existing <i>Pimelea spicata</i> individuals and is sympathetic ongoing recruitment of new individuals of this species	Protects an important population of <i>Pimelea spicata</i> located within the asset protection zone at this location	<i>Pimelea spicata</i>	5	Mitigation Measures Guideline CPCP Guidelines for Infrastructure Development	NA	NA	Yes	NA	Population 532 in GMAC identified in Cumberland Plain Assessment Report (Lots 3002, 3003 and 3004, DP 802845 and Lot 2000 DP 790848)

Table 21. Disease – Threatened flora risk mitigation

Development	Mitigation measure	Rationale for measure	Species	Commitment	Implementation mechanism	GPEC	WSA	GMAC	WTN	Other location
<ul style="list-style-type: none"> Urban & industrial Infrastructure (including essential infrastructure) Intensive plant agriculture 	Incorporate best-practice site hygiene protocols to manage the potential spread of pathogens, such as Phytophthora and myrtle rust adjacent to potential habitat for relevant species.	Minimises the risk spreading pathogens due to construction activities adjacent to potential habitat for the species	<i>Persoonia bargoensis</i>	5	DCP template Mitigation Measures Guideline CPCP Guidelines for Infrastructure Development	No	No	Yes	Yes	NA
As above	As above	As above	<i>Persoonia nutans</i>	5	As above	Yes	Yes	No	No	NA

Mitigation measures to address residual risks to threatened ecological communities

Table 22. General risk mitigation measures for threatened ecological communities

Development	Mitigation measure	Rationale for measure	Ecological community	Commitment	Implementation mechanism	GPEC	WSA	GMAC	WTN	Other location
<ul style="list-style-type: none"> Urban & industrial Infrastructure (including essential infrastructure) Intensive plant agriculture 	When implementing mitigation measures to manage indirect impacts to Cooks River/ Castlereagh Ironbark Forest, undertake mitigation in accordance with Best Practice Guidelines: Cooks River/ Castlereagh Ironbark Forest (NSW DECC, 2008) within and adjacent to the TEC.	Minimises the risk of several types of indirect impact on the TEC adjacent to urban development	Cooks River/ Castlereagh Ironbark Forest (NSW & Cth)	5	DCP template CPCP Guidelines for Infrastructure Development	No	Yes (Kemps Creek)	No	No	NA
<ul style="list-style-type: none"> Urban & industrial Infrastructure (including essential infrastructure) Intensive plant agriculture 	Incorporate best-practice site hygiene protocols to manage the potential spread of pathogens, such as <i>Phytophthora</i> and myrtle rust adjacent to potential habitat for relevant TECs	Minimises the risk of spreading pathogens due to construction activities for urban development adjacent to TECs	Cooks River/ Castlereagh Ironbark Forest (NSW & Cth)	5	DCP template Mitigation Measures Guideline CPCP Guidelines for Infrastructure Development	No	Yes (Kemps Creek)	No	No	NA
As above	As above	As above	Cumberland Plain Woodland (NSW & Cth)	5	As above	Yes	Yes	No	No	NA
As above	As above	As above	River-flat Eucalypt Forest (NSW)/ Coastal Floodplain Eucalypt Forest (Cth)	5	As above	Yes	Yes	Yes	Yes	NA
As above	As above	As above	Shale Gravel Transition Forest (NSW)	5	As above	Yes	Yes (Kemps Creek)	No	No	NA
As above	As above	As above	Shale Sandstone Transition Forest (NSW & Cth)	5	As above	No	No	Y	Y	NA

Development	Mitigation measure	Rationale for measure	Ecological community	Commitment	Implementation mechanism	GPEC	WSA	GMAC	WTN	Other location
As above	As above	As above	Swamp Oak Floodplain Forest (NSW)/Coastal Swamp Oak Forest (Cth)	5	As above	Yes	Yes	No	No	NA

Mitigation measures to address residual risks to other protected matters

Table 23. General risk mitigation measures for other protected matters

Development	Mitigation measure	Rationale for measure	Protected matter	Commitment	Implementation mechanism	GPEC	WSA	GMAC	WTN	Other location
<ul style="list-style-type: none"> • Urban & industrial • Infrastructure (including essential infrastructure) 	Ensure development adjacent to the southern and western boundaries of Commonwealth land comprising the Orchard Hills Defence Establishment mitigates impacts to surface water flows and the water quality of Blaxland Creek	Minimises the risk of indirect impacts from hydrological disturbance on an important waterway on Commonwealth land that occurs adjacent to urban development	Commonwealth land	5	Mitigation Measures Guideline CPCP Guidelines for Infrastructure Development	Yes	No	No	No	Orchard Hills Defence Site

