

Local Biodiversity Plan 2026-2030 City of Wanneroo

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Acknowledgment of Country

The City of Wanneroo acknowledges the Traditional Custodians of the land we are working on, the Whadjuk people. We would like to pay respect to the Elders of the Noongar nation past, present and future, who have walked and cared for the land and we acknowledge and respect their continuing culture and the contributions made to the life of this City and this region.

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Executive Summary

The City of Wanneroo's **Local Biodiversity Plan 2026–2030** sets a clear direction to protect, restore and better connect the City's remaining natural areas as it continues to grow. The plan supports the City's vision – *Together we grow – safe, green and connected* – and aligns with the Council Plan 2025–2035 and the Environmental and Sustainability Strategy by translating biodiversity priorities into practical actions.

Covering approximately 687 **square kilometres**, with 32km of coastline, the City contains diverse wetlands, bushland and coastal habitats within the Southwest Australian Biodiversity Hotspot.

About 43 per cent of the City retains natural vegetation, but only around 31 per cent is currently protected. Continued growth increases risks from clearing, fragmentation, altered hydrology, invasive species and climate change.

The plan focuses on conserving biodiversity at genetic, species and ecosystem levels by prioritising protection and restoration where it will deliver the greatest benefit. It defines Local Natural Areas (LNAs) – these are City managed natural areas and natural areas on private land – and applies vegetation complex representation and ecological criteria to identify priority areas for retention, enhancement and improved connectivity. This approach will deliver co-benefits such as urban cooling, improved liveability and greater climate resilience.

Key focus areas (2026–2030)

- Protect and retain priority LNAs through stronger planning and management mechanisms, particularly in growth areas.
- Prioritise conservation by ecological thresholds, improving representation of under-represented vegetation complexes.
- Restore degraded natural areas (including wetlands, buffers and regional open space) to improve condition and function.
- Improve connectivity by retaining and enhancing ecological linkages and delivering targeted urban greening to create stepping stones between habitats.
- Conserve key biodiversity assets (threatened and priority ecological communities, flora and fauna, wetlands, coastal habitats and karst/cave systems) supported by targeted surveys and improved data.
- Manage key threats (clearing, fragmentation, altered hydrology, uncontrolled access and dumping, invasive species, inappropriate fire regimes and climate impacts) and strengthen delivery through clear implementation pathways and community participation.

The adoption and implementation of the Local Biodiversity Plan will help the City balance growth with environmental protection, safeguard biodiversity values that contribute to community wellbeing and support state and national biodiversity objectives.

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Abbreviation Tables

Table A1: *Abbreviations – Organisations*

Organisations	
COW	City of Wanneroo
DBCA	Department of Biodiversity, Conservation and Attractions
DCCEEW	Department of Climate Change, Energy, the Environment and Water
DFES	Department of Fire and Emergency Services
DWER	Department of Water and Environmental Regulation
DPLH	Department of Planning Lands and Heritage
WALGA	West Australian Local Government Association
WAPC	Western Australian Planning Commission

Table A2: *Abbreviations – General terms*

General terms	
CCW	Conservation Category Wetland
ESA	Environmentally Sensitive Area
KPI's	Key Performance Indicators
LNA	Local Natural Area
NA	Natural Areas
MUW	Multiple Use Wetland
P1	Priority 1
P2	Priority 2
P3	Priority 3
P4	Priority 4
PEC	Priority Ecological Community
POS	Public Open Space
REW	Resource Enhancement Wetland
ROS	Regional Open Space
TEC	Threatened Ecological Community
UFI	Unique Feature Identifier

Table A3: Abbreviations –Legislation

Legislation	
BC Act	Biodiversity Conservation Act 2016 (WA)
EP Act	Environmental Protection Act 1986 (WA)
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999 (Federal)

*Table A4:**Table A5: Abbreviations – Documents*

Documents	
CBP	Corporate Business Plan
DPS2	District Planning Scheme
LES	Local Environment Strategy
LPP	Local Planning Policies
LPS	Local Planning Strategy
MRS	Metropolitan Region Scheme
NAAMP	Natural Area Asset Management Plan
SPP	State Planning Policies

1 City Vision and Purpose

Together we grow - safe, green and connected.

We work together to create strong, vibrant, safe and connected neighbourhoods that improve daily life and protect our environment for the future.

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2 Background

2.1 The City of Wanneroo Landscape and Natural Values

The City of Wanneroo (hereafter referred to as 'the City'), is an expanding and thriving local government area located on the northern fringe of the Perth metropolitan area and includes a variety of coastal, wetland and bushland landscapes.

The City lies within the Swan Coastal Plain of the Southwest Bioregion, part of one of the world's recognised biodiversity hotspots.

These regions contain significant amounts of endemic plants but have lost more than 70 per cent of their original natural vegetation and are therefore threatened. Within the City there are also threatened and priority ecological communities, rare and priority flora and fauna, wetlands, karsts and caves, coastal areas and ecological linkages, all of which require active conservation.

2.2 A Growing City

As of 2026 the population of the City was estimated to be 252, 380 people and is expected to grow to 437, 016 people by 2046, an increase of 73.16 per cent (.id consulting PTY LTD, 2024).

Supporting this growth will require additional housing, infrastructure and services across the City, which will put pressure on the local environment, including habitat loss, fragmentation of ecological corridors, greater demand on natural resources and potential declines in biodiversity.

To manage these impacts, future planning must consider the City's environmental values and incorporate innovative approaches that enhance urban biodiversity to help balance growth with environmental protection while improving community wellbeing and urban resilience.

3 Priorities for Cooler, Greener Communities Include Biodiversity Targets for the City of Wanneroo

The Council Plan 2025-2035 is the City's primary strategic document, which sets out goals, priorities and targets for the City over the next 10 years. The Environmental and Sustainability Strategy (ESS) is the City's overarching environmental strategy, which identifies initiatives to deliver the strategic priorities, goals and targets set in the Council Plan. The Local Biodiversity Plan is an initiative identified in the ESS and further explores how the Council Plan's priorities and targets relating to biodiversity can be achieved. These targets include:

Strategic Goal 2- A Sustainable City

"Together, we protect today's environment to create a healthier, greener tomorrow for all"

Strategic priority 2.1: Cool our streets with more trees and greenery

Cooler, greener communities that improve urban liveability, reduce heat, enhance biodiversity and resilience to climate change.

Strategic Target:

40%

By 2035 there will be an increase to 40% of the amount of protected, restored and conserved natural areas, as well as additional urban greening, to support biodiversity.

Goal 4- A Connected and Liveable City

Strategic Priority 4.2: Build resilient places for people and nature

Quality, well-maintained public open spaces and infrastructure that supports biodiversity, community wellbeing and climate resilience, designed to thrive in the long-term and bring lasting benefits to people and the environment.

Figure 1 shows the remaining natural areas in the City. Currently, about 43 per cent of City of Wanneroo land remains as natural areas with approximately 31 per cent of naturally vegetated areas considered protected. This includes natural vegetation in state forests, national and regional parks, other state and City-managed land, Bush Forever sites, lands reserved under the **Metropolitan Region Scheme (MRS)** for **Regional Open Space (ROS)** (formerly Parks and Recreation), as well as City-managed local conservation areas and private lands with conservation covenants over them. These areas vary in quality and condition and level of biodiversity they support.

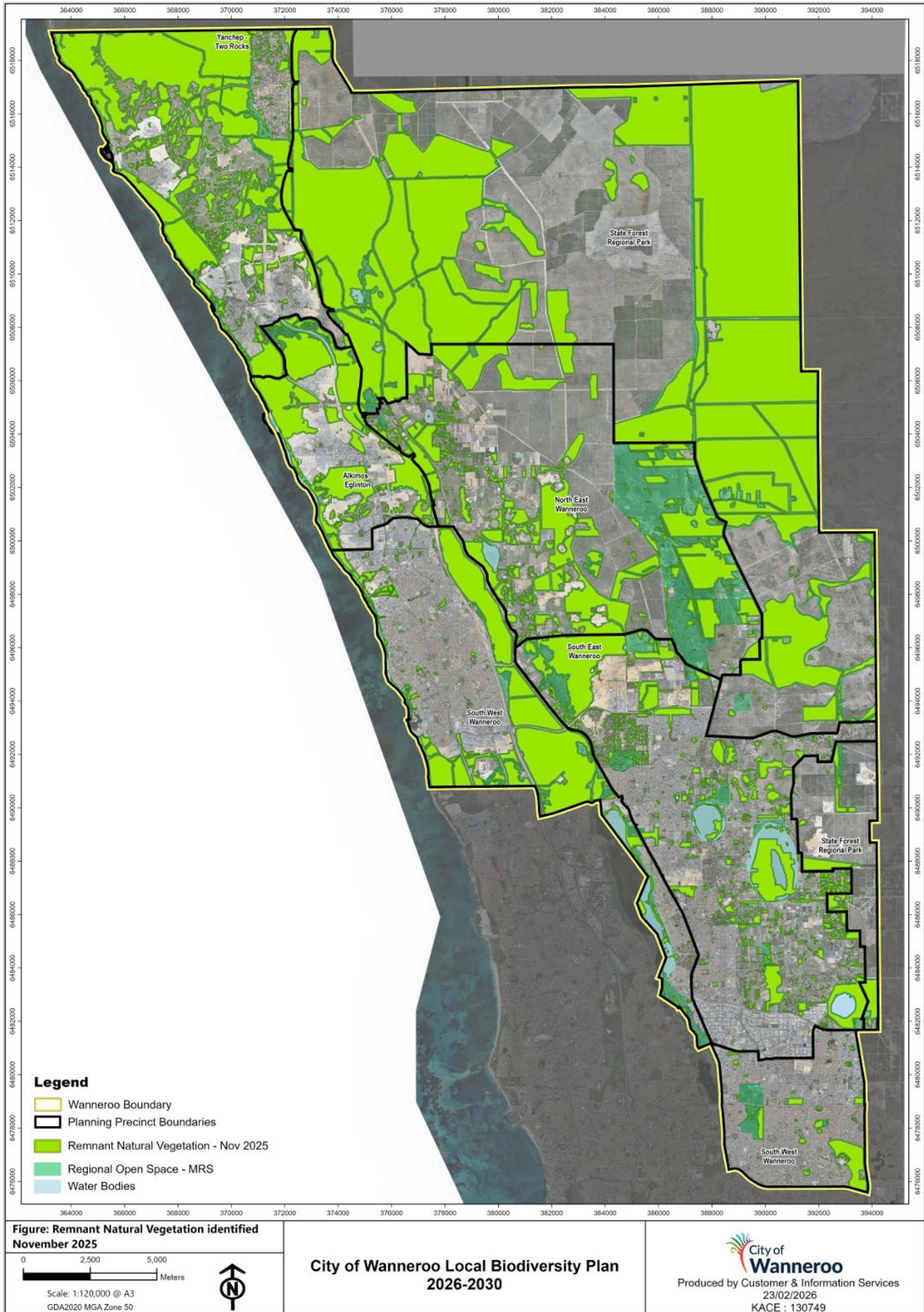


Figure 1: Remnant natural vegetation as at November 2026

3.1 Target Outcomes

Further strategic protection, restoration and conservation of the City's natural areas will:

- Support the nurturing and improvement of liveability and outcomes associated with conservation and the natural environment.
- Increase the protection and retention of underrepresented ecological communities and high-priority natural areas within the City to maintain biodiversity, ecosystem services and the co-benefits natural areas provide.
- Ensure that priority areas appropriate for restoration are identified and rehabilitated to support biodiversity.
- Identify important attributes of our natural areas and address factors contributing to degradation and extinction of flora and fauna species.
- Contribute to federal and state biodiversity targets.

Providing additional urban greening in our suburbs to support biodiversity will also:

- Increase the co-benefits natural environments and biodiversity provide to our communities.
- Provide stepping stones and links between our natural areas for flora and fauna, assisting genetic, species and ecosystem diversity.
- Improve resilience to climate change and other threats to biodiversity.

4 Biodiversity and Its Importance

4.1 What is Biodiversity?

Biodiversity is the variety of all living things, the different plants, animals, fungi and microorganisms, the genetic information they contain and the ecosystems they form. (Australian Museum, 2023). It includes organisms that live on land, in the sea and in freshwater.

An **ecosystem** is made up of a community of living organisms interacting with each other and with their physical environment. They are linked together through energy flows and nutrient cycling.

Biodiversity is typically considered at three levels:

Genetic diversity means the variety of genes in a species. Each species has individuals with different genetic makeups and different groups (populations) of the same species can have different genes. To protect genetic diversity, we need to protect all these different populations.

Species diversity means the number of different species living in a habitat or region. The Swan Coastal Plain, which includes the City of Wanneroo, has a high level of species diversity, especially in its birds and plant communities.

Ecosystem diversity refers to the range of different ecosystems found in a particular area.

The biodiversity within the City of Wanneroo is unique to the area through local genetic adaption. Biodiversity is key to resilient ecological systems that are essential in nutrient cycling, air and water quality, soil stabilisation, flood control, climate regulation, cultural values and vital habitat for many native fauna.

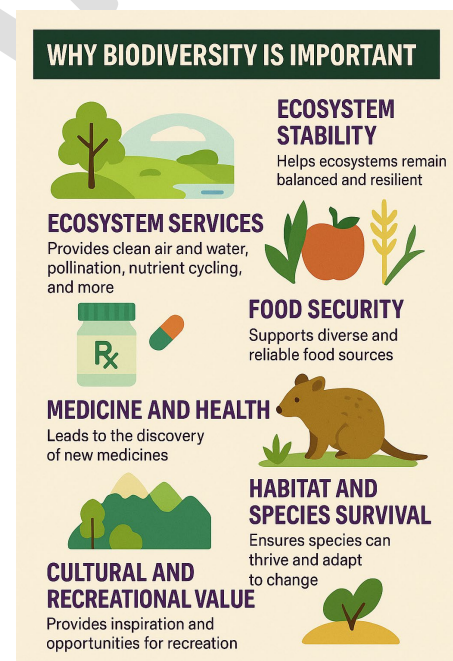
4.2 Nature's Co-benefits and its Connection to the Community

Ecosystem Services are the benefits people derive from ecosystems. **Co-benefits** are the added benefits from managing biodiversity and include urban cooling, carbon sequestration and erosion control. All Western Australians depend in some way on the ecosystem services and co-benefits that native vegetation provides. (Department of Water and Environmental Regulation, 2022)

Ecosystem Services Examples	
Provisioning-	food, water, fibre, fuel
Regulating-	erosion control, water filtration, disease control
Supporting-	biodiversity conservation
Cultural services-	sense of place, nature-based or cultural tourism

Through the provision of ecosystem services, biodiversity fosters economic development and promotes human wellbeing. (CSIRO(Commonwealth Scientific and Industrial Research Organisation), 2015) Tourism in Western Australia relies on natural assets and destinations, while ecosystem services, such as nutrient cycling and crop pollination, support sustainable agricultural and business. The natural environment of the City of Wanneroo helps create our unique sense of place and is intrinsically linked with the cultural values of the Noongar people of the southwest region, who have a long history of use of native vegetation in a sustainably managed way.

Opportunities exist within the City to challenge the way biodiversity and its benefits are supported, integrated and connected.



Graphic place holder

5 What is a Local Biodiversity Plan?

A Local Biodiversity Plan (LBP):

- Summarises legislative and policy obligations related to biodiversity conservation.
- Outlines the biodiversity assets preserved within a local government area and highlights key conservation priorities, with a focus on Local Natural Areas (LNAs).
- Evaluates existing biodiversity conservation measures within the local planning framework.
- Proposes actions to enhance biodiversity conservation efforts in and around LNAs.
- Supports stakeholder engagement in biodiversity initiatives.

Conservation refers to the protection of our natural areas through the care, management and maintenance of ecosystems, habitats, species and populations to safeguard the natural conditions for their long-term permanence. Restoration and enhancement may be required to assist in this process.

5.1 Previous Local Biodiversity Strategies and Plans

The City's first Local Biodiversity Strategy 2011-2016 (CoW 2011) was established in 2011 and thereafter, a Local Biodiversity Plan (LBP) from 2018-19 to 2023-24 (CoW 2018a) .

These documents identified assets within the City requiring conservation, threats to these assets, opportunities and goals to conserve them and proposed initiatives to enable these goals to be achieved.

This version is complementary with a renewed focus on the new Council Plan's priorities, goals and targets. Figures and table inputs within the previous LBP (2018-19-2023-24) have been updated with reviewed datasets and information.

5.2 Status of Previous City Strategic Biodiversity Documents and Initiatives

The 2011-2016 Local Biodiversity Strategy was the City's first biodiversity-focused plan, laying the foundation for ongoing conservation efforts. Key outcomes included:

- Development and later revision of the Coastal Management Plan and the Coastal Hazard Risk Management and Adaptation Plan.
- Adoption of local planning policy to protect caves and karstic features in planning processes.
- Inclusion of conservation reserves in local classifications in the DPS2 to balance conservation protection and passive recreation.

The most recent Local Biodiversity Plan for the City dates from 2018-19.

Key achievements included:

- Integrated natural area data into internal mapping systems for better planning.
- Established consistent Environmental and Foreshore Management Plan guidelines.
- Developed a Natural Area Asset Management Plan.
- Partnered with other local governments on drainage and feral animal control projects.
- Boosted community engagement in natural area management and citizen science.
- Secured Bush Forever protection for several high-priority natural areas.

Future Focus Areas to be further developed from the LBP:

- Develop a central database to compile natural area data from consultants and developers.
- Enhance community education on key environmental issues.

These focus areas have been incorporated into the implementation of this plan as the City continues to advance its biodiversity goals.

6 Legislative, Policy and Strategic Framework

Biodiversity conservation requires a collaborative approach involving the commonwealth, state, and local governments, as well as industry, non-government organisations, private individuals and the broader community. Each plays a role in contributing to conservation efforts at the appropriate level.

Developing and implementing a local biodiversity plan is an effective tool for meeting legislative requirements and achieving strategic conservation goals at the local government level while contributing to federal and state goals.

6.1 Federal Strategies and Policies

Australia's Strategy for Nature 2024-2030 is the overarching framework for all national, state and territory and **local strategies**, legislation, policies and actions that target nature. The strategy builds on previous and existing work and is underpinned by science. It sets six national targets and three enablers of change the City's LBP can draw upon to help achieve targets at a local level.

Together with the City's Council Plan (2025-2035), the Local Biodiversity Plan draws on influences from Australia's Strategy for Nature 2024-2030, the previous Australia's Biodiversity Conservation Strategy 2010-2030 as well as the previous National Targets for Biodiversity (2001-2005).

The National 30 by 30 Roadmap, Australia's Strategy for the National Reserve System and the National Other Effective area-based Conservation Measures (OECMs) Framework are all guiding documents to assist in the delivery of the protecting and conserving 30 per cent of land by 2030.

Other key national policies include Nature Positive Plan: better for the environment, better for business and the Threatened Species Action Plan 2022-2032.

Six national targets and 3 enablers of change to halt and reverse biodiversity loss in Australia and put nature on a path to recovery:

Targets



No new extinctions

Prevent new extinctions of native species, support the recovery of threatened species and maintain their genetic diversity.



Increase Australia's circularity rate and reduce pollution and its impacts on biodiversity by 2030

Increase the circularity of Australia's economy, to reduce our material footprint and waste generation by 2030. Reduce pollution in Australia's environment and its impacts on biodiversity, including reducing plastic pollution.



Eradicate or control invasive species in priority landscapes and further minimise their introduction by 2030

Minimise and mitigate the impacts of invasive species by eradicating or controlling established invasive species in priority landscapes and places; and further minimise the introduction and establishment of new invasive species, to maximise threatened species recovery and protect biodiversity and related cultural heritage values.



Priority degraded areas are under effective restoration by 2030

Priority degraded areas (across terrestrial, inland water, coastal and marine ecosystems) are under effective restoration by 2030 to recover biodiversity and improve ecosystem functions and services, ecological integrity and connectivity.



Protect and conserve 30% of Australia's landmass and 30% of Australia's marine areas by 2030

Protect and conserve at least 30% of Australia's terrestrial and inland water areas, and marine and coastal areas by 2030, especially areas of particular importance for biodiversity and ecosystem functions and services, ensuring protected and conserved areas are ecologically representative, well connected and effectively managed, recognising and respecting the rights of First Nations peoples.



Minimise the impact of climate change on biodiversity

Minimise the impact of climate change on biodiversity and increase its resilience through mitigation, adaptation and disaster risk reduction actions including by embedding climate change adaptation in all relevant decision-making, and through nature-based solutions and/or ecosystem-based approaches, while minimising negative and fostering positive impacts of climate action on biodiversity.

Enablers



Mainstream nature into government and business decision-making, including in financing, policies, regulations and planning processes.



Ensure equitable representation and participation in decisions relating to nature, particularly for First Nations peoples.



Ensure environmental data and information are widely accessible and support decision-making.

Australia's Strategy for Nature, Commonwealth of Australia 2024

The City has an opportunity to contribute towards achieving the targets set by Australia's Strategy for Nature 2024-2030 through the delivery of its LBP. The LBP identifies

opportunities and initiatives and sets targets to maintain and enhance biodiversity at a local scale, contributing to the national targets. Further investigation into the City's ability to contribute to the 30 by 30 target through the National OECMs may strengthen the advocacy for the protection of suitable natural areas currently not afforded formal protection.

See Table 19: Actions

Protection: Action 1.2 - Strategic Planning

6.2 State Strategies and Policies

The Native Vegetation Policy for Western Australia explores how the policy will influence all sectors, including local government. The policy acknowledges that strategic coordination and stewardship across sectors is needed to restore landscape and ecosystem function. (Department of Water and Environmental Regulation, 2022).

Outcome 1 of the policy is to:

Enable all sectors to contribute to a **net gain** and **landscape-scale** conservation and restoration.

Through many actions identified in this plan, the City has an opportunity to contribute to net gain where improvement to the extent and /or the condition of native vegetation exceeds the losses.

The Urban Green Strategy Perth Let's Grow Action Plan 2026-2030 is a whole-of-government approach that sets a clear, long-term direction for boosting tree canopy, vegetation and green spaces across public and private land in the Perth and Peel regions. It has action areas relating to vegetation retention and enhancement, urban greening for biodiversity and green links. This strategy and associated action plan will complement many areas of the LBP.

6.3 Federal Legislation

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and *Environment Protection and Biodiversity Conservation Regulations 2025* are the Australian Government's key environmental legislation. They protect Matters of National Environmental Significance (MNES), including threatened species and ecological communities. Under this Act, the City of Wanneroo contains threatened fauna, flora and ecological communities of national environmental significance, highlighting the need for careful consideration of these values in planning and land management.

The *Nature Repair Act 2023* was developed as the primary step to create a legislative, national and voluntary biodiversity market where biodiversity credits can be earned, bought and sold. It incentivises actions to restore and protect the environment. Supporting framework and methods are still being developed to convert the law into a workable market.

As the framework and methods are established, the City's projects that restore our natural areas through rehabilitation, formal protection and pest management may be eligible for tradeable certificates. The City could explore its potential in the market as it evolves.

See Table 19: Actions

Conservation: Action 3.1 – Strategic Planning, Nature Repair Market

6.4 State Legislation

The *Biodiversity Conservation Act 2016* and *Biodiversity Conservation Regulations 2018* provide protection for biodiversity, particularly threatened species and threatened ecological communities for Western Australia.

The *Planning and Development Act 2005 (WA)* is the state's legislation for land use planning and control. The MRS provides the legal framework for guiding land use and development at the regional scale. It sets out how land across Perth is zoned and reserved, for example, urban, rural, ROS, public purposes etc. It also identifies Bush Forever areas which operate in addition to the provisions of the scheme which applies to underlying zone or reserve.

The MRS was recently updated through the *Planning and Development Amendment (Metropolitan Region Scheme) Act 2024*.

6.5 State Planning Policies

State Planning Policies (SPP) provide the highest level of planning policy control and guidance in WA under Part 3 of the *Planning and Development Act 2005*, and they provide context for decision making on land use and development. The following SPPs are relevant to biodiversity protection in the City and should be consulted during development approval assessments.

- SPP2.0: Environment and Natural Resources Policy (2003)
- SPP 2.4: Basic Raw Materials (2021)
- SPP 2.5: Rural Planning (2016)
- SPP 2.6: Coastal Planning (2021)
- SPP 2.8: Bushland Policy for the Perth Metropolitan Region (2010)
- SPP 2.9: Water and Planning for Water Guidelines (Dec 2025)
- SPP 3.7: Planning in Bushfire Prone Areas (2024)

6.6 Integration of City Policies, Strategies and Plans

There are several other City policies, strategies and plans which support environmental and biodiversity objectives and play an important role in further supporting the LBP. The City's environment policy objective is to demonstrate the City's commitment to protecting and enhancing its natural environment and incorporating the principles of ecologically sustainable development throughout its operations and business activities to benefit current and future generations considering environmental, economic and social impacts (Triple Bottom Line).

6.7 District Planning Scheme No. 2

The **District Planning Scheme (DPS2)** sets out the planning boundaries for the City (CoW 2023b). This plan is more specific than the MRS (which covers the whole of metropolitan Perth) but less spatially specific than local structure plans. The environmental conservation aims of the DPS2 Part 1.9 are-

- (j) To provide the local government and landowners with appropriate mechanisms to protect identified places of landscape or environmental value within the City.
- (k) To ensure that adequate regard is given to the protection of the natural environment in the determination of land use and development proposals in accordance with sustainable development principles.”
- (l) To promote planning, management and strategic control of development in a rational and systematic manner, taking into account the aspirations of residents, environmental capacity and the costs and benefits of development.

Part 2.2 of DPS2 allows for local reserves to be classified as Environmental Conservation. The objectives for Environmental Conservation reserves are:

- To identify areas with biodiversity and conservation value and to protect these areas from development and subdivision.
- To identify and protect areas of biodiversity conservation significance within national parks and state and other conservation reserves.

There are currently 55 environmental conservation reserves. There are also several classified as **Public Open Space (POS)** and support dual purposes. The City is currently completing a review of all reserves with dual classifications with the intention of establishing more single purpose classifications. This will better allow for specific management of environmental conservation areas and vulnerable areas that are threatened.

DPS2 also considers the protection and relocation of native fauna. A Native Fauna Management Plan is an additional development requirement that applies to all zones within DPS2 where land is to be cleared or alterations made to drainage and landforms, or, in the opinion of the local government, the area may provide habitat to native fauna.

See Table 19: Actions

Protection: [Action 1.1 – Strategic Planning, Scheme](#)

Protection: [Action 1.3- Strategic Planning, Policy](#)

6.8 Local Planning Strategy

The *Planning and Development (Local Planning Schemes) Regulations* (2015) state that local governments are required to prepare a **Local Planning Strategy (LPS)** to set out their long-term planning directions. The City is currently preparing a LPS that will guide future planning and development to the year 2041, focusing on key issues affecting social, economic, and environmental factors. It will also provide the strategic basis for the preparation of the City's new Local Planning Scheme No. 3.

The City has prepared and advertised its draft LPS which will soon be considered by the WAPC for final approval. Following this, the City will prepare its new Local Planning Scheme No. 3 to implement the strategy.

6.9 Natural Area Asset Management Plan

The Natural Area Asset Management Plan (NAAMP) was developed for City-managed natural areas and provides information on the state of natural area assets, processes and systems and consider how current and future community services based on natural areas assets will be safely and sustainably provided in the most cost-effective manner. Many actions proposed in the NAAMP align with the previous iteration of the LBP. These documents are closely related and should be read in conjunction with each other.

See Table 19: Actions

Conservation: [Action 3.2 - Asset Planning, NAAMP and surveying](#)

6.10 Community Involvement

Several volunteer groups exist within the City that are involved with the management of different natural areas. Some of these groups are listed in **Table 1**. These volunteer groups make an important contribution to the management of natural areas, including rehabilitation planting, weed identification and control, rubbish removal and monitoring and recording of key native and invasive flora and fauna species – under the direction of City operational staff. There are many citizen science projects that volunteers and the public also undertake to assist in valuable data and information collection. The City also engages schools to participate in planting programs.

Table 1: Community groups in the City of Wanneroo involved in biodiversity conservation

Community Groups	
Quinns Rocks Environment Group	Friends of Koondoola Bushland
Friends of Chancellor Park	Friends of Voyager Park
Yanchep Coast Care	Friends of Yellagonga
Friends of Damian, Belgrade, Edgar Griffiths, Benmuni, Franklin and Chicquita Parks	

Key stakeholders that are involved in the management of biodiversity within the City are listed in **Table 2** below.

Table 2: Key stakeholders of biodiversity in the City of Wanneroo.

Stakeholder groups	
City of Wanneroo Community Members	Department of Biodiversity, Conservation and Attraction (DBCA)
City of Joondalup	Department of Climate Change, Environment and Water (DCEEW)
City of Stirling	Department of Planning Lands and Heritage (DPLH)
City of Swan	Department of Water and Environmental Regulation (DWER)
Community Groups	Mindarie Regional Council
Environmental Advisory Group	Other Local Government Organisations
Resident Associations	

Opportunity exists to further engage the community and volunteers to participate in activities that build capacity for biodiversity conservation.

See Table 19: Actions

Education, Community Capacity Building and Internal Processes: **Action 5.5-** Education and Community Capacity Building.

Education, Community Capacity Building and Internal Processes: **Action 5.6-** Community Capacity Building.

Table 3 provides a summary of all relevant legislation, policy and strategies that relate to biodiversity.

Table 3: Relevant legislation, policy and strategies that relate to biodiversity

STATUTORY AND LEGISLATIVE MECHANISMS	KEY STRATEGIC AND POLICY DOCUMENTS
COMMONWEALTH	
Environmental Protection and Biodiversity Conservation Act 1999 Nature Repair Act 2023	Australia's Strategy for Nature 2024-2030 National Roadmap for protecting and conserving 30% of Australia's land by 2030 Nature Positive Plan: better for the environment, better for business 2022 Threatened Species Action Plan 2022-2032
WESTERN AUSTRALIA	
Biodiversity Conservation Act (2016), Biodiversity Conservation Regulations 2018 WA Environmental Protection Act (1986), Environmental Protection (Clearing of Native Vegetation) Regulations 2004, Conservation and Land Management Act (1984) Swan and Canning Rivers Management Act (2006) Biosecurity and Agriculture Management Act (2007)	Native vegetation policy for Western Australia 2022 Urban Green Strategy Perth Let's Grow Action Plan 2026-2030 Statement of Environmental Principles, factors, objectives and aims of EIA, EPA 2023 WA Environmental Offsets Policy and Guidelines Environmental Protection (Environmentally Sensitive Areas) Notice 2005 EPA Guidance Statement No. 33: Environmental Guidance for Planning and Development (2008)
Planning and Development Act 2005, Planning and Development (Local Planning Schemes) Regulations 2015 Planning and Development Amendment (Metropolitan Region Scheme) Act 2024	State Planning Policies (SPP): SPP 2.0 - Environment and Natural Resources Policy - Jun 2003 SPP 2.4 - Planning for Basic Raw Materials - Jul 2021 SPP 2.5 - Rural planning - Dec 2016 SPP 2.6 - State coastal planning - Jul 2013 SPP 2.8 - Bushland Policy for the Perth Metropolitan Region - Jun 2010 SPP 2.9- Water and Planning for Water Guidelines-December 2025 SPP 3.7- Bushfire – September 2024
• Local Government Act 1995	
• Bushfires Act 1954 (amended 2016)	
• Contaminated Sites Act 2003	
• Aboriginal Cultural Heritage Act 1972	
• Waterways Conservation Act (1976)	

STATUTORY AND LEGISLATIVE MECHANISMS	KEY STRATEGIC AND POLICY DOCUMENTS
CITY OF WANNEROO	
Local Planning Strategy (draft 2024)	
District Planning Scheme 2	Local Planning Policies • LPP 1.1: Conservation Reserves (CoW 2021) • LPP 2.4: Site Works and Retaining for Residential Development (CoW 2019) • LPP 3.3: Fauna Management (CoW 2022) • LPP 4.1: Wetlands (CoW 2022) • LPP 4.11: Variation to Building Envelopes (CoW 2020) • LPP 4.13: Caves and Karstic Features (CoW 2018) • LPP 4.19: Medium density Housing (CoW 2023) • LPP 4.21: Coastal Assets (CoW 2016) • LPP 4.3: Public Open Space (CoW 2021) • LPP 4.4: Urban Water Management (CoW 2020) • LPP 4.8: Tree Preservation (CoW 2004) • LPP 4.9: Subdivision of Rural Zoned Land (CoW 2018) • LPP 5.3: East Wanneroo (CoW 2023) Environmental Management Plan Guidelines
	Council Plan • Corporate Business Plan
	Environmental and Sustainability Strategy 2025- • EMS • CCAMS (Decarbonisation Plan future) • CHRMAP • Urban Forest Strategy (Urban Forest Plan Future) • Waterwise Plan • Yellagonga Integrated Catchment Management Plan
	Council Policy Environment Policy Asset Management Policy • Natural Areas Asset Management Plan Pesticide Management Policy Strategic Land Policy City Tree policy

7 The City's Natural Areas and Biodiversity

A comprehensive description and understanding of the City's remaining **natural areas** is essential for achieving the biodiversity priorities and targets in the Council Plan.

7.1 Natural Areas

Natural Areas (NA) are defined as any physical area that contains native species or ecological communities in a relatively natural state and hence contain biodiversity.

Currently, approximately 43 per cent of land within the City of Wanneroo are vegetated natural areas. Approximately 31 per cent is considered protected but varies in condition, quality and the ecological communities represented. Improving the conservation of natural areas is essential to the retention of biodiversity and its resilience across the landscape. The City has many important biodiversity assets within these natural areas. These are discussed in detail in **Section 9**. It is important that each asset is maintained at a sustainable level. Threats to sustainability of our natural areas and biodiversity are discussed in detail in **Section 10**. Natural areas are either managed by the state government, local government or privately. Natural areas managed by the City of Wanneroo or occurring on private land are defined in this plan as a **Local Natural Area (LNA)**. The City's remaining natural areas are discussed in **Section 3** and shown in **Figure 1**. **Diagram 1** details the breakdown of management of natural areas within the City and provides context in planning terms.

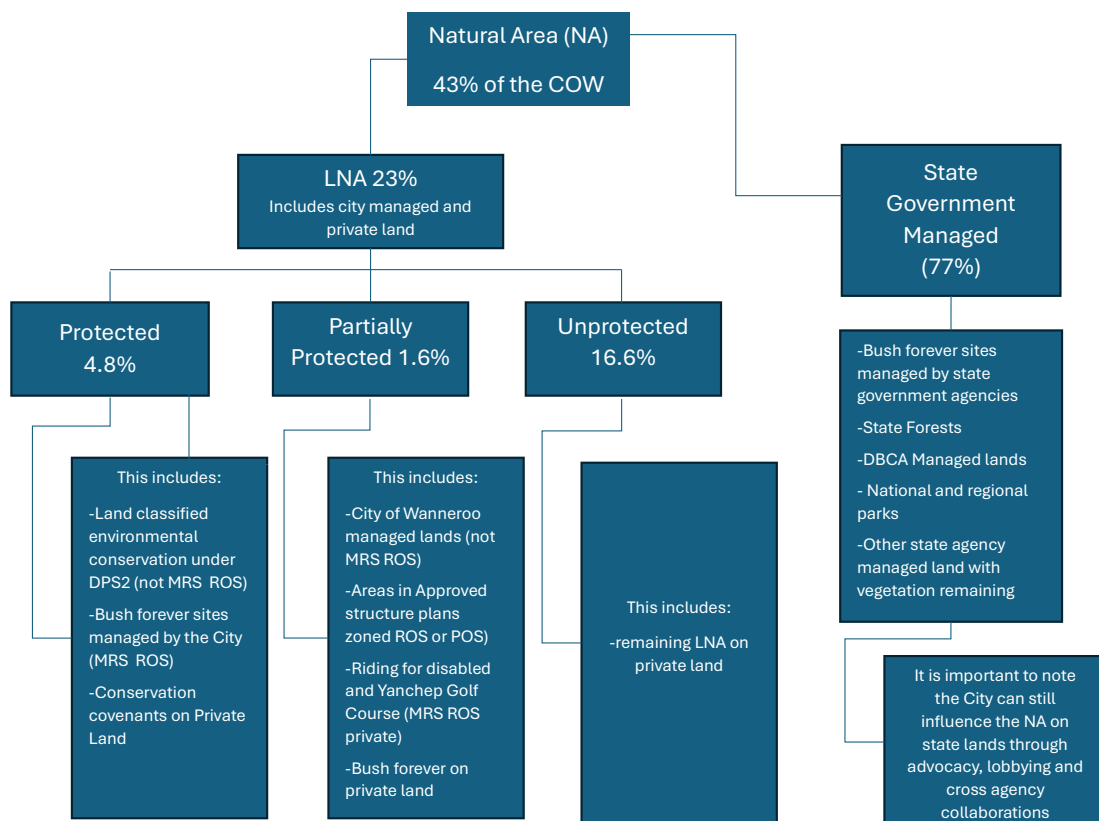


Diagram 1: Breakdown of natural area management across the City

An analysis of the City's natural areas is shown in **Figure 2**. Currently 77 per cent of the City's natural areas occurs on land owned or managed by state agencies, whilst the City manages six per cent, with the remaining 17 per cent occurring on private property. The protection level varies within each of these categories.

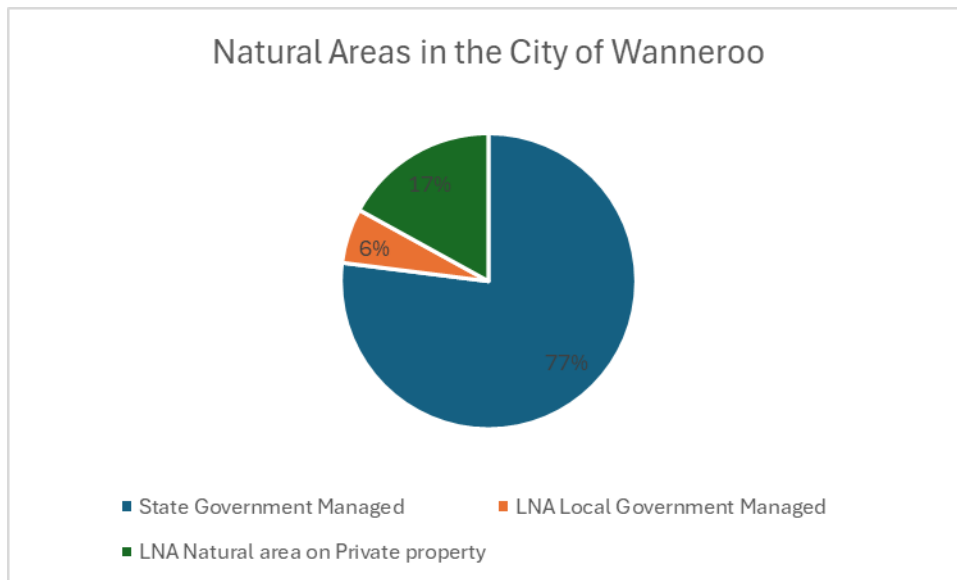


Figure 2: Percentage of natural areas in the City of Wanneroo and current management status

7.2 Local Natural Areas (LNA)

Local Natural Areas (LNA) are natural areas within the City of Wanneroo that the City manages or natural areas occurring on private land.

LNA includes natural areas in the MRS reserved for ROS managed by the City, natural areas on private property and in public open space.

It excludes lands under the management of state agencies such as state forests, Department of Planning, Lands and Heritage-managed lands, Department of Biodiversity Conservation and Attractions-managed lands, Water Corporation, Main Roads and Department of Education-managed lands. Bush Forever sites vested with state agencies and regional parks (except those with dual management shared with the City) are also not considered as LNA.

Table 4: LNA definition in planning terms

LNA inclusions	LNA exclusions
• Crown land vested with the City and managed for the purposes of Conservation. • Land that is formally protected with a reserve classification titled "Conservation" under the City's DPS2 or MRS reserved ROS (formally Parks and Recreation) • Natural areas in public or ROS, managed by the City of Wanneroo but not fully recognised as being managed for the purpose of conservation • Natural areas on private land including MRS zoned ROS and Bush Forever	• Bush Forever sites with management vested with state agencies • State Forests • DBCA managed lands • Regional Parks (except those with dual management shared with the City) • Other state government agency managed lands with vegetation- e.g. Main Roads WA, Water Corporation, Department of Planning, Lands and Heritage, Department of Water and Environmental Regulation, Department of Education

LNA can be divided into protection categories based on the level of protection the area is currently afforded through planning and management. The categorisation of an area into a protection category is not final and can change.

