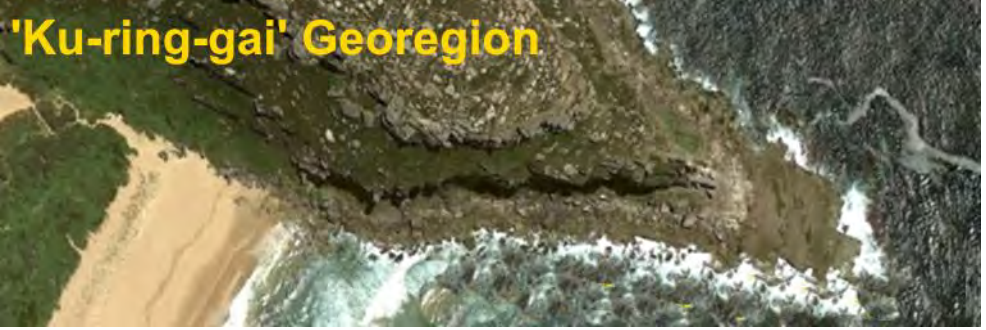
Ku-ring-gai GeoRegion

A world-class wonderland of natural and cultural heritage



Protecting and Showcasing **‘Ku**-ring-**gai’** Geoheritage

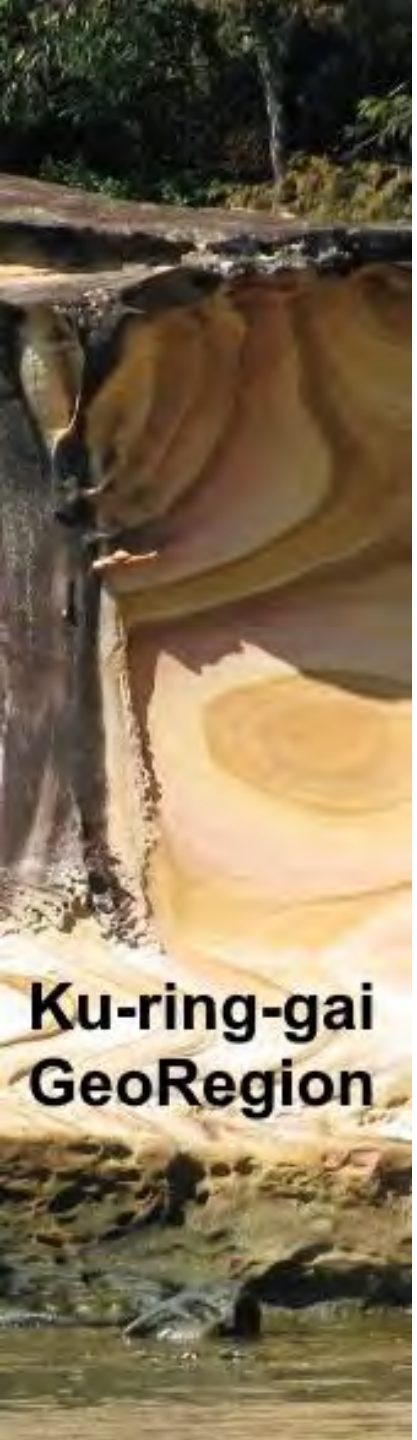
What is Geoheritage?

Geological or landform features that are unique or excellent scientific or reference sites which:

- promote awareness and appreciation of our geological heritage;
- record evidence of past environments;
- strengthen conservation; and
- provide opportunities for geotourism.

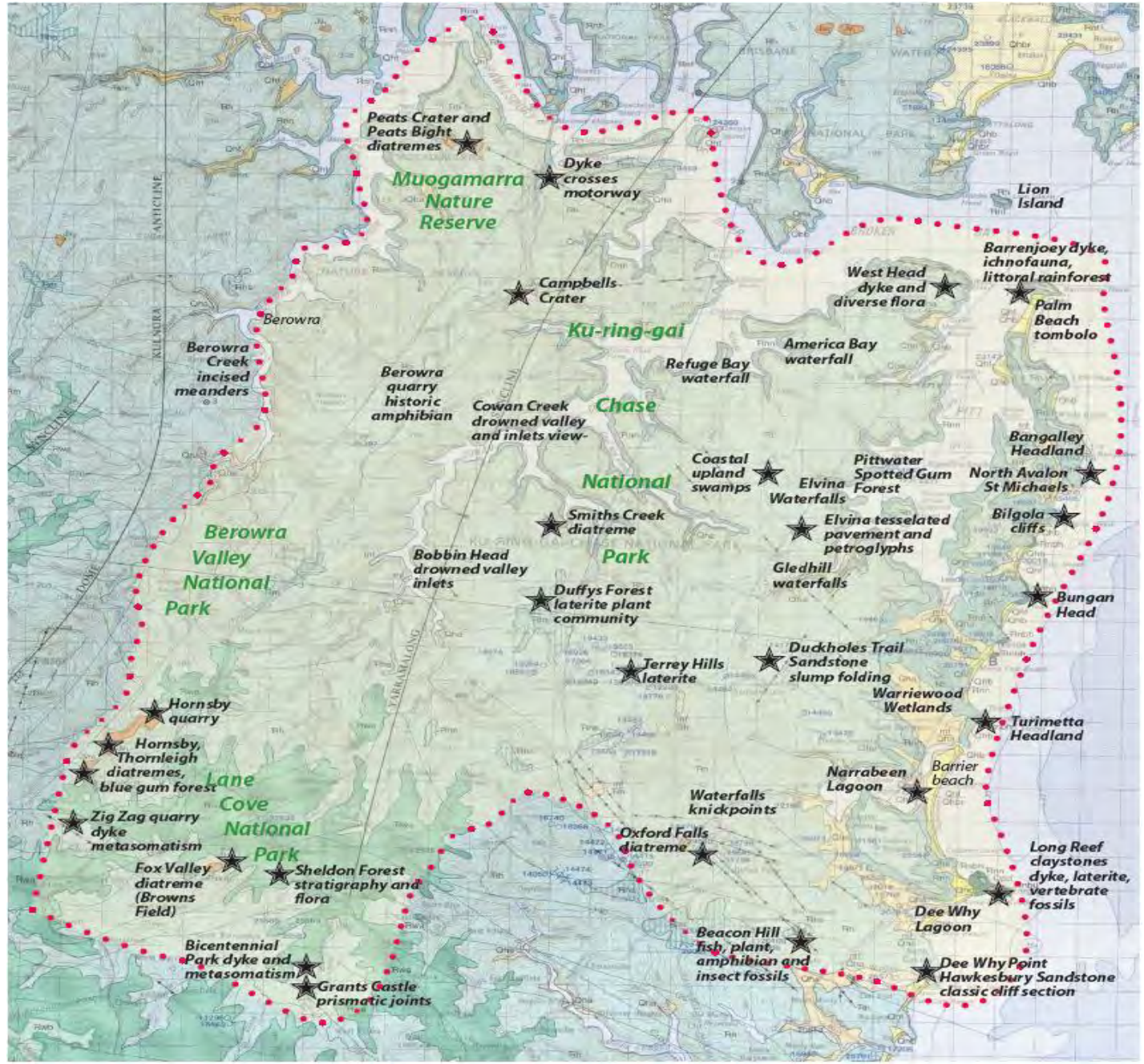
The creation of new geotrails can demonstrate significant tourism and regional economic benefits.

Potential to develop into a UNESCO Global Geopark.



Geotrail development in the Ku-ring-gai GeoRegion

- Since 2021 we have been in a working partnership with:
  - ➢ NSW National Parks and Wildlife Service; and
  - ➢ three local government agencies - Hornsby, Ku-ring-gai, and Northern Beaches.
- Approved by the NSW Geological Survey
- 50+ geosites and 5-6 formative geotrails
- Enable visitors to understand the relationship to flora and fauna, Aboriginal culture, thus enriching their visits to the GeoRegion.
- Raising the awareness of the natural and cultural heritage of our area will lead to better conservation and protection outcomes.


Peats Crater and Peats Bight diatremes
Dyke crosses motorway
Muogamarra Nature Reserve
Lion Island
Barrenjoey dyke, ichnofauna, littoral rainforest
West Head dyke and diverse flora
Palm Beach tombolo
Campbells Crater
Berowra
Ku-ring-gai
America Bay waterfall
Refuge Bay waterfall
Berowra Creek incised meanders
Berowra quarry historic amphibian
Cowan Creek drowned valley and inlets view-
Chase
Bangalley Headland
Coastal upland swamps
Pittwater Spotted Gum Forest
North Avalon St Michaels
Elvina Waterfalls
National
Smiths Creek diatreme
Elvina tesselated pavement and petroglyphs
Bilgola cliffs
Berowra Valley National Park
Bobbin Head drowned valley inlets
Park
Gledhill waterfalls
Duffys Forest laterite plant community
Bungan Head
Duckholes Trail Sandstone slump folding
Terrey Hills laterite
Warriewood Wetlands
Hornsby quarry
Turimetta Headland
Hornsby, Thornleigh diatremes, blue gum forest
Narrabeen Lagoon
Barrier beach
Lane Cove National Park
Waterfalls knickpoints
Zig Zag quarry dyke metasomatism
Oxford Falls diatreme
Long Reef daystones dyke, laterite, vertebrate fossils
Fox Valley diatreme (Browns Field)
Sheldon Forest stratigraphy and flora
Dee Why Lagoon
Beacon Hill fish, plant, amphibian and insect fossils
Bicentennial Park dyke and metasomatism
Dee Why Point Hawkesbury Sandstone classic cliff section
Grants Castle prismatic joints

The ‘Ku-ring-gai’ GeoRegion captures:

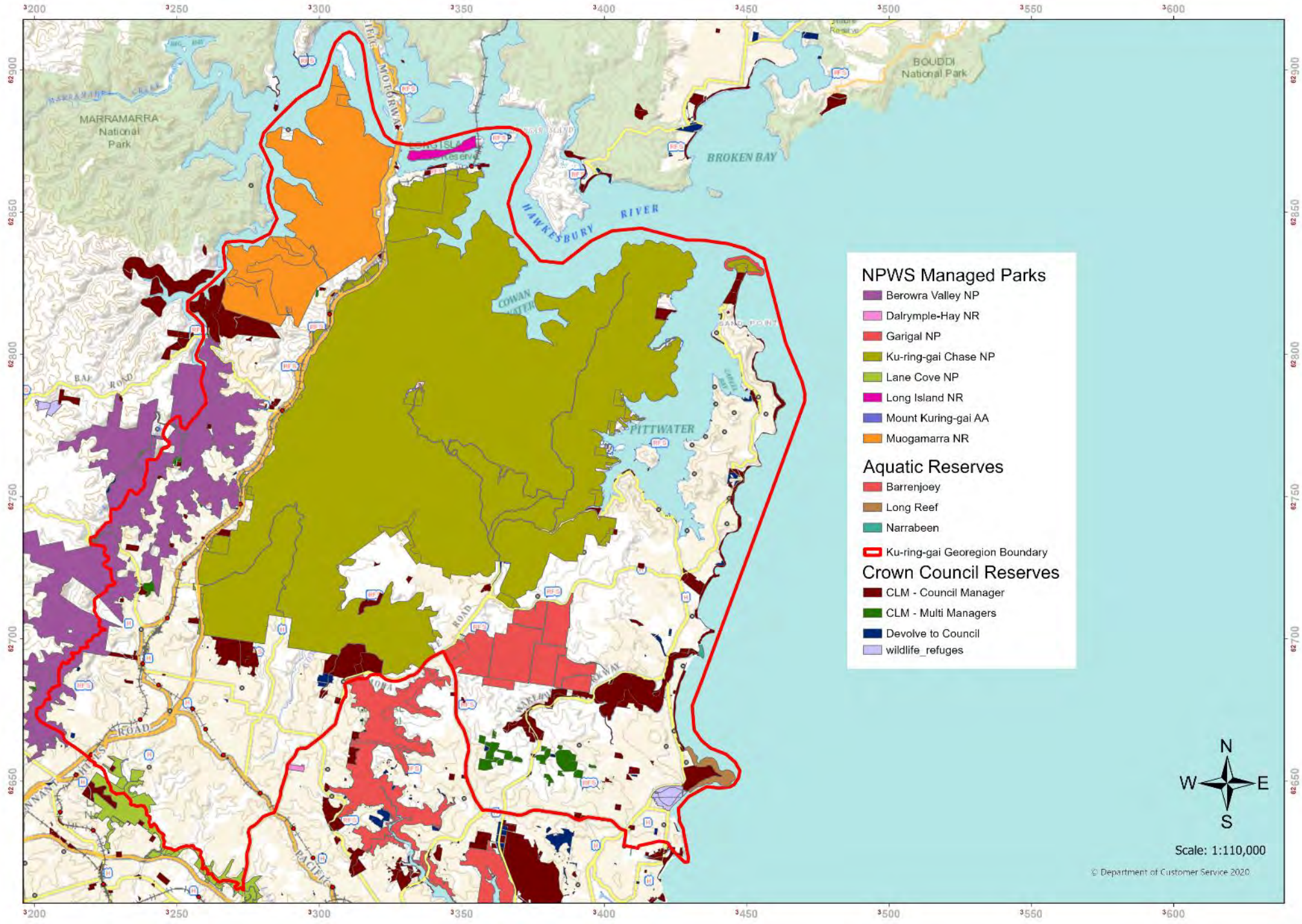
- Cliffs, beaches and lagoons from Long Reef to Barrenjoey.
- Ku-ring-gai Chase National Park and Mt Ku-ring-gai Aboriginal Area.
- Muogamarra and Dalrymple-Hay Nature Reserves.
- Sections of Garigal, Berowra Valley and Lane Cove National Parks.
- 3 x Aquatic Reserves.
- Several significant Council-managed and Crown Land Trust reserves.

Showcasing:

- Numerous significant geological sites.
- Rare and threatened flora and fauna.
- A human history dictated by the landscape.

Why?

- ‘Ku-ring-gai’ Geosites reveal the best exposed geological section of early to mid-Triassic period (240 million years ago) sedimentary rocks in the Sydney Basin.
- Diversity of fossils reflect past environments over nearly 50 million years.
- Includes eight volcanic diatremes (pipes) and associated dykes with the Hornsby diatreme being perhaps the best exposed geological section of its type in the world.


MARRAMARRA National Park
BOUDDI National Park
BROKEN BAY
HAWKESBURY RIVER
PITTWATER
NPWS Managed Parks
Berowra Valley NP
Dalrymple-Hay NR
Garigal NP
Ku-ring-gai Chase NP
Lane Cove NP
Long Island NR
Mount Kuring-gai AA
Muogamarra NR
Aquatic Reserves
Barrenjoey
Long Reef
Narrabeen
Ku-ring-gai Georegion Boundary
Crown Council Reserves
CLM - Council Manager
CLM - Multi Managers
Devolve to Council
wildlife_refuges
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Scale: 1:110,000
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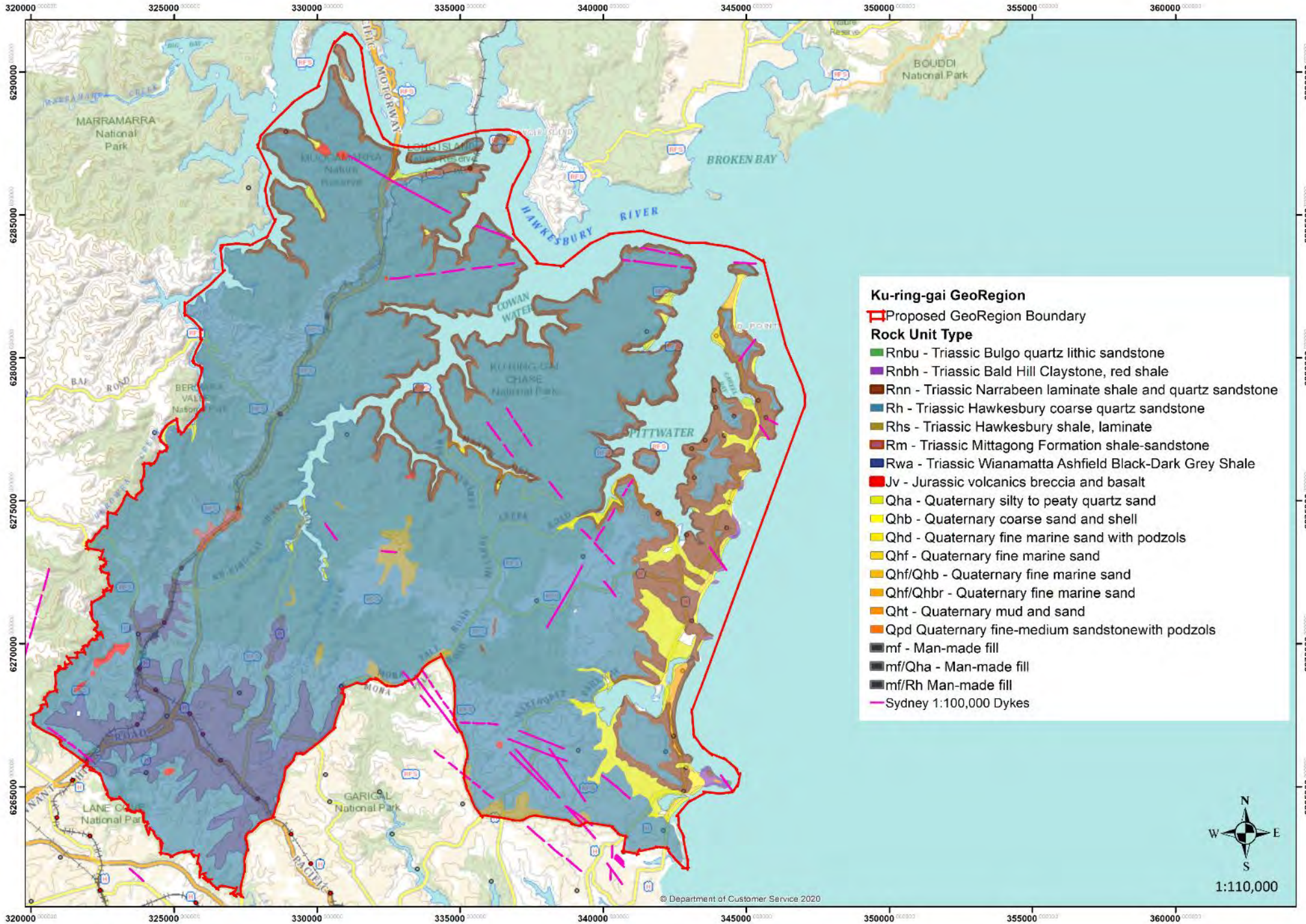
Ku-ring-gai GeoRegion
Proposed GeoRegion Boundary
Rock Unit Type
Rnbu - Triassic Bulgo quartz lithic sandstone
Rnbh - Triassic Bald Hill Claystone, red shale
Rnn - Triassic Narrabeen laminate shale and quartz sandstone
Rh - Triassic Hawkesbury coarse quartz sandstone
Rhs - Triassic Hawkesbury shale, laminate
Rm - Triassic Mittagong Formation shale-sandstone
Rwa - Triassic Wianamatta Ashfield Black-Dark Grey Shale
Jv - Jurassic volcanics breccia and basalt
Qha - Quaternary silty to peaty quartz sand
Qhb - Quaternary coarse sand and shell
Qhd - Quaternary fine marine sand with podzols
Qhf - Quaternary fine marine sand
Qhf/Qhb - Quaternary fine marine sand
Qhf/Qhbr - Quaternary fine marine sand
Qht - Quaternary mud and sand
Qpd Quaternary fine-medium sandstonewith podzols
mf - Man-made fill
mf/Qha - Man-made fill
mf/Rh Man-made fill
Sydney 1:100,000 Dykes
MARRAMARRA National Park
BROKEN BAY
BOUDDI National Park
HAWKESBURY RIVER
COWAN WATER
KU-RING-GAI CHASE National Park
PITTWATER
GARIGAL National Park
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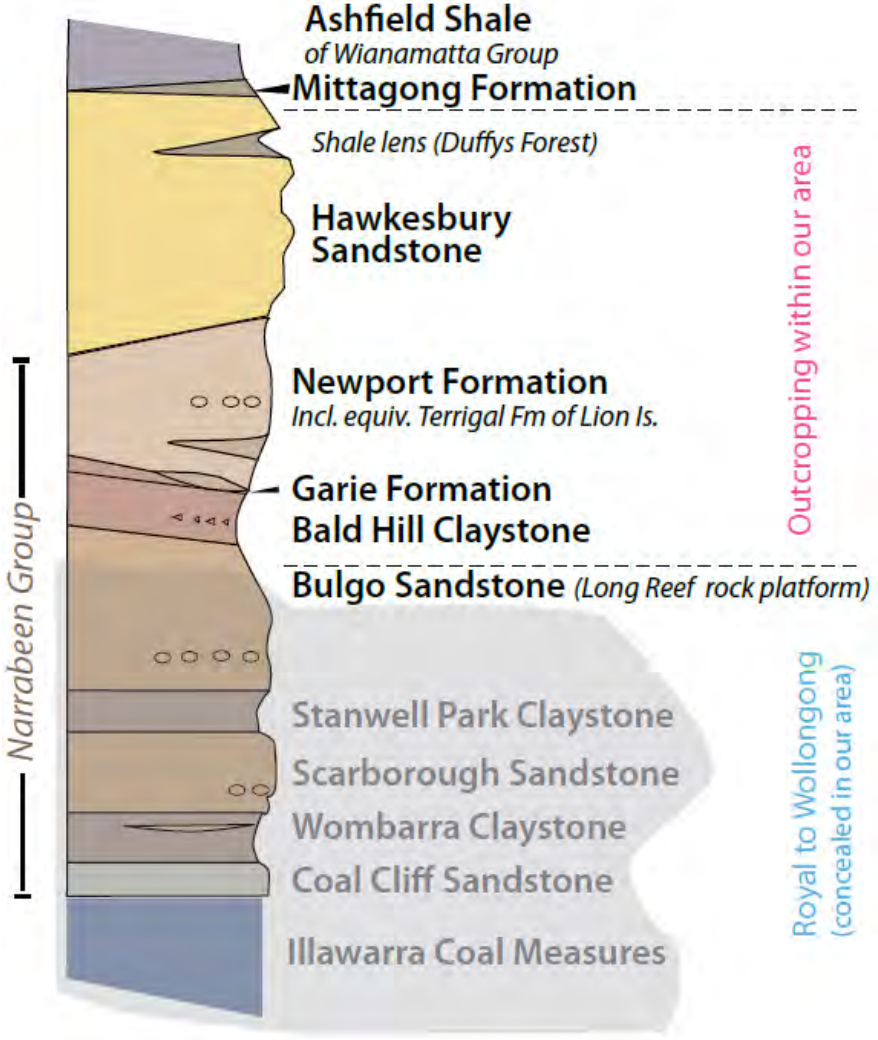
Triassic - Narrabeen Group