Major transport corridors

Mitigation measures to address residual risks to threatened fauna

Table 24. Habitat features and connectivity – Threatened fauna risk mitigation in major transport corridors

Mitigation measure	Rationale for measure	Species	Commitment	Implementation mechanism	GPEC	WSA	GMAC	WTN	Other location
Incorporate artificial breeding and roosting habitat (e.g. bat boxes, structural cavities) in the design of bridges associated with the major infrastructure corridors in accordance with relevant guidelines or standards.	Minimises the potential impacts of the major infrastructure corridors to human-made structures that may be used by microbats for roosting or breeding	eastern coastal free-tailed bat, little bent-winged bat, large bent-winged bat, southern myotis, yellow-bellied sheathtail bat	6	State-significant infrastructure assessment and approval	NA	NA	NA	NA	All major transport corridors within and outside nominated areas

Table 25. Disease – Threatened fauna risk mitigation in major transport corridors

Mitigation measure	Rationale for measure	Species	Commitment	Implementation mechanism	GPEC	WSA	GMAC	WTN	Other location
Incorporate best-practice site hygiene protocols to manage the potential spread of pathogens, such as <i>Phytophthora</i> and myrtle rust within or adjacent to potential habitat for relevant species	Minimises the risk of spreading pathogens due to construction activities adjacent to potential habitat for the species	greater glider	6	State-significant infrastructure assessment and approval	NA	NA	NA	NA	All major transport corridors within and outside nominated areas

Table 26. Other – Threatened fauna risk mitigation in major transport corridors

Mitigation measure	Rationale for measure	Species	Commitment	Implementation mechanism	GPEC	WSA	GMAC	WTN	Other location
Consult with relevant land managers to manage indirect impacts to known populations and habitat for Cumberland Plain land snail on public land adjacent to major infrastructure corridors during construction and operation of the development, taking into account relevant guidance in the weed control implementation strategy and the fire management strategy.	Minimises indirect impacts to Cumberland Plain land snail adjacent to major infrastructure corridors	Cumberland Plain land snail Key indirect impacts/threats to be managed are: <ul style="list-style-type: none"> weed invasion inappropriate fire regimes removal of fallen logs for firewood and slashing of habitat 	6	Consultation with local councils and other public agencies	NA	NA	NA	NA	All major transport corridors within nominated areas

Table 27. Tunnels – Threatened fauna risk mitigation in major transport corridors

Mitigation measure	Rationale for measure	Species	Commitment	Implementation mechanism	GPEC	WSA	GMAC	WTN	Other location
Manage the threat of inadvertent impacts on adjacent habitat of the species.	Minimises the risk of indirect impacts during tunnel construction and operation	Cumberland Plain land snail	6	State-significant infrastructure assessment and approval	NA	NA	NA	NA	Metro Rail Future Extension tunnel

Mitigation measures to address residual risks to flora

Table 28. Weed invasion – Threatened flora risk mitigation in major transport corridors

Mitigation measure	Rationale for measure	Species	Commitment	Implementation mechanism	GPEC	WSA	GMAC	WTN	Other location
Manage weeds for flora populations and habitat adjacent to major infrastructure corridors during construction and operation of the development, considering relevant guidance in the weed control implementation strategy.	Minimises indirect impacts to flora populations and habitat adjacent to major infrastructure corridors	<i>Dillwynia tenuifolia</i> <i>Pultenaea parviflora</i> <i>Persoonia nutans</i>	6 and15	State-significant infrastructure assessment and approval	NA	NA	NA	NA	Outer Sydney Orbital in Wianamatta Regional Park M7/Ropes Crossing link Road
As above	As above	<i>Grevillea juniperina</i> subsp. <i>juniperina</i>	6 and15	State-significant infrastructure assessment and approval	NA	NA	NA	NA	Outer Sydney Orbital in GPEC M7/Ropes Crossing link Road Western Sydney Freight Line
As above	As above	<i>Cynanchum elegans</i>	6 and15	State-significant infrastructure assessment and approval	NA	NA	NA	NA	Outer Sydney Orbital at Cobbity

Table 29. Hydrology – Threatened flora risk mitigation in major transport corridors

