TEACHER BOOKLET

Sampling along a transcect

	BIOLOGY
Name	

Students will work in small groups to collect detailed data about a variety of living things in the study area.

Students will need:

- ☐ 10 metre long transect marker (i.e. tape, rope, string – Mark one metre intervals with knots or coloured ties).
- ☐ Reference chart of living things in the area
- ☐ Transect data recording sheet.
- ☐ Pencils.

Section 1. Introduction

Aim

In this activity, students use transects to collect detailed data about the variety of living things in the study area. A transect is a 10-metre-long straight line across the study area. At one-metre intervals, whatever living thing is under (or above) the tagged mark is recorded. For example, at the start of the transect line, there's grass; at 1 metre, there's soil; at 2 metres, there's a magpie in a wattle tree, and so on. Using transects allows you to collect random data about the distribution and abundance of living things in an area.

Helpful hints

In an area that is sparsely populated, sampling at one-metre intervals might not be best. For example, on a rocky area or a beach, it might be necessary to record all living things along the transect line.

During the class survey, it might be easier to identify living things by a code and take time later to name them if it's necessary.

DAINTREE RESEARCH OBSERVATORY - JCU

For this task students will be collecting data at the Daintree Research Observatory, which is run by James Cook University.

Location

The Daintree Rainforest Observatory is located at 40 m elevation in lowland tropical rainforest at Cape Tribulation, 140 kilometres north of Cairns in Queensland Australia (16º 06' 14.8" S, 145º 26' 58.0" E). The site is adjacent to the Daintree National Park. The Daintree rainforest has the highest biodiversity anywhere in Australia and has a unique Gondwanan flora.

In 1988 the rainforests among which the crane is situated were declared the Wet Tropics World Heritage Area. This is one of the few areas in the world where the reef meets the rainforest and the only place where two World Heritage Areas sit side by side. The site is flanked to the west by coastal ranges rising to more than 1400m and by the Coral Sea to the east.

Climate

Annual average rainfall is approximately 3500mm and is strongly seasonal with 70% falling during the wet season which runs from December to April. Summers are often hot and humid with the mean daily temperature in January around 28°C. However, temperatures up to 36°C are not unusual during the summer months. Winters are mild and dry with the mean daily temperature in July around 22°C.

Northern Australia is subject to tropical cyclones in the wet season and their occurrence is unpredictable. The impact of these severe tropical storm systems are regarded as a natural phenomenon and a key evolutionary factor in shaping the ecology of Queensland's tropical lowland rainforests.

History

The area in which this site is located was selectively logged in the late 1950's and early 1960's. There are however standing specimens of Toona ciliata (Red Cedar) in the area, which suggests that this logging was probably not intensive.

Extreme disturbance due to storm damage (tropical cyclones) is common in the area on a cycle of approximately 50 years. On the 11th of February 1999, tropical cyclone Rona (category 3) passed over the Cape Tribulation area causing widespread major damage. Wind gusts of up to 170 km/hr, local flooding and storm surges of up to 1.4m were recorded in the area. The canopy crane site was severely damaged, as approximately 10% of the trees were felled and 50% of the trees suffered complete crown loss on the research plot. The past 10 years has shown profound recovery of the forest.

http://www.jcu.edu.au/canopycrane/about/JCUPRD_046915.html

Section 2. Process

Step 1 – Set up the transect line for sampling

Working in groups of two or three, students choose a line for sampling in the study area. They extend the transect line between two points, if possible starting in one kind of ecosystem and finishing in another. The transect line can be secured with pegs at each end to minimise movement.

Step 2 – Mark the transect on the map

Each group of students plots the length and direction of their transect line on a map of the study area.

Step 3 – Record living things found at one-metre intervals

At each one-metre interval, observe the living thing(s) immediately under or above the tagged mark. Note this information on the data recording sheet. Collect a sample, take a photograph or do a drawing of each living thing so that you can identify it later.

Step 4 – Compare data

When each group has finished sampling along their transect line, compare the data collected by all. The Biodiversity varies from place to place – this is called 'variation over distance'. Variations between years or seasons are called 'variations over time'. Biodiversity changes over distance and time.

Step 5 – Identify new specimens

Identify any new specimens that were found. Give them a code and then enter them in the reference chart.

Reporting

Prepare a large map of the site on which to plot the results of all the transects. Use a bar graph to show the numbers of each species found. Comparisons between data from different transects can be discussed and reasons for variations suggested.

When data from earlier surveys is available for comparison, changes over time can be discussed and explanations offered. Is the area biologically stable? Or is it changing over time into a different type of ecosystem?

Discuss common data, unique data and the variety in biodiversity.

Reflection

Were students successful in gathering data along the transects?

Where an environmental gradient was included in a transect, was this evident in the data collected?

Did data from the different groups vary appreciably?

