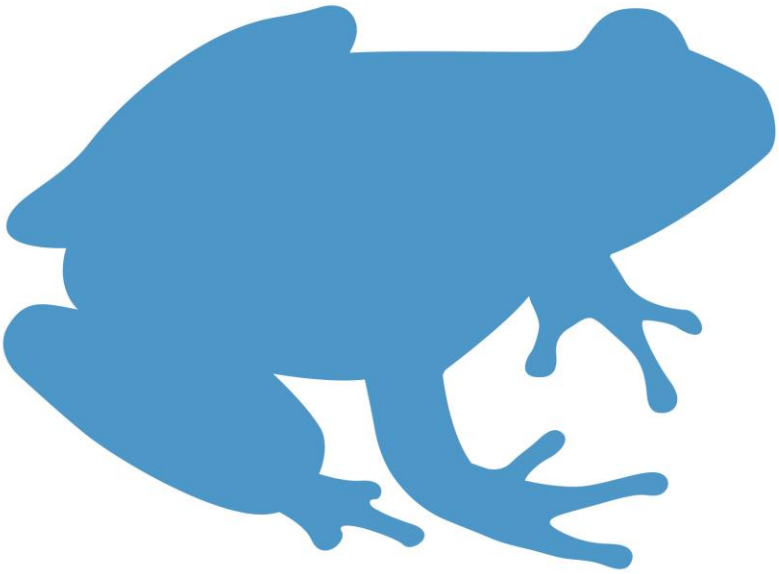

Module 5: 9-10

Saving our frogs - Science

Melbourne Water Frog Census

Melbourne Water
Enhancing Life and Liveability

Saving our frogs (Years 9–10)—Science

Lesson plan

Victorian Curriculum F–10[1] links:

Science

Levels 9 and 10

Science Understanding

Biological sciences

Ecosystems consist of communities of interdependent organisms and abiotic components of the environment; matter and energy flow through these systems (VCSSU121)

Introduction

Frogs provide a very useful context to teach ecological concepts. They play a key role in many aquatic ecosystems and the status of frog populations can be used as an indicator of the relative health of an ecosystem.

The following activities focus on the recovery of two threatened frog species: the closely related growling grass frog (*Litoria raniformis*) and the green and golden bell frog (*Litoria aurea*). An understanding of the biology and ecology of these frogs provides insights into how populations of these frogs should be managed to enhance their recovery.

These activities can be used individually or in sequence.

Activity 1: Why are the frogs disappearing?

Students work through the *Environmental evaluation project: frog pond habitat* learning object to learn about the ecology, threats and feeding relationships of green and golden bell frogs.

Activity 2: Conducting a frog census in our local area—excursion or at-home activity

Students participate as citizen scientists in the Frog Census by recording frog calls in a local frog habitat.

Activity 3: Growling grass frog feeding relationships and energy flow

Students create a food web using historical data from a growling grass frog habitat on the outskirts of Melbourne and explore matter and energy flow through this ecosystem.

Activity 4: Managing frog habitat in urban areas

Students use a scenario about the development of a residential area to make recommendations—as consultant ecologists—to government agencies about how impacts on a local growling grass frog population can be mitigated.

[1] Victorian Curriculum and Assessment Authority (VCAA) <http://victoriancurriculum.vcaa.vic.edu.au/> Accessed 1 February 2017.

Activity 1: Why are the frogs disappearing?

The Scootle learning object, *Environmental evaluation project: frog pond habitat* (TLFID L418), provides a useful tool to introduce ecological processes and biological monitoring techniques. This learning object is published under Creative Commons licence and is freely available from Scootle at <http://www.scootle.edu.au/ec/viewing/L418/index.html>.

Students investigate the factors that might be contributing to the decline of the green and golden bell frog in a wetland habitat. The learning object is valuable as:

- an introduction to ecological monitoring methods
- a review of hypothesis testing and food webs
- an overview of the biology and ecology of these frogs.

