

# Protecting, Conserving and Presenting 'Ku-ring-gai' Geoheritage

A world-class wonderland of natural and cultural heritage

---



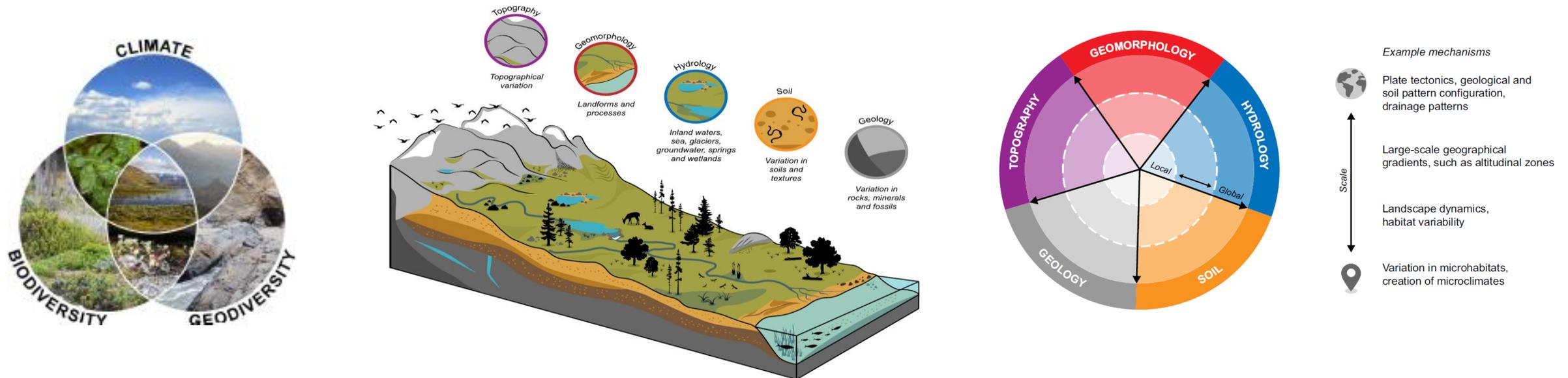
# Definitions

## Geodiversity

The natural variety of geological, geomorphological, pedological, hydrological features of a given area, from the purely static features (i.e., products such as shorelines, sandy spits, limestone pinnacles, or river canyons) at one extreme, to the assemblage of products, and at the other, their formative processes (e.g., active parabolic dunes forming under a given wind regime).

## Geoheritage

Globally, nationally, state-wide, to local features of geology, such as its igneous, metamorphic, sedimentary, stratigraphic, structural, geochemical, mineralogic, palaeontologic, geomorphic, pedologic, and hydrologic attributes, at all scales, that are intrinsically important sites, or culturally important sites, that offer information or insights into the formation or evolution of the Earth, or into the history of science, or that can be used for research, teaching, or reference.



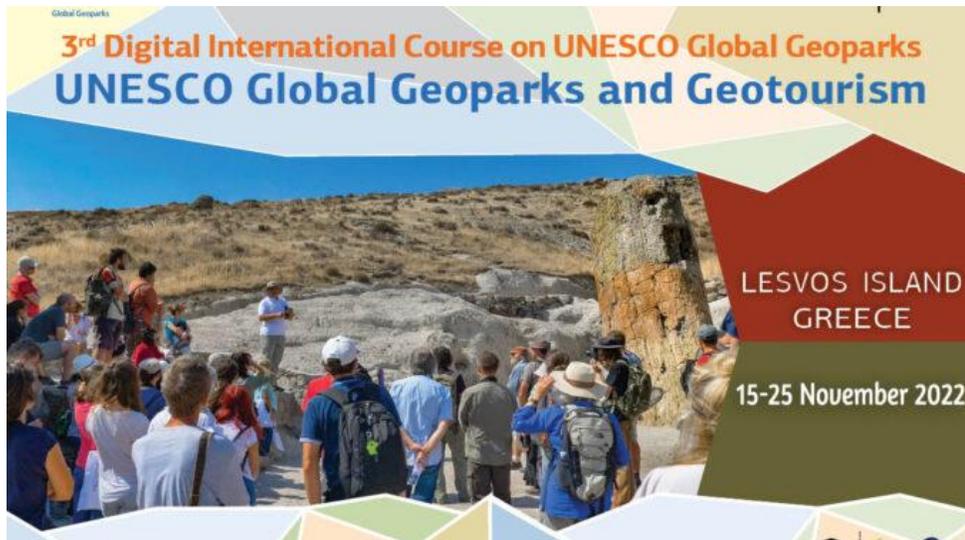
# Definitions

## Geo-tourism

In addition to its primary role in promoting tourism to geo-sites, geo-tourism raises public awareness and appreciation of geodiversity. It fosters geo-heritage conservation through appropriate sustainability measures and advances sound geological understanding through interpretation.

## Geopark / Georegion

A Geopark or Georegion is a defined geographic area with geological heritage of significance and with a coherent and strong management structure and where a sustainable economic development strategy is in place. Geoparks have three main focus areas: conservation, education and promotion of local economy through geo-tourism.



Izu Peninsula Global Geopark, Japan

# Project Initiation

## **FOKE**

Friends of Ku-ring-gai Environment is a community group dedicated to the conservation and protection of Ku-ring-gai's built and natural environment. It works on behalf of residents for the maintenance of Ku-ring-gai's built and natural heritage and the enhancement of its existing character and amenity. Originally proposing world heritage status, on learning of the UNESCO Global Geopark program, FOKE sought the establishment of a working group to investigate a nomination proposal.

