

# Kamay Botany Bay Environmental Education Centre

## Excursion outline

### Stage 6: Ecosystems at Risk

#### Fieldwork at Towra Point Nature Reserve

This study will investigate:

- The spatial patterns and dimensions of the site;
- Biophysical interactions including the effects of weather, climate, geomorphic and hydrologic processes, bio geographical processes and adjustments in response to natural stress;
- The nature and rate of change which effects ecosystem functioning;
- Human impacts;
- Traditional and contemporary management practices.

The outcomes to be achieved from this field study by the student are:

- a) Explains the changing nature, spatial patterns and interactions of ecosystems;
- b) Explains the factors which place ecosystems at risk and the reasons for their protection;
- c) Evaluates environmental management strategies in terms of ecological sustainability;
- d) Evaluates the impact of, and responses of people to, environmental change.

Four sites on the Towra Point peninsula will be used during the field study:

1. The cleared area adjacent to Captain Cook Drive (the old horse stables)
2. The old radar station site and the barrier swamp
3. Remnant littoral rainforest
4. Towra beach

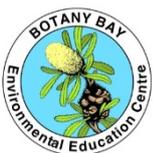
Students are advised that taking additional notes, photographs or other recording of geographical information about the biophysical environment of the area is advised. Not all aspects of this study can be completely addressed in the time available on site. Additional materials have been provided to give an overview of:

- Weather and climate;
- Geomorphic and hydrologic processes which have shaped the landform.

#### Resource

Mangrove and Saltmarsh ecosystems

<https://vimeopro.com/littlegeckmedia/gsls-saltmarsh-and-mangrove-ecosystems>



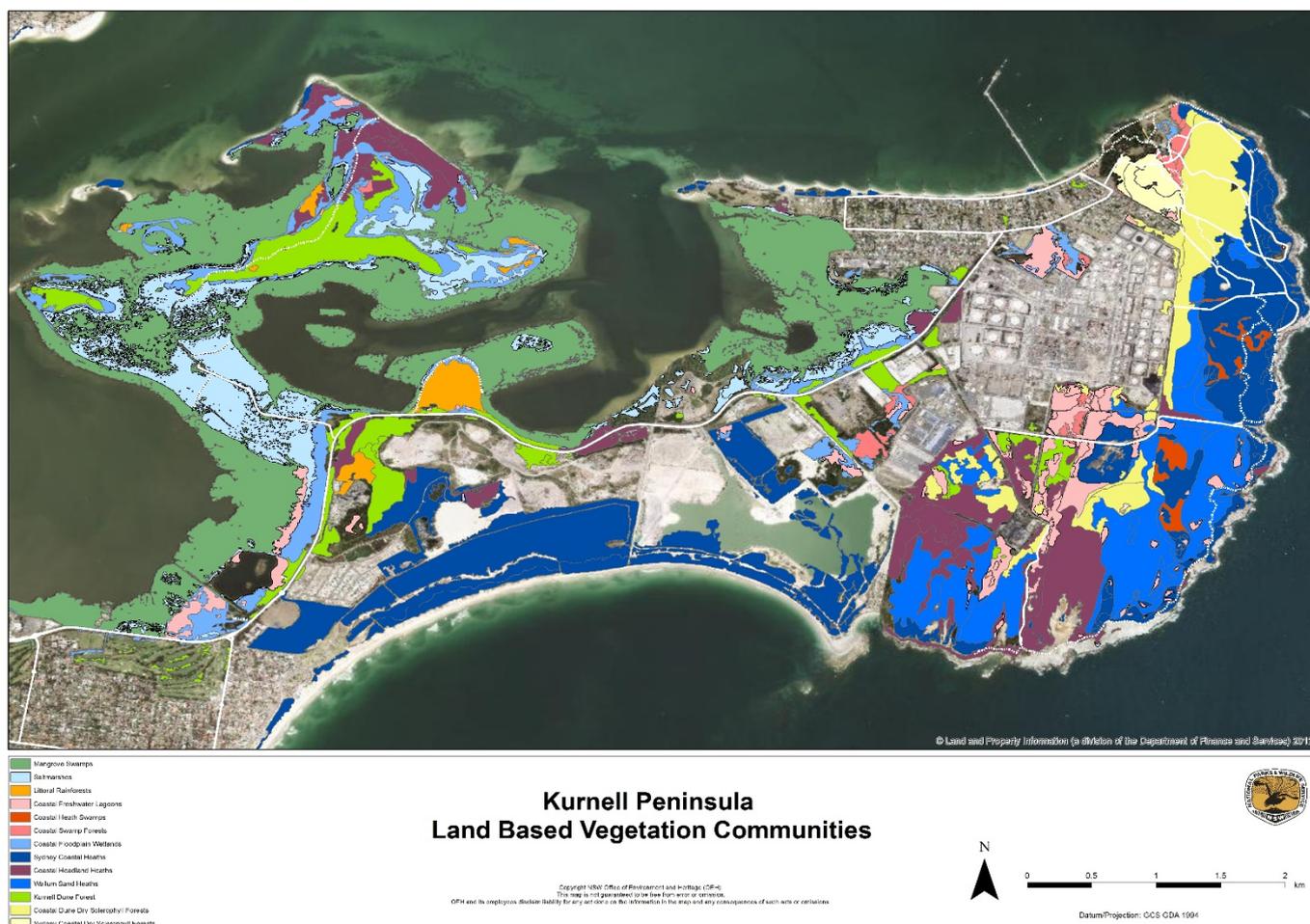
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Education