Protected areas: are those areas that are currently afforded sufficient protection for the City to conserve the biodiversity present in the area.

Partially protected areas: are those that are afforded some protection but may be poorly defined or unclear that the protection is for the purpose of conservation.

Unprotected areas: are LNA that exist outside the other two protection categories and are afforded no protection.

Table 5 below provides the definitions of protection categories and examples in planning terms.

Table 5: Protection categories of LNA and examples in planning terms

	Protected	Partially Protected	Unprotected
Definition	Afforded sufficient protection for the City to conserve the biodiversity present in the area either through the MRS, the City's DPS2 or formal covenants	Managed by the City or privately for the purpose of conservation or POS but not afforded official protections.	Afforded no official protections
Examples	• Bush Forever sites owned by state agencies with management vested with the City (MRS reserved ROS) • Crown land with management vested with the City for the purpose of conservation (MRS reserved ROS) • Land reserved for Environmental Conservation under DPS2 • Areas with Conservation Covenants over them •	• Crown land with management vested with the City but purpose does not specify conservation (MRS reserved ROS) • City managed lands not reserved MRS ROS or DPS 2 environmental conservation but managed for conservation • POS areas with an approved structure plan over them but are yet to be completed • MRS reserved private recreation (riding for disabled and Yanchep golf course) • Bush Forever sites on Private property without active management plans	• All other areas of LNA on both private and public land

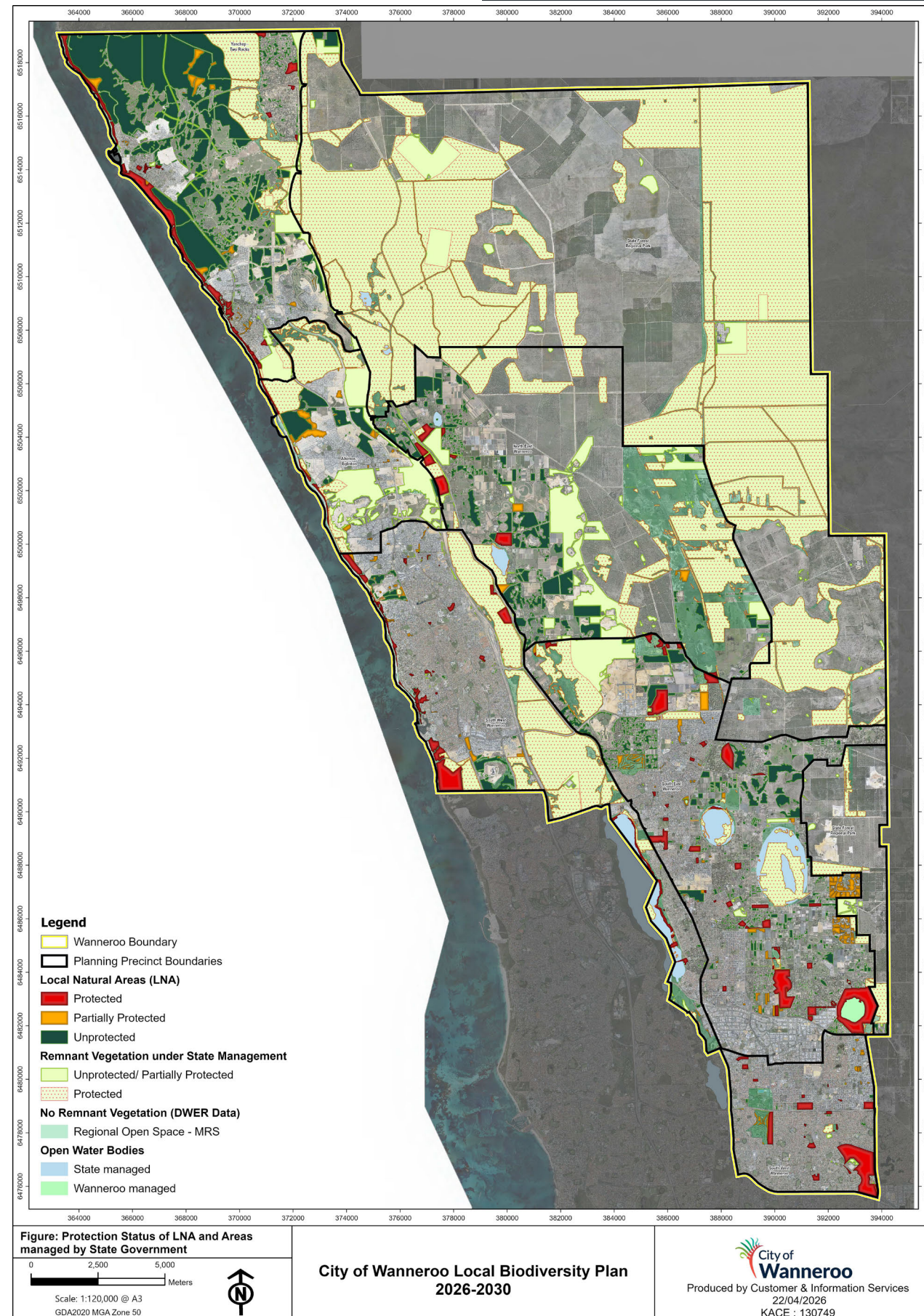


Figure 3: Protection status of LNA in the City of Wanneroo

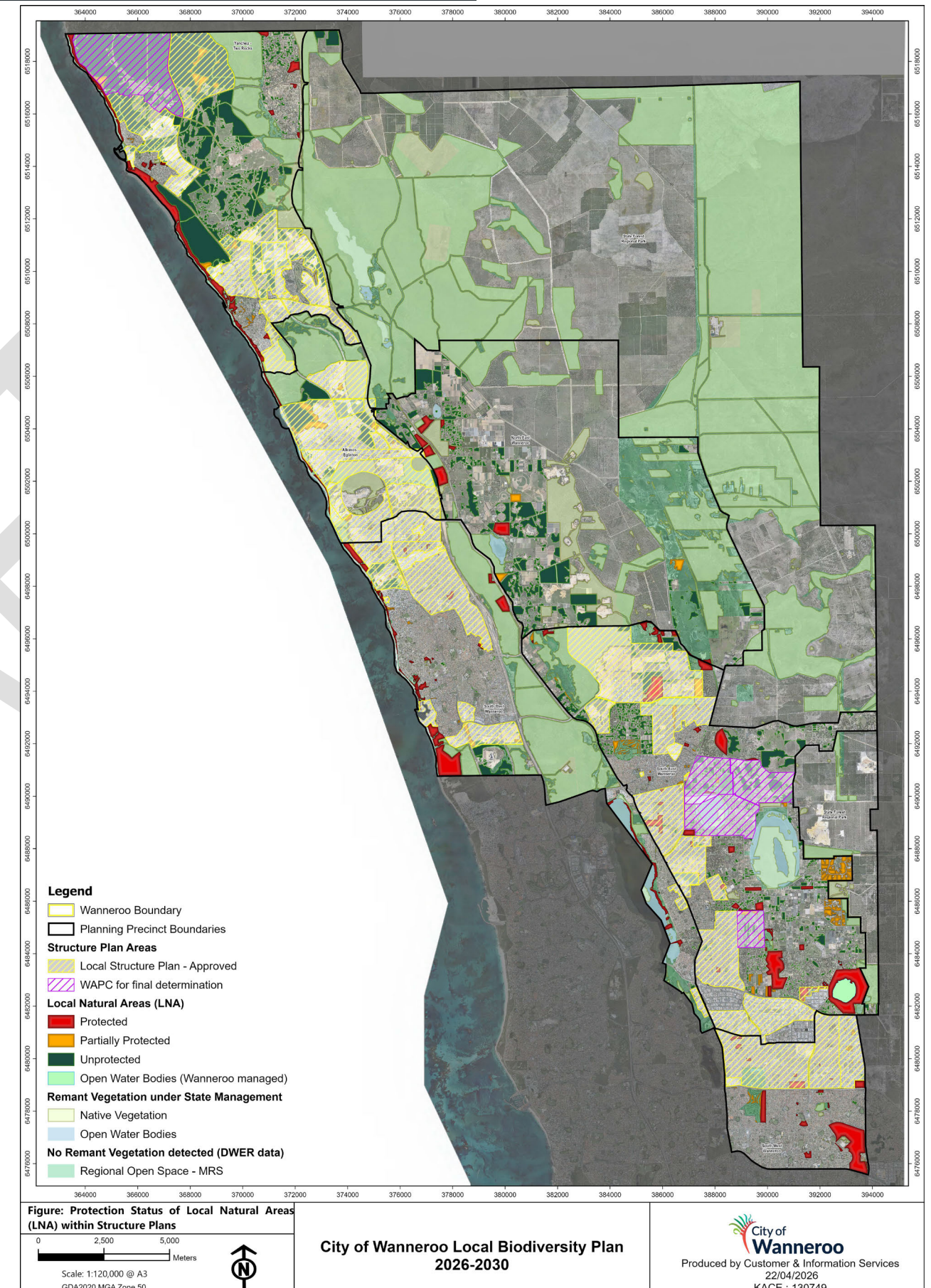


Figure 4: Protection status of LNA with approved and draft local structure plans

Figure 3 shows the remaining natural in the City. It highlights the remaining LNAs and their protection categories as well as providing a visual representation of the natural areas managed by State Government. Approximately 23 per cent of the identified LNA is managed by the City, with the remaining 77 per cent occurring on privately owned land. The prioritisation of these LNAs is discussed in **Section 8**.

Figure 4 shows the LNAs under local structure plans that are most likely to be lost. There is approximately 2,200ha of unprotected LNA in approved structure plans which will be developed and ultimately lost. There are areas of partially protected LNA which have retention potential in POS.

Opportunity: There is opportunity for partially protected areas, not reserved as ROS in the MRS, to be afforded full protection through the classification of environmental conservation under DPS2. Lands that are reserved as ROS in the MRS vested with the City but not for the purpose of conservation, can be further protected by requesting a variation of the purpose in management orders to reflect conservation purposes.

Opportunity: Although local government is not the decision maker for land use changes under the MRS, there is an opportunity to advocate through the planning system for retention of LNAs on private property. Under the current state government planning framework and legislation, the retention of LNAs on private property for biodiversity retention is difficult, particularly as urbanisation driven by population increase and housing shortages is high priority.

See Table 19: Actions

Protection: **Action 1.1** – Strategic Planning, Scheme

Protection: **Action 1.9**- Planning, Conservation Classification and Management Orders

Managing threats to LNA through maintenance and restoration will continue to enhance the City's biodiversity. The threats to biodiversity are further discussed in **Section 10**.

Educating the community regarding LNA on private property can also influence biodiversity retention. Opportunities also exist for private landowners to place conservation covenants over LNA to ensure future retention of LNA on their property now and into the future.

See Table 19: Actions

Education, Community Capacity Building and Internal Processes: **Action 5.2** – Private landowners, LNA

7.3 State Government-Managed Natural Areas

The City encompasses a range of natural areas managed by state government including state forests, national and regional parks, other parks managed by the Department of Biodiversity and Attractions and WAPC and Bush Forever sites. Although not managed directly, the City can influence management through advocacy and cross agency collaboration. There are several areas managed by the DPLH, where the City could become the future land manager. Many of these areas intersect with important ecological linkages as shown in **Figure 11** and discussed in **section 10.7**.

Opportunity: As shown in **Figure 5** as black areas, there are several areas which are MRS zoned ROS but do not contain remnant vegetation. Some are considered Bush Forever areas. These areas have good potential for restoration, with most located around wetlands and their buffer areas. Many of these are also in priority areas.

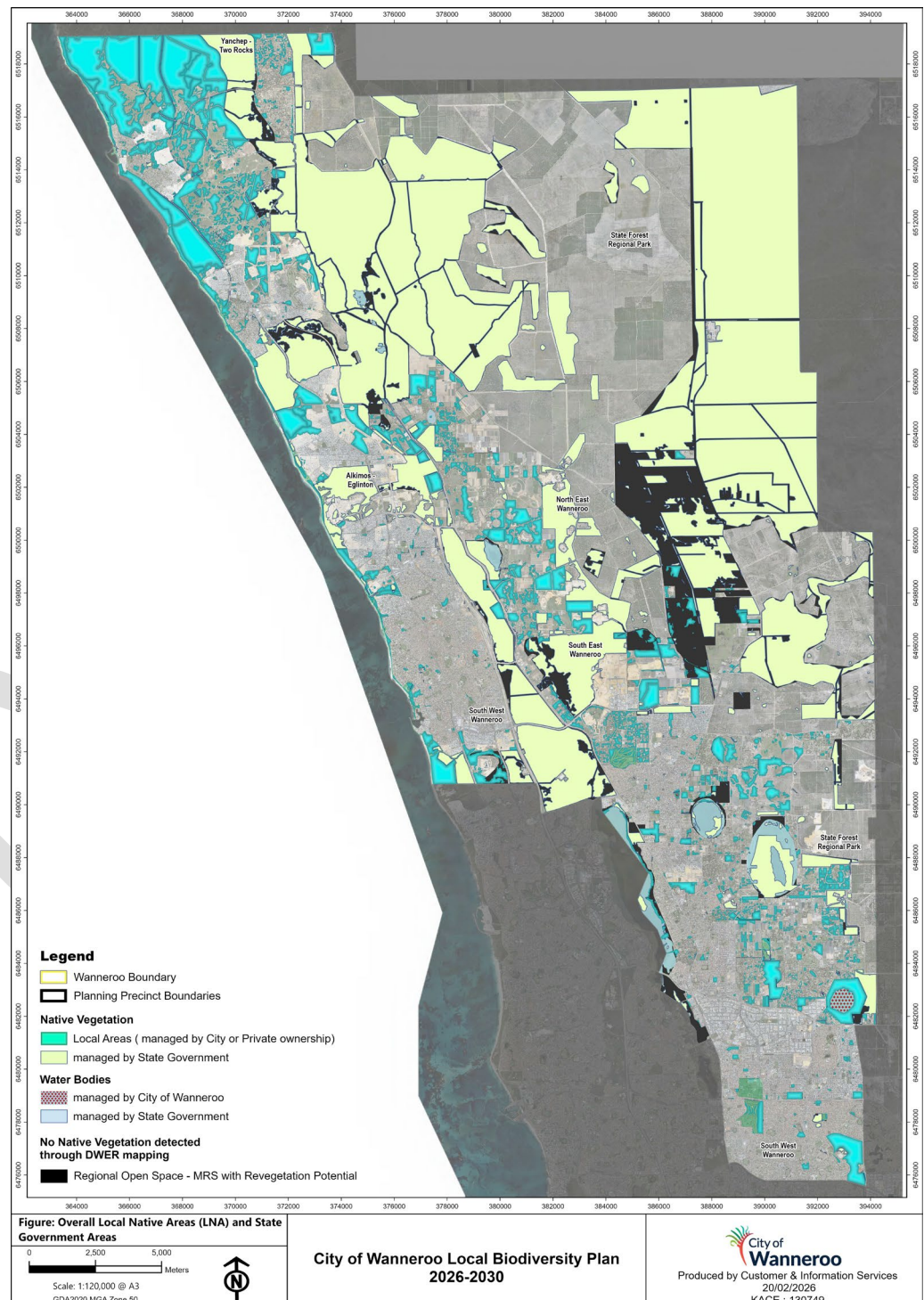


Figure 5: Overall LNAs and State Government areas

Opportunity: There are areas within state forest where regional, local and Perth nature links exist. There is opportunity to advocate for the state government to protect and restore selected areas and strategic location of state forest with a focus on important ecological linkages.

Opportunity: Within the City, there are natural areas on unallocated Crown land and private property designated as Bush Forever or Bush Forever subject to negotiated planning outcomes and wetlands, all of which could form part of future MRS reserved ROS for conservation.

Opportunity: State government-managed land being developed through Development WA may have potential for retention through allocation of POS.

See Table 19: Actions

Protection: **Action 1.4-** Strategic Planning, Surveying

Protection: **Action 9.4-** Strategic Planning, Wetlands

Restoration: **Action 2.2 –** Advocacy to State Government

Opportunity: Education can play a key part in ensuring the retention, maintenance and enhancement of state and federal government-protected assets on private property. There are several areas where there is Bush Forever, conservation categories, TEC and priority species on private land.

See Table 19: Actions

Education, Community Capacity Building and Internal Processes: **Action 5.1-** Private Landowners, LNA

Education, Community Capacity Building and Internal Processes: **Action 5.2-** Private Landowners, LNA

8 Prioritising What We Have Left: Examining Vegetation Complexes and Important Ecological Features in LNAs

With further urbanisation, removal of the City's natural areas will continue to occur. A strategic approach to prioritise the remaining local natural areas will help maximise biodiversity outcomes for the City. Approximately, a further nine per cent of the City's remaining natural areas needs to be protected or restored to meet the City's Council Plan targets.

Further analysis of the remaining vegetation complexes, together with prioritising important ecological criteria, through a multi criteria analysis, was undertaken to understand the importance of the remaining local natural areas within the City. This will help ensure ecological thresholds are addressed in the City's biodiversity targets.

8.1 Thresholds That Keep Ecological Communities Healthy and Protect our Biodiversity

To protect biodiversity, the City aims to increase the amount of protected and restored natural areas, ensuring that all ecological communities and key environmental features are represented. The LBP uses vegetation complexes to represent biodiversity diversity, together with a matrix of ecological values to identify priority areas for conservation.

Ecological communities are groups of native plants, animals and other organisms interacting within a habitat, shaped by soil, climate and water availability.

Vegetation complexes are recurring plant communities linked to specific soil and landform units.

Maintaining biodiversity requires intact examples of each ecosystem type. To prevent rapid species loss, at least 30 per cent of the original extent of each ecological community should be retained; where less than 30 per cent remains, all remaining areas should be protected. The conservation thresholds applied in this plan reflect long-standing biodiversity planning principles established in national targets (Environment Australia 2001) and subsequently adopted and refined through state policy and EPA guidance. In highly urbanised areas, a 10 per cent benchmark may apply. (Environmental Protection Authority, 2008). These thresholds guide the LBP, which follows the Biodiversity Planning Guidelines (WALGA & PBP 2004; Del Marco et al. 2004; EPA 2000), that provide mapping, data and frameworks to guide conservation planning.

This also relates to the national target of protecting and conserving 30 per cent of land by 2030. This national target is about protecting and conserving quality areas, not just about reaching this target (Australia, 2024).

Some vegetation complexes are under the 30 per cent threshold within the City and regionally on the Swan Coastal Plan. The condition of some natural areas, especially on private property, is unknown. City-managed natural areas may include areas such as vehicle access tracks, walking paths and firebreaks, as well as vegetation removal for fire mitigation purposes. Some natural areas on private property may be degraded and contain only a remnant tree layer or a scattered shrub layer, with limited rehabilitation potential. Setting a target of 40 per cent of restored and conserved areas will

compensate for areas where condition cannot be confirmed, restoration may not be possible, or an ecological community is underrepresented.

8.2 Taking a closer look at the Vegetation Complexes occurring within the City

The LPB uses mapped vegetation complexes, based on landform, soil, water and climate, to represent ecological diversity. This approach is practical because vegetation types within a complex can act as effective indicators of broader ecological processes and interactions.

The City of Wanneroo is located on the Swan Coastal Plain bioregion, which comprises 15 vegetation complexes as mapped by Heddle et al in 1980. Of these complexes, 12 are within the City of Wanneroo. A full description of the vegetation complexes is provided in **Appendix A. Figure 6** shows the natural areas remaining in the City of Wanneroo and the corresponding vegetation complexes.

Table 6 shows the amount of remaining natural vegetation occurring within the City and the vegetation complexes they represent. The table compares the pre-1750 vegetation complex data with what remains in each vegetation complex on the Swan Coastal Plain and within the City to establish what remains regionally and locally.

Table 6: Vegetation complex extent

Vegetation Complex	Pre-European extent locally in the COW	Current extent remaining locally in the COW		Formally protected areas remaining locally in COW		Local Natural Areas (% of current extent)	
	ha	ha	%	ha	%	ha	%
Bassendean Dunes							
Bassendean Central and South	924	266	29%	200	22%	188	71%
Bassendean Central and South Transition	618	609	98%	607	98%	0	0%
Bassendean North	8723	4504	52%	4313	49%	44	1%
Bassendean North Transition	2486	1668	67%	1513	61%	126	8%
Spearwood Dunes							
Cottesloe Central and South	13314	5145	39%	2837	21%	1151	22%
Cottesloe North	8716	5922	68%	5126	59%	280	5%
Karrakatta Central and South	10540	1340	13%	757	7%	863	64%
Karrakatta North	5153	988	19%	847	16%	0	0%
Karrakatta North – Transition	2343	1813	77%	1773	76%	0	0%
Quindalup Dunes							
Quindalup	8794	4703	53%	1205	14%	3271	70%
Wetlands							
Herdsmen	1760	776	44%	592	34%	251	32%
Pinjar	4893	1541	31%	1080	22%	420	27%

Note: Formally protected refers to areas with formal conservation measures (State managed ROS and Conservation classification under DPS2) it includes DBCA managed lands and areas managed for environmental conservation under DPS 2

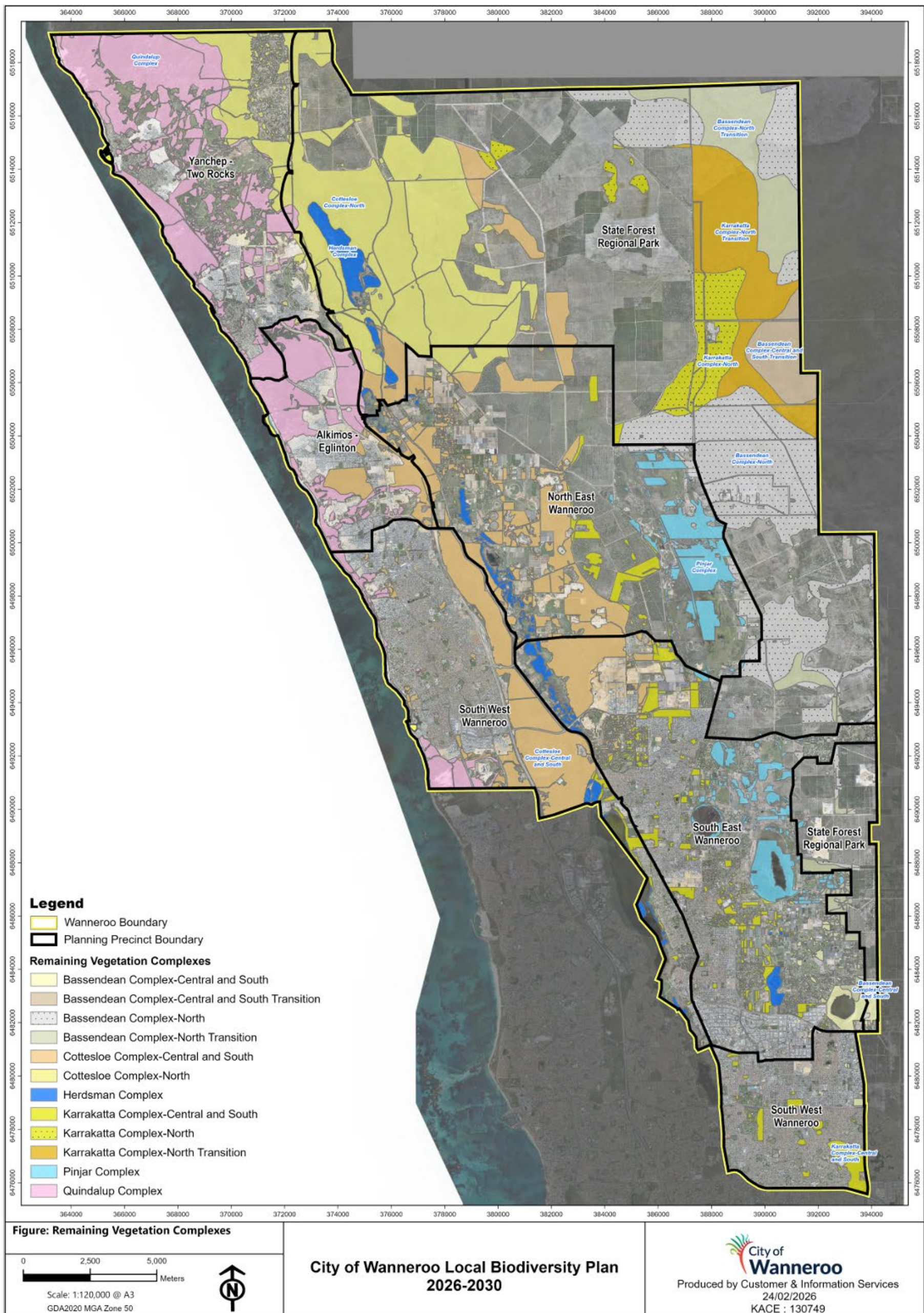


Figure 6: Remaining vegetation complexes

Local vegetation complex data was further analysed to establish the amount remaining in LNA and what is formally protected (protected LNA and state-managed vegetation in ROS). The results from this analysis were used to establish priorities for conservation of vegetation complexes.

The following thresholds are applied in the assessment of vegetation complexes and their priority for conservation.

- Vegetation complexes with less than 30 per cent of the pre-European extent remaining on the Swan Coastal Plain.
- Vegetation complexes with 90-100 per cent of its original extent within the City.
- A vegetation complex with less than 30 per cent of pre-European extent remaining in the City.
- A vegetation complex with less than 30 per cent of pre-European extent remaining in the City and less than 30 per cent formally protected.
- A vegetation complex with less than 30 per cent of pre-European extent remaining in the City and less than 10 per cent formally protected.
- A vegetation complex with less than 10 per cent of pre-European extent remaining in the City and less than 10 per cent formally protected.

Table 7 prescribes a priority level for each vegetation complex within the City based on the above criteria. These priorities have been assigned based on the regional and local representation of the vegetation complex and its level of protection within the City.

Table 7: Vegetation complexes remaining and assigned priority

Vegetation Complexes	Extent occurring in the COW (%)	Regional extent remaining (%)	Local extent remaining (%)	Local extent formally protected (% of original extent)	Priority
Bassendean Central and South	1%	24%	29%	22%	Critical
Bassendean Central and South Transition	28%	98%	98%	98%	Low
Bassendean North	11%	71%	52%	49%	Low
Bassendean North Transition	12%	88%	67%	61%	Low
Cottesloe Central and South	29%	31%	39%	21%	High
Cottesloe North	20%	58%	68%	59%	Low
Karrakatta Central and South	20%	23%	13%	7%	Critical
Karrakatta North	12%	45%	19%	16%	High
Karrakatta North – Transition	45%	88%	77%	76%	Low
Quindalup	16%	57%	53%	14%	Medium
Herdsmen	18%	31%	44%	34%	Medium
Pinjar	100%	31%	31%	22%	Critical

Table 8: Priority categorisation criteria

Category	Criteria
Critical	• Less than 30% of original extent remaining regionally; • Less than 10% of original extent remaining locally; • Less than 10% Protected locally. • Endemic to the City of Wanneroo
High	• Greater than 30% of original extent remaining regionally; • Less than 30% of original extent remaining locally; • Less than 30% Protected locally.
Medium	• Greater than 30% of original extent remaining regionally; • Adequately represented locally; • Less than 30% Protected locally.
Low	• Adequately represented regionally; • Adequately represented locally; • Adequately Protected

Regional extent remaining = % of Pre-European extent remaining in the Swan Coastal Plain:

Local extent remaining = % of Pre-European extent remaining in the City of Wanneroo: the area of native vegetation remaining in the City divided by the pre-European extent of each complex.

Local extent protected = % of Pre-European extent protected in the City of Wanneroo: this is the area formally protected in the City divided by the Pre-European extent within the City

Based on the values presented in **Table 7** and **Table 8**, it was determined that the following vegetation complexes required further prioritisation for conservation:

The **Pinjar** complex is known to occur only within the City and requires conservation for its unique characteristics. This complex is also approaching the 30 per cent threshold with only approximately 31 per cent remaining on the SCP with 22 per cent formally protected.

Bassendean Central and South, Karrakatta Central and South and Karrakatta North vegetation complexes require further conservation as they have less than 30 per cent of their original extent remaining locally in the City. It is noted that the **Quindalup** vegetation complex will also fall into this category once structure plan areas are cleared for development with approximately 50 per cent of the original extent of this complex existing in areas with current structure plan approval.

The **Karrakatta Central and South** vegetation complex also requires protection as less than 10 per cent of the original extent is within protected areas of the City.

Cottesloe Central and South, Herdsman and Pinjar complexes are approaching the 30 per cent threshold regionally and are likely to become a priority for protection in the near future.

Herdsman Complex, with originally over 1,500ha in the City, now has less than 1500ha remaining.

Opportunity: To further understand the vegetation remaining in each complex and its importance, there is a need to understand the quality or condition of what remains and determine opportunity for restoration and rehabilitation. This will be particularly important with vegetation complexes identified as critical and high priority for the City. Ecological survey work through the City's NAAMP together with ecological survey work for natural areas not managed by the City, will be integral in the prioritisation of natural areas for retention, restoration and conservation efforts.

See Table 19: Actions

Protection: **Action 1.4-** Strategic Planning, Surveying

Restoration: **Action 2.3-** Ecological corridors and priority vegetation complexes

Conservation: **Action 3.2** – Asset Planning, NAAMP and surveying

Conservation: **Action 3.3** – Planning, Environmental Management Plan (EMP) guidelines and surveying

8.3 Matrix of Important Ecological Features and Multiple Criteria Assessment

To further investigate the significance of the City's LNA, in addition to vegetation complex information, other important ecological features or criteria have also been identified and prioritised.

Similar to the previous LBP, the ecological criteria was derived from the Local Government Biodiversity Planning Guidelines for the Perth Metropolitan Region (Del Marco *et al.* 2004) and incorporated biodiversity considerations including regional and local representation of the vegetation complexes, connectivity, rarity, proximity to wetland and coastal systems and climate change. Through a workshop with the City of Wanneroo environmental staff, the ecological criteria was assigned priority ratings based on their importance.

The ecological criteria identified and their priority ratings can be found in **Table 9**.

Table 9: Priority rating across ecological criteria

Ecological Criteria	Priority
Regional Representation	
Of an ecological community with only 1500 ha or 30% or less remaining in the IBRA sub-region -Bassemdean Complex- Central and South -Karrakatta Complex- Central and South	1
Of an ecological community with 90 - 100% of its original extent occurs within the LGA -Pinjar Complex	1
Vegetation within 50 m of Conservation Estate and/or Bush Forever Site	4
ESA	3
Large natural areas (between ≥ 2 ha and < 4 ha)	3
Large natural areas (≥ 4 ha)	2
Local Representation	
Of an ecological community with 1500 ha or less or 30% or less remaining in the LGA -Bassendean Complex- Central and South -Herdsman Complex -Karrakatta complex- Central and South -Karrakatta Complex- North	2
Of an ecological community with 1500 ha or less or 30% or less remaining in the LGA AND $< 30\%$ formally protected -Bassendean Complex- Central and South -Karrakatta Complex- North	2
Of an ecological community with 1500 ha or less or 30% or less remaining in the LGA AND $< 10\%$ formally protected -Karrakatta Complex- central and South	2
Of an ecological community with 10% or less remaining in the LGA AND $< 10\%$ formally protected -None	1
Rarity	
Contains a Threatened Ecological Community	1
Contains a Priority Ecological Community	2
Vegetation within 50 m of a Threatened (Declared Rare) Flora (DRF)	3
Vegetation within 50 m of a Priority Flora (1, 2, 3, 4)	3
Vegetation within 50 m of Threatened and Specially Protected Fauna	3
Vegetation within 50 m of Rare or Priority Fauna (1, 2, 3, 4)	3
Contains significant habitat for significant fauna (Black Cuckatoo)	1
Maintaining Ecological Processes – Connectivity	
Vegetation within a Regional Ecological Linkage	1
Vegetation within a Local Ecological Linkage	1
Vegetation within a NatureLinks linkage	2
Protection of Wetland, Coastal Dunes and their associated vegetation	
Within CCW or REW area and/or within 50 m of the wetland boundary	1
Climate Change	
Within 50 m of 2120 CHRMAP scenario	2
Other	
High and Medium Karst risk	2
Contains a 'friends of Group'	4

Using QGIS, a multi-criteria analysis was performed on the City's LNAs using purchased and publicly available datasets relating to the ecological criteria identified and the agreed priority ratings, to determine their ecological importance and therefore overall priority for protection. The list of datasets used is provided in **Appendix B**.

LNA have been assigned an overall priority rating (1-4) with 1 being the highest priority. The overall priority assigned corresponds to the highest rated ecological criteria present. The results of this analysis are provided in **Figure 7** and are detailed for each Biodiversity Planning Precinct in **Section 11**.

Figure 8 shows the priority ranking of the LNA currently under draft and adopted structure plans. Further detailed maps of the areas under draft structure plans can be found in **Appendix C**. Areas

having the highest priority 1 can be found inland with many priority areas contained in the critical priority vegetation complex areas, with the majority of priority 2 LNA in the north coastal areas.

It should be noted that the analysis does not take into consideration the quality of the vegetation in the Local Natural Area and that vegetation quality should be an additional consideration in all planning assessments. It should also be noted that priority should not only be afforded to areas of highest ecological value (i.e. those areas depicted in red), but to all remaining Local Natural Areas.

Priority Local Natural Area mapping represents a snapshot in time and needs to be used as an addition to proper assessments of biodiversity values under the provisions of the Environmental Protection and Biodiversity Conservation Act 1999. Assessments are needed in addition to field surveys to reflect any new listings of species and ecological communities and inconsistencies between State and Commonwealth legislation. Some areas mapped as 'Low Priority' might be mapped that way due to a lack of past surveys in those areas rather than absence of biodiversity value.

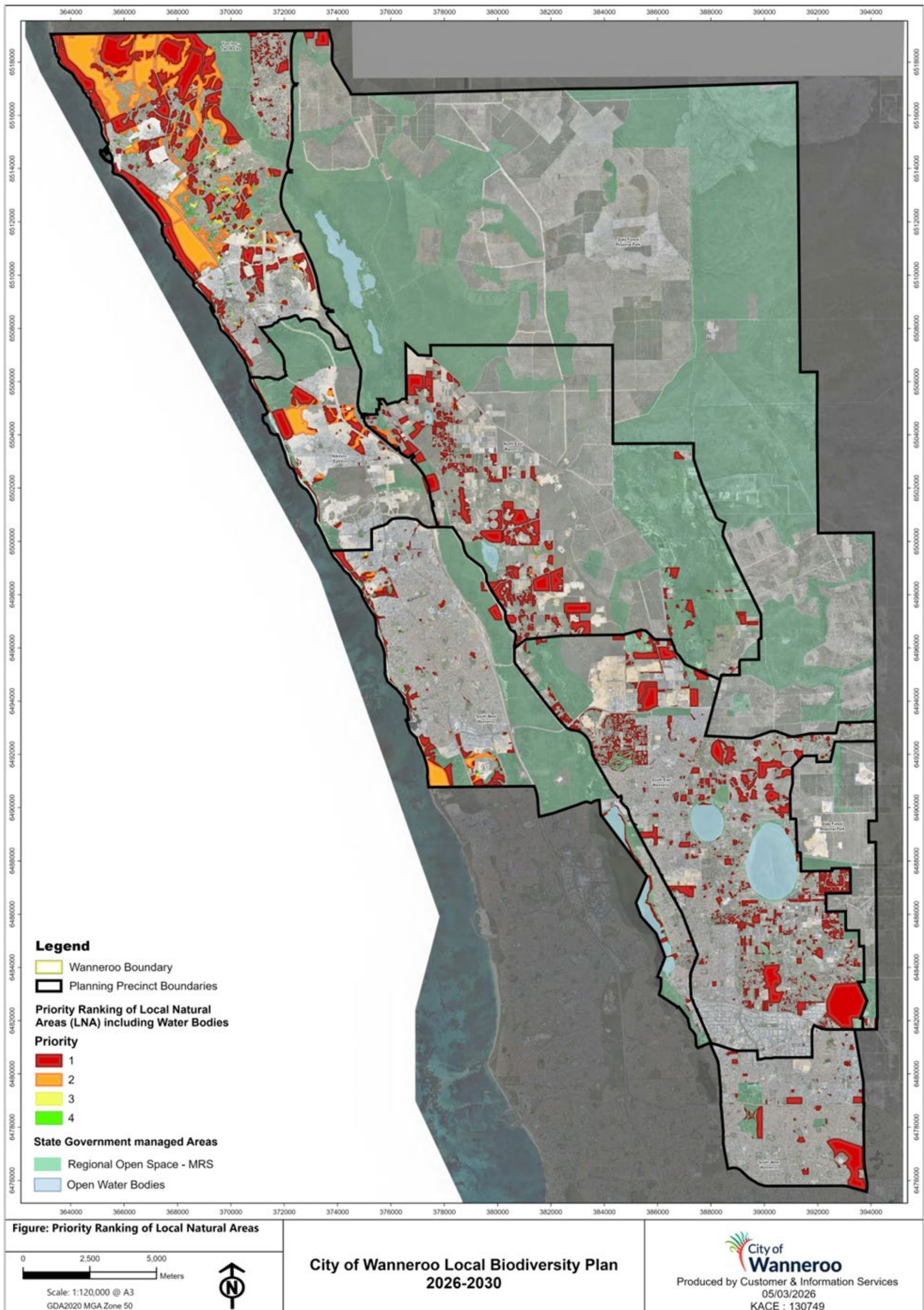


Figure 7: Priority ranking of LNA

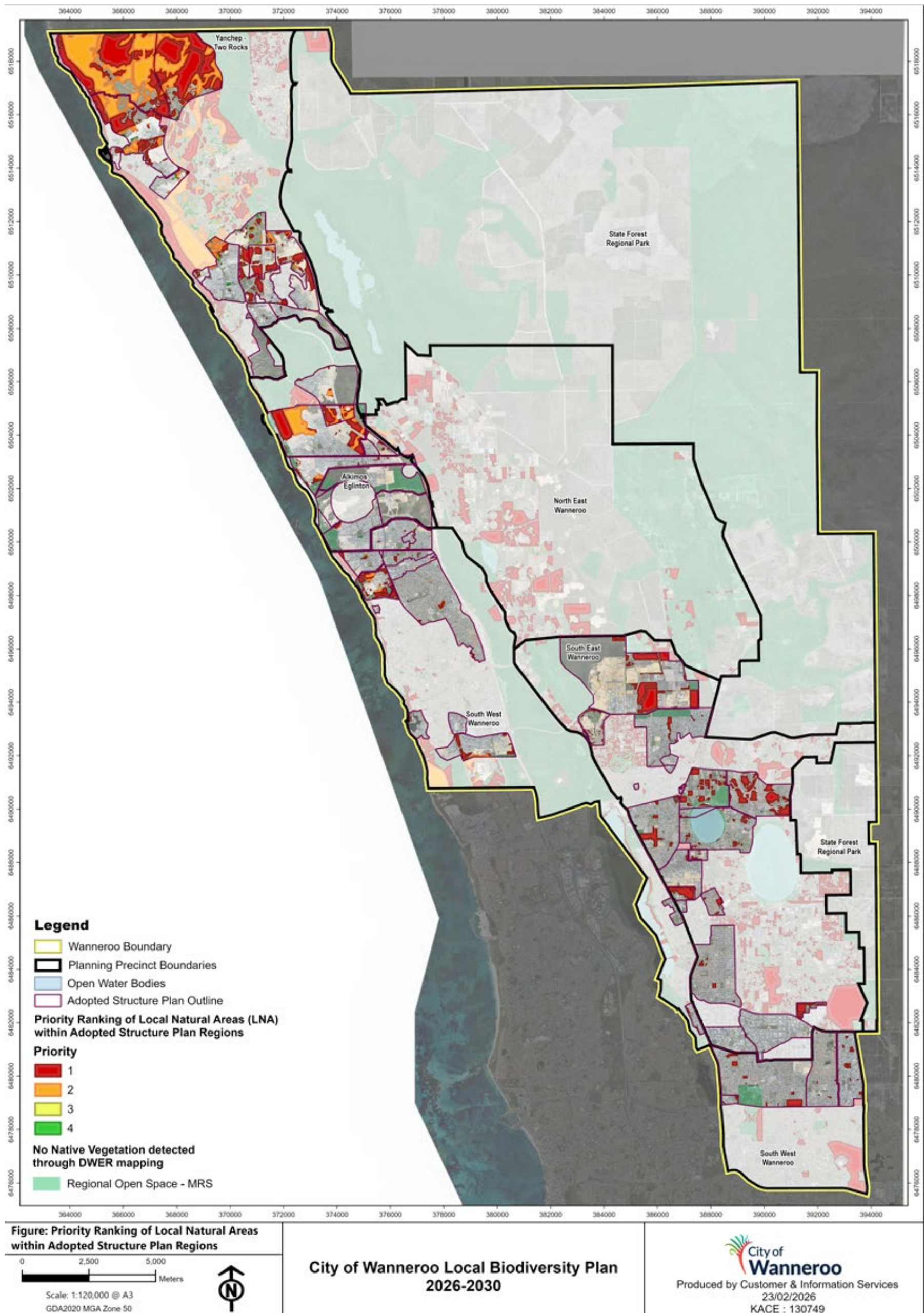


Figure 8: Priority ranking of LNA with in draft and approved structure plan regions

9 The City's Biodiversity Assets, Ecological Values and Opportunities

There are many factors that contribute to the City's overall biodiversity and many are interrelated. Biodiversity assets and ecological values must be understood to protect, restore and conserve natural areas and their biodiversity. Although conserving individual species and features is critical, the combination of many factors make natural areas important because they support many ecological communities and perform many functions across the entire landscape.