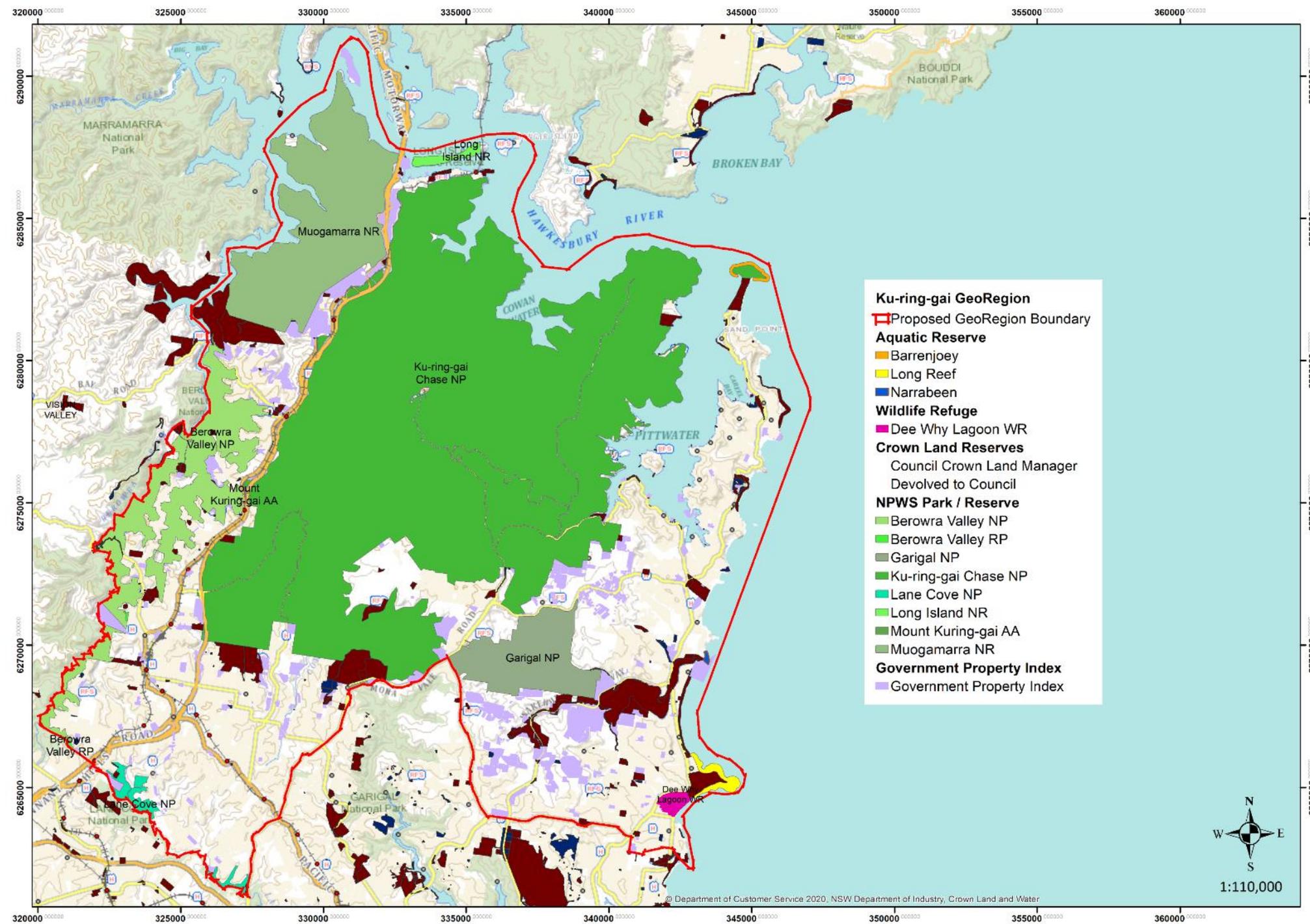
## **Working Group Establishment**

Gradually a working group has been assembled and slowly growing involving: Ursula Bonzol (Friends of Ku-ring-gai Environment and Ex General Manager/CEO), Angus M Robinson (Australian Geoscience Council), Bob Conroy (former Executive Director, NSW National Parks and Wildlife Service), Dr John Martyn (Geologist and author), Dr Peter Mitchell (Environmental scientist, former academic), Jayden Walsh (Ecologist), David Robson (Retired GSNSW Chief Geophysicist), Rob Corkery (Geological, planning and environmental consultant).



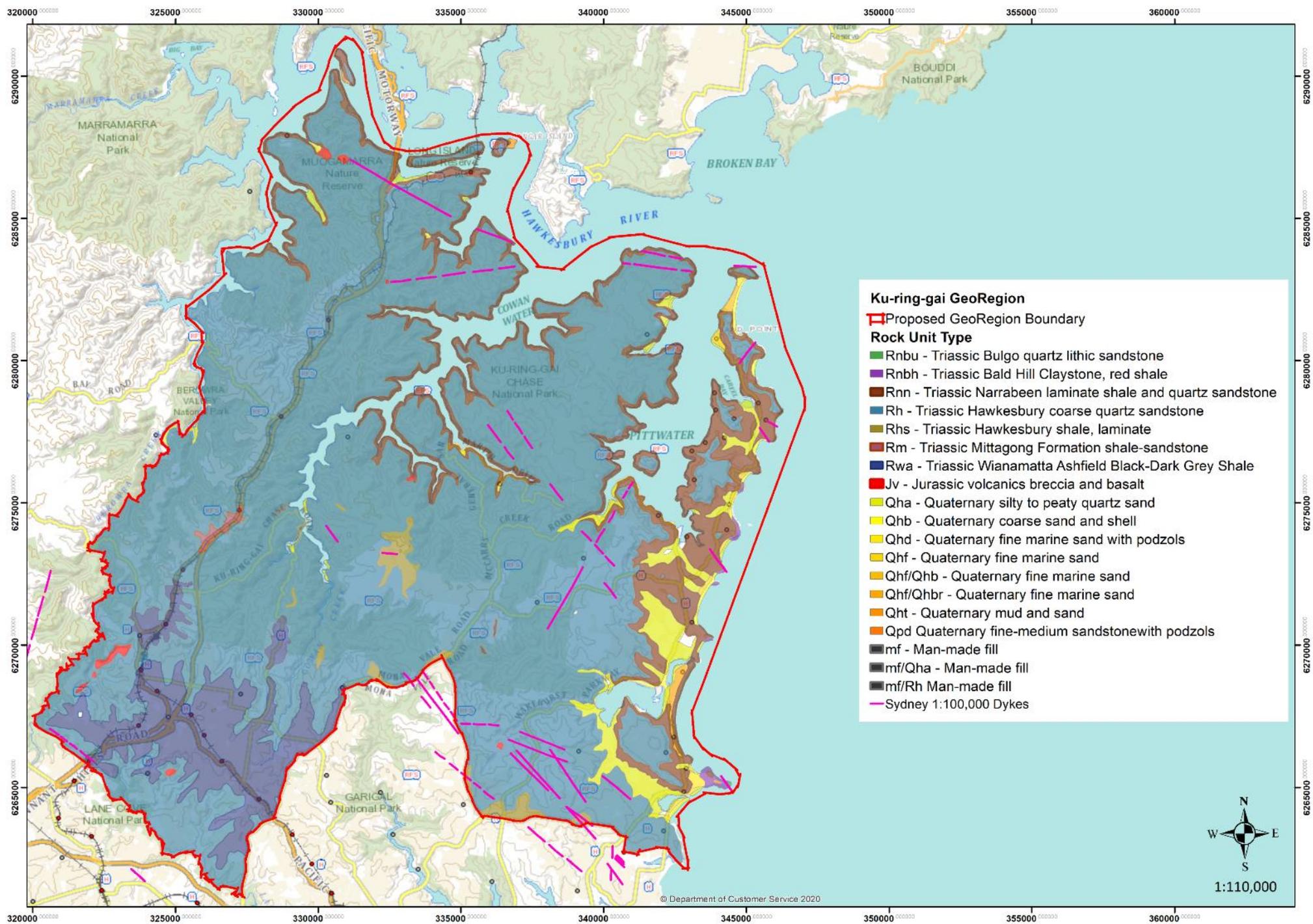
**Ku-ring-gai GeoRegion**  
[Red outline symbol] Proposed GeoRegion Boundary





- Ku-ring-gai GeoRegion**
- ▭ Proposed GeoRegion Boundary
- Aquatic Reserve**
- ▭ Barrenjoey
  - ▭ Long Reef
  - ▭ Narrabeen
- Wildlife Refuge**
- ▭ Dee Why Lagoon WR
- Crown Land Reserves**
- ▭ Council Crown Land Manager
  - ▭ Devolved to Council
- NPWS Park / Reserve**
- ▭ Berowra Valley NP
  - ▭ Berowra Valley RP
  - ▭ Garigal NP
  - ▭ Ku-ring-gai Chase NP
  - ▭ Lane Cove NP
  - ▭ Long Island NR
  - ▭ Mount Kuring-gai AA
  - ▭ Muogamarra NR
- Government Property Index**
- ▭ Government Property Index



