



CENTRAL COAST

GREEN GRID: OUR PLACE

CENTRAL COAST COUNCIL


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Central
Coast
Council

ACKNOWLEDGMENT OF COUNTRY

We acknowledge the traditional owners of the land on which we live, and pay our respects to elders past and present and emerging.



The Central Coast has great natural places for recreation, which are also important in protecting a wide variety of plants and animals.

EXECUTIVE SUMMARY

The Central Coast Green Grid Plan has been developed to improve urban ecosystems, biodiversity resilience, urban amenity and connectivity, between public spaces for the benefit of the Central Coast community, over the next 20 years, the Plan was developed with funding from the NSW Government's Metropolitan Greenspace Program and was developed internally by Council.

Green space is a key hallmark of liveability in urban areas. This plan aims to improve the overall 'liveability' of the region, where natural areas are preserved and enhanced, and our public spaces are quality, enjoyable places to use. The Plan will shape the built environment to ensure that the Central Coast remains one of Australia's most distinctive ecologically diverse and liveable regions.

The Plan identified different components of the region and formed them into spatial Grids, represented by; the **Ecological Grid, Recreational Grid, Hydrological Grid, Cultural Grid, Agricultural Grid** and **Transport & Public Domain Grid**. The six Grids were mapped and used to understand the current extent of components of each Grid. Interesting findings included that:

- 25% of the land area of the Central Coast is managed by the NSW National Parks and Wildlife Service as National Park, Nature Reserve or State Conservation Area.
- There are 3,960 kilometres of creeks and streams on the Central Coast, of which 49% are in public ownership.
- There is almost 120,000 hectares of native vegetation on the Central Coast, representing 65% of the region.
- There are 15 patrolled surf beaches and over 70 playgrounds.
- In both RU1 Primary Production and RU2 Rural Landscape zoned land, rural living was the predominant use where no dominant commercial use was observed. Extensive agriculture represented 3.8% of RU1 land, extensive agriculture represented 1.4% of RU2 land.

The analysis of the current Grids was supported by a series of technical studies that:

- Considered the availability of land zoned (or protected) for use as open space.
- Identified the observed distribution of wildlife and modelled distribution of threatened plants.
- Developed a framework for identifying cultural landscapes on the Central Coast, including a case study on the Mangrove Creek area.
- Document review of strategic planning, development and land management documents that relate to the Plan.

An important component of the Plan is a project ranking matrix developed for each Grid, which determines the benefit of proposed projects across the Grids. The project ranking matrix is intended to be used to determine the community and environmental benefit of future proposed projects and identify if a project has strategic merit. The matrix does not consider project cost or overall economic benefit. The identified projects included are both physical projects (often referred to as 'hard projects') and studies (often referred to as 'soft projects').

Once this Plan is endorsed, Green Grid delivery plans will be prepared at the more detailed Social Planning District level; to identify areas where projects that benefit the community and/ or the environment are required, or where these projects provide linkages between existing Grids, to strengthen the overall connectivity of the Green Grid network. The delivery plans will be informed by the findings of the technical studies, mapping contained within the Plan and subsequent local engagement sessions to ensure the Central Coast is a vibrant, liveable community into the future.

CENTRAL COAST SNAPSHOT

PREFACE

The Central Coast is a unique place due to its National Parks, State Forests, Council reserves and great beaches. The unspoilt coastlines attract both locals and visitors on weekends for picnics, swimming and surfing, while the lakes and rivers offer fishing, kayaking and stand-up paddle boarding etc. In the cooler months, the firetrails attract mountain bikers and bushwalkers while Saturday sports occur on the sportsfields, or a visit to the plateau areas to purchase fresh vegetables. These attributes make Central Coast a great place to visit and live. With predicted population increases, we need to make sure that in the future everyone still has access to open space and that the experience is the same or better than it currently is.

This plan identifies existing open space and the features within these areas, and presents easy to interpret maps and figures on the current state of play. The maps have helped us to identify where gaps in open space occur and how we can connect areas of open space to improve connections for people and wildlife.

The plan integrates with the Central Coast Regional Plan (2016 - 2036), Central Coast Council's Community Strategic Plan 'One Coast' and the interim Local Strategic Planning Statement states that a **Green Grid** will be developed, which criss-crosses the region allowing residents to **connect to a network of open space, natural areas and recreational facilities**. Links also occur with the NSW

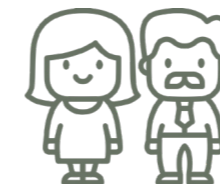
Premier's Priorities of Greening Our City and greener, more accessible public spaces.

Not only is the Central Coast a great place to recreate, it's also important for protecting a wide variety of plants and animals. According to a report by the Australian Conservation Foundation in 2020, the Central Coast is ranked 4th for the number of threatened species, at 39 threatened species.

A total of 104 plant and 132 animal species that are threatened with extinction have been recorded in the Central Coast Local Government Area, along with 15 Endangered Ecological Communities.

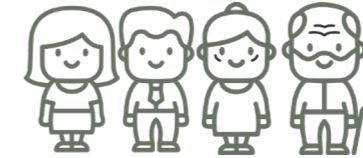
This Green Grid plan was informed by ecological field surveys and modelling which guide what lands are to be conserved and where wildlife corridors are needed. The plan has linkages to the Central Coast Strategic Conservation Planning project, currently being prepared by the NSW Department of Planning, Industry and Environment.

This Plan covers the entire Central Coast region and provides the framework to enhance regional **liveability** and **connectivity** by developing social planning district Green Grid Plans at the more localised level. These plans will be developed through close consultation with the community over the next five years.



339,550

Population
2016



415,050

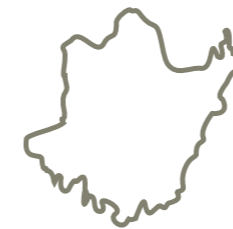
Projected Population
2036



75,000

Additional people expected
to live on the Central Coast
over next two decades

With the projected increase in population growth, provision for additional or improved public facilities will need to occur to meet the additional demand.



184,511

hectares is the total size of
the Central Coast Council
local government area



75,975

hectares of the region is
State Forests, National
Parks and Council
bushland reserves



3%

of the region is land
zoned for open space



Central Coast is ranked 4th
for the number of threatened
species



90%

of people are within 400m of
open space



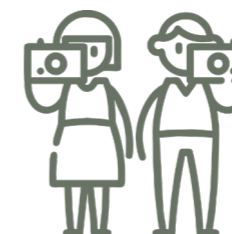
3%

of the region is land zoned
for open space, in addition
to the 41% that is publicly
owned bushland.



15

patrolled surf beaches
during the school
holidays



4,600,000

visitors 2016
(Tourist Research Australia)

Forecast that domestic tourism will increase at an average annual rate of 2.9% for day trips and 2.2% for single or multi-night visits until 2026-2027. This will result in an increase in overall visitor numbers to the Central Coast.

CONSULTATION IN THE DEVELOPMENT OF THIS PLAN

The development of this Plan over a 12 month period involved 8 months of engagement with both internal Council staff across multiple teams and external stakeholders:

- NSW Office of Strategic Lands.
- Biodiversity Conservation Division, Department of Planning, Industry and Environment.
- Planning and Assessment, Department of Planning, Industry and Environment.
- NSW National Parks and Wildlife Service.
- Forestry Corporation of NSW.
- NSW Office of Sport.
- Lake Macquarie City Council.
- Darkinjung Local Aboriginal Land Council.
- Urban Development Institute of Australia.
- Grow Urban Shade Trees (GUST).
- National Parks Association (NPA) Central Coast Branch.
- Tourism Central Coast.
- Wyong Region Chamber of Commerce.
- Sport Central Coast.
- Central Coast Biodiversity Power of Partnerships working group.
- Government Architect NSW office.
- Community Environment Network.

Consultation sessions schedule throughout the first 3 stages of the project and divided into 3 sets of Stakeholder group:

- internal
- government agencies
- community (residents and local business)

The purpose of these sessions were to:

- Refine the aims and ranking criteria of each grid.
- Identify relevant planning documents that could be reviewed.
- Nominate projects not previously included in already completed planning documents.
- Refine the definition and measurement of quality open space.

PLANNING FOR THE CENTRAL COAST GREEN GRID

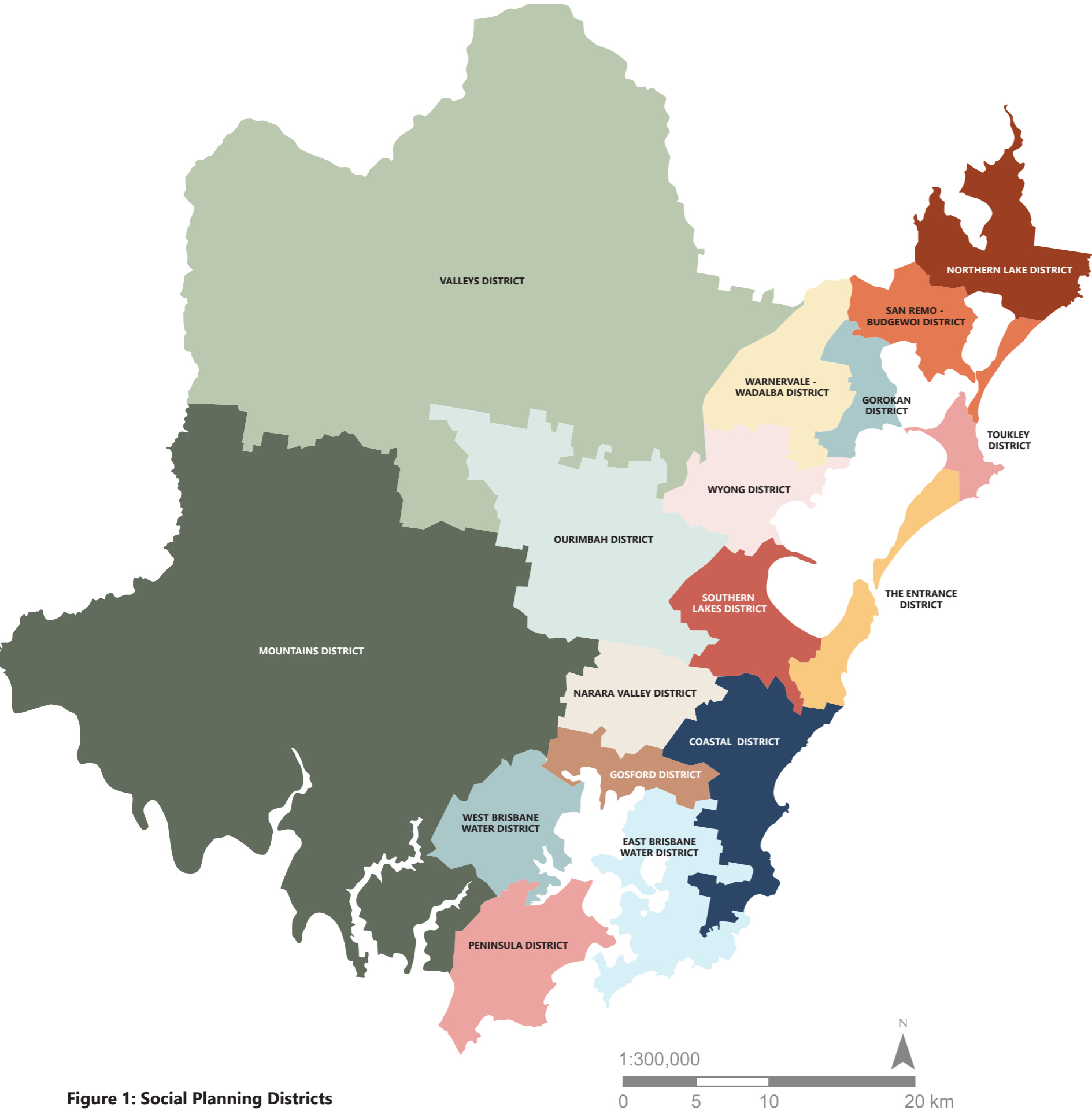


Figure 1: Social Planning Districts

The Central Coast Green Grid Plan is developed as a framework that provides the vision and strategic direction to improve regional liveability, ecological resilience and connectivity. The Central Coast Local Government Area (LGA) covers an area of over 184,000 hectares, which equates to 15% of the Greater Sydney Metropolitan Area that is made up of 35 Councils.

A place-based approach is adopted to implement the Green Grid at a finer scale. This requires using the 17 Social Planning Districts across the LGA (Figure 1).

The 17 social planning districts based on development type, population density and census data. The planning districts vary in size and population. However, each district generally represent the catchment boundaries that indicate the community relationships and aid in the consideration of access to services and community facilities.

HISTORY OF DEVELOPING GREEN BELTS IN NEW SOUTH WALES AND THE CENTRAL COAST

Early targets for open space

In the United States, between 1906 and the early 1970s, the National Recreation (and Parks) Association identified a required figure of 10 acres per 1000 people within a population for open space (Wilkinson 1985). In the United Kingdom from 1925, a figure of seven acres per 1000 people within a population was identified by the National Playing Fields Association (Veal 2013). These historical figures were later incorporated into municipal planning schemes which generally appeared after World War Two, including in Australia.

Strategic Planning Tools

The County of Cumberland Planning Scheme, (Figure 1) the Western Sydney Parklands Masterplan (Figure 3) and the Parramatta Priority Growth Area structure plan (Figure 2) illustrate the different scales of strategic planning, where elements of the Grids, such as parks, green corridors and waterways, are incorporated into the design.



Figure 2: 1948 County of Cumberland Planning Scheme identified green space around Sydney, including the future Western Sydney Parklands.

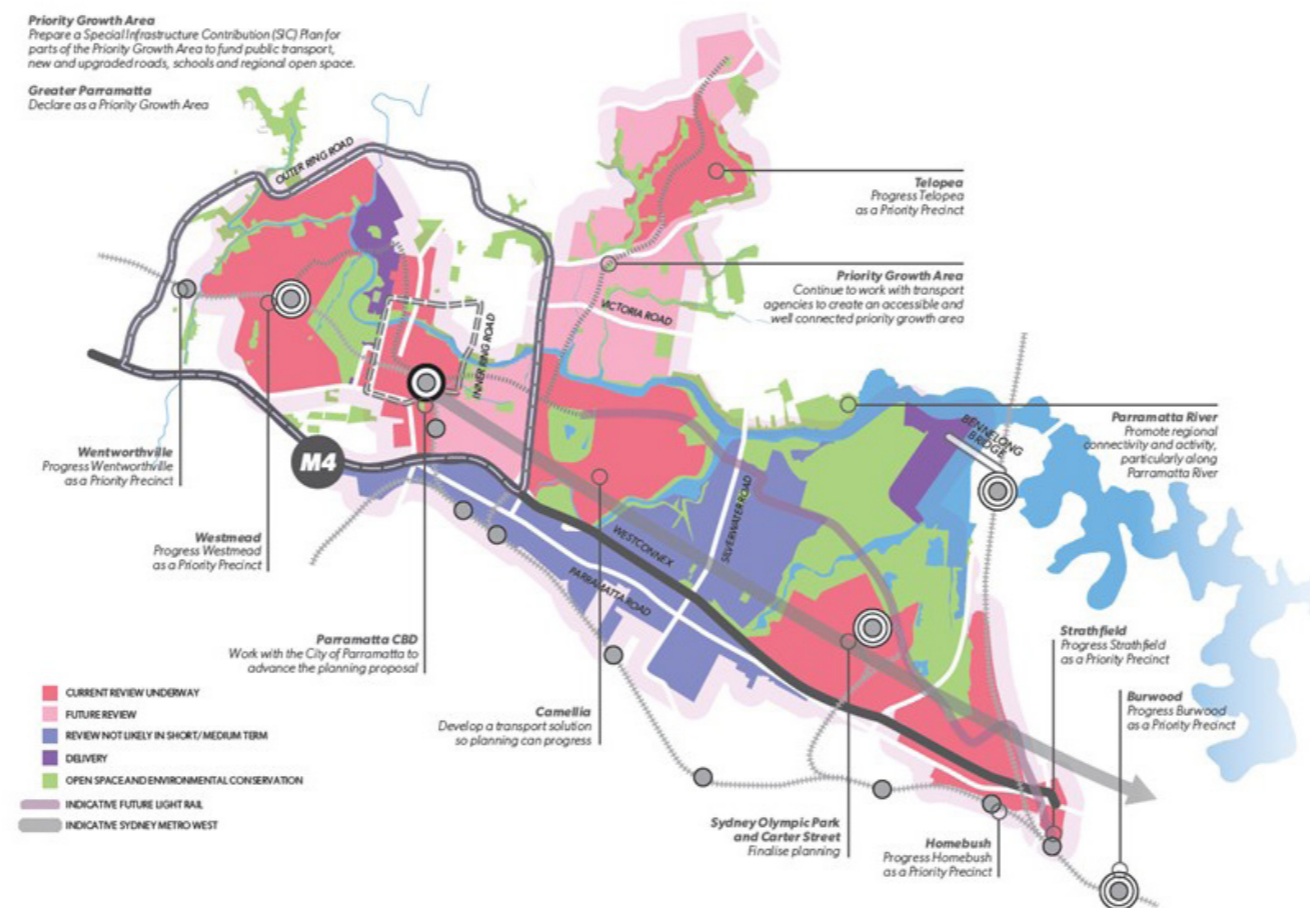


Figure 3: Parramatta Priority Growth Area structure plan, an example of subregional planning