Native vegetation includes vascular plants as well as plants without a vascular system such as mosses and lichens. Native vegetation, while contributing to biodiversity through a wide range of plant species, also provides the food, shelter, habitat for native fauna and microorganisms, as well as breeding territories and pathways to move through the landscape. Threatened and Priority Ecological Communities

An **ecological community** is a naturally occurring assemblage of organisms in a particular habitat, as defined in the *Biodiversity Conservation Act 2016* (BC Act). Ecological communities may comprise various life forms including plants, animals and microorganisms, and provide an important level of biological diversity in addition to genetics and species (Threatened Ecological Communities, DBCA website, Government of Western Australia 2025).

9.1 Threatened and Priority Ecological Communities

The City of Wanneroo supports several Threatened Ecological Communities (TEC) protected under federal and state legislation and Priority Ecological Communities (PEC) listed by the DBCA. Although PECs are not a listing category under the BC Act, under Part 10 of the BC Act all flora that may be present in an ecological community are protected in WA.

Five TECs listed under the Commonwealth *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act) are known to occur within the City of Wanneroo, two of which are listed as Critically Endangered and three listed as Endangered. Under the state *Biodiversity Conservation Act of 2016* (BC Act) four of these communities are listed as Critically Endangered as seen in **Table 10**.

Table 10: Threatened ecological communities in the City of Wanneroo

Threatened Ecological Community	BC Act (WA)	EPBC Act (Commonwealth)
Aquatic Root Mat Community in Caves of the Swan Coastal Plain		Endangered
Floristic Community Type name: Aquatic Root Mat Community number 1 of Caves of the Swan Coastal Plain (Caves SCP 01)	Critically Endangered	
Sedgeland in Holocene dune swales of the southern Swan Coastal Plain		Endangered
Floristic Community Type name: Sedgeland in Holocene dune swales of the southern Swan Coastal Plain (floristic community type 19 as originally described in Gibson et al. 1994)	Critically Endangered	

Honeymyrtle shrubland on limestone ridges of the Swan Coastal Plain Bioregion		Critically Endangered
Floristic Community Type name: <i>Melaleuca huegelii</i> – <i>M. systema</i> shrublands of limestone ridges (floristic community type 26a as originally described in Gibson et al. 1994)	Critically Endangered	
Banksia Woodlands on Swan Coastal Plain	Priority Ecological Community- Priority 3	Endangered
Floristic Community Type name: <i>Banksia attenuata</i> woodlands over species rich dense shrublands (floristic community type 20a as originally described in Gibson et al. 1994) – (Commonly a component of the endangered Banksia Woodlands of the Swan Coastal Plain EPBC listed TEC)'	Critically Endangered	
Tuart (<i>Eucalyptus gomphocephala</i>) Woodlands and Forests of the Swan Coastal Plain	Priority Ecological Community- Priority 3 The description, area and condition thresholds that apply to the EPBC-listed TEC of the same name, also apply to this Priority Ecological Community	Critically Endangered

A full list of TECs and PECS known to occur within the City of Wanneroo is provided in **Appendix D**.

Opportunity: There is a need to further understand the quality and extent of TECs and PECs to assist in the management and protection of these areas. Further education and research into the ecology and management of the communities is necessary for their conservation.

See Table 19: Actions

Planning: **Action 1.4**– Strategic Planning, Surveying

Conservation: **Action 3.2** – Asset Planning, NAAMP and surveying

Conservation: **Action 3.4** – Planning and process, TEC, PEC, Threatened and Priority Species management

Conservation: **Action 3.5** – Planning and process, TEC, PEC, Threatened and Priority Species management

9.2 Threatened and Priority Flora

With such diverse vegetation and habitat types the City of Wanneroo supports a range of threatened and priority flora species listed under both the state BC Act and the federal EPBC Act. A full list of threatened and priority flora can be found in **Appendix D**.

Under the EPBC Act there are three threatened species listed as endangered and one listed as vulnerable within the City. **Table 11** shows the number of threatened and priority species found within the City of Wanneroo. There are 42 species listed under the BC Act as shown in **Appendix D**.

Table 11: Number of flora species in the CoW listed under the State and Federal legislation

Classification	Number of Listed Species	
	BC Act 2016	EPBC Act 1999
Critically Endangered	2	-
Endangered	2	3
Vulnerable	1	1
Priority 1	6	-
Priority2	9	-
Priority 3	15	-
Priority 4	7	-
Total	42	4

Opportunity: On-ground surveys and mapping to determine the occurrence and extent of species and habitat will assist in the management and protection of these species. Several species that occur in the City have not been adequately surveyed, recorded and reported to relevant state departments. Species listed on WA Herbarium Florabase and DBCA database need verification.

Surveys of threatened and priority flora undertaken during the planning process should be mapped, recorded and reported to the relevant state department to improve knowledge of their occurrence and effective management. This includes surveys initiated by the City, WAPC and developers.

Further education and research into the management of the species is necessary for their conservation.

See Table 19: Actions

Planning: **Action 1.4-** Strategic Planning, Surveying

Conservation: **Action 3.2** – Asset Planning, NAAMP and surveying

Conservation: **Action 3.4** – Planning and process, TEC, PEC, Threatened and Priority Species management

Conservation: **Action 3.5** – Planning and process, TEC, PEC, Threatened and Priority Species management

Education, Community Capacity Building and Internal Processes: **Action 5.5** – Education and community capacity building

9.3 Significant Fauna

The City of Wanneroo has 78 species historically listed under the BC Act and 53 under the EPBC Act as shown in **Appendix D**. Of these listed species there are 46 birds, four fish, 10 invertebrates, 12 mammals and six reptiles. This includes many marine and migratory sea birds within the City's coastal areas. Some of the listed species in the City include:

- Carnaby's Black Cockatoo (*Calyptrorhynchus latirostris*)
- Forest Red-Tailed Black Cockatoo (*Calyptrorhynchus banksii naso*)
- Chuditch or Western Quoll (*Dasyurus geoffroii*)
- Loggerhead turtle (*Caretta caretta*)

Table 12: Number of fauna species in the CoW listed under the State and Federal legislation

Classification	Number of Listed Species	
	BC Act 2016	EPBC Act 1999
Critically Endangered	4	2
Endangered	10	16
Vulnerable	19	17
Priority 1	2	-
Priority2	2	-
Priority 3	7	-
Priority 4	7	-
Other Specially Protected	2	-
Migratory	21	31
Conservation Dependent	2	-
Total	76	66

A full list of threatened and priority fauna can be found in **Appendix D**.

Opportunity: Strengthening ecological data, improving habitat quality, supporting species-specific recovery actions and advocating for functional wildlife corridors are essential in achieving sustainable long-term conservation outcomes.

Opportunity: On- ground surveys and mapping to determine the occurrence and extent of species will assist yjeir management and protection. Several species identified have not been adequately surveyed, recorded or reported to relevant state departments. Increased understanding of their ecology will assist development of actions for management.

See Table 19: Actions

Planning: **Action 1.4-** Strategic Planning, Surveying

Conservation: **Action 3.2** – Asset Planning, NAAMP and surveying

Conservation: **Action 3.4** – Planning and process, TEC, PEC, Threatened and Priority Species management

Conservation: **Action 3.5** – Planning and process, TEC, PEC, Threatened and Priority Species management

Conservation: **Action 3.6** - Planning and process, TEC, PEC, Threatened and Priority Species management

Education, Community Capacity Building and Internal Processes: **Action 5.5** – Education and community capacity building

Opportunity: Connectivity between natural areas is being reduced through ongoing development and infrastructure expansion, resulting in restricted wildlife movement, increased mortality risks, and reduced genetic diversity.

See Table 19: Actions

Protection: **Action 1.6** - Strategic Planning/Assets Planning/ Conservation, wildlife

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9.4 Wetlands

The City contains a chain of linear wetlands, circular wetlands and subterranean wetlands, which represent an outstanding system of intact freshwater wetlands on the Swan Coastal Plain. The network of wetlands and vegetation complexes provide high value conservation areas, fauna habitat as well as opportunities for passive, nature-based recreation. Wetlands and surrounding vegetation serve as an important breeding ground for local birds and summer refuge for bird populations including trans-equatorial migratory wading birds.

The City contains 179 wetlands, 86 of which are classified as Conservation Category Wetlands (CCW), 44 Resource Enhancement Wetlands (REW) and 53 Multiple Use Wetlands (MUW). The wetlands within the City and their categories are shown in **Figure 9**. A full list of named known wetlands can be found in **Appendix E**. Detailed maps showing geomorphic wetland features for each planning precinct can also be found in **Appendix E**.

Key wetlands classified as CCW include Lake Joondalup, Lake Pinjar, Lake Jandabup, Lake Mariginiup, Loch McNess, Gnaragara Lake, Nowergup Lake, Beenyup Swamp, Walluburnup Swamp, Wilgarup Lake and Lake Adams, which form an important complex of wetlands extending north-south located where two dominant landform elements intersect, the Spearwood Dunes and Bassendean Dunes. Other significant wetlands include Karli Spring, a groundwater fed spring of important Aboriginal heritage value located within the City's foreshore reserve in Alkimos.

Lentic wetlands (still or very slow-moving wetlands) are dynamic systems that change over time in response to natural processes, including sedimentation, hydrological variation and vegetation succession. Although wetlands may be transitory features in the landscape over geological timescales, their current ecological attributes remain important. Wetlands can also be resilient systems, and degraded wetlands may recover ecological and biodiversity values where hydrological and ecological conditions are restored or maintained.

Geomorphic wetlands are low-lying landforms where the ground surface may intersect with groundwater in an unconfined aquifer when water levels are sufficiently high. Under appropriate hydrological conditions, these areas can function as wetlands, including sump lands, damp lands and shallow open water systems. In some locations, drying climatic conditions, reduced groundwater levels or land use change may reduce or remove visible surface water. However, this does not necessarily remove the wetland landform or its potential to function as a wetland. If wetter conditions return, or groundwater levels rise for other reasons, surface inundation may reoccur. Where inundation is sustained, wetland fringing vegetation, aquatic vegetation and associated ecological productivity may also re-establish over time.

Opportunity: Many wetlands in the City of Wanneroo are located on private property and historically have been cleared or altered, particularly in rural areas. There are currently 18 conservation category wetlands on private property. It is unknown if these are being managed appropriately and education regarding these wetlands is important for their conservation. Restoration opportunities should be identified.

See Table 19: Actions

Education, Community Capacity Building and Internal Processes: **Action 5.3-** Private landowners education, wetlands

Restoration: Action 2.1 - Wetland restoration

Opportunity: Studies of the East Wanneroo wetlands (as outlined in the environmental report accompanying the East Wanneroo District Structure Plan) note that many have been altered and their current management classifications may be outdated. This may also apply to other wetlands within the City. There is an opportunity to reassess and potentially reclassify some wetlands and their associated management categories, providing further protection for local natural areas within the City.

See Table 19: Actions**Protection: Action 1.7- Strategic planning, wetlands**

Opportunity: Restoration of degraded wetlands and their buffers, especially in ROS are large areas of restoration potential which could add to the total area of natural areas within the City. Monitoring and management of City managed wetlands will guide conservation of these wetlands.

See Table 19: Actions**Restoration: Action 2.1 - Wetland restoration****Conservation: Action 3.15- Wetlands management****Conservation: Action 3.16- Wetlands management**

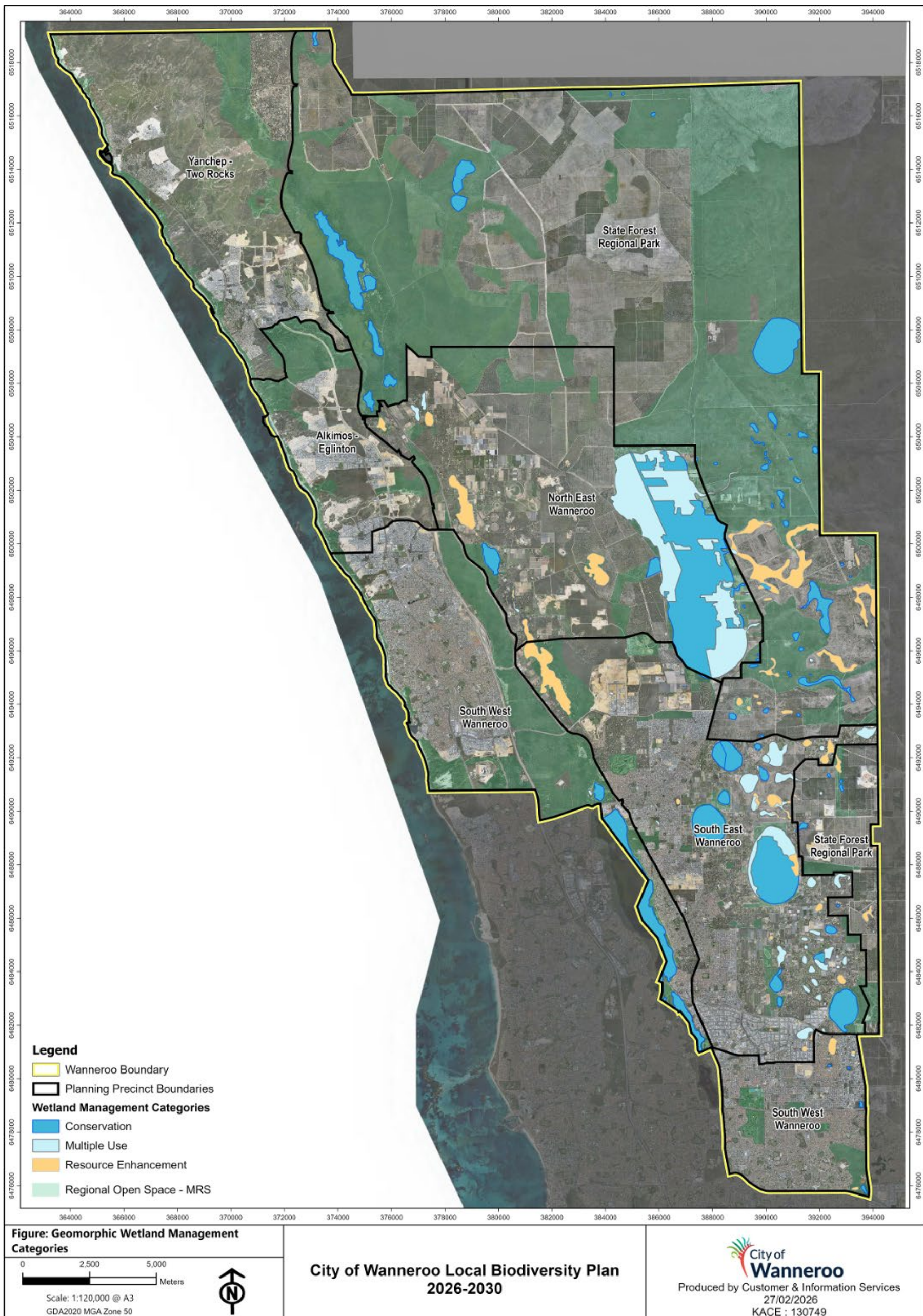


Figure 9: Geomorphic wetland management categories

9.5 Karst and Caves

Karst is a term used to describe landscapes that are commonly characterised by closed depressions, subterranean drainage and caves. Karst landscapes are driven by the hydrological cycle and formed principally by solution of the rock, most commonly limestone (DEC 2012). Karst features are a key environmental characteristic in the City of Wanneroo due to the distribution of Tamala limestone where the weathering of Tamala results in karstic landform features, including lakes and caves.

An extensive belt of karstic landforms including hundreds of caves run in a north-west to south-east direction through Yanchep National Park in the vicinity of Loch McNess. These caves support subterranean fauna including known populations of stygofauna and critically endangered aquatic root mat communities.

The presence of caves and karsts has been investigated extensively over the decades. A map providing the general locations where the City's karst features occur is provided in **Figure 10**.

Opportunity: Increased awareness of catchment scale effects from development on threatened ecological communities, threatened flora and fauna associated with cave and karst features is important for conservation of these species.

See Table 19: Actions

Protection: **Action 1.8-** Planning, policy and surveying, caves and karstic features

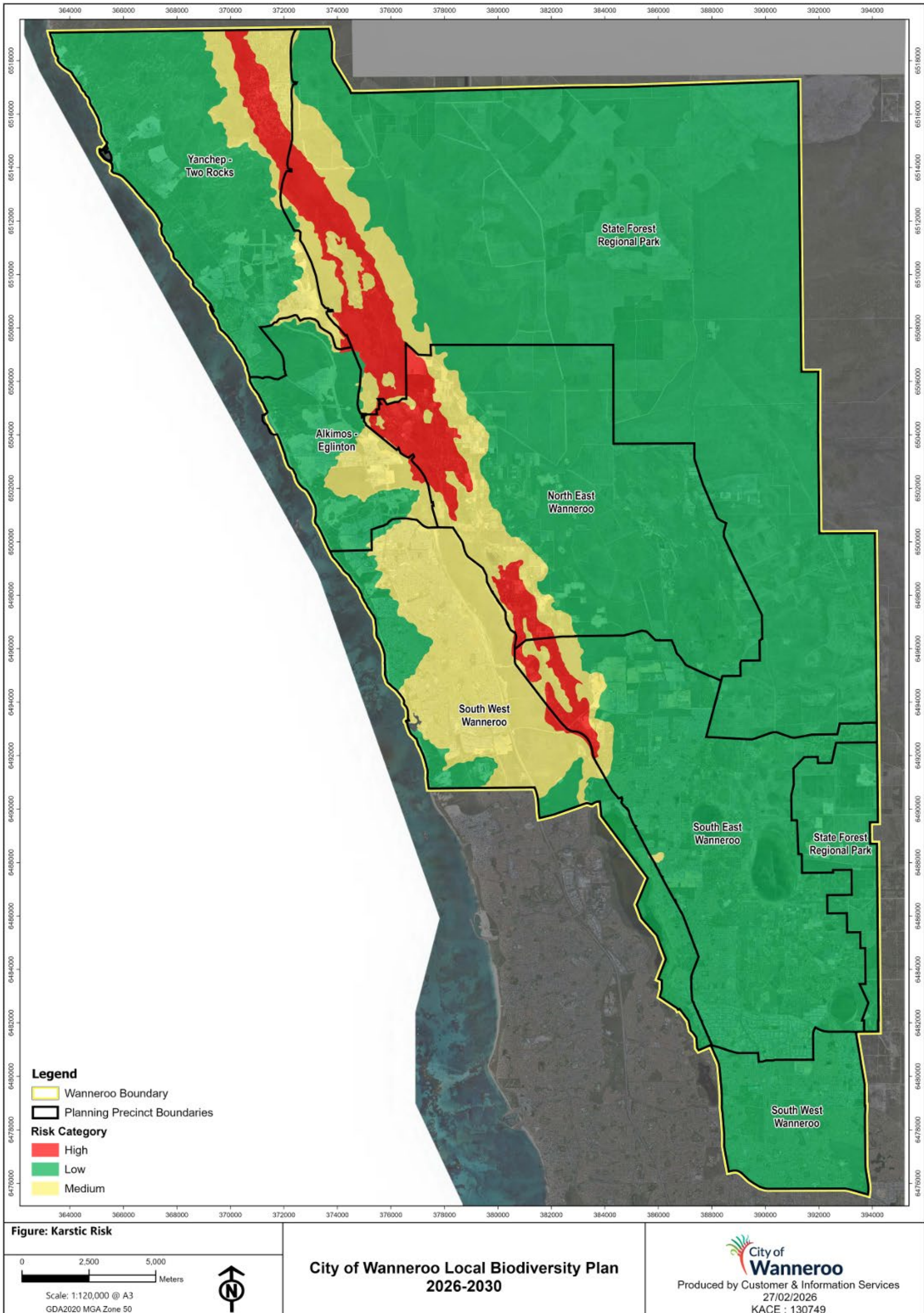


Figure 10: Karstic features risk zones

9.6 Coastal Areas

The City of Wanneroo's coastline stretches for 32km, from Tamala Park (south of Mindarie) to Two Rocks in the north. Coastal vegetation has an important function in stabilising dunes, vital in providing natural protection from storms, rising sea levels associated with climate change and erosion. Foreshore areas along the coastline also provide for recreational areas and are impacted by housing and infrastructure development, as well as climate change impacts.

The City's coastline represents important regional conservation value and also provides an extensive ecological linkage characterised by coastal limestone cliffs and coastal heathland vegetation. The coastline also represents relict sand dune formations (the Quindalup dune system).

Significant development is occurring in the northern corridor in the Alkimos-Eglinton and Yanchep-Two Rocks planning precincts, with large portions of LNA currently under structure plans. There is opportunity for some LNA to be retained along the coastline and in POS.

The City's Coastal Management Plan 2021 (CMP) was developed in accordance with State Planning Policy 2.6: State Coastal Planning Policy. The CMP provides the framework for the development and management of the City's coastal foreshore. In 2018 the City adopted a Coastal Hazard Risk Management and Adaptation Plan (CHRMAP). The CHRMAP identifies areas of the coastline that are vulnerable to coastal hazards over a 100-year timeframe and identifies a series of vulnerability lines based on future planning timeframes. This will help the City plan for future key areas likely to be impacted in the short to medium term (2050) which includes PEC in Mindarie and Two Rocks.

Opportunity: Identify key vegetation within the coastal area for retention, including within POS. Ensure coastal hazard planning includes the retention of key coastal foreshore habitats.

See Table 19: Actions

Protection: [Action 1.5- Strategic Planning/Assets Planning/ Conservation, ecological linkages](#)

9.7 Ecological Linkages

Ecological linkages allow for the movement of wildlife and connect significant vegetation, habitat and landscape features. The local and regional ecological linkages within the City generally run from north to south and east to west, connecting continuous corridors of vegetation, the coastline and the national park inland.

In fragmented landscapes, ecological linkages and connectivity are particularly important for conserving biodiversity, allowing wildlife to move away from threats, preventing them from becoming isolated, maintaining genetic diversity and ensuring they have ongoing access to vital resources such as suitable habitat, food and water sources.

Perth Regional Ecological Linkages link protected regionally significant natural areas by retaining the best condition LNAs available between them that can act as stepping stones for flora and fauna. (Western Australian Local Government Association)

In preparing this Plan, the City's ecological mapping was reviewed to identify key linkages, including those classified through Naturelinks, which highlight optimal wildlife movement routes in urban areas. Further detail on local Naturelinks is provided in **Appendix F**

The regional and local ecological linkages together with Perth Naturelinks have been included in this Plan as shown in **Figure 11**.

Where there is significant loss of these linkages, urban greening for biodiversity can play an important role in connecting key habitat areas.

Opportunity: The City should advocate for vegetation retention along key corridors as well as influence nature linked urban design in areas yet to undergo urban development. Re-creating complex ecological biodiversity is difficult and protection is key.

Links between protected natural areas increase the total area available to support biodiversity (NatureLinks, 2022). The City can influence the linking of natural areas through vegetation retention, and urban greening for biodiversity including along verges, road reserves, walkways, trails and cycleways, parklands, drainage and conservation parks.

There is opportunity for planting of appropriate species through urban greening for biodiversity initiatives to assist in the restoration of habitat, connectivity and the associated biodiversity benefits.

See Table 19: Actions

Protection: **Action 1.5-** Strategic Planning/Assets Planning/ Conservation, Ecological linkages

Urban Greening for Biodiversity: **Action 4.1-** Urban Greening for Biodiversity, Naturelinks

Urban Greening for Biodiversity: **Action 4.2-** Urban Greening for Biodiversity, City managed areas

Opportunity: Connectivity between natural areas is being reduced through ongoing development and infrastructure expansion, resulting in restricted wildlife movement, increased mortality risks, and reduced genetic diversity.

See Table 19: Actions

Protection: **Action 1.6-** Strategic Planning/Assets Planning/ Conservation, Wildlife

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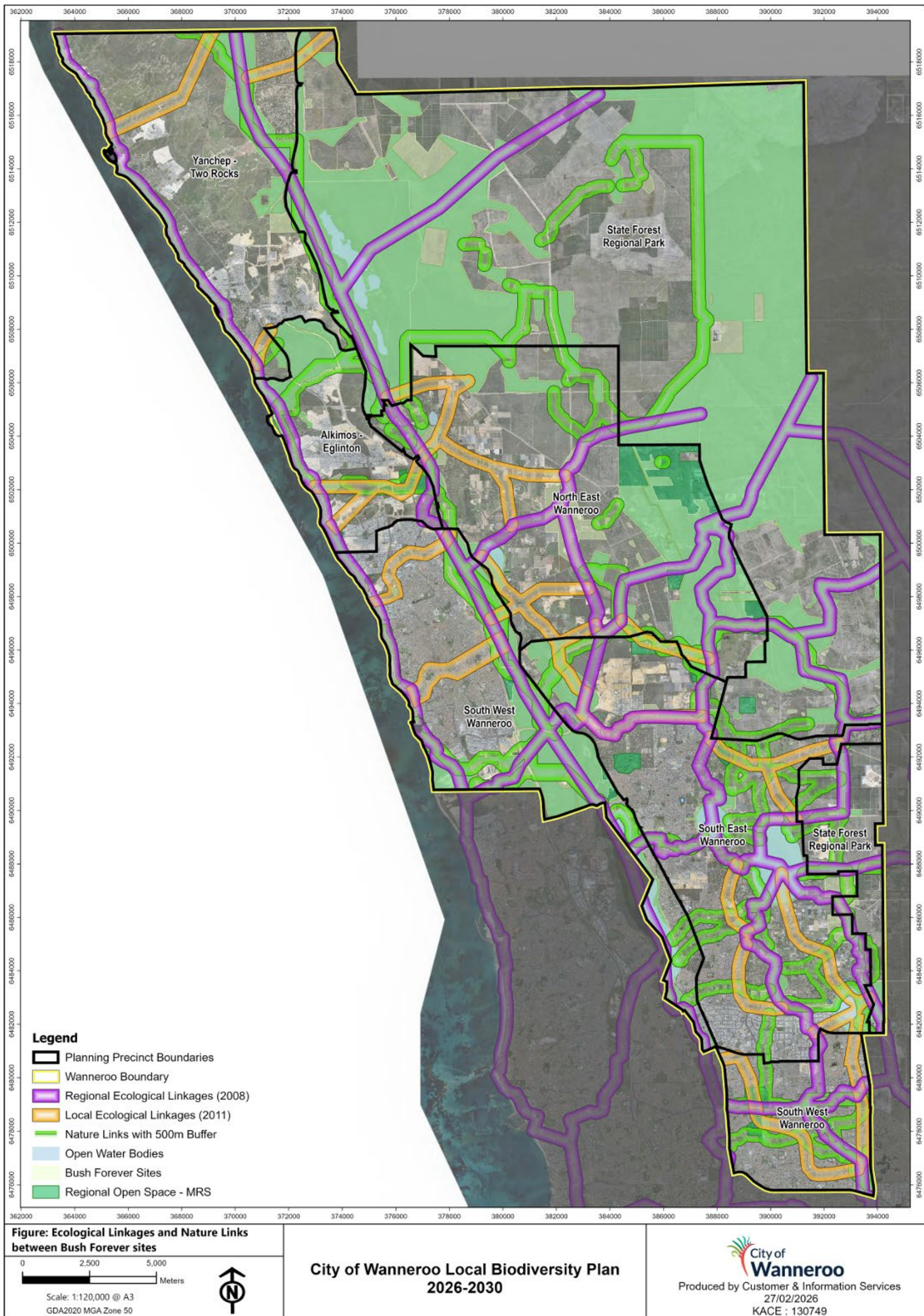


Figure 11: Regional, local ecological linkages including Perth Naturelinks

10 Threats to Biodiversity and Opportunities for Improvement

The City of Wanneroo is experiencing rapid urbanisation and land use change resulting in loss of vegetation and habitat. Climate change, invasive species, pollution and resource extraction increase the pressures on biodiversity not only on a global level but also on a local scale. Multiple pressures create cumulative impacts that amplify threats to our environment, and abrupt changes in ecological systems have been recorded in the past five years. (Cresswell ID, Janke T & Johnston EL (2021))

The key threats to biodiversity in the City of Wanneroo include:

- Clearing of vegetation and land use change
- Habitat loss
- Habitat fragmentation
- Altered hydrology
- Climate change
- Inappropriate fire regimes
- Uncontrolled access
- Invasive species
- Lack of awareness and scientific prejudice
- Insufficient resourcing, governance and trust
- Lack of corporate knowledge and competing priorities

10.1 Clearing of Vegetation and land Use Change

Extensive land clearing for development across the City is a significant threat to biodiversity. Land clearing fragments remaining habitats, leaving smaller patches more vulnerable to a range of impacts, some of which are discussed below. In the wider area of Southwest WA, land clearing also has specific as well as accumulative implications on the natural environment including:

- Loss of landform feature
- Salinisation of land and inland waters
- Altered water regimes
- Soil erosion
- Eutrophication and
- Increased greenhouse gas emissions

A key issue is the scientific tendency toward *botanical and taxonomic exceptionalism* – focusing narrowly on rare or ‘special’ species. This approach often justifies clearing vegetation on the basis that no threatened species are present, implying common vegetation is expendable. Over time, this leads to incremental loss of widespread but ecologically important vegetation, ultimately pushing once-common types toward rarity. It also overlooks the broader ecological, landscape and resilience benefits provided by so-called non-exceptional native vegetation. Such arguments are frequently used in reports, assessments and tribunal hearings to support development proposals, undermining efforts to protect natural areas that provide significant long-term environmental and community value.

Opportunities: As urban development continues to expand, additional vegetation clearing will take place. Implementing sustainable land use planning and development that prioritises biodiversity can play a crucial role in preserving functional natural areas and ecological connections. The *Planning and Development Act 2005* recognises that biodiversity must be considered in development projects.

Through identification of priority LNAs the LBP can guide the strategic retention of vegetation. Although the Department of Planning, Lands and Heritage, in conjunction with other state departments, oversees strategic land use planning and zoning provisions, the City can influence outcomes at the local level through the Local Planning Scheme, and with local planning policies (LPPs) and local development strategies.

The City's ability to influence the protection of biodiversity may be limited depending on which stage of the planning process that decisions are made. Freehold tenure of land and intensive land-use zonings under the MRS such as urban and industrial pose the greatest constraints to the protection of natural areas. District (Local) Planning Schemes are important as a statutory planning tool in its statutory provisions on biodiversity conservation.

See Table 19: Actions

Protection: **Action 1.1-** Strategic planning, Scheme

Protection: **Action 1.3-** Strategic planning, Policy

Protection: **Action 1.4-** Strategic planning, Surveying

Protection: **Action 1.5-** Strategic planning/Assets planning, Conservation, Ecological linkages

Protection: **Action 1.9-** Planning, Conservation classification and management orders

Education, Community capacity building and Internal Processes: **Action 5.1-** Private landowners

Education, Community capacity building and Internal Processes: **Action 5.2-** Private landowners, LNA

10.2 Habitat Loss and fragmentation

Habitat loss occurs when the spatial extent of natural environments is cleared, altered or degraded. Land clearing and fragmentation of vegetation into isolated pockets makes it harder for plants and animals to move, share genes, and re-populate or colonise isolated and degraded habitats. Habitat loss and fragmentation are interrelated and often occur concurrently.

Loss of habitat reduces the viability of all native fauna species and therefore contributes to biodiversity decline and species extinction, both locally and regionally. Habitat fragmentation from urban development isolates species populations, making it harder for them to find food, mates and shelter, and generally increasing their vulnerability to a wide range of impacts (Liu Z, 2016). Additionally, the smaller a habitat becomes the more prone it is to external and internal impacts, including weed invasion, feral pests, fire and human disturbance. This is particularly the case where small, fragmented habitat is surrounded by urban development.

Opportunity: To assist in mitigating these impacts, integrating green spaces, through urban greening for biodiversity initiatives and wildlife corridors/stepping stones, into urban planning is essential for preserving and enhancing biodiversity within city environments.

See Table 19: Actions

Protection: **Action 1.3-** Strategic Planning, Policy

Urban Greening for Biodiversity: **Action 4.1-** Urban greening for biodiversity – Naturelinks

Urban Greening for Biodiversity: **Action 4.2-** Urban greening for biodiversity- City managed areas

Managing heritage sites in natural areas can sometimes conflict with conserving local wildlife, especially when non-native plants are preserved for their historical value. It's important to find a balance between preserving heritage and protecting native species. Additionally, farming practices like overgrazing and soil compaction by livestock can harm the environment, leading to issues like erosion and loss of vegetation. Using proper grazing methods and stocking rates assists in mitigating these issues.

See Table 19: Actions

Protection: **Action 1.10-** Planning, Livestock management

10.3 Altered Hydrology

Urbanisation and changes in how land is used can seriously affect the water quality and supply. Shifts in how groundwater is used and replenished, such as using less groundwater, lower evapotranspiration, more hard surfaces (like concrete), new drainage systems and changes in land levels, can all impact how wetlands function. These changes often cause groundwater levels to rise. As water levels are altered, vegetation may be affected as many plants are dependent on a particular water level and can only tolerate fluctuations for a period. This in turn effects fauna species dependant on vegetation and wading habitats.

As stormwater moves through urban areas, it picks up litter, chemicals, nutrients and sediments before entering natural water bodies. This pollution can harm the water quality in wetlands. As urban development grows, stormwater flows increase, raising the risk of water pollution.

Opportunity: As urbanisation continues, it is important to ensure wetland health and ecological function is maintained. As part of the planning process, district and local water management strategies and urban water management plans should be undertaken to guide development and assess wetland categories, boundaries and buffers and ensure wetland function and health is maintained and protected. There is also opportunity to restore biodiversity values dependent on hydrological subsurface and surface water balances, particularly through urban water management plans intentionally devised to: (i) enhance existing wetland environments; (ii) avoid adverse impacts on wetland water regimes – e.g. inundating peripheral/fringing vegetation; (iii) diverting surplus water into re-created artificial wetland environments that include habitat values.

See Table 19: Actions

Restoration: [Action 2.4- Planning/assets, Urban water](#)

10.4 Uncontrolled Access

Unregulated vehicle activities like trail biking and four-wheel driving can damage natural areas by disturbing vegetation, compacting soil, spreading diseases such as dieback and disrupting fauna. Aerial imagery reveals significant degradation of coastal dunes from such activities. Similarly, uncontrolled pedestrian access leads to vegetation trampling, habitat disruption, soil erosion, and diminished landscape aesthetics. Illegal dumping of garden waste, soil and rubbish introduces weeds and pathogens, further threatening these environments.

Opportunity: Focusing on prevention (reducing access and dumping opportunities) alongside rapid response and site rehabilitation, the City can reduce ongoing vegetation loss, soil disturbance, erosion, weed/pathogen introduction (including via dumped garden waste) and fauna disturbance.

See Table 19: Actions

Conservation: [Action 3.17- General management](#)

10.5 Invasive Species

Weeds, pests and pathogens are a key threat to biodiversity in Western Australia causing a decline in native species populations due to changes in competition, predation, mortality or habitat degradation by introduced species. (Department of the Environment, Water, Heritage and Arts, 2009)

10.5.1 Feral animals and insects

Feral animals such as rabbits, foxes and cats exist throughout the City and can significantly impact vegetation and wildlife.

Feral rabbits compete with native wildlife, as well as damage and degrade land. They can prevent regeneration of plants by eating seeds and seedlings. The City monitors rabbit populations and impacts and undertakes control when required.

Foxes are a problem in the City's reserves, posing a major threat to local wildlife. They are predators of turtles found in several of the City's wetlands, as well as ground-nesting birds and small to medium-sized mammals such as quenda, wallabies, and young kangaroos. Predation by the European fox is officially listed as a key threatening process under the Commonwealth EPBC Act.

According to the research undertaken by the Threatened Species Recovery Hub, feral cats in Australia eat about 2 billion reptiles, birds, frogs and mammals each year and over one billion invertebrates. Mammals are the most commonly eaten of these prey items with more than one billion mammals killed by cats in Australia every year. Pet cats that roam and hunt kill an additional 390 million mammals, birds and reptiles annually. (Woinarski, Murphy, & Legge, 2020).

In 2023 The City of Wanneroo Cat Local Law 2016 was repealed and replaced with the City of Wanneroo Cats Law 2023. This law includes prohibition of cats in 28 key parks and reserves.

The City carries out feral animal control focusing on rabbits, foxes and cats in strategically selected City-managed conservation areas. Details on control locations and target species is available to the community on the City's website.

Polyphagous Shot-hole Borer (PSHB), native to Southeast Asia, is a tree-boring beetle that has a symbiotic relationship with a *Fusarium* fungus. Detected in Perth in 2021, the PSHB cultivates this fungus inside plants as a food source for themselves and their larvae. In susceptible trees, the fungus kills the tree by restricting the movement of water and nutrients. This causes symptoms such as Fusarium dieback and eventually tree death. The beetle also causes structural damage by creating tunnels, known as galleries, throughout the plant. Many of the tree species both native and non-native found in the City are hosts to the PSHB, including some key Banksia species and Tuarts that are associated with Threatened Ecological Communities.

The City is collaborating with the Department of Primary Industries and Regional Development (DPIRD) to combat the PSHB through a coordinated response to eradicate the borer. Staff are being trained to identify PSHB activity and raise awareness of the potential impacts of the PSHB within the community.

Opportunity: It is important to continue to monitor and control the impacts feral animals and insects have on biodiversity. Control methods are continuously evolving and new threats that may develop in the future. It is important to develop formal guidelines for management.

See Table 19: Actions

Conservation: **Action 3.8-** Planning and Process Pathogen, Disease, Pest and Invasive Species management

Conservation: **Action 3.9-** Planning and Process Pathogen, Disease, Pest and Invasive Species management

10.5.2 Weeds, Pathogens and Diseases

Weeds often respond positively and rapidly to land or habitat disturbance such as clearing, rubbish dumping, trampling and fire events. Weeds create many issues for biodiversity within the City including:

- Competition with native vegetation by inhibiting growth and displacing native species
- Reducing the native vegetation available to fauna for habitat and foraging
- Replacement of diverse native plant communities with more uniform weed communities
- Inhibiting native plant regeneration through long competition
- Changing nutrient cycling of native communities
- Altering soil acidity
- Weeds may also increase bushfire risk through adding to fuel loads

Pathogens or diseases are more likely to occur in native areas and have negative impacts when the site is highly fragmented and experiences high amounts of human disturbances. *Phytophthora* (Dieback) is a disease caused by the introduction of a water mould which lives in soil and plant tissue and kills up to 40 per cent of our native jarrah forest plant species and is required to be managed under the *Environment Protection and Biodiversity Conservation Act 1999* and the *Environmental Protection Act 1986*. Dieback is spread by animal and human vectors and therefore it is important to manage illegal activities and access into the City's natural areas.

Opportunity: It is important to monitor and control the impacts weeds, pathogens and diseases have on biodiversity. Control methods are continuously evolving and new threats that may develop in the future. It is important to develop formal guidelines for management.

See Table 19: Actions

Conservation: **Action 3.7-** Planning and Process Pathogen, Disease, Pest and Invasive Species management

Conservation: **Action 3.9-** Planning and Process Pathogen, Disease, Pest and Invasive Species management

10.6 Climate Change

Climate change is reshaping ecosystems by altering species distribution, interactions and the timing of natural events. These changes can disrupt food webs and exceed ecosystems' capacity to withstand extreme events such as bushfires, sea level rise, floods and droughts. Understanding the long-term impacts of a changing climate on local biodiversity is crucial, especially as rising temperatures, frequent fires and species displacement become more common.