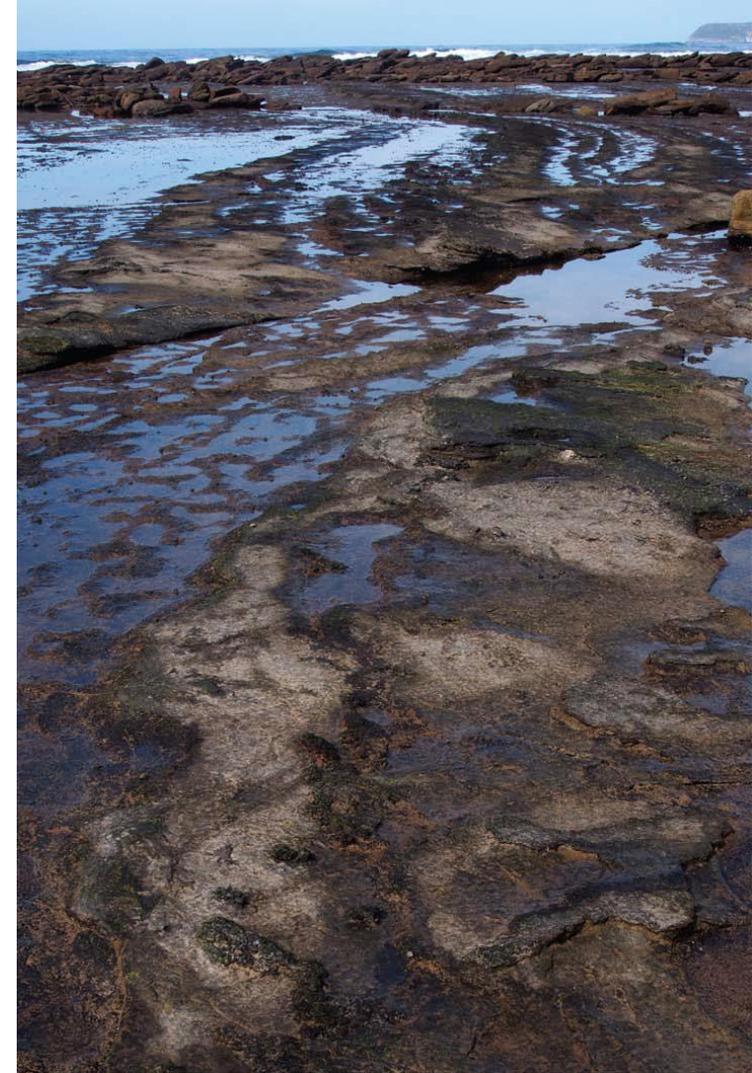
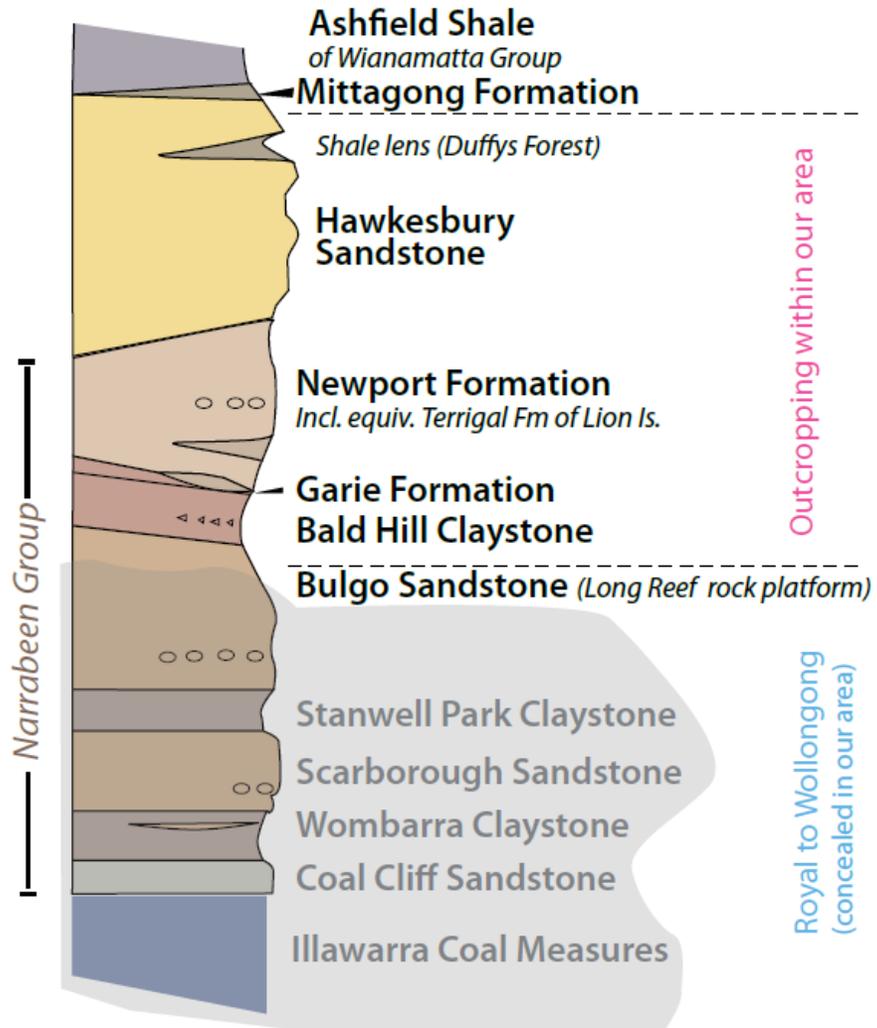


**Ku-ring-gai GeoRegion**

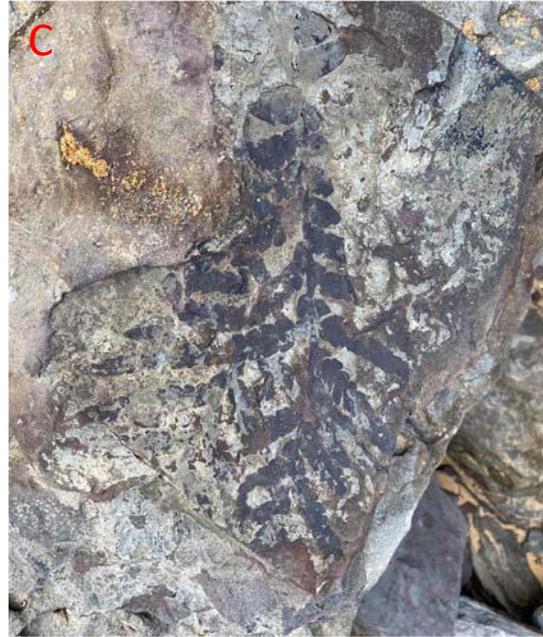
- - - Proposed GeoRegion Boundary
- Rock Unit Type**
- Rnbu - Triassic Bulgo quartz lithic sandstone
- Rnbh - Triassic Bald Hill Claystone, red shale
- Rnn - Triassic Narrabeen laminate shale and quartz sandstone
- Rh - Triassic Hawkesbury coarse quartz sandstone
- Rhs - Triassic Hawkesbury shale, laminate
- 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



# Narrabeen Series



# Narrabeen Series



# Hawkesbury Series



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

# Hawkesbury Series



# Jurassic Period



Hornsby Diatreme



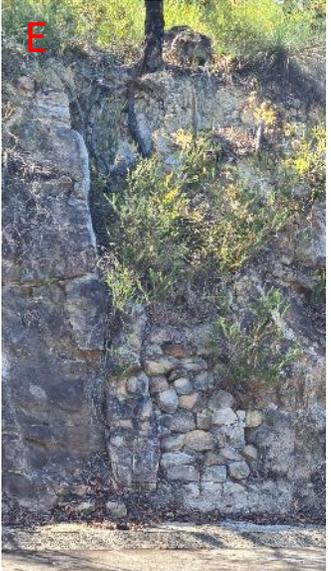
Fossilised Spirifer, a marine brachiopod



Barrenjoey Dyke, north side



Peats Crater, Cowan



West Head Road Dyke



Ingleside Dyke



Long Reef Dyke

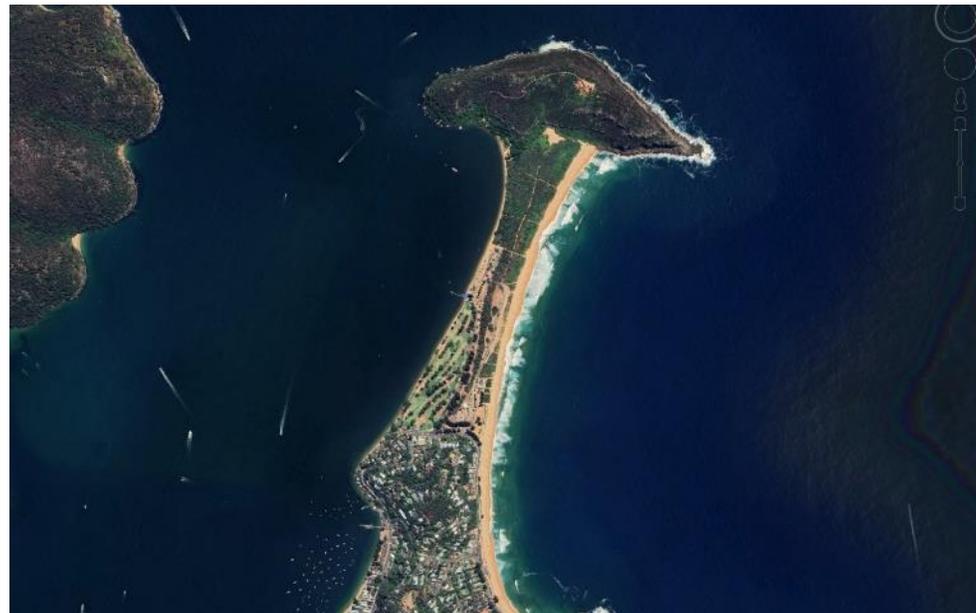
# Fluvial Geomorphology



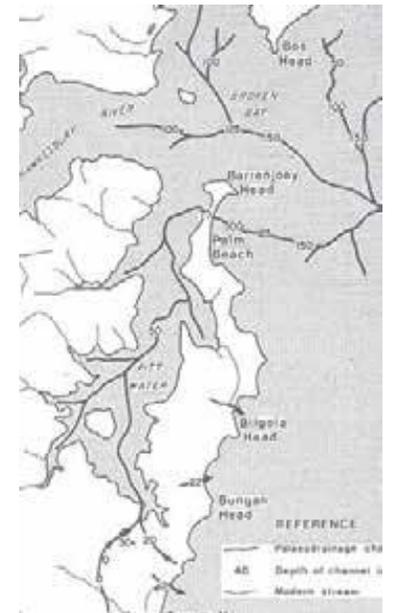
Flooded river valley of Jerusalem Bay and Broken Bay