Figure 4: Western Sydney Parklands Masterplan

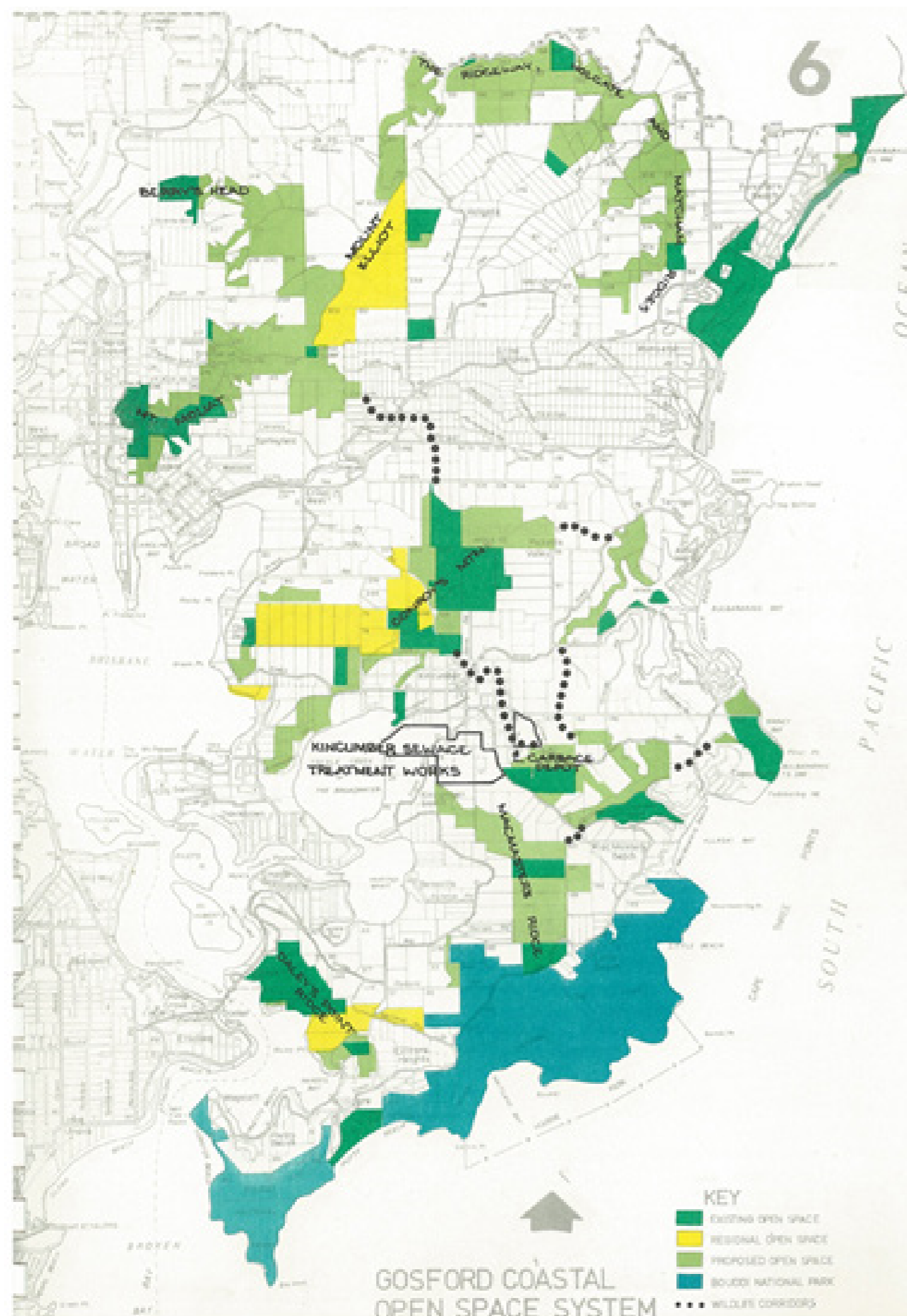


Figure 5: 1980 Coastal Open Space System for the Gosford area

Coastal Open Space System, Gosford Local Government Area (1980)

The Coastal Open Space System (COSS) was originally developed by the then Gosford City Council between 1978 and 1984. The purpose of COSS was to strategically identify natural areas with scenic, recreational and biodiversity values which created locally important reserves such as Rumbalara, Katandra and Kincumba Mountain. In 2003 the concept of COSS was extended to additional areas, including natural areas among existing COSS reserves, additional lands along the ridgeway and those west of Narara and Niagara Park (Gosford City Council 2010). Currently, there are 2,513 ha of COSS reserves and 1,586 ha of proposed COSS land. Of the proposed COSS land, 220 ha (14%) is owned by the State of NSW (Crown Land), 462 ha (29%) is owned by Darkinjung Aboriginal Land Council and the remainder consisting of smaller private landholdings. COSS is recognised as an important scheme and the Central Coast Community Strategic Plan 2018-2028 Action F2 advocates for the expansion of COSS.



NSW PREMIER'S PRIORITIES

The NSW Government currently has a priority to not only **improve access** to open space, but also the **quality** of open space.

The Premier is focused on delivering two important 'Premier's Priorities' that will help make NSW a more resilient and live-able place:

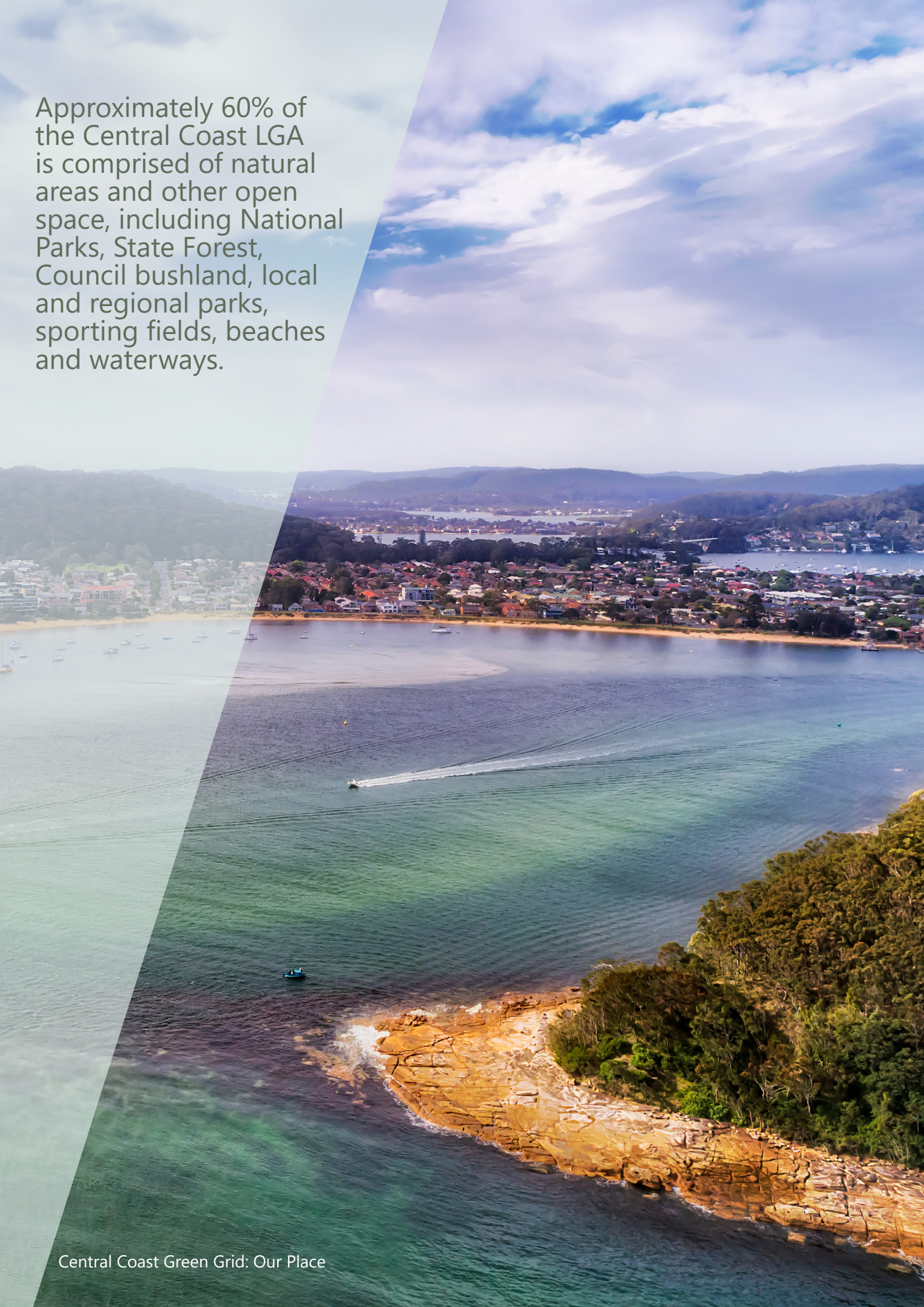
- I. Provide greater access to quality, green, open and public spaces closer to homes. The aim is to "increase the proportion of homes in urban areas within 10 minutes' walk of **quality** green, open and public space by 10 per cent by 2023".
- II. Increasing the tree canopy (Note: this was aimed at Greater Sydney by 2022. This has since been extended to all NSW via the Hunter Blue-Green Grid (in progress), and Central Coast Green Grid. And the aims of the NSW DPIE *Greener Places Strategy 2020*)

The focus for the future of the built environment is building, improving and promoting places that the communities of NSW use as a part of everyday life.

NSW Premier priority #12 is to *"Increase the proportion of homes in urban areas within 10 minutes' walk of **quality** green, open and **public** space by 10 per cent by 2023".*

*The Premiers Priorities are reflected through The Department of Planning Industry and Environment's goal for "everyone in NSW to enjoy **attractive, safe and accessible** parks and outdoor spaces".*





Approximately 60% of the Central Coast LGA is comprised of natural areas and other open space, including National Parks, State Forest, Council bushland, local and regional parks, sporting fields, beaches and waterways.

CENTRAL COAST LANDSCAPE CHARACTER

The Central Coast area is a mix of urban, agricultural and natural landscapes. Urban development is concentrated along the coastline between the Pacific Motorway (M1) and the Pacific Ocean. Approximately 60% of the Central Coast LGA is comprised of natural areas and other open space, including National Parks, State Forest, Council bushland, local and regional parks, sporting fields, beaches and waterways.

The landscape character of the Central Coast varies with the location. These include:

The **beaches and coastlines**, including the iconic Maitland Bay, considered as one the most scenic natural beaches in New South Wales, which combined with the Bouddi National Park Coastal walk, makes this area a key destination;

Brisbane Water, being a youthful, wave-dominated barrier estuary. The water has its origin at the confluence of the Narara and Coorumbine Creeks, to the south-east of Gosford, and travels for approximately 18 kilometres in a southerly direction to its mouth at Broken Bay, about seven kilometres from the Tasman Sea, at Barrenjoey Head. A number of towns surround the shores including Booker Bay, Davistown, Ettalong Beach, Gosford, Green Point, Kincumber, Phegans Bay, Saratoga, Wagstaffe, and Woy Woy. Contained within Brisbane Water are St Huberts Island, Rileys Island and Pelican Island.

The Hawkesbury River is a tide dominated drowned river valley, flowing on the southern end of the Central Coast, with the upper catchment being part of the Greater Blue Mountains World Heritage area. A significant landscape for both Aboriginal and European people, the river represents a significant cultural landscape with stories passed down through many generations.

Tuggerah Lakes are an estuary which is a unique environment rich in biodiversity. Over the years, the natural function and condition of the estuary has been influenced by many different human activities around the foreshores and throughout the catchment. Land clearing and land use change, loss of important natural filters (streambank, wetland and saltmarsh vegetation), changed water flows, more pollutants, nutrients and sediment reaching the lakes, and extensive foreshore modifications have all contributed to change, including fewer native seagrass beds, more frequent algal blooms, increased amounts of smelly 'ooze' around the foreshores and an overall loss of habitat and amenity value for native plants, wildlife and the community.

Vegetated hills and lush valleys are a key component of the land to the east and north of Gosford, including the settlements of Holgate, Matcham, Mt Elliot and Fountaindale. These include environmental living properties and many of the Coastal Open Space System (COSS) reserves, including Katandra.

Agricultural areas, west of the M1 Motorway are key areas for agricultural production, including for poultry and citrus. These areas also provide a unique character to the region and allow for activities such as the Central Coast Harvest Festival.

The town and city centres of Gosford, Terrigal, Wyong, Tuggerah and The Entrance, being the main service and entertainment areas for the region, providing for quality food with good company.

STRATEGIC CONTEXT

The Central Coast Green Grid Plan interacts with a number of NSW Government legislative instruments, including Acts, Regulations, State Environmental Planning Policies (SEPPs) and Sydney Regional Environmental Plans (SREPs), as well as other broad policy directives, such as the Central Coast Regional Plan. The interaction with these and other documents and the intended pathway to project implementation is shown below.

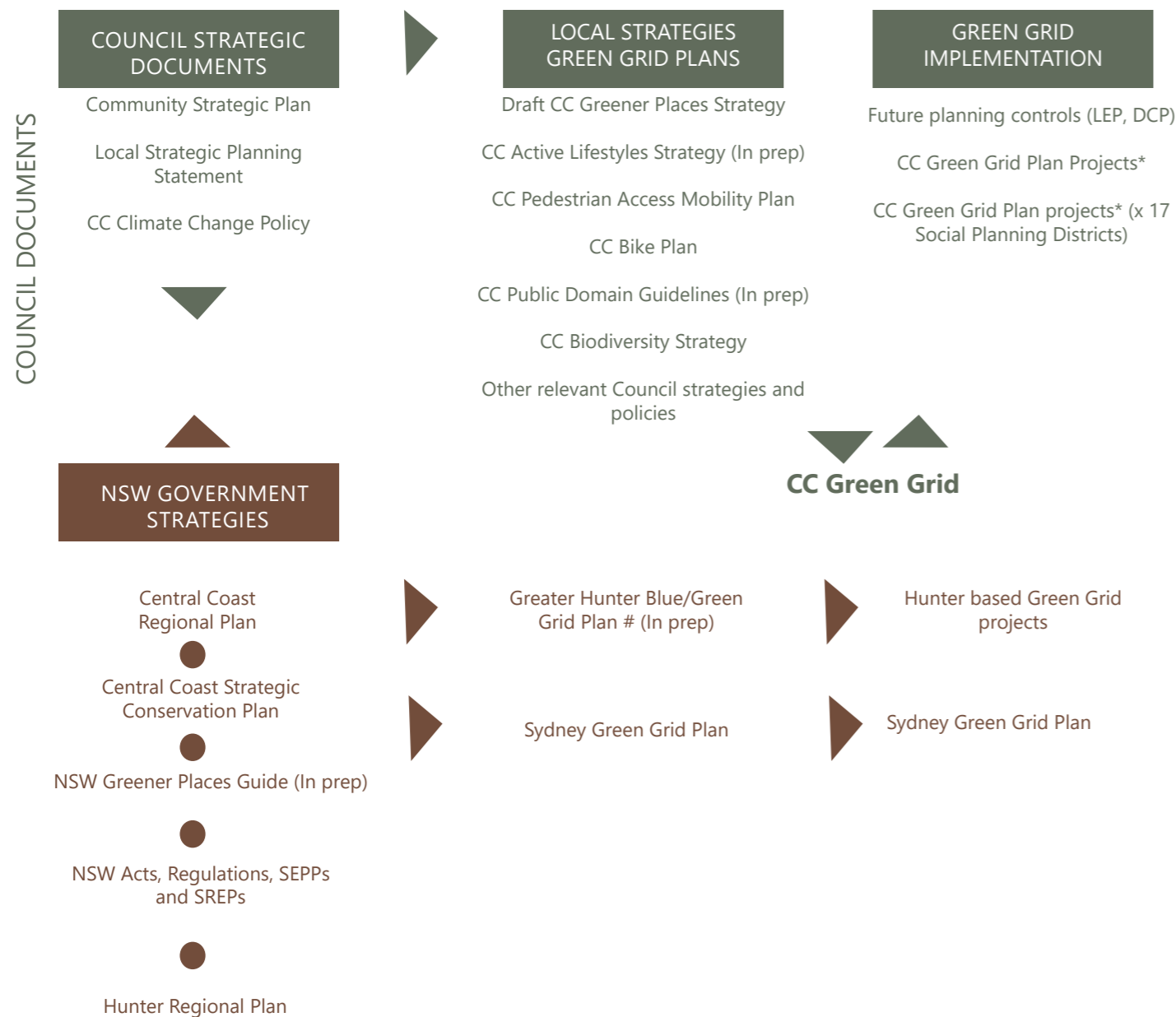


Figure 6: Relationship of the Central Coast Green Grid to other strategic planning documents.

*Document was prepared in consultation with NSW Government agencies and projects may occur across various public land tenures.

#Document is being prepared in conjunction with 10 Hunter Councils.

Strategic document review

The strategic document review identified 250 projects, which consist of:

- Place-based planning documents, which have a detailed focus on managing and improving specific areas. Examples of place-based planning documents include masterplans, town centre structure plans, NSW National Parks & Wildlife Service Plans of Management for National Parks and Nature Reserves and Flood Risk Management Plans.
- Higher level strategic planning documents, which are used to inform policy decisions and future place-based planning documents. These generally do not identify individual work locations and instead provide a strategic framework. Examples of these type of documents include the Central Coast Regional Plan (2016–2036), the 'interim' Local Strategic Planning Statement 2020 and One Central Coast - Community Strategic Plan 2018–2028, Council's Biodiversity Strategy and Greener Places Strategy. These documents had been prepared between 2008 and 2020.

The principal strategic planning documents that guide the work of this Plan are *One Central Coast - Community Strategic Plan 2018–2028 (CSP)*, the interim *Local Strategic Planning Statement 2020–2036 (LSPS)* and the *Central Coast Regional Plan 2016–2036 (CCRP)*. The CCRP is regional framework directive from the State Government, the LSPS covers locally specific framework, while the CSP is a vision statement from a community perspective. These documents were established to shape development on the Central Coast over the next 20+ years.