Students can work through this learning object either individually or in pairs. Alternatively, you could use it as a whole-class activity.

Equipment

Computer or digital device with a digital projector or interactive whiteboard for whole class discussions

Whiteboard

Computers or devices for student use, either individually or in pairs

Activity steps

1. Ask students to share their experiences with frogs in your local area. You could ask prompting questions such:

   How can you find frogs?

   Where have you seen or heard frogs?

   What sorts of habitats are frogs found in?

   What is the life cycle of a frog?

   What factors might affect the survival of frogs?
2. On the whiteboard, begin a class list of factors that can affect the survival of frogs. You can build on this list in the subsequent activities.
3. Explain that while there are over 200 species of frogs in Australia, at least four species have become extinct in the last 40 years and more than 32 species of frogs are classified as endangered or critically endangered.
4. Introduce the learning object *Environmental evaluation project: frog pond habitat* and explain the purpose of the activity and the learning object. You may need to demonstrate how to begin.
5. Students work through the learning object and record the factors that could impact on the frog populations.
6. To finish, review the key ideas covered in the learning object and add other factors that might affect the survival of the green and golden bell frog to the list mentioned in Step 2. Explain that more recent research indicates that while predation by mosquitofish may be a factor in the decline of the green and golden bell frog, it may

only significantly affect those populations already under pressure from other factors such as lack of food or disease such as the chytrid fungal disease. Refer to the *Case study—The Kooragang Island green and golden bell frog project* (Worksheet 1).

Additional activity

Students or the class could discover more about the green and golden bell frog using the Atlas of Living Australia at <https://www.ala.org.au/>. Select the orange Browse species button and type the name of the frog (common or scientific) into the search box.

Some students might be interested in exploring some of the issues that arise from the use of artificially created habitats to enhance the survival rates of some threatened frog species (Worksheet 1).

Worksheet 1

Case study—The Kooragang Island green and golden bell frog project[2]

The endangered green and golden bell frog (*Litoria aurea*)—a close relative of the growling grass frog—has disappeared from over 90% of its historical range in south-eastern Australia. Using both habitat creation and breed and release programs, a significant effort has been put into the recovery of this frog. However, the success rate for these programs is low. One of these habitat creation projects was evaluated to determine the factors that contributed to breeding failure in the created habitat.

To do this a team of biologists compared the created habitat with natural ponds where existing natural frog populations bred or didn't breed. The created habitat is located on Kooragang Island on the outskirts of Newcastle in New South Wales.

They found that 'the vegetation and invertebrate diversity were low within the created habitat, potentially reducing energy and nutritional resources required for breeding'[2]. Reproduction typically requires a lot of energy and only healthy populations with an ample food supply are usually successful. While the green and gold bell frog continued to live and grow in the created habitat, they did not breed during the three and a half years of monitoring by the researchers.

Another reason for the lack of breeding may have been the lack of calling by male frogs. Female frogs are often stimulated into reproductive readiness by males calling. Calling requires substantial energy expenditure on the part of the male frogs. The lack of food sources in the created ponds could have affected the frogs' energy levels.

The study also found a greater incidence of a potentially fatal disease caused by the chytrid fungus in frogs in the created habitat compared to wild populations: possibly because the frogs had less food which affected their immune system's ability to fight infection.

The biologists monitored the presence of invasive mosquitofish in the created habitat and natural ponds. They found that the mosquitofish co-occurred with frog tadpoles in the natural ponds and stated that the fish had minimal impact on green and golden bell frog breeding within the created habitat. They did, however, note that it was important to exclude predatory fish from re-introduction sites to improve the survival rate of green and golden bell tadpoles.

To address these issues the researchers recommended that future projects:

- plant a variety of plant species known to attract invertebrates as a food source for the frogs at all stages of development to improve reproduction and immune function
- create some permanent ponds for breeding
- build the created habitat close to existing frog populations to aid colonisation
- trial the use of artificial mating calls
- use techniques which reduce the prevalence of chytrid fungal disease.