A



B

C

Triassic - Narrabeen Group

A

C

E

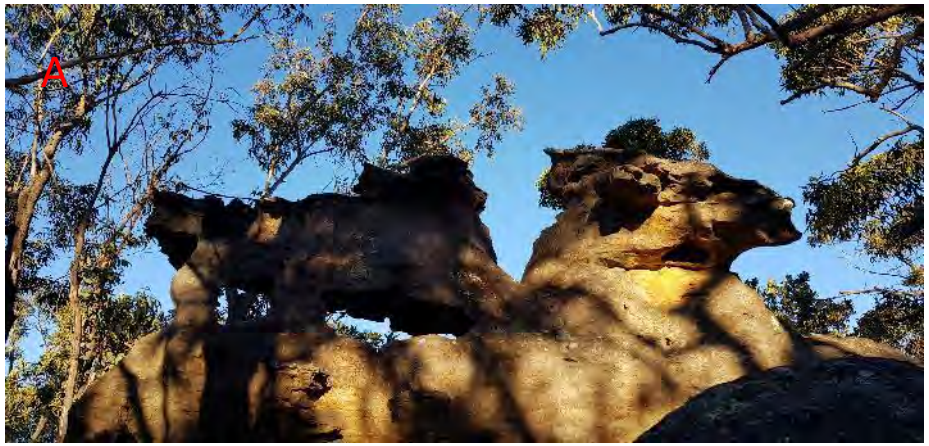
F

B

D

G

Triassic - Hawkesbury Sandstone



Griffin Rock, Tumbledown Dick

Honeycomb weathering, Smiths Creek

Spaceship Rock, Salvation Creek

Tessellated pavement, Elvina Bay

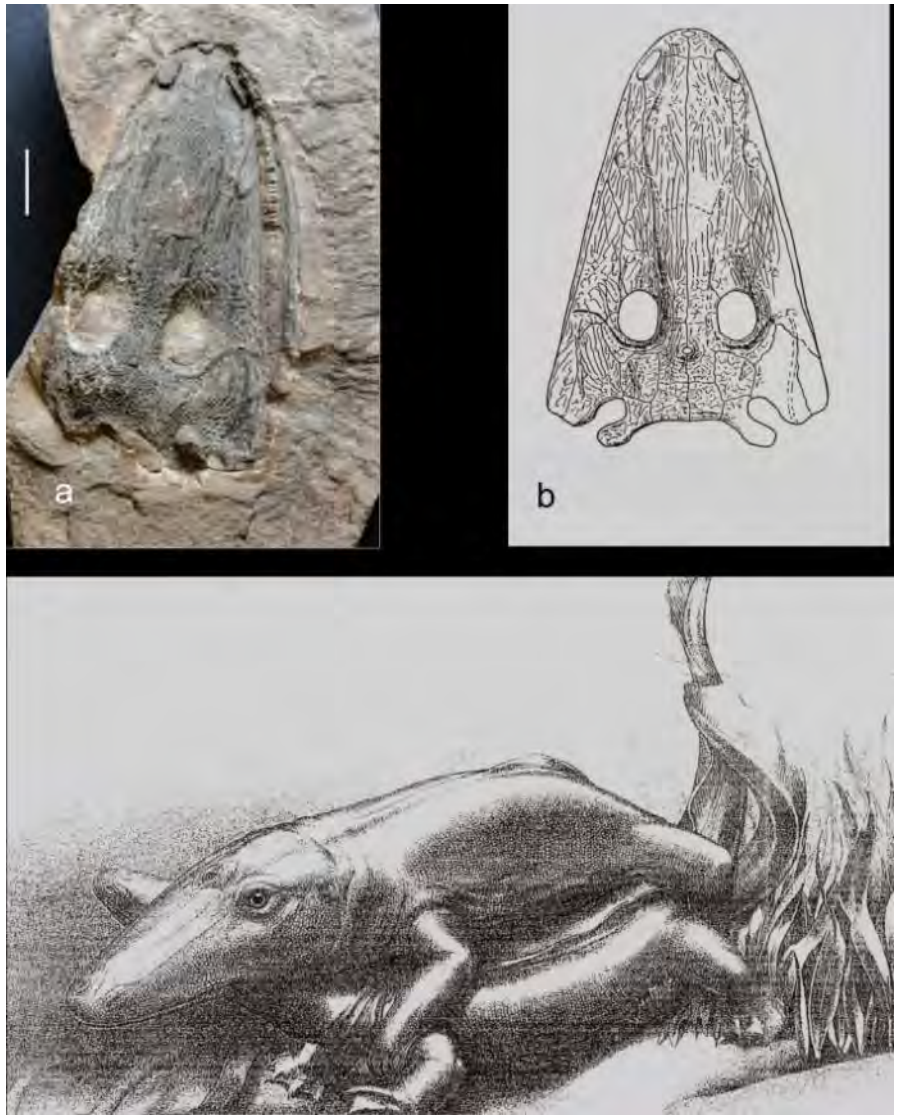
Stone Basin, Cowan

Hawkesbury Sandstone cliff face, West Head

Triassic - Hawkesbury Sandstone

Triassic – Upper Hawkesbury Shale Lens

Courtesy Australian Museum – Beacon Hill freshwater fish fossils

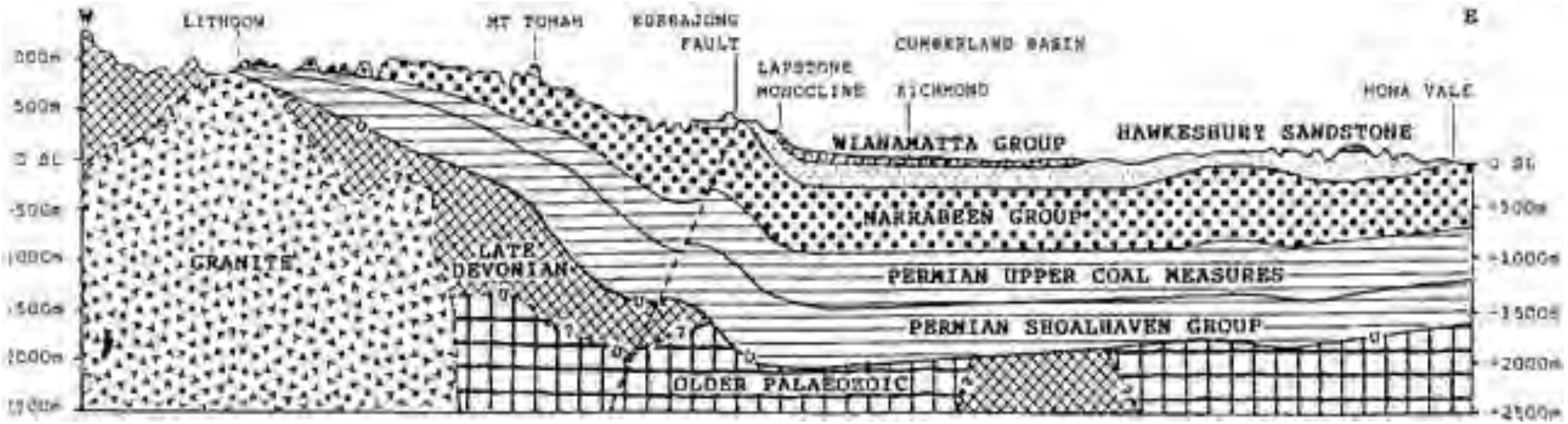


and *Parotosuchus brookvalensis* or *Subcyclotosaurus brookvalensis*

Triassic - Wianamatta Group

Blue Gum High Forest on Ashfield shale, Dalrymple-Hay Nature Reserve (STEP).