## Booking Information

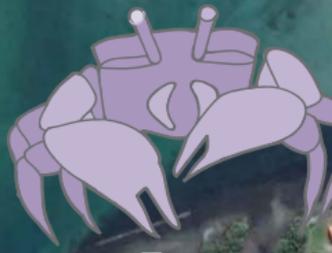
<b>Location</b>	Towra Point Nature Reserve
<b>Bus booking</b>	Meet at the gate. A map with directions will be provided
<b>Timing</b>	Ideally schools should allow 4 hours for the program, including meal and toilet breaks.
<b>Bring</b>	Medications, food, water, sunblock, hats and wet weather gear
<b>Appropriate dress</b>	Students should wear clothing/shoes suited to working in an outdoor environment and appropriate to the season. <b>Students will be walking through water in wetlands.</b> Advisable to wear old shoes, aquatic shoes or cheap shoes.
<b>Staffing</b>	The EEC complies with NSW DEC policy for a student/adult ratio of 15:1 for bushwalking. Parent helpers welcome, no pre-schoolers.
<b>Extreme or wet weather</b>	May result in the excursion being modified, postponed or cancelled. An out of hours contact number will be supplied in your booking information. <b>Rescheduling in the event of extreme or wet weather include: high winds and/ or heat greater than 34 degrees, bush fire, National Park closure and flood risk.</b>
<b>Medical or special needs</b>	Please notify EEC staff at time of booking
<b>Risk Management Guidelines</b>	Will be provided at the time of booking
<b>Excursion Pack</b>	Teacher background notes and digital worksheets will be provided ( <b>worksheets must be printed in colour and brought on the day</b> ).



<https://vimeo.com/littlegeckomedia/gslis-saltmarsh-and-mangrove-ecosystems>

A video series

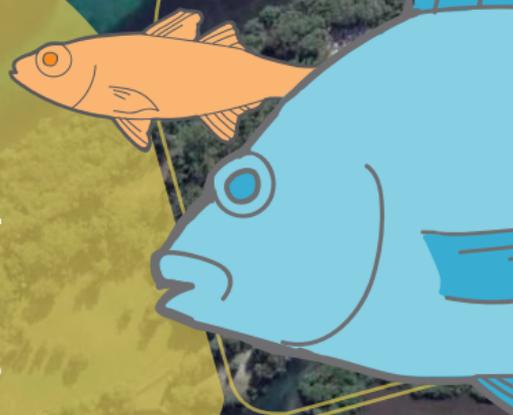
# Mangrove and saltmarsh ecosystems



**Case studies and support material addressing HSC biology 2018 module 4, ecosystem dynamics, population dynamics, and future ecosystems.**

**Cutting edge scientific research is underway in the complex and fascinating coastal wetlands around Sydney.**

**Meet leading scientists and natural resource managers as they discuss their work and research.**





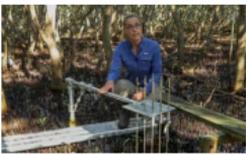
**1 Introduction** Professor Neil Saintilan (Macquarie University) provides an introduction to the component species, the interactions of these species, and the relationships between the biotic and abiotic factors in the mangrove and saltmarsh ecosystems.



**2 Crabs** Professor Neil Saintilan explains the importance of one organism; the crab, in the mangrove and saltmarsh ecosystems. We will hear more about crabs and the transfer of energy in segment 5.



**3 Waterbirds** One of the important values of saltmarsh is the unique habitat they provide for waterbirds. Domestic and international bird species rely on the saltmarsh ecosystem. The world record for a migratory bird flight is 11,000 km non-stop; the small sharp-tailed sand piper the size of a sparrow, flies from Alaska to its summer feeding grounds in New Zealand.



**4 An investigation: measuring surface elevation**

'Climate change is driving shifts in the distribution of vegetation communities across the globe.' (Rogers K, Saintilan N, Mazumder D, Kelleway JJ. 2019 *Mangrove dynamics and blue carbon sequestration* Biol. Lett. 20180471). Hear directly from leading scientists, Associate Professor Kerry Lee Rogers (University of Wollongong) and Professor Neil Saintilan (Macquarie University) as they walk us through some techniques used in their research about sea level rise and the mangrove and saltmarsh ecosystems, and carbon sequestration. Concludes with [a link](#) to published research methods and data.



**5 Detecting the transfer of energy** The biotic components of an ecosystem transfer and transform energy. Find out about the research undertaken at the Australian Nuclear Science & Technology Organisation (ANSTO) into the transfer of energy within the mangrove saltmarsh ecosystems. Dr Debashish Mazumder is the Senior Research Scientist at ANSTO's Institute of Environmental Research.



**6 Ecosystem surveying technique: quadrats** and **7 Ecosystem surveying techniques: transects** An ecological consultant demonstrates ecosystem surveying techniques for the collection of valid and reliable data. Geraldene Dalby-Ball is the director of Kingfisher Urban Ecology & Wetlands.



**8 Restoring Coastal Saltmarsh at Kurnell** Human activities can reduce biodiversity. Part of Brendon Graham's role as Natural Areas Manager at Sutherland Shire Council has been to protect and restore saltmarsh in the highly urbanised area of Kurnell in Sydney.