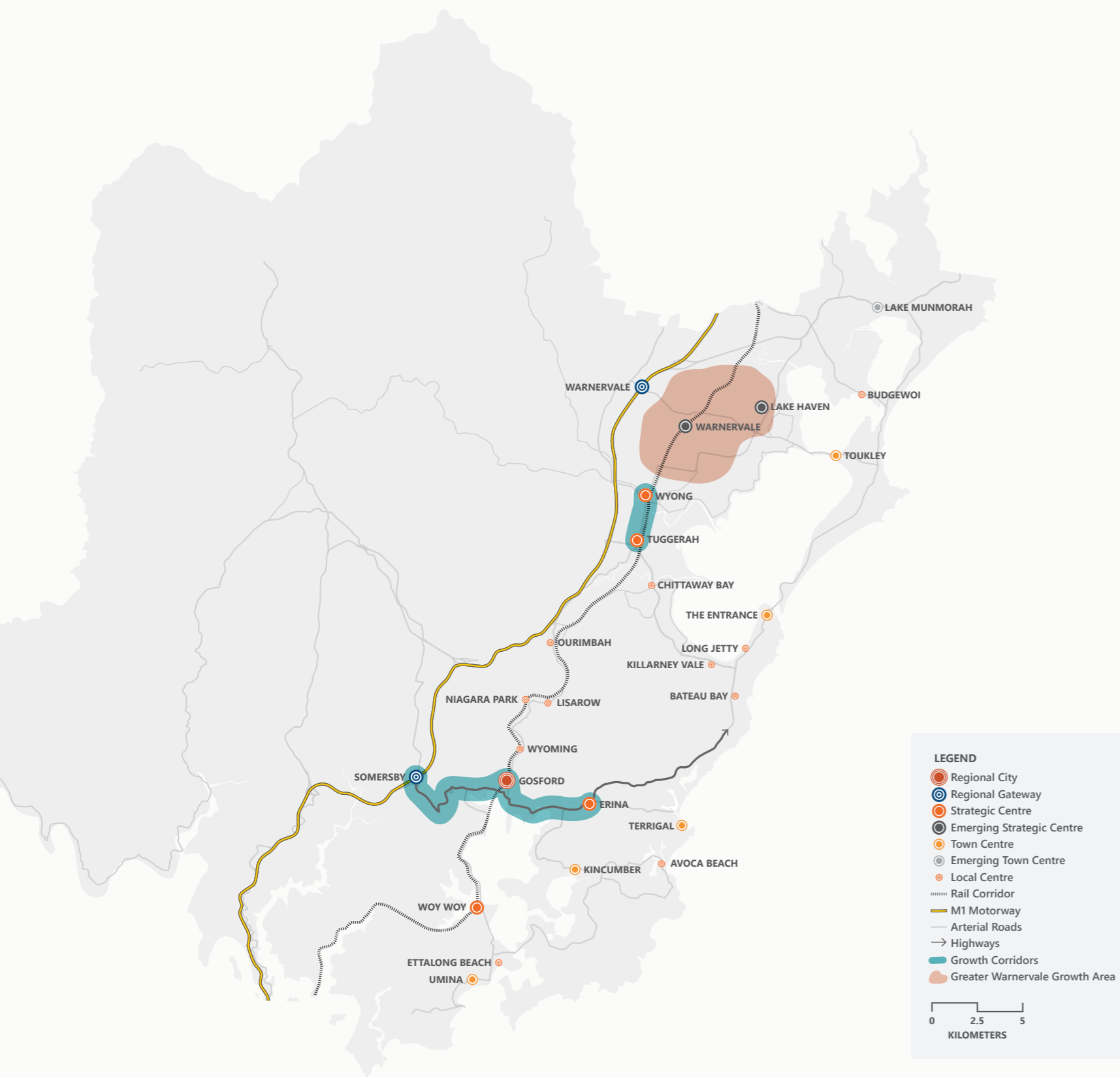


Figure 7: Identified corridors within the Central Coast Regional Plan

'Interim' Local Strategic Planning Statement (2020–2036)

The Central Coast Regional Plan 2016–2036 (CCRP) and 'interim' Local Strategic Planning Statement 2020 (LSPS) identifies the crucial role that urban centres will play in delivering a strong urban development model that supports the economy, community, public health and environment on the Central Coast.

There are a number of centres across the Central Coast, which offer different services, character and amenity. Our small to medium sized centres include a number of local centres, and town local centres which generally provide services to meet the daily needs of residents and some higher order services. Our larger strategic centres, growth corridors, and the 'regional city' of Gosford City Centre have concentrations of civic, cultural and recreational facilities, professional and health services and other higher order and specialised services.

There are four identified main strategic centres (Woy Woy, Erina, Wyong & Tuggerah) as well as the 'regional city' of Gosford City Centre. Key planning resources are being dedicated to the revitalisation of the Gosford City Centre, including the development of a new playspace on the Leagues Club field.

There are two major growth corridors on the Central Coast being the Somersby to Erina growth corridor in the south, and the Tuggerah to Warnervale growth corridor in the north.

"Everyone in NSW to enjoy attractive, safe and accessible parks and outdoor spaces"

Central Coast is estimated to grow to a population of 415,050 by 2036, with as many as 75,500 new residents living in the Region.

Around 25% of these anticipated dwellings by 2036, are forecast to occur within the region's strategic centres and the Gosford City Centre. The aim of the LSPS is to prioritise our centres and corridors to accommodate ecologically sustainable population growth.

It is crucial to plan for connectivity to these centres and corridors, which includes various mobility options that is supported by public transport and by green infrastructure, such as shared paths for riding and walking. It is also crucial to plan for the recreational needs of the future population, and to develop new spaces that encourage active lifestyles while continuing to preserve our natural assets.

Furthermore, it is necessary to conserve and improve the recreation space and connectivity for the social planning districts that have limited access to open space. These districts may not fall within the two major growth corridors or four main strategic centres, however a similar focus needs to be on 'liveability' in these areas.

There is a renewed focus on improving our existing places, in line with the Premier's Priority for "everyone in NSW to enjoy attractive, safe and accessible parks and outdoor spaces".

The Central Coast Green Grid objectives are aligned to the overall urban management actions of the interim Local Strategic Planning Statement (LSPS), thus will assist in the implementation of the LSPS at the local level.



Bouddi Coast
 Bullimah Beach
 Maitland Bay
 Maitland Bay Carpa
 Mt Bouddi
 Little Beach

'Interim' Local Strategic Planning Statement (2020–2036) continued..

The LSPS provides a land use vision that will guide sustainable growth and development across the Region into 2036 and beyond.

The LSPS frames how Council will develop relevant strategies and processes to improve ecological values across all land types, including within urban and natural areas.

Council is preparing strategic guidance on how to manage terrestrial, marine and aquatic biodiversity on the Central Coast. This will include considering expansion of the Coastal Open Space Scheme (COSS) to the northern parts of the LGA. Council's Greener Places Strategy and Central Coast Green Grid project aims to provide the roadmap to improve urban ecological functions such as wildlife corridors, along with mitigating urban heat island effects across the region.

The three overarching objectives captured by this strategy are:

- **Smart**, through embracing new ways of doing things.
- **Green**, through promoting ecologically sustainable development and protection of the environment.
- **Liveable**, through maintaining and enhancing the quality of life on the Central Coast.

These are supported through the four 'planning pillars' of:

- **Place**; through establishing liveable communities.
- **Environment**; through the protection and enhancement of the environment.
- **Lifestyle**; through promoting a healthy, active lifestyle in the outdoors.
- **Infrastructure**; through infrastructure investment, in particular public transport.

Specific urban management actions included in the LSPS are to:

1. Revitalise our Centres; which seeks to bring **activity and life** into our existing centres. It requires a sustainable, smart, innovative and resilient approach to growth. An emphasis is placed on improved activity achieved by encouraging walkability in our centres.
2. Renew the urban form; this action will improve the **living environment** for new and existing communities. An urban management strategy involves building the planning tools that create new housing types, an upgraded public realm, and better movement networks, particularly green networks such as green walking and cycling networks. The key to urban renewal is ensuring open spaces are adequate in providing a wide variety of spaces to cater to a wide range of community needs.
3. Define the urban edge; this action will define where urban development should stop, and **environmental protection** starts. It aims to not compromise on the quality of life and character of place as our community grows. Defining the urban edge will provide critical steps to ensure that the expected increase in population is largely fulfilled by in-fill residential development, and renewal and that our important environmental lands are protected into the future.

Retaining open and green space will help prevent land fragmentation and ensure the careful stewardship of the environment by limiting the encroachment of development on other environmental values, such as protecting and strengthening habitats for wildlife corridors.

4. Create a sustainable region; **A sustainable planning** perspective embraces and thrives with change. Sustainable planning involves transforming our neighbourhoods to be inclusive, adaptable, resilient and thriving liveable urban areas.

Central Coast Regional Plan (2016–2036)

The Central Coast Regional Plan (CCRP) 2036 is a 20-year blueprint for the future of the Central Coast. The Plan “aims to build a strong economy capable of generating jobs, providing greater housing choice, essential infrastructure, lively centres for shopping, entertainment and dining, and protecting the natural environment”.

The Central Coast Green Grid integrates with the CCRP, which states that “a green grid will be developed, which criss-crosses the region to connect a network of open space, natural areas and recreational facilities. Protecting the region’s coastal areas, water resources and biodiversity has assured the lifestyles, economic prosperity and environmental health of the region”.

Part of these grids that criss-cross the region, are biodiversity corridors, including the North Wyong

Shire Structure Plan green corridor and the Coastal Open Space System, which provide habitat for plants and animals. These areas are part of a broader biodiversity corridor network that links to the Great Dividing Range, Hawkesbury River, Ku-ring-gai Chase National Park and Watagans National Park. They also form part of a national wildlife corridor that extends from Victoria to Far North Queensland.

The CCRP established the region’s Southern Growth Corridor, which extends from Somersby to Erina, and the Northern Growth Corridor, which extends from Tuggerah to Warnervale, have significant capacity for growth.

As part of this planned growth, is the corresponding action to “strengthen the Coastal Open Space System by expanding its links and extending new corridors to balance growth in the north of the region and protect the network of natural areas across the region.” (CCRP Direction 12)

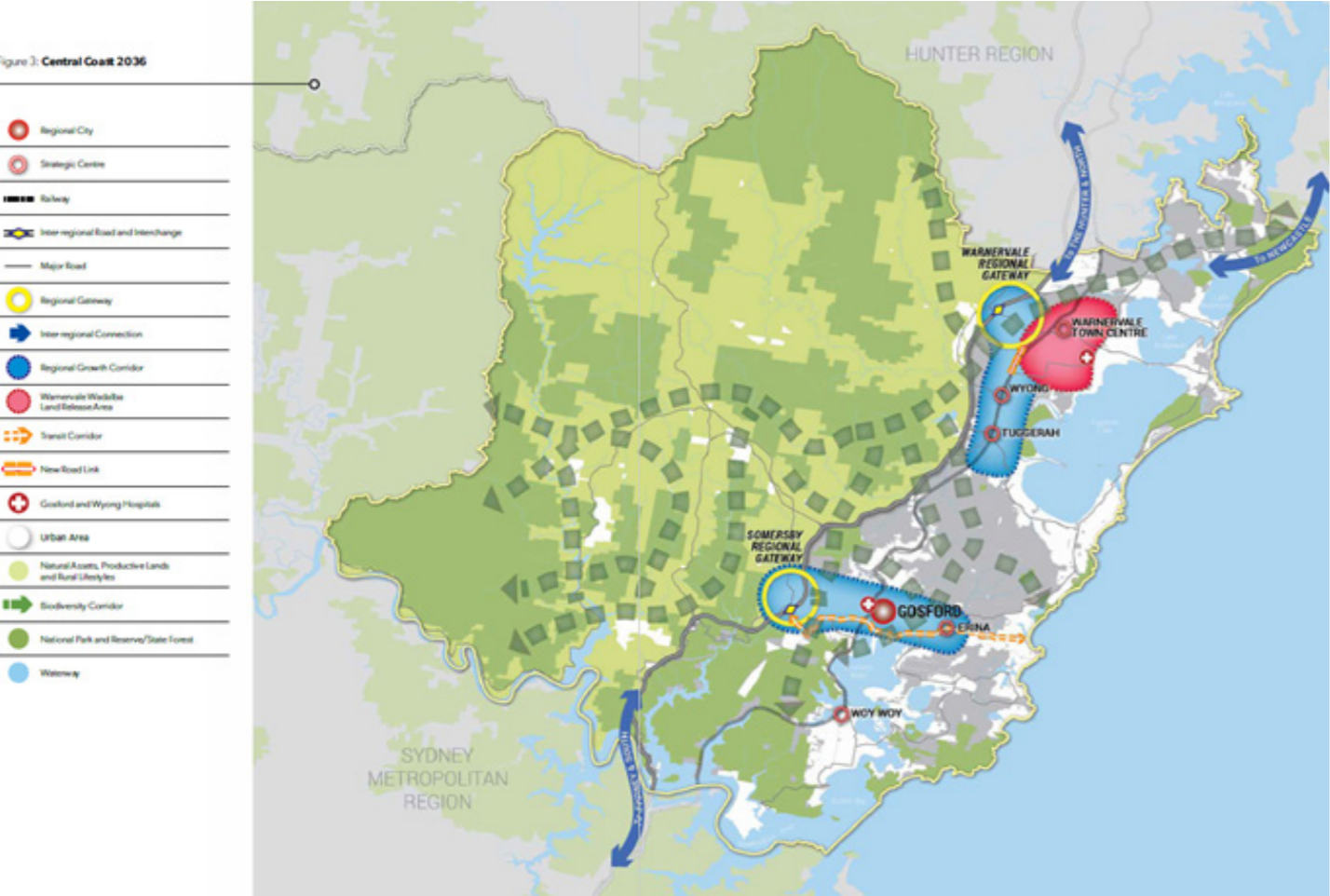


Figure 8: identified Green Corridors within the Central Coast Regional Plan

CENTRAL COAST REGIONAL PLAN DIRECTIVES:



Direction 8: Recognise the cultural landscape of the Central Coast



Direction 9: Protect and enhance productive agricultural land



Direction 11: Sustain and balance productive landscapes west of the M1



Direction 12: Protect and manage environmental values



Direction 13: Sustain water quality and security



Direction 14: Protect the coast and manage natural hazards and climate change



Direction 18: Create places that are inclusive, well-designed and offer attractive lifestyles



Direction 23: Manage rural lifestyles



Central Coast Community Strategic Plan- One Coast (2018–2028)

The CSP is a 10-year plan developed by Council, and was developed through engagement with the community to help set the priorities and confirm strategies and activities that best achieve the community's desired outcomes for the future.

The Central Coast Community Strategic Plan-One Coast (2018–2028) defines the priorities of the Central Coast community and represents a considered and evidence-based roadmap for the future of the Central Coast. The five themes captured by this plan are:

Fostering a sense of **belonging** in the community by;

- Ensuring that the Central Coast becomes a **smart** and competitive region with a range of opportunities for people to study and work;
- Maintaining the region's **green** credentials through protecting and preserving the natural, beauty, bushland and waterways that surround us on the Central Coast and to secure our environmental resources for future generations.
- the delivery of essential infrastructure and an environmentally sustainable approach to our growth and development in an open and **responsible** manner.
- Ensuring that the region is **liveable**, through reliable public transport, healthy lifestyle options and accessible and well-maintained facilities.

Hunter Regional Plan (2016–2036)

The Hunter Regional Plan provides a strategic plan for growth in the greater Hunter region until 2036, catering an additional 130,000 residents and an ageing population. The plan provides an overarching framework to guide subsequent and more detailed land use plans, development proposals and infrastructure funding decisions. This plan specifies the development of the Hunter Blue-Green Grid, which will link open space, natural areas and recreation facilities, supplemented by the protection of high environmental value areas and biodiversity corridors.

These grids will specifically interact with the Central Coast Green Grid plan and consultation has occurred with Department of Planning, Industry and Environment, Lake Macquarie Council, Forestry Corporation and NSW National Parks and Wildlife Service as the main 'neighbours' of the Central Coast Green Grid plan on how to facilitate connection between the two Green Grid Plans.

Draft Greener Places Design Guide, GANSW (2020) & Greener Places Strategy, CCC (2019)

Underpinning the NSW government Draft Greener Places Design Guide 2020 (The Guide), the draft green infrastructure policy, the Central Coast Green Grid promotes sustainable development while maximising quality open spaces and liveability.

The Guide is a design framework for urban green infrastructure. It seeks to capture the collective aspirations and expectations in planning, designing and delivering green infrastructure in urban areas across NSW.

The Guide provides advice on:

- Open space for recreation: green infrastructure for people,
- Urban tree canopy; green infrastructure for adaptation and resilience and
- Bushland and waterways: green infrastructure for habitat and ecological health

Council has developed a Draft Greener Places Strategy, (exhibited 2019), which aids in delivering the green infrastructure that the State's design guide is necessitating.

The Greener Places Strategy promotes, maintains and enhances urban greening across the Central Coast by planting and maintaining trees in public areas. It is a Central Coast wide strategy that includes mechanisms to sustain and enhance the urban forest canopy across all land parcels in the urban suburbs.

Sitting beneath these planning documents is the Central Coast Green Grid plan, with a scope that is cross tenure, across all public lands in the region, including Council lands, National Parks and other reserves, State Forests and crown reserves, and informing future land use of private lands, covering not only green

infrastructure in an urban context, but expands on green infrastructure from the urban to the peri-urban and rural areas. The plan also specifically focuses on the other overlapping elements that make up the grids across the region, including waterways and creek corridors, transport routes and the public domain, cultural landscapes and agricultural areas.

In addition, the Government Architects Office of New South Wales (GANSW), has prepared a Draft Urban Tree Canopy Manual, as part of the State's green infrastructure policy framework (the Draft Greener Places Design Guide), to support the expansion of the urban tree canopy, as per the Premier's Priorities'.

Draft Greener Places Design Guide

Design principles for NSW. Four principles to help deliver green infrastructure in NSW.



Integration

combine green infrastructure with urban development and grey infrastructure



Connectivity

create an interconnected network of open space



Multifunctionality

deliver multiple ecosystem services simultaneously



Participation

involve stakeholders in development and implementation



Concept drawings, Mark Wassan, Central Coast Council

Infrastructure Planning

The identified corridors represent existing large-scale transport linkages between our centres, providing existing infrastructure and potential to support better physical, social and economic connections between them. Not only is there a need to strengthen the identified corridors and provide green infrastructure options along them, but to also improve connectivity at a smaller scale in the form of green infrastructure for short trips, to encourage active transport and active lifestyles.

Transport for NSW is currently preparing the Draft Central Coast Regional Transport Plan (CC RTP) strategy that will complement the Central Coast Regional Plan 2036. The CC RTP will identify initiatives to support walking, cycling, public transport, as well as road and freight connectivity over the next 40 years when it is released in 2021.

A Walking Strategic Business Case is currently undergoing consultation with Central Coast Council and is expected to be completed by late 2020. The aim is to make walking the most desirable choice for short trips around centres, local areas, public transport, schools and key attractors by 2030. Transport for NSW will also begin developing a Cycling Investment Program Strategic Business Case for Regional NSW in 2021, which includes the Central Coast.

What is the Central Coast Pedestrian Access and Mobility Plan (PAMP) and the Central Coast Bike Plan 2019–2029?

The primary purpose of the PAMP is to identify the highest priority pedestrian routes, and subsequently, identify future upgrades and augmentation of infrastructure along these routes, and to prioritise the location of proposed new infrastructure. This includes identifying where existing on-road cycleways and shared paths had missing sections of connection; where a small amount of work can maximise connectivity. It is hoped that the implementation of the PAMP will increase active transport and walking for the majority of local trips, rather than the use of cars.

The Central Coast Bike Plan identified several priority corridors through a set of criteria that were developed during the community engagement. The Bike Plan also identified other localised projects previously identified by Council. It is envisaged that the pathways identified in both the PAMP and Bike Plan will be at least partially delivered as projects aligned to the recreational grid. Ensuring that there is sufficient tree canopy over current and future paths will be one of the key components for delivering the Central Coast Green Grid.

Only 0.3% of persons employed in Central Coast LGA indicated a mode of transport to work via bicycle, ABS 2017.