Section 3. Teacher Resources

Wet Tropics Management Authority

- http://www.wettropics.gov.au/home

Measuring Biodiversity – from Berkely.edu

- http://gk12calbio.berkeley.edu/lessons/less_measbiodiv.html

This transect teachers guide sourced from:

Education Queensland

http://www.eco-online.eq.edu.au/novascotia/resources/sampling.html

Section 4. DATA COLLECTION FOR BIODIVERSITY SURVEY

Surveyor's name

Location _____ Time _____

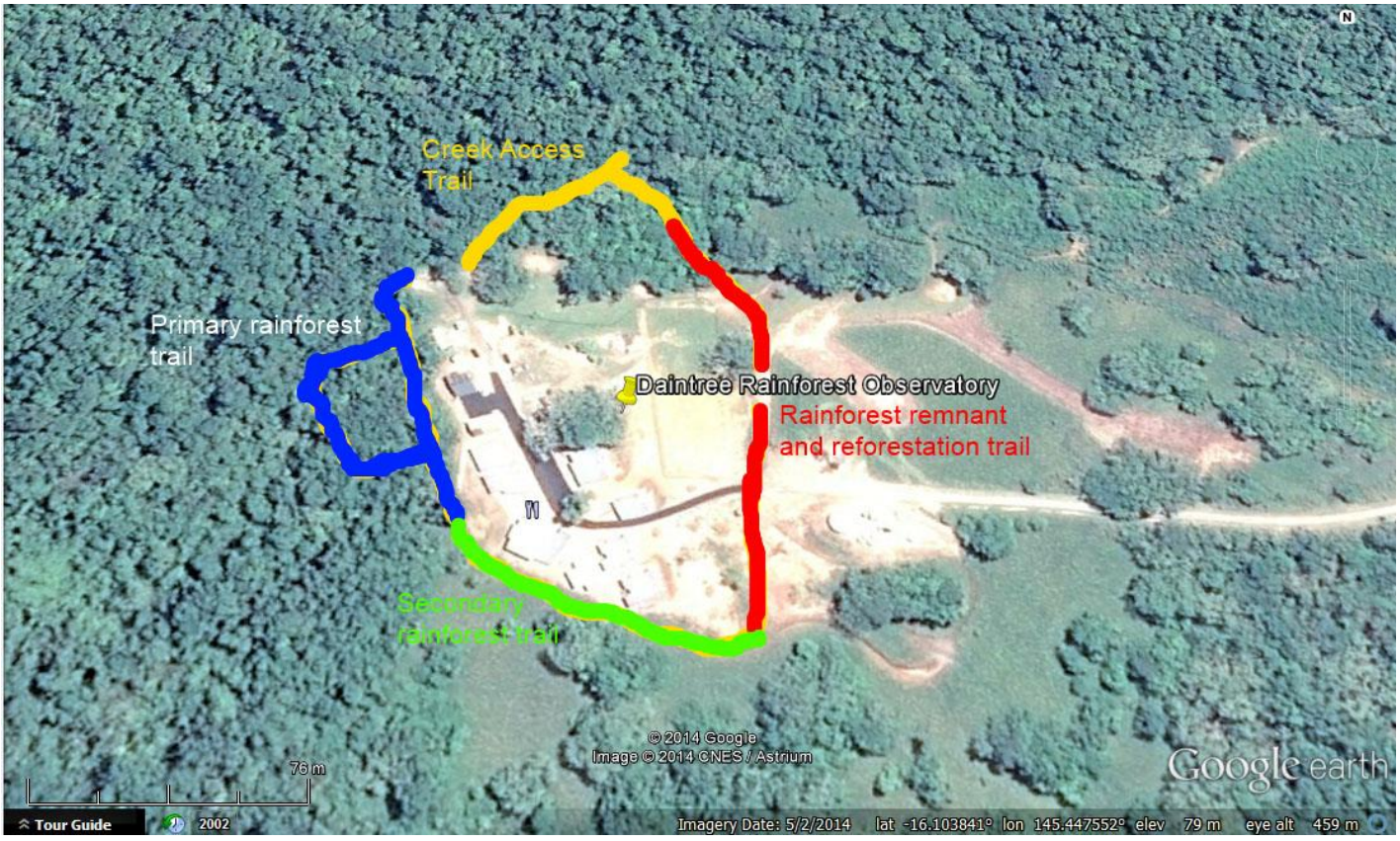
Date _____ **Reference point** _____

Compass heading **Distance from ref. point**

Ecosystem types _____

Global position: North/South_____East_____ Season _____

Map of study area



Features of the ecosystem

Section 5. TRANSECT DATA

Distance in metres	Specimen	Description
0		
1		
2		
3		
4		

5 _____

6 _____

7 _____

8 _____

9 _____

10 _____