Mittagong Formation exposed on a railway cutting on the North Shore Line (STEP)



Jurassic – Cretaceous

Hornsby Diatreme

Fossilised Spirifer, a marine brachiopod

Barrenjoey Dyke, north side

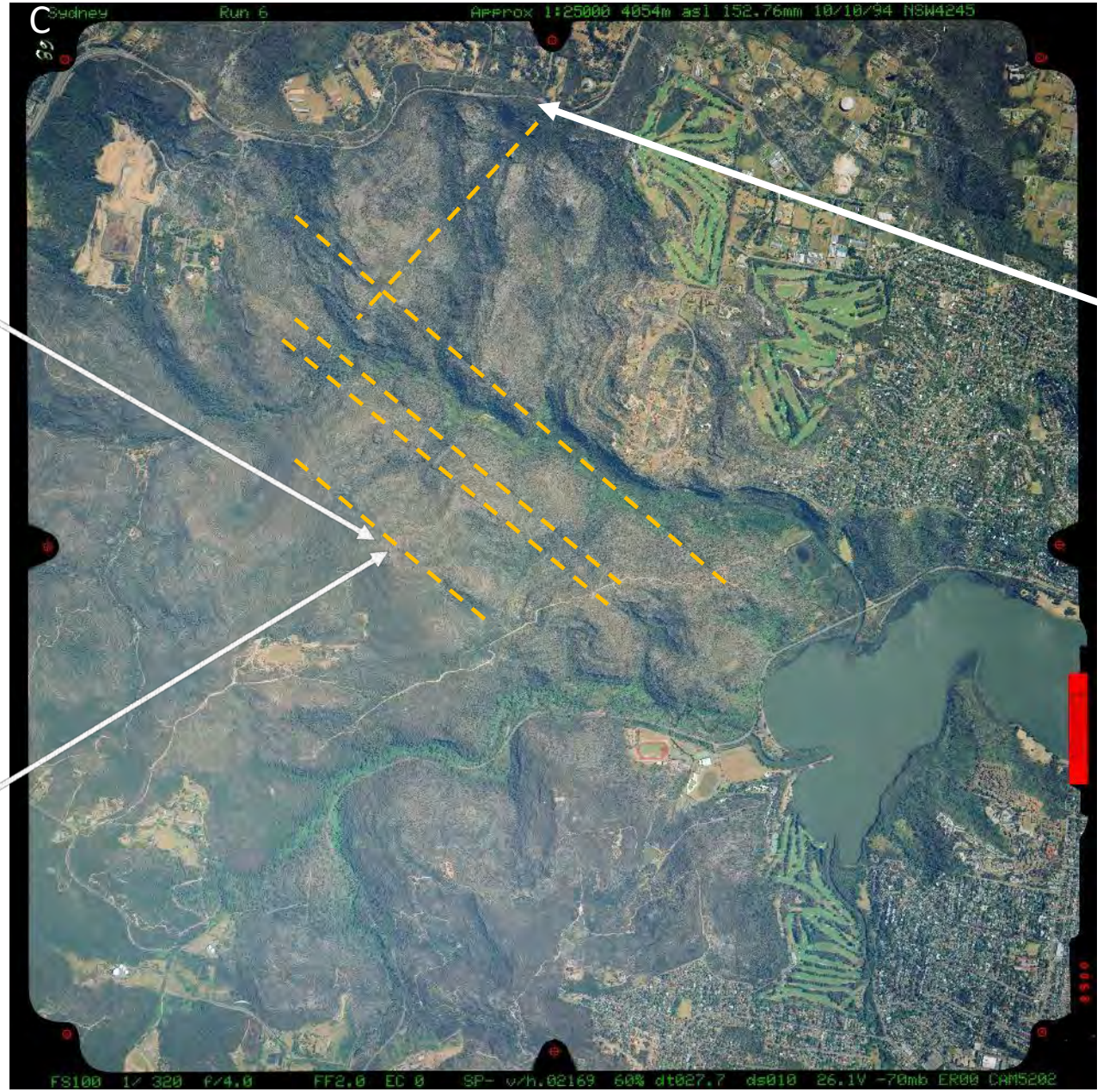
Peats Craters, Cowan

West Head Road Dyke

Ingleside Dyke

Long Reef Dyke

Jurassic – Cretaceous



A-B: Narrow sandstone slot canyons coincident with joint lines, possibly dykes.

C: Aerial photographic of the Deep and Middle Creek Catchments following the 1994 bushfire (Photo: 10-10-1994)

D: Ingleside Dyke – Road cutting Mona Vale Road opposite Addison Road.

DAILY TELEGRAPH FEBRUARY 8, 1946 3

NEXT

SOLDIERS FIGHT 30-MILE FIRE IN FRENCH'S FOREST

BUSHFIRES blazing on a 30-mile front at Terrey Hills, French's Forest, last night. Hampered by lack of equipment and shortage of water, soldiers, civilians, and police, fought to save 20 homes threatened by the fires.


Search Google Maps
M1
Cowan, New South Wales
Google Street View
Jan 2025
See more dates
Share
Google

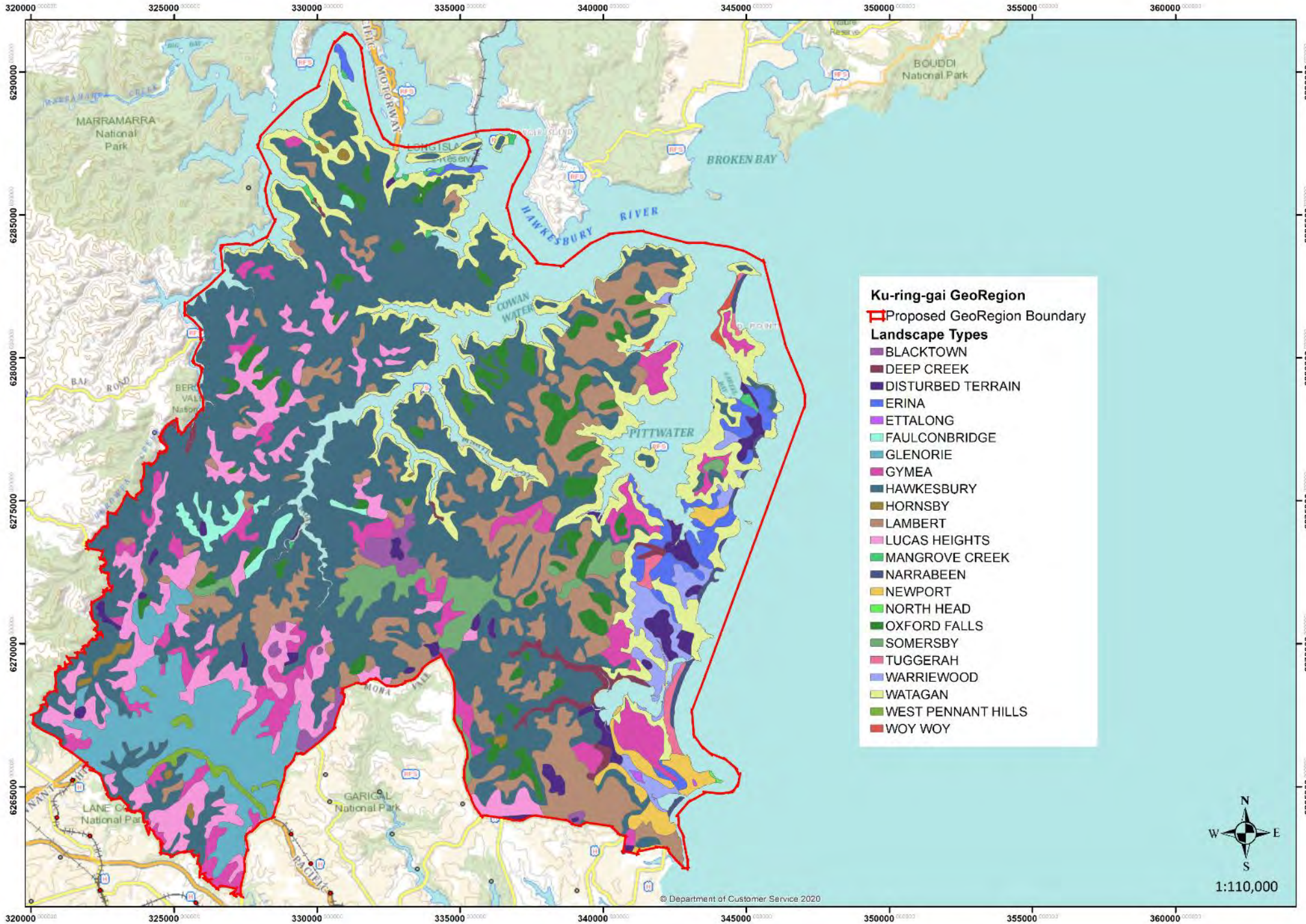
Quaternary Period - Fluvial Geomorphology