Urban climate mitigation

A key challenge for achieving ecologically sustainable development is effective planning for resilience and adapting to likely impacts from climate change. These challenges are recognised by Council through its Climate Change Policy, which was adopted in 2019. The Central Coast Green Grid Plan aligns to the following actions:

- D7: Incorporate climate change risks in strategic and infrastructure planning for the region to maximise local liveability through informed land use planning, development of planning controls and guidelines that facilitates regional urban growth, transport connectivity and utility services.
- D12: Develop strategies, plans and development controls to protect, conserve and work in partnerships with community and local agencies to enhance resilience of biodiversity across the Central Coast region.

These actions will be incorporated into this Plan through:

- Identifying priority locations for projects that address Urban Heat Island Effects and establishing ranking criteria for ensuring that projects that mitigate urban heat are given priority. Priority 25 of the LSPS also aims to 'manage heat wave risks through strategic planting and maintenance of vegetation'.
- Identifying areas of greatest biodiversity value and including ranking criteria for projects that adequately mitigate threats to biodiversity.
- Identifying Council aims to further adapt to climate change through infrastructure, construction, rehabilitation and land use planning. As part of this infrastructure is green infrastructure, which directly aids in managing urban heat island effect (UHIE).

The sustainable maintenance of vegetation, not only the planting, is key to the success of green infrastructure. This can be achieved through use of innovative engineering for rainwater harvesting, innovative watering technology on Council assets such as golf clubs, sports fields and local parks. And appropriate selection of native vegetation.

The draft Central Coast Greener Places Strategy mapped Urban Heat Islands on the Central Coast, as displayed below. The Greener Places Strategy and Central Coast Green Grid supports the aim of the LSPS to mitigate the impacts of climate change on the regions water resources, coastal ecosystems, infrastructure, health, agriculture and biodiversity (CCRP Direction 14).

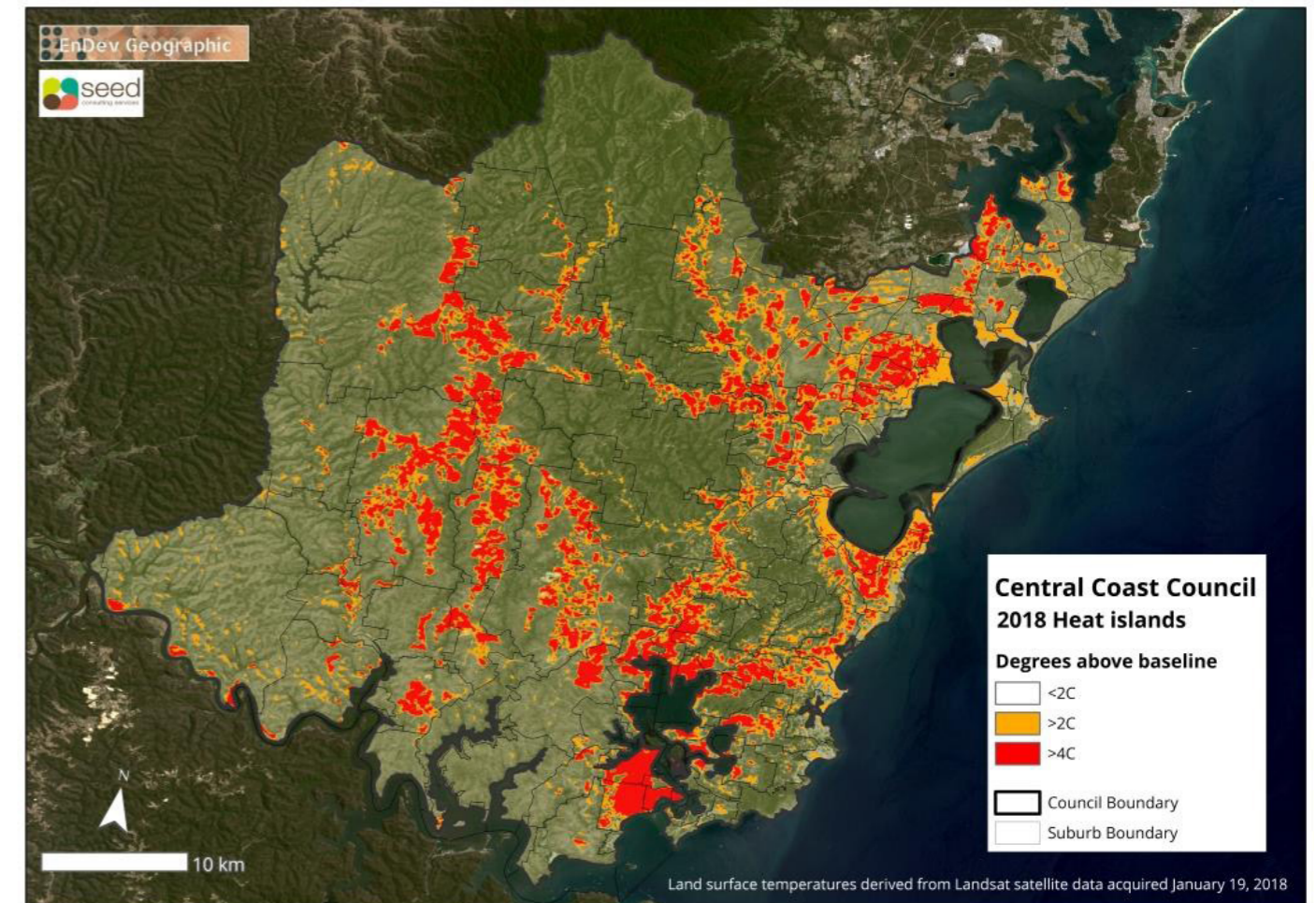


Figure 9: Identified Urban Heat Island Areas on the Central Coast.

Providing a shaded and green environment in our towns and cities provides up to four to five degrees of cooling.

The sustainable maintenance of vegetation, not only the planting, is key to the success of green infrastructure.



METHODOLOGY

Establishing the baseline

Existing spatial data was obtained from a wide range of sources and used to prepare figures, including those related to:

- land use (such as land zoning), location of existing urban footprints and the location of transport infrastructure.
- environmental information such as the distribution of native vegetation and location of waterways.

Where further information was required on the distribution of wildlife, targeted fauna surveys were completed across 100 comprehensive sites targeting ground-dwelling mammals, insectivorous bats and diurnal birds. Further details on the methods used to conduct these fauna surveys are included (refer to Appendix documents).

To determine the location of key habitat for threatened flora species on the Central Coast, a modelling process known as Maximum Entropy (MaxEnt) occurred (refer to Appendix documents).

Understanding Central Coast Cultural Landscapes

Existing information on the distribution of cultural landscapes on the Central Coast was lacking. Cultural landscapes have a broader level of thinking to those of heritage sites, as they may occur across a broader area than a designated heritage site and can also consist entirely of a place without any physical features. These are being assessed through a specialist study that identifies the criteria for cultural landscapes, this study is listed (refer to

Appendix documents).

A cultural landscapes map has been developed (Figure 13) to inform the future implementation of the green grid at the more detailed Social Planning District scale.

Identifying the strategic intent

Documents that have previously been prepared by Council and NSW Government agencies were reviewed to determine if any had previously identified projects that had not been completed but aligned to the principles of the Green Grid. The authors of documents that are currently being prepared by Council or NSW Government agencies were contacted and the strategic intent of these documents was determined to identify if this related to any potential Green Grid project. This resulted in the identification of 250 potential projects across the Central Coast. These include physical projects as well as 'soft' planning projects. The titles of the documents that were reviewed are included (refer to Appendix documents).

Understanding and identifying the different priorities and potential projects across a wide stakeholder group facilitate alignment of initiatives across multiple stakeholders to implement these visionary projects in partnerships. Such partnerships at regional scale will avoid replications, waste of resources and empower community to be involved in driving this vision.



METHODOLOGY

Potential projects list

Following the review of strategic planning and operational documents from internal and external stakeholders, a potential projects list was formed. It was from these documents that the majority of the projects were drawn from. In addition, projects listed were nominated by community and Council staff during workshops. (Refer full projects list in Appendix documents)

Council conducted workshops to engage with internal stakeholders, and external stakeholders including Lake Macquarie City Council. The intent for future work, as the project progresses to a more detailed scale, is to engage in greater detail with adjoining local government areas; Cessnock City Council, Hawkesbury City Council, The Hills Shire Council and Hornsby Shire Council.

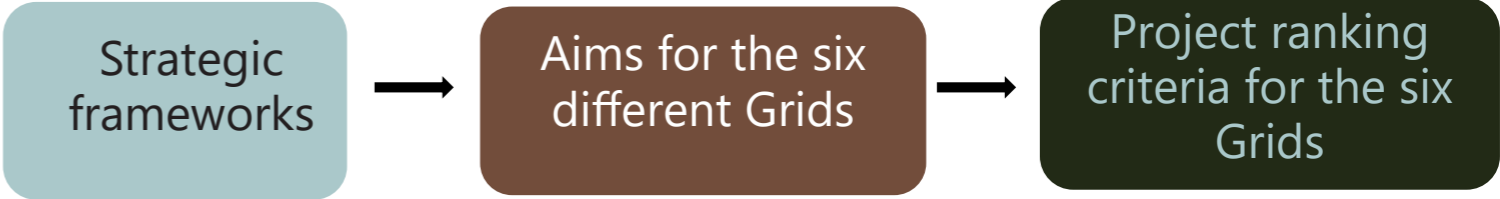
Project ranking criteria

As the Central Coast Green Grid Plan not only establishes a future strategic direction, it also establishes a ranking criterion for ensuring that projects intended to benefit the community align to Green Grid principles. The project ranking criteria were developed through a series of workshops with stakeholders from Central Coast Council, NSW Government agencies and community reference group members. The ranking criteria are closely aligned to the overall aim for each grid and it is intended that when a project is considered for inclusion in the Green Grid Plan, it is ranked

against criteria for each Grid to receive an overall score for that Grid. Due to the different number of criteria for each Grid the scores were standardised as an overall percentage for each Grid before an overall rank could be determined, based on the average percentage across the six Grids. The purpose of the criteria is to assess the strategic merit of a project, before detailed design and costing is undertaken.

There were three common criteria regarding alignment to the aims & objectives of the three principal strategic documents; the CSP, LSPS and CCRP.

The criteria used for ranking is outlined in Table 1.



CENTRAL COAST GREEN GRID PRINCIPLES

Overarching vision

The Central Coast Green Grid will improve urban ecosystems, biodiversity resilience, urban amenity, connectivity, and liveability of public spaces for the benefit of the Central Coast community over the next 20 years. This will be achieved by creating quality green spaces closer to homes, protecting and managing environmentally important lands and increasing the tree canopy to improve liveability across the Central Coast.

Overarching aims:

1. Facilitating the development of appropriate technical specifications for effective implementation
2. Anything done as part of the overarching Green Grid needs to be sympathetic to the aims of the other six grids.
3. Improving the liveability and walkability of local centres
4. Improving climate resilience
5. Supporting ecologically sustainable development
6. Ensuring that Green Grid projects are complementary to the aims of other grids, in that the values of other grids are not compromised through completing non sympathetic projects.

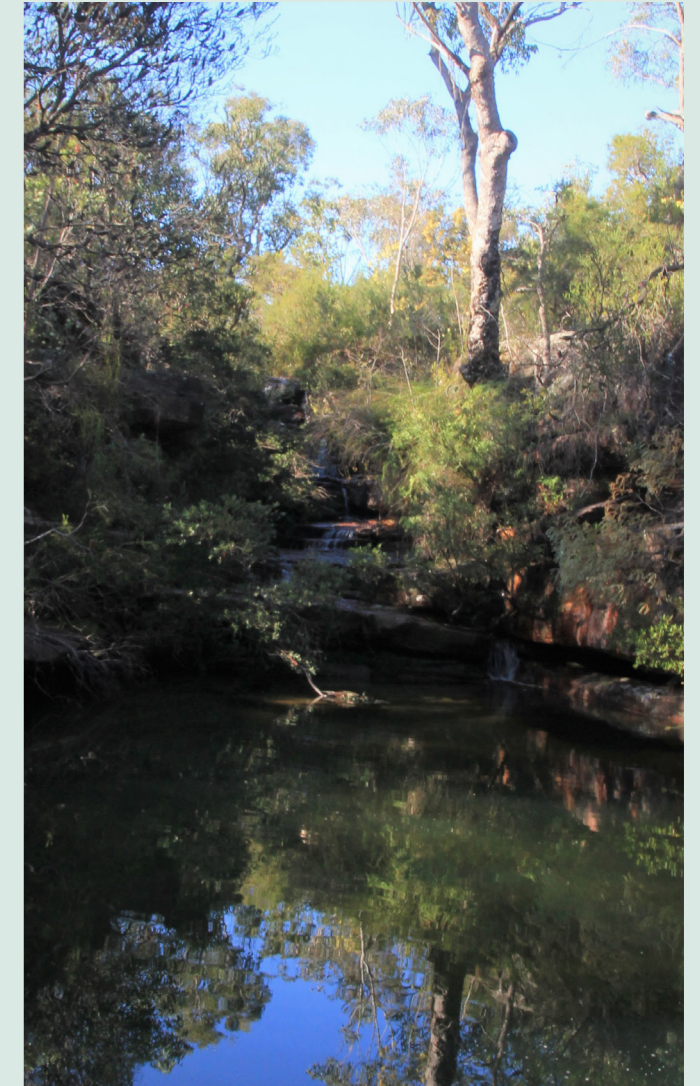
Specific principles relating to each Grid

The **Recreational Grid** aims to improve connectivity, accessibility and quality of open space. This will be achieved through:

1. Encouragement for participation in outdoor activities
2. Improving opportunities for sustainable outdoor recreation within natural areas, including establishing the Central Coast as a destination for such activities
3. Ensuring active & passive recreational facilities are of a high standard and accessible to the community, in particular ensuring access of such facilities within a local neighbourhood (i.e. within walking distance appropriate to the desired typologies)
4. Establishing sustainable passive recreational opportunities within and adjacent to waterways
5. Improved inclusiveness and connectivity

The **Ecological Grid** aims to maintain ecological processes on the Central Coast through:

1. Improving ecological resilience within natural areas in response to increasing pressure from climate change, urban development and other indirect impacts
2. Ensuring areas of high biodiversity value are adequately protected and managed, in particular areas that are predicted to contain a high diversity of threatened flora and/or fauna
3. Encourage community behaviours that protect and enhance ecological values by developing educational resources and supporting community participation in greening activities
4. Reviewing and improving Councils Environmental Management System to ensure infrastructure works are undertaken in a manner which protects and enhances ecological processes within the LGA
5. Considering the impacts of activities to ensure synergies with the above



The **Hydrological Grid** aims to protect & enhance natural waterways and coastline. This will occur through:

1. Best practice management of waterways, including increased appropriate use of blue-green infrastructure
2. Increasing climate resilience by including appropriate planning
3. Ensuring adequate riparian protection & enhancement occurs adjacent to waterways
4. Maintain the ecological character of wetlands through the implementation of ecosystems approaches, within the context of sustainable development
5. Considering likely impacts of flooding and identify alternative flood mitigation measures that have synergies with the above



CENTRAL COAST GREEN GRID PRINCIPLES

The **Agricultural Grid** aims to identify & support key agricultural & rural areas, to strengthen production and connection to our agricultural lands, and encourage the maintenance of the rural landscape character. This will be achieved through:

1. Identifying important agricultural lands zoned for these uses
2. Identifying rural landscape character elements and important vistas
3. Encouraging quality agricultural and nature-based tourism ventures, to establish the region as a key destination for these types of activities; such as farm tourism
4. Encouraging sustainability; such as sustainable agricultural practices and sustainable food production within a rural, peri-urban and urban context

.....

The **Cultural Grid** aims to conserve and interpret areas and items of cultural significance through:

1. Supporting the continued identification and conservation of significant heritage items, conservation areas, places and landscapes with regard to natural, Aboriginal Cultural heritage and historic values.
2. Supporting the identification of cultural landscapes and developing management guidelines that recognise and appropriately conserve the significance of these landscapes
3. Improving connectivity, both tangible and intangible, among heritage items, heritage conservation areas and cultural landscapes
4. Promoting opportunities for cultural tourism and economic development

The **Transport & Public Domain Grid** aims to provide green active transport corridors, for more sustainable, active and connected local centres. This will be achieved through:

1. Providing connectivity to centres and places of interest such as shorelines, beaches and public reserves
2. Improving environmental performance of public domain areas, including during infrastructure upgrades, such as considering life cycle analysis of projects, addressing 'Urban Heat Island Effect' (UHIE) and providing habitat for urban wildlife
3. Improving public amenity by providing safe modes of active transport, sheltered by appropriate planting

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Table 1: Project ranking criteria used to determine the benefit of an individual project to against each Grid.