For the City, this poses specific challenges: rural lands and bushfire-prone settlements, groundwater-dependent industries and vulnerable coastal areas facing erosion. Rising greenhouse gas levels are contributing to these effects and the City is responding through its Climate Change Adaptation and Mitigation Strategy, future Decarbonisation Plan and Draft Environment and Sustainability Strategy.

Opportunity: Protecting biodiversity increasingly depends on the effective integration of climate change mitigation and adaptation into strategic planning and on-ground management. Mitigation measures that reduce greenhouse gas emissions and enhance carbon storage can help limit the rate and severity of climatic change, while adaptation planning is required to strengthen ecological resilience to heat, drought, altered fire regimes and sea level rise. Together, these approaches support the long-term persistence of species, ecological communities and ecosystem services across the City.

Many of the actions identified in this plan indirectly assist in mitigating the effects of climate change on biodiversity in the City through:

- o addressing habitat protection and connectivity, including east-west ecological corridors, and assistance from urban greening for biodiversity, so species can move as conditions shift
- o identifying and prioritising protection of cooler, wetter, shaded, groundwater supported, coastal, riparian and wetland refuges that buffer heat and drought
- o managing wetlands, buffers, groundwater regimes and stormwater design carefully to reduce amplification of drying and salinity risks
- o maintaining multiple populations across the landscape to preserve adaptive capacity, avoiding isolated remnants
- o focus on ecological processes and not just single species movement away from exceptionalism concepts in planning
- o fire regime management plan for increased fire frequency/intensity; protect long-unburnt habitat from intense fire, manage post-fire weeds, and avoid fuel treatments that overly simplify habitats
- o intensifying conservation attention to threatened species/communities and ecosystems already below extent/condition thresholds – these are least able to absorb further climate stress.

Opportunity: Several plans are already in place, such as the Urban Forest Strategy and Coastal Hazard Risk Management and Adaptation Plan. The Local Biodiversity Strategy will further support the City's climate resilience and environmental goals.

See Table 19: Actions

Urban Greening for Biodiversity: **Action 4.3-** Climate change

Urban Greening for Biodiversity: **Action 4.4-** Climate change

10.7 Fire Management

Fire management is essential to reduce the risk of out-of-control bushfires that can be disastrous to life, property and the environment. Fire mitigation conducted in an appropriate manner can be beneficial to the biodiversity of an area. Inappropriate fire management can be detrimental.

Frequency of fire, the season, intensity, pattern and post-fire environmental conditions can affect how well a natural area responds to a fire event. Fire and its effect on the environment is complex and impacts may be greater because of many factors working together. (Department of Environmental Regulation , 2015)

Burning events that are too frequent or burn too intensely have a devastating effect on biodiversity values in bushland and foreshore reserves. Fire frequency affects the composition and structure of vegetation which in turn affects the habitat available for local fauna. Frequent fire leads to both flora and fauna extinction and allows domination of non-native species to the detriment of the local environment.

Fires reduce vegetation cover and can release nutrients, which provides ideal conditions for weed growth. Weed control after a fire event is very important for survival of the bushland and to reduce future fuel load. Fire also results in a significant reduction in important habitat for fauna, such as above ground material including leaf litter and logs. Supplementary habitat for fauna, such as quenda bungalows may assist in fauna conservation after a fire.

To retain vegetation diversity, intervals between fires must be long enough to allow certain plant species to set seed before the next fire. Biodiversity is greatest where habitat heterogeneity (represented by a wide range of post-fire successional stages in the vegetation) is maximised. (Department of Environmental Regulation , 2015). This means that a variety of fire ages in natural areas is important, with a mosaic of recent burns and long unburnt areas.

Other fire mitigation measures can reduce total vegetation and conservation viability, reduce the species diversity, remove critical habitat and increase edge effects, including weed growth and erosion, particularly in already fragmented landscapes. Careful consideration needs to be undertaken to ensure biodiversity at all levels is not lost beyond repair.

Cultural burning practices developed by Aboriginal people can have positive effects on biodiversity. The practice applies fire at the right season and the right time to ensure slow burns, low-flame height to preserve tree canopy, create mosaics, allow insects and animals to avoid fire fronts, support seed germination, avoid adverse impacts on soil nutrients and take account of flowering and nesting seasons.

The City's natural landscapes have been significantly altered due to urbanisation, climate change, introduced flora and fauna and fragmentation. This landscape requires a diverse land management approach using a hybrid of traditional and contemporary techniques. (Bushfire Centre of Excellence, Department of Fire and Emergency Services, 2021).

The City's *Bushfire Risk Management Plan 2025-2027* (City of Wanneroo, 2025) is consistent with the *State Emergency Management Policy 3.2 – Emergency Risk Management Planning* and is a strategic integrated approach to manage bushfire risk in the City. While it is primarily a document to assist in

fire mitigation, it has consideration for the biodiversity values and references several environmental legislative documents including the City's strategic documents and local biodiversity. The *Bushfire Risk Management Plan* also takes into consideration the impacts of fires on environmental assets and states that any significant damage to an environmental asset is a major consequence and any permanent damage is categorised as a catastrophic consequence.

Whilst conservation of biodiversity and bushfire mitigation often conflict, it is important to recognise that the City is predominantly located in an area designated as bushfire prone. Even though bushfire risk is a complex threat, there is legislation and an obligation to consider biodiversity values in bushfire mitigation programs on all land tenures.

Opportunity: Ensuring fire mitigation practices consider biodiversity outcomes is essential for the long-term conservation of the City's natural areas. Poorly considered or excessive clearing and removal of vegetation is not supported and is contrary to the biodiversity target set in the City's Council Plan. Asset protection areas (i.e. firebreaks and fire management access tracks, etc.) should be established outside of newly proposed conservation areas and viability of conservation reserves maintained with guidance from LPP 1.1 Conservation Reserves.

Opportunity: Ensure fire mitigation practices and methods are continually informed by ongoing research into avoidable fire impacts on ecological communities. Frequency and type of fire mitigation practices should not lead to the local extinction of flora and fauna species, significantly degrade the condition of the vegetation, permanently reduce tree canopy or form small pockets of unviable natural areas.

Opportunity: Where fire management activities cause, or are likely to cause, permanent damage or degradation to natural areas, an independent best-practice review of fire management will assist in compliance, identify actions and promote continuous improvement of operational procedures to achieve best balance of fire management and biodiversity outcomes.

Opportunity: Building relationships with indigenous community experts to enhance knowledge of traditional cultural fire control practices – and how these principles may assist in fire mitigation practices in today's landscape setting – should occur.

Opportunity: Building knowledge on the effects of fire on TECs and Threatened and Priority Flora and Fauna – and how this knowledge can be applied to inform fire management best practice to enhance biodiversity protection and minimise unnecessary environmental disturbance – would greatly improve conservation outcomes.

See Table 19: Actions

Protection: **Action 1.11-** Planning/Conservation, Fire Management

Conservation: **Action 3.10-** Fire management

Conservation: **Action 3.11-** Fire management

Conservation: **Action 3.12-** Fire management

Conservation: **Action 3.13-** Fire management

Conservation: **Action 3.14-** Fire management

Education, Community Capacity Building and Internal Processes: **Action 5.8-** Internal Processes-Fire management

10.8 Lack of awareness

Increasing knowledge and awareness of local biodiversity within the community is critical in improving sustainable behaviours and attitudes towards the natural environment. Community awareness allows the execution of actions required for meaningful change by individuals, landowners and groups. The City has an important role in promoting environmental awareness, engaging the community in biodiversity conservation and educating the public, schools, universities and businesses.

Property owners can have a strong sense of ownership regarding what they believe to be appropriate actions to undertake on private property. This includes clearing native vegetation without complying with the City's regulations and state and federal laws. This leads to unapproved and illegal clearing on private property.

Opportunity: Engage with private landowners whose properties contain native vegetation, especially rural and rural residential landowners, to provide information on natural vegetation protection and advice on clearing controls and approvals, as well as compliance with relevant legislation. Consideration of the retention of native vegetation through community programs, using incentives to contribute to meaningful change.

See Table 19: Actions

Education, Community Capacity Building and Internal Processes: **Action 5.1-** Private landowners

Education, Community Capacity Building and Internal Processes: **Action 5.2-** Private landowners

Education, Community Capacity Building and Internal Processes: **Action 5.3-** Private landowners, Wetlands

Education, Community Capacity Building and Internal Processes: **Action 5.4-** Illegal Clearing

Opportunity: An allied opportunity to the above is a general outreach program to raise overall sustainability awareness, as it relates to all aspects of sustainable living. A culture change in this domain would help support the community's general attitude to wider attempts to protect the environment and take responsibility for their actions.

See Table 19: Actions

Education, Community Capacity Building and Internal Processes: **Action 5.5-** Education and Community Capacity Building

10.9 Resourcing, Governance and Trust

Verification of natural areas on private property and areas of development will require a high level of ecological expertise. Resourcing constraints (staff and budget) often means local government is unable to verify every natural area within a development proposal. It is important for local governments to prioritise natural areas based on the potential values of the site to determine which areas may need site verification.

A governance matter of concern is failure to implement or enforce adopted policies and guidelines. Local Planning Policies (LPP) for Public Open Space (LPP 4.3), Conservation Reserves (LPP 1.1), Wetlands (LPP 4.1) for example, all provide detailed provisions that, if implemented and enforced, would achieve many biodiversity protection and retention objectives. This brings into sharp focus the need for improved governance and effective implementation of environmental protection policies and guidelines.

With respect to the planning system and the development industry – stakeholders to whom many of these instruments primarily apply – there is a clear need for the planning approvals process to respond more effectively. In practice, the frequently applied planning principle of “giving due regard to” relevant objectives under other legislative or policy frameworks too often results in only cursory consideration, followed by nominal acknowledgement and dismissal. This practice should be addressed as a matter of urgency. The planning approvals process, including related governance and review bodies such as the State Administrative Tribunal, must be more consistently responsive to documented environmental protection imperatives.

Opportunity: Actions developed through the LBP will require prioritisation and resourcing to implement. The City will require business cases to align with its long-term financial plan and Council Plan. How limited environmental and sustainability capabilities within the City can be deployed to best achieve the actions set in this Plan needs to be considered.

See Table 19: Actions

Education, Community Capacity Building and Internal Processes: **Action 5.11-** Internal Processes, Resourcing

Implementation of the Strategy will be monitored, with an annual progress report prepared and submitted to the Executive Management Team.

A comprehensive review of this Local Biodiversity Plan is anticipated in 2031, with a subsequent Local Biodiversity Plan for 2031-32–2035-36 to be developed and implemented.

10.10 Corporate Knowledge and Internal Processes

A live biodiversity data system is needed to retain corporate knowledge, manage staff turnover, and keep records current as environmental conditions and conservation assets change. Knowledge held by community volunteer groups and research organisations should also be routinely captured and recorded to support effective biodiversity management across City reserves. Earlier consideration of environmental and sustainability factors needs to be considered and better understood to streamline internal processes.

Opportunity: Formalisation of databases and mapping is important to transfer and retain information important for the management and conservation of the City's natural areas.

See Table 19: Actions

Education, Community capacity building and Internal Processes: **Action 5.7-** Internal processes, collaboration

Education, Community capacity building and Internal Processes: **Action 5.9-** Internal processes, Data

Education, Community capacity building and Internal Processes: **Action 5.10-** Internal processes, Data

11 Biodiversity Conservation by Planning Precinct

The City has been divided into six biodiversity planning precincts - each presenting with different opportunities for biodiversity planning.

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11.1 Yanchep-Two Rocks

The Yanchep-Two Rocks Biodiversity Planning Precinct covers an area of approximately 7,080ha, with the boundary determined using the *Yanchep-Two Rocks District Structure Plan* (Structure plan No. 43). The precinct is bounded by Yanchep National Park, the Wilbinga National Park (in the Shire of Gingin) and the coastline and contains the suburbs of Yanchep and Two Rocks as shown **Figure 12 a)**. This precinct has seen significant urban development recently that is expected to undergo further development in the future. A large proportion of area in the Two Rocks area already has structure plan approval as shown in **Figure 12b)**.

The precinct contains two vegetation complexes: Quindalup and Cottesloe North. This precinct comprises most the City's extent of the Quindalup vegetation complex. Due to the significant development of the northern corridor of the City, this complex has been drastically reduced by over 4,000ha across the City, of which approximately 3,000ha of vegetation loss has occurred. The extent of each complex within this precinct is detailed in **Table 13**.

Table 13: Remaining Vegetation Complexes within the Yanchep-Two Rocks Biodiversity Planning Precinct

Vegetation Complex	Pre-European Extent in Precinct (ha)	Current Extent in Precinct (ha)
Cottesloe North	1,694	920
Quindalup	5,386	3,091
Total	7,080	4,011

The total area of native vegetation remaining in the Yanchep-Two rocks Biodiversity precinct is 4,011ha. The priority rating of these natural areas is shown in **Figure 12 b)**, which demonstrates variable priorities across the precinct. The most significant high-priority ranking area is associated with regional ecological linkage number 65 circle in **Figure 12c)**.

With further development expected in the Yanchep-Two rocks Precinct, according to zonings in the MRS and DPS, large natural areas are under threat, meaning that the importance of biodiversity is to be considered in the planning and approvals process. A large portion of this precinct already has subdivision approval from the WAPC, but there is also a relatively large area yet to have subdivision approval. Proactive planning, policy and management to conserve Priority 1 and 2 LNAs good or better vegetation quality is needed in this biodiversity planning precinct.

Opportunity: The district structure plan for this area is due for review, with local structure plan 91 for North Two Rocks still draft and under review.

As circled and identified in **Figure 12 (b)**, the protection of a potential east-west linkage south of Two Rocks LSP No.69 should be investigated as part of the review of the Yanchep- Two Rock District Structure Plan, required for completion in 2031.

The relevant authority should also investigate the protection of vegetation, especially in good or better-quality vegetation within the potential east- west local ecological link identified in **Figure 12 c)** during the review of the draft North Two Rocks LSP No.91.

Consideration needs to be given to wildlife connectivity over proposed extensions to major road and rail infrastructure projects.

Protection: **Action 1.5 and action 1.6**

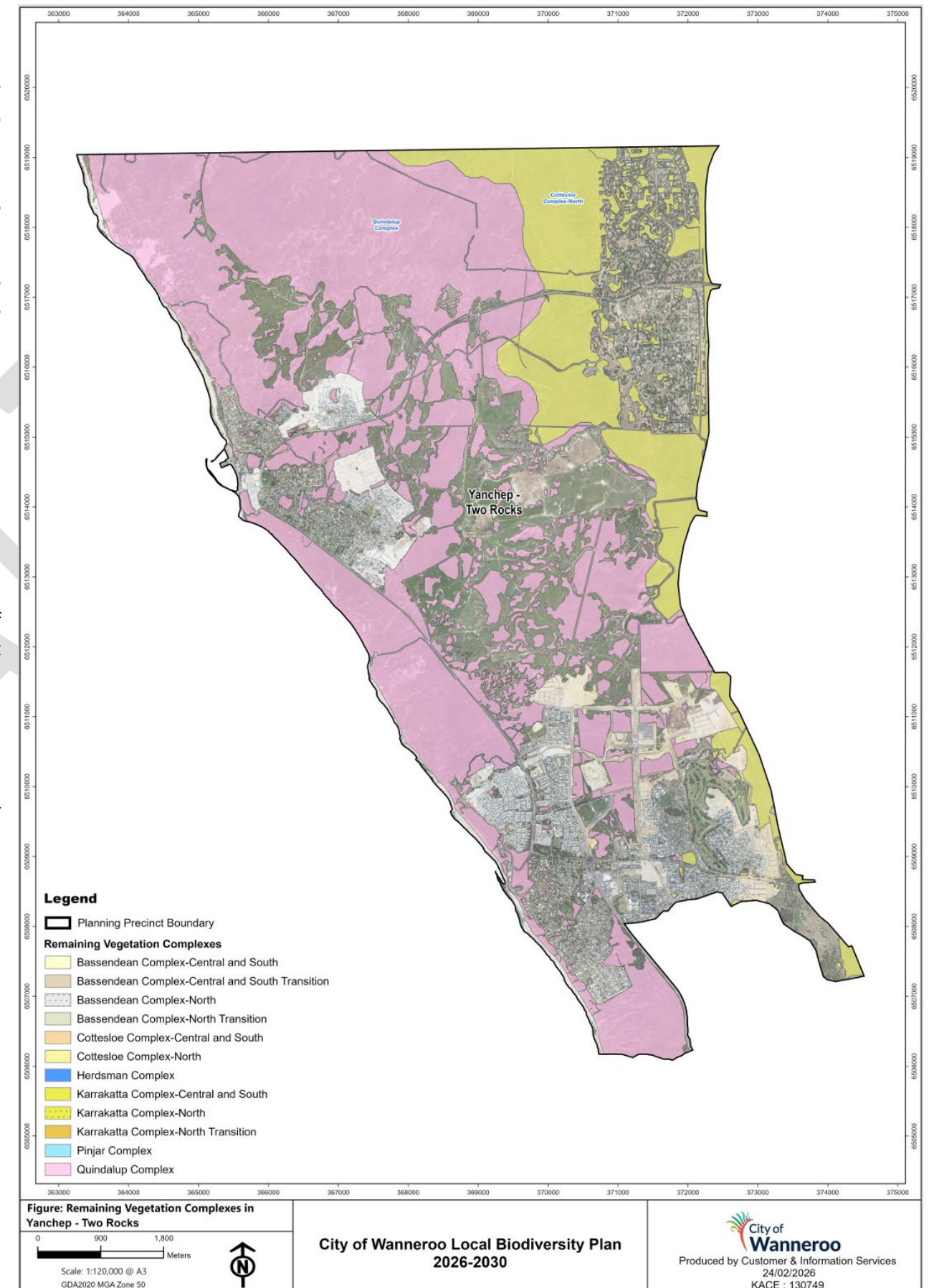


Figure 12: a) Remaining vegetation complexes in Yanchep – Two Rocks

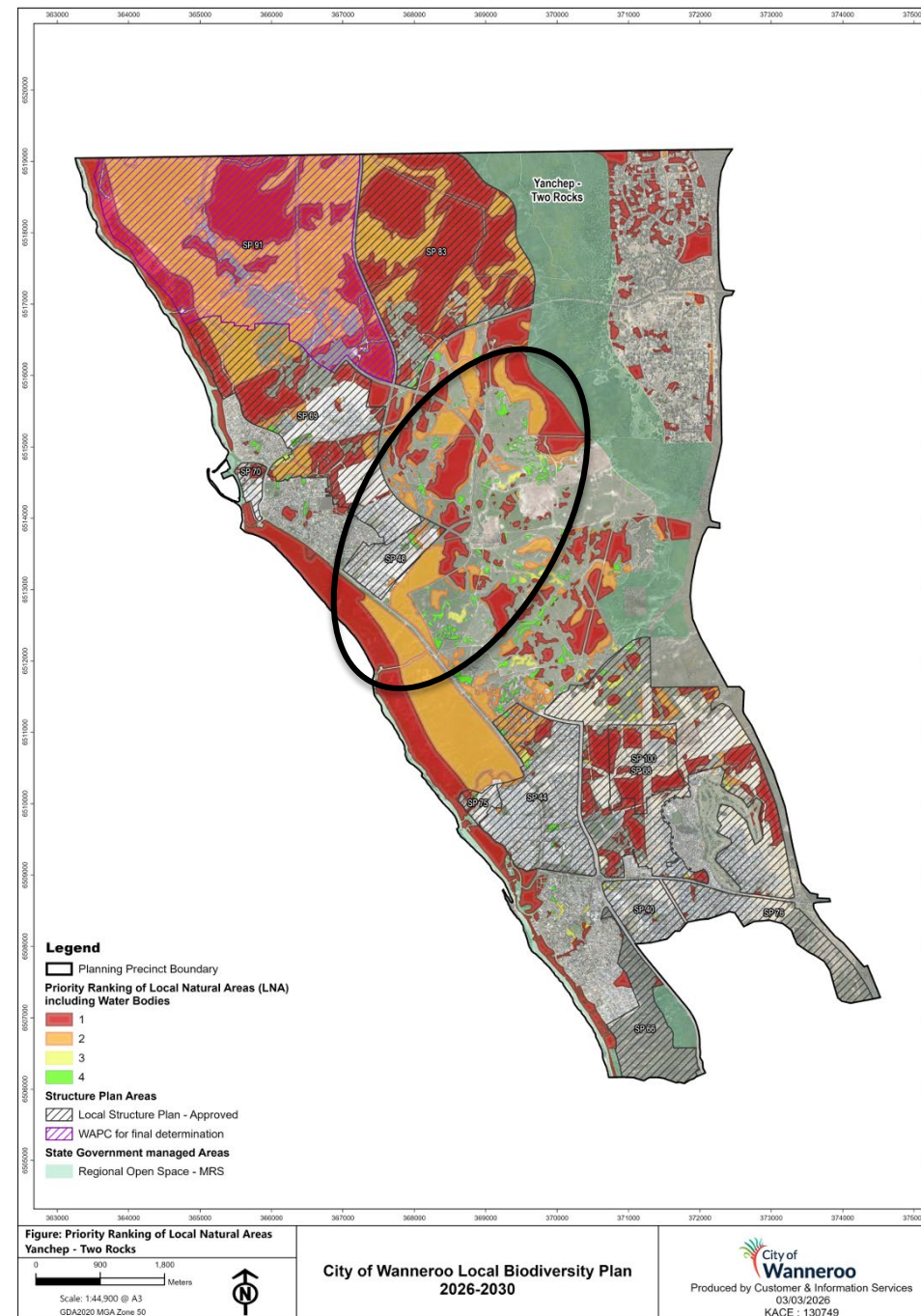


Figure 12: b) Priority ranking of LNA in Yanchep – Two Rocks

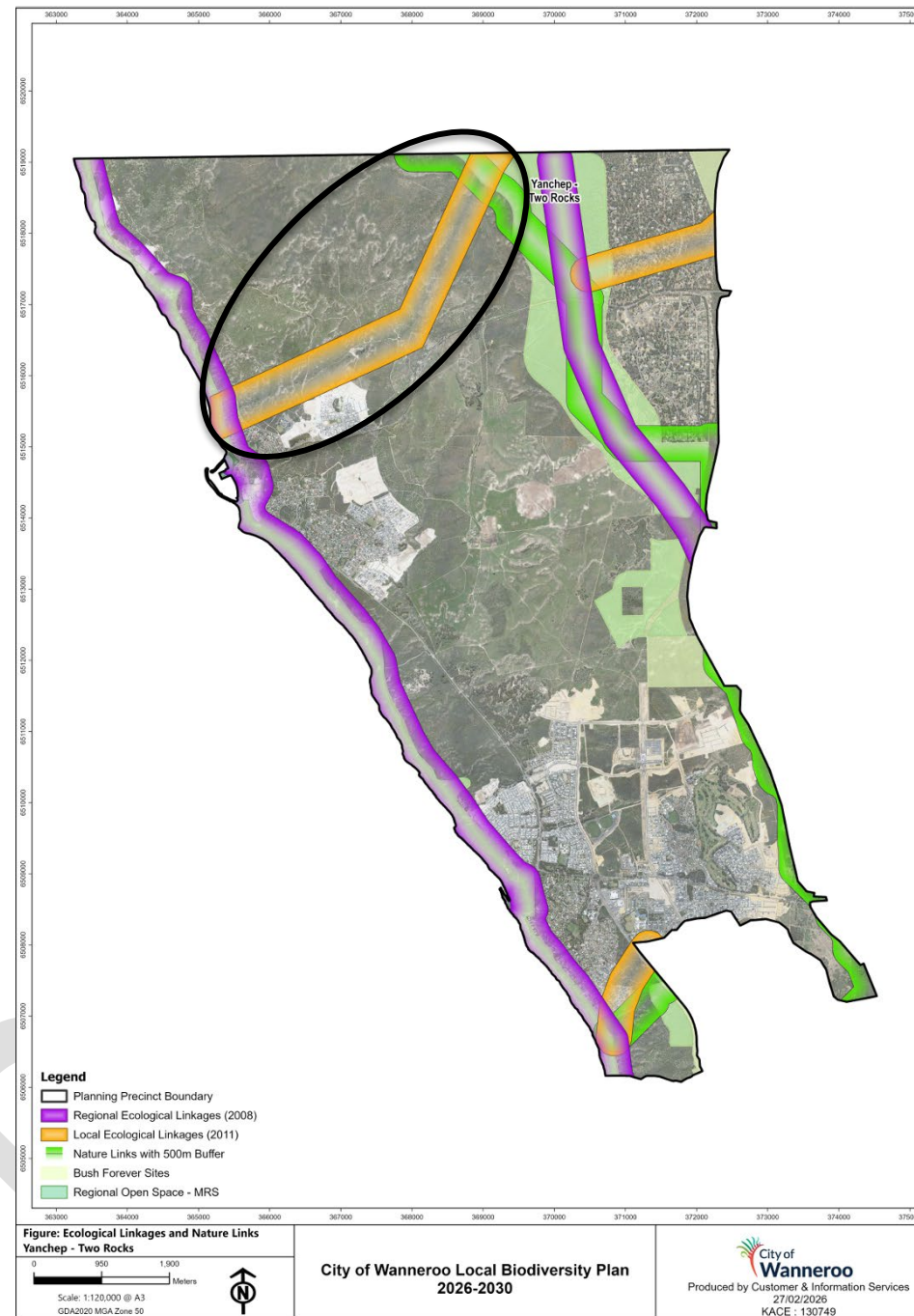


Figure 12: c) Ecological linkages and nature links in Yanchep – Two Rocks

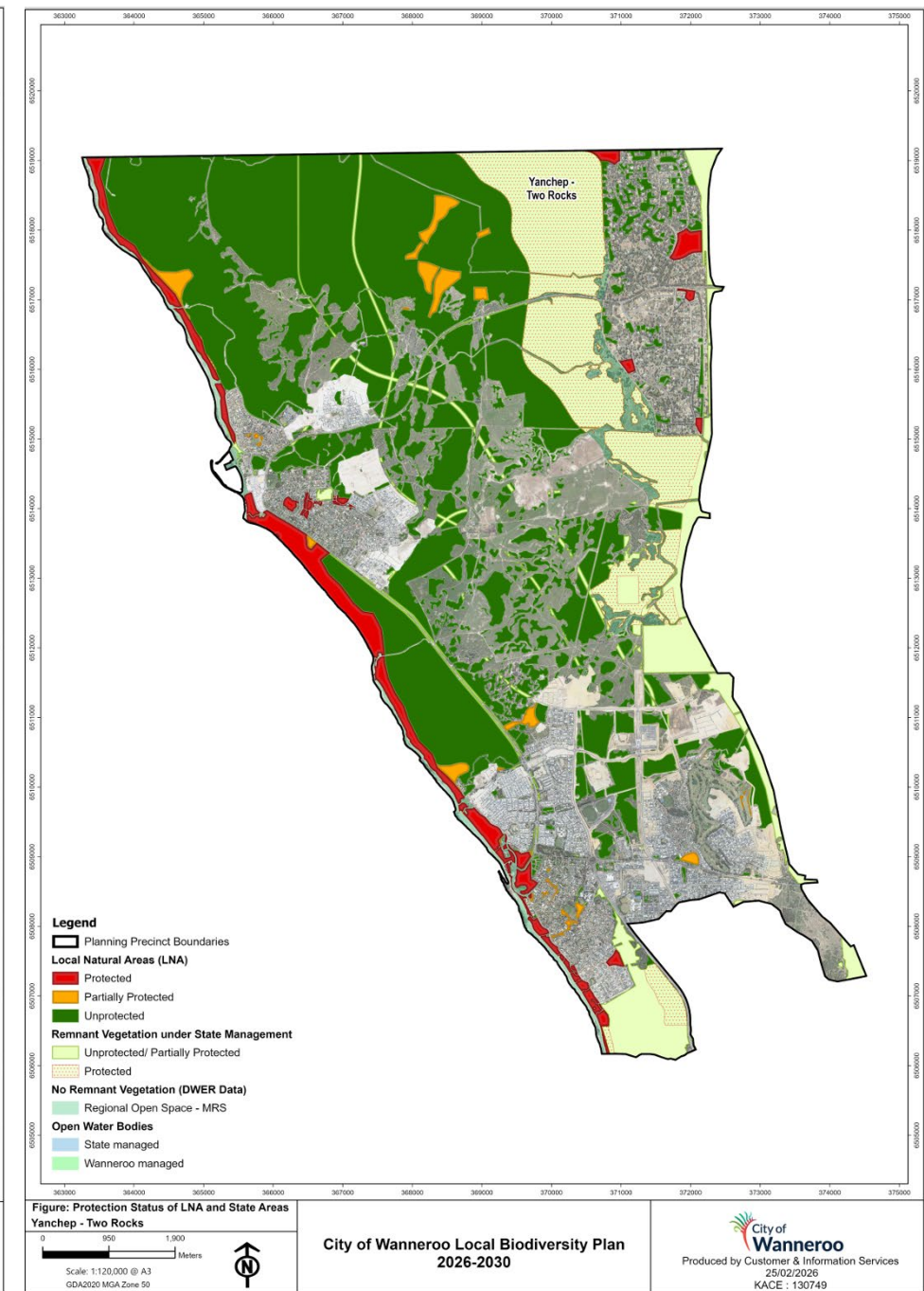


Figure 12: d) Protection status of LNA and state areas in Yanchep – Two Rocks

11.2 Alkimos-Eglinton

The Alkimos-Eglinton Biodiversity Planning Precinct covers an area of approximately 2,953ha and extends 3.5km inland to the recently extended Mitchell Freeway and has a coastal frontage of 7.5km. It encompasses the suburbs of Alkimos and Eglinton, which have undergone recent urban development like the Yanchep-Two Rocks Precinct, resulting in a reduction of natural areas due to residential development. It is expected that urban development will continue in this precinct, with the majority zoned as Urban under the MRS, apart from the Water Corporation Alkimos Water Precinct and large areas of ROS. A large portion of the ecological link to the south will be retained.

The vegetation complexes that occur within the Alkimos-Eglinton Local Biodiversity Precinct include the Cottesloe Central and South, Cottesloe North and Quindalup complexes with a small portion (0.2ha) of the Herdsman complex. The extent is shown in **Figure 13 a)** is detailed in **Table 14**.

Table 14: Remaining Vegetation Complexes within the Alkimos-Eglinton Biodiversity Planning Precinct

Vegetation Complex	Pre-European Extent in Precinct (ha)	Current Extent in Precinct (ha)
Cottesloe Central and South	676	371
Cottesloe North	22	12
Herdsman	0.3	0.2
Quindalup	2,254	1,182
Total	2,953	1,565

The total area of remaining native vegetation in the Alkimos-Eglinton biodiversity precinct is 1,565ha. The natural areas remaining in this precinct is shown in **Figure 13**, with a medium-high average priority ranking across the precinct as shown in **Figure 13b**).

The Alkimos-Eglinton precinct will also be subject to extensive further development, some of which is already in progress. Many natural areas in the precinct already have approved structure plans over them. As circled in **Figure 13 c)** there are two major east-west ecological links where portions of vegetation are proposed to be retained.

Consideration needs to be given to wildlife connectivity over proposed extensions to major road and rail infrastructure projects.

Protection Actions: [1.5](#) and [1.6](#)