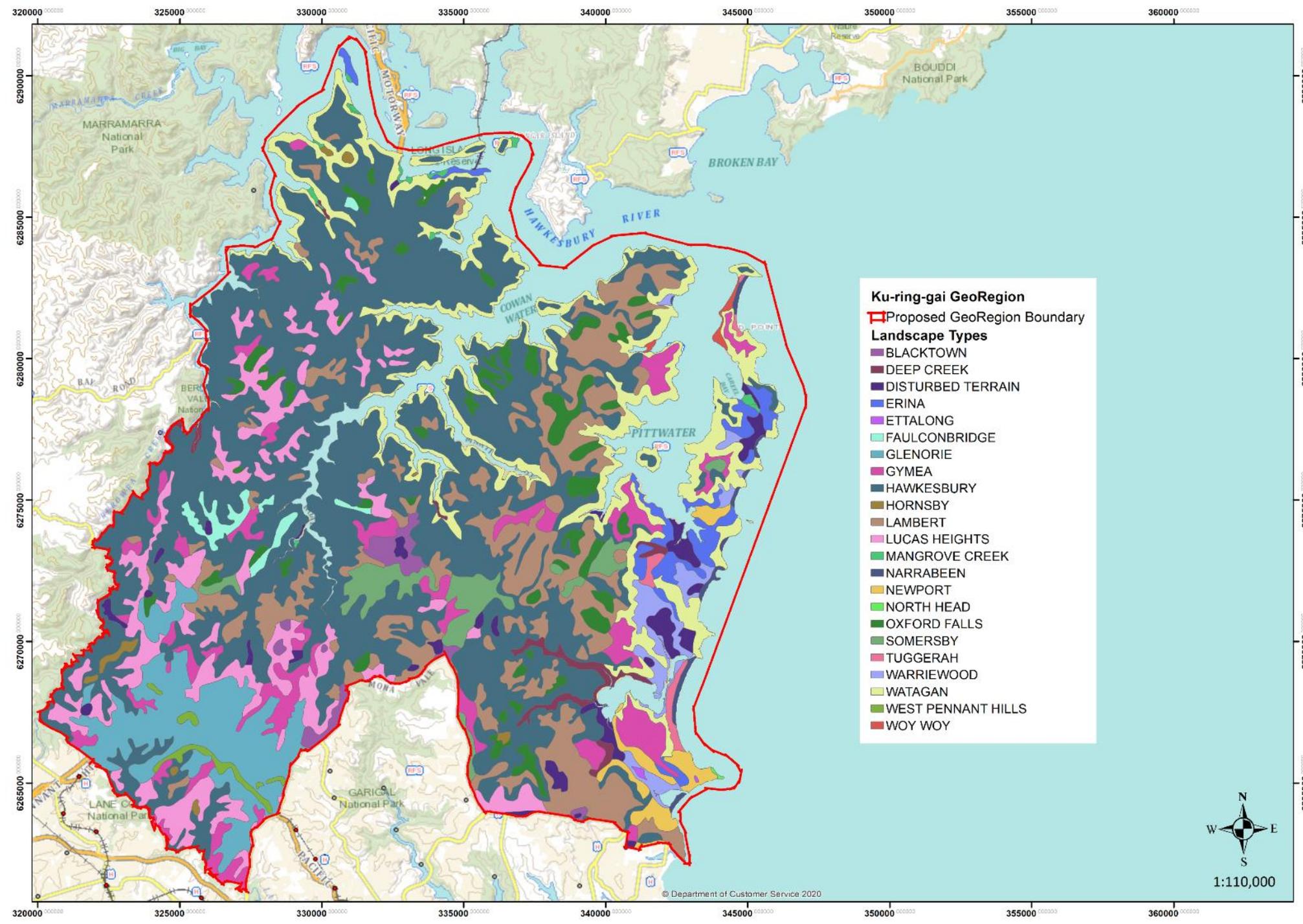
Flooded river valleys of Smiths Creek and Cowan Creek, from Mt Murray Anderson