Flooded river valley of Jerusalem Bay and Broken Bay

Flooded river valleys of Smiths Creek and Cowan Creek, from Mt Murray Anderson

The tombolo and tied island of Palm Beach and Barrenjoey

Hawkesbury channels before sea level rise


Ku-ring-gai GeoRegion
Proposed GeoRegion Boundary
Landscape Types
BLACKTOWN
DEEP CREEK
DISTURBED TERRAIN
ERINA
ETTALONG
FAULCONBRIDGE
GLENORIE
GYMEA
HAWKESBURY
HORNSBY
LAMBERT
LUCAS HEIGHTS
MANGROVE CREEK
NARRABEEN
NEWPORT
NORTH HEAD
OXFORD FALLS
SOMERSBY
TUGGERAH
WARRIEWOOD
WATAGAN
WEST PENNANT HILLS
WOY WOY
MARRAMARRA National Park
BOUDDI National Park
BROKEN BAY
HAWKESBURY RIVER
COWAN WATER
PITTWATER
GARIGAL National Park
LANE COVE National Park
MONA VALE
PACIFIC
LONGISLAND Reserve
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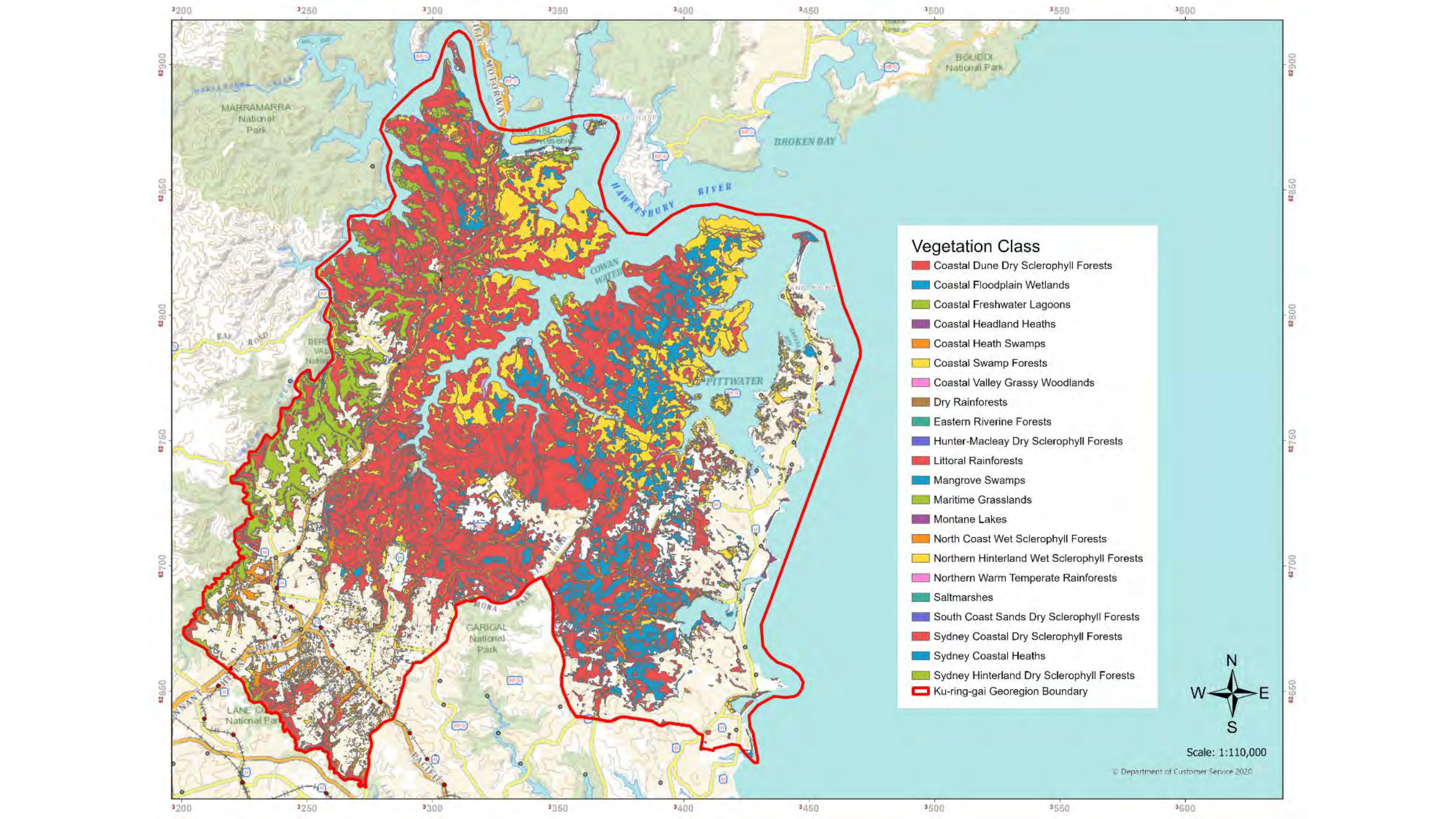
Vegetation Class
Coastal Dune Dry Sclerophyll Forests
Coastal Floodplain Wetlands
Coastal Freshwater Lagoons
Coastal Headland Heaths
Coastal Heath Swamps
Coastal Swamp Forests
Coastal Valley Grassy Woodlands
Dry Rainforests
Eastern Riverine Forests
Hunter-Macleay Dry Sclerophyll Forests
Littoral Rainforests
Mangrove Swamps
Maritime Grasslands
Montane Lakes
North Coast Wet Sclerophyll Forests
Northern Hinterland Wet Sclerophyll Forests
Northern Warm Temperate Rainforests
Saltmarshes
South Coast Sands Dry Sclerophyll Forests
Sydney Coastal Dry Sclerophyll Forests
Sydney Coastal Heaths
Sydney Hinterland Dry Sclerophyll Forests
Ku-ring-gai Georegion Boundary
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Scale: 1:110,000
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MARRAMARRA National Park
BOUDDI National Park
BROKEN BAY
HAWKESBURY RIVER
COWAN WATER
PITTWATER
GARIGAL National Park
LANE COVE National Park
MOTORWAY
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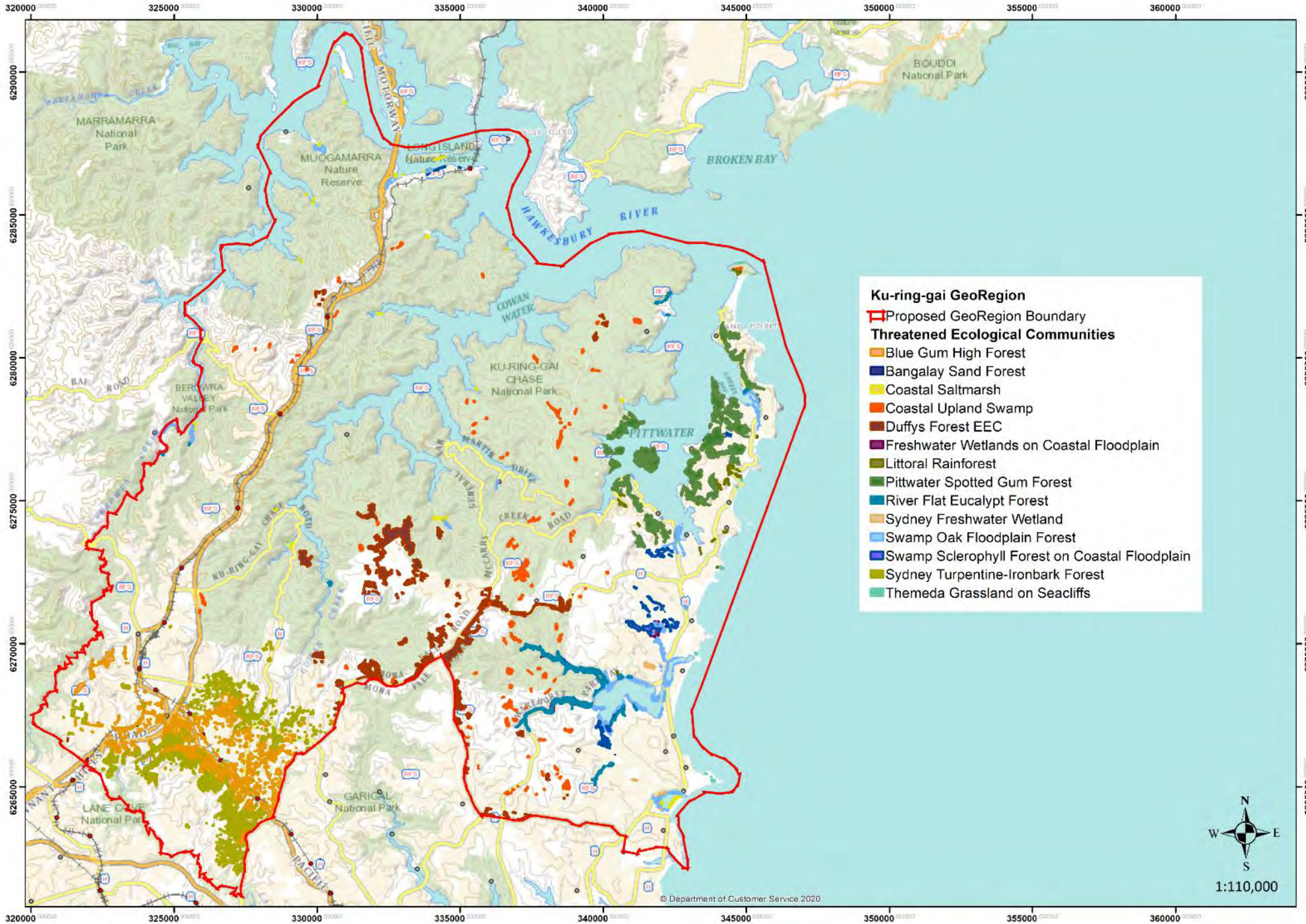
Ku-ring-gai GeoRegion
Proposed GeoRegion Boundary
Threatened Ecological Communities
Blue Gum High Forest
Bangalay Sand Forest
Coastal Saltmarsh
Coastal Upland Swamp
Duffys Forest EEC
Freshwater Wetlands on Coastal Floodplain
Littoral Rainforest
Pittwater Spotted Gum Forest
River Flat Eucalypt Forest
Sydney Freshwater Wetland
Swamp Oak Floodplain Forest
Swamp Sclerophyll Forest on Coastal Floodplain
Sydney Turpentine-Ironbark Forest
Themeda Grassland on Seacliffs
MARRAMARRA National Park
MUOGAMARRA Nature Reserve
LONG ISLAND Nature Reserve
BOUDDI National Park
BROKEN BAY
HAWKESBURY RIVER
COWAN WATER
KU-RING-GAI CHASE National Park
BEROWRA VALLEY National Park
PITTWATER
GARIGAL National Park
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Threatened Ecological Communities