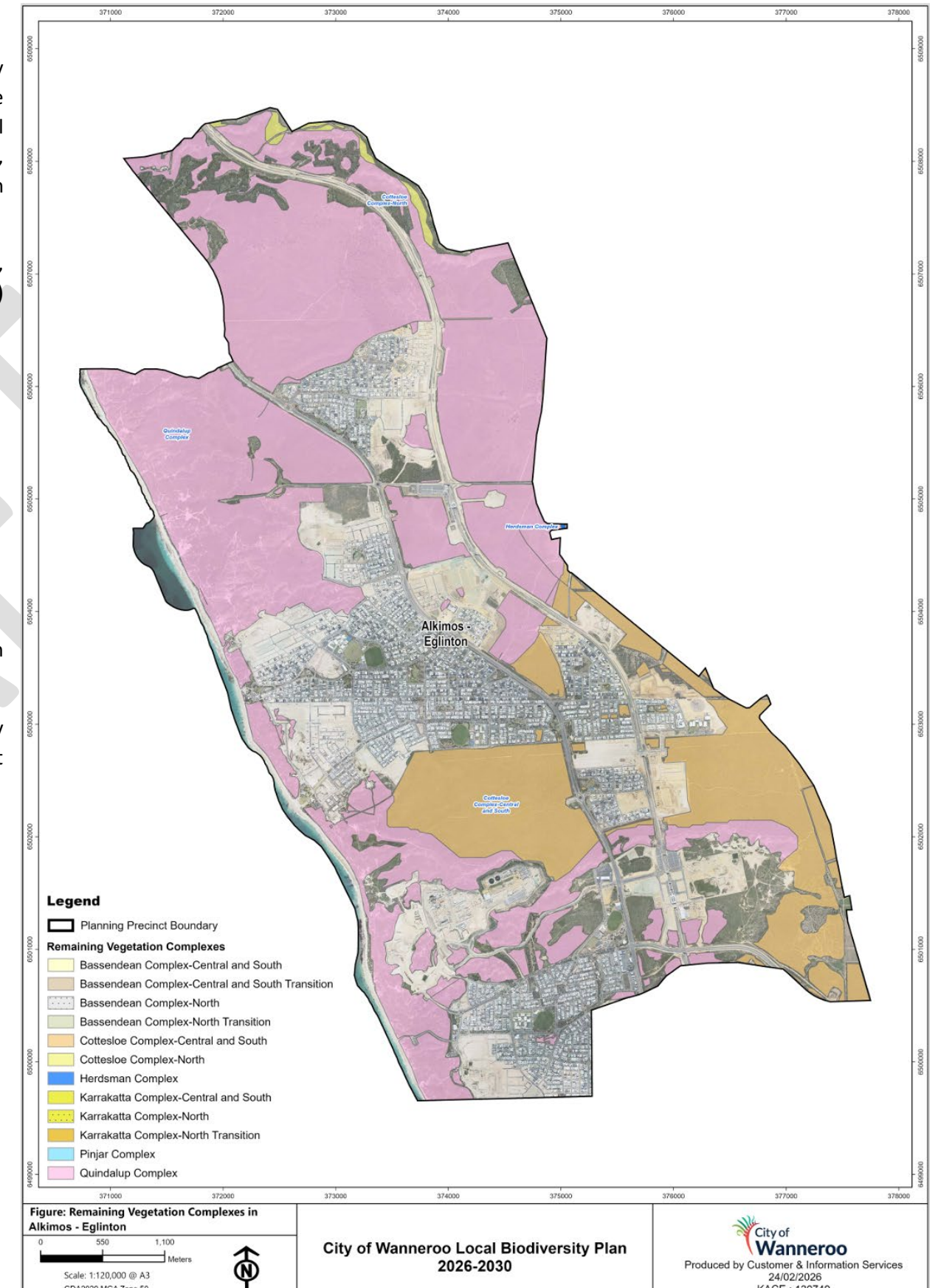


Figure 13: a) Remaining vegetation complexes in Alkimos - Eglinton

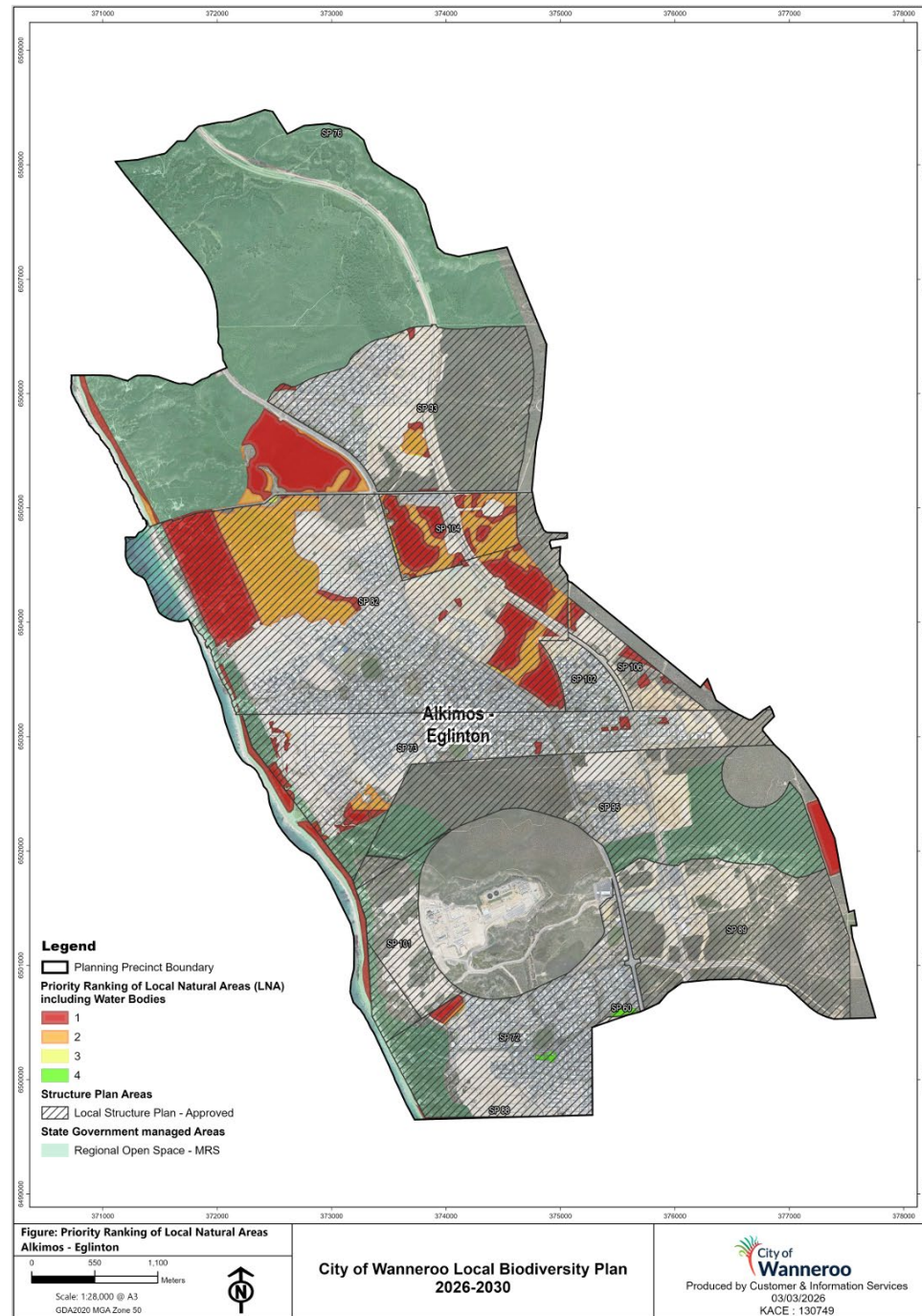


Figure 13: b) Priority ranking of LNAs in Alkimos - Eglinton

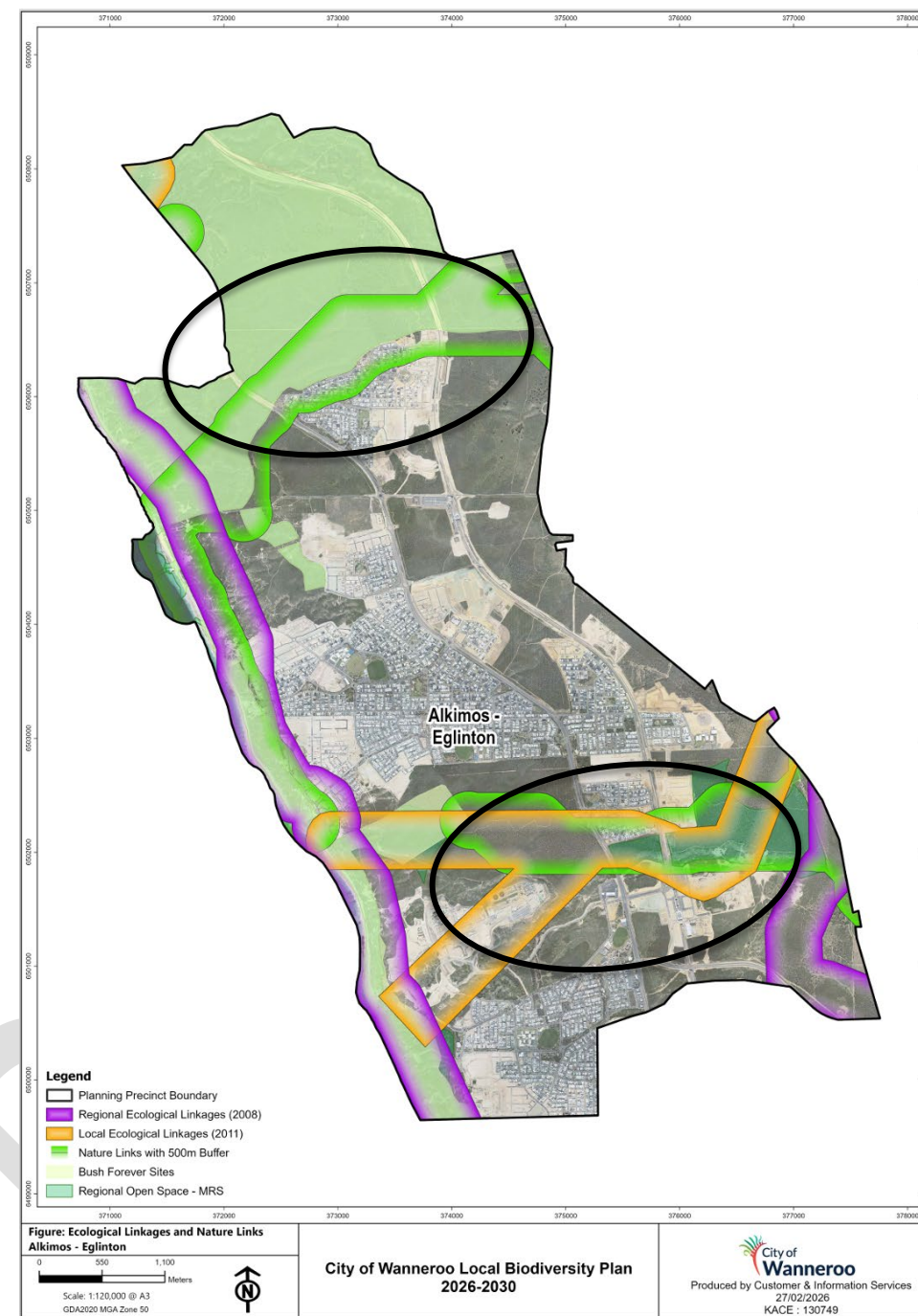


Figure 13: c) Ecological linkages and nature links in Alkimos - Eglinton

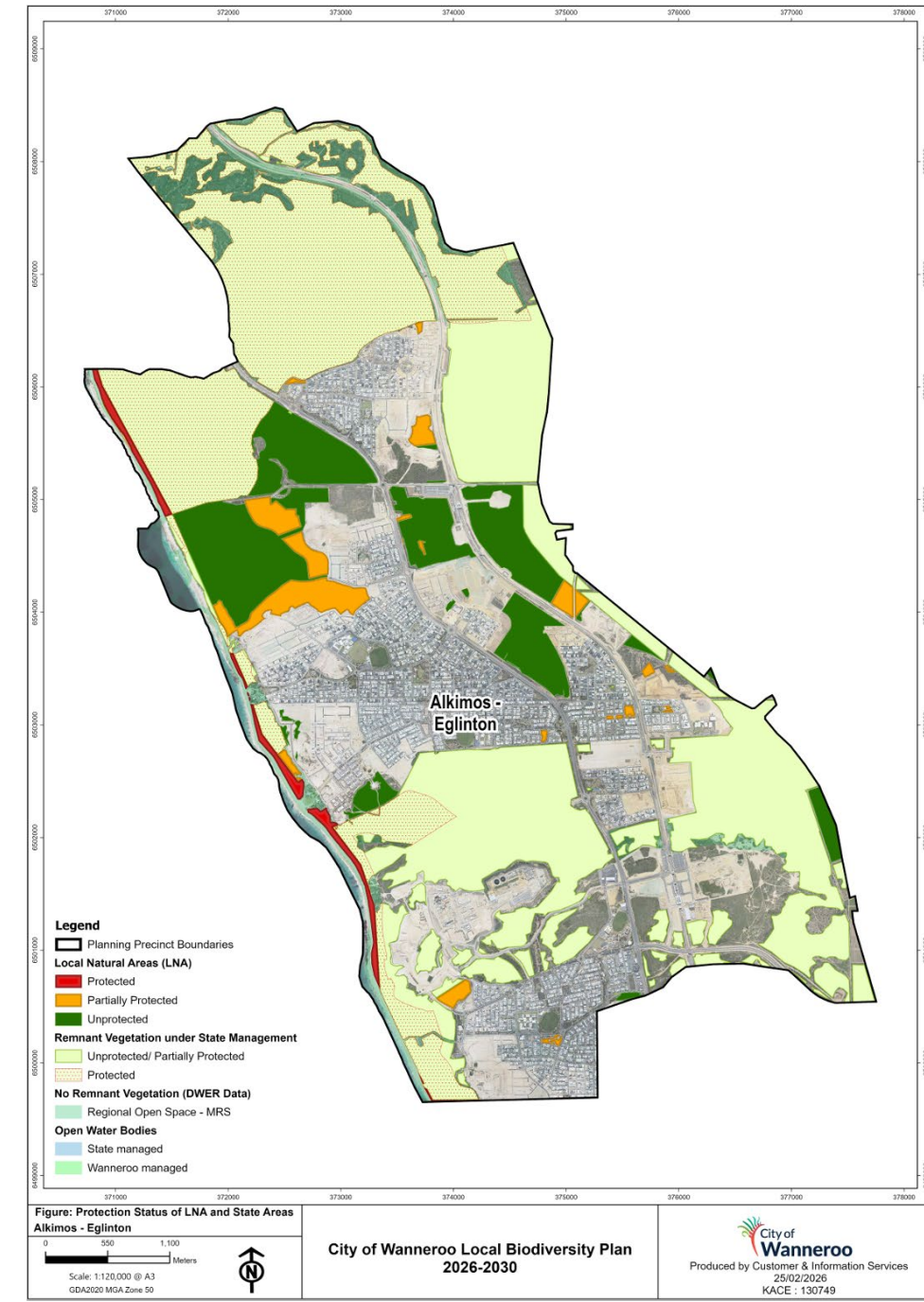


Figure 13: d) Protection status of LNA and state areas in Alkimos - Eglinton

11.3 State Forest-Regional and National Parks

The State Forest-Regional and National Parks Biodiversity Planning Precinct consists mainly of natural areas that already have some form of protection or conservation mainly in state forest, regional and national parks. The precinct also contains small areas zoned general rural under DPS No. 2 most of which is Crown land where some protection is assumed. All vegetation complexes that exist within the City are present in this precinct as shown in **Figure 14 (a)**. The extent of each complex is detailed in **Table 15**.

Table 15: Remaining Vegetation Complexes within the State Forest-Regional Park Biodiversity Planning Precinct

Vegetation Complex	Pre-European Extent in Precinct (ha)	Current Extent in Precinct (ha)
Bassendean Central and South	108	78
Bassendean Central and South - Transition	618	608
Bassendean North	8,086	4,301
Bassendean North – Transition	2,078	1,505
Cottesloe Central and South	1,903	715
Cottesloe North	6,679	4,780
Karrakatta Central and South	416	342
Karrakatta North	717	22
Karrakatta North Transition	5,144	988
Quindalup	2,343	1,813
Herdsmen	403	20
Pinjar	69	65
Total	28,564	15,236

The precinct contains 15,236ha of remaining native vegetation. It should be noted that this precinct has the potential for basic raw material extraction in accordance with *State Planning Policy 2.4: Basic Raw Materials*. This presents uncertainty as to the level of protection this precinct will maintain in the future and may result in some vegetation loss through approved basic raw material operations.

The high proportion of natural areas under existing protection doesn't present many opportunities for increasing the conservation of biodiversity in this area, however, there is opportunity to improve the condition of the natural areas. Maintaining the vegetation already protected in these areas and improving the quality should be the main priority of this precinct. There is opportunity to advocate for the rehabilitation of areas of state forest to maintain the ecological lineage in the north, as shown in **Figure 14 c)**.

Restoration Action: [2.1](#) and [2.2](#)

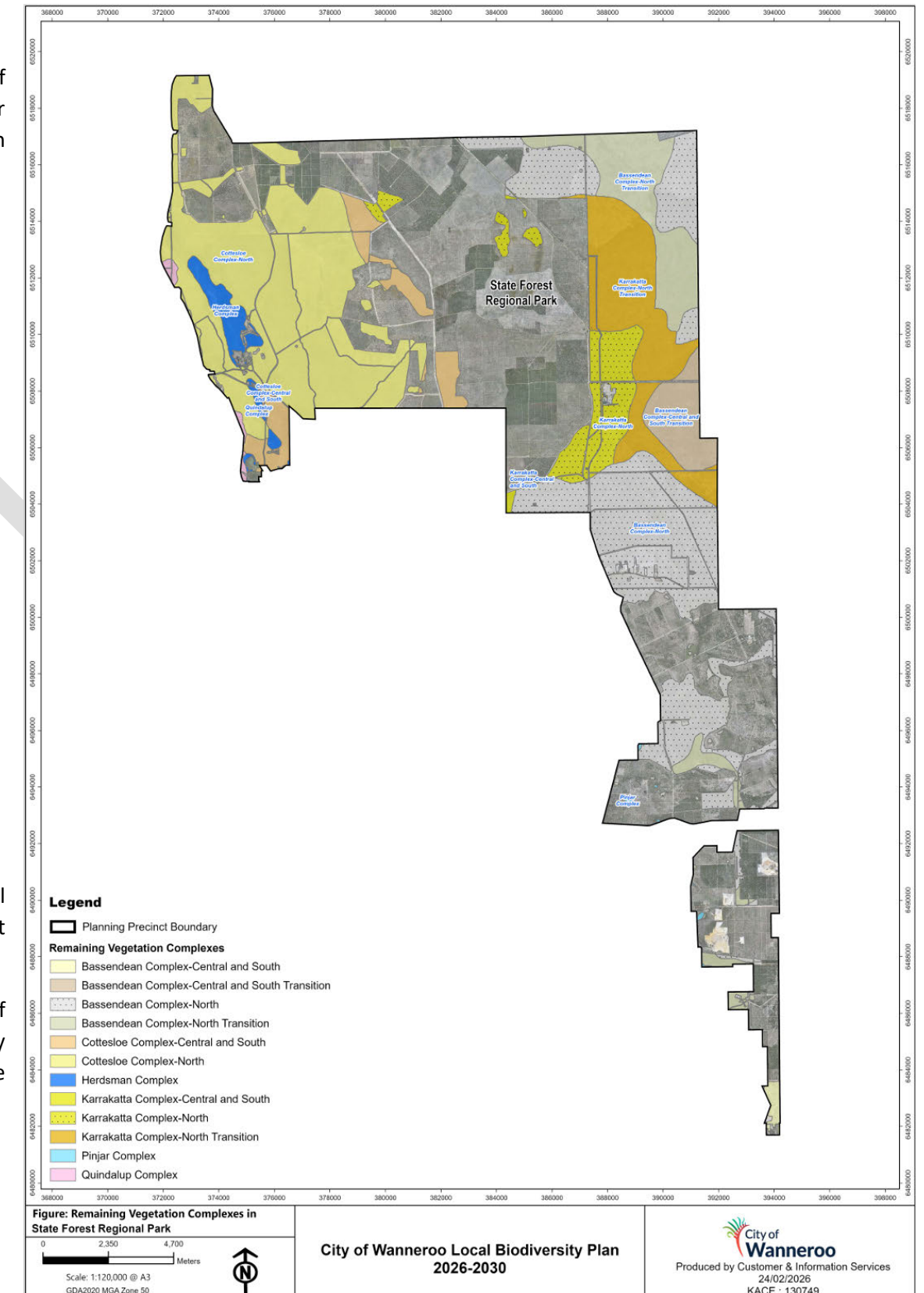


Figure 14: a) Remaining vegetation complexes in State Forest Regional Park

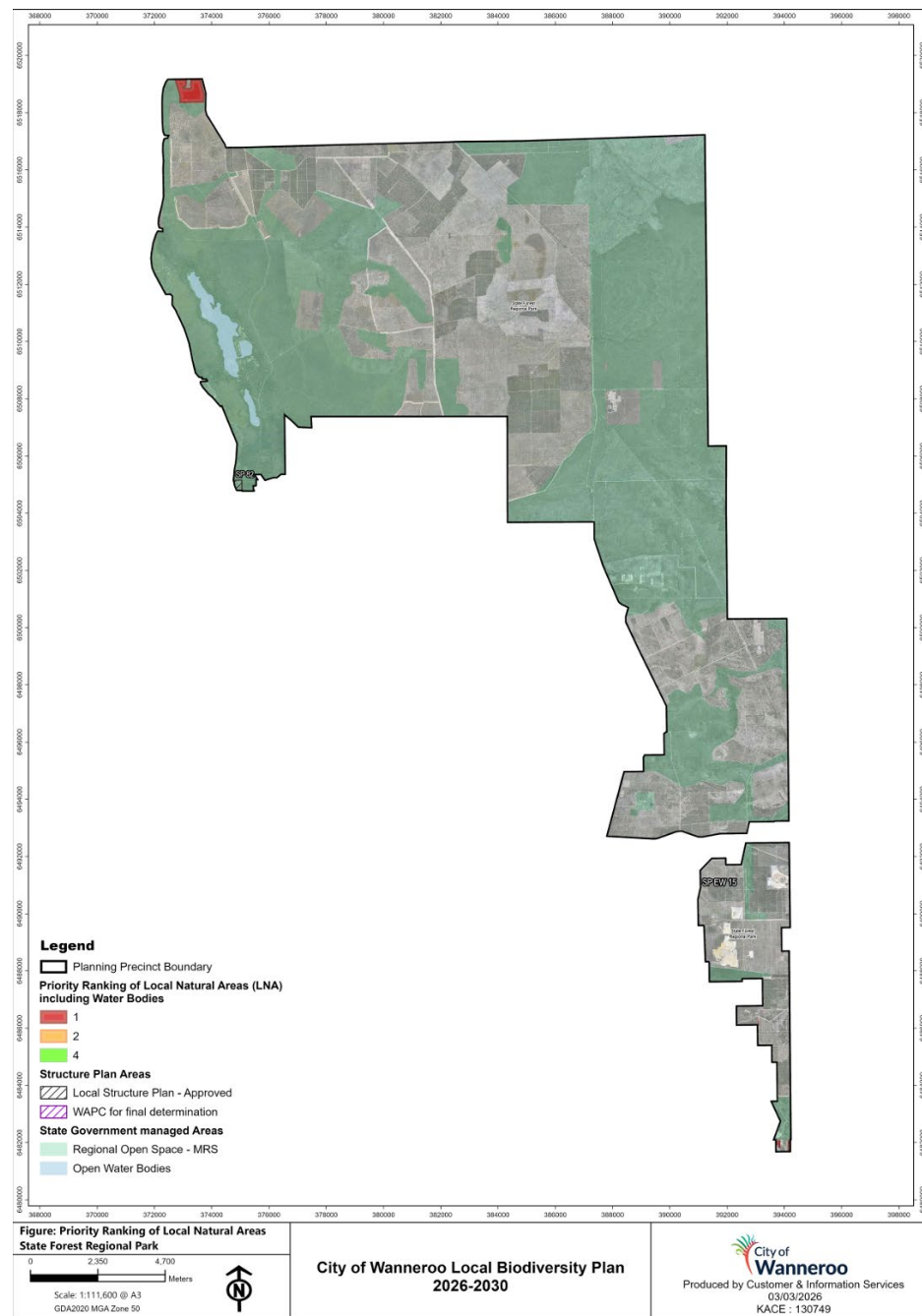


Figure 14: b) Priority ranking of LNAs – State Forest Regional Park

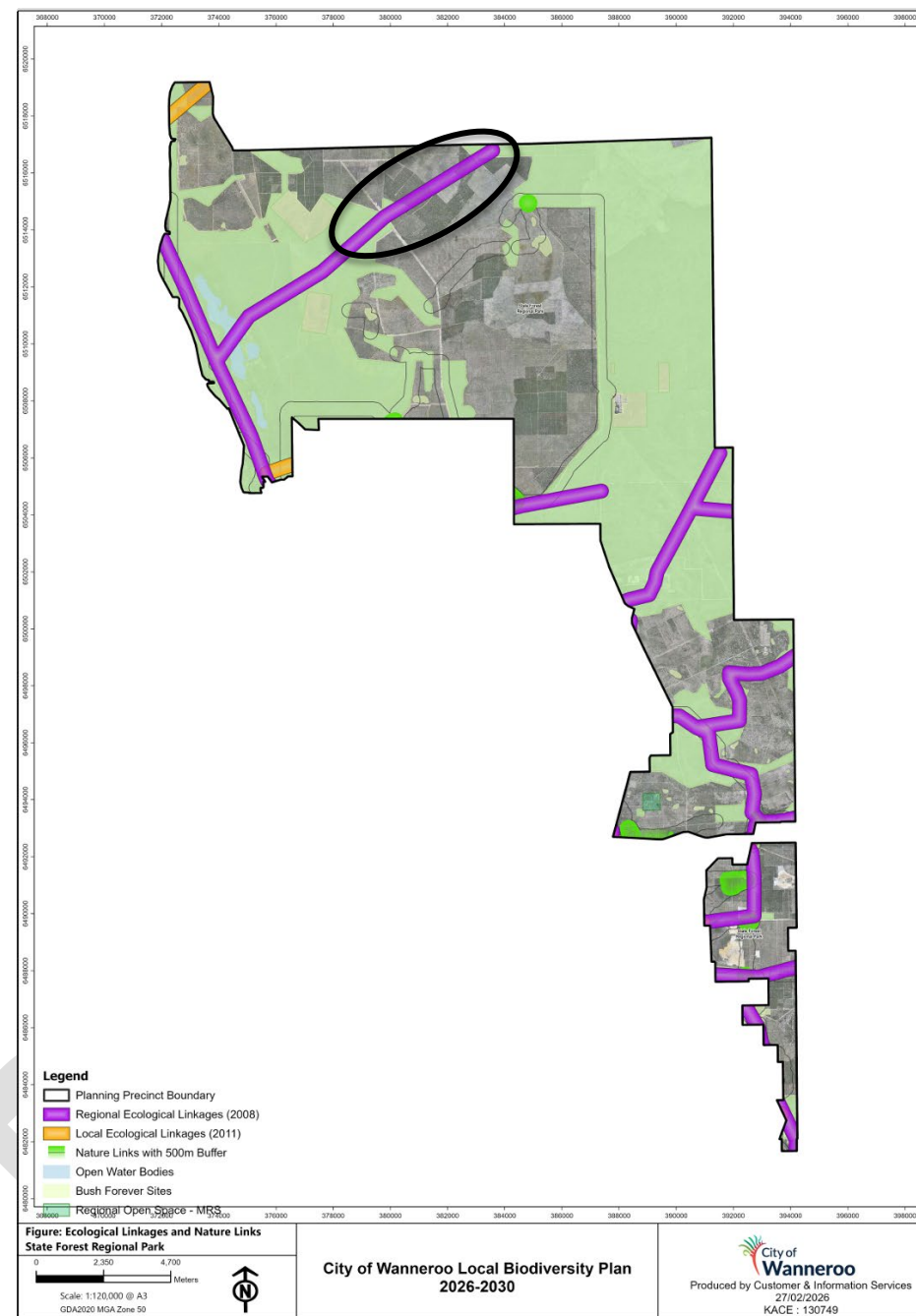


Figure 14: c) Ecological linkages and nature links – State Forest Regional Park

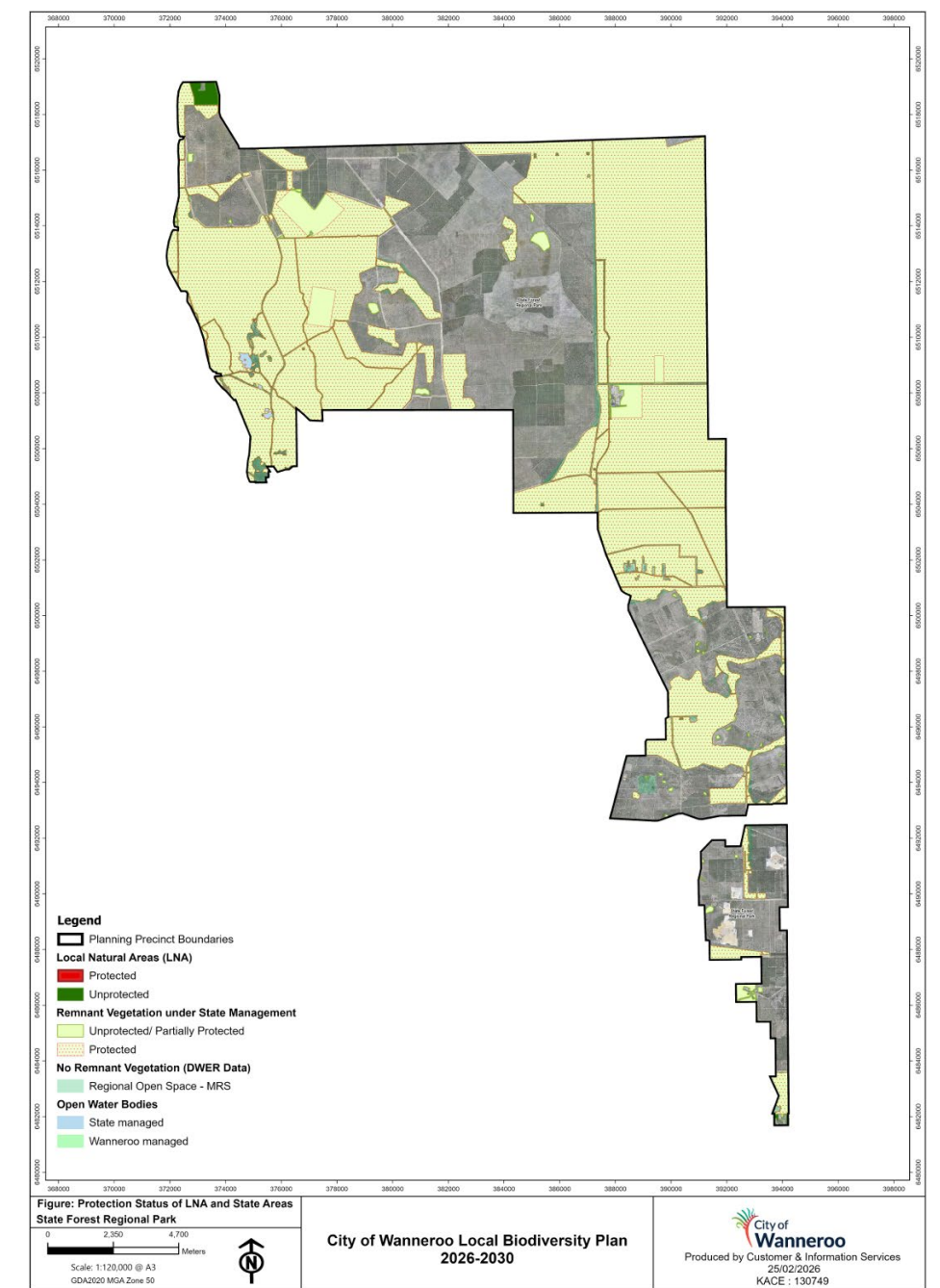


Figure 14: d) Protection status of LNA and state areas – State Forest Regional Park

11.4 North East Wanneroo

The North East Wanneroo Biodiversity Planning Precinct includes the suburbs of Carabooda, Pinjar and Nowergup and is largely characterised by land that is zoned for agricultural uses and state forest. A large amount of the General Rural Zone has been purchased by the state due to the presence of a priority drinking water source area, which is assumed to have protection as part of the *Gnangara Sustainability Strategy*. This precinct contains seven vegetation complexes as seen in **Table 16** and **Figure 15 a).**

The total area remaining as native vegetation is 3,550ha. The extent of these areas and their priority is seen in **Figure 15 b).** This precinct contains a high proportion of rural areas, as well as areas of state forest and ROS.

The areas that will have the largest relevance to this biodiversity planning precinct is the illegal clearing of vegetation on private land due to a lack of awareness surrounding the clearing approvals process. Educating residents on this process and providing accessible documents to the community can increase awareness and eventually reduce the instances of illegal clearing. This precinct also presents opportunities for biodiversity conservation with large areas of connected remnant high-priority vegetation remaining as circled in **Figure 15 (b).** The Carabooda District Structure Plan is currently being finalised and aims to retain over 230ha of natural area in this location.

This precinct contains numerous natural areas of high priority. Many of these values are seen in Bush Forever sites. These values are spread across the reserves and parks in the precinct especially those containing or surrounding wetlands. The ecological criteria fulfilled to give these areas high priority include:

- The presence of the under-represented Pinjar complex
- The presence of Bush Forever sites and conservation estates
- The designation of environmentally sensitive areas
- The presence of large natural areas
- The presence of wetlands
- The intersection with regional ecological linkages
- The presence of Black Cockatoo foraging habitat
- The presence of TECs PECs
- The presence of priority and threatened flora and fauna

Table 16: Remaining Vegetation Complexes within the North East Wanneroo Biodiversity Planning Precinct

Vegetation Complex	Pre-European Extent in Precinct (ha)	Current Extent in Precinct (ha)
Bassendean North	382	174
Cottesloe Central and South	5,220	1,875
Cottesloe North	319	211
Karrakatta Central and South	1,827	285
Quindalup	2	2
Herdsmen	555	157
Pinjar	2,360	846
Total	10,664	3,550

Protection Action: **1.1 and 1.4**

Education, Community Capacity Building and Internal Processes Action: **5.4**

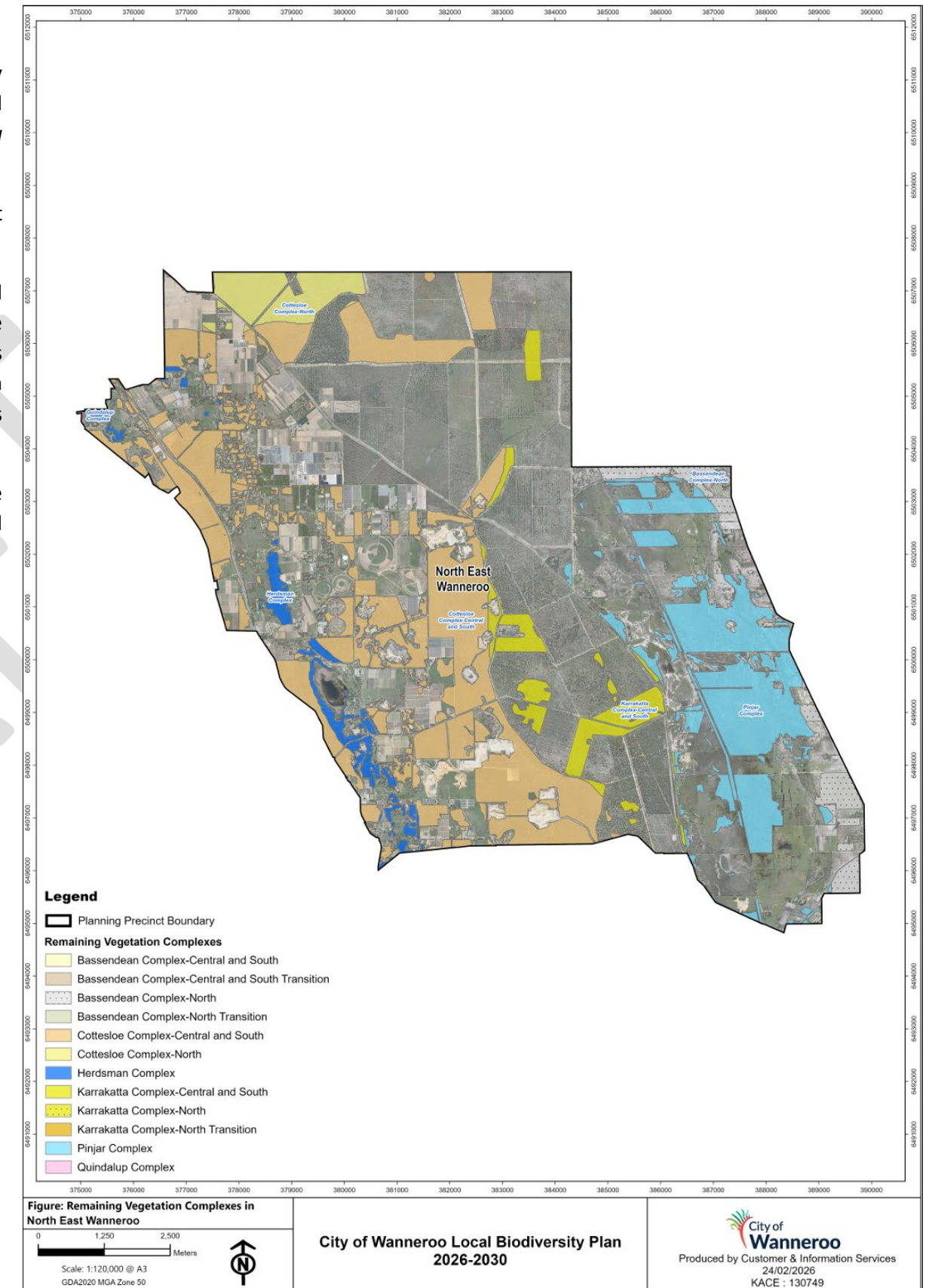


Figure 15: a) Remaining vegetation complexes in North East Wanneroo

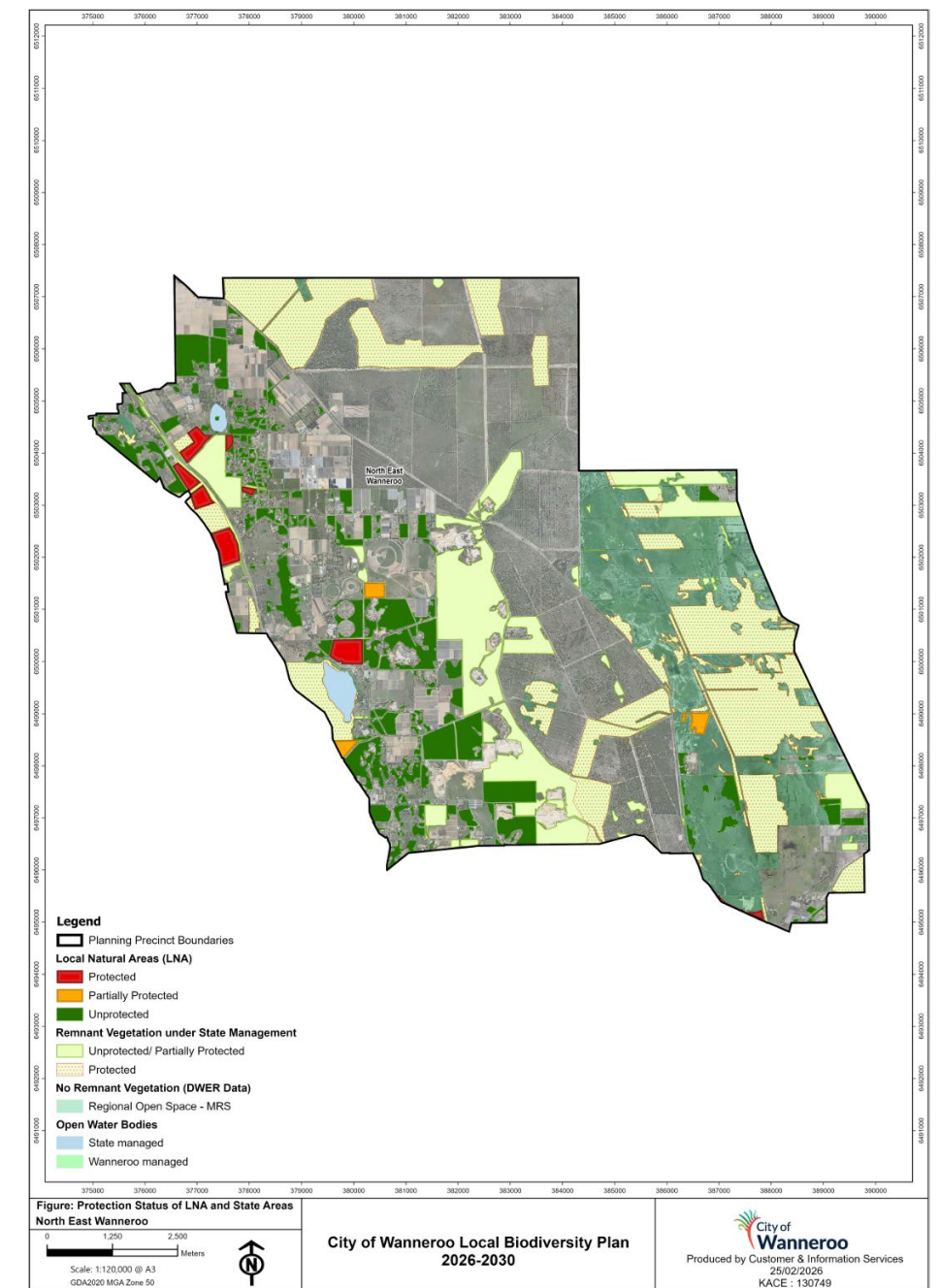
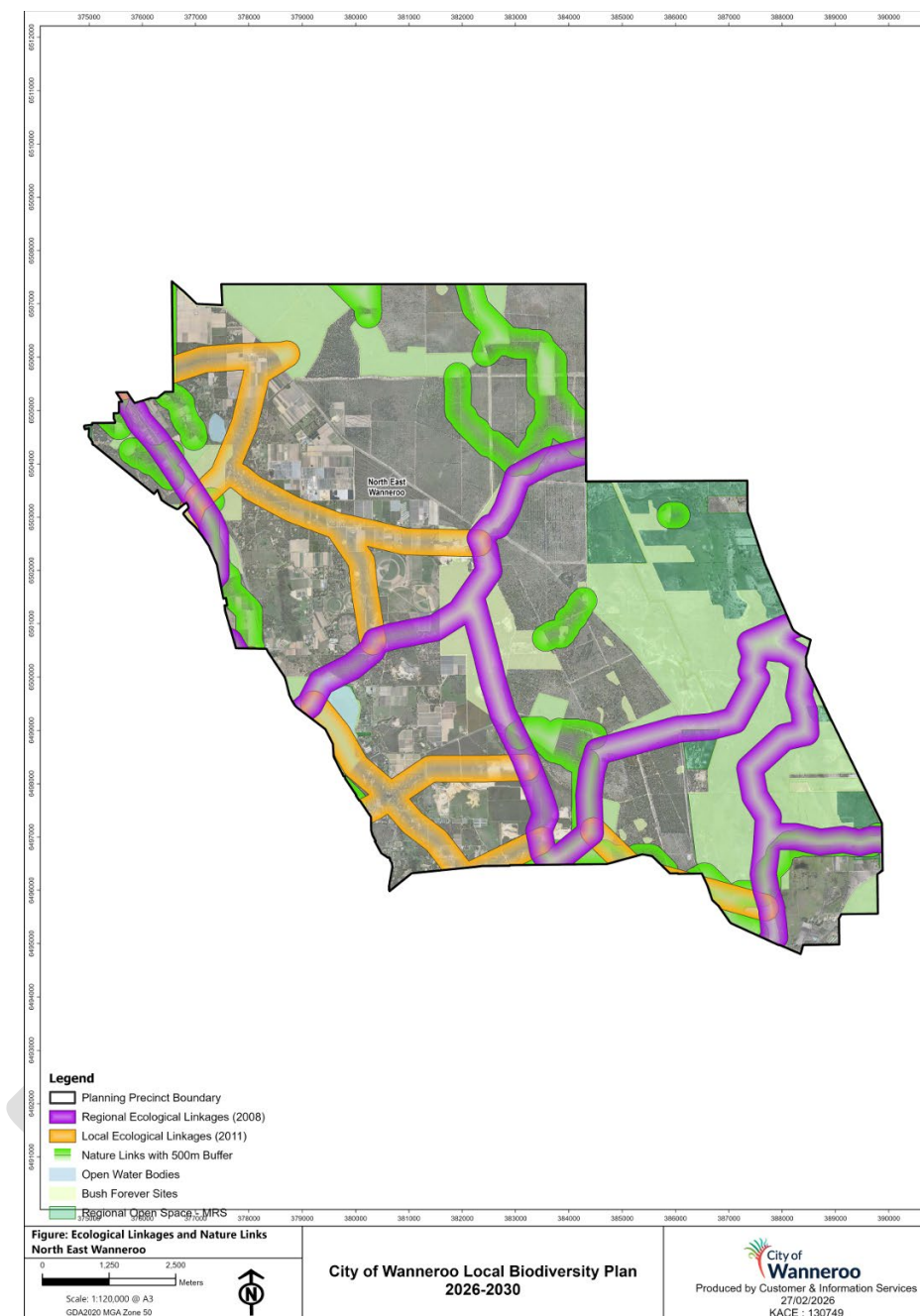
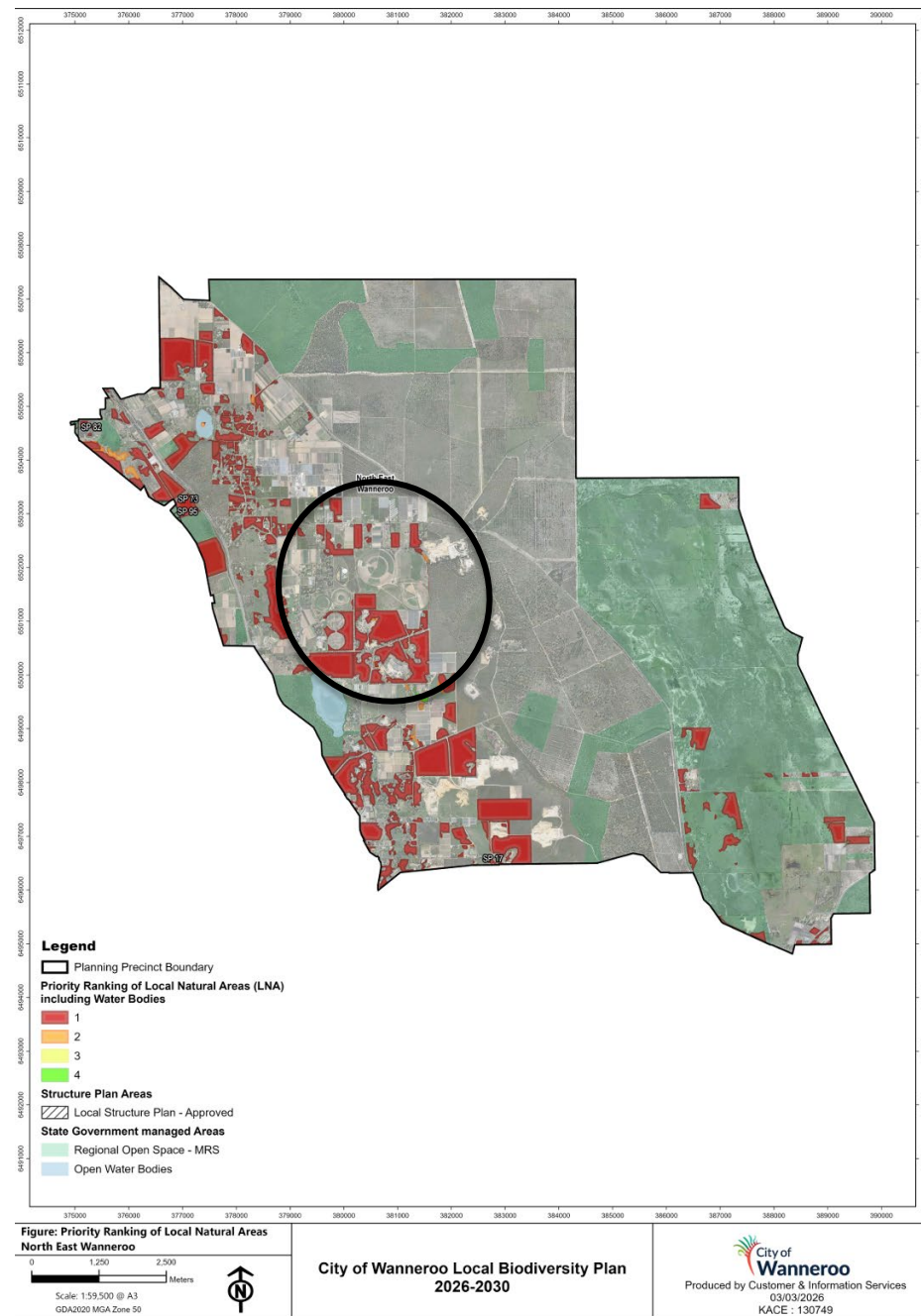


Figure 15: b) Priority ranking of LNAs in North East Wanneroo

Figure 15: c) Ecological linkages and nature links in North East Wanneroo

Figure 15: d) Protection status of LNA and State Areas in North East Wanneroo

11.5 South East Wanneroo

The South East Wanneroo Biodiversity Planning Precinct comprises the suburbs of Neerabup, Banksia Grove, Tapping, Mariginiup, Jandabup and Wanneroo through to Gngangara and Wangara. This precinct is already urbanised, aside from small rural lot subdivisions and land planned for urbanisation. This area is subject to the East Wanneroo Structure Plan planning process and the Neerabup industrial area and is likely to undergo significant redevelopment. It also supports multiple conservation category wetlands, many on private property. As shown in **Appendix E** and detailed in **Appendix Map vii**).

