



Biodiversity Up Close - Introduction and Teacher Notes



Biodiversity Up Close is a rigorous and easy to use tool to assess the biodiversity in the school ground. It can also be used to assess the biodiversity within an area of native habitat found close to the school. This tool has been adapted by CERES from the Environmental Management in Agriculture Worksheets (Department of Sustainability and Environment, 2005) and Biodiversity Up Close Condensed Version (LandLearn).

The Biodiversity Up Close tool can be used a number of times within a school to provide snapshots of the state of biodiversity in the school ground over time. It is hoped that this will support long term and short term improvements to be made within the school ground.

There are a number of steps in undertaking the audit:

- **Step 1:** Obtaining an Aerial Photograph
- **Step 2:** Determining the Size of the School Ground in Hectares
- **Step 3:** Undertaking the Habitat Quality Assessment - assessing: Tree Measurements, Understorey and Vegetation Structure, Environmental Weeds, Organic Litter, Logs and Rocks, Soil Management, Habitat Extras, Quick Habitat Quality Assessment.
- **Step 4:** Undertaking the Action Plan for Biodiversity

Using the tool with students:

Depending on the Level that your class is at, you may wish to work through each habitat assessment sheet as a class, or split the class into small groups to fill in a number of sheets at the one time and report back to the group.

Step 1: Obtaining an Aerial Photograph Using Google Earth

To begin your school ground biodiversity audit, you must first obtain an aerial photograph. Your school may already have one or you may be able to use Google Earth.

If you don't have Google Earth on your computer, download it at <http://earth.google.com>

1. Enter your school name and suburb in the 'Fly to' search engine.
2. Zoom in on your school until it fills the frame of the screen, rotate the image so that the school boundaries are square with the frame.
3. Click on 'Edit, copy, copy image'. (Copy three images – one close up of the school ground, and maps showing the land in a 1km and 5km radius around the school.)
4. Paste the images into blank Word Documents – drag the corners of the image to make them fit the size of the page. Draw a grid over the map showing the close up of the school ground (as shown below) and count the number of squares covering the school ground.
5. Finally, determine the area of your school ground using one of the methods below:
 - a. Use Google Earth - Go to 'Tools, Ruler, Line' and change the unit of measurement to 'metres'. Use this 'ruler, line' function to obtain the dimensions of your school ground and calculate the area of your school.
 - b. Take accurate measurements on the ground with your students using a trundle wheel.
 - c. Use a pre-existing map that has a scale to work out the area covered by the school.

Step 2: Determining the Size of the School Ground in Hectares

1. Work out the area of your school ground in square metres (m²).

For a rectangular/square shaped school simply multiply the school boundary length by width.

If your school is an irregular shape, break it up into smaller shapes and calculate the area of each individually and then add them up. (The area of a triangle = base x height ÷ 2)

eg. To calculate the area of a school which has a length of 100m and a width of 75m:
 $100 \times 75 = 7,500 \text{ m}^2$

2. Convert area from square metres to hectares

Knowing the area of your school in hectares is important as it allows comparisons to be made accurately between schools of differing size.

To calculate the number of hectares in the school ground divide the school area by the area of a hectare (1 hectare = 100m x 100m = 10,000 m²)

eg. To calculate the number of hectares in a school of 7,500m²
 $7,500 \div 10,000 = 0.75 \text{ hectares (or } \frac{3}{4} \text{ of a hectare).}$



Student Report Sheet: Tree Measurements

Results:

1. Work out the number of **trees** (over 6m) per hectare in the school grounds

_____ trees ÷ _____ hectares in school grounds = trees per hectare

2. Work out the number of **habitat trees** per hectare in the school grounds

_____ habitat trees ÷ _____ hectares in school grounds = trees per hectare

3. Work out the number of **native trees** per hectare in the school grounds

_____ native trees ÷ _____ hectares in school grounds = trees per hectare

Habitat Score:

Look at your results and tick the 'Tree Measurements' rankings (colour) and scores (number).