Ecological Grid	Hydrological Grid	Recreational Grid	Cultural Grid	Agricultural Grid	Transport & Public Domain Grid
Does it align with the objectives of the Community Strategic Plan?	Does it align with the objectives of the Community Strategic Plan?	Does it align with the objectives of the Community Strategic Plan?	Does it align with the objectives of the Community Strategic Plan?	Does it align with the objectives of the Community Strategic Plan?	Does it align with the objectives of the Community Strategic Plan?
Does it align with the objectives of the LSPS?	Does it align with the objectives of the LSPS?	Does it align with the objectives of the LSPS?	Does it align with the objectives of the LSPS?	Does it align with the objectives of the LSPS?	Does it align with the objectives of the LSPS?
Does it align with the objectives of Central Coast Regional Plan?	Does it align with the objectives of Central Coast Regional Plan?	Does it align with the objectives of Central Coast Regional Plan?	Does it align with the objectives of Central Coast Regional Plan?	Does it align with the objectives of Central Coast Regional Plan?	Does it align with the objectives of Central Coast Regional Plan?
Does the project protect and/ or enhance Endangered Ecological Communities?	Does the project enhance appropriate access to public land alongside waterways?	Does the project improve the quality and accessibility of the open space within 400 m of an area mapped FSR of 0.6 or more*	Does the project promote/improve the appreciation of the heritage and history of the area?	Does the project contribute to circular economy initiatives?	Does the project benefit projects identified within the Central Coast Pedestrian Access Mobility Plan or Central Coast Bike Plan priority routes listed?
Does the project protect and/ or enhance COSS lands?	Does the project protect and/or enhance a coastal wetland, including upstream works?	Does the project improve the quality and accessibility of the open space within 400 m of the two identified major growth corridors; Somersby to Erina growth corridor and the Tuggerah to Warnervale growth corridor?	Does the project promote/improve the connectivity between heritage items, places and landscapes?	Does the project improve agricultural tourism opportunities?	Is there sufficient width or can there be sufficient space generated (i.e convert to one way street) to accommodate some or all of following; <ul style="list-style-type: none">on-road cycleways, bus lanes, canopy planting as well as vehicle carriageway and kerbside parking)
Does the project protect and/or enhance areas with a predicted high diversity of threatened flora?*	Does the project improve water quality in coastal lakes, lagoons and wetlands?	Does the project improve the quality and accessibility of the open space in a identified SPD where low levels of open space improvement have been identified?*	Does the project provide benefits for cultural tourism and the experience economy?	Does the project support & sustain local food production?	Does the project occur within 500 m of a 'strategic centre', Greater Warnervale Growth Area' or 'Regional City' or the two identified major growth corridors; Somersby to Erina growth corridor and the Tuggerah to Warnervale growth corridor? (Within 500 = 2, score. Within 1km = 1 score. >1km = 0 score)
Does the project protect and/or enhance areas with a predicted high diversity of threatened fauna?*	Does the project promote the sustainable use of waterways? (I.e does it incorporate WSUD principles)	Does the project align to ecotourism principles?			Does the project address 'Urban Heat Island Effect' (UHIE)
Is the project located within a wetland or riparian area?	Does the project improve the region's resilience to climate change? (urban heat island effect - vegetation planting)	Does the project improve sustainable access to natural area reserves?			Does the project improve walkability or active transport? Via connectivity to places of interest (e.g. recreation areas, foreshores) or town centres?
Does the project improve ecological resilience, in particular in relation to climate change?	Does the project reduce the impact of hydrological systems on built infrastructure?	Does the project address Urban Heat Island Effect?			
(i.e in terms of bushfire management & domestic animals along wildlife corridors)	Does it require minimal maintenance? (E.g is there scope for joint Council and community upkeep?)	Does the project address a need for this particular type of recreational activity?			
		Does the project ensure improved quality in outdoor recreational areas?*			
		Does it require minimal maintenance? (E.g is there scope for joint Council and community upkeep i.e community gardens? Appropriate planting, replacement costs etc)			
		Does the project incorporate dual use of the space? (to be consistent with the other six Grids i.e ecological)?			
		Does the project increase the percentage (or have significant potential to) of the community participating regularly in sport and active recreation?			

*'Open Space' is any open piece of land that has a primary purpose of being used by the public for recreation. Being RE1 zoned land and incl. walking tracks or fire trails recorded in Council reserves/National Parks or State Forests.

*Refer to Appendices where these were investigated

*Each project will be ranked against each of the six grid criteria

*'Quality' as applicable to recreational uses, being "comfortable, enjoyable, safe, inclusive & attractive"

The criteria were ranked in the following manner:

0	1	2
Unlikely to meet criteria	Partially meets criteria, however better examples occur elsewhere	Fully meets criteria



Connecting Our Foreshores Project”, community and environment boardwalk, Picnic Point to Killarney Vale

Testing the project ranking criteria

Eighteen diverse projects were chosen at random to test the project ranking criteria. The projects chosen include a range of project areas within the LGA, with varying project scales and intended purpose. The intent is not to obtain a total score instead the process for project ranking is used to determine the benefits for each different Grid. This is not final and not an endorsement for any project. Further refinement may occur.

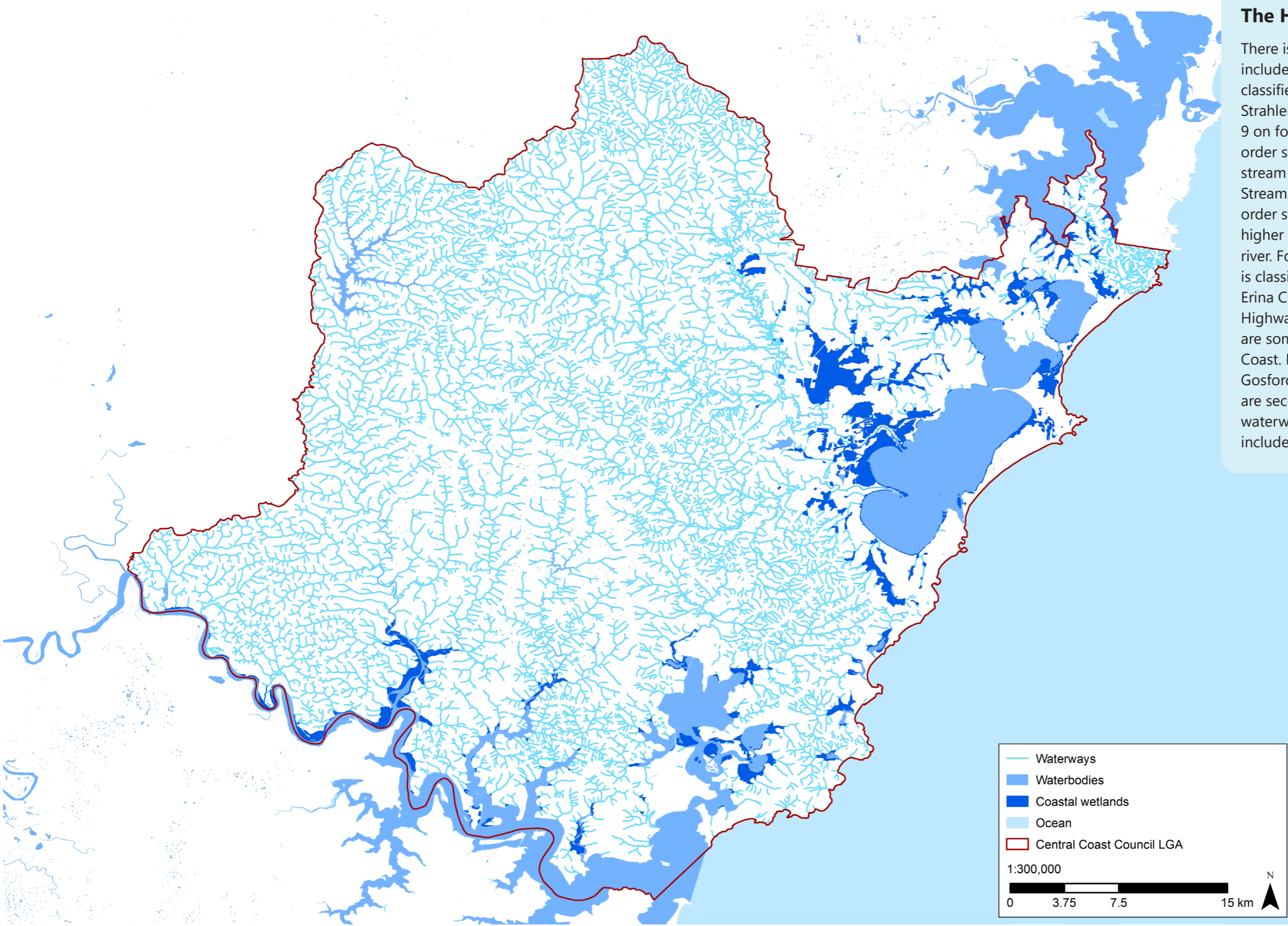
Note: the scores were converted to percentages as there is unequal scores among grids (i.e. some grids have more questions than others).

Primary Grid	Ecological Grid	Cultural Grid	Hydrological Grid	Transport & Public Domain Grid	Agricultural Grid	Recreational Grid
Project A - Chapmans Hill Reserve, Wyong	5/14	3/6	4/14	4/10	0/6	11/22
%	36%	50%	29%	40%	0%	50%
Gosford - new multi-level carpark (1200)	3/14	0/6	2/14	3/10	0/6	1/22
%	21%	0%	14%	30%	0%	0%
Kulnura harvest trail	1/14	6/6	2/14	0/10	5/6	12/22
%	7%	100%	14%	0%	83%	54%
Porters Creek Boardwalk, Wyong	3/14	4/6	3/14	4/10	0/6	13/22
%	21%	67%	21%	40%	0%	59%
Mt Alison walking trail network, Jiliby	3/14	1/6	1/14	0/10	0/6	10/22
%	21%	17%	7%	0%	0%	45%
Wyong River foreshore to Baker Park cycleway	4/14	6/6	5/14	9/10	0/6	15/22
%	29%	100%	36%	90%	0%	68%
President's Hill walking trails, Gosford	3/14	2/6	1/14	3/10	0/6	14/22
%	21%	33%	7%	30%	0%	64%
Stage 2 Wadalba Wildlife Corridor - aquisition	11/14	0/6	6/14	0/10	0/6	3/22
%	79%	0%	43%	0%	0%	14%
Davistown foreshore cycleway and flood barrier	2/14	0/6	7/14	6/10	0/6	7/22
%	14%	0%	50%	60%	0%	32%

Primary Grid	Ecological Grid	Cultural Grid	Hydrological Grid	Transport & Public Domain Grid	Agricultural Grid	Recreational Grid
Investigate mountainbike trails, BrokenBaySportRec	2/14	3/6	1/14	0/10	0/6	11/22
%	14%	50%	7%	0%	0%	50%
Roadside vegetation marker scheme, CCoast & Hunter	13/14	0/6	4/14	0/10	0/6	2/22
%	93%	0%	29%	0%	0%	9%
Tuggerah Lakes Cycle Loop, Gorokan to Rocky Point	4/14	0/6	5/14	4/10	0/6	6/22
%	29%	0%	36%	40%	0%	27%
San Remo BMX facility expansion	1/14	0/6	1/14	0/10	0/6	11/22
%	7%	0%	7%	0%	0%	50%
Footbridge upgrade in Liamena Avenue, San Remo	1/14	0/6	4/14	1/10	0/6	9/22
%	7%	0%	29%	10%	0%	41%
Stormwater management/retention dam west of the M1	0/14	0/6	4/14	0/10	0/6	0/22
%	0%	0%	29%	0%	0%	0%
Adelaide Street Oval Redevelopment	1/14	0/6	5/14	1/10	0/6	7/22
%	7%	0%	36%	10%	0%	32%
Gosford to Point Clare Railway Shared Pathway	1/14	3/6	4/14	8/10	0/6	13/22
%	7%	50%	29%	80%	0%	59%
Community Garden,Pioneer Dairy Crown Res.,Tuggerah	2/14	3/6	5/14	1/10	3/6	16/22
%	14%	0%	36%	10%	50%	73%

RESULTS: INTRODUCING THE GRIDS

THE HYDROLOGICAL GRID



The Hydrological Grid

There is a total of 3,960.6 km of waterways included in this Green Grid Plan. Streams are classified according to their size, based on the Strahler Stream Order classification (see Figure 9 on following page). Streams start as a first order stream, which become a second order stream when two first order streams meet. Streams become a third order when two second order streams meet and so on. Due to this, the higher the stream order the larger the stream or river. For example, the Wyong River at Wyong is classified as a fourth order stream while Erina Creek where it crosses the Central Coast Highway is also a fourth order stream as these are some of the largest streams on the Central Coast. In contrast both Brady's Gully in North Gosford and Bonny Boy Gully at Gwandalan are second order streams. The breakdown of waterways in each Social Planning District is included in Table 2.

Figure 10: Creeks, streams and water bodies on the Central Coast

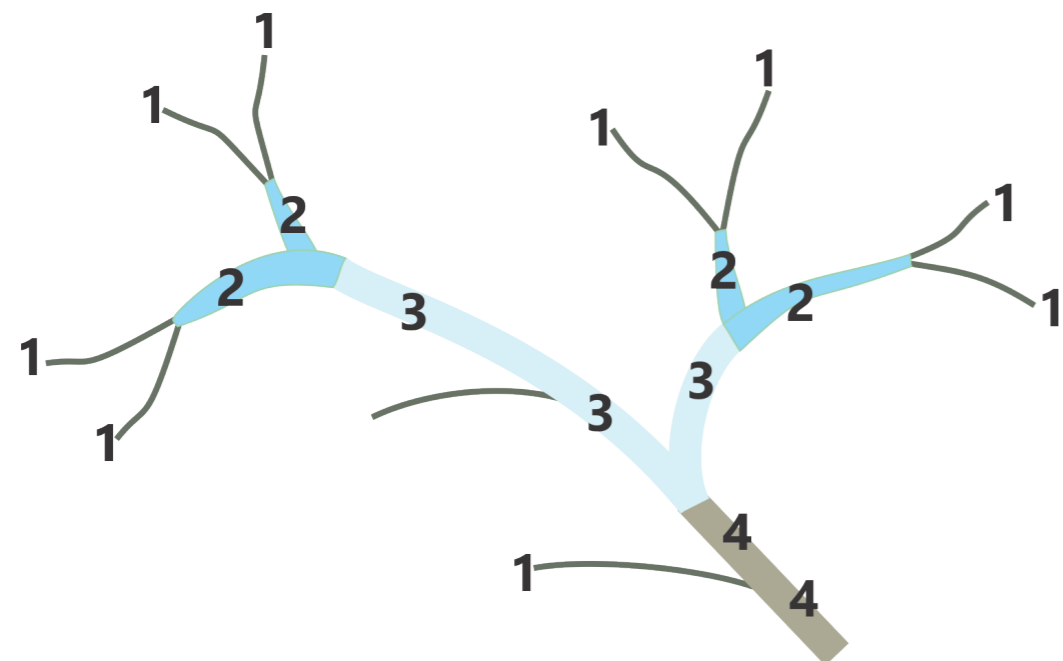


Figure 11: The Strahler Stream Order streams reach a higher order when two streams of the same order meet.

Table 2. Length (km) of streams within each of the Social Planning Districts of the Central Coast

Social planning district	Stream Order				Total
	1	2	3	4+	
Coastal	78.2	31.9	20.4	11.8	142.3
East Brisbane Waters	58.3	17.4	7.4	0.1	83.3
Gorokan	10.3	2.7	1.9	3.8	18.7
Gosford Central	20.1	9.8	5	8.2	43.1
Mountains	650.6	285.1	147.4	111.2	1,167.7
Narara Valley	62.2	20.1	11.1	13.7	107.1
Northern Lakes	72.7	32.9	13.5	3.7	122.8
Ourimbah	189.1	70.8	37.3	53.5	345.3
Peninsula	40.1	13.5	4.7	6.3	64.6
San Remo-Budgewoi	4.7	4	1.5	0.8	11
Southern Lakes	45.1	20.1	14.9	8.7	87.3
The Entrance	5.8	2.2	0	0	8
Toukley	2.1	0.1	0	0	2.1
Valleys	790.2	329.8	187	195	1,464.9
Warnervale-Wadalba	37.6	21.8	14	5.7	79.2
West Brisbane Waters	65.6	25.6	9.1	3	103.3
Wyong	20.5	15.7	7.7	16	60

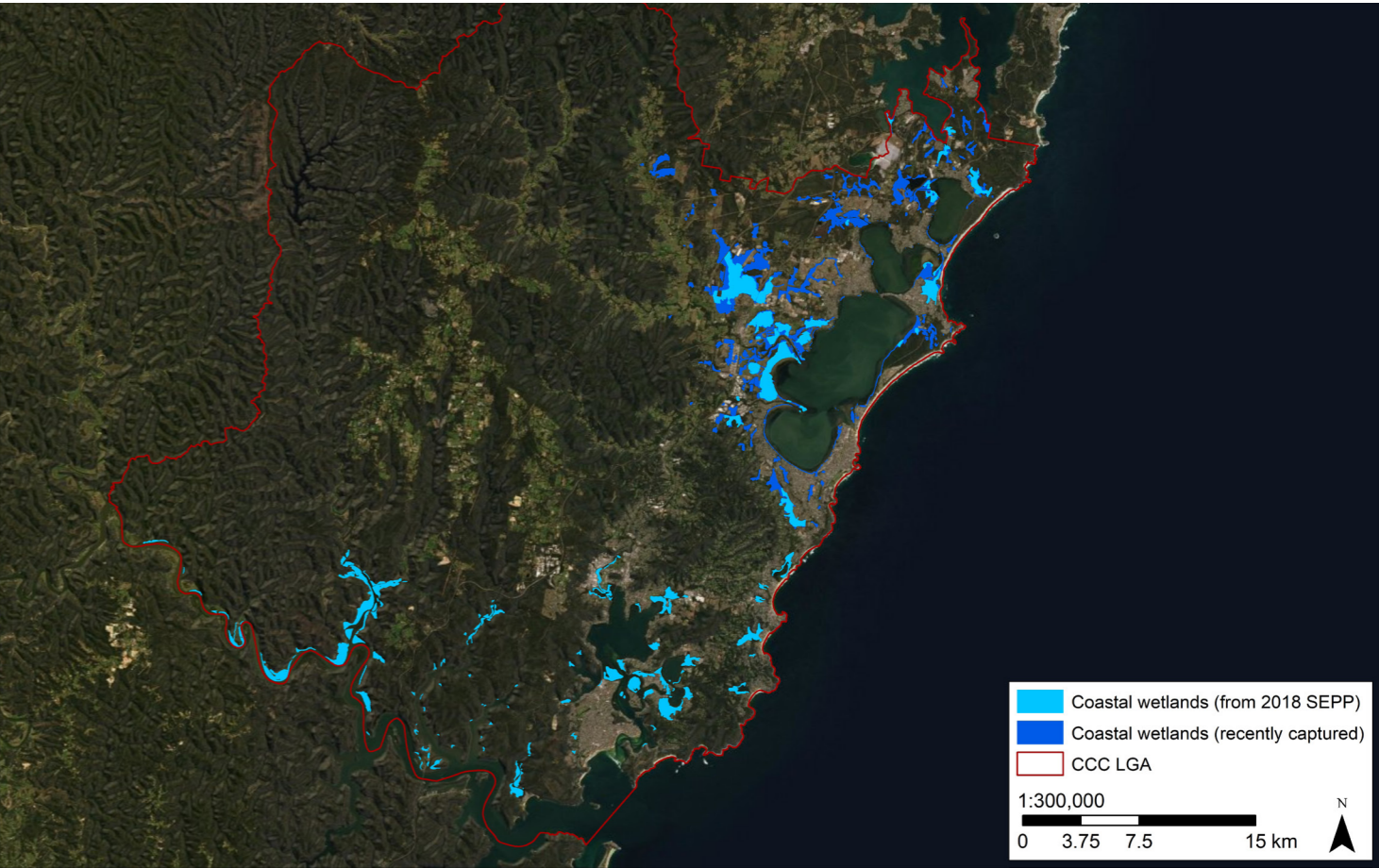


Figure 12: Coastal Wetlands

Of the 3,960.6 km of waterways included within the Green Grid Plan, 3,186.5 km of waterways (80%) include high quality native vegetation on the streambank, 531.6 km (13%) are within disturbed native vegetation, 6.1 km (0.15%) including streambank areas dominated entirely by weeds and 256.9 km (6.5%) of waterways lack any mapped vegetation on the streambank, such as those that consist of lawns or seawalls (Table 3).