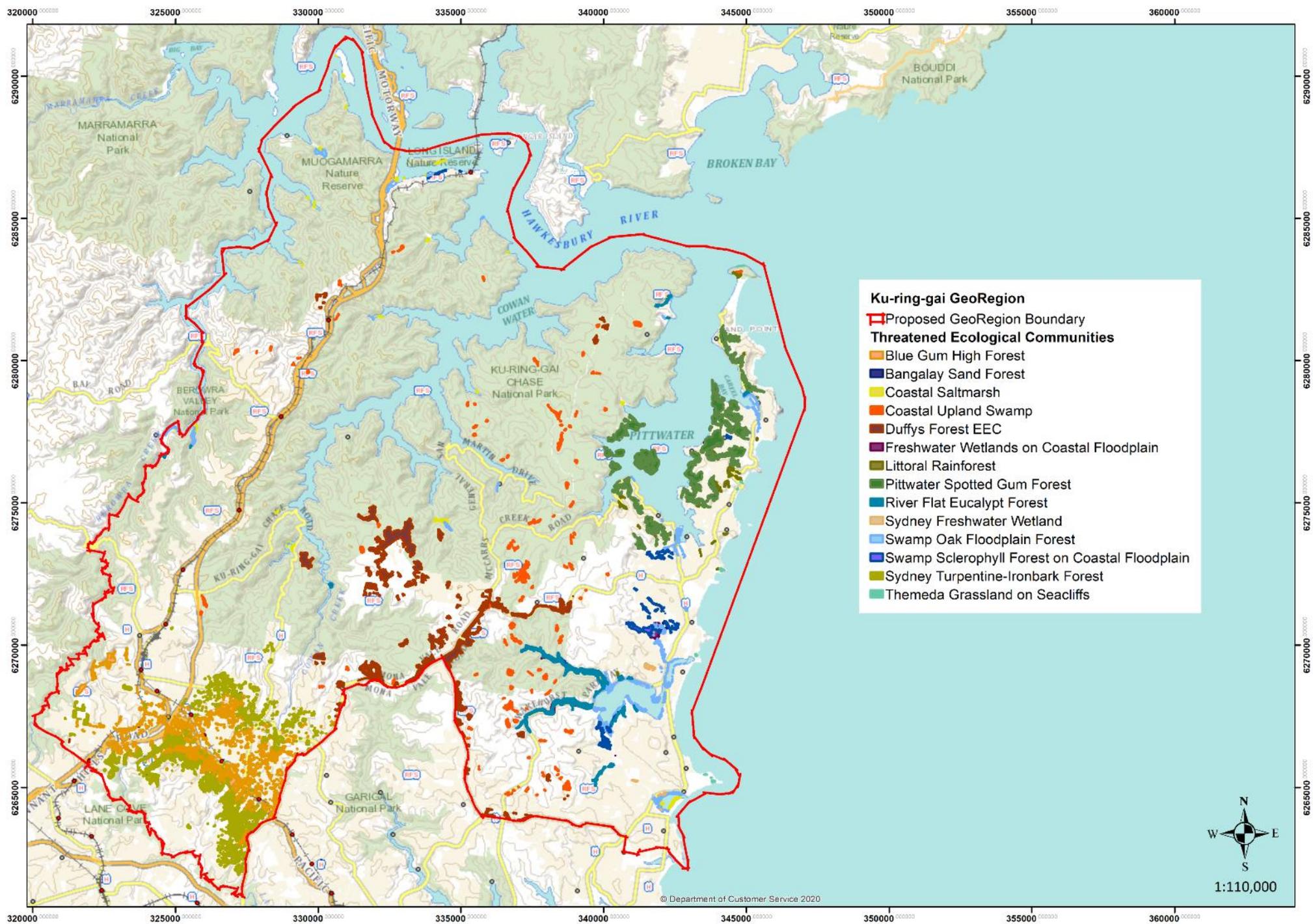


The tombolo and tied island of Palm Beach and Barrenjoey



Hawkesbury channels before sea level rise





# Threatened Ecological Communities



Blue Gum High Forest, Thornleigh



Duffys Forest EEC, Belrose



Coastal Upland Swamps, Salvation Creek



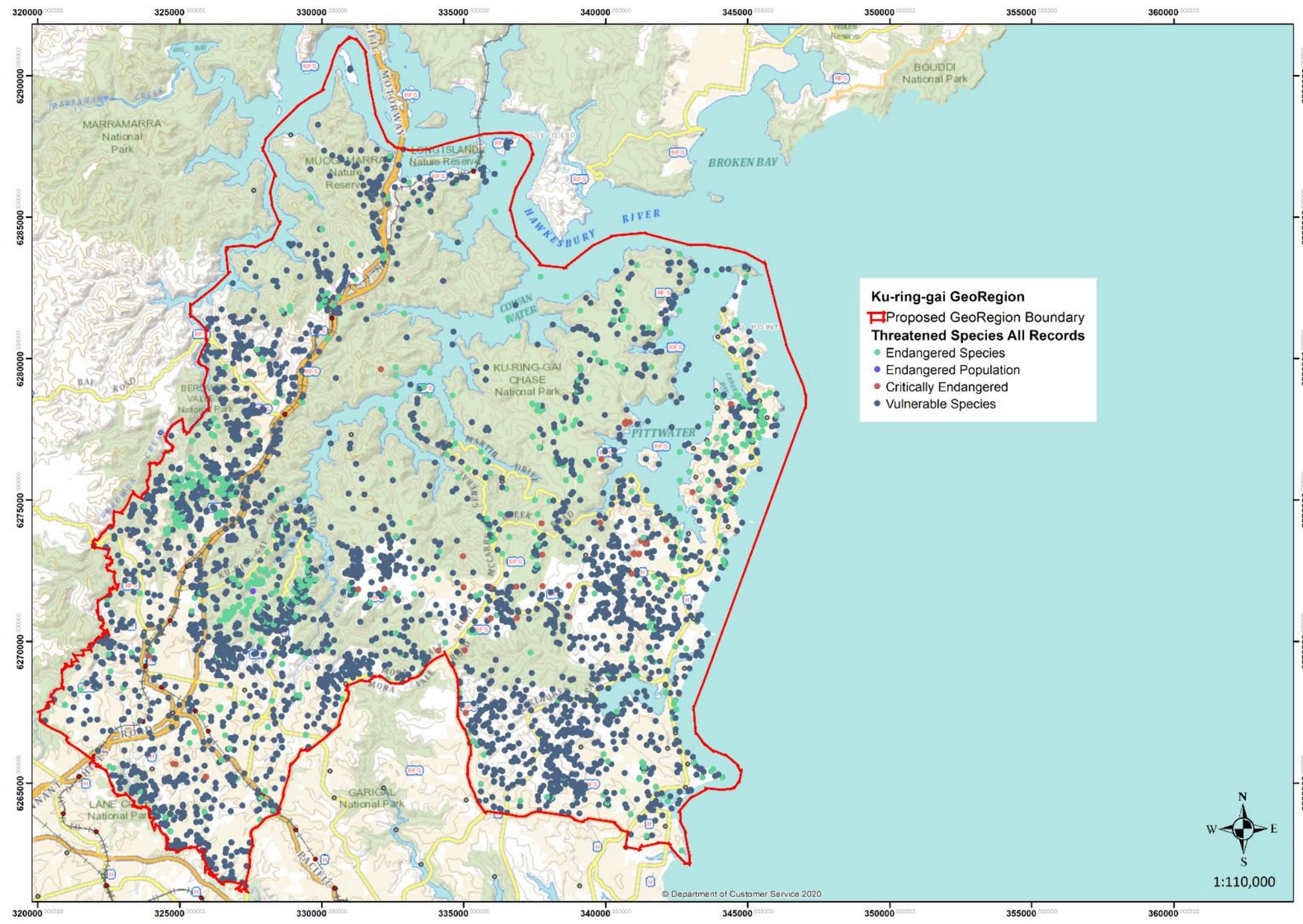
Coastal Freshwater Wetlands

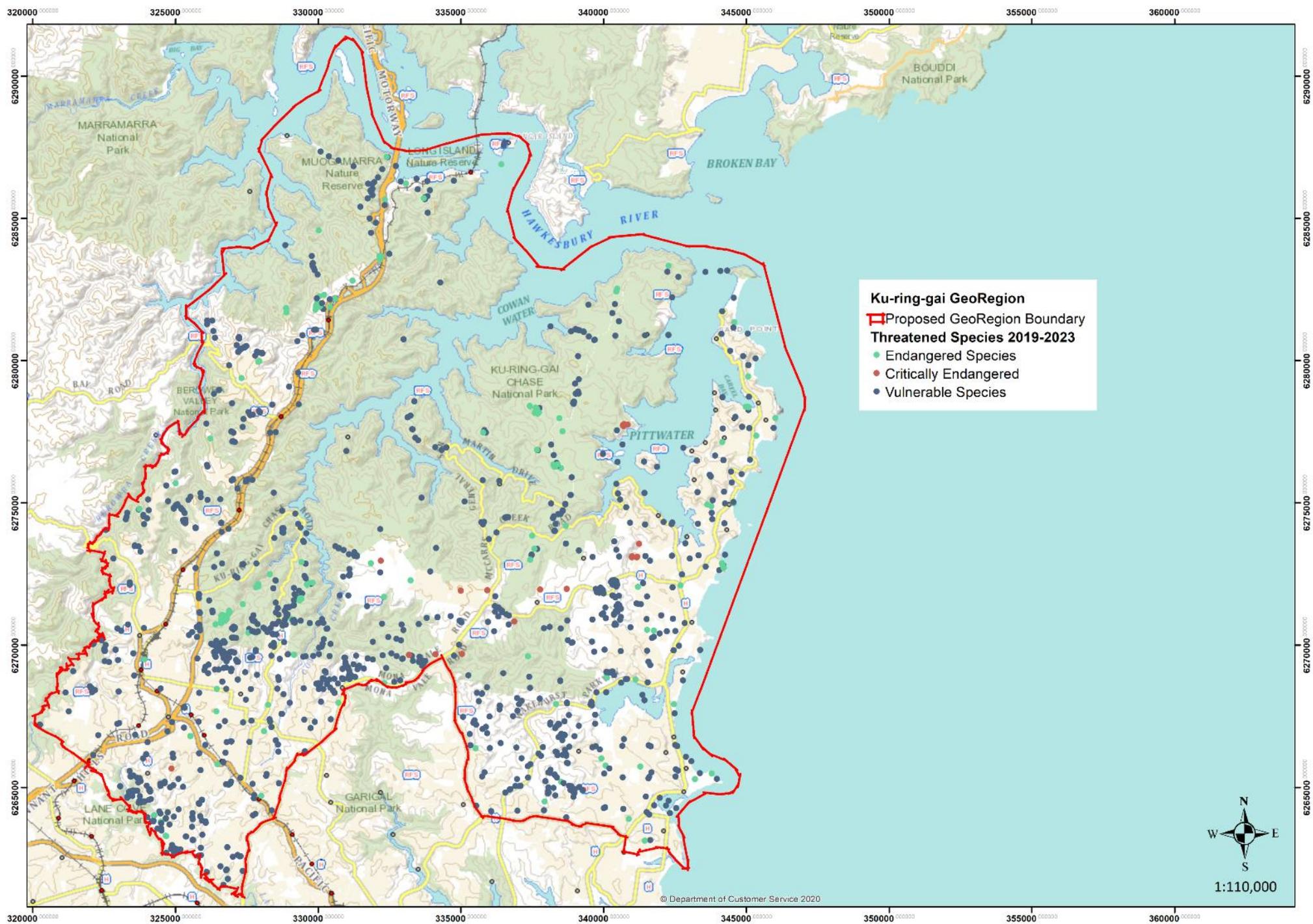


Volcanic dyke vegetation, West Head



Coastal Upland Swamps, Salvation Creek





# 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



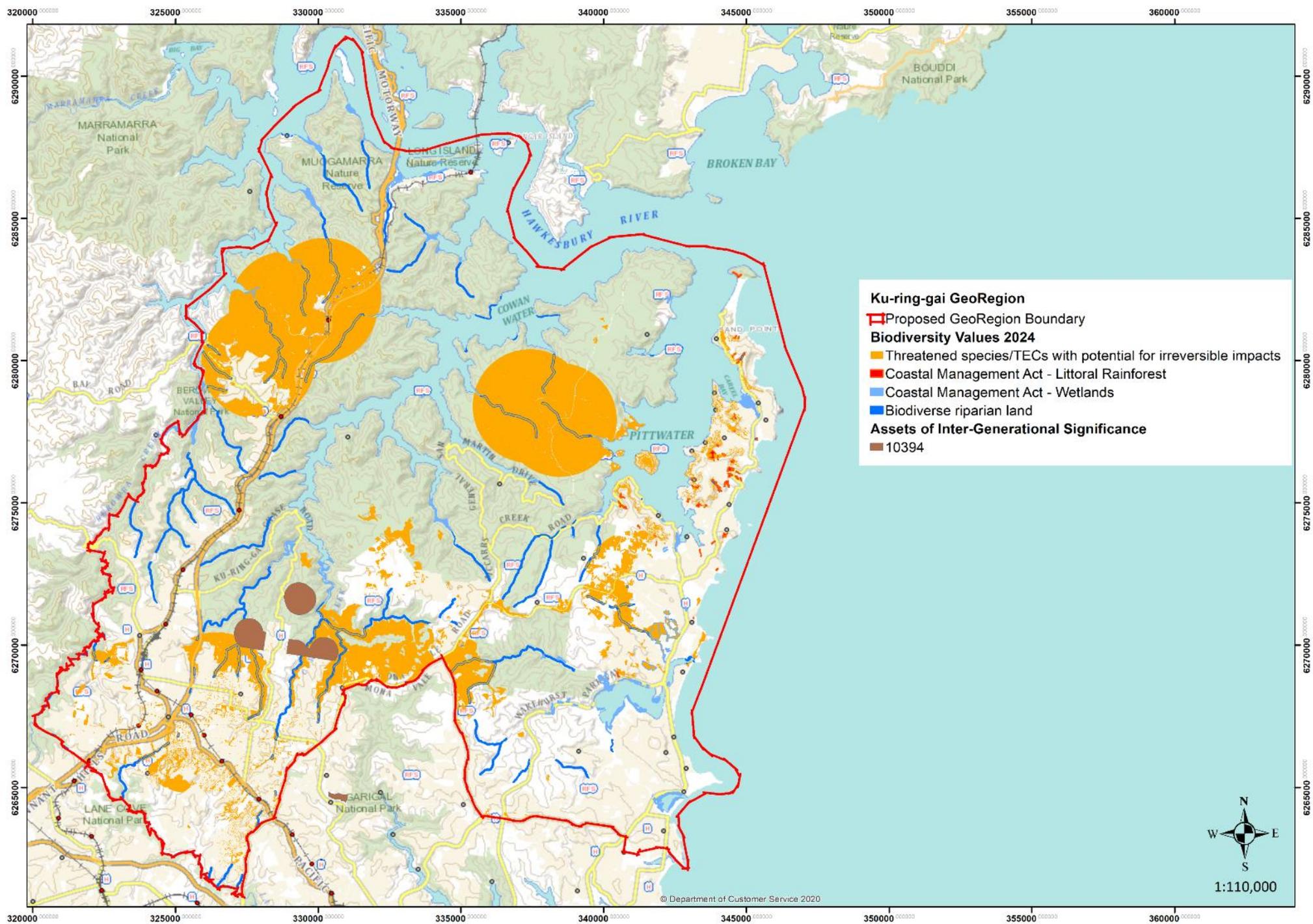