[2] Klop-Toker, K, Valdez J, Fardell L, Clulow J, et al. 2016, We made your bed, why won't you lie in it? Food availability and disease may affect reproductive output of reintroduced frogs. *PLoS ONE*, 11(7): e0159143. doi:10.1371/journal.pone.0159143 <http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0159143>

Activity 2: Conducting a frog census in our local area—excursion or at-home activity

Giving students the opportunity to explore their local environment provides benefits on many levels. There is an increasing volume of literature which suggests that interaction with the natural environment—even impacted urban environments—leads to improved well-being and both cognitive and behavioural function and development[3].

In this activity, students and their families have the opportunity to be citizen scientists: collecting meaningful and useful data for the Frog Census, an initiative managed by Melbourne Water.

Melbourne Water is responsible for 8400 kilometres of rivers and creeks as well as important wetland habitats in the greater Melbourne region and is committed to protecting and enhancing animal and plant habitats for the future. The management decisions it makes need to be based on accurate information.

Conducting an evening Frog Census excursion to a local frog habitat site is a great way to interact with your local environment. While the frogs themselves may be difficult to find, in breeding season they are easily heard.

Using the Frog Census app or another recording device, students record frog calls and identify the frogs and gain an appreciation of the ecology of their habitat. They gain first-hand experience of the impacts of humans on urban wetlands.

Ensure you follow all school excursion and health and safety guidelines.

Alternatively, students could also monitor frogs with their parents as an at-home activity.

Information about how and when to conduct a frog survey, organise a school monitoring program, prevent the spread of frog disease and stay safe are included in the *Frog Census Handbook for Schools* available from <https://www.melbournewater.com.au/getinvolved/protecttheenvironment/Pages/Frog-Census.aspx>

The Frog Census app, developed by Melbourne Water, makes frog monitoring easy and provides a great opportunity for Melbourne students to contribute to this important citizen science project (<https://www.melbournewater.com.au/getinvolved/protecttheenvironment/Pages/Frog-Census.aspx>). The app can be used on both Apple and Android devices.

Alternatively, you can download resources from the Melbourne Water Frog Census web page above. Students can record frog calls and send the Frog Census datasheet and sound files to Melbourne Water as per the instructions on the web page.

[3] This paper is just one of many available online:
De Young, R et.al. 2017, Some psychological benefits of urban nature: Mental vitality from time spent in nearby nature. In Columbus, AM (Ed) *Advances in Psychology Research 116*, Chapter 4, Nova Science Publishers, Hauppauge, NY, pp. 93–120. Available from <https://deepblue.lib.umich.edu/handle/2027.42/136087 >

For more information about how to prepare students for this excursion, go to *Activity 2: Identifying our frogs—excursion or at-home activity* in the Years 7–8 Frog Census Module.

Useful links

Waterbug Census—Melbourne Water

Waterbugs (macroinvertebrates) are also useful biological indicators and students can be citizen scientists by monitoring waterbugs for Melbourne Water's Waterbug Census. This data is important for ongoing research and water management. For more information about the Waterbug Census go to https://www.melbournewater.com.au/getinvolved/protecttheenvironment/Pages/Waterbug-Census.aspx

***Macroinvertebrates as biological indicators* activity (Year 9–10)—Melbourne Water Story**

This activity outlines how students can collect, identify macroinvertebrates and analyse the data to determine the health of the waterway. It can be found on the Melbourne Water Story website at <http://waterstory.melbournewater.com.au/educate/year-9-10>.

Platypus Census—Melbourne Water

Melbourne Water also runs a Platypus Census program with its own platypusSPOT app. For more information go to <https://www.melbournewater.com.au/getinvolved/protecttheenvironment/Pages/Platypus-Census.aspx>

Activity 3: Growling grass frog feeding relationships

Growling grass frog populations are under threat, particularly in urban areas such as Melbourne. Understanding the feeding relationships that affect growling grass frogs is critically important when considering how to manage existing populations to enhance the chances that this frog will survive and thrive.