The precinct contains 2,530ha of natural areas with seven vegetation complexes within it as shown in **Table 17** and **Figure 16 a**). The extent of these areas and the priority rating can be seen in **Figure 16 b**). This biodiversity planning precinct contains a large proportion of areas with a high priority ranking and needs to be conserved accordingly.

Table 17: Remaining Vegetation Complexes within the South East Wanneroo Biodiversity Planning Precinct

Vegetation Complex	Pre-European Extent in Precinct (ha)	Current Extent in Precinct (ha)
Bassendean Central and South	557	165
Bassendean North	251	25
Bassendean North - Transition	408	163
Cottesloe Central and South	1,311	625
Karrakatta Central and South	4,810	694
Herdsmen	469	183
Pinjar	2,130	675
Total	9,936	2,530

This precinct mostly contains areas zoned as rural, industrial, urban development and parks and recreation. Approximately 46 geomorphic wetlands occur in this precinct, with some assigned multiple management categories. Several geomorphic wetlands contained in this precinct are listed as Conservation Category Wetlands. These wetlands should be given significant consideration in terms of biodiversity planning and management. Alongside appropriate planning and management for the Conservation Category Wetlands in this precinct other opportunities include conserving native vegetation on rural land and within urban areas.

This precinct contains many natural areas of high priority. These values are spread across the reserves and parks, especially those containing or surrounding wetlands. The ecological criteria fulfilled to give these areas high priority included:

- The presence of all three vegetation complexes with limited remaining existence within the City and regionally
- The presence of Bush Forever sites and conservation estates
- The designation as environmentally sensitive areas
- The presence of large natural areas
- The presence of wetlands
- The intersection of local and regional ecological linkages
- The presence of Black Cockatoo foraging habitats
- The presence of a PEC and
- The presence of threatened and priority fauna

Protection Action: 1.4, 1.5 and 1.6

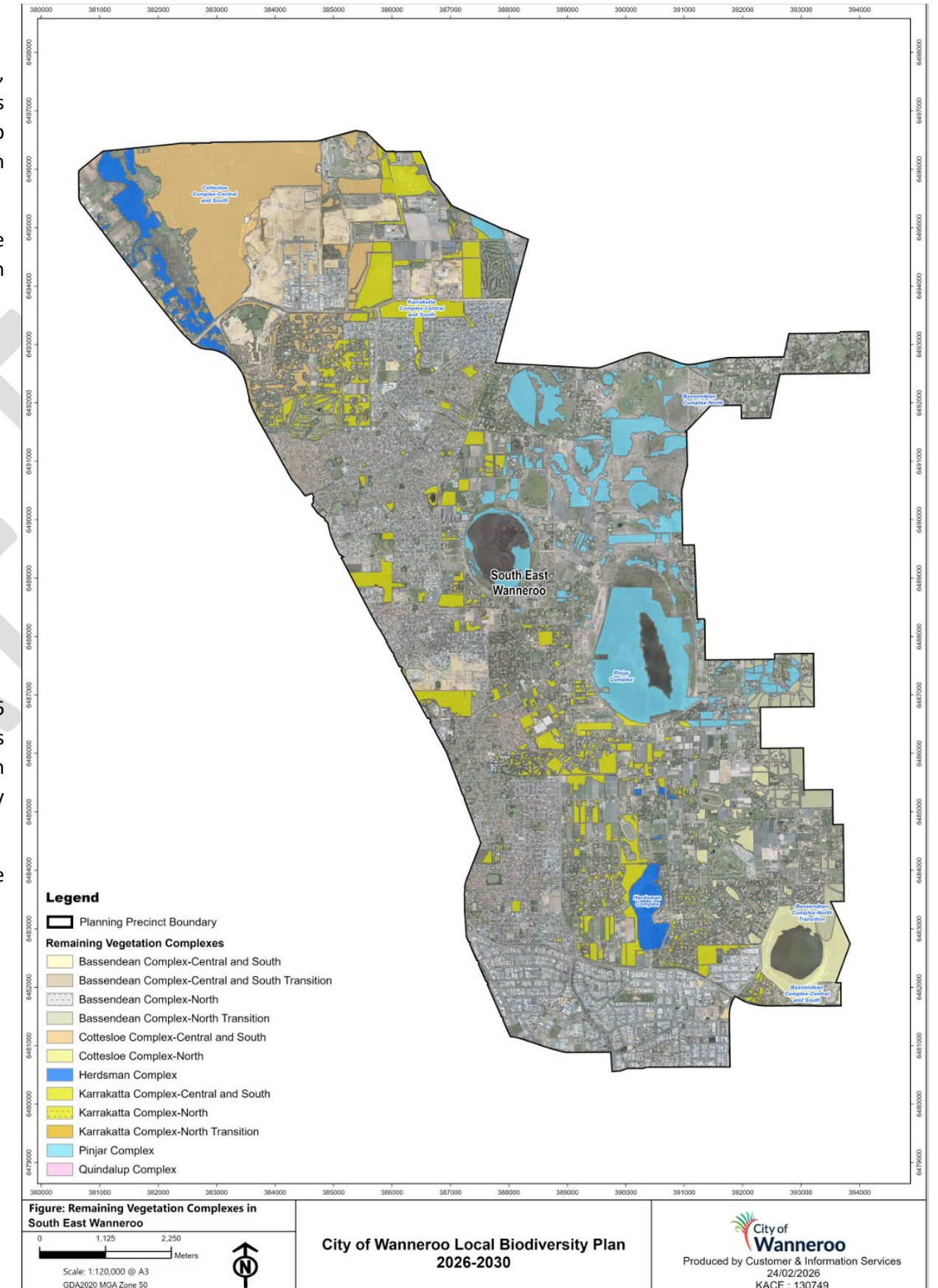


Figure 16: a) Remaining vegetation complexes in South East Wanneroo

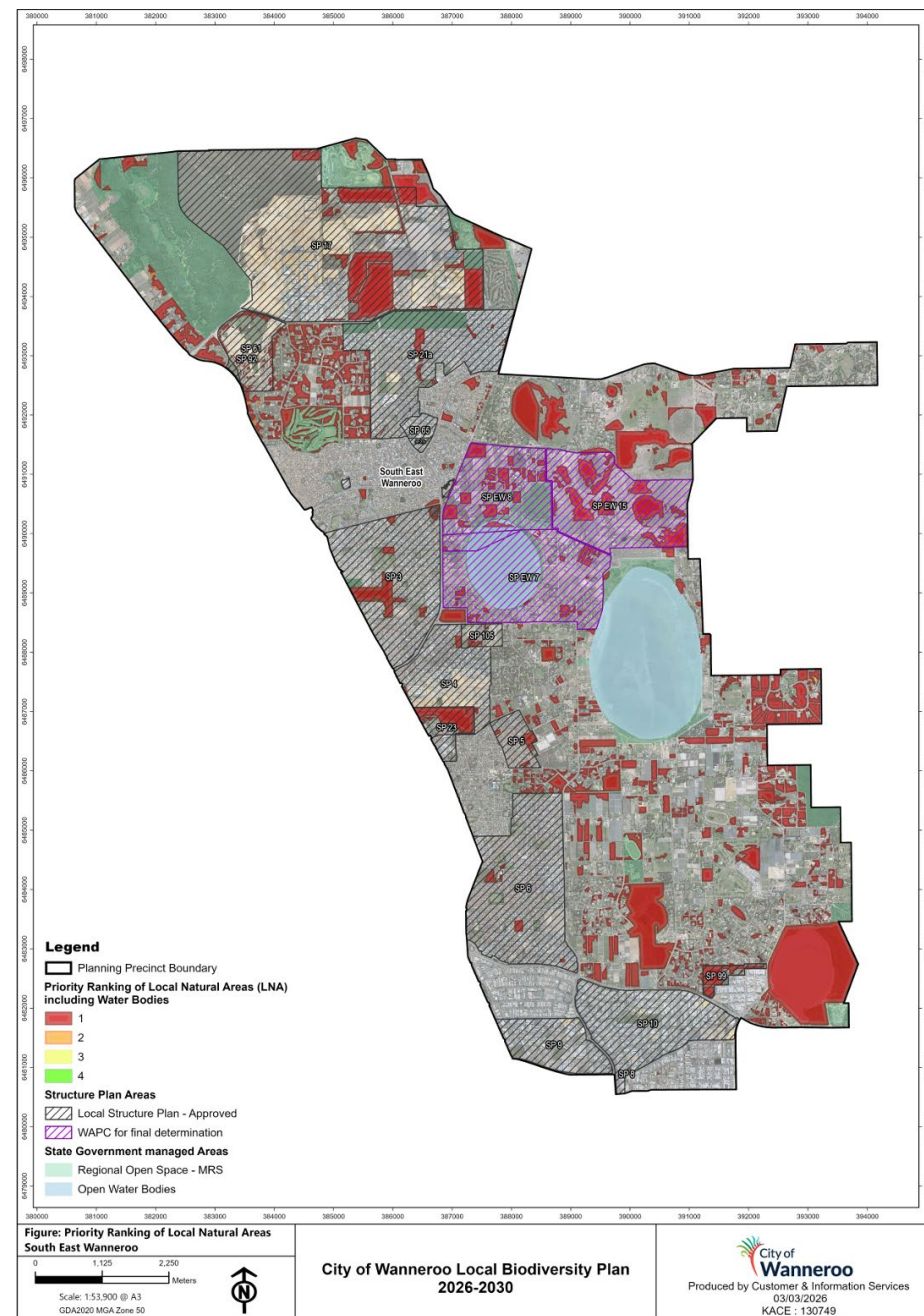


Figure 16: b) Priority ranking of LNAs in South East Wanneroo

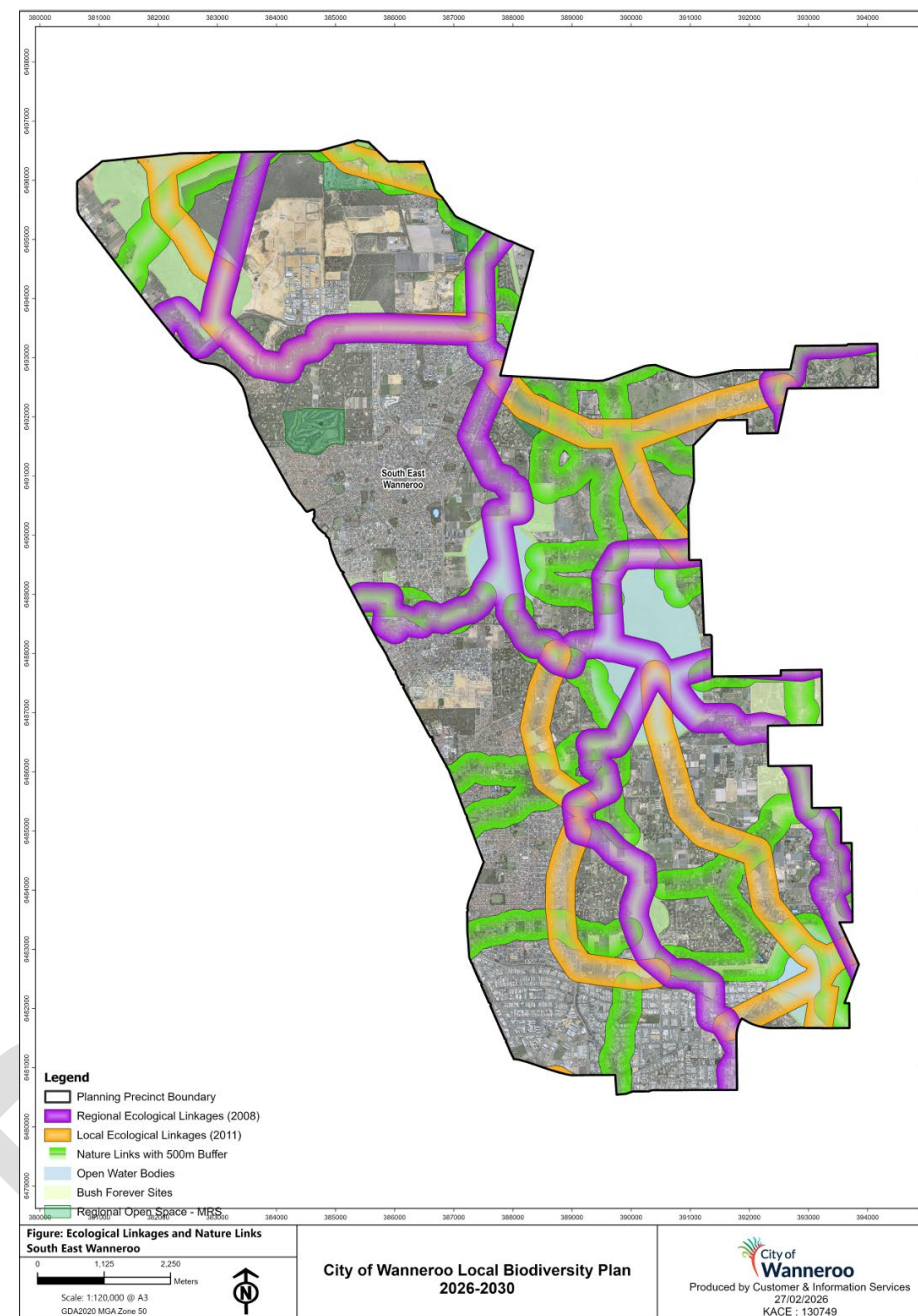


Figure 16: c) Ecological linkages and nature links in South East Wanneroo

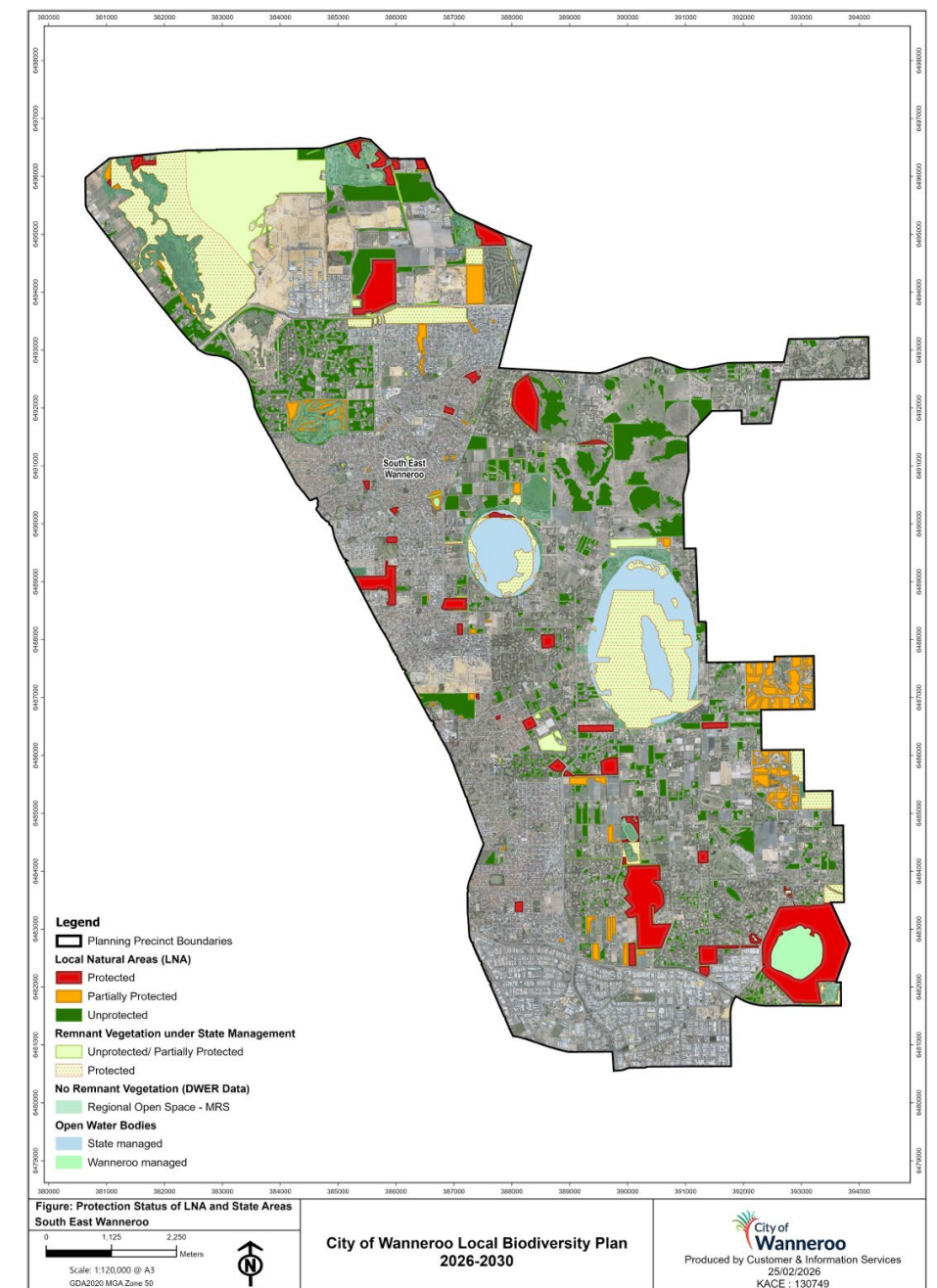


Figure 16: d) Protection status of LNA and state areas in South East Wanneroo

11.6 South West Wanneroo

The South West Wanneroo Biodiversity Planning Precinct includes the suburbs of Mindarie, Quinns Rocks, Jindalee, Butler, Merriwa and Clarkson in the west and Girrawheen and Koondoola in the southeast linked by a corridor running along Lake Joondalup. This precinct largely consists of developed areas and has a limited scope for biodiversity conservation. However, there are opportunities to improve the native vegetation that exists within the built environment through future local structure planning processes. The majority of vegetation within this precinct exists within the Neerabup National Park, which is managed by the state government.

Five vegetation complexes exist within the South West Wanneroo Biodiversity Planning Precinct, shown in **Table 18**

Table 18: Remaining Vegetation Complexes within the Southwest Wanneroo Biodiversity Planning Precinct

Vegetation Complex	Pre-European Extent in Precinct (Ha)	Current Extent in Precinct (Ha)
Bassendean Central and South	260	23
Cottesloe Central and South	4,192	1,559
Karrakatta Central and South	3,185	340
Quindalup	1,012	337
Herdsmen	319	93
Total	8,967	2,352

The total area of native vegetation remaining in the South West Wanneroo Biodiversity precinct is 2,352ha. The priority score of these natural areas is shown in **Figure 17b**, which demonstrate a high priority across the precinct. The main zonings across this precinct include Public Purpose, Residential and Urban Development under DPS 2.

This Biodiversity Precinct presents opportunities for improving biodiversity along foreshores and in urban areas such as through providing street trees and vegetated verges. Opportunities for increasing the biodiversity values within conservation reserves and other protected areas are also present.

The southeast corner of this precinct contains natural areas of the highest priority. These values are mostly retained in Highview Park and Koondoola bushland, indicating vital biodiversity assets. The ecological criteria fulfilled to give these areas high priority included:

- The presence of underrepresented Karrakatta Central and south vegetation complexes
- The presence of bush forever sites/conservation estates
- Designation as an environmentally sensitive area
- Natural areas being over 4ha in size
- The presence of TECs and PECs
- The presence of threatened and priority fauna
- The presence of Black Cockatoo foraging habitat
- And the intersection with both regional and local ecological linkage

Urban Greening for Biodiversity Action: 4.1 and 4.2
Restoration Action 2.3

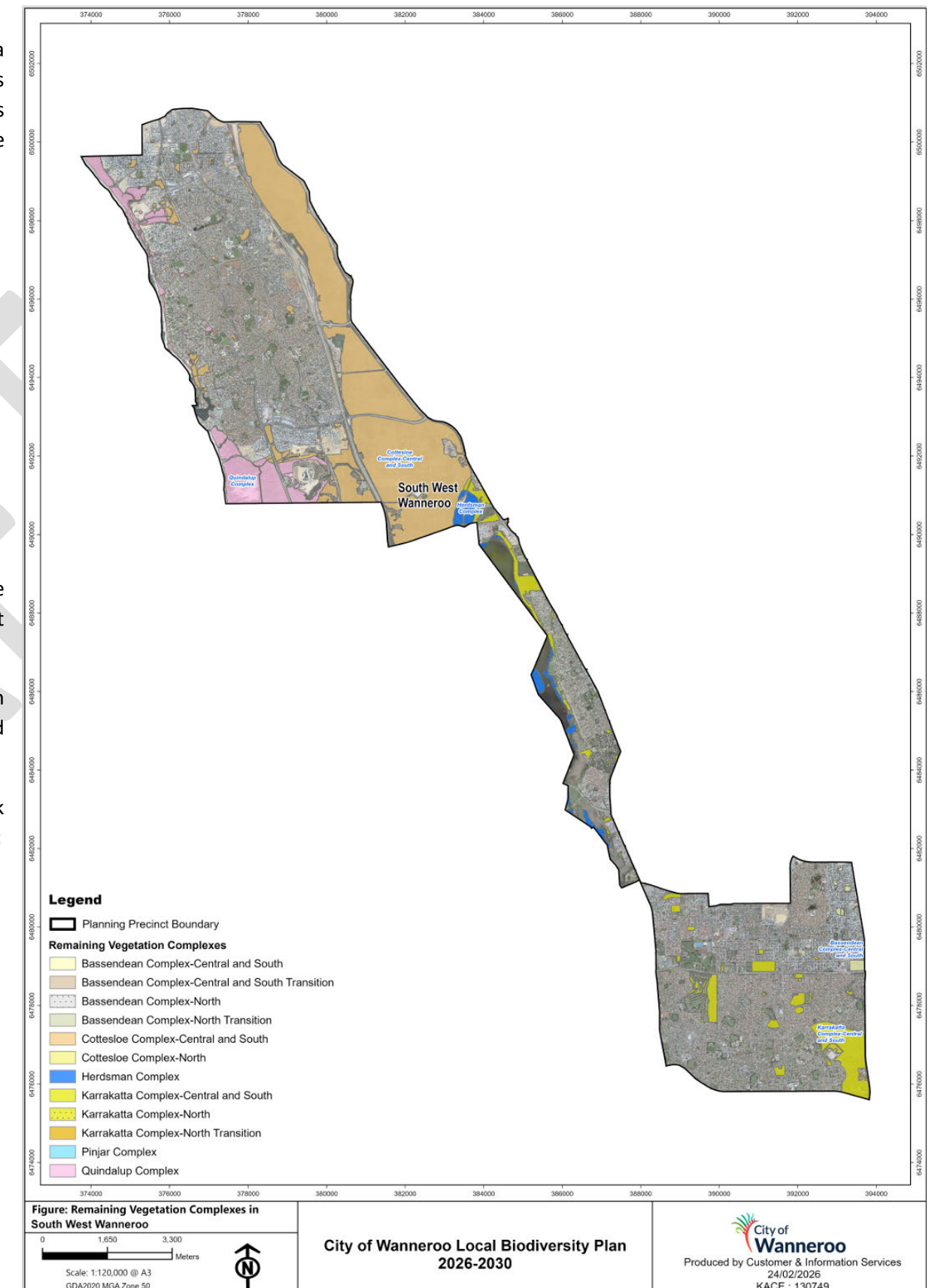


Figure 17: a) Remaining vegetation complexes in South West Wanneroo

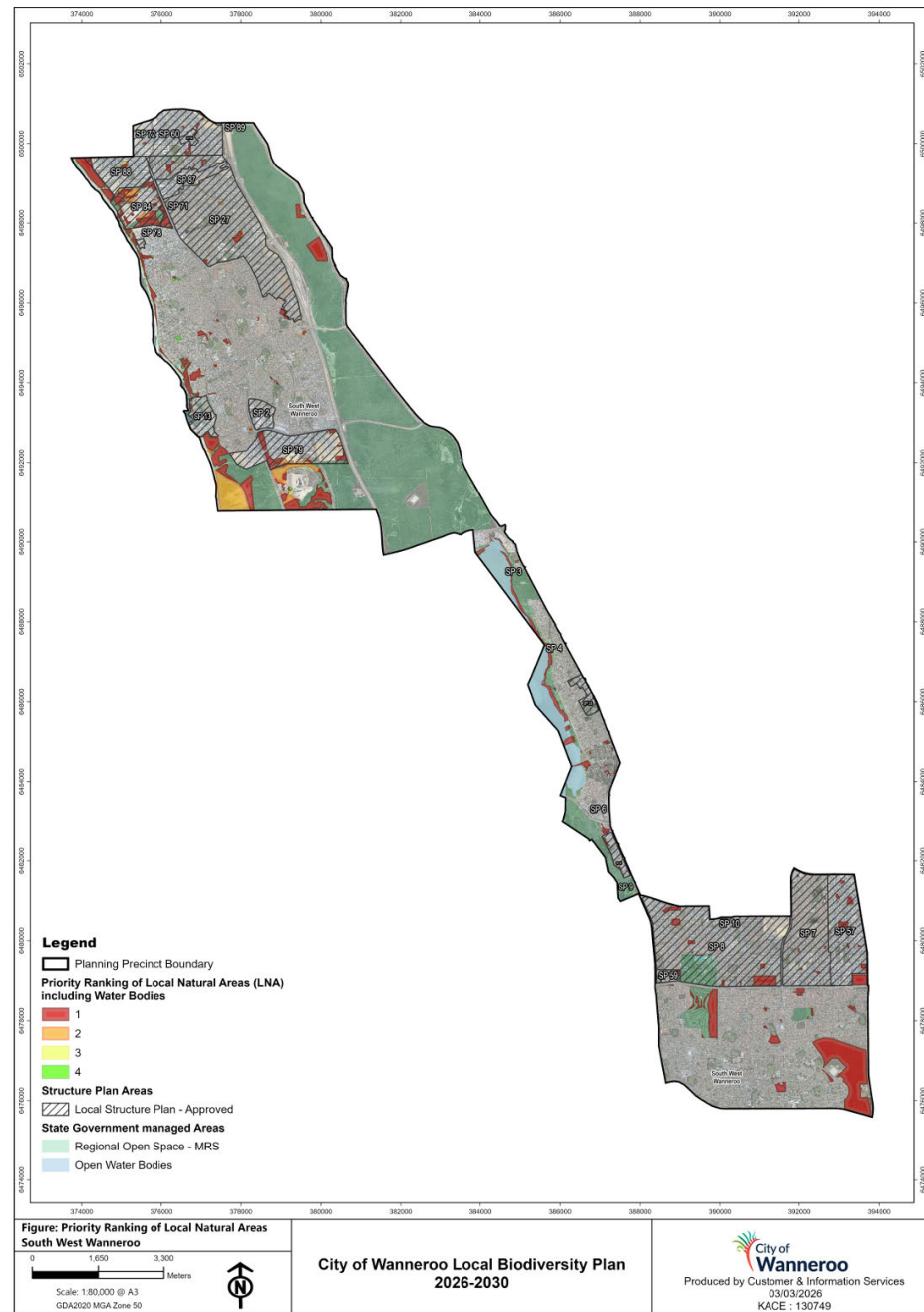


Figure 17: b) Priority ranking of LNAs in South West Wanneroo

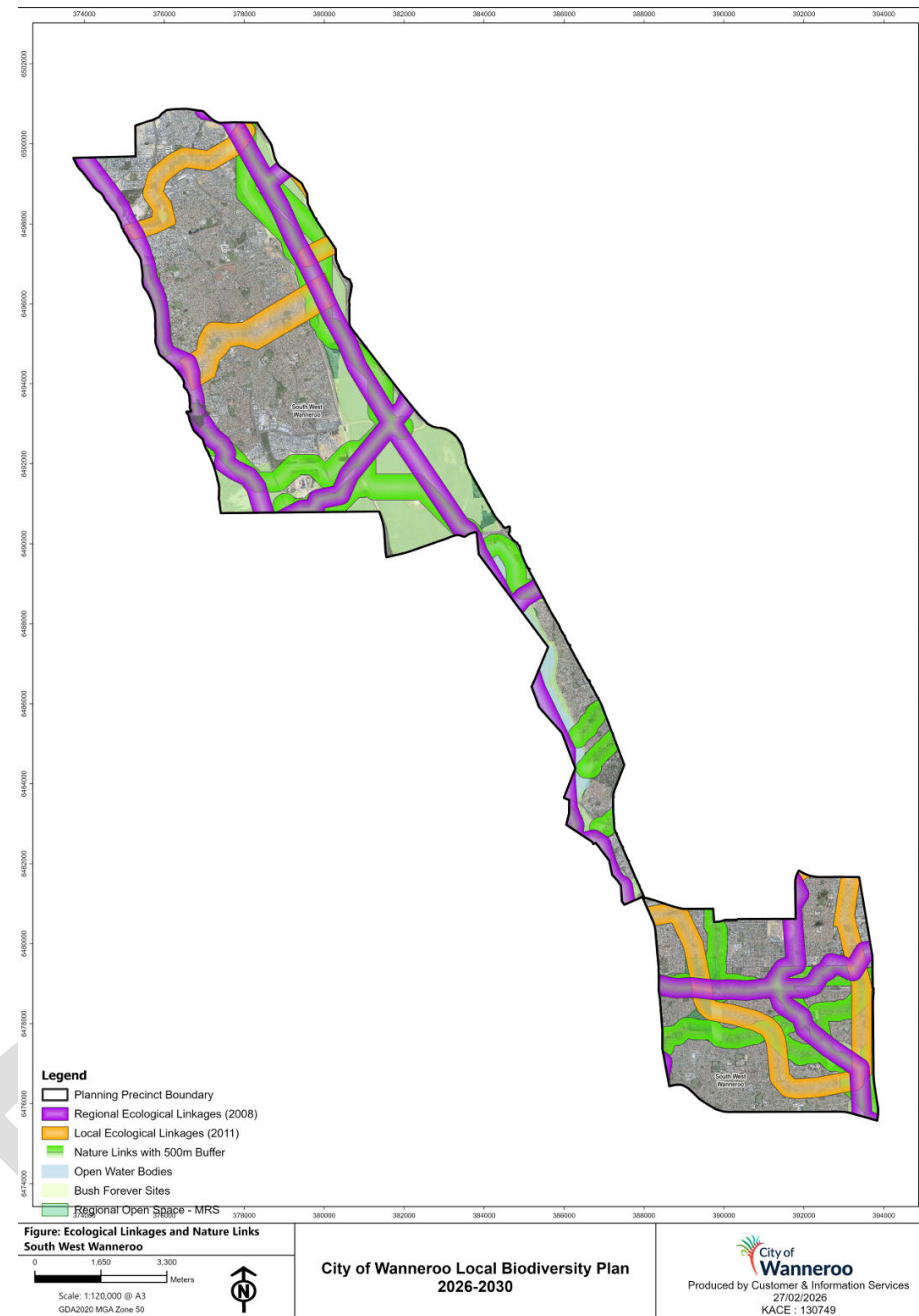


Figure 17: c) Ecological linkages and nature links in South West Wanneroo

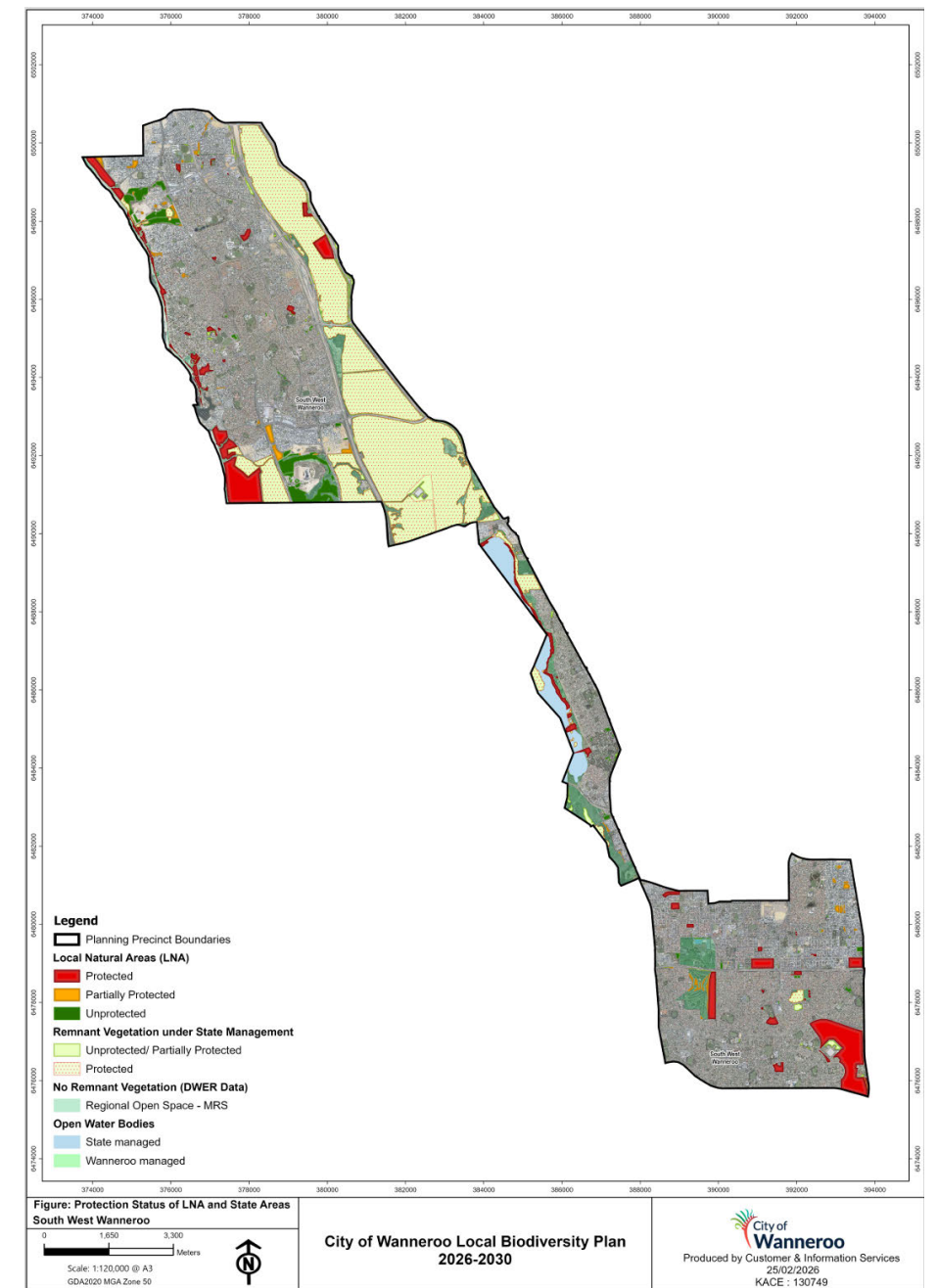


Figure 17: d) Protection status of LNA and state areas in South West Wanneroo

12 Actions

The actions to be investigated and implemented as part of this plan are listed in **Table 19** below.

