

# Overview

## Freshwater Studies: Years 10-12



### Overview

*Freshwater Studies* investigates the relationship and interactions that occur between abiotic and biotic aspects of freshwater ecosystems. The program assists students to understand how environmental factors limit the distribution and abundance of species in an ecosystem and how data can be used to evaluate the condition of a waterway.

In the field, students work in small groups to record and contrast data from two sites: Mimosa Creek and Stable Swamp Creek. Students utilise a variety of equipment to collect abiotic data, including DO, pH, temperature, salinity, turbidity etc. Dip nets are used to collect water samples for analysis under stereo microscopes. Macroinvertebrate diversity and abundance data is used to calculate a quantitative value to describe species richness and evenness for the two locations. Sensitivity indexes for individual species provide another measure of the health of the freshwater ecosystems.

At the conclusion of the program, students apply their new data, knowledge and skills to suggest improvements and management strategies aimed at improving the health of the waterway.

*Freshwater Studies* has been assessed as medium risk. A Curriculum Activity Risk Assessment is available on request. A student field booklet will be provided upon confirmation of your booking.

### Biology

**Unit 3:** Biodiversity and the interconnectedness of life

**Topic 1:** Describing biodiversity

**Topic 2:** Ecosystem dynamics

#### Learning Goals

- **recognise** that biodiversity includes the diversity of species and ecosystems.
- **determine** the diversity of macro-invertebrate and vertebrate species in two local freshwater ecosystems (Mimosa Creek and Stable Swamp Creek) using Simpson's diversity index as a measure of species richness and evenness (relative species abundance).
- **use** a variety of appropriate technologies, such as Horiba data loggers, nitrate and phosphate test strips, turbidity tubes and other equipment to measure abiotic factors in the field.
- **analyse** species diversity indices, pollution sensitivity and abiotic factors (pH, nitrate levels, phosphate levels, salinity, conductivity, turbidity, dissolved oxygen, water temperature and rainfall) to compare ecosystems across spatial and temporal scales.
- **explain** how environmental factors limit the distribution and abundance of species in an ecosystem.
- **evaluate** the health of local freshwater ecosystems using data collected from the field.
- **design** modifications to the local environment to reduce the level of human impact, and maintain the level of biodiversity, in local ecosystems.