In this activity, students create a food web based on historical data gathered in a growling grass frog habitat on the outskirts of Melbourne. This food web can be analysed to identify composition of the trophic levels and the flows of energy and matter in this ecosystem. It also provides information about possible threats to the frog population to provide insights into how these threats could be managed.

Equipment

Computer or digital device with a digital projector or interactive whiteboard for whole class discussions

Whiteboard

Computers or devices for student use, either individually or in pairs

Energy flow in the soil video [6:11] in Part 5 of the *Student Digital* resources in the Science by Doing *Ecosystem and change* resources at <https://www.sciencebydoing.edu.au/curriculum/teacher/resources/ecosystems-and-change>. See *Useful resources* below.

For each pair:

- One copy of the *Feeding relationships in growling grass frog habitats* (Worksheet 2)
- A4 sheets of paper for labels
- Pens
- Pencils
- Eraser
- Glue
- One A3 sheet of paper

Activity steps

Feeding relationships

1. Begin by reviewing student ideas about the different ways that organisms interact in an ecosystem e.g. predation, prey, parasitism.
2. Explain that populations of the growling grass frog are declining rapidly in the Melbourne area and biologists are monitoring existing frog habitats to identify those factors that are critical for growling grass frog survival.
3. Explain that biologists make sense of the complex feeding relationships in an ecosystem by drawing a food web. Using the *Feeding relationships in growling grass frog habitats* (Worksheet 2), pairs create a food web including the growling grass frog based on historical data from Pakenham on the outskirts of Melbourne.

You can find instructions about how to create a food web from the *Years 7–8 Lesson plan Activity 3: Frogs and food webs*. This activity might be a useful alternative activity for some students. It describes the feeding relationships of another frog (the eastern common froglet) in the Edithvale Wetlands.

The Years 7–8 activity also includes information about sourcing fauna and flora symbols from the free online Integration and Application Network (IAN) image library at <http://ian.umces.edu/imagelibrary/> that could be used to make a pictorial food web. It provides an alternative activity in which students could create a digital food web using the IAN image library.

Energy cycle

4. Students share their food webs with the class. Discuss the different roles that organisms play in a food web e.g. producer, first order consumer, second order consumer and decomposers. Ask the students to design a table to classify the organisms in their food web.
5. Discuss how energy and matter flows through the food web. The video, *Energy flow in the soil* [6:11] provides a useful overview for this topic. Explain that organisms need enough energy to survive, grow and reproduce. Ask students to predict what factors would reduce the amount of energy and matter (food) that growling grass frogs would receive if there were changes to that habitat.

   The *Case study—The Kooragang Island green and golden bell frog project* (Worksheet 1) provides an interesting illustration about the importance of ensuring that green and golden bell frogs have the variety of food sources they require in a created habit to provide sufficient energy for breeding.

Useful links

***Ecosystems and change* unit (Year 9)—Science by Doing**

This valuable resource covers both body systems and ecosystems and includes lots of student activities and experimental investigations. The unit and support resources can be freely accessed from Scootle or Fuse. Alternatively, teachers can download the resources from the Science by Doing website by registering using your school email address. This unit can be found at:
<https://www.sciencebydoing.edu.au/curriculum/teacher/resources/ecosystems-and-change>

***The nitrogen cycle at the sewage treatment plant* activity (Years 9 and 10)—Melbourne Water**

In this activity, students investigate another matter cycle (nitrogen) using the real-world context of a sewage treatment plant. It explains how students can design an experiment to test the effect of different nitrogen compounds on plant growth. It can be found on the Melbourne Water Story website at <http://waterstory.melbournewater.com.au/educate/year-9-10>.