Blue Gum High Forest, Thornleigh

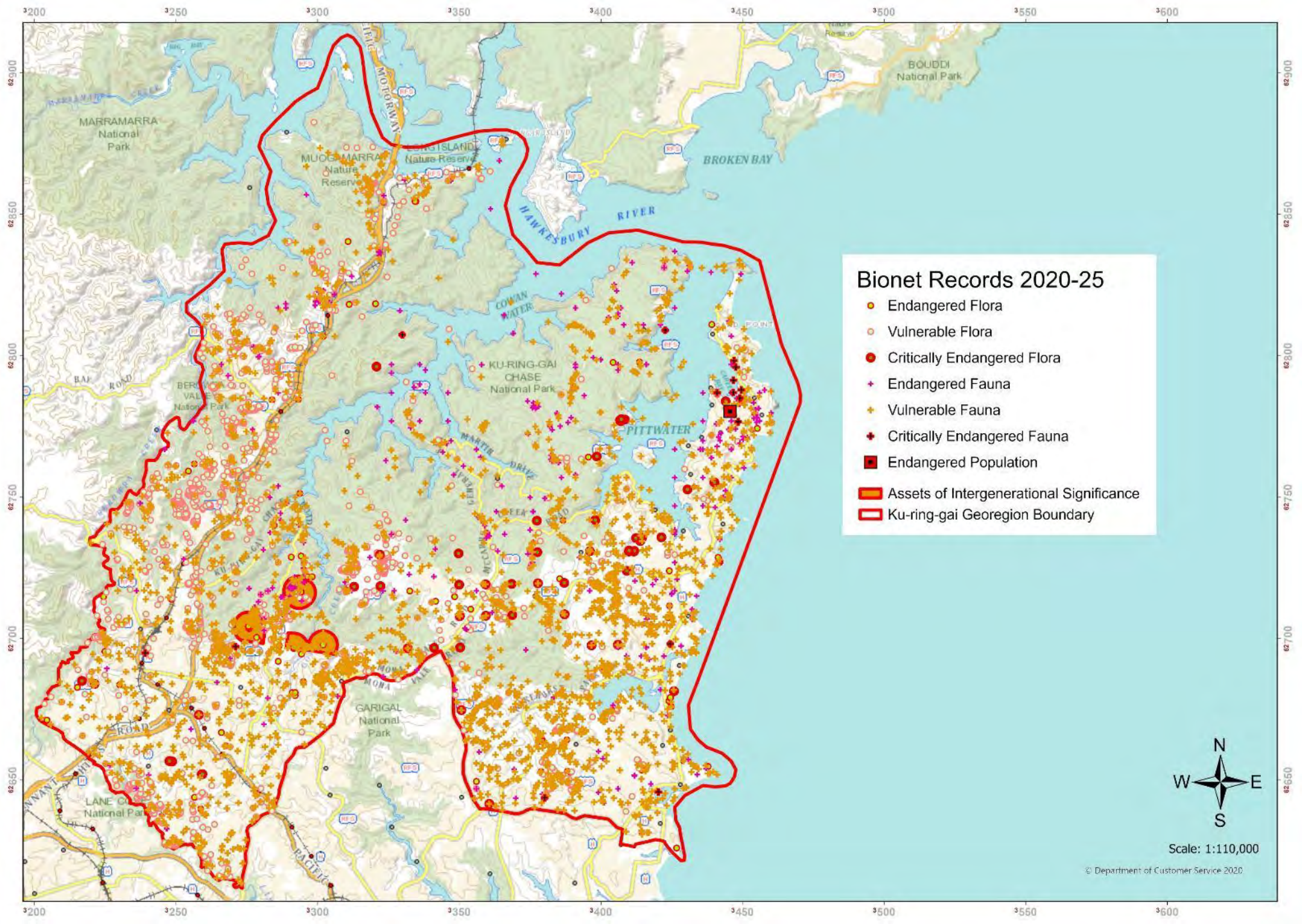
Duffys Forest EEC, Belrose

Coastal Upland Swamps, Salvation Creek

Coastal Freshwater Wetlands, Warriewood

Volcanic dyke vegetation, West Head

Coastal Upland Swamps, Salvation Creek


Bionet Records 2020-25
Endangered Flora
Vulnerable Flora
Critically Endangered Flora
Endangered Fauna
Vulnerable Fauna
Critically Endangered Fauna
Endangered Population
Assets of Intergenerational Significance
Ku-ring-gai Georegion Boundary
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MARRAMARRA National Park
MUOGAMARRA Nature Reserve
LONG ISLAND Nature Reserve
BROKEN BAY
BOUDDI National Park
HAWKESBURY RIVER
COWAN WATER
KU-RING-GAI CHASE National Park
PITTWATER
GARIGAL National Park
MONA VALE ROAD
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Threatened Plant Species

Darwinia biflora

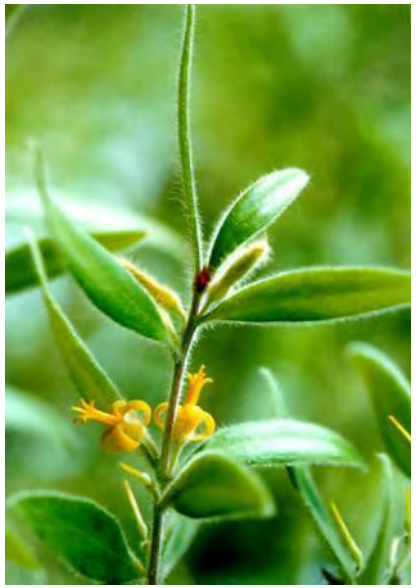
Tetratheca glandulosa

Grevillea caleyi

Micromyrtus blakelyi

Eucalyptus camfieldii

Halogodendron lucasii



Persoonia mollis ssp maxima

Threatened Animal Species

Rockwarbler - not threatened but endemic to Sydney Basin sandstone

Eastern Pygmy Possum

Powerful Owl

Red-Crowned Toadlet

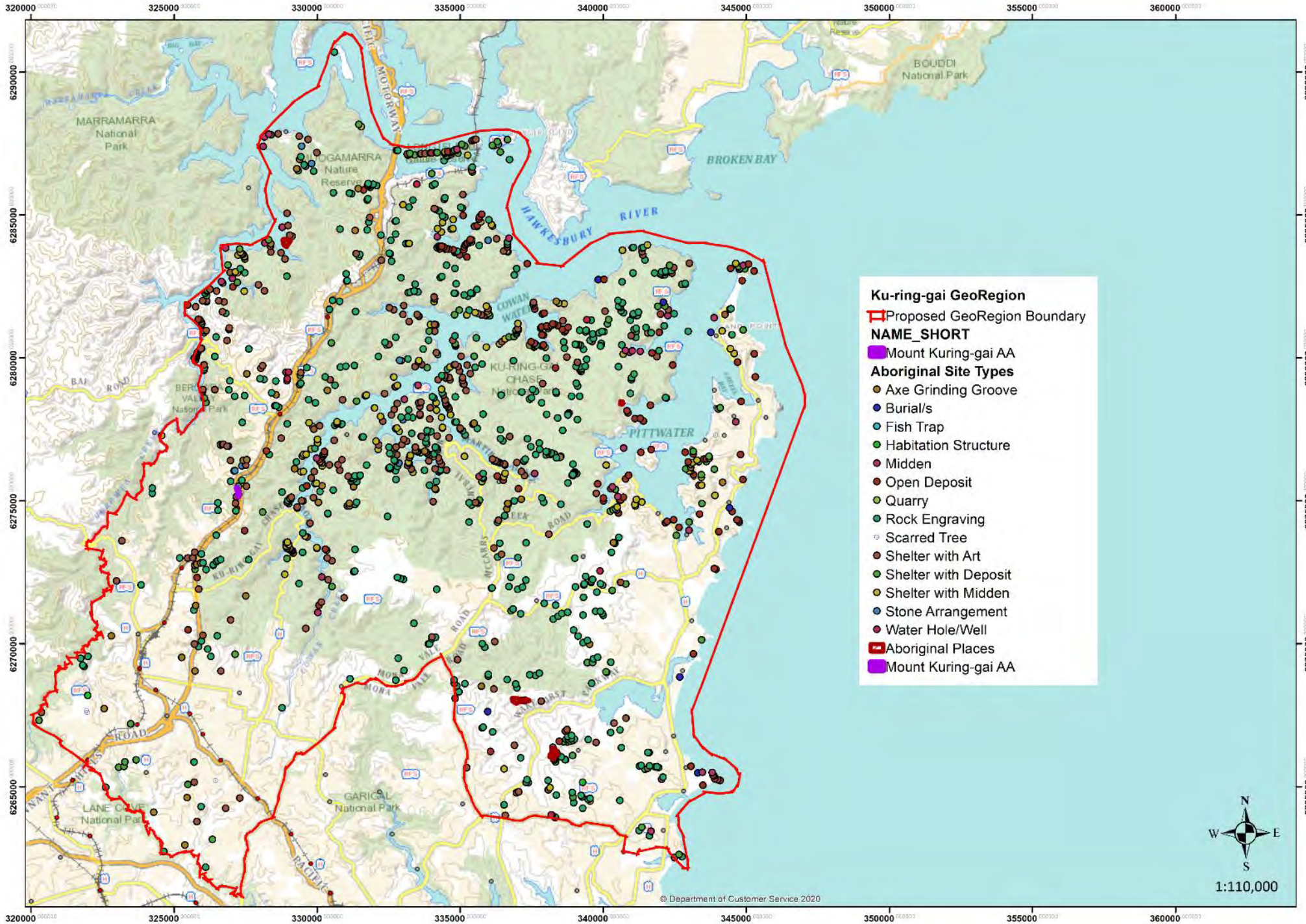
Grey Headed Flying Fox

Giant Dragonfly

Southern Brown Bandicoot

Aboriginal Country

Ku-ring-gai Georegion	Number of Types		No in Protected Areas		Elevation mASL		Slope Degrees		Distance To Freshwater		Distance To an Estuary/Coast	
Site Types	No.	% of Total	No.	% of Total	Average	SD	Average	SD	Average	SD	Average	SD
Rock Engraving	647	38.8%	434	67.1%	120	57	8	6	229	176	815	640
Shelter with Art	389	23.3%	300	77.1%	61	59	16	8	231	215	376	599
Shelter with Midden	166	10.0%	133	80.1%	33	29	16	7	252	258	103	229
Open Deposit	145	8.7%	79	54.5%	27	43	13	7	338	351	126	316
Axe Grinding Groove	111	6.7%	66	59.5%	121	56	9	6	155	165	902	623
Shelter with Deposit	97	5.8%	45	46.4%	57	56	12	7	379	381	513	864
Midden	63	3.8%	37	58.7%	24	36	13	7	376	391	119	297
Stone Arrangement	16	1.0%	11	68.8%	142	24	8	5	137	75	734	489
Burial	11	0.7%	4	36.4%	22	35	11	11	540	456	166	386
Water Hole/Well	8	0.5%	4	50.0%	102	59	8	5	160	181	971	725
Habitation Structure	6	0.4%	3	50.0%	111	46	13	4	630	826	1023	697
Scarred Tree	5	0.3%	0	0.0%	149	41	8	4	286	102	1541	781
Quarry	2	0.1%	1	50.0%	138	33	5	2	399	18	433	145
Fish Trap	1	0.1%	1	100.0%	15	0	5	0	31	0	22	0
Total of Site Types	**1667**	**100.0%**	**1118**	**67.1%**	**82**	**65**	**12**	**8**	**253**	**254**	**541**	**656**