Grey Headed Flying Fox

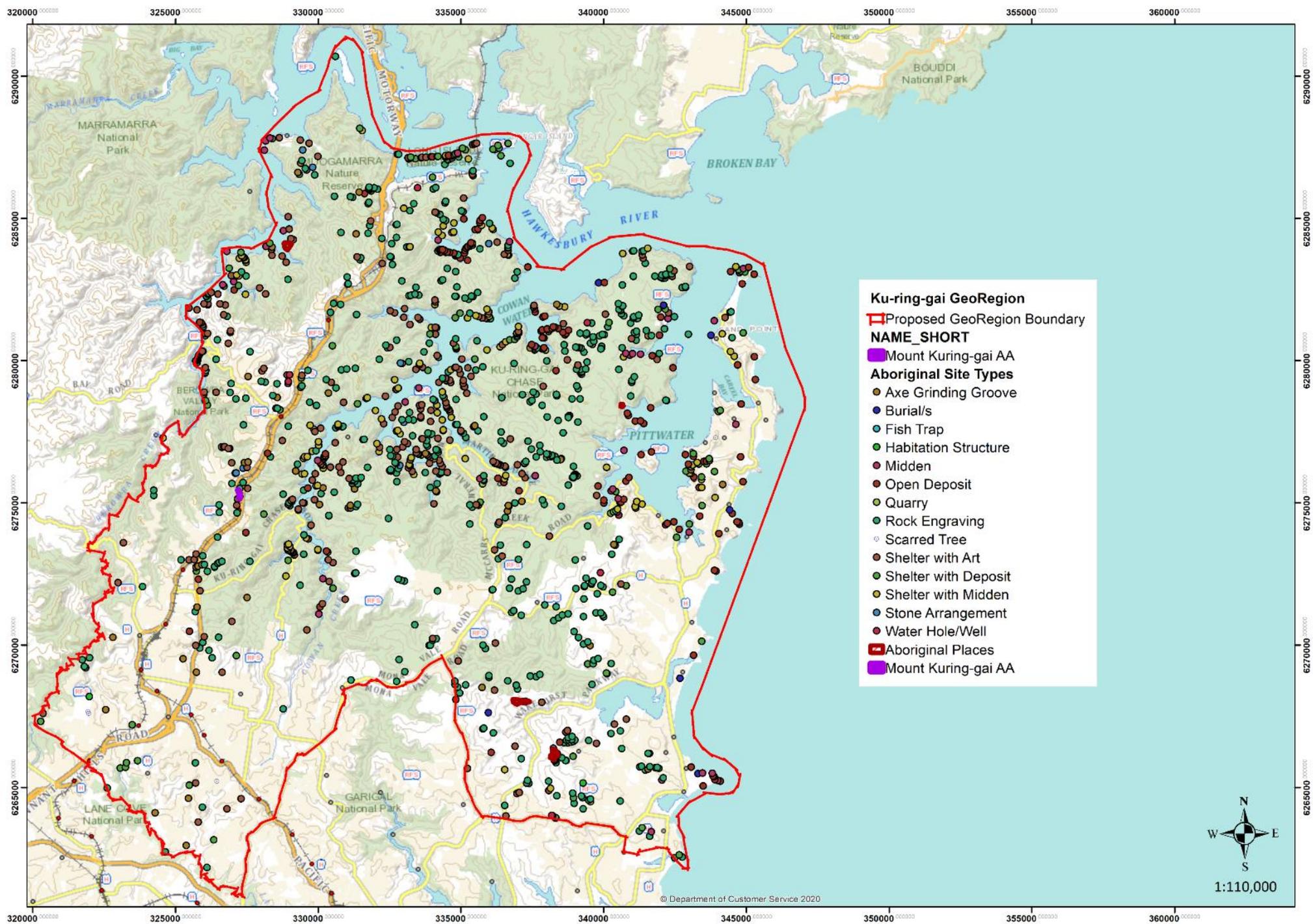


Giant Dragonfly



Southern Brown Bandicoot





# Aboriginal Connections to Country

Ku-ring-gai Georegion	Number of Types		No in Protected Areas		Elevation mASL		Slope Degrees		Distance To Freshwater		Distance To an Estuary/Coast	
	No.	% of Total	No.	% of Total	Average	SD	Average	SD	Average	SD	Average	SD
Site Types												
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
<b>Total of Site Types</b>	<b>1667</b>	<b>100.0%</b>	<b>1118</b>	<b>67.1%</b>	<b>82</b>	<b>65</b>	<b>12</b>	<b>8</b>	<b>253</b>	<b>254</b>	<b>541</b>	<b>656</b>

