



FROGS – CONSERVATION

Background

Australia has a fascinating and spectacular variety of frogs, over 210 of the world's ~5,000 species. The majority of Australian frogs are unique due to Australia's long isolation. The origin of Australia's frog fauna can be traced back many millions of years when Australia formed part of a large landmass called Gondwana.

Victoria has at least 35 species, all of which belong to one of two frog families; tree frogs (Hylidae) and the ground or marsh frogs (Myobatrachidae). In Victoria, a number of frog species have declined or are currently in decline. The Baw Baw Frog was once common on Mt Baw Baw around the ski resort however have now disappeared completely from the mountain. Similarly, the now endangered Growling Grass Frog was once common around parts of Melbourne.

Some declining species e.g. the Southern Barred Frog and the Booroolong Frog are at the limit of their range in Victoria. Very small changes in climate or habitat could make the environment unsuitable for these species and result in their extinction in Victoria. Species such as the Spotted Tree Frog have disappeared from much of their habitat. Predation from introduced trout, increasing sediment loads from stream disturbances and disease appear to be contributing factors.

Introduced predators including cats and foxes may reduce frog numbers while the spread of introduced fish like trout and mosquito fish can destroy tadpole populations. Use of pesticides and herbicides can lead to frog declines causing respiratory problems and abnormalities in frogs, tadpoles and embryos.

Increasingly, communities are becoming involved in a number of conservation projects – recording frogs in the local area by conducting surveys, joining frog/field naturalist groups and creating 'frog friendly' gardens and reserves. Creating suitable habitat and allowing local frogs to move in naturally to colonize this habitat is one of the best ways to increase your local frog population.

Aim

The aim of this session is to:

- Investigate some of the reasons for frog decline using an interactive web-based program
- Prepare an electronic report providing evidence to support your findings.

Materials

- Access to computers and the internet
- Coloured pencils
- Growling Grass Frog website <http://frogs.org.au/frogs/species/Litoria/raniformis/>
- Environmental evaluation report – frog pond habitat website
<http://frogs.org.au/frogs/species/Litoria/raniformis/>
- Growling Grass Frog Action Statement
<http://www.dse.vic.gov.au/DSE/nrenpa.nsf/LinkView/69770772A2A1F48BCA256FB300073432E7A24BB36FF60A144A256DEA00244294>

Notes for teachers

- This activity requires internet access for students to the above websites.
- The introductory activity involves students identifying the Ecolinc logo as a frog (Growling Grass Frog) and investigating reasons why a frog is a suitable logo for Ecolinc – frogs are good environmental indicators.
- Students record some key information relating to the Growling Grass Frog using the Growling Grass Frog website.
- Students then examine the causes of decline in a frog population using an interactive web-based program simulating a frog pond habitat.
- As part of the program students will:
 - analyse the water quality of a pond by testing dissolved oxygen, pH, temperature and total phosphorus on-line
 - build a food web to examine the relationships between the living things in the habitat
 - examine the predator/prey relationships for the life cycles of the frog, tadpoles and frog eggs
 - examine data and determine the major cause of decline in a frog population
 - construct an environmental evaluation report, by examining the data presented and detailing the major cause of decline in a frog population.
- Finally students will examine the current DSE Draft Flora and Fauna Guarantee Action Statement for the Growling Grass frog from the DSE web site and list some of the appropriate management strategies which could be used to conserve a frog population in a frog pond habitat.

Estimated Duration

- Introduction: 10 mins
- Frog Pond Habitat Decline Activity: 20 mins
- Preparation of electronic report: 10 mins
- Identification of management strategies 10 mins

FROGS - CONSERVATION

Introduction

1. Can you identify Ecolinc's logo? Why is this a suitable logo for an environmental centre?

In order to complete this activity, view the powerpoint presentation 'Frog Conservation' and one of the many web-sites providing information about the Growling Grass Frog e.g.

<http://frogs.org.au/frogs/species/Litoria/raniformis/>

The Growling Grass Frog has also been known as the green and golden frog, southern bell frog and warty swamp frog. Its scientific name is *Litoria raniformis*.