Ku-ring-gai GeoRegion
Proposed GeoRegion Boundary
NAME_SHORT
Mount Kuring-gai AA
Aboriginal Site Types
Axe Grinding Groove
Burial/s
Fish Trap
Habitation Structure
Midden
Open Deposit
Quarry
Rock Engraving
Scarred Tree
Shelter with Art
Shelter with Deposit
Shelter with Midden
Stone Arrangement
Water Hole/Well
Aboriginal Places
Mount Kuring-gai AA
MARRAMARRA National Park
BOUDDI National Park
BROKEN BAY
HAWKESBURY RIVER
PITTWATER
GARIGAL National Park
LANE COVE National Park
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Aboriginal Country – Shelters with Art

Near the Duckholes, McCarrs Creek in Ku-ring-gai Chase NP

Shelter near West Head Beach

East Apple Tree Bay, Ku-ring-gai Chase NP

Smiths Creek KCNP

Shelter near Hallet's Beach

Aboriginal Country – Engravings

Vertical engravings of Snapper and Wallaby, Cowan Creek

Engraving site Emus and Wallabies, Ingleside

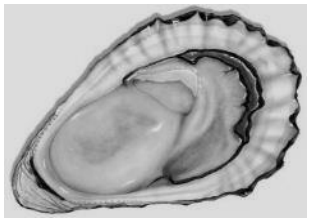
Engraving of a whale, Waratah Trail, KCNP

Daramulan holding a boomerang, near Topham Trig, KCNP

Aboriginal Country - Middens

Duffys Wharf, KCNP

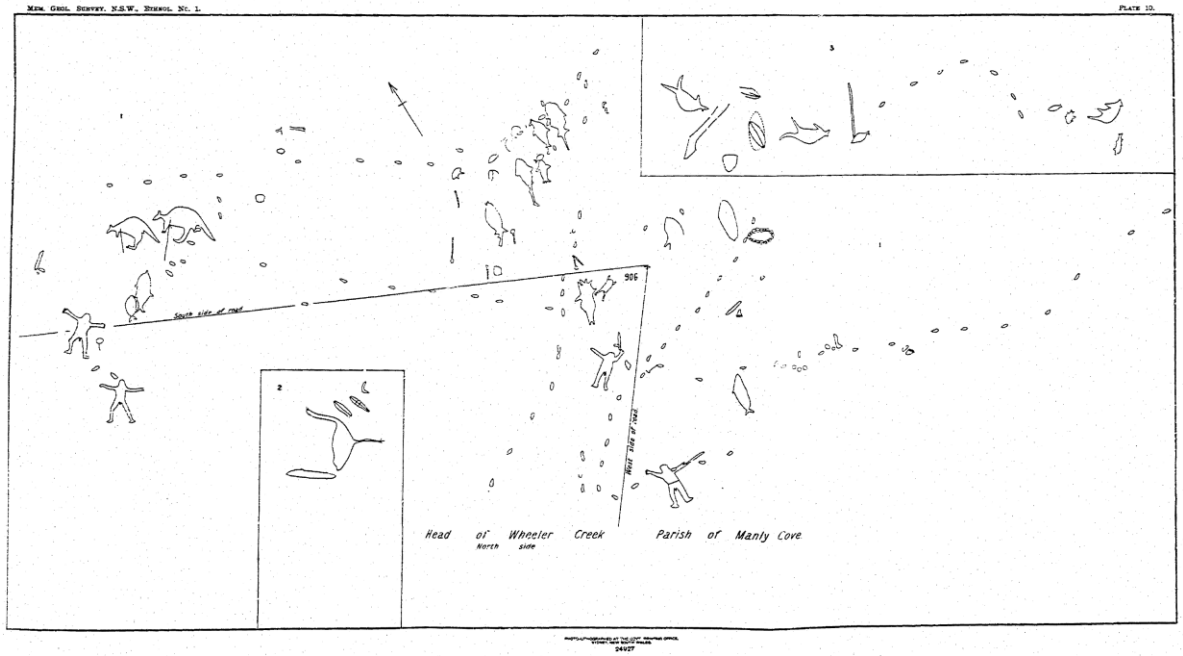
The Basin Lagoon, KCNP



Aboriginal Country – Aboriginal Places

http://www.pittwateronlinenews.com/Moon-Rock-Declared-An-Aboriginal-Place.php

http://www.pittwateronlinenews.com/Moon-Rock-Declared-An-Aboriginal-Place.php



From: Campbell, W.D. (1899). Aboriginal Carvings of Port Jackson and Broken Bay. Ethnological Series No. 1. Plate X. Memoirs of the Geological Society of NSW. Department of Mines and Agriculture.

Aboriginal Country – Mt Ku-ring-gai AA

From: McCarthy, F.D. (1959). Records of the Rock Engravings of the Sydney-Hawkesbury District. Part 2. Some Important Ritual Groups in the County of Cumberland. Records of the Australian Museum. Vol. XXIV, No. 14.

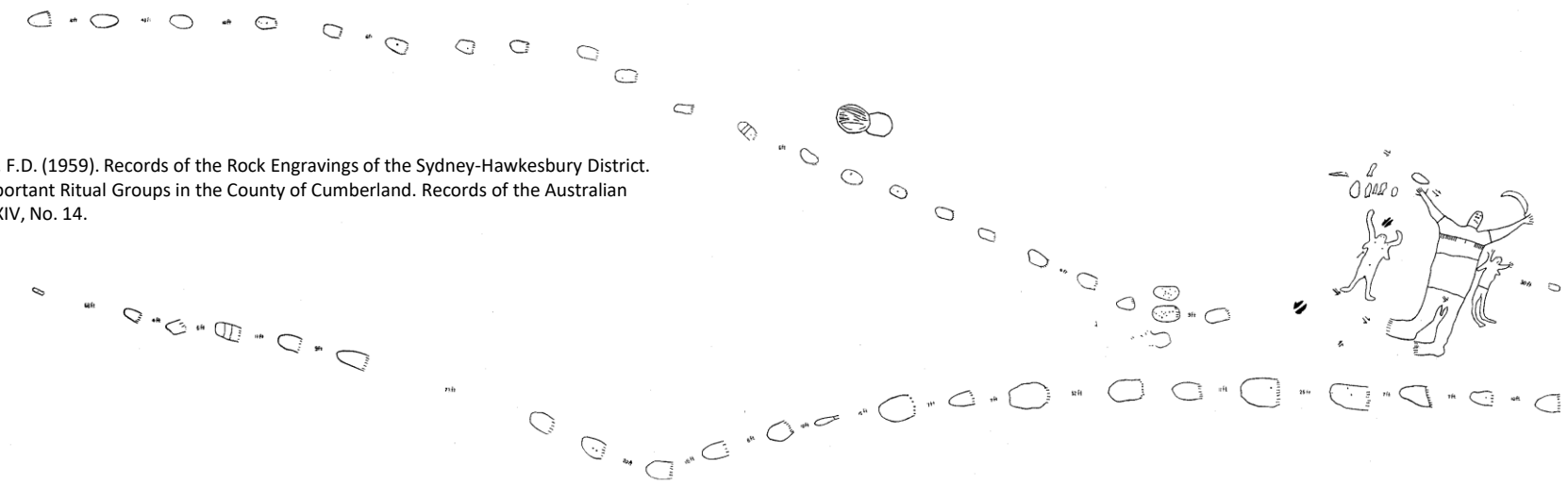
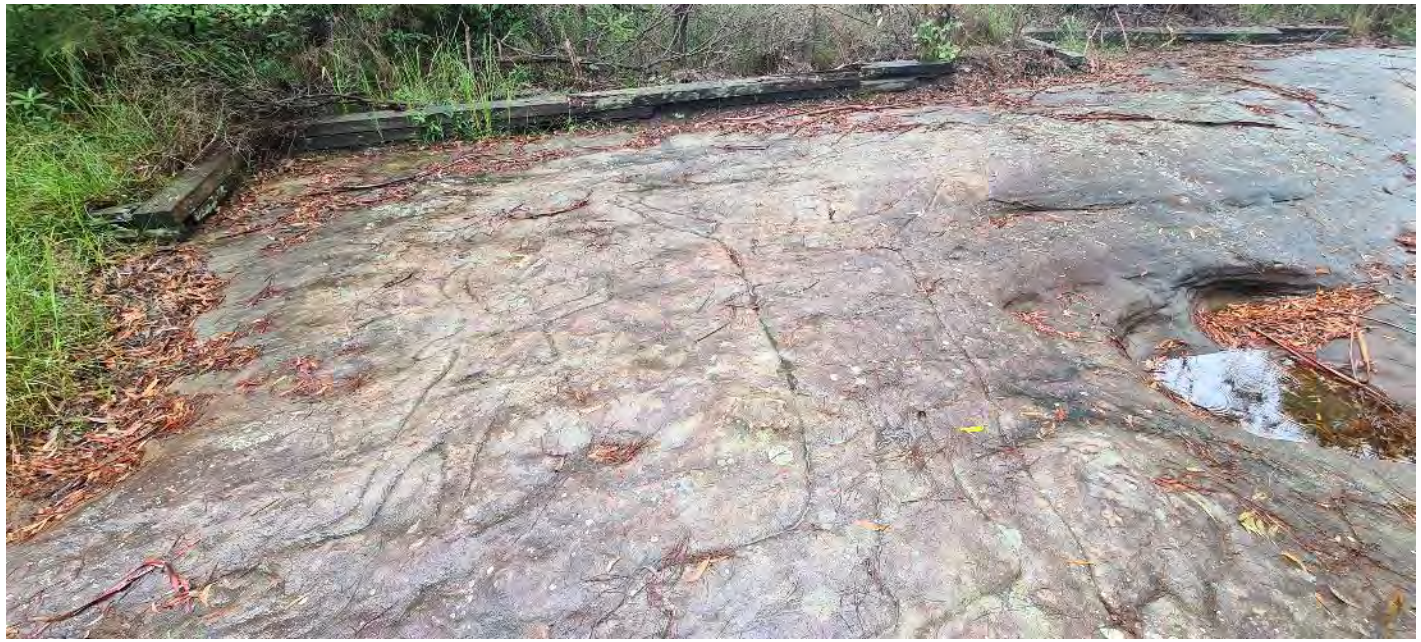


Fig. 1.—Group 1: Mt. Kuring-gai. In situ the footprints at the lower right hand corner join on to the series shown at the top left hand side of the diagram.