< 10 trees per hectare	10 - 20 trees per hectare	> 20 trees per hectare		
0	5	10		
No habitat trees	< 5 habitat trees per hectare	5 -10 habitat trees per hectare	> 10 habitat trees per hectare	> 10 large <u>native</u> trees per hectare
0	2	5	7	10

Discussion and Recommendations:

1. Why is it important to have trees?

2. Does your school need more trees? Where in the school would you plant them?

3. What could students do to help look after the trees in your school?

Student Worksheet: Understorey and Vegetation Structure



Understorey

An understorey are the plants that grow under trees (except lawns and ovals). Understorey plants include herbs, grasses, shrubs, mosses, lichens and small trees. Because there are lots of different understorey plants, there usually lots of different animals living there as well.

Chocolate Lily is an understorey plant that smells like chocolate (but unfortunately doesn't taste like chocolate)!

Your team
will need a
school map.

What to do:

Step 1: Walk around your school. On the map, shade the boxes where you find understorey plants.

Step 2: Circle the types of understorey plants you find in your school grounds:

Shrubs:

Small shrub (a plant less than 1m tall)

Shrub (a plant 1-5m tall)

Vines and Grasses:

Scrambler, climber or vine plant

Tall grass (more than 1m tall)

Herbs (not the herbs you eat):

Ferns

Orchids

Small grass (less than 1m tall)

Moss, lichen

Step 3: Are most of these plants native (belong to Australia) or exotic (from another country)? We found mostly _____ plants.

Step 5: How many boxes did your team shade on the map?

boxes

Step 6: What is the total number of boxes on the map that cover your whole school?

boxes

Student Report Sheet: Understorey and Vegetation Structure

Results:

Work out what **percentage** (%) of your school grounds is covered in understorey and vegetation.

Number of boxes we shaded in on our map boxes

÷

Total number of boxes on the map that cover our whole school boxes

X 100 = %

Habitat Score:

Look at your results and tick the 'Understorey and Vegetation Structure' ranking (colour) and score (number).

0-5% understorey cover in school grounds	5-15% understorey cover in school grounds	15-25% understorey cover in school grounds	More than 25% understorey cover in school grounds	More than 25% understorey cover in school grounds and most is native.
0	7	13	19	25

Discussion and Recommendations:

1. Why it is important to have understorey plants?

2. Does your school need more understorey plants? Where would you plant it?

4. What could students do to help look after understorey plants in your school?



Student Worksheet: Environmental Weeds



Environmental Weeds

A weed is any plant that requires action to reduce its effect on the environment. Many plants introduced into Australia in the last 200 years are now weeds. Environmental weeds are weeds that produce large numbers of seeds, spread quickly and can damage the environment, like **agapanthus**.

What to do:

Step 1: Walk around the school ground and search for environmental weeds.

Step 2: Find out the name of your weeds. List in the table below the different types of environmental weeds that you find and shade in on the map where they are found in the school ground.

Quick-Draw Picture	Weed Species Name	Scientific Name



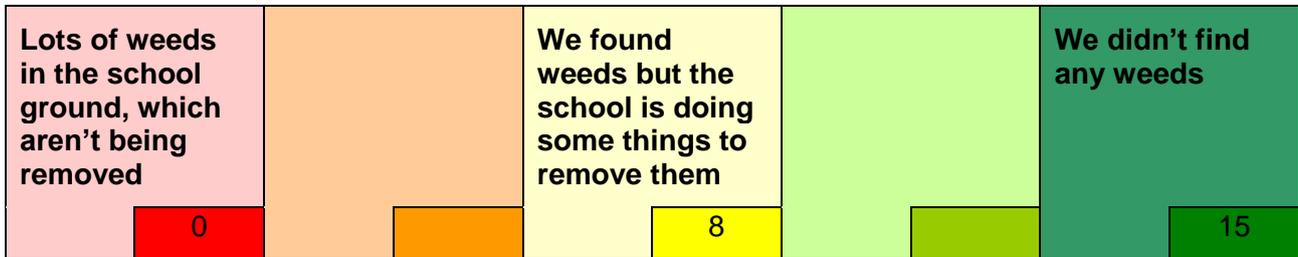
Student Report Sheet: Environmental Weeds

Results:

1. If time, see if you can find any more weed names by using books or the Internet.
2. Which areas in your school need the most weeding? Who might do it?