Table 19: LBP Table of Actions

Number	LBP section	Theme	Action	Approximate Time Frame (Financial Year)
1- Protection				
1.1	6.7,7.2,10.1, 11.4	Strategic planning, Scheme	Investigate and implement provisions in LPS 3 and/or local planning policy to increase retention of Local Natural Areas (LNA) on private properties.	Commence 2026/2027-2028/2029
1.2	6.1	Strategic planning	Investigate the federal '30 by 30' roadmap and OECMs frameworks as mechanisms to protect the City's natural areas and report suitable LNAs for consideration to OECM listing.	2026/2027
1.3	10.1, 10.2, 6.7	Strategic planning, Policy	Ensure existing provisions in LPP 1.1 Conservation, LPP 4.3 Public Open Space, LPP 4.8 Tree Preservation and LPP 4.1 Wetlands are reviewed and implemented with the aim to protect environmental values, retain biodiversity, shade and amenity. Ensure the City implements the measures contained within its Local Planning Policies when undertaking all its works and projects.	2026/2027 and ongoing
1.4	7.3,8.2, 9.1 9.2, 9.3, 10.1, 11.4, 11.5	Strategic planning, Surveying	Advocate for early-stage identification of priority areas for retention and ensure comprehensive ecological, flora, fauna and vegetation surveys are undertaken at District Structure Plan (DSP) and Local Structure Plan (LSP) stages for land subject to urban rezoning or development, rather than deferred to subdivision or development application stages. -Vegetation, flora and fauna surveys are to be undertaken in accordance with EPA-endorsed technical guidance and DWER standards, including appropriate seasonal coverage and survey level sufficient to determine conservation significance (e.g. reconnaissance surveys alone are not acceptable for decision-making). -Prioritise LNA, in particular to wetlands, vegetation within or near proximity to ecological linkages and identified vegetation within critical priority vegetation complexes for retention and restoration.	Ongoing
1.5	9.6, 9.7, 10.1, 11.1, 11.5	Strategic planning/assets planning/ conservation, Ecological linkages	Advocate for retention and conservation of priority LNA identified within, or in proximity, to ecological linkages at all stages of the planning process. Advocate for continuity of coastal ecological linkages as coastal node development is undertaken, through vegetation retention or strategic landscaping where retention is not viable. Advocate for east-west ecological corridors linking coastal areas to inland natural areas to strengthen biodiversity connectivity, climate change resilience and coastline protection. An example is connecting Two Rocks-Yanchep precinct remnant vegetation from coast inland to Yanchep National Park identified in planning precinct section 11.1.	Ongoing

			Require the relevant authority to investigate the protection of a potential east-west linkage south of Two Rocks LSP No.69 identified in the planning precinct section 11.1. as part of the review of the Yanchep-Two Rock District Structure Plan to be completed by 2031.	
Number	LBP section	Theme	Action	Approximate Time Frame (Financial Year)
1.6	9.3, 9.7, 11.1 11.2	Strategic planning/assets planning/ conservation, Wildlife	Advocate for improved wildlife movement and safety by establishing viable wildlife corridors and habitat connectivity throughout the planning, development and maintenance processes. May include application of fencing, signage, fauna underpasses and overpasses and various new technologies.	2026/2027 ongoing
1.7	9.4	Strategic planning, Wetlands	Work with DBCA to investigate status and update classification of wetlands within the City, to achieve better protection and improve management of surrounding land use. As urbanisation occurs, ensure wetlands are accurately surveyed, the classification of wetlands is current and if required, reclassified at early stages of planning. Ensure appropriate wetland buffers and management plans are developed and applied as urbanisation occurs in the City.	2027/2028
1.8	9.5	Planning, Policy and Surveying, Caves and karstic features	Ensure known cave and karstic feature areas and associated threatened ecological communities, flora and fauna are adequately surveyed through planning stages, and catchment scale affects identified and managed accordingly.	Ongoing
1.9	7.2, 10.1, 11.2	Planning, Conservation classification and management orders	As part of the structure plan normalisation process, review reserve classifications in approved local structure plans and, where justified, ensure Conservation Reserves are securely designated as such. Continue to classify sections of POS managed for conservation as “conservation” under DPS2, including those not zoned as ROS under the MRS. Investigate and apply variations to existing management orders so that lands reserved as ROS in the MRS and currently vested with the City for non-conservation purposes, are reclassified to as their primary purpose.	2026/2027 and ongoing
1.10	10.2	Planning, Livestock management	Review the local planning framework to ensure that it adequately addresses and supports the management of livestock on properties where important environmental values exist	Ongoing
1.11	10.7	Planning/conservation, Fire management	-Investigate protection of LNAs by enabling individual properties to obtain variations to the Firebreak Notice where standard compliance is not practical due to environmental values or site-specific constraints. -Incorporate environmental considerations during on-ground firebreak inspections and issue individual properties with variations to the Fire Break Notice if appropriate to ensure biodiversity values are balanced with bushfire risk management requirements, on both City-managed land and private properties.	2026/2027 and ongoing

Number	LBP section	Theme	Action	Approximate Time Frame (Financial Year)
2- Restoration				
2.1	9.4, 11.4	Wetland restoration	Investigate the potential for restoration of key wetlands areas across all land tenures (i.e. private, local and state government) and take appropriate action to initiate rehabilitation where practical and appropriate. Restore conservation and resource enhancement category wetlands and their buffers on City managed land where appropriate. e.g. Lake Gnangara, Lake Joondalup, Lake Badgerup.	Commence 2026/2027 then ongoing
2.2	7.3, 11.3, 11.4	Advocacy to State Government	Advocate to state government to restore identified areas of degraded regional open space, particularly in Bush Forever areas, wetlands and their buffers. e.g. Pinjar Wetland area, Little Lake Mariginiup. Advocate to state government to restore and protect selected strategic areas of State Forest 65 to create ecological linkages, NatureLinks and wetland areas and buffers.	2026/2027 and ongoing
2.3	8.2, 11.6	Ecological Corridors and Priority Vegetation Complexes	Undertake substantial restoration in priority City managed local natural areas especially in critical/high priority vegetation complex areas and ecological corridors.	2027/2028
2.4	10.3	Planning/assets, Urban water	Investigate the potential for Urban Water Management Plans to include objectives for the enhancement of existing wetland ecologies, and for establishing artificial wetlands that provide additional ecological and wildlife habitat values and contribute to overall biodiversity resilience of the City.	2029/2030

Number	LBP section	Theme	Action	Approximate Time Frame (Financial Year)
3. Conservation				
3.1	6.3	Strategic Planning, Nature repair market	Investigate the City's ability and undertake actions to enter the biodiversity market under the Native Repair Act 2023 as framework and methods are established to support the Act.	Commence 2026/2027
3.2	6.9, 8.2, 9.1, 9.2, 9.3,	Asset Planning, NAAMP and surveying	Review and undertake actions in accordance with the endorsed Natural Areas Asset Management Plan (NAAMP). Advocate for additional resources to expand the annual Natural Area Biological Survey program (for City managed land) to secure detailed baseline data to guide and prioritise restoration projects and ongoing management activities, especially for critical flora and vegetation values. Review and develop management plans for high priority City managed areas. Implement rapid bushland condition assessments to determine current condition and align maintenance priorities.	2027/2028
3.3	8.2	Planning, EMP guidelines and surveying	Update the City's Environmental Management Plan Guidelines to include requirements to transfer flora, vegetation and fauna ISA data (DWER standards) to the City from Developers for Natural Areas. Incorporate this data into the City's GIS mapping system to guide and prioritise restoration projects and ongoing management activities.	2026/2027
3.4	9.1, 9.2, 9.3	Planning and Process, TEC, PEC, threatened and priority species management	Consult and coordinate with relevant stakeholders (e.g. developers, WAPC, the City and its contactors) to ensure relevant scientific data is appropriately captured, aligned with ISA data standards (DWER) and transferred to relevant data systems held by government and research institutions – for use by authorised entities.	2026/2027 and ongoing
3.5	9.1, 9.2, 9.3	Planning and Process, TEC, PEC, threatened and priority species management	Consult and coordinate with leading research institutions, federal and state government organisations where practical, to improve conservation management methods, especially for TECs, PECs and threatened and priority flora and fauna. Utilise the Approved Conservation Advice and other associated documents for TECs and threatened species listed under the EPBC Act for conservation guidance and management.	Ongoing
3.6	9.3	Planning and Process, TEC, PEC, threatened and priority species management	Continue to support and implement strategic conservation initiatives for priority, near-threatened and threatened species, including partnerships with research institutions and conservation organisations. This includes programs such as the <i>Keep Carnaby's Flying - Ngoolarks Forever Project</i> (Murdoch University and BirdLife Australia) WA Bat Monitoring in collaboration with Conservation Council of Western Australia. Prioritise and implement actions identified in the City of Wanneroo Black Cockatoo Action Plan, including habitat protection, restoration, monitoring, community education, and the delivery and maintenance of a network of watering stations to support the long-term viability of local populations.	2026/2027 and ongoing

Number	LBP section	Theme	Action	Approximate Time Frame (Financial Year)
3.7	10.5.2	Planning and Process, Pathogen, disease, pest and invasive species management	Develop and implement an Integrated Weed Management Plan to guide a coordinated and integrated approach to weed control.	2028/2029
3.8	10.5.1	Planning and Process, Pathogen, disease, pest and invasive species management	Develop and implement an Integrated Feral Animal Management Plan to guide a coordinated and integrated approach to feral animal control across the City, including collaboration across other land tenures.	2028/2029
3.9	10.5.1, 10.5.2	Planning and Process, Pathogen, disease, pest and invasive species management	Maintain awareness of emerging research on key biodiversity threats from pathogens, pests, and diseases, including Phytophthora dieback and Polyphagous Shot-Hole Borer (PSHB) and implement proactive best-practice management and education.	Ongoing
3.10	10.7	Fire Management	Continue consulting with external stakeholders and community groups regarding fire mitigation activities, taking account of and avoiding potential biodiversity impacts. Refer relevant matters to governing bodies to seek advice on the potential impacts of mitigation activities as needed.	2027/2028 and ongoing
3.11	10.7	Fire Management	Continue engaging with Cultural Custodians to improve understanding of cultural fire practices as a means of enhancing the health of Country and associated cultural values and explore how these principles can inform current land management practices.	Ongoing
3.12	10.7	Fire Management	Develop guidelines and decision-making frameworks to balance fire risk mitigation objectives with biodiversity conservation outcomes.	2027/2028
3.13	10.7	Fire Management	Further develop and implement post fire monitoring and continuous improvement programs to assess the outcomes of mitigation activities, including fuel loads, weed presence, flora diversity and composition and fauna observations.	2027/2028
3.14	10.7	Fire Management	Remain informed on current science and best practice for protecting biodiversity while balancing fire risk mitigation in a drying climate and implement as appropriate.	Ongoing
3.15	9.4	Wetlands Management	Monitor the quality and condition of City managed wetlands and undertake actions to conserve these wetlands. Include monitoring of water quality and levels, vegetation condition, species diversity and habitats as required.	2027/2028 and ongoing
3.16	9.4	Wetlands Management	Continue to review and undertake actions and projects identified in the Yellagonga Integrated Catchment Management Plan.	2026/2027 and ongoing
3.17	10.4	General Management	Continue to identify and manage uncontrolled access and rehabilitate key areas as required. Take steps to prevent and mitigate rubbish dumping and contamination in local natural areas.	Ongoing

Number	LBP section	Theme	Action	Approximate Time Frame (Financial Year)
4. Urban Greening for Biodiversity				
4.1	9.7,10.2, 11.6	Urban Greening for Biodiversity, Naturelinks	Investigate, survey and establish practical Naturelinks in the City. Develop a pilot project with NatureLink Perth principles to activate Naturelinks to assist in re-establishment of linkages in urbanised areas (e.g. Creating a NatureLink in Balga project). NATURELINKS Naturelink Perth Build on Naturelinks connecting with other land managers, e.g. neighbouring LGAs, Water Corporation, etc.).	2028/2029
4.2	9.7,10.2, 11.6	Urban Greening for Biodiversity, City managed areas	Undertake urban greening for biodiversity initiatives in conjunction with urban forest plan initiatives, prioritising ecological linkages and Naturelinks where practical. These may include pocket forests, greening drainage sumps miscellaneous water bodies, cycleways, pedestrian walkways, verges, environmental-based place activation sites, and hydrozone areas in parks.	Ongoing
4.3	10.6	Climate Change	Use climate change-ready urban greening initiatives (local native species where appropriate, diversity in plantings, water-sensitive design) to avoid urban heat islands, mitigate impacts of extreme heat events, and support/protect wildlife movement.	Ongoing
4.4	10.6	Climate Change	Undertake pilot project using plant species from drier climates in WA, e.g. Jurien Bay /Geraldton area, for urban greening projects and to monitor species resilience and diversity.	Commence 2027/2028
5. Education, Community Capacity Building and Internal Processes				
5.1	7.3, 10.1, 10.8	Private Landowners, LNA	Establish a program to educate and build capacity for private landowners to retain, enhance and maintain LNAs especially where they include state or federal protected attributes including Bush Forever, wetlands, threatened and priority flora, fauna and ecological communities.	Commence planning 2026/2027 and ongoing
5.2	7.2, 7.3, 10.1, 10.8	Private Landowners, LNA	Develop a targeted landholder outreach program to rural and rural residential properties containing native vegetation, supported by mapping and prioritisation. This may include: In conjunction with DWER (as the delegated authority administering the EP Act 1999), preparing and making available a 'clearing approvals' information pack (e.g. explanatory flowchart, checklist, timeframes and penalties) to improve understanding of legal obligations. Delivering workshops/field days on vegetation retention, weed management and bushfire risk management that avoids unnecessary vegetation removal. Investigating the potential for incentives to retain and manage native vegetation (e.g. small grants, subsidised weed control, or support for fencing/protecting sensitive areas) on private properties. Providing a pathway and practical guidance for landholders to establish conservation covenants where appropriate.	2026/2027- 2028/2029
5.3	9.4, 10.8	Private Landowners, Wetlands	Educate landowners on the presence and conservation of wetlands on private property.	2027/2028

5.4	10.8, 11.4	Illegal Clearing	Investigate mechanisms to strengthen surveillance, compliance and enforcement activities to deter illegal clearing and implement as appropriate.	2026/2027
Number	LBP section	Theme	Action	Approximate Time Frame (Financial Year)
5.5	6.10, 9.3, 10.8	Education and Community Capacity Building	Deliver a coordinated community engagement and capacity-building program to expand and strengthen participation by key stakeholders, private landowners, community groups and volunteers in biodiversity conservation. This may include: Supporting citizen science initiatives. Fostering community involvement in restoration of natural areas and urban greening for biodiversity (including NatureLinks projects). Delivering targeted education programs and initiatives that increase awareness of local biodiversity, wildlife, trees and natural areas, and broader sustainable living and environmental management practices.	2026/2027 and expand in later years
5.6	6.10	Community Capacity Building	Encourage the formation of "Friends of" Groups both on City and state government-managed land with priority natural areas, to restore and conserve natural areas and contribute to monitoring and research. Promote 'Friends Of' groups on the City's platforms, including the City's Website.	Ongoing
5.7	10.10	Internal Processes, Collaboration	Strengthen and formalise internal procedures and processes for environmental and sustainability consultation for planning and City-managed projects, as well as collaboration between service units with environmental and sustainability teams. Engage environment and sustainability officers in early and subsequent stages of all City managed asset planning, development and delivery.	2026/2027
5.8	10.7	Internal Processes, Fire management	Undertake an independent review of the current delivery of the fire mitigation program to assess its effectiveness and identify potential impacts on biodiversity values.	2027/2028
5.9	10.10	Internal Processes, Data	Investigate the development of a biodiversity database/system that secures corporate knowledge and incorporates validated community derived information, with capability for ongoing updates through an appropriate platform.	2029/2030
5.10	10.10	Internal Processes, Data	Develop processes to maintain LNA data and statistics and ensure data informing the Environmental Intramaps module remains current and new information is presented in specific data layers.	Commence 2026/2027
5.11	10.9	Internal Processes, Resourcing	Consider resource requirements and work force planning to assist with natural area management, conservation, restoration, capacity building and education.	Ongoing

12.1 Implementation, Monitoring and Review

The City will determine the prioritisation, implementation and resourcing of actions required to progress the Local Biodiversity Plan (LBP). Where competing City priorities arise, these will be carefully considered and a clear process will be established to identify, assess and resolve conflicts.

Implementation of the strategy will be monitored, with an annual progress report prepared and submitted to the Executive Management Team.

A comprehensive review of this Local Biodiversity Plan is anticipated in 2031, with a subsequent Local Biodiversity Plan for 2031-32–2035-36 to be developed and implemented.

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13 References

13.1 General references

The references listed below have been considered as part of preparing this document.

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14 Appendices

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Appendix A: Vegetation Complexes within the City of Wanneroo

A description of the 12 vegetation complexes mapped within the City of Wanneroo is provided in **Appendix Table i)**

Appendix Table i)–Description of Vegetation Complexes within the City of Wanneroo

Vegetation Complex	Description
Bassendean Dunes	
Bassendean Complex - Central and South	Vegetation ranges from woodland of <i>Eucalyptus marginata</i> (Jarrah) - <i>Allocasuarina fraseriana</i> (Sheoak) - Banksia species to low woodland of Melaleuca species, and sedgelands on the sites with more moisture. This area includes the transition of <i>Eucalyptus marginata</i> (Jarrah) to <i>Eucalyptus todtiana</i> (Pricklybark) in the vicinity of Perth.
Bassendean Complex – Central and South Transition	Woodland of <i>Eucalyptus marginata</i> (Jarrah) - <i>Corymbia calophylla</i> (Marri) with well-defined second storey of <i>Allocasuarina fraseriana</i> (Sheoak) and <i>Banksia grandis</i> (Bull Banksia) on the deeper soils and a closed scrub on the sites with more moisture. The understorey species reflect similarities with the adjacent vegetation complexes.
Bassendean Complex – North	Vegetation ranges from a low open forest and low open woodland of Banksia species <i>Eucalyptus todtiana</i> (Pricklybark) to low woodland of Melaleuca species and sedgelands which occupy the sites with more moisture.
Bassendean Complex – North Transition	A transition complex of low open forest and low woodland of Banksia species - <i>Eucalyptus todtiana</i> (Pricklybark) on a series of high sand dunes. The understorey species reflect similarities with both the Bassendean-North and Karrakatta-North vegetation complexes.

Appendix Table i)– Description of Vegetation Complexes within the City of Wanneroo
continued

Vegetation Complex	Description
Spearwood Dunes	
Cottesloe Complex – Central and South	Mosaic of woodland of <i>Eucalyptus gomphocephala</i> (Tuart) and open forest of <i>Eucalyptus gomphocephala</i> (Tuart) - <i>Eucalyptus marginata</i> (Jarrah) - <i>Corymbia calophylla</i> (Marri); closed heath on the Limestone outcrops.
Cottesloe Complex – North	Predominantly low open forest and low woodland of <i>Banksia attenuata</i> (Slender Banksia) - <i>Banksia menziesii</i> (Firewood Banksia) - <i>Eucalyptus tottiana</i> (Pricklybark); closed heath on the Limestone outcrops.
Karrakatta Complex – Central and South	Mosaic of woodland of <i>Eucalyptus gomphocephala</i> (Tuart) and open forest of <i>Eucalyptus gomphocephala</i> (Tuart) - <i>Eucalyptus marginata</i> (Jarrah) - <i>Corymbia calophylla</i> (Marri); closed heath on the Limestone outcrops.
Karrakatta Complex – North	Predominantly low open forest and low woodland of Banksia species E- <i>Eucalyptus tottiana</i> (Pricklybark), less consistently open forest of <i>Eucalyptus gomphocephala</i> (Tuart) - <i>Eucalyptus tottiana</i> (Pricklybark) - Banksia species.
Karrakatta Complex – North Transition	A transition complex of low open forest and low woodland of Banksia species - <i>Eucalyptus tottiana</i> (Pricklybark) on the transition zone of a series of high sand dunes between Bassendean-North and Karrakatta-North.
Quindalup Dunes	
Quindalup Complex	Coastal dune complex consisting mainly of two alliances - the strand and fore-dune alliance and the mobile and stable dune alliance. Local variations include the low closed forest of <i>Melaleuca lanceolata</i> (Rottnest Teatree) - <i>Callitris preissii</i> (Rottnest Island Pine), the closed scrub of <i>Acacia rostellifera</i> (Summer-scented Wattle) and the low closed <i>Agonis flexuosa</i> (Peppermint) forest of Geographe Bay.

Appendix Table i)– Description of Vegetation Complexes within the City of Wanneroo
continued

Vegetation Complex	Description
Wetlands	
Herdsman Complex	Sedgelands and fringing woodland of <i>Eucalyptus rudis</i> (Flooded Gum) - <i>Melaleuca</i> species.
Pinjar Complex	Vegetation ranges from woodland of <i>Eucalyptus marginata</i> (Jarrah) - <i>Banksia</i> species to a fringing woodland of <i>Eucalyptus rudis</i> (Flooded Gum) - <i>Melaleuca preissiana</i> (Moonah) and sedgelands.

Heddle *et al.* 1980.

Appendix B: Ecological Criteria used for Multiple Criteria Analysis, Data Sets and Sources

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Ecological criteria used in the multiple criteria analysis was derived from the Local Government Biodiversity Planning Guidelines for the Perth Metropolitan Region (Del Marco *et al.* 2004) and incorporates biodiversity considerations, including regional and local representation, connectivity, rarity, proximity to wetland and coastal systems and climate change. All ecological criteria included and associated weighting was discussed and agreed upon through workshops with the City of Wanneroo. **Appendix Table ii** below presents the data sets used and their associated weightings.

Appendix Table ii: Ecological criteria used in the Multiple criteria analysis, the data set and associated weighting

Priority Category	Ecological Criteria	Data	Source	Data last updated
Regional Representation				
1	Of an ecological community with only 1500 ha or 30% or less remaining in the IBRA sub-region	Vegetation Complexes - Swan Coastal Plain (DBCA-046): - Bassendean Complex - Central and South - Karrakatta Complex - Central and South	https://catalogue.data.wa.gov.au/dataset/vegetation-complexes-swan-coastal-plain	24/08/2018
1	Of an ecological community with 90 - 100% of its original extent occurs within the LGA	Vegetation Complexes - Swan Coastal Plain (DBCA-046): - Pinjar Complex	https://catalogue.data.wa.gov.au/dataset/vegetation-complexes-swan-coastal-plain	24/08/2018
2	Large natural areas (≥4 ha)	Native Vegetation data updated by Wanneroo (see explanation *)	City of Wanneroo	01/02/2026
3	Large natural areas (between ≥2 ha and <4ha)	Native Vegetation data updated by Wanneroo (see explanation *)	City of Wanneroo	01/02/2026
3	Environmental Sensitive Areas	Clearing Regulations - Environmentally Sensitive Areas (DWER-046)	https://catalogue.data.wa.gov.au/dataset/clearing-regulations-environmentally-sensitive-areas-dwer-046	09/11/2021
4	Vegetation within 50 m of Conservation Estate and/or Bush Forever Site	· Bush Forever Sites · DPaW Managed land · National Parks · Nature Reserves · Conservation Parks · CALM Act Reserves · A Class Reserve	https://catalogue.data.wa.gov.au/dataset/region-scheme-special-areas-dop-073 - Reserves (LGATE-227)	01/02/2026
4	Natural areas (< 2 ha)	Native Vegetation data updated by Wanneroo (see explanation *)	City of Wanneroo	01/02/2026

Priority Category	Ecological Criteria	Data	Source	Data last updated
Local Representation				
1	Of an ecological community with 10% or less remaining in the LGA AND <10% formally protected	Vegetation Complexes - Swan Coastal Plain (DBCA-046): - None	https://catalogue.data.wa.gov.au/dataset/vegetation-complexes-swan-coastal-plain	24/08/2018
2	Of an ecological community with 1500 ha or less or 30% or less remaining in the LGA	Vegetation Complexes - Swan Coastal Plain (DBCA-046): - Bassendean Complex - Central and South - Herdsman Complex - Karakatta Complex - Central and South - Karakatta Complex – North	https://catalogue.data.wa.gov.au/dataset/vegetation-complexes-swan-coastal-plain	24/08/2018
2	Of an ecological community with 1500 ha or less or 30% or less remaining in the LGA AND <30% formally protected	Vegetation Complexes - Swan Coastal Plain (DBCA-046): - Bassendean Complex - Central and South - Karakatta Complex – North	https://catalogue.data.wa.gov.au/dataset/vegetation-complexes-swan-coastal-plain	24/08/2018
2	Of an ecological community with 1500 ha or less or 30% or less remaining in the LGA AND <10% formally protected	Vegetation Complexes - Swan Coastal Plain (DBCA-046): - Karakatta Complex - Central and South	https://catalogue.data.wa.gov.au/dataset/vegetation-complexes-swan-coastal-plain	24/08/2018

Priority Category	Ecological Criteria	Data	Source	Data last updated
Rarity				
1	Contains a Threatened Ecological Community	Threatened and Priority Ecological Community boundaries in WA Commonwealth listed TECs: 'Critically Endangered', 'Endangered', 'Vulnerable'	Department of Biodiversity, Conservation and Attraction's Threatened and Priority Ecological Communities database: Communities Data <communities.data@dbca.wa.gov.au>	13/08/2024
1	Contains significant habitat for significant fauna (black cockatoos data: foraging, breeding, roosting)	- Compiled White Tailed Black Cockatoo Breeding Site locations (1933-2019) - Black Cockatoo Roosting Sites (includes the 2019 roost services) - Carnaby's Cockatoo Areas requiring investigation as feeding habitat in the Swan Coastal Plain (SCP) IBRA Region (DBCA-057)	* Department of Biodiversity, Conservation and Attraction's Threatened and Priority Fauna database Fauna Data <fauna.data@dbca.wa.gov.au> * https://catalogue.data.wa.gov.au/en/dataset/carnabys-cockatoo-unconfirm-feeding-areas-scp	21/05/2024
2	Contains a Priority Ecological Community	Threatened and Priority Ecological Community boundaries in WA Priority 1 - 5	Department of Biodiversity, Conservation and Attraction's Threatened and Priority Ecological Communities database: Communities Data <communities.data@dbca.wa.gov.au>	13/08/2024
3	Vegetation within 50 m of a Threatened (Declared Rare) Flora (DRF)	Threatened and Priority Flora (DBCA-036)	Department of Biodiversity, Conservation and Attraction's Threatened and Priority Flora database Flora Data <flora.data@dbca.wa.gov.au>	11/09/2025
3	Vegetation within 50 m of a Priority Flora (1, 2, 3, 4) (WAHerb data)	WAHerb July 2024: Conservation Code: 1, 2, 3, 4	Department of Biodiversity, Conservation and Attraction's Threatened and Priority Flora database Flora Data <flora.data@dbca.wa.gov.au>	26/06/2024
3	Vegetation within 50 m of Threatened or Priority Fauna and Specially Protected Fauna	Threatened and Priority Fauna (DBCA-037) - Priority 1 - 4 - Specially Protected - Threatened - Endangered or Critically Endangered or Vulnerable	Department of Biodiversity, Conservation and Attraction's Threatened and Priority Fauna database Fauna Data <fauna.data@dbca.wa.gov.au>	13/01/2025

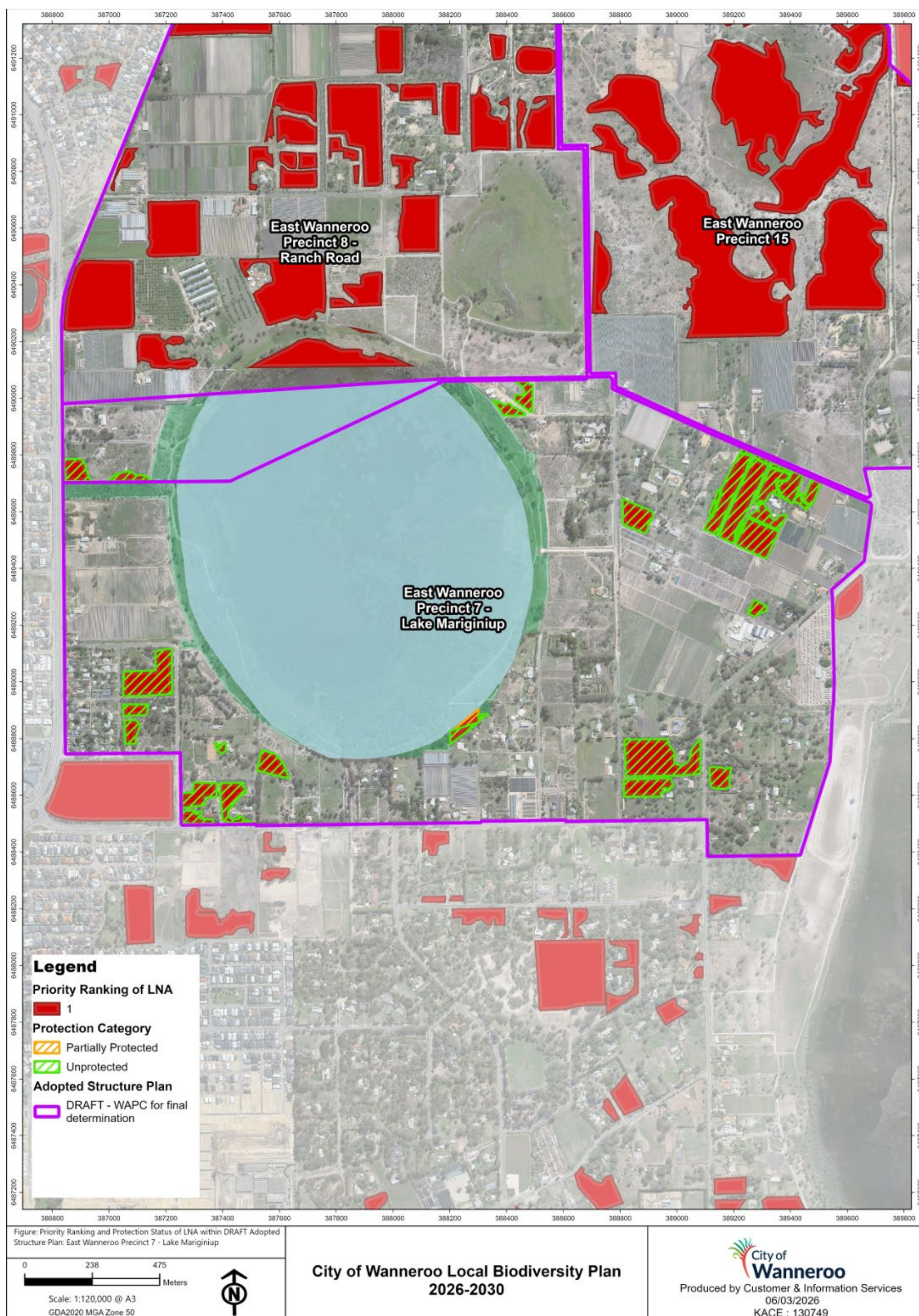
Priority Category	Ecological Criteria	Data	Source	Data last updated
Maintaining Ecological Processes – Connectivity				
1	Vegetation within a Regional Ecological Linkage	Perth Regional Ecological Linkages - Perth Biodiversity Project, WALGA, West Perth.	https://catalogue.data.wa.gov.au/en/dataset/perth-regional-ecological-linkages	2008
1	Vegetation within a Local Ecological Linkage			April 2011
2	Vegetation within a NatureLinks linkage	Data provided by NatureLink Perth (buffered by 250m) as detailed in Appendix C	https://naturelinkperth.org/	
Protection of Wetland, Coastal Dunes and their associated vegetation				
1	Within CCW or REW area and/or within 50 m of the wetland boundary	Geomorphic Wetlands, Swan Coastal Plain (DBCA-019)	https://catalogue.data.wa.gov.au/en/dataset/geomorphic-wetlands-swan-coastal-plain	17/02/2026
Climate Change				
2	Within 50 m of 2120 CHRMAP scenario	CHRMAP data - Coastal Hazard Risk Management and Adaption Plan	Coastal Vulnerability and Hazard Mapping Study completed by MP Rogers & Associates	2015
Other				
2	High and Medium Karst risk	Karst Risk dataset - The Western Australian Speleological Group	City of Wanneroo	
4	Contains a 'friends of Group'	Cadastral boundaries aligning with 'Friends of' group parks/reserves: Friends of Damian Park/ Belgrade Park, Edgar Griffiths Park, Benmuni Park, Franklin and Chiquita Park, Friends of Chancellor Park, Friends of Voyager Park, Friends of Koondoola Bushland, Friends of Mary Park, Friends of Kahana Park, Yanchep Coast Care		

**(*) Native Vegetation data
updated by Wanneroo**

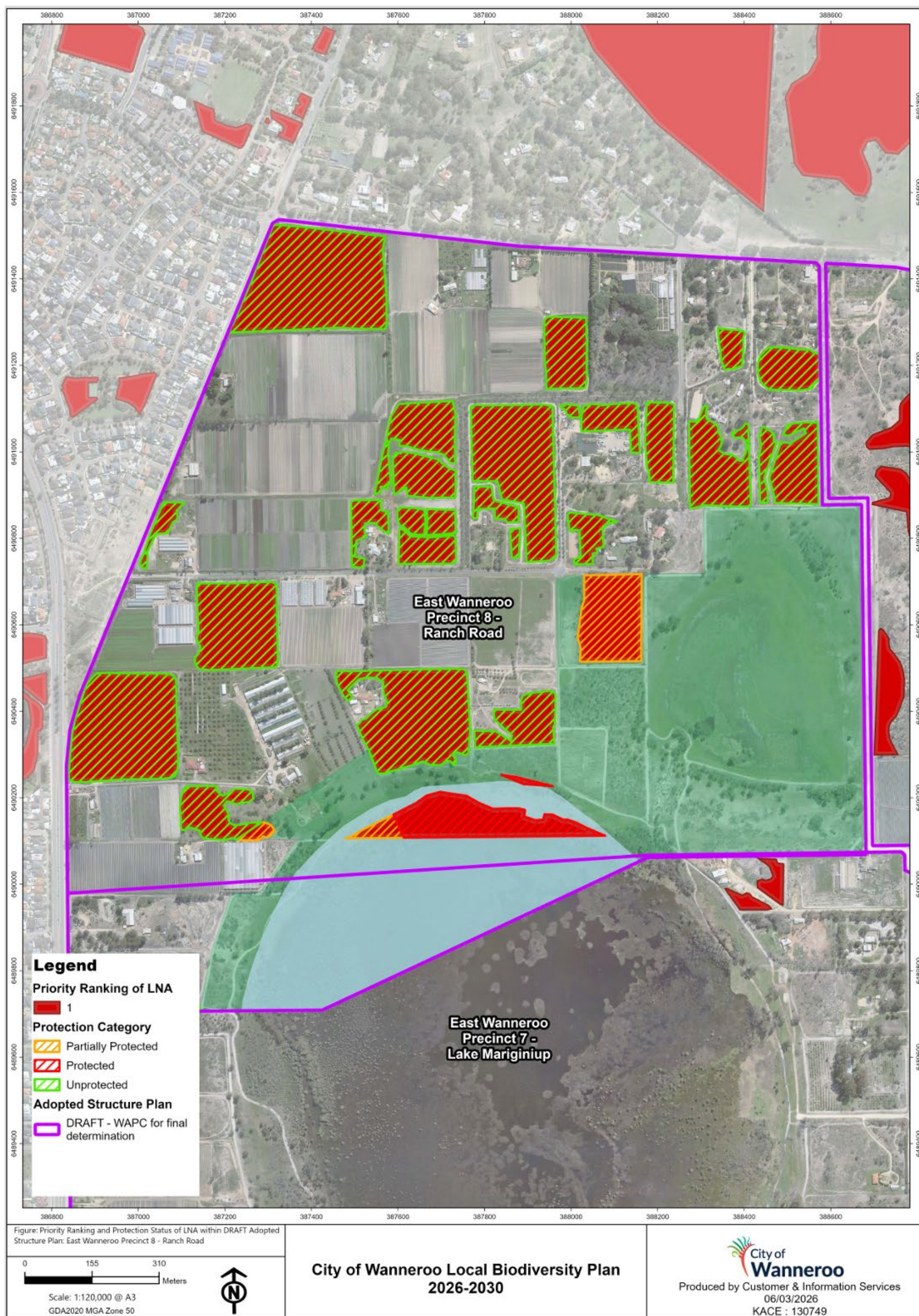
Method	Source
Available datasets were identified as outdated and did not accurately reflect the current extent of native vegetation within Wanneroo. To address this, staff undertook an update of the existing spatial data using a combination of available datasets, recent aerial imagery, and on-ground knowledge. The primary datasets used were Swan Coastal Plain and Perth-Peel Native Vegetation Extent 2024 (DWER-141) and Native Vegetation Extent (DPIRD-005). The latter was published in May 2023 and is based on aerial photography acquired between 1996 and 2020. These were compared with high-resolution aerial imagery published in November 2025 by Nearmap to identify where vegetation mapping no longer matched current conditions. Areas of discrepancy were reviewed and updated to better reflect what is on the ground in November 2025. This process was supported by input from environmental officers who regularly conduct site inspections to confirm vegetation extent and condition. Where available, Environmental Management Plans prepared by EMERGE were also considered to improve understanding of vegetation quality in specific bushland areas.	https://catalogue.data.wa.gov.au/en/dataset/native-vegetation-extent

Appendix C: Priority Ranking of LNA in Draft Structure Plan Areas Maps

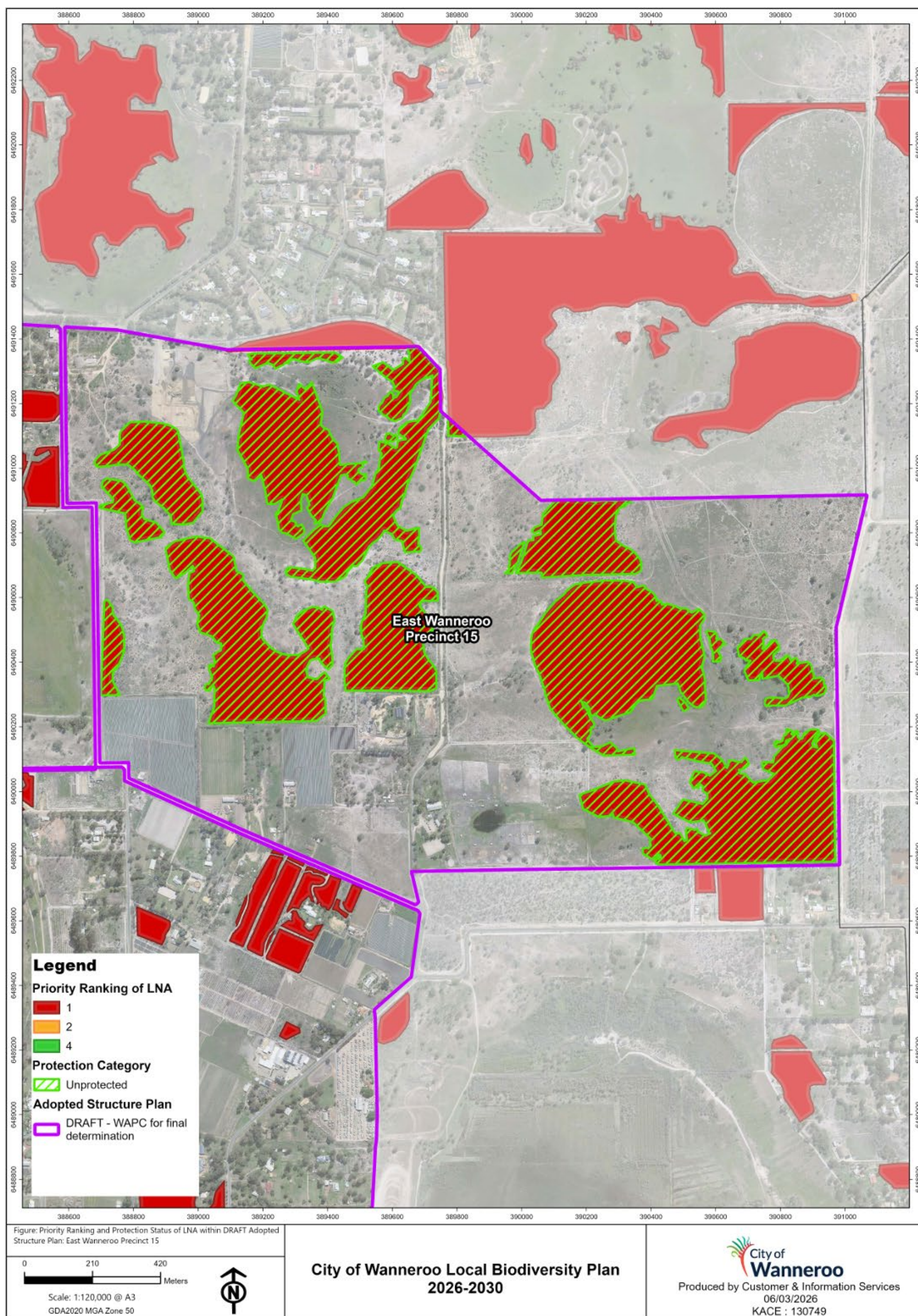
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Appendix Map i) Priority Ranking and Protection Category of LNA in East Wanneroo Draft Structure Plan Precinct 7



Appendix Map ii) Priority Ranking and Protection Category of LNA in East Wanneroo Draft Structure Plan Precinct 8



Appendix Map iii) Priority Ranking and Protection Category of LNA in East Wanneroo Draft Structure Plan Precinct 15

Appendix D: Significant Vegetation, Flora and Fauna Features in the City Of Wanneroo

This appendix contains information on the significant biodiversity features in the City of Wanneroo, specifically the threatened (TEC) and priority (PEC) ecological communities, flora and fauna. Data in this section is derived from DBCA's TEC, PEC, Priority Fauna and Priority Flora Lists current as of December 2025.

Appendix Table iii) TECs and PECs and listings under State and Commonwealth legislation.