Mitigation measure	Rationale for measure	Species	Commitment	Implementation mechanism	GPEC	WSA	GMAC	WTN	Other location
Manage hydrology impacts to relevant flora species and habitat adjacent to major infrastructure corridors during construction and operation of the development.	Minimises the risk of hydrological impacts to the species	<i>Cynanchum elegans</i>	6	State-significant infrastructure assessment and approval	NA	NA	NA	NA	Outer Sydney Orbital at Cobbity

Table 30. Disease – Threatened flora risk mitigation in major transport corridors

Mitigation measure	Rationale for measure	Species	Commitment	Implementation mechanism	GPEC	WSA	GMAC	WTN	Other location
Incorporate best-practice site hygiene protocols to manage the potential spread of pathogens, such as <i>Phytophthora</i> and myrtle rust adjacent to potential habitat for relevant species.	Minimises the risk of spreading pathogens due to construction activities adjacent to potential habitat for the species	<i>Persoonia nutans</i>	6	State-significant infrastructure assessment and approval	NA	NA	NA	NA	Outer Sydney Orbital in Wianamatta Regional Park

Table 31. Tunnels – Threatened flora risk mitigation in major transport corridors

Mitigation measure	Rationale for measure	Species	Commitment	Implementation mechanism	GPEC	WSA	GMAC	WTN	Other location
Manage key threats to the species, including: <ul style="list-style-type: none"> hydrological disturbance spread of weeds spread of infection/disease soil erosion and sedimentation ground settling or subsidence 	Minimises the risk of indirect impacts during tunnel construction and operation	<i>Eucalyptus benthamii</i>	6	State-significant infrastructure assessment and approval	NA	NA	NA	NA	Outer Sydney Orbital tunnel
As above	Minimises the risk of indirect impacts during tunnel construction and operation	<i>Pimelea spicata</i>	6	State-significant infrastructure assessment and approval	NA	NA	NA	NA	Metro Rail Future Extension tunnel
As above	Minimises the risk of indirect impacts during tunnel construction and operation	<i>Pomaderris brunnea</i>	6	State-significant infrastructure assessment and approval	NA	NA	NA	NA	Outer Sydney Orbital tunnel

Mitigation measures to address residual risks to threatened ecological communities

Table 32. General risk mitigation measures for threatened ecological communities

Mitigation measure	Rationale for measure	Species	Commitment	Implementation mechanism	GPEC	WSA	GMAC	WTN	Other location
When implementing mitigation measures to manage indirect impacts to Cooks River/Castlereagh Ironbark Forest, undertake mitigation in accordance with Best Practice Guidelines: Cooks River/Castlereagh Ironbark Forest (NSW DECC, 2008) within and adjacent to the TEC.	Minimises the risk of several indirect impact types on the TEC adjacent to urban development and major infrastructure corridors	Cooks River/Castlereagh Ironbark Forest (NSW & Cth)	6	State-significant infrastructure assessment and approval	NA	NA	NA	NA	Outer Sydney Orbital at Wianamatta Regional Park
Incorporate best-practice site hygiene protocols to manage the potential spread of pathogens, such as <i>Phytophthora</i> and myrtle rust adjacent to potential habitat for relevant TECs.	Minimises the risk of spreading pathogens due to construction activities for urban development or major infrastructure adjacent to TECs	Cooks River/Castlereagh Ironbark Forest (NSW & Cth)	6	State-significant infrastructure assessment and approval	NA	NA	NA	NA	Outer Sydney Orbital at Wianamatta Regional Park
As above	As above	Cumberland Plain Woodland (NSW & Cth)	6	State-significant infrastructure assessment and approval	NA	NA	NA	NA	Outer Sydney Orbital adjacent to WSA Western Sydney Freight Line
As above	As above	River-flat Eucalypt Forest (NSW)/Coastal Floodplain Eucalypt Forest (Cth)	6	State-significant infrastructure assessment and approval	Yes	Yes	Yes	Yes	
As above	As above	Shale Gravel Transition Forest (NSW)	6	State-significant infrastructure assessment and approval	NA	NA	NA	NA	Outer Sydney Orbital at Wianamatta Regional Park
As above	As above	Swamp Oak Floodplain Forest (NSW)/Coastal Swamp Oak Forest (Cth)	6	State-significant infrastructure assessment and approval	NA	NA	NA	NA	Outer Sydney Orbital in GPEC

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The bark of a scribbly gum

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