Table 3. Length (km) of stream orders within native, disturbed, exotic and non-vegetated areas in the CCC LGA.

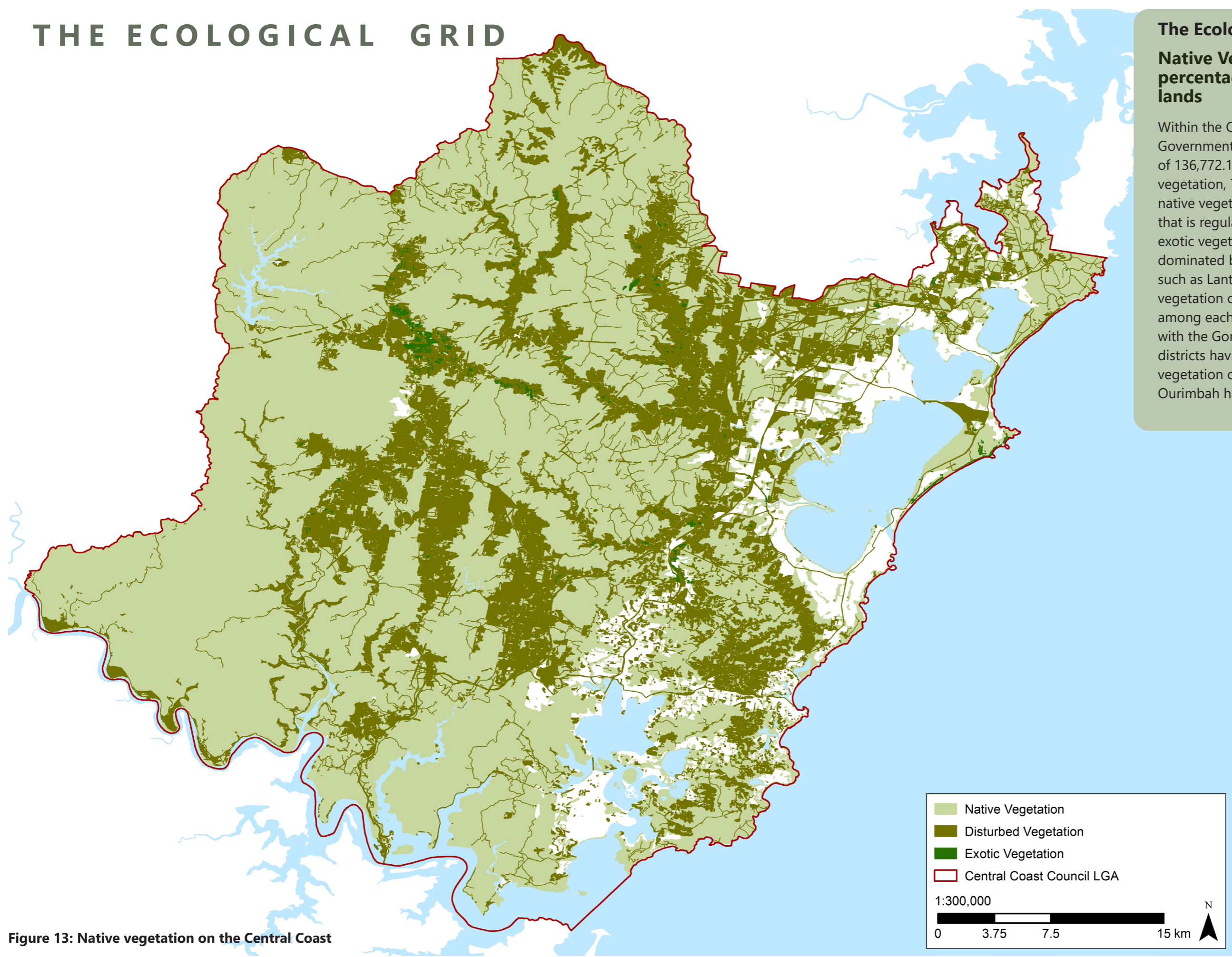
Stream Order	Native	Disturbed	Exotic	No Vegetation
1	1,785.7	307.3	1.9	58.3
2	738.1	118.9	1.1	45.4
3	385.0	59.7	0.3	38.0
4+	277.8	45.7	2.9	115.1
Total (km)	3,186.5	531.6	6.1	256.9

A total of 1,858.4 km (47%) of waterways are within conserved or semi-conserved lands in the Central Coast Green Grid Plan. Of these, 1,143.6 km are within National Park, 610.2 km are within State Forest, and 104.6 km are within Council Bushland Reserves (Table 4).

Table 4: Length (km) of stream orders 1–6, total waterway length and percentage of waterways within conserved lands in the CCC LGA.

Stream Order	National Park	State Forest	Council Bushland	% Conserved
1	687.5	336.6	107.1	53
2	266.3	145.8	43.9	50
3	139.1	85.3	21.6	51
4+	50.8	42.5	16.6	25
Total	1,143.6	610.2	189.2	49

THE ECOLOGICAL GRID



The Ecological Grid

Native Vegetation including percentage of conserved lands

Within the Central Coast Local Government Area, there is a total of 136,772.1 ha of mapped native vegetation, 71,352.5 ha of disturbed native vegetation, such as bushland that is regularly slashed and 391.2 ha of exotic vegetation, being areas entirely dominated by environmental weeds such as Lantana. The levels of native vegetation cover as a percentage vary among each Social Planning District, with the Gorokan and Gosford Central districts having the lowest level of native vegetation cover (32% each) while Ourimbah has the highest (82%; Table 5).

Figure 13: Native vegetation on the Central Coast

THE ECOLOGICAL GRID

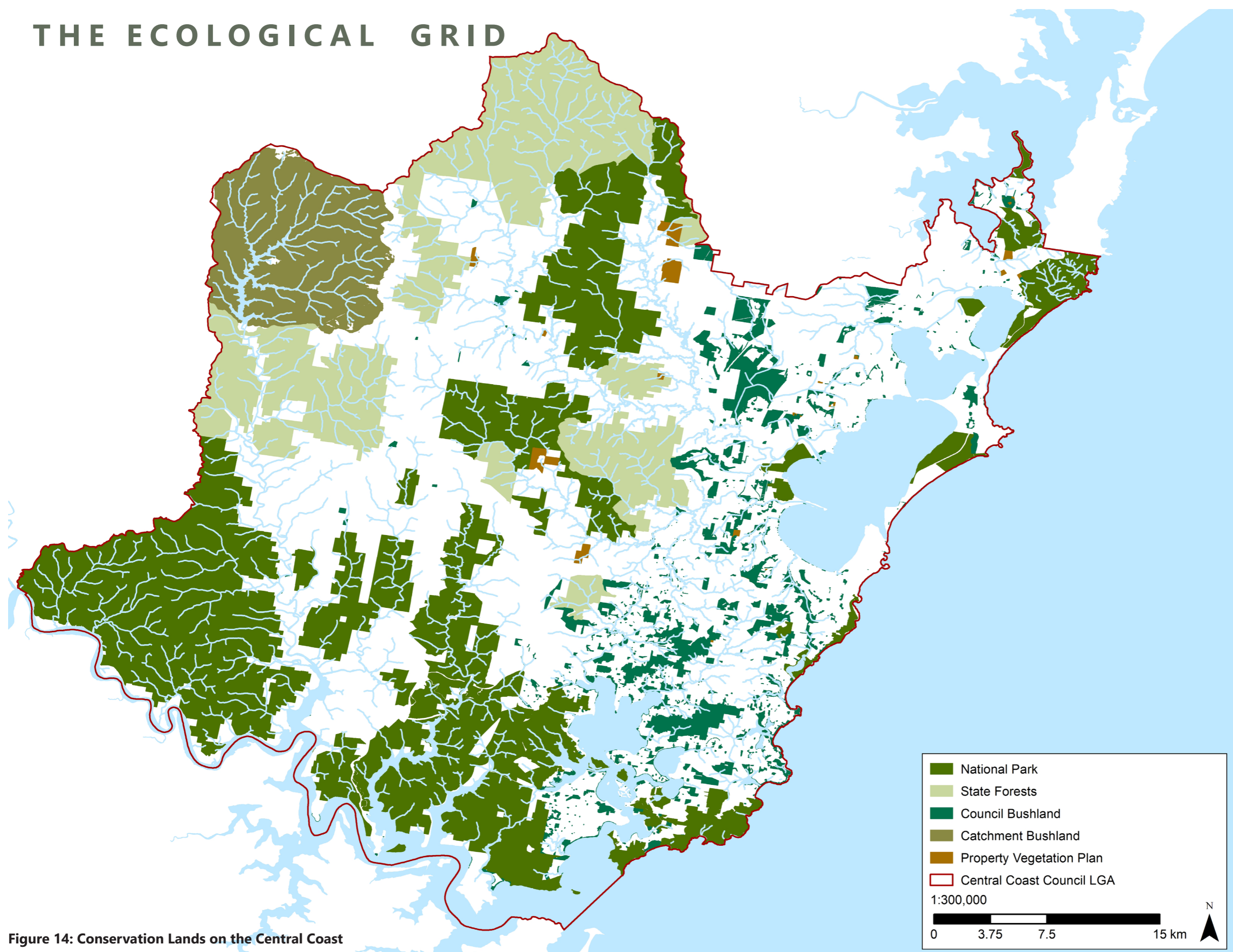


Figure 14: Conservation Lands on the Central Coast



Table 5: native vegetation cover by each Social Planning District, including the amount that is in public ownership

Social Planning District	Native vegetation (ha)	native vegetation cover (%)	Reserved native vegetation (%)	Disturbed native vegetation (ha)	Disturbed native vegetation cover (%)	Reserved disturbed native vegetation (%)	Exotic vegetation (ha)	Exotic vegetation cover (%)	Reserved exotic vegetation (%)
Coastal	2,298	42	42	1,744	32	5	0	0	NA
East Brisbane Waters	2,990	60	70	646	13	11	0	0	NA
Gorokan	494	32	11	161	11	5	0	0	NA
Gosford Central	634	32	52	276	14	8	0	0	NA
Mountains	42,308	80	70	9,766	19	3	15	<1	<1
Narara Valley	1,583	46	2	746	22	0	0	0	77
Northern Lakes	2,798	61	60	616	13	8	5	<1	11
Ourimbah	9,355	82	64	1,748	15	8	46	<1	1
Peninsula	3,044	67	79	176	4	22	0	0	NA
San Remo-Budgewoi	1,403	46	32	425	14	15	10	<1	43
Southern Lakes	1,706	47	30	910	25	4	2	<1	2
The Entrance	752	35	68	72	3	7	20	1	20
Toukley	419	41	30	230	23	3	21	2	46
Valleys	42,600	77	52	11,408	21	12	242	<1	<1
Warnervale-Wadalba	2,202	49	32	1,321	30	4	2	<1	<1
West Brisbane Waters	3,288	80	85	250	6	13	0	0	NA
Wyong	1,370	35	53	1,083	28	20	6	<1	37
Total	119,967	65	60	31632	17	8	370	<1	9

A photograph of a lush rainforest. In the foreground, a stream flows through dense vegetation, including large ferns and palm trees. The background is filled with tall trees and thick foliage, creating a sense of depth and a vibrant green environment.

What is an Endangered Ecological Community?

Endangered Ecological Communities

An ecological community is a naturally occurring group of native plants, animals and other life-forms such as fungi that occur within a specific location. An example of an ecological community is Lowland Rainforest which consists of the rainforest plants and the animals such as Fruit Doves that live in the rainforest.

An Endangered Ecological Community is where this group of plants and animals is at a high risk of extinction in the immediate future. Endangered Ecological Communities are listed under State and/ or Federal biodiversity legislation and have legislative protection.

**Lowland Rainforest at Katandra
Reserve**

There are 16 endangered ecological communities (EEC's) within the Central Coast Green Grid planning area (Table 1). Of these 52% are within National Park, State Forest or Council owned bushland.

Table 6: Total area (ha) of all Endangered Ecological Communities’s within the CCC LGA including their reservation status

EEC	Total area (ha)	National Park (ha)	State Forest (ha)	Council Bushland (ha)	Percentage reserved
Coastal Saltmarsh	167.2	51.7	0.0	24.8	46
Coastal Upland Swamp	401.3	149.2	18.7	24.9	48
Duffys Forest*	708.9	1.5	28.8	4.9	5
Freshwater Wetlands on Coastal Floodplains	295.4	71.6	0.0	102.9	59
Kincumber Scribbly Gum Forest	75.4	0.0	0.0	1.8	2
Littoral Rainforest	174.6	118.9	0.0	2.9	70
Low woodland with heathland on indurated sand at Norah Head	79.4	13.0	0.0	0.0	16
Low woodland with heathland on indurated sand at Norah Head (possible but outside of Norah Head)	236.7	227.2	0.0	6.7	99
Lower Hunter Spotted Gum-Ironbark Forest#	475.4	0.0	0.0	155.8	33
Lowland Rainforest	6,281.9	1,937.0	1,815.0	361.2	65
Pittwater and Wagstaffe Spotted Gum Forest	114.6	50.2	0.0	16.0	58
River-Flat Eucalypt Forest on Coastal Floodplains	443.7	50.0	6.6	90.1	33
Swamp Oak Floodplain Forest	1,224.3	284.8	0.0	134.3	34
Swamp Sclerophyll Forest on Coastal Floodplains	2,444.4	205.3	17.9	858.2	44
Themeda grassland on seacliffs and coastal head-lands	32.1	24.8	0.0	2.6	85
Umina Coastal Sandplain Woodland	32.7	0.2	0.0	11.3	35
Total	13,155.2	3185.4	1886.9	1798.3	52

*Vegetation in the Somersby Plateau shares many characteristics of Duffy’s Forest EEC and is likely to represent a variant of this community.

#Vegetation considered by Dr Stephen Bell to be representative of the Lower Hunter Spotted Gum-Ironbark Forest EEC, however that occurs outside of the type locality.

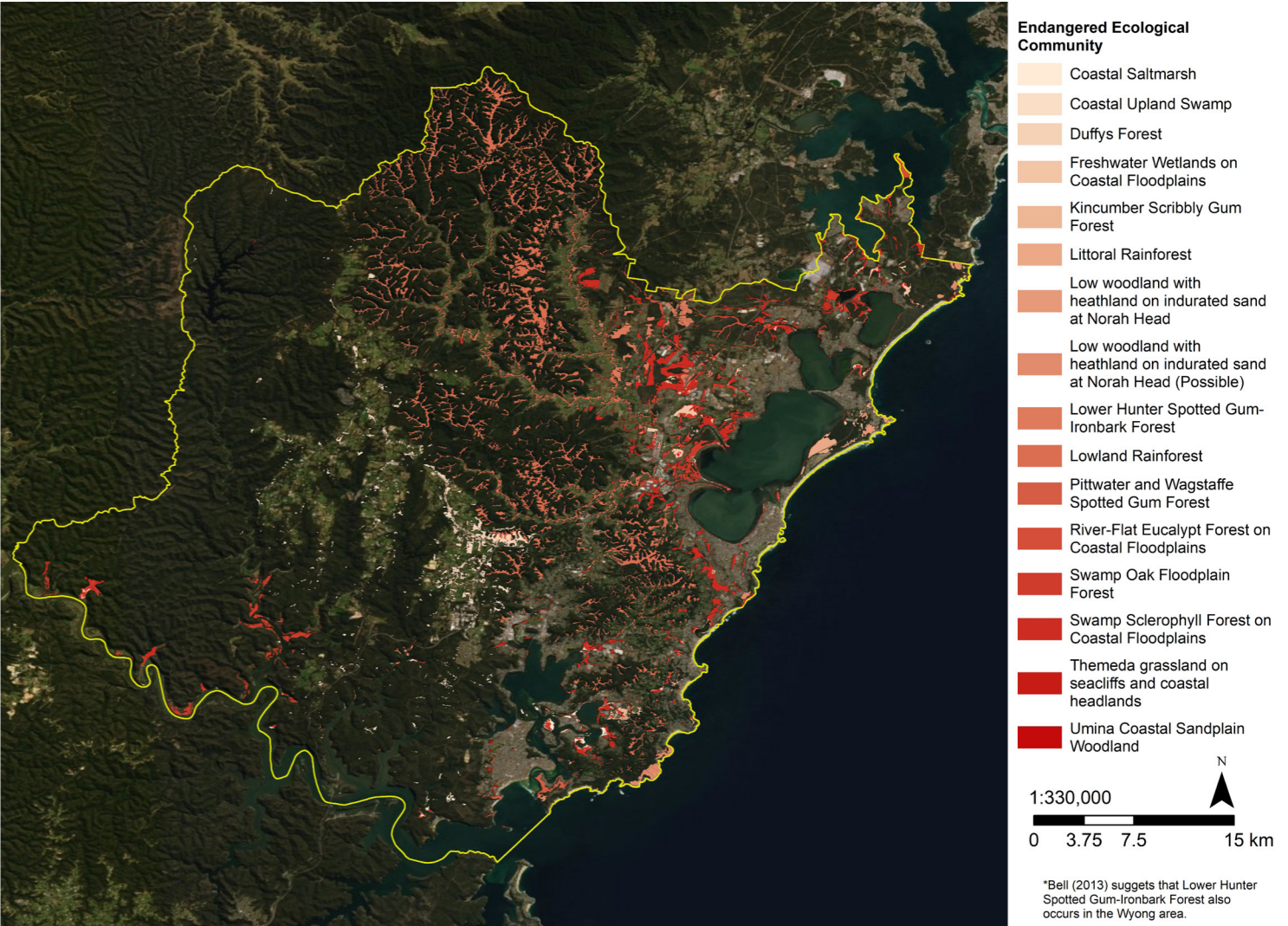


Figure 15: Endangered Ecological Communities

Distribution of key threatened flora

Records of threatened flora were obtained from NSW Government databases and used in the development of computer-generated models and description of the method used in model preparation is included in the appendices. The advantage of models is that they allow for all lands to be considered and rank the relative importance of different areas.

