

Field Guide: Teacher Notes



Bob Winters ©

Activity 2

Changes in the environment affect organisms

Objectives

After completing this activity, students will:

- Investigate the causes of decline in a population of an endangered plant or animal.
- Assess how changes in a grassland ecosystem can affect plants and animals.

Target audience

Level 6

Activity

This lesson builds on what students have understood in Activity 1. In the first activity, students learnt that plants and animals are alike in some ways and different in others. In this activity students will explore how changes in the grassland environment affects organisms. Students will explore endangered plants and animals and how they are conserved. Students examine Action Statements to determine the threats posed for these organisms and will endeavour to develop ways to manage the organisms.

Duration

50 minute session (plus 50 minutes for presentations to peers)

Materials

iPad, iPhone or computer with internet connection

Flora and Fauna Field Guide App. or Field Guide from the Ecolinc website

Data projector linked to a computer with an internet connection and PowerPoint

Student workbook

Pencil

Begin this lesson by introducing terms that students will use in the lesson (ecosystem, habitat, predator and introduced predator). Ask students to explain what is meant by each of these terms. If these words are new to your students, you could write each word on the board and take time to explain and define each of them using the following examples:

Ecosystem – a biological community of interacting organisms and their environment

Habitat – the environment in which an organism lives

Predator – an animal that naturally preys on other animals

Introduced predator – an animal that naturally preys on other animals, which is living outside its native distribution range, such as foxes and cats.

Follow this introduction by engaging students in a brainstorming session about grasslands, how they have become endangered and how this affects organisms. Talk about threats to grasslands and who manages grasslands. Record student responses on the board and consider these prompts to keep to discussion lively (answers have been provided):

1. What is a grassland?

Remind students that they answered this question in the previous activity. Grasslands are flat open spaces covered mainly in grass, but also with other plants, wildflowers and a small number of trees and low shrubs. They receive less rainfall than forests but more than deserts. Answer will vary.

2. What does endangered mean?

An organism that is endangered is at risk of being extinct.

3. Do you know any endangered animals?

Students may talk about many non native plants and animals which may include the Giant Panda, Red Wolf, Southern Bluefin Tuna and the Siberian Tiger.

4. What has caused these animals to be endangered?

There are many reasons why an animal becomes endangered. Some problems include habitat loss, pollution, competition from other organisms, over exploitation and introduction of introduced species.

Grasslands were once extensive across western Victoria, but now they are an endangered ecosystem. Show students the PowerPoint and the map of Victoria showing the extent of grasslands pre 1750 and currently. The yellow area indicates Natural Temperate Grassland and the green area indicates Grassy Eucalypt Woodland. Ask students to explain the differences between the two images. Explain that the grassland ecosystem of Victoria once covered approximately a third of the state. Now less than 0.5% remains today. Pose the following questions to discuss the issue.

5. Where are grasslands found now?

Grasslands are mostly found as small and highly fragmented remnants. These patches are commonly found on private land, with some on public sites such as roadsides, rail reserves and cemeteries.

6. Ask what has caused the decline in this ecosystem? What are the threats to grasslands?

Vegetation clearing

Fragmentation of remnants

Weed invasion

Excessive grazing (from cattle or native animals) or mowing

Use of herbicides and fertilisers

Inappropriate use of fire.

7. What is the name of the Government Department that looks after ecosystems in Victoria? What other aspects of the environment are they responsible for?

The Department of Environment and Primary Industries (DEPI) (formerly the DSE), leads the Victorian Government's efforts to sustainably manage water resources and catchments, climate change, bushfires, parks and other public land, forests, biodiversity and ecosystem conservation.

8. The DEPI manages endangered plants and animals in ecosystems by developing Action Statements. What information would you expect these Action Statements to outline?

Action statements are basically brief management plans. They cover the following:

Background information on the plant or animal, including a description, distribution, habitat, life history, the reasons for its decline and the threats.

What has been done to conserve the plant or animal and what will be done.

Action Statements apply for three to five years, after which time they should be reviewed and updated.

9. Since grasslands throughout Victoria are endangered, would you expect many plants and animals that live in grasslands to also be endangered?

Students will have varying answers and reasons. Students may assume that if there are few grasslands in Victoria, there is less habitat available, therefore many plants and animals will be endangered.

After the brainstorm, explain to students that they will research one endangered plant or animal to determine how it became endangered. In this activity students will access an Action Statement for a plant or animal. Students need to have access to the Field Guide as an application on an iPad or iPhone, or on a computer via the Ecolinc website for this activity.

