



### Program Overview

The mangroves at Bobbin Head provide an interesting case study for students to investigate the biotic and abiotic relationships of such a dynamic ecosystem and to use this as a springboard to understanding the potential impact of climate change on mangroves in river valleys.

### Inquiry Questions

1. What effect can one species have on the other species in a community?
2. How do adaptations increase the organism's ability to survive?
3. How can human activity impact on an ecosystem?

### Learning Experiences

NOTE: There is pre and post visit work for schools/ students wanting to complete this as a depth study.

#### Abundance and Distribution of Crabs

Using sampling techniques, students will make predictions and then plan and conduct an investigation for determining the abundance and distribution of crabs across the mangrove forest and the influences of abiotic and biotic factors on population patterns.

#### Biotic Investigation

Students will observe and identify the various species that live in the mangrove ecosystem and using food webs and other sources, identify some of the key relationships (predation, competition and symbiosis) and predict consequences for populations of these biotic factors.

### Plant and Animal Adaptations

Students will investigate two species, the Grey Mangrove and the Semaphore Crab, and identify adaptations that have increased their ability to survive in the mangrove ecosystem.

### Past and Future Environments

Students will learn about the local Aboriginal people and how Aboriginal sites help us understand changes to the environment.

Students will be undertaking fieldwork as part of an ongoing study of changes to an identified mangrove forest. This fieldwork includes undertaking abundance and distribution, abiotic testing, tree health analysis and collecting photographic data.

The fieldwork completed during the day will lead to further secondary-sourced research at school to complete a depth study.

### Key Syllabus Outcomes and Content

#### Outcomes

BIO11-1, BIO11-2, BIO11-3, BIO11-4, BIO11-5  
BIO11-10, BIO11-11

#### Intended Learning

Students:

- conduct [practical investigations](#), individually or in teams, or use secondary sources to examine the adaptations of organisms that increase their ability to survive in their [environment](#), including:
  - structural adaptations
  - physiological adaptations
  - behavioural adaptations
- investigate and determine relationships between biotic and abiotic factors in an ecosystem, including: (ACSBL019)

- the impact of abiotic factors (ACSBL021, ACSBL022, ACSBL025)
- the impact of biotic factors, including predation, competition and symbiotic relationships (ACSBL024)
- the ecological niches occupied by species (ACSBL023)
- predicting consequences for populations in ecosystems due to predation, competition, symbiosis and disease (ACSBL019, ACSBL020)
- measuring populations of organisms using sampling techniques (ACSBL003, ACSBL015)
- investigate changes in past ecosystems that may inform our approach to the management of future ecosystems, including:
  - the role of changing climate on ecosystems