Overview

Forest Studies: Simpson's Diversity & Lincoln Index

Toohey Forest Environmental Education Centre

Overview

Forest Studies is a whole day program where teachers can elect to compare either (i) a wet and dry sclerophyll forest or (ii) disturbed vs undisturbed sites. The Forest Studies program assists students to explain how environmental factors limit the distribution and abundance of species in an ecosystem, and how data can be used to evaluate the condition of ecosystems.

Students begin the day with an introduction to plant identification using our Toohey Forest Plant ID booklet. Then students work in small groups to establish two quadrats within designated boundaries. Students utilise Vernier data loggers, soil pH kits, laser rangefinders and spherical densitometers to collect a range of abiotic data . Biotic data is also collected, allowing students to analyse this data in a variety of ways.

Plant diversity and abundance data is used to calculate a quantitative value to describe species richness, evenness and the health of an ecosystem (i.e. Simpson's Diversity Index). Students apply this primary data, secondary data, knowledge and skills to outline the arguments for and against a hypothetical development scenario in Toohey Forest and can construct vegetation profiles.

Our day concludes with an activity that simulates data collection for Lincoln Index calculations, which attempt to estimate the population size of a given organism. This can also be used to estimate biomass of certain vertebrates within Toohey Forest.

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

***This program compliments 'Ecological Sampling Techniques' and is often taught as a prequel to that program, with no overlap in content.**

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 plant species in a wet and dry sclerophyll forest ecosystem using Simpson's Diversity Index as a measure of species richness and evenness (relative species abundance) and a Forest Condition Score as a measure of forest health.
- **use** a variety of appropriate technologies, such as Vernier data loggers, soil pH testing kits, inclinometers to measure canopy height and other equipment to measure abiotic factors in the field.
- **analyse** species diversity indices, forest condition scores and abiotic data (soil pH, air temperature, soil temperature, soil moisture, humidity and light intensity) to compare ecosystems across spatial and temporal scales.
- **explain** how environmental factors limit the distribution and abundance of species in an ecosystem.
- **evaluate** the condition of forest ecosystems using data collected from the field.
- **Use** the Lincoln Index to estimate population size from secondary or primary data

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