Worksheet 2

Feeding relationships in growling grass frog habitats

The growling grass frog (*Litoria raniformis*) was once common across south-eastern Australia. However, populations of the frog have been in serious decline since the early 1990s. Growling grass frogs can still be found in a range of habitats around both natural and man-made waterbodies. In fact, some relatively large local populations can still be found around disturbed or man-made waterbodies such as the ponds at the Werribee Sewage Treatment Plant[4].

Ecologists have studied existing growling grass frog habitats in areas such as Pakenham on the outskirts of Melbourne[5] to understand how best to conserve and re-establish the frogs. They aim to identify key factors that enhance the quality of frog habitats.

Clearly feeding relationships are important for growling grass frog survival, growth and reproduction: what they eat and what eats them. The following information was collected from the Atlas of Living Australia (http://www.ala.org.au/) and represents a pond habitat in the Pakenham area in the summer of 2008.

Use this information to design a food web which shows the feeding relationships for growling grass frogs and the other organisms in that habitat. Use the plants and animals highlighted in bold.

Life in a Pakenham pond

Growling grass frog **tadpoles** live amongst the submerged **water plants**, feeding on the **algae** that grow on the plants. They also eat strands of floating algae.

The adult **frogs** move between ponds and shelter in the reeds around the edge of the ponds. Growling grass frogs are large frogs which eat a variety of terrestrial (dry land) **insects** such as cockroaches, beetles and moths. They also eat small **lizards**, **fish** and even other frogs.

Freshwater **snails** are omnivorous but mostly feed on the algae on the submerged water plants and on the plants themselves. Sometimes they scavenge on the **detritus** (dead plant and animal material) on the bottom of the pond. The snails are eaten by carnivorous eastern long-necked **turtles**. The turtles also eat tadpoles, frogs, small fish and crayfish (yabbies). **Crayfish** feed on anything they find on the bottom of the pond including detritus and water plants.

Macroinvertebrates (waterbugs) such as **water boatmen** swim near the surface of the pond. Water boatmen usually eat small pieces of detritus but will occasionally hunt tadpoles. The detritus is decomposed by **bacteria** and **fungi**.

A lowland copperhead **snake** lurks around the pond catching frogs and lizards. The common garden skink is one of the lizards that lives near the pond. It eats **insects** and other invertebrates (animals without a backbone).

[4] Melbourne Water 2016, *Record number of Growling Grass Frogs at Western Treatment Plant*, <https://www.melbournewater.com.au/aboutus/news/pages/record-number-of-growling-grass-frogs-at-western-treatment-plant.aspx > Accessed 25 February 2017.
[5] Hamer, AJ & Organ, AK 2008, Aspects of the ecology and conservation of the Growling Grass Frog *Litoria raniformis* in an urban-fringe environment, southern Victoria, *Australian Zoologist, vol.* 34 (3), pp. 393–407. <http://publications.rzsnsw.org.au/doi/pdf/10.7882/AZ.2008.017?code=rzsw-site>

Birds such as the Australian wood **duck** visit the pond to eat shallow water plants and to graze on the surrounding grass. They also occasionally eat insects.

Introduced predators like foxes, feral **cats** and pet cats are a serious threat to wildlife; they eat a wide range of pond animals including frogs, lizards and fish.

Mosquitofish[6] [7] (*Gambusia*) are small fish introduced to Australia in 1925 to control mosquitoes. That didn't work. But the fish quickly spread across all states except the Northern Territory and are now a significant threat to aquatic ecosystems. Their diet includes tadpoles and macroinvertebrates.

[6] Australian Museum 2016, Eastern Gambusia, *Gambusia holbrooki* Girard, 1859, <https://australianmuseum.net.au/eastern-gambusia-gambusia-holbrooki-girard-1859>, accessed 26 February 2017.
[7] Department of the Environment 2017, *Litoria raniformis in Species Profile and Threats Database, Department of the Environment, Canberra*, available from <http://www.environment.gov.au/sprat>, accessed 26 Feb 2017.