Threatened or Priority Ecological Community	BC Act (WA)	EPBC Act (Commonwealth)
Aquatic Root Mat Community in Caves of the Swan Coastal Plain		Endangered
Floristic Community Type name: Aquatic Root Mat Community number 1 of Caves of the Swan Coastal Plain (Caves SCP 01)	Critically Endangered	
Sedgeland in Holocene dune swales of the southern Swan Coastal Plain		Endangered
Floristic Community Type name: Sedgeland in Holocene dune swales of the southern Swan Coastal Plain (floristic community type 19 as originally described in Gibson et al. 1994)	Critically Endangered	
Honeymyrtle shrubland on limestone ridges of the Swan Coastal Plain Bioregion		Critically Endangered
Floristic Community Type name: <i>Melaleuca huegelii</i> – <i>M. systena</i> shrublands of limestone ridges (floristic community type 26a as originally described in Gibson et al. 1994)	Critically Endangered	
Banksia Woodlands on Swan Coastal Plain	Priority Ecological Community- Priority 3	Endangered
Floristic Community Type name: <i>Banksia attenuata</i> woodlands over species rich dense shrublands (floristic community type 20a as originally described in Gibson et al. 1994) – (Commonly a component of the endangered Banksia Woodlands of the Swan Coastal Plain EPBC listed TEC)	Critically Endangered	
Floristic Community Type name: Low lying Banksia attenuata woodlands or shrublands ('floristic community type 21c') (A component of the Endangered Banksia Woodlands of the Swan Coastal Plain EPBC listed TEC)	Priority Ecological Community- Priority 3	
Floristic Community Type name: Banksia ilicifolia woodlands, southern Swan Coastal Plain ('floristic community type 22') (A component of the Endangered Banksia Woodlands of the Swan Coastal Plain EPBC listed TEC)	Priority Ecological Community- Priority 3	
Floristic Community Type name: Northern Spearwood shrublands and woodlands ('floristic community type 24') – (Can be a component of the Endangered Banksia Woodlands of the Swan Coastal Plain EPBC listed TEC)	Priority Ecological Community- Priority 3	

Floristic Community Type name: Southern Swan Coastal Plain <i>Eucalyptus gomphocephala</i> - <i>Agonis flexuosa</i> woodlands (floristic community type 25) (Can be a component of the Endangered Banksia Woodlands of the Swan Coastal Plain EPBC listed TEC) or 'Tuart (<i>Eucalyptus gomphocephala</i>) Woodlands and Forests of the Swan Coastal Plain ecological community'(Critically Endangered EPBC listed TEC))	Priority Ecological Community- Priority 3	
Threatened or Priority Ecological Community	BC Act (WA)	EPBC Act (Commonwealth)
Tuart (<i>Eucalyptus gomphocephala</i>) Woodlands and Forests of the Swan Coastal Plain Quindalup <i>Eucalyptus gomphocephala</i> and / or <i>Agonis flexuosa</i> woodlands ('floristic community type 30b') (Can be a component of 'Tuart (<i>Eucalyptus gomphocephala</i>) Woodlands and Forests of the Swan Coastal Plain ecological community'(Critically Endangered EPBC listed TEC)) Southern Swan Coastal Plain <i>Eucalyptus gomphocephala</i> - <i>Agonis flexuosa</i> woodlands (floristic community type 25) (Can be a component of 'Banksia Woodlands of the Swan Coastal Plain ecological community' (Endangered TEC)) or Can be a component of 'Tuart (<i>Eucalyptus gomphocephala</i>) Woodlands and Forests of the Swan Coastal Plain ecological community'(Critically Endangered EPBC listed TEC))	Priority Ecological Community- Priority 3 The description, area and condition thresholds that apply to the EPBC-listed TEC of the same name, also apply to this Priority Ecological Community Priority Ecological Community- Priority 3 Priority Ecological Community- Priority 3	Critically Endangered
Priority Ecological Community	BC Act (WA)	EPBC Act (Commonwealth)
Acacia shrublands on taller dunes, southern Swan Coastal Plain ('floristic community type 29b')	Priority Ecological Community- Priority 3	-
Coastal shrublands on shallow sands, southern Swan Coastal Plain ('floristic community type 29a')	Priority Ecological Community- Priority 3	-

Appendix Table iv): Listing Codes Classifications

Code	Classification
CR	Critically Endangered
EN	Endangered
Vu	Vulnerable
P1	Priority 1
P2	Priority 2
P3	Priority 3
P4	Priority 4
OS	Other Specially Protected
Mi	Migratory
CD	Conservation Dependent

Appendix Table v): Threatened and Priority Fauna in the City of Wanneroo

Common Name	Scientific Name	Class	BC Act Listing	EPBC Act Listing
Crystal Cave crangonyctoid, cave shrimp	<i>Hurleya sp. (WAM C23193)</i>	INVERTEBRATE	CR	
Curlew sandpiper	<i>Calidris ferruginea</i>	BIRD	CR	CR MI
Douglas's broad-headed bee	<i>Hesperocolletes douglasi</i>	INVERTEBRATE	CR	CR
Great knot	<i>Calidris tenuirostris</i>	BIRD	CR	VU MI
Australasian bittern	<i>Botaurus poiciloptilus</i>	BIRD	EN	EN
Australian lesser noddy	<i>Anous tenuirostris melanops</i>	BIRD	EN	VU
Australian painted snipe	<i>Rostratula australis</i>	BIRD	EN	EN
Australian sea-lion	<i>Neophoca cinerea</i>	MAMMAL	EN	EN
Baudin's cockatoo	<i>Zanda baudinii</i>	BIRD	EN	EN
Black-stripe minnow, black-striped dwarf galaxias	<i>Galaxiella nigrostriata</i>	FISH	EN	EN
Carnaby's cockatoo	<i>Zanda latirostris</i>	BIRD	EN	EN
Indian yellow-nosed albatross	<i>Thalassarche carteri</i>	BIRD	EN	VU MI
Loggerhead turtle	<i>Caretta caretta</i>	REPTILE	EN	EN MI
Red knot	<i>Calidris canutus</i>	BIRD	EN	VU MI

Common Name	Scientific Name	Class	BC Act Listing	EPBC Act Listing
White-tailed black cockatoo	<i>Calyptorhynchus sp. 'white-tailed black cockatoo'</i>	BIRD	EN	EN
White-tailed black cockatoo	<i>Calyptorhynchus sp. 'white-tailed black cockatoo'</i>	BIRD	EN	
Atlantic yellow-nosed albatross	<i>Thalassarche chlororhynchos</i>	BIRD	VU	MI
Carter's freshwater mussel	<i>Westralunio carteri</i>	INVERTEBRATE	VU	VU
Chuditch, western quoll	<i>Dasyurus geoffroii</i>	MAMMAL	VU	VU
Fairy tern	<i>Sternula nereis nereis</i>	BIRD	VU	VU
Flatback turtle	<i>Natator depressus</i>	REPTILE	VU	VU MI
Flesh-footed shearwater, fleshy-footed shearwater	<i>Ardenna carneipes</i>	BIRD	VU	MI
Forest red-tailed black cockatoo	<i>Calyptorhynchus banksii naso</i>	BIRD	VU	VU
Great white shark	<i>Carcharodon carcharias</i>	FISH	VU	VU MI
Greater sand plover, large sand plover	<i>Charadrius leschenaultii</i>	BIRD	VU	VU MI
Green turtle	<i>Chelonia mydas</i>	REPTILE	VU	VU MI
Grey nurse shark	<i>Carcharias taurus</i>	FISH	VU	VU
Grey-headed albatross	<i>Thalassarche chrysostoma</i>	BIRD	VU	EN MI
Leatherback turtle	<i>Dermochelys coriacea</i>	REPTILE	VU	EN MI
Mud minnow, western dwarf galaxias	<i>Galaxiella munda</i>	FISH	VU	VU
Shy albatross	<i>Thalassarche cauta cauta</i>	BIRD	VU	EN MI
Southern right whale	<i>Eubalaena australis</i>	MAMMAL	VU	EN MI
Sperm whale	<i>Physeter macrocephalus</i>	MAMMAL	VU	MI
Subantarctic fur-seal	<i>Arctocephalus tropicalis</i>	MAMMAL	VU	EN
Subantarctic fur-seal	<i>Arctocephalus tropicalis</i>	MAMMAL	VU	EN
White-chinned petrel	<i>Procellaria aequinoctialis</i>	BIRD	VU	MI
Javelin legless lizard (Shark Bay)	<i>Delma concinna major</i>	REPTILE	P1	
Australian little bittern	<i>Ixobrychus dubius</i>	BIRD	P4	
Blue-billed duck	<i>Oxyura australis</i>	BIRD	P4	
Graceful sunmoth	<i>Synemon gratiosa</i>	INVERTEBRATE	P4	
Quenda, southwestern brown bandicoot	<i>Isodon fusciventer</i>	MAMMAL	P4	
Tammar wallaby	<i>Notamacropus eugenii derbianus</i>	MAMMAL	P4	
Water-rat, rakali	<i>Hydromys chrysogaster</i>	MAMMAL	P4	
Western brush wallaby	<i>Notamacropus irma</i>	MAMMAL	P4	
New Zealand fur-seal, long-nosed fur-seal	<i>Arctocephalus forsteri</i>	MAMMAL	OS	
Peregrine falcon	<i>Falco peregrinus</i>	BIRD	OS	
Black-tailed godwit	<i>Limosa limosa</i>	BIRD	MI	EN MI
Caspian Tern	<i>Hydroprogne caspia</i>	BIRD	MI	MI

Common Name	Scientific Name	Class	BC Act Listing	EPBC Act Listing
Common greenshank, greenshank	<i>Tringa nebularia</i>	BIRD	MI	EN MI
Common Sandpiper	<i>Actitis hypoleucos</i>	BIRD	MI	MI
Crested tern	<i>Thalasseus bergii</i>	BIRD	MI	MI
Fork-tailed swift	<i>Apus pacificus</i>	BIRD	MI	MI
Glossy ibis	<i>Plegadis falcinellus</i>	BIRD	MI	MI
Grey plover	<i>Pluvialis squatarola</i>	BIRD	MI	VU MI
Long-toed Stint	<i>Calidris subminuta</i>	BIRD	MI	MI
Marsh sandpiper, little greenshank	<i>Tringa stagnatilis</i>	BIRD	MI	MI
Oriental pratincole	<i>Glareola maldivarum</i>	BIRD	MI	MI
Osprey, eastern osprey	<i>Pandion cristatus</i>	BIRD	MI	MI
Pectoral Sandpiper	<i>Calidris melanotos</i>	BIRD	MI	MI
Red-necked stint	<i>Calidris ruficollis</i>	BIRD	MI	MI
Ruddy turnstone	<i>Arenaria interpres</i>	BIRD	MI	VU MI
Sanderling	<i>Calidris alba</i>	BIRD	MI	MI
Sharp-tailed sandpiper	<i>Calidris acuminata</i>	BIRD	MI	VU MI
Southern giant petrel	<i>Macronectes giganteus</i>	BIRD	MI	EN MI
Streaked shearwater	<i>Calonectris leucomelas</i>	BIRD	MI	MI
White-winged black tern, white-winged tern	<i>Chlidonias leucopterus</i>	BIRD	MI	MI
Wilson's storm-petrel	<i>Oceanites oceanicus</i>	BIRD	MI	MI
Wood sandpiper	<i>Tringa glareola</i>	BIRD	MI	MI
South-western brush-tailed phascogale, wambenger	<i>Phascogale tapoatafa wambenger</i>	MAMMAL	CD	
Humpback whale	<i>Megaptera novaeangliae</i>	MAMMAL	CD & MI	VU MI

Appendix Table vi): Threatened and Priority Flora in the City of Wanneroo

Scientific Name	BC Act Listing	EPBC Act Listing
<i>Caladenia huegelii</i>	CR	EN
<i>Calectasia elegans</i>	CR	-
<i>Marianthus paralius</i>	EN	EN
<i>Melaleuca</i> sp. Wanneroo (G.J. Keighery 16705)	EN	EN
<i>Eucalyptus argutifolia</i>	VU	VU
<i>Baeckea</i> sp. Limestone (N. Gibson & M.N. Lyons 1425)	P1	
<i>Drosera patens</i>	P1	
<i>Drosera</i> x <i>sidjamesii</i>	P1	
<i>Grevillea evanescens</i>	P1	
<i>Haloragis luminosa</i>	P1	
<i>Leucopogon maritimus</i>	P1	
<i>Acacia benthamii</i>	P2	
<i>Amanita wadulawitu</i>	P2	
<i>Drosera</i> x <i>badgerupii</i>	P2	
<i>Fabronia hampeana</i>	P2	
<i>Lecania sylvestris</i>	P2	
<i>Lecania turicensis</i> var. <i>turicensis</i>	P2	
<i>Netrostylis</i> sp. Chandala (G.J. Keighery 17055)	P2	
<i>Poranthera moorokatta</i>	P2	
<i>Rinodina bischoffii</i>	P2	
<i>Amanita carneiphylla</i>	P3	
<i>Adenanthos cygnorum</i> subsp. <i>chamaephyton</i>	P3	
<i>Beyeria cinerea</i> subs. <i>cinerea</i>	P3	
<i>Conostylis bracteata</i>	P3	
<i>Cyathochaeta teretifolia</i>	P3	
<i>Dampiera triloba</i>	P3	
<i>Hibbertia leptotheca</i>	P3	
<i>Lasiopetalum membranaceum</i>	P3	
<i>Pimelea calcicola</i>	P3	
<i>Placynthium nigrum</i>	P3	
<i>Sarcozona bicarinata</i>	P3	
<i>Sphaerolobium calcicola</i>	P3	

Scientific Name	BC Act Listing	EPBC Act Listing
<i>Stylidium maritimum</i>	P3	
<i>Styphelia filifolia</i>	P3	
<i>Styphelia porcata</i>	P3	
<i>Conostylis pauciflora</i> subsp. <i>euryrhipis</i>	P4	
<i>Eucalyptus foecunda</i> subsp. <i>foecunda</i>	P4	
<i>Jacksonia sericea</i>	P4	
<i>Lepidium pseudotasmanicum</i>	P4	
<i>Schoenus griffinianus</i>	P4	
<i>Stylidium longitubum</i>	P4	
<i>Tripterococcus</i> sp. <i>Brachylobus</i> (A.S. George 14234)	P4	

Appendix E: Geomorphic Wetlands Within the City of Wanneroo

A list of the key known wetlands within the City of Wanneroo and their relevant management categories are provided in **Appendix Table vii**). Wetland Management categories descriptions are provided in **Appendix Table viii**). Maps detailing classification categories for wetlands for each precinct are also provided below.

Appendix Table vii): Key known geomorphic wetlands within the City of Wanneroo

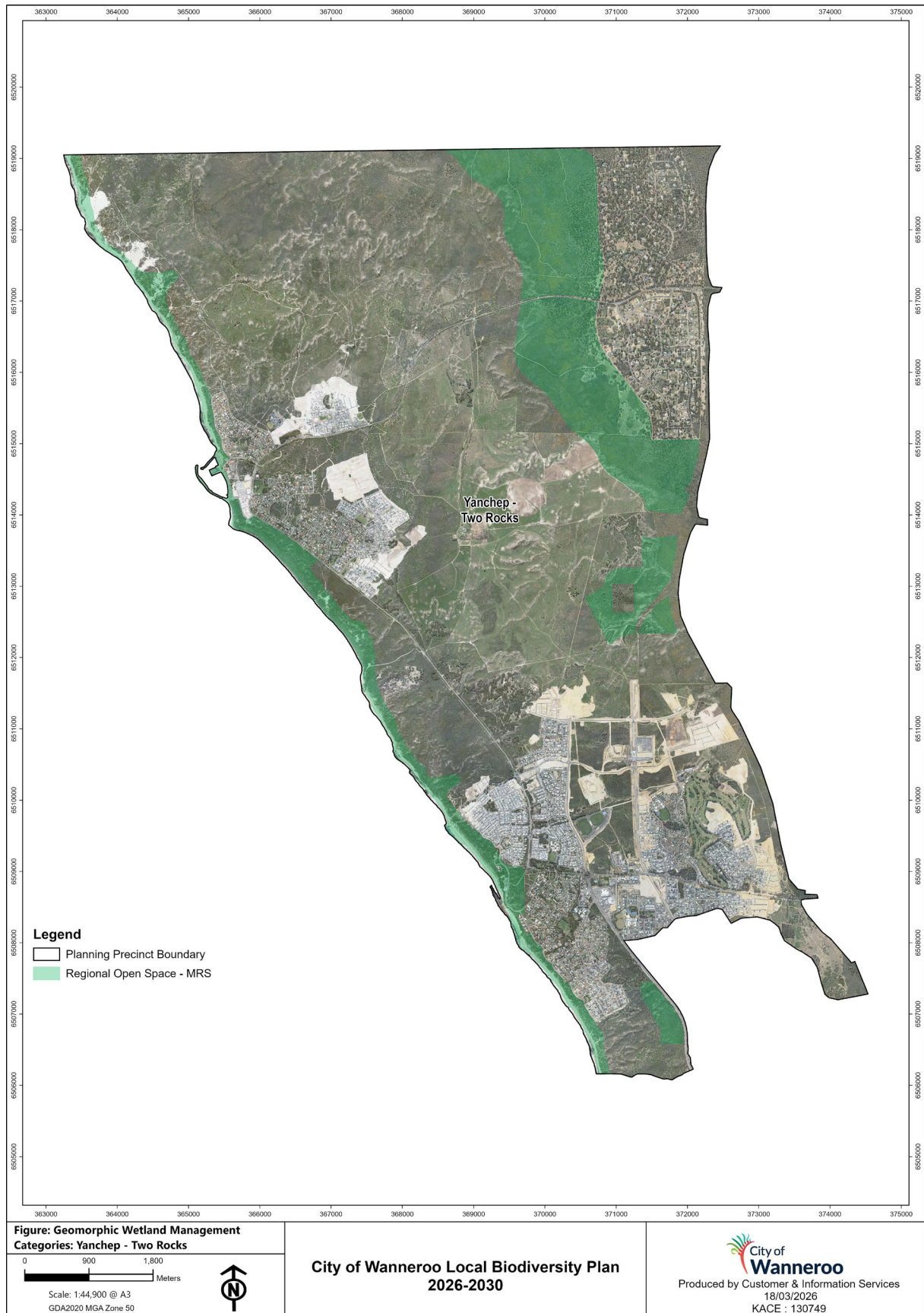
Wetland Name	UFI	Biodiversity Planning Precinct	Classification	Management Category
Badgerup Lake	8165	South East Wanneroo	Sumpland	Conservation
Beenyup Swamp	8169	South West Wanneroo	Sumpland	Conservation
Beonaddy Swamp	8016	North East Wanneroo	Sumpland	Resource Enhancement
Bustard Landing	8098	State Forest Regional Park	Dampland	Conservation
Bustard North	8119	State Forest Regional Park	Dampland	Conservation
Bustard Swamp	8099	State Forest Regional Park	Dampland	Conservation
Camel Swamp	7938	North East Wanneroo	Dampland	Resource Enhancement
Carabooda Lake	8009	North East Wanneroo	Sumpland	Resource Enhancement
Coogee Swamp	8015	North East Wanneroo	Lake	Resource Enhancement
Gnangara Lake	8130	South East Wanneroo	Lake	Conservation
Hawkins Road Swamp	8093	South East Wanneroo; State Forest Regional Park	Sumpland	Conservation
Jandabup Lake	7957; 8114; 15006	South East Wanneroo	Lake	Conservation; Resource Enhancement; Multiple Use
Jinbup Swamp	7956	South East Wanneroo	Sumpland	Multiple Use
Lake Adams	7959; 7960	South East Wanneroo	Dampland	Conservation
Lake Joondalup	7954	South West Wanneroo	Lake	Conservation
Lake Pinjar	7915; 7916; 7917; 7929; 7931; 7933; 7935; 7937; 7939; 7947; 7948; 13373; 13374; 15005	North East Wanneroo; State Forest Regional Park; South East Wanneroo	Sumpland	Conservation; Multiple Use
Little Badgerup Lake	8132	South East Wanneroo	Sumpland	Conservation
Little Coogee Flat	7945	State Forest Regional Park	Dampland	Conservation
Little Coogee Swamp	7941	State Forest Regional Park	Dampland	Resource Enhancement
Little Dundarbar	8117	South East Wanneroo	Sumpland	Multiple Use
Little Mariginup	8161	South East Wanneroo	Sumpland	Conservation
Loch McNess	8010	State Forest Regional Park	Lake	Conservation
Mariginup Lake	7953	South East Wanneroo	Lake	Conservation
Mindarie Lake	8013	North East Wanneroo	Sumpland	Multiple Use
Neerabup Lake	8019	North East Wanneroo; South East Wanneroo	Sumpland	Resource Enhancement
Nowergup Lake	8021	North East Wanneroo	Lake	Conservation
Paul's Swamp	8159; 8160	South West Wanneroo	Sumpland	Conservation; Multiple Use
Pinesend Farm Swamp	8153	South East Wanneroo	Dampland	Multiple Use
Pippidinny Swamp	8012	State Forest Regional Park	Sumpland	Conservation
Snake Swamp	8116; 8135	South East Wanneroo; South West Wanneroo	Dampland	Multiple Use; Resource Enhancement
Wallubuenup Swamp	15458	South West Wanneroo	Sumpland	Conservation
Wilgarup Lake	8022	State Forest Regional Park	Sumpland	Conservation

Yonderup Lake	8011	State Forest Regional Park	Lake	Conservation
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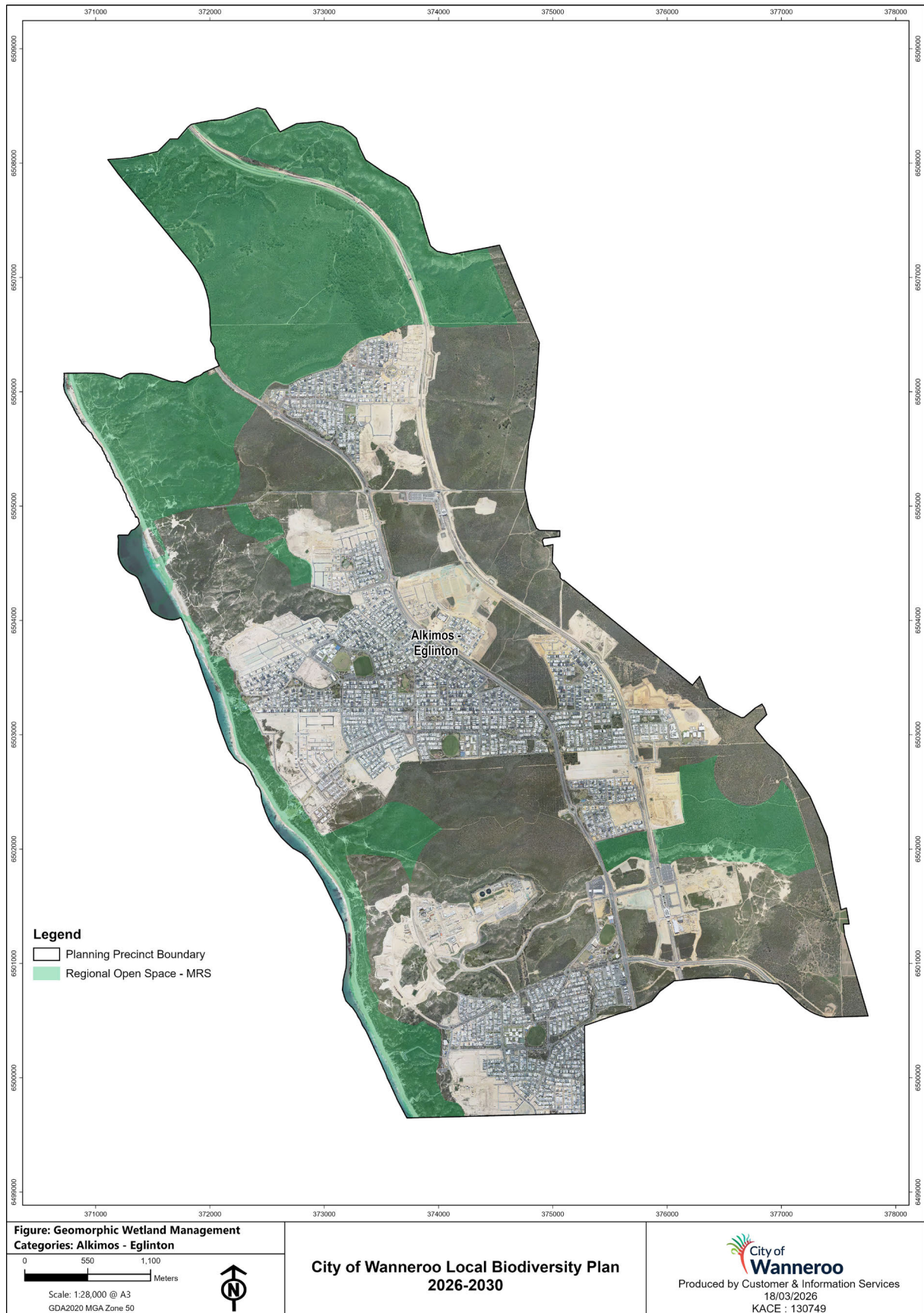
See **Appendix Table viii** table below for the management categories of the geomorphic wetlands as prepared by the Wetlands Section of the Department of Biodiversity, Conservation and Attractions and the Urban Water Branch of the Department of Water and Environmental Regulation (DBCA 2017)

Appendix Table viii): Management Categories of geomorphic wetlands (DBCA 2017)

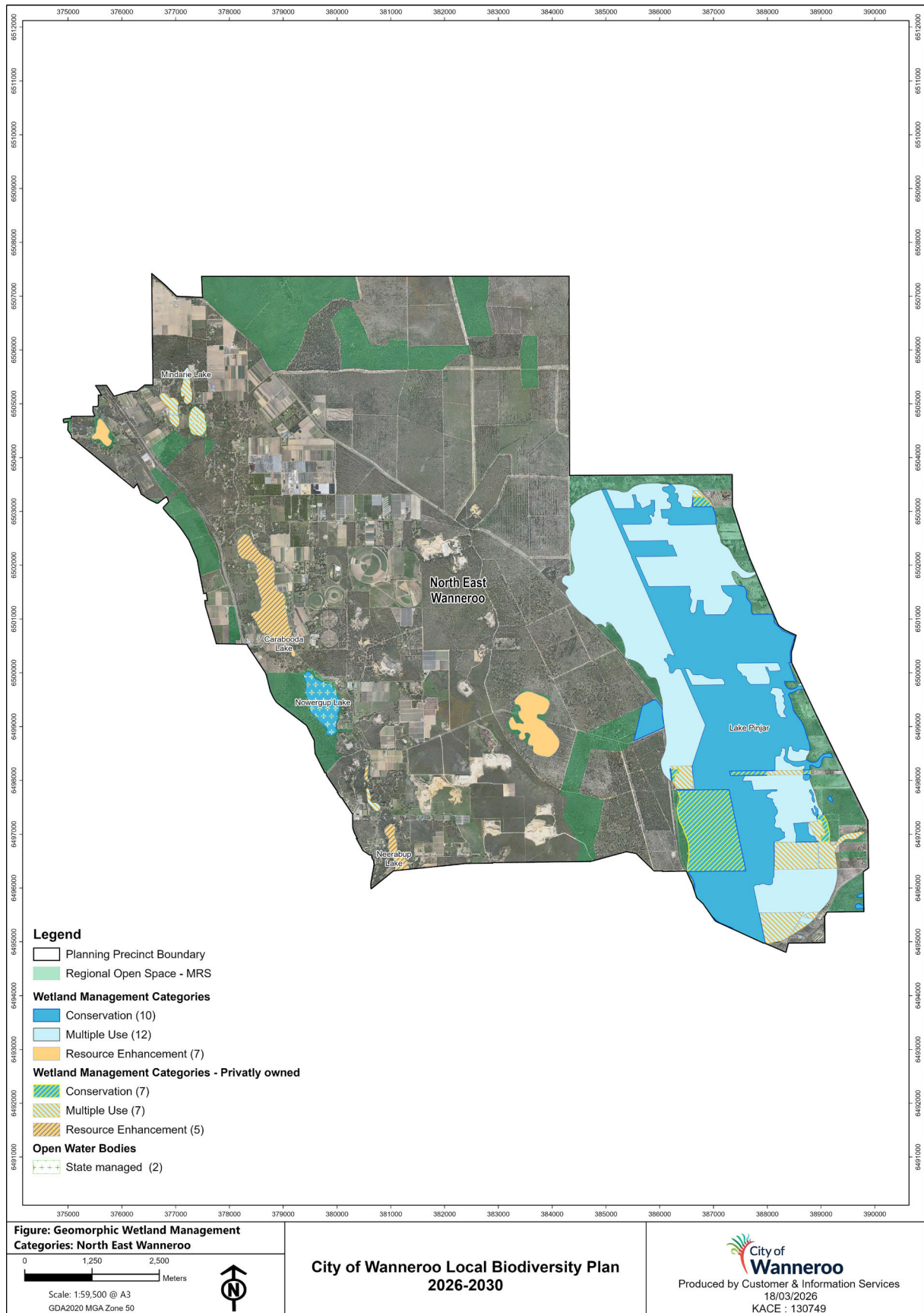
Management Category	General description	Objectives
Conservation Category Wetlands (CCW)	Wetlands which support a high level of attributes and functions.	To preserve and protect their existing conservation values through various mechanisms including: • reservation in national parks, Crown reserves and state-owned land • wetland covenanting by landowners. No development or clearing is considered appropriate. These are the most valuable wetlands and any activity that may lead to further loss or degradation is inappropriate.
Resource Enhancement Wetlands (REW)	Wetlands which may have been modified or degraded, but still support substantial attributes and functions	To manage, restore and protect towards improving their conservation value and hydrological/ hydrogeological regime. These wetlands have the potential to be restored or rehabilitated to Conservation category focusing on wetland functions, structure and biodiversity value.
Multiple Use Wetlands (MUW)	Wetlands with few remaining important attributes and functions	The use, development and management of these wetlands should be considered in the context of ecologically sustainable development and best management practice catchment planning. Their role in managing the natural hydrological and hydrogeological regime of the general area should be maintained.



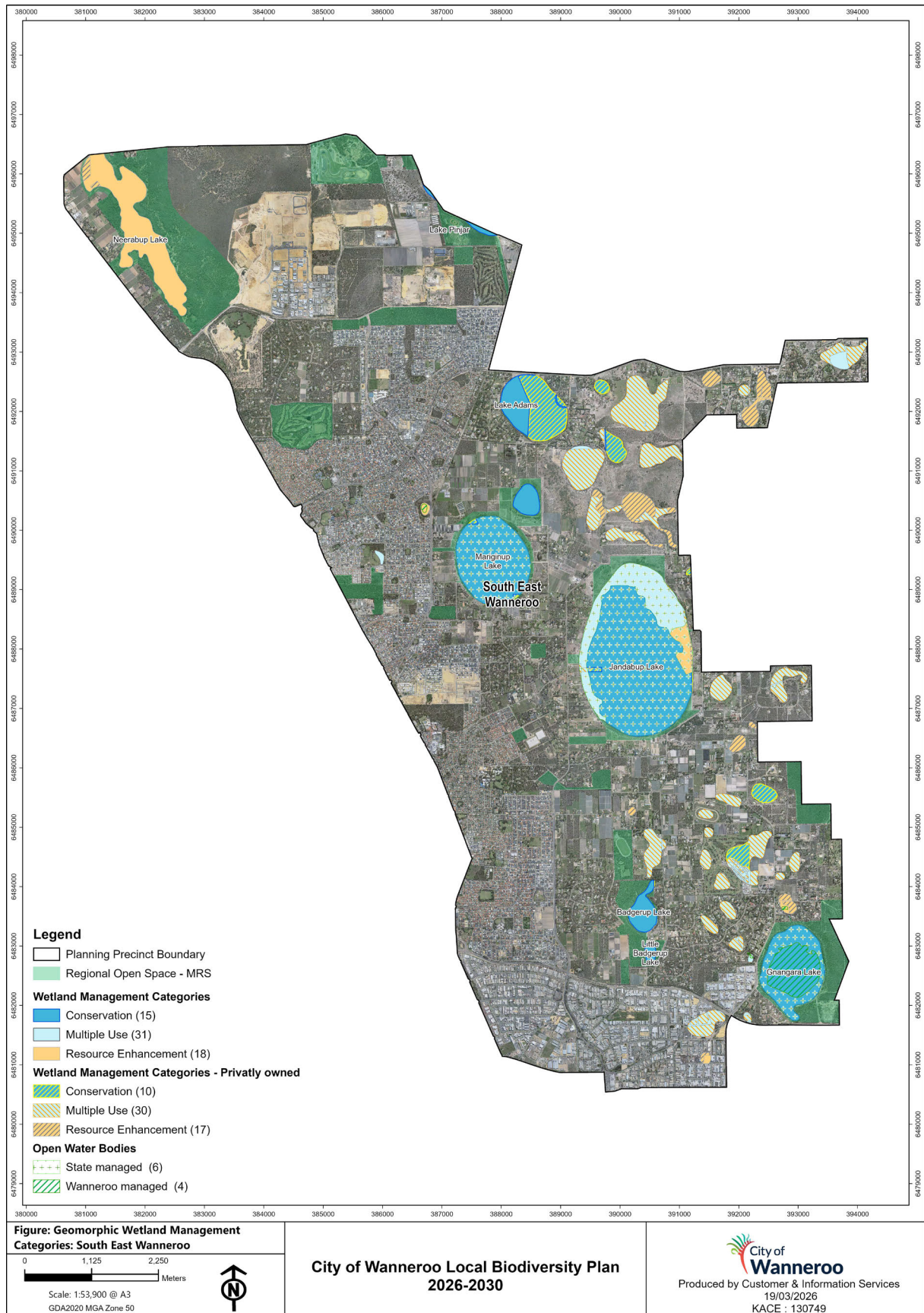
Appendix Map iv): Wetlands and classification category Yanchep -Two Rocks Precinct



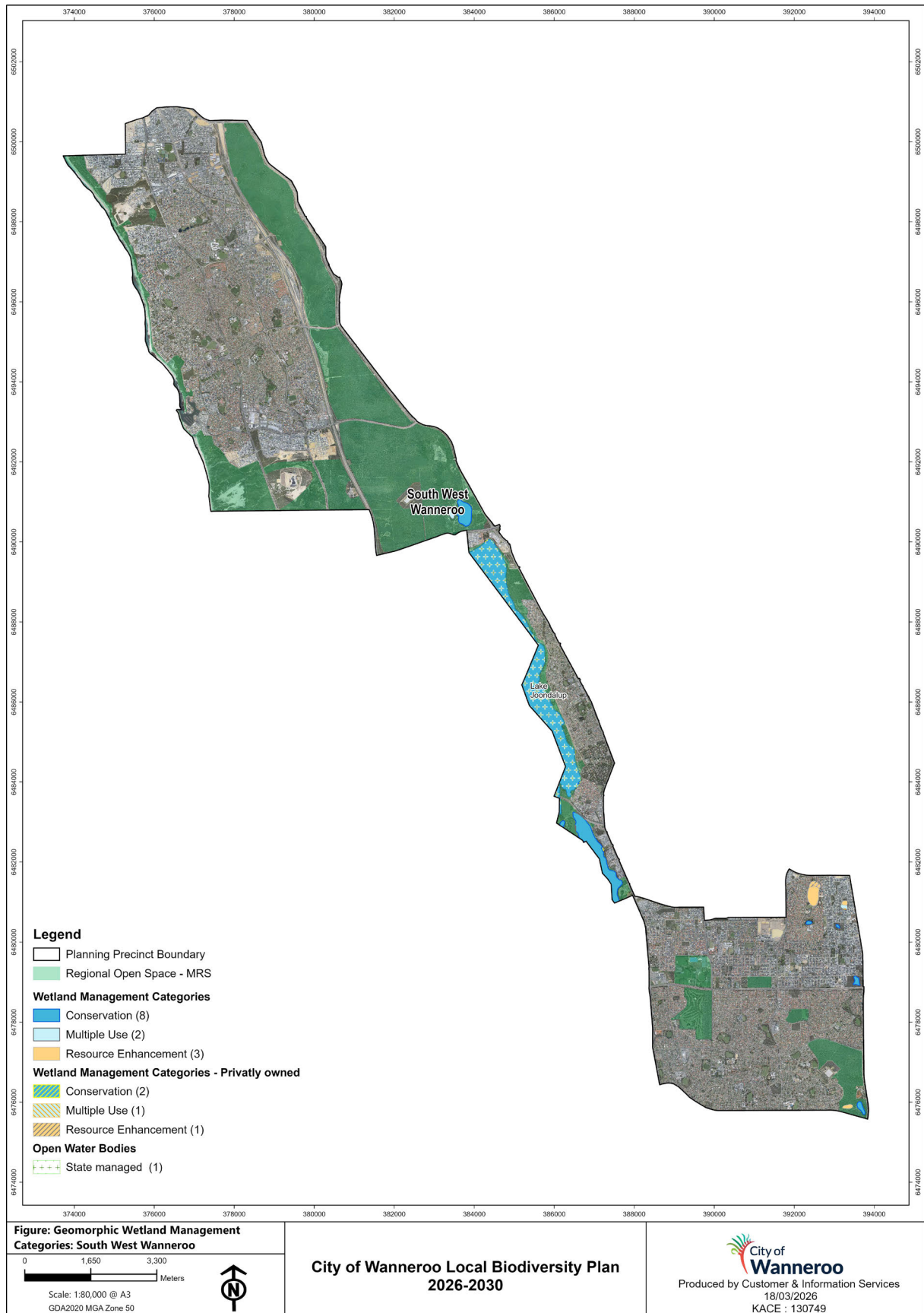
Appendix Map v): Wetlands and classification category Alkimos- Eglinton Precinct



Appendix Map vi): Wetlands and classification category North East Wanneroo Precinct



Appendix Map vii): Wetlands and classification category South East Wanneroo Precinct



Appendix Map viii): Wetlands and classification category South West Wanneroo Precinct

DRAFT

TECHNICAL MEMORANDUM

Ecological Linkage Update

PROJECT NUMBER	EP23-112(04)	DOC. NUMBER	EP23-112(04)--002 AS
PROJECT	Local Biodiversity Strategy Review	CLIENT	City of Wanneroo
AUTHOR	Ash Singh	REVIEWER	Toni Burbidge
VERSION	001	DATE	08/05/2024

1 BACKGROUND

As part of the City of Wanneroo's (the City's) request to review its 2018-19-2023-24 Local Biodiversity Plan, it was requested to update ecological linkage mapping across the City. This updated mapping is intended to support the City's decision-making for biodiversity conservation and will be incorporated into the City's revised Local Biodiversity Strategy (LBS).

2 ECOLOGICAL LINKAGES

Ecological linkages are geographical links between natural areas which represent the pathway of least hostility to species movement across the urban landscape. This connectivity facilitates the flow of individuals and genetic material between habitat patches. Ecological linkages are critical to improving the viability of natural areas that may be too small or degraded to be viable on their own, and therefore to biodiversity conservation within these areas.

3 METHODOLOGY

3.1 Datasets

3.1.1 State and Local Government Data

Emerge Associates obtained and reviewed regional ecological linkage data provided by the Western Australian Local Government Association (WALGA) (WALGA and PBP 2009). These linkages were mapped to identify connections between patches of remnant vegetation deemed to be of regional significance in the Perth Metropolitan Region (PMR) Scheme Area. These linkages were drafted manually in 2004 by the Perth Biodiversity Project with input from the then Department of Environment, the Department of Conservation and Land Management, and the Department for Planning and Infrastructure. A buffer of 250m on either side of linkage lines were created, as 500m-wide linkages were considered the minimum width required to promote the viability of Local Natural Areas connected by linkages.

Emerge Associates also obtained local ecological linkage data provided by the City of Wanneroo, which covers the extent of the City (City of Wanneroo, pers. comm.). The linkages were drafted manually in 2011, with a buffer of 250m created on either side of linkage lines.

3.1.2 NatureLinks

Emerge Associates contacted NatureLink Perth and obtained data which informs the NatureLinks across the City. NatureLinks are nature-friendly pathways between natural areas which reduces risk for species moving across the urban landscape, and do not require a particular width or land use

Ecological Linkage Update



type. This data was sought to identify any potential linkages that may have been overlooked in the previously mapped regional and local ecological linkage data, with a particular focus on the north-east of the City of Wanneroo.

NatureLinks used least-cost path modelling to create their ecological linkage data. Least-cost path modelling is a Geographical Information Systems capability which involves the creation of a source layer and cost layer associated with a geographical area. The source layer identifies the natural areas to be connected by linkages, and the cost layer allocates risk to wildlife survival associated with different landscape types.

In NatureLinks, the source layer incorporated 'formal' and 'semi-formal' protected areas over 10ha in size over the Perth and Peel regions. They were simplified to remove small gaps between them at a maximum of 50m, unless they consisted of freeways. The cost layer was developed at a 10m resolution over the entire Perth and Peel regions. Higher cost values represent higher stress associated with moving through a particular landscape. Landscape elements were divided into three categories: land cover, land use and barriers (Table 1). Land cover and land use layers were averaged together to allow for what is present on the ground and the management of the area to be considered together.

After the development of the source and cost layers, paths between natural areas that minimise risk to species movement (least-cost' paths) were modelled as line data. A buffer of 250m on either side of the linkage lines were created to ensure consistency with the linkage data provided by state and local governments.

Table 1. A table of the different landscape features and their associated cost values identified by O'Donnell (2020) for NatureLink Perth.

Layer	Landscape feature	Description	Cost
Land cover			
	Native remnant vegetation	Natural habitat patches for native species	1
	Perennial vegetation	Vegetation species can take advantage of all year round	20
	Annual vegetation	Vegetation which is present seasonally and species can only take advantage for movement seasonally	50
	Urban bare	Bare ground which leaves species open to the elements	90
	Open water	Open water a species would have to swim or fly over to cross	100
Land use			
	Protected areas	Native vegetation and wetlands that has a level of protection	1
	Parks and forestry	Land zoned for recreation and forestry	10
	Utilities	Open drainage and transmission powerlines	20
	Rural	Primary Production land	50
	Street block	Residential, industrial, commercial, hospital/medical, education areas	70

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Table 1. A table of the different landscape features and their associated cost values identified by O'Donnell (2020) for NatureLink Perth.

Layer	Landscape feature	Description	Cost
	Other	Some transport and other utilities areas	70
Barriers			
	Airport native remnant vegetation	Native remnant vegetation at the airport which is highly affected by noise pollution and fences	20
	Culverts	Tunnels that carry drainage and water	50
	Local roads	Roads managed by local governments designed for local traffic	70
	State roads	Roads managed by state governments designed for large volumes of traffic across multiple jurisdictions	150
	Rail	The Transperth train network and the rail freight corridor, which are less busy than road traffic but have high fences	150
	Airport	Perth and Jandakot airports	150
	Freeway	Roads designed for high-speed traffic which are unhindered by intersections	200
	Open water	Open water a species would have to swim or fly over to cross	200

3.2 Combination of ecological linkage data

Following a workshop with City staff, it was determined that NatureLinks should be included in the LBS. By combining regional, local and NatureLinks data, the City is able to visually represent a holistic approach to protecting, creating and maintaining natural ecological linkages across the City.

4 SUMMARY

This ecological mapping has been created to assist the City in protecting its biodiversity and important environmental features and has been incorporated in the City's revised LBS.

5 REFERENCES

5.1 General references

O'Donnell, C. 2020, *Evaluating connectivity and ecological linkages between Perth's protected areas to support biodiversity*.

Western Australian local Government Association and Perth Biodiversity Project (WALGA and PBP) 2009, *South West Regional Ecological Linkages*, Perth.

5.2 Online references

NatureLink Perth 2022, *NatureLinks – Supporting biodiversity and people's wellbeing*, viewed April 2024,
<https://storymaps.arcgis.com/stories/11b2e487e22b40f99da65f7dea55b89>

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