Habitat Score:

Look at your results and tick the 'Environmental Weeds' ranking (colour) and score (number).



Discussion and Recommendations:

1. Why is it important to reduce the amount of weeds in the school grounds?

2. What could students do to help reduce weeds in your school?

3. What could people at home do to help reduce weeds in your local community?

4. What other things could your school do to help native plants and animals?

Student Worksheet: Organic Litter



Organic litter includes things like fallen leaves, twigs, tanbark, mulch and small branches less than 30cm thick. **Slaters** look like mini armadillos! They like to live in dark and moist environments such as leaf litter, compost heaps, under rocks and logs. They eat decaying vegetable matter and fungi, turning it into rich soil nutrients.

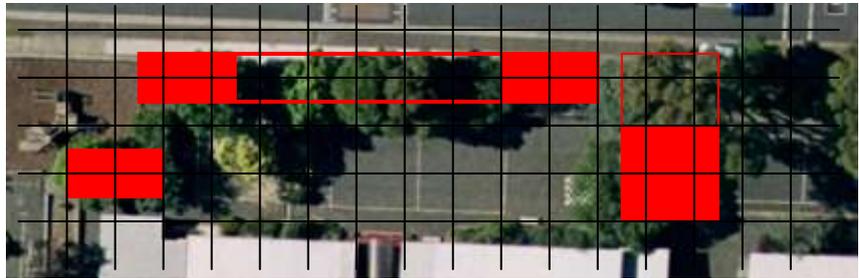


What to do:

Step 1: Walk around the school ground.

On the map, **draw around** the boxes where the **garden beds** are the school ground. On the map, **shade** in the boxes of the garden beds that are covered by **organic litter**.

Your map will look a bit like this:



Step 3: Count the total number of boxes that are **drawn around** on the map



boxes were drawn around

Step 4: Count the total number of boxes that are **shaded** on the map



boxes were shaded

Step 5: **Circle** the types of organic litter you found



fallen leaves



twigs



tanbark



mulch



small branches

other

Student Report Sheet: Organic Litter

Results:

Work out the percentage of garden beds that contain organic litter.

$$\begin{array}{r} \text{Number of boxes shaded on the map} \\ \div \\ \text{Number of boxes drawn around on the map} \\ \times 100 = \end{array} \begin{array}{c} \square \\ \square \\ \square \% \end{array}$$

Habitat Score:

Look at your results and tick the 'Organic Litter' ranking (colour) and score (number).

0-25% cover of organic litter in gardens	25-49% cover of organic litter in gardens	50-74% cover of organic litter in gardens	75-99% cover of organic litter in gardens	100% cover of organic litter in gardens
0	2	5	7	10

Discussion and Recommendations:

1. Why do you think it is important to have organic litter in the school grounds?

2. What animals might live in organic litter?

3. How can students look after organic litter?



Student Worksheet: Logs, Rocks and Soil Management



Echidnas look scary but are actually scared of other animals! They prefer to hide in hollow **logs** or curl up in a ball than to fight a predator.



Termites are like little soil engineers. They munch on rotting logs, which assist them to break down into rich **soil nutrients** and sculpt hollows in **logs** as they feed.

What to do: Logs and Rocks

Walk around the school ground and make a tally below of the number of rocks and logs found in the school ground.

- > Look for logs with a circumference greater than 30cm – about the size of your ankle.
- > Look for rocks bigger than the size of your hand.

Number of Logs in the School Ground	Number of Rocks in the School Ground
Total number of logs =	Total number of rocks =

AND

What to do: Soil Management

Walk around the school ground and circle the answer to the following questions:

- a) Is there any erosion present in the school ground? Yes No
Erosion is the wearing away and movement of soil by things like rain and wind.



- b) Is there any compaction present in the school ground? Yes No
Compaction is when the soil is packed together, making it hard for plants to grow.