Activity 4: Managing frog habitat in urban areas

Urban development is a threat to many species including frogs. The decline of growling grass frogs in Melbourne provides an important case study to develop student understanding about the complex ecological processes involved in the local extinction of frog populations. Using a scenario about the development of a residential area, students—in the role of an ecologist—make recommendations to government agencies about how impacts on a local growling grass frog population can be mitigated.

Equipment

Computer or digital device with a digital projector or interactive whiteboard for whole class discussions

Whiteboard

For each pair:

One copy of the *Growling grass frogs in urban Melbourne* (Worksheet 3)

Activity steps

1. Explain that native frog populations are declining around Melbourne. Ask students to suggest reasons for this decline and make a class list on the whiteboard.
2. Highlight the plight of the growling grass frog in the Greater Melbourne region and display the following scenario on the board:

   > Imagine you are ecologists working as consultants. A new residential development is planned for an area on the outskirts of Melbourne. It is adjacent to a wetlands system where growling grass frogs have been found. The wetland system surrounds a creek and has a large permanent water hole and four semi-permanent ponds.
   >
   > In 2002 the growling grass frog was declared endangered under the Victorian Flora and Fauna Guarantee Act 1988 and a conservation strategy was developed for this species to ensure that populations are protected in the Melbourne region.
   >
   > You have been asked to make recommendations to the relevant government agencies and Melbourne Water about how best to minimise the impact of the development on the existing growling grass frog population.
   >
   > Use the *Growling grass frogs in urban Melbourne (Worksheet 3)* fact sheet to develop your recommendations and justify each recommendation. For example, additional ponds should be built near the large permanent pond. This will provide additional habitat for adult frogs as they move around their habitat.
3. As a class, brainstorm a list of focus questions that would need to be answered to complete this task.
4. Decide how you would like the students to report. For instance, they could make a dot point list of recommendations or add their recommendations to an annotated map of a theoretical (or actual) wetland system near Melbourne. In any case, students need to justify each recommendation.
5. Students work on this task in pairs or in small groups. To start the task, you could recommend that students work through the fact sheet and put a line through those risk factors that they could not mitigate.

6. At the end of the task, student groups report their findings and reasoning to the class.

Extension activity

There is a lot of online information on this topic (see Useful links below) and students interested in delving deeper into this topic could develop a more sophisticated and specific list of recommendations or could focus on a real case study of an area soon to be developed.

Resources

The following resources relate to the biology and conservation of growling grass frogs in urban Melbourne.

State Wide Integrated Flora and Fauna Teams 2017, *Growling grass frog*, <http://www.swifft.net.au/cb_pages/growling_grass_frog.php>, accessed 24 February 2017.

Museums Victoria. *Growling grass frog, Litoria raniformis* <https://museumvictoria.com.au/discoverycentre/infosheets/frogs-of-victoria/growling-grass-frog/>, accessed 1 February 2017.

Parris, K, *It's not easy being green… in the city*, posted August 6, 2012, <https://kirstenparris.com/2012/08/06/its-not-easy-being-green-in-the-city/>, accessed 1 February 2017.

Clemann, N & Gillespie, GR 2012, *National Recovery Plan for the Southern Bell Frog Litoria raniformis,* Victorian Government Department of Sustainability and Environment, <https://www.environment.gov.au/system/files/resources/9b960bf4-cc03-4ee9-b1a4-b80494662f64/files/litoria-raniformis.docx>, accessed 14 March 2017.

Ecology and Heritage Partners Pty Ltd 2011, *Sub-regional Growling Grass Frog Litoria raniformis Conservation Strategy within the Revised Urban Growth Boundary and 28 precincts*: *Technical background and guidelines*, <http://www.depi.vic.gov.au/__data/assets/pdf_file/0005/309218/EHP-Sub-regional-GGF-strategy-within-the-revised-UGB-and-28-precincts-technical-background-Nov-2011-PART-A.pdf>, accessed 13