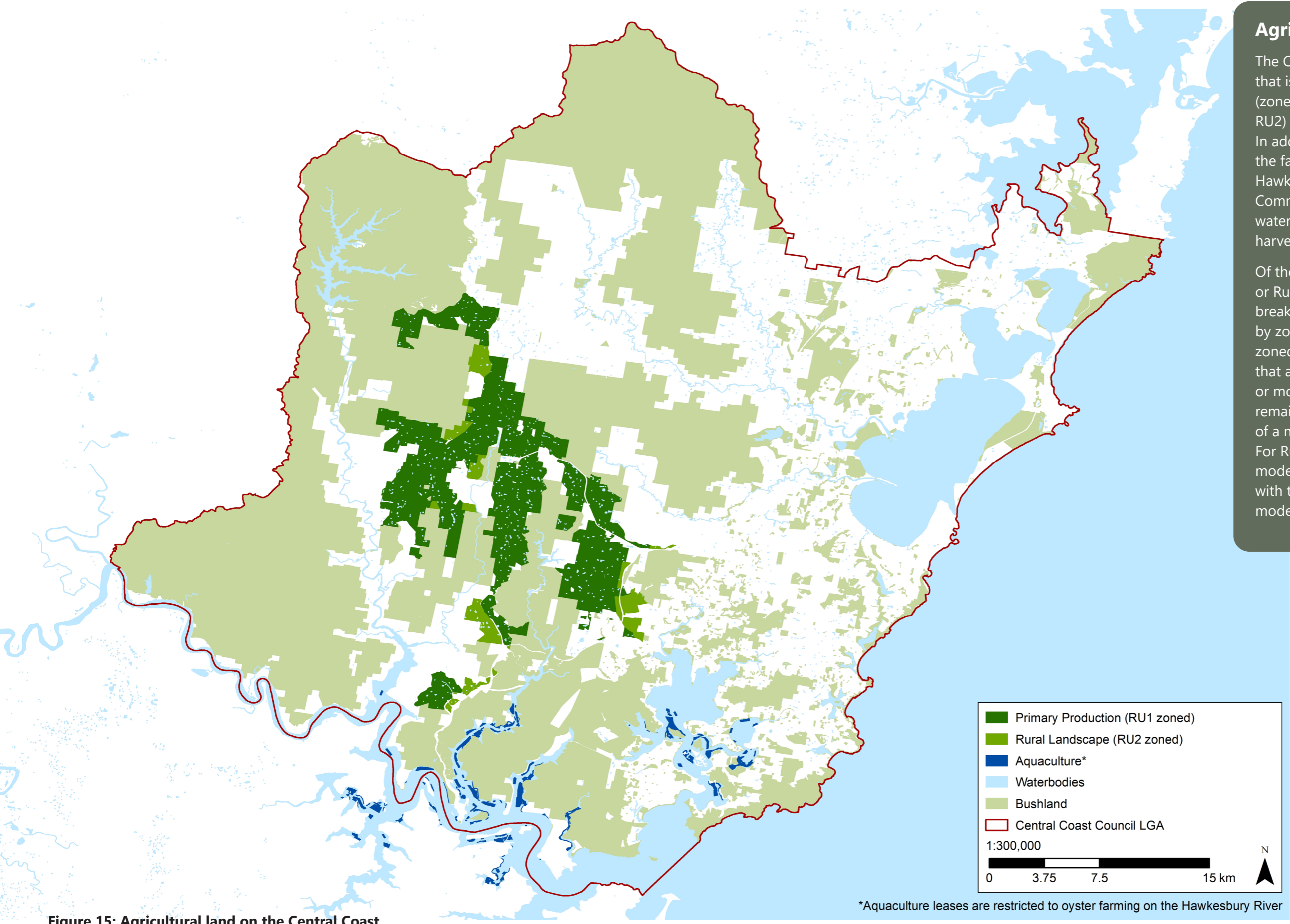


Distribution of fauna

The targeted field surveys detected 17 species of microbat, including eight threatened species, 16 species of native ground-dwelling and/ or climbing mammals, including four threatened species, five species of introduced mammals, three species of reptiles and 82 bird species, including two exotic species and four threatened species. The surveys are discussed in detail in the appendices.



THE AGRICULTURAL GRID



Agricultural Grid

The Central Coast contains 22,327 ha of land that is zoned either for Primary Production (zoned RU1) or as a Rural Landscape (zoned RU2) in relevant Local Environmental Plans. In addition, 4,390 ha of aquatic leases for the farming of oysters occur along the Hawkesbury River and in Brisbane Water. Commercial fishing licences occur over waters of the region, which allow for the harvesting of fin fish, prawns and crayfish.

Of the land zoned for Primary Production or Rural Landscape, Table 7 outlines the breakdown of different soil fertility classes by zoning. Of these, around 25% of land zoned for Primary Production contains soils that are considered to be of a moderate or moderately high fertility, with the remaining primary production lands being of a moderately low or low fertility class. For Rural Landscape lands, 17% contain moderate or moderately high soil fertility, with the remaining lands containing low or moderately low soil fertility.

Figure 15: Agricultural land on the Central Coast



Paradise Garden, Kulnura -
Photo by Isaac Tseng

Table 7: Percentage of Primary Production (RU1) and Rural Landscape (RU2) zoned lands under different soil fertility classes

Fertility class	RU1 zoned lands (ha)	RU2 zoned lands (ha)	% RU1 lands	% RU2 lands
Low	4,347	1259	22	40
Moderately low	10,036	1,313.	52	41
Moderate	1,453	224	7	7
Moderately high	3,280	316	17	10
not assessed	69	18	0	0



Pearls of Australia, Mooney Mooney - Photo by Jacs Powell

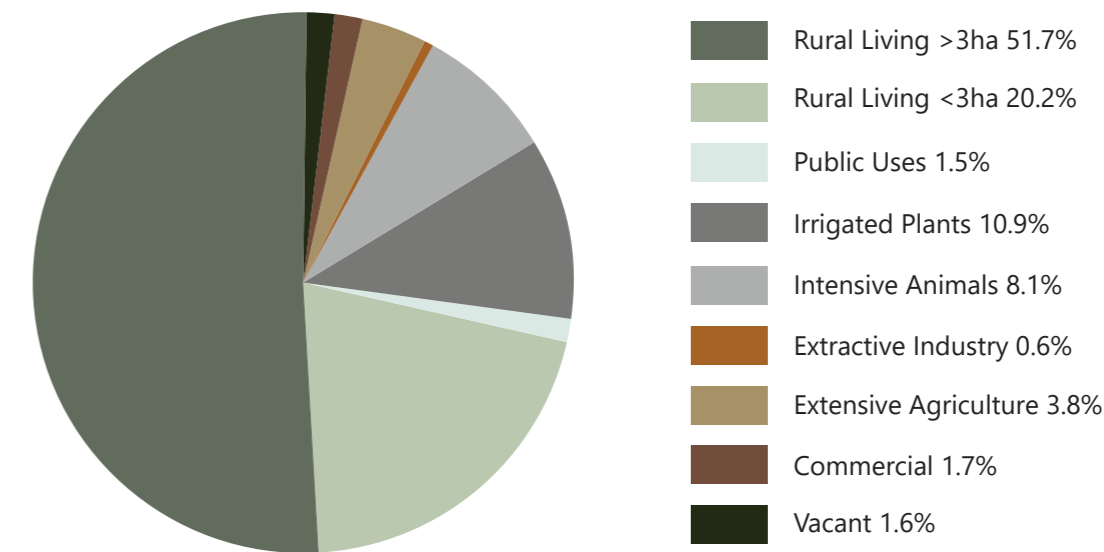


Council completed a rural lands audit in 2020, through visual assessments of properties to determine the types of uses that were occurring within each zone. In both RU1 Primary Production and RU2 Rural Landscape zoned land, rural living was the predominant use where no dominant commercial use was observed.

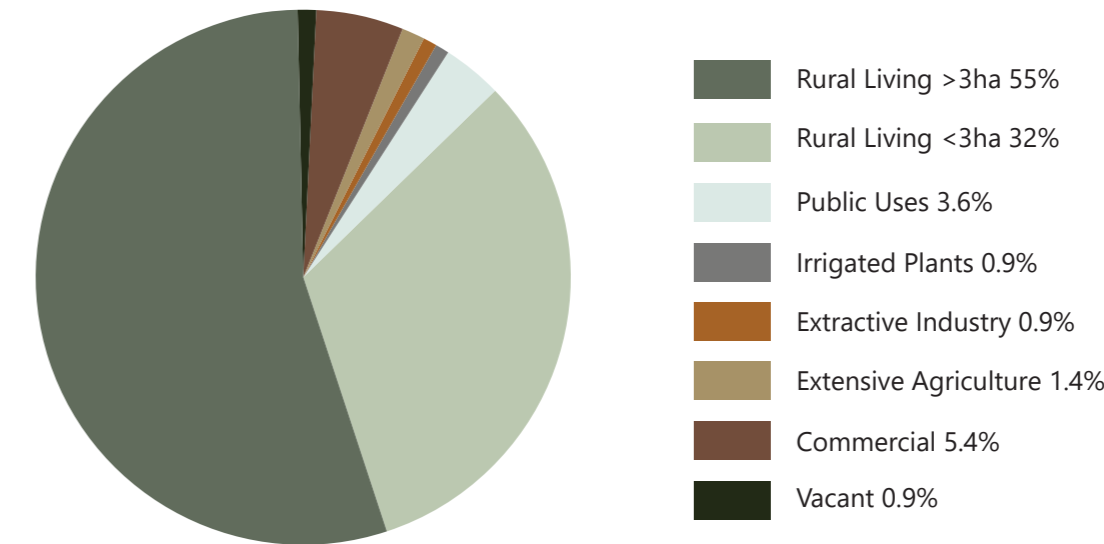
The most common commercial use across RU1 zoned lands was irrigated plants (including orchards, vineyards and market gardens) occurring across 10.9% of zoned lands, followed by intensive animal production (including land uses such as horse studs, chicken farms and piggeries) across 8.1% of zoned lands, followed by extensive agriculture across 3.8% of zoned lands.

Within RU2 zoned lands, agricultural focused commercial uses were less common, with irrigated plants representing 0.9% of zoned lands while extensive agriculture represented 1.4% of zoned lands.

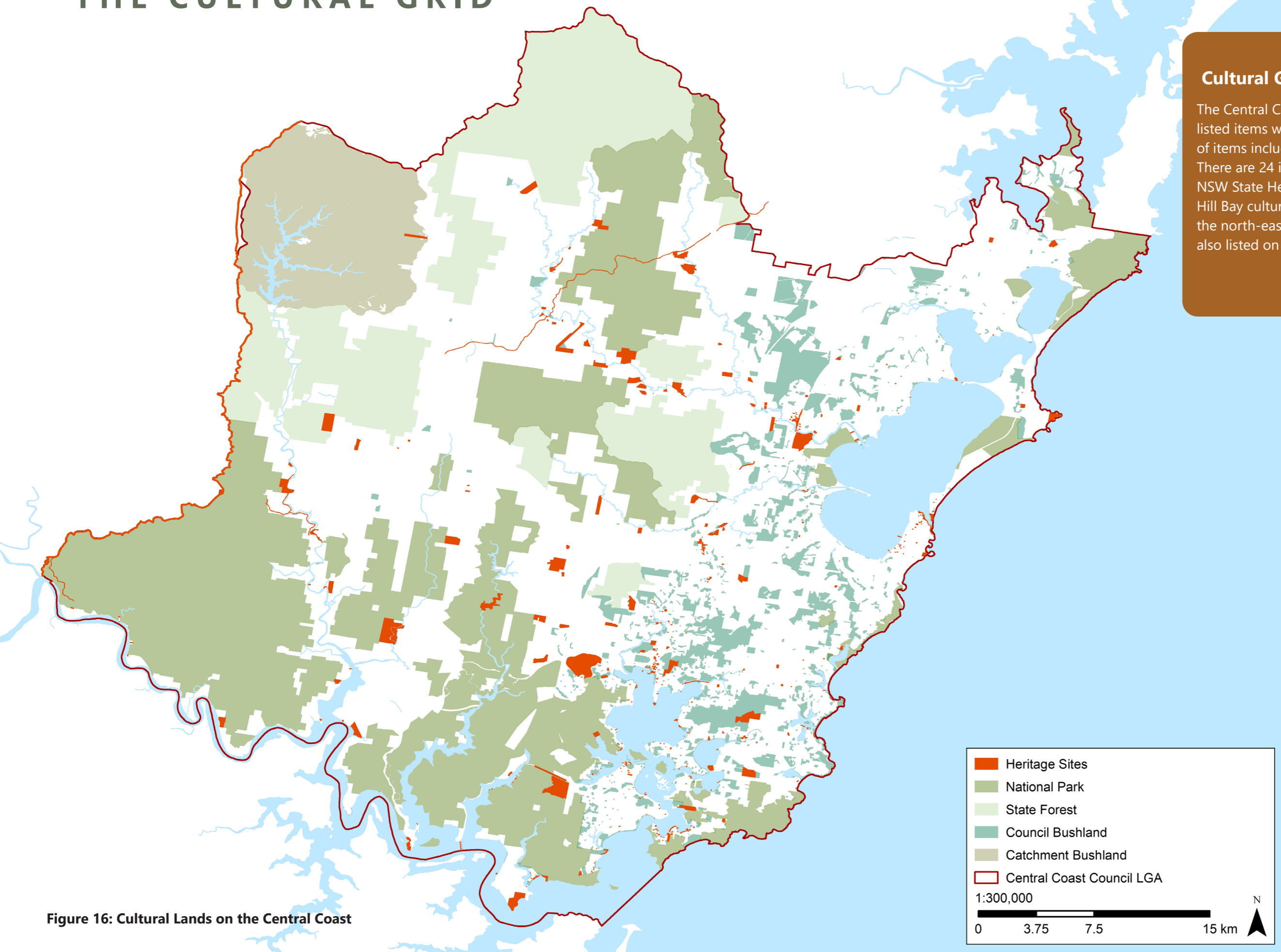
Landuse within land zoned RU1 Primary Production



Landuse within land zoned RU2 Rural Landscape



THE CULTURAL GRID



Cultural Grid

The Central Coast contains 460 heritage listed items which represent a wide range of items including houses, trees and ruins. There are 24 items that are listed on the NSW State Heritage Register. The Catherine Hill Bay cultural precinct, located adjacent to the north-eastern boundary of this Plan is also listed on the State Heritage Register.

Figure 16: Cultural Lands on the Central Coast



Wyoming Cottage circa 1910

Wyoming Cottage, providing a glimpse of life in the 1830s

Frederick Augustus Hely arrived in Australia from Ireland with his wife and children to take the position of Principal Superintendent of Convicts in 1823, in the colony of New South Wales. Hely held a great deal of influence in the colony and soon became Acting Superintendent of Police, before moving to the Gosford area in 1832 where he became a court magistrate and started to develop a large agricultural estate at present day Wyoming. Hely commissioned colonial Architect John Verge to design buildings on the estate, including Wyoming Cottage and also included The Grange, the property's former stables which still survives. Despite remaining in private ownership, Wyoming Cottage has remained substantially in-tact during this time and provides an insight into colonial life on the Central Coast over 180 years ago.

Wyoming Cottage in 2020



The 'cultural landscape' is defined as the landscape resulting from human activity and intervention over time. It includes the layers of human activity and values in the natural landscape. As an 'imprint of human history' these landscapes can tell us about achievements and values of our predecessors, from our First Peoples to non-Indigenous activities and settlement over time.

A Cultural Landscape Framework study (refer to Appendix documents) looked at the cultural influences within the area in order to gain an understanding and provide guidelines for the future

study. It identified a broad outline of the types of Cultural Landscapes on the Central Coast and produced a brief summary of these landscapes. Their names have been selected mostly on the basis of natural landscape characteristics and are subject to future consultation.

In addition, a Case Study of Mangrove Creek Cultural Landscape (refer to Appendix documents) examines the Cultural Landscape following the methodology, subject to future consultation, proposed in the cultural landscape framework.