# 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

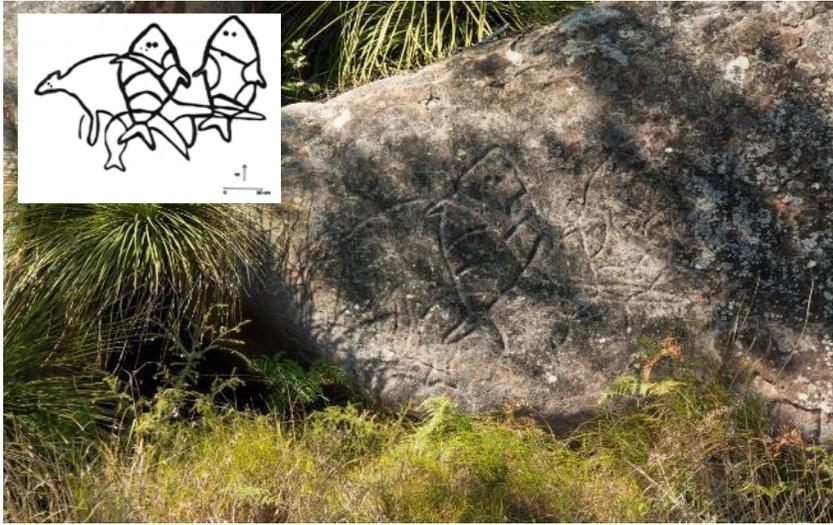


Smiths Creek KCNP



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

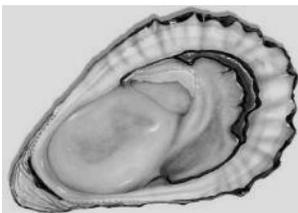
# Aboriginal Country - Middens



Duffys Wharf, KCNP



The Basin Lagoon, KCNP



# Aboriginal Country – Aboriginal Places



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

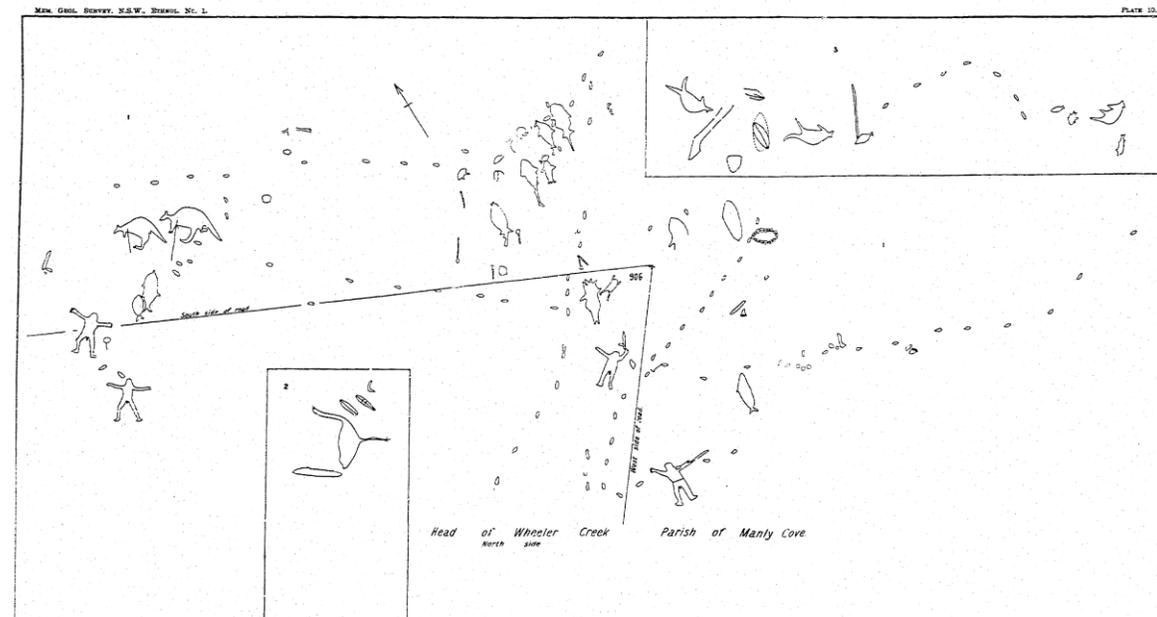
**Cromer Heights Rock Engravings And Shelter Officially Declared A Significant And Important Aboriginal Place**



Photo - from left: Mayor Michael Regan, Anthony Harris, Conny Harris and MP for Mackellar: Jason Falinski at the site this week. Source: Pittwater On-Line News Jan-Feb 2020.



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



# Aboriginal Country – Mt Ku-ring-gai AA

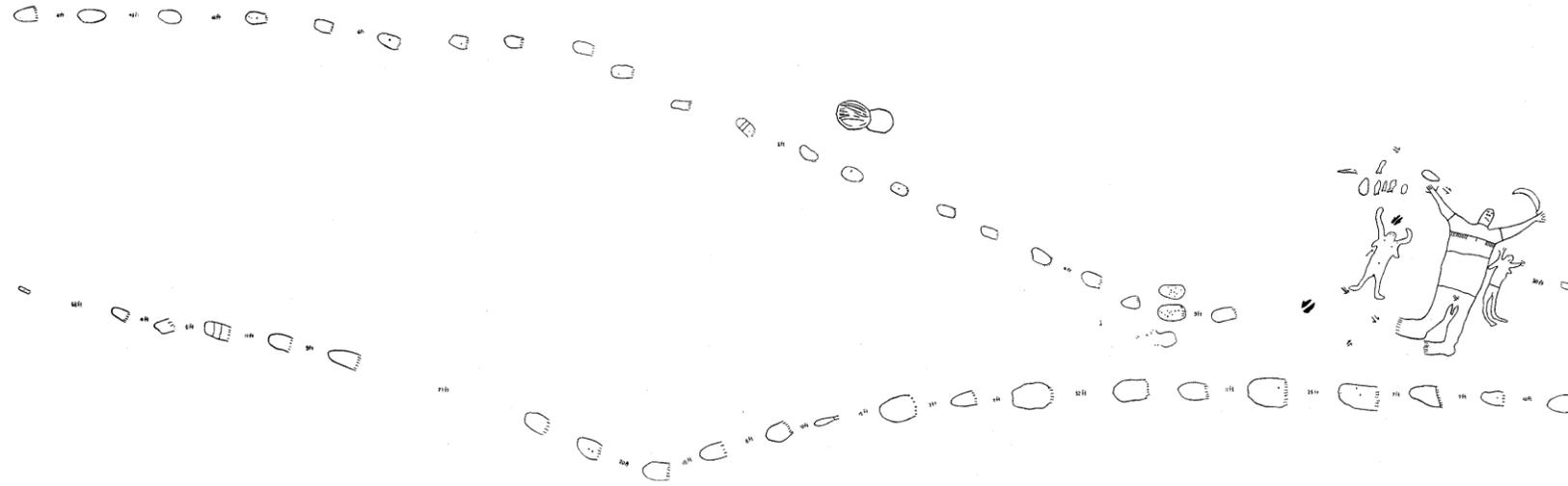


Fig. 1 –Group 1: Mt. Kuring-gai. In situ footprints at the lower right hand corner join on to the series shown at the top left hand side of the diagram.



# Aboriginal Country - Other Site Types



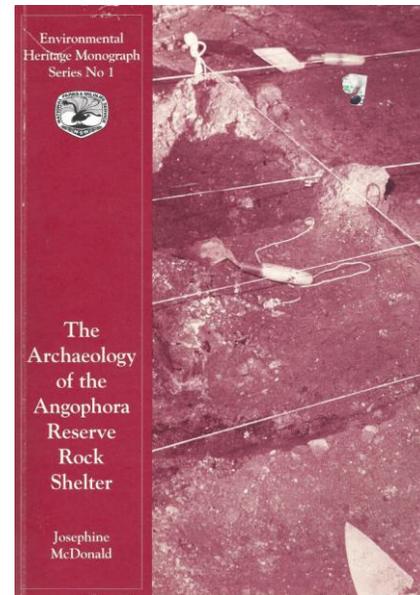
Grinding grooves in runnels, West Head



Possible scarred turpentine, West Head



Stone arrangement and engraving of a penguin, Mackerel Trail



Angophora Reserve Occupation Shelter, Avalon

# 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.

# The Proposal

## **Stage One:**

Identify and establish geosites and geotrails with the support of the land managers e.g. NSW NPWS, local government, MLALC, other government agencies; together with support from Aboriginal community members, conservation groups 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.