2. Once widespread, the Growling Grass Frog is now listed as 'endangered' by the Victorian Department of Sustainability and Environment (DSE). What has caused this once widespread frog to become endangered?

-
3. Where do growling grass frogs live? What do they eat?

-
4. Describe a growling grass frog's call.

-
5. Complete this sketch of a growling grass frog, indicating skin colour, (mainly green or brown), whether the back is smooth or bumpy, and the front and back limbs (showing the shape/width of toe pads and digits).



Growling Grass Frog

Environmental evaluation project – frog pond habitat

In order to find out why particular frog species have declined, data relating to the type of frog and their habitat must be collected and analysed.

In this activity you will use a web-based program to;

- analyse the water quality of a pond by testing dissolved oxygen, pH, temperature and total phosphorus
- build a food web to examine the relationships between the living things in the habitat
- examine the predator/prey relationships for the life cycles of a frog, tadpoles and frog eggs
- examine data and determine the major cause of decline in a frog population
- construct a report, by examining the data presented, detailing the major cause of decline in a frog population.

6. Use the internet to access the following website

http://www.cadre.com.au/showcase/tlf_frogpond/index.html

7. Read the introduction and answer the first 5 introductory questions. What are the likely causes of a declining population of frogs?

8. You will now compare the frog pond habitat over time comparing any visual differences you notice. Can you identify any major changes in the habitat that could be affecting the frog population?

9. Next you will test the water quality of the frog pond for dissolved oxygen, temperature, pH and total phosphorus. Follow the instructions and record your results in the table below.

	This year	1 year ago	2 years ago	3 years ago	4 years ago
Dissolved oxygen (mg/L)		6.3	8.0	8.0	11.0
Temperature (°C)		17.0	19.0	18.0	20.0
pH (0-14)		7.0	6.5	7.0	7.0
Total phosphorus (mg/L)		0.43	0.35	0.25	0.28

10. Has the water quality changed dramatically compared to previous years?

11. The next step involves investigating a food web in the frog pond to see the relationships between the living things in a habitat. You will include frogs, tadpoles and frog eggs.

List the animals that prey on frogs, tadpoles or frog eggs.

12. Use the population modeller to see what happens to the population of frogs if the populations of the other species change. Which species has the greatest long-term impact on the frog population, and at which part of its life cycle?

13. Use the population counter to count each species population then record this year's results in the table below.

	Frog	Tadpole	Eggs	Beetle larvae	Beetle	Dragonfly Larvae	Dragonfly	Egret	Tree Snake	Turtle	Trout	Mosquito Fish	Algae	Detritus
This year														
1 year ago	8	30	27000	70	13	56	11	3	2	3	17	21	√	√
2 years ago	11	80	38000	84	18	71	9	2	3	4	33	3	√	√
3 years ago	13	110	42000	76	17	63	12	5	4	5	30	-	√	√
4 years ago	15	120	45000	70	15	58	10	3	3	3	29	-	√	√

Can you identify any new frog predators or predators whose population has dramatically increased during the study period?

14. From the data you have collected, which of three possible causes for the decline of the frog population do you have evidence to support? Tick the correct option.

- a. Habitat loss
- b. Increased predation
- c. Water quality

15. Which predator do you think is the likely cause?

16. Which evidence supports this finding?

Complete the environmental evaluation project on-line and then print your report.

17. How would you manage the frog pond habitat in order for the frog species to recover?

18. Action statements are generally prepared for threatened species of animals and plants in order to conserve populations.

Locate the Draft Action Statement for the Growling Grass Frog by accessing the following website

<http://www.dse.vic.gov.au/DSE/nrenpa.nsf/LinkView/69770772A2A1F48BCA256FB300073432E7A24BB36FF60A144A256DEA00244294>

There are six objectives in the Action Plan with a number of action statements and targets.

Which of these objectives and actions would be applicable for managing a frog pond habitat?