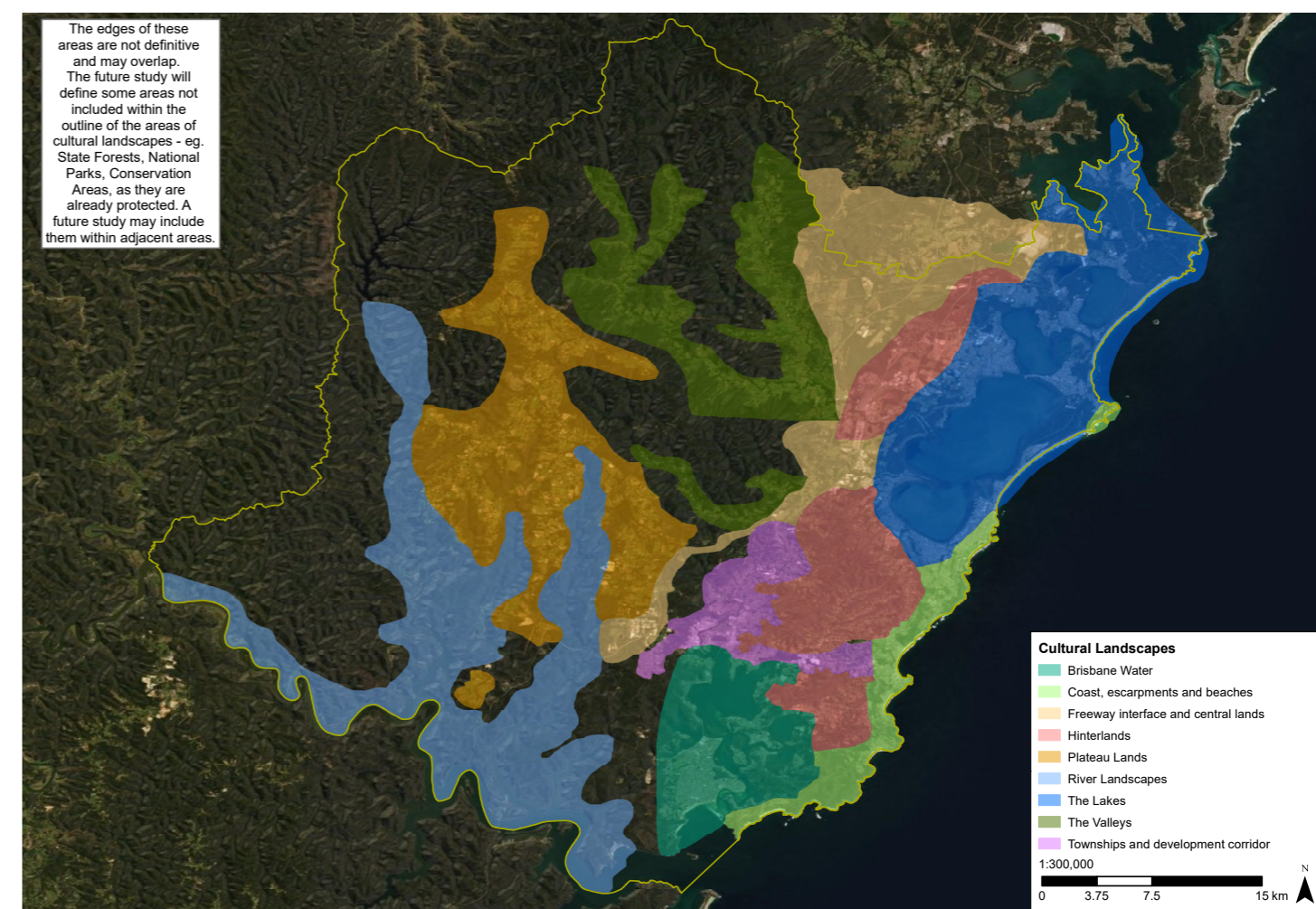
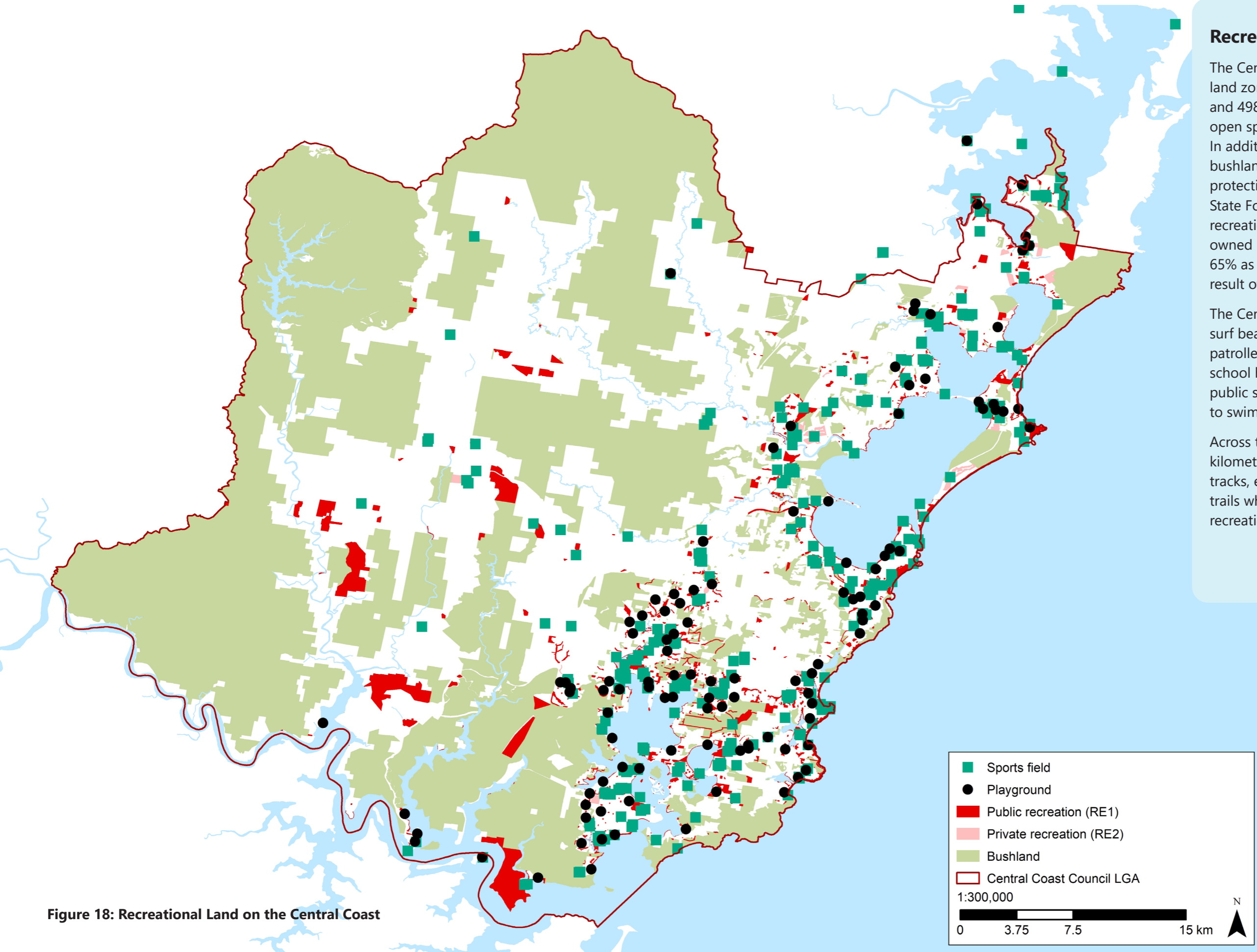


Figure 17: Cultural Landscapes map

THE RECREATIONAL GRID



Recreational Grid

The Central Coast contains 4,829 ha of land zoned for public open space (RE1) and 498 ha of land zoned for private open space (RE2) such as golf courses. In addition, a number of Council bushland reserves zoned environmental protection, National Parks and State Forests offer opportunities for recreation. 35% of land zoned RE1 is owned by Central Coast Council, leaving 65% as areas for future open space as a result of future acquisition.

The Central Coast contains 15 patrolled surf beaches (Budgewoi Beach is only patrolled during the Christmas peak school holiday), an estimated seven public swimming pools (excluding learn to swim schools).

Across the region there are 88 kilometres of mapped bushland walking tracks, excluding unmapped 'informal' trails which may provide additional recreational opportunities.

Figure 18: Recreational Land on the Central Coast

National Parks, State Forests and Council bushland reserves

Approximately 40% of the Central Coast consists of publicly owned natural areas, located within 20 National Parks, State Conservation Areas and Nature Reserves, covering an area of 46,809 ha, four State Forests, covering an area of 21,798 ha and over 1,000 individual Council reserves, covering approximately 6,000 ha.

Some of the most iconic bushland walking tracks include:

- **The Great North Walk**, a 260 km walk which crosses the region on its route between Sydney Cove and Newcastle city and has over 100 km in the Green Grid region.
- **Bouddi coastal walk**, an 8.5 km coastal walk, through Bouddi National Park which takes in spectacular coastline in the Killcare peninsula.
- **Red Gum loop track**, a 3.5 km loop track through large Red Gums in Wyrabylong National Park, Magenta.
- **Somersby Falls walking track**, a 500 m return walking track to the base of a waterfall in Brisbane Water National Park.
- **Katandra loop track**, a 4.7 km loop track through rainforest and Eucalypt forest in Council’s Katandra Reserve northeast of Gosford.
- **Arboretum Trail** in Strickland State Forest is a 2.3 km loop track through an arboretum that was planted over 100 years ago, including large Bunya Pines.

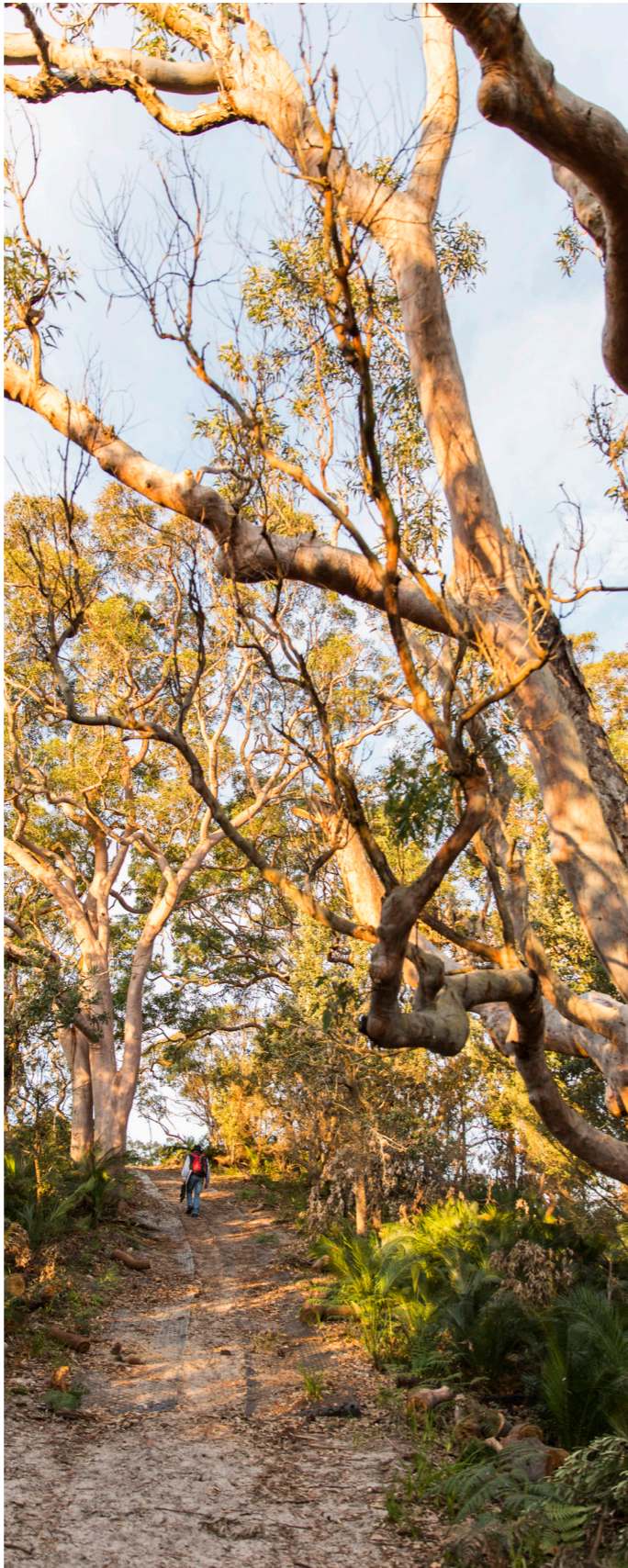


Table 8: Area of land covered by State Forest and National Park on the Central Coast

State Forest	Land area (ha)	National Parks and Nature Reserves	Land area (ha)
Olney*	10,509.7 (18767.6 total*)	Bouddi National Park*	1,367 (1617.3 total*)
Ourimbah	3,576.5	Brisbane Water National Park	12,100.6
Strickland	484.5	Dharug National Park	15,205.3
MacPherson	6,499.7	Cockle Bay Nature Reserve	7,2.57
		Tuggerah Nature Reserve and State Conservation Area	324.6
		Colongra Swamp Nature Reserve	117.6
		Rileys Island Nature Reserve	41.7
		Wyrabalong National Park	580.5
		Munmorah State Conservation Area	1,327.77
		Palm Grove Nature Reserve	238.9
		Jilliby State Conservation Area*	10,517.2 (12061.4 total*)
		Popran National Park	4,031.5
		Palm Grove Nature Reserve	238.9
		Wambina Nature Reserve	54.3
		Wamberal Lagoon Nature Reserve	142.5
		Lake Macquarie State Conservation Area*	571.7 (1271.7 total*)

*These reserves extend beyond the Central Coast and these calculations include the total area of each.

Table 9: Land area of iconic Council and other bushland reserves

Council Reserve	Land area (ha)
Rumbalara	330.6
Kincumba Mountain	645.9
Katandra Reserve	183.6
Berry’s Head	46.6
Triple Springs (The Ridgeway)	44.2
Blackwall Mountain	38.1
Winney Bay	37.0
Other reserves	
Central Coast Wetlands, Pioneer Dairy Crown Reserve	154.3



Current availability of open space

Availability of open space was considered within 400m for each of the 17 Social Planning Districts and described in detail in Appendices. Across the Central Coast, 89% of people lived within a 400m radius of publicly owned (RE1) zoned land (Table 10), however this was not equal across all Social Planning Districts (see Appendices).

Table 10: Availability of open space across the Central Coast region.

Type of Open Space	No. People Outside	No. People within	% People Outside	% People within	No. Dwellings Outside	No. Dwellings within	% Dwellings Outside	% dwellings within
All RE1 and RE2 zoned land	31380	296357	10	90	11359	133027	8	92
All RE1 zoned land	34588	293149	11	89	12974	131412	9	91
All publicly owned RE1 zoned land	35216	292521	11	89	13281	131105	9	91
All RE1 and RE2 zoned land with sports facilities or playgrounds	118274	209463	36	64	48350	96036	33	67
All publicly owned bushland with mapped walking tracks and fire trails	253797	73940	77	23	110144	34242	76	24
All publicly owned RE1 and bushland with walking tracks and fire trails	31168	296569	10	90	11477	132909	8	92

TRANSPORT & PUBLIC DOMAIN GRID



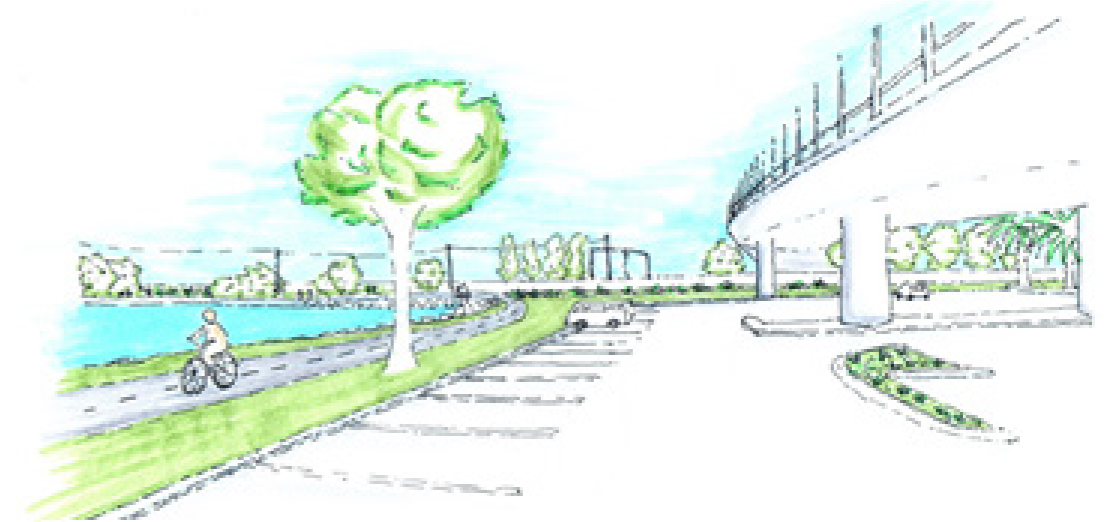
Figure 19: Urban form vision sketches (Jessica Summerhayes, Central Coast Council)

Transport & Public Domain Grid

The Transport & Public Domain Grid focuses on understanding the current transport grids and investigating how to improve infrastructure, particularly public transport infrastructure such as cycleways, train lines, bus routes and walking routes. The Grid also focuses on public domain projects that improve the quality and connectivity between places such as plazas, galleries, community centres, showgrounds and shared streetscapes.

There is one railway line within the Central Coast Council LGA spanning 119 km. There are 13 train stations along this line located at Gosford, Koolewong, Lisarow, Narara, Niagra Park, Ourimbah, Point Claire, Tascott, Tuggerah, Warnervale, Wondabyne, Woy Woy and Wyong.

There are multiple town centres, smaller centres and one CBD; the Gosford Central Business District.



IMPLEMENTATION OF THE CENTRAL COAST GREEN GRID PLAN

Appendices to this Plan

To understand the ecological values, cultural landscapes and availability of open space, a series of appendices were produced to accompany the Central Coast Green Grid Plan. These were:

- A field survey of wildlife species across 100 sites in the region, to identify areas of greatest wildlife diversity and activity.
- A study that modelled the key habitats for threatened plants in the region, to determine their level of reservation in public lands.
- A cultural landscapes study, which identified the broad cultural landscapes of the region and a focused case study on the Mangrove Creek area.
- An analysis of eight Central Coast centres to determine availability of open space in these areas
- Consideration for each Social Planning District the availability of open space within 400 metres of where people live.
- A list of strategic documents reviewed for the preparation of the Plan.
- A list of potential projects, including the source of the project and its general location, to be ranked at a later stage.

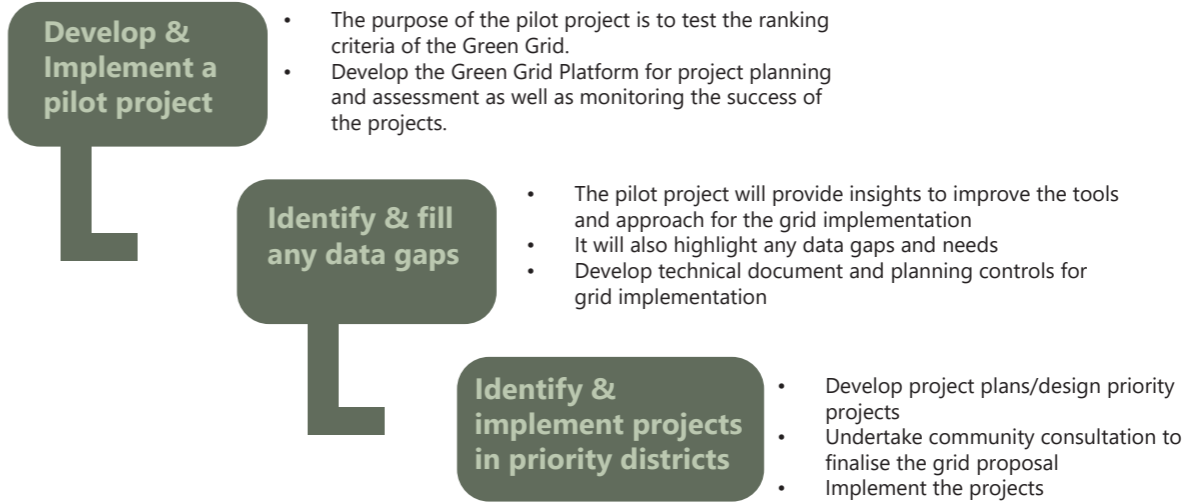
It is intended that the Appendices will serve as baseline information to guide the development of Social Planning District Implementation Plans where specific projects will be ranked against the criteria included in this Plan.

Next steps

For each Social Planning District or aggregation of Social Planning Districts, a Green Grid Implementation Plan will be prepared. The Implementation Plan will aim to:

1. Integrate the results of threatened flora monitoring, the targeted fauna surveys and the Department of Planning, Industry and Environment’s Central Coast Strategic Conservation Plan into outcomes for the Ecological Grid. This will be used to determine the location of future conservation lands and conservation projects.
2. Undertake detailed community consultation to identify projects in addition to those identified the appendix, within each Social Planning District, prior to the ranking of each project against the criteria contained within this document to determine its strategic merit.
3. Use the ranking matrix to determine the alignment of future projects to Green Grid principles, to determine the project’s strategic merit.
4. A pilot project will also be developed by Council that will consider the principles of one or two Grids (for example the Public Domain and Cultural Landscapes Grids) within this Plan and how they can be applied at a local scale. The pilot project will follow the following process:

Implementation of Green Grid



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