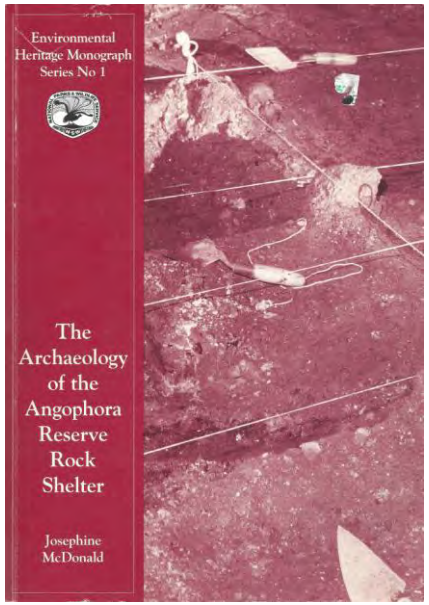


Aboriginal Country - Other Site Types

Grinding grooves in runnels, West Head

Possible scarred turpentine, West Head

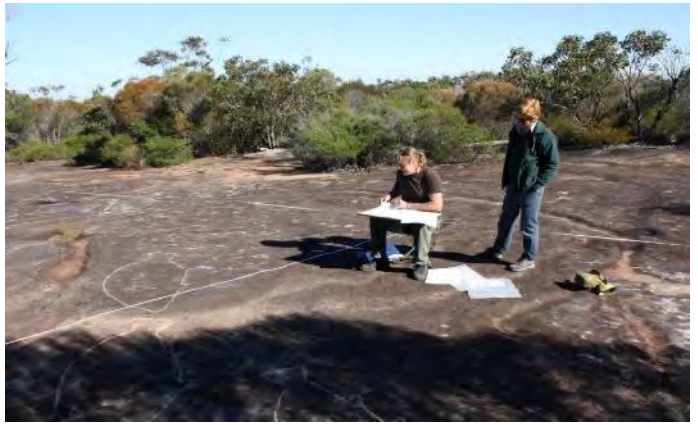
Stone arrangement and engraving of a penguin, Mackerel Trail



Angophora Reserve Occupation Shelter, Avalon

Aboriginal Country – Connections (not just about the sites)

- Caring and working for Country e.g. education, interpretation, story-telling;
- Cultural identification, pride in heritage, elder-youth intervention programs;
- Appointment and training of Aboriginal caretakers;
- Supervised and culturally appropriate highlighting; and
- Cultural fire practices.



Photos courtesy from Eric Keidge, NPWS

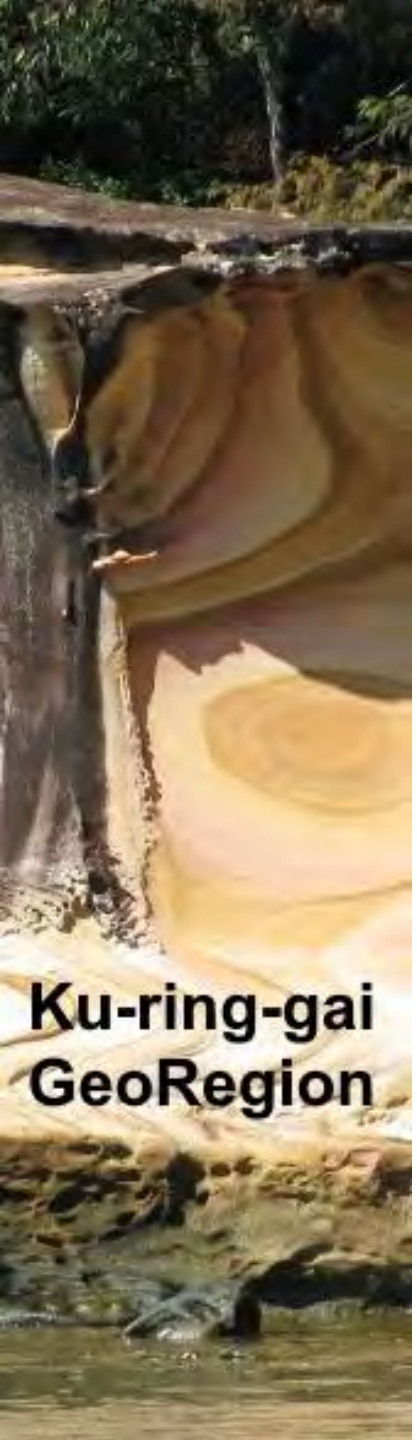
The Proposed Plan

Stage One:

Identify and establish geosites and geotrails (the latter enhancing existing user experiences) with the support of the NSW National Parks and Wildlife Service, Local Government Agencies, and local tourism organisations.

Stage Two:

With State & LGA endorsement, seek Australian Government support for a nomination to UNESCO to register an agreed ('Ku-ring-gai') area as an Aspiring Global Geopark as soon as possible.

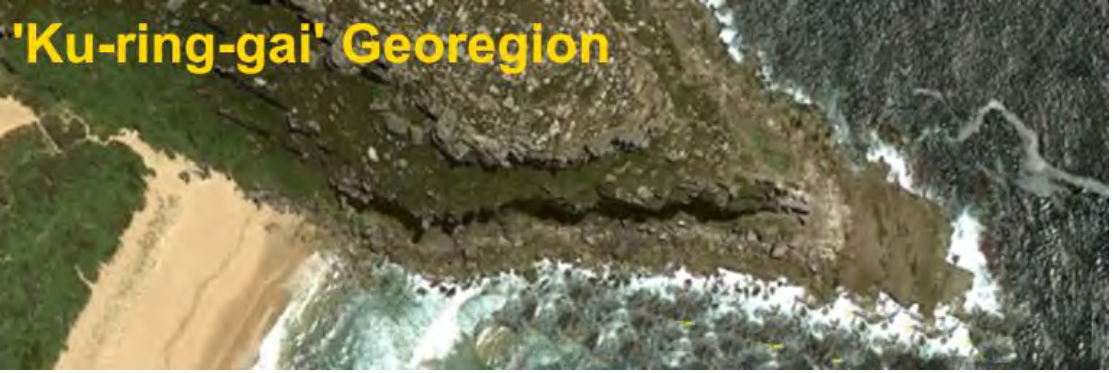


Our approach to the Ku-ring-gai GeoRegion

- Supporting the AGC preferred approach to GeoRegion and Geopark development.
- Emphasise the concept of identifying GeoRegions, not Geoparks, in key areas of outstanding geoheritage, with early consultation with State Geological Surveys to address their requirements.
- Initially focus on developing geotrails within the GeoRegions to build community, business, State/Territory Government support.

Benefits of developing a GeoRegion for geotourism

- By celebrating the geological heritage of an identified GeoRegion, and in connection with all other aspects of the area's natural and cultural heritage (and most significantly, Aboriginal heritage), geotourism enhances awareness and understanding of key issues facing society.
- Geotourism gives local people a sense of pride and strengthens their identification with a GeoRegion.



Geotourism: Place based and Holistic

Comprises the following features of both natural and cultural heritage:

- Abiotic - non-living aspects such as climate and geology e.g. landscapes and landforms: GEODIVERSITY
- Biotics - the living parts e.g. fauna(animals) and flora(plants): BIODIVERSITY
- Cultural - past & present,non-living and built: HUMAN DIVERSITY

Progress to date: 'Defacto **Geopark**'

- Four Key Geotrails detailed: Sheldon Forest, Browns Field in Ku-ring-gai and Long Reef in the Northern Beaches & West Head within KCNP.
- GeoRegion website now available with maps and information to support the geotrails, geosites and aboriginal sites.
- Website allows information for teachers and school groups, with a number of videos and other resources.
- Currently developing plans for range of guided walks and talks over the next 12 months and enhanced education-related projects.
- Continuing prospects of financial support from community and geological groups.

An extensive area north of Sydney that showcases the geological evolution of the area that forms a major part of the Greater Sydney Basin.

Extensive deep valleys drowned by sea level rise

Jurassic diatremes that roared and bored to the surface

Sandstone plateaus with rich flora and abundant Aboriginal engravings

Beautiful but endangered forests, heaths and swamplands

Triassic coast world-class sedimentary geology

Igneous dykes that cleave the landscape

For millions of years the area has recorded the changes in climate and geomorphology that brought volcanoes to life in the Jurassic Period, and which saw sea level vary through 125 m in the Pleistocene Period. The ancient landscape supports diverse vegetation communities ranging from rainforest, to woodlands, shrublands, upland and mangrove swamps and seagrass meadows.

Coastal cliffs reveal a sequence of Triassic Period sediments deposited on the former Gondwana Supercontinent and the modern shoreline exhibits diverse marine life forms. Heritage sites such as rock engravings that bound our First Peoples to this land are widespread.

LEARN MORE

Next Steps

- Work with NPWS, Hornsby, Ku-ring-gai and Northern Beaches Councils on additional ‘Ku-ring-gai’ geosites and geotrails.
- Continue to seek tourism development grant funding or sponsorship to develop signage, information, and visitor facilities.
- Work with major stakeholders (governments, First Nations Peoples etc) to gain support for a proposed Geopark nomination within the ‘Ku-ring-gai’ GeoRegion.

Australia's UNESCO Sites

Program	Sites
World Heritage	22
Man and the Biosphere	5
UNESCO Global Geoparks	0

There are currently 213 Global UNESCO Global Geoparks in 48 countries, of which 47 are located in China, and one in NZ.

Requirements for a UNESCO Global Geopark

- Must contain geosites of national and international significance.
- Must have been functioning as a ‘defacto’ Geopark for at least one year with geotrails, signage, promotional material, and management.
- Must have received awards or formal recognition in geodiversity, conservation or sustainable geotourism.
- Should involve strong community support, particularly First Nations Peoples.