The plants and animals listed below are a selection of endangered species in the Western Volcanic Plains, with Action Statements that are easy to follow. There are other species listed in the Field Guide with Action Statements that you could use, if you wish. The information in the Action Statements can be quite involved therefore it may be useful for your students to work in pairs. It would be useful for all Action Statements to be covered, therefore ensure that each group chooses a different animal or plant.

Fauna	Group	Common name
	Bustard	Australian Bustard
	Cockatoo	Red-tailed Black Cockatoo (south eastern)
	Lizard	Corangamite Water Skink
	Marsupial	Eastern Barred Bandicoot
		Spot-tailed Quoll
	Parrot	Swift Parrot
Flora	Grass	Adamson's Blown-grass
	Orchid	Basalt Greenhood
		Fragrant Leek-orchid
		Gorae Leek-orchid
		Purple Diuris
	Sedge	Curly Sedge

The following is a list of instructions for students. It would be useful for you to go through the instructions slowly, while referring to an Action Statement and display this on an overhead projector. Use the Golden Sun Moth (Insect – Moth) as an example.

Open the Field Guide and select the organism. Scroll down to the Conservation Status. Firstly ask students to explain what conservation status means. Write these terms on the board and explain them:

DEPI Advisory Lists are maintained by the DEPI and are based on technical information and advice obtained by a range of experts. The information in these lists serves to increase community awareness of threatened species and may encourage individuals and groups to engage in activities to protect species and habitats. There are no legal requirements that flow from a species being listed on the Advisory List. Species are allocated into a category depending on their status:

- Extinct
- Regionally Extinct
- Extinct in the Wild
- Critically Endangered
- Endangered
- Vulnerable
- Near Threatened
- Data Deficient

FFG Act: The Victorian Flora and Fauna Guarantee Act is a legal document for the conservation of threatened plants and animals and communities in Victoria. Organisms listed are threatened, and an Action Statement must be prepared by the DEPI which provides information about the species, habitat, life history, reasons for decline and threats. The aim is to better manage the species.

EPBC: The Environmental Protection and Biodiversity Conservation Act is a legal document that provides protection and management of plants, animals and communities in Australia.

Species are allocated to a category depending on their status:

- Extinct
- Extinct in the Wild
- Critically Endangered
- Endangered
- Vulnerable
- Conservation dependant

Ask students to select an Action Statement and scroll through the document. Students will need to refer to their workbook to determine what information needs to be found. Students need to find information on habitat and threatening processes, which in most cases is found in the first few pages. If students are unsure of a term in the document, encourage them to use the glossary.

It will be beneficial for students to learn about each of the threatened plants and animals in grasslands, therefore ask each group to present their findings to the class. You might like to note the threats of each species on the board, which will be used in a discussion at the end of the presentations.

Once students have presented their findings to the class, conclude the session by engaging students in a discussion about threats to grassland organisms. Ask students to tell you the threats grasslands face and how the reduction in distribution of grasslands affects plants and animals. Students will complete the conclusion questions in their workbook.

Student worksheet

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1. You will investigate an endangered organism. Access the appropriate Action Statement. Look for clues as to why the organism is endangered. Refer to the following subheadings and complete the following table.

Common name			
Scientific name			
Animal or plant			
Conservation status	DEPI Advisory List	FFG Act	EPBC
Habitat (circle answers)	Grassland Herb-field Grassy woodland Woodland Open-shrub land Montane (mountainous country) Moist and dry forests Heathland Roadsides Along waterways Other: _____		
Potentially threatening processes	Habitat loss Introduced predators Weeds Grazing by cattle and sheep Hunting Use of fertilisers in farming land Disturbance from road works		
Decline and threats (circle answers)	Native animal predation Site disturbance Competition from native plants Other: _____		

Conclusion

2. What is the main threat/s to endangered grassland organisms?

Habitat loss, introduced predators, weed invasion, excessive grazing and use of fertilisers are the most common threats to grassland organisms.

3. Explain how adverse changes in the environment affect organisms. Give one example.

Students should choose one of the threats mentioned above and explain the impact on the plant or animal.

4. Suggest some methods to manage threatened organisms.

Students may list revegetation, management of predators (e.g. baits), management of weeds by removal, protection of sites containing endangered plants, fencing off areas, and reduction of grazing by introduced and native species.