- c) Are the garden beds in the school ground mulched? Yes No
Can you see mulch (like tanbark) in the gardens?



- d) Is your school doing anything to help protect soil? Yes No
eg. fencing off areas, putting in plants, making walking paths.





Student Report Sheet: Logs, Rocks and Soil Management

Logs and Rocks Results:

1. Number of logs + number of rocks =

logs and rocks

2. Number of hectares in the school grounds =

hectares

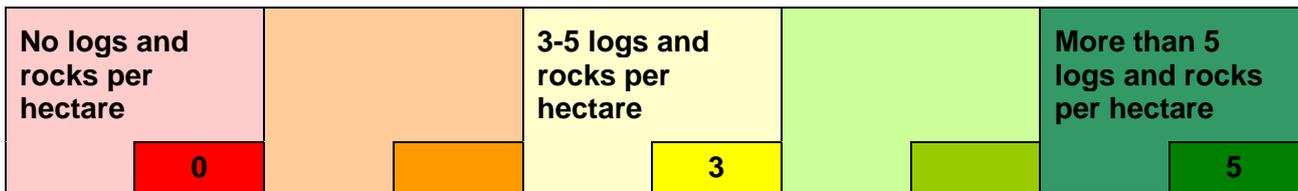
3. Work out the number of logs and rocks per hectare in your school

Number of logs and rocks (total) \div number of hectares in the school grounds

= logs and rocks per hectare

Logs and Rocks Habitat Score:

Look at your results and tick the 'Logs and Rocks' ranking (colour) and score (number).



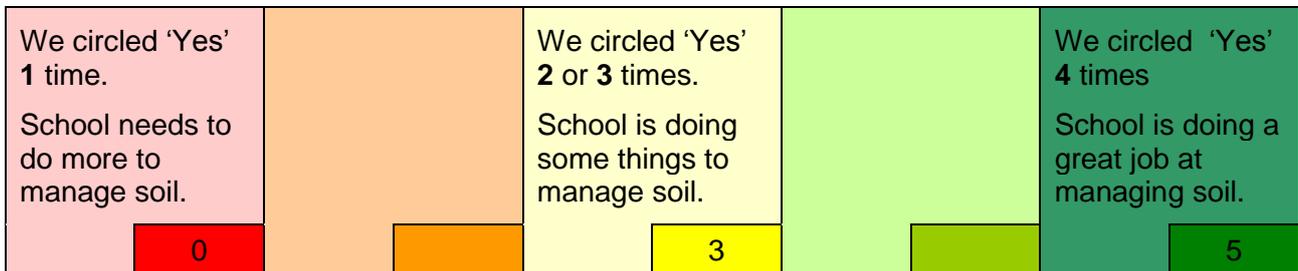
Soil Management Results:

How many times did you circle **Yes** on your worksheet?

times

Soil Management Habitat Score:

Look at your results and tick the 'Soil Management' ranking (colour) and score (number).



Discussion and Recommendations:

1. What could your school do to improve logs, rocks and soil management?



Student Worksheet: Habitat Extras



Habitat Extras

A habitat an environmental area where species of animal, plant or other types of organisms live. It is the physical environment that surrounds, affects and is used by plant and animals species. Ponds and wetlands provide important habitat for numerous species including insects, frogs, reptiles and birds. **There are 208 species of frogs in Australia!**

What to do:

Step 1: Walk around the school ground and tick the Habitat Extras that are present.

- Composting area
- Worm farm/s
- Vegetable garden and/or fruit orchard
- 'Lizard Lounge' (garden especially for lizards and small animals)
- Plants and/or animals in the classroom
- Frog pond and/or wetland
- Bird bath
- Plants in the school ground have labels/name tags
- Nest boxes
- Indigenous food garden (aka 'bush tucker garden')
- Outside bins have lids OR all our bins are inside the buildings (none outside)
- School grows (propagates) indigenous plant seeds
- Green house
- Limited spraying of chemicals in grounds (ask your teacher about this)
- Fallen branches and leaf litter in garden beds (ask 'Organic Litter' team about this)
- Water from taps used to water gardens (eg. buckets under bubbler taps)
- Native plants naturally regenerating (new plants are growing without our help)
- School plan to reduce litter in the school ground

Step 2: Is your school doing anything else to help plants and animals? eg. fundraising

Step 3: How many Habitat Extras are present in your school ground?

Habitat Extras



Student Report Sheet: Habitat Extras

Habitat Score:

Look at your results and tick the 'Habitat Extras' ranking (colour) and score (number).

<p>Our school has no habitat extras</p> <p style="text-align: center;">0</p>	<p>Our school has 1-3 habitat extras</p> <p style="text-align: center;">5</p>	<p>Our school has 3-6 habitat extras</p> <p style="text-align: center;">10</p>	<p>Our school has 7-10 habitat extras</p> <p style="text-align: center;">15</p>	<p>Our school has more than 10 habitat extras</p> <p style="text-align: center;">20</p>
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Discussion and Recommendations:

1. What do you think are the best habitat extras at your school? Why?

2. What else could your school do to help plants and animals? Where?

3. What could students do to help plants and animals?



School Ground Habitat Quality Assessment



Attribute	Description	Ranking	Score
Number of Trees/ha = = <u>number of trees</u> number of hectares in the school	< 10 trees / ha	Red	0
	10 – 20 trees / ha	Yellow	5
	> 20 trees / ha	Deep Green	10
Number of Habitat Trees/ha = = <u>number of habitat trees</u> number of hectares in the school	No large trees	Red	0
	< 5 habitat trees/ha	Orange	2
	5 – 10 habitat trees/ha	Yellow	5
	> 10 habitat trees/ha	Light Green	7
	> 10 native habitat trees/ha	Deep Green	10
Understorey and Vegetation Structure <u>Underline when present:</u> Understorey: Shrub (1-5m), Small Shrub < 1m, Tall grass > 1m, Scrambler/climber Herb-layer: Fern, Moss/Lichen, Orchids, Native Grasses < 0.5m, Other _____	< 5% understorey cover in the school ground	Red	0
	5 –15% understorey cover in the school ground	Orange	7
	15 – 25% understorey cover in the school ground	Yellow	13
	> 25% understorey cover in the school ground	Light Green	19
	> 25% native understorey cover in the school ground	Deep Green	25
Environmental Weeds	No action taken to identify or remove weeds	Red	0
	Weeds present - some action taken to manage weeds	Yellow	8
	No weeds present	Deep Green	15
Organic Litter = Organic litter includes leaves, twigs, small branches, tanbark and mulch < 30 cm circumference	< 25% cover of organic litter in gardens	Red	0
	25 – 49% cover of organic litter in gardens	Orange	2
	50 – 74% cover of organic litter in gardens	Yellow	5
	75 – 99% cover of organic litter in gardens	Light Green	7
	100% cover of organic litter in gardens	Deep Green	10
Logs and Rocks/ha = = <u>number of logs and rocks</u> number of hectares in the school	No Logs or rocks	Red	0
	3 – 5 logs or rocks/ha	Yellow	3
	> 5 logs or rocks/ha	Deep Green	5
Soil Management	Soil management issues present, no action or plan to manage these made	Red	0
	Soil management issues present, some attempt made to manage these	Yellow	3
	Soil managed effectively	Deep Green	5
Habitat Extras <u>Underline when present:</u> Composting area, Vegetable garden/ orchard, Lids on bins or bins located inside the buildings, Indigenous plant propagation, Lizard lounge, Plants and/or animals in the classroom, Frog pond/wetland, Plan to decrease rubbish in the school ground, Bird bath, Indigenous food garden, Plants (flora) in the school ground identified and labelled, Nest boxes, List of animals (fauna) in the school ground maintained, Water from taps used to water gardens, Native plants naturally regenerating, Other	0 enhancements underlined	Red	0
	< 3 enhancements underlined	Orange	5
	3 – 6 enhancements underlined	Yellow	10
	7 – 10 enhancements underlined	Light Green	15
	> 10 enhancements underlined	Deep Green	20
TOTAL (out of 100)	Aim for score > 75		