# Geopark Considerations

- Focus on appreciation of geological heritage as part of an integrated concept of conservation, education and sustainable development.
- Status does not imply restrictions on any economic activity.
- Multi-tenure geoparks are best managed through a formal agreement amongst the stakeholders.
- Establishment of geotrails through a 'defacto' geopark does not require any additional protective measures.

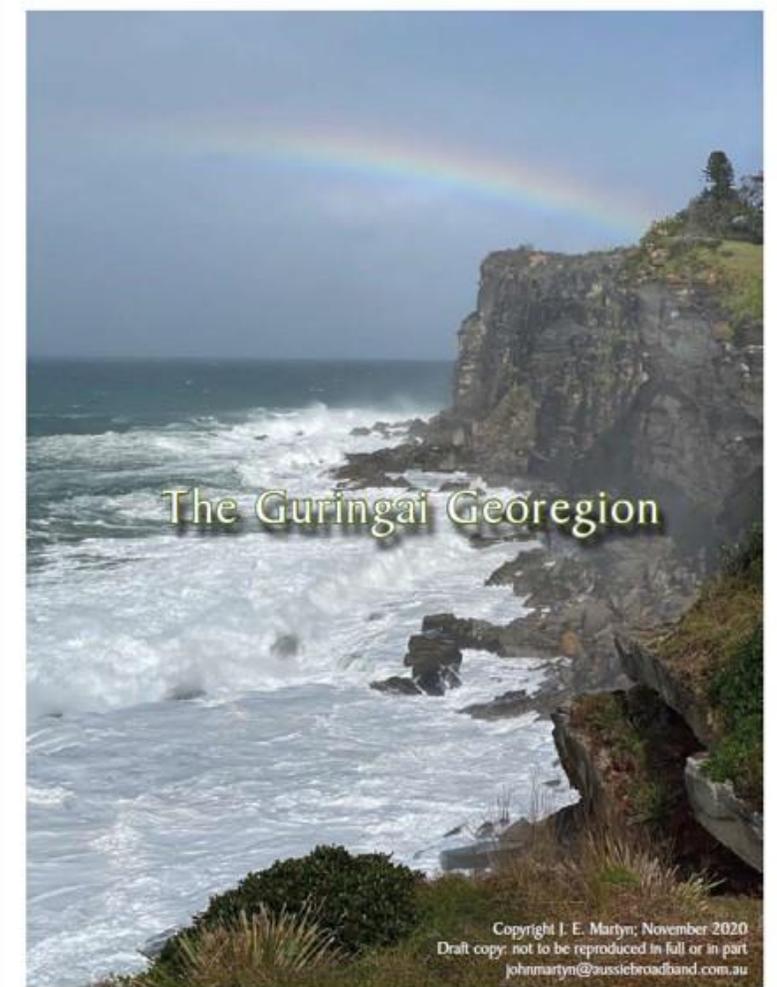
# Next Steps

- Conferring with key stakeholders; NPWS, local government, First Nation Peoples and community groups;
- Working with Hornsby, Ku-ring-gai and Northern Beaches Councils on locating and presenting 'Ku-ring-gai' geosites and geotrails;
- Seeking external funding or sponsorship to develop signage, information and visitor facilities;
- Working with major stakeholders e.g. Ministers, Mayors, Chief Executives and peak partnership groups in identifying and proposing a possible Geopark designation for the 'Ku-ring-gai' GeoRegion.

# Support Documentation

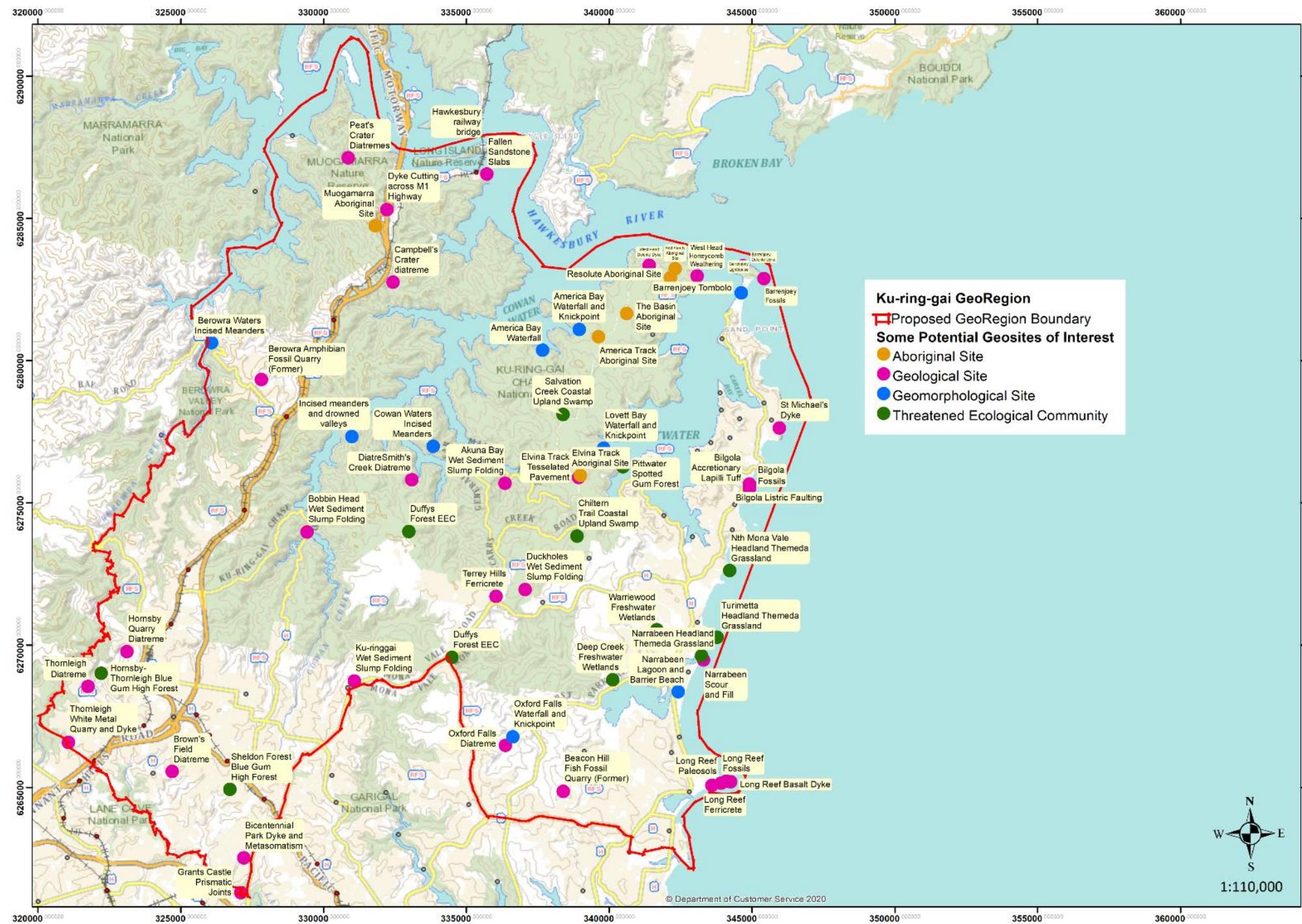
A 'Ku-ring-gai' GeoRegion support publication has been drafted by John Martyn which:

- Is currently 135 pages of informative, well written text and beautiful photos.
- Highlights over 40 geosites of local, national and/or international significance.
- Documents the connection with hundreds of Aboriginal sites as well as unique and distinctive landscapes, vegetation communities and associated flora and fauna.



# Other Actions Underway

- A peer-reviewed journal paper, *The Cultural and Natural History of the Ku-ring-gai GeoRegion*, has recently been published by the Linnean Society of NSW and a hard copy is available for sale via the NPWS Shop at Bobbin Head.
- The GSNSW has reviewed the above-mentioned documentation and has formally advised of its support to the concept of a UNESCO Global Geopark proposal embracing this GeoRegion.
- The group continues to add to the list of geologically significant sites in this GeoRegion, both of national and international importance.
- Further work is underway identifying other natural and cultural heritage values of the GeoRegion.



1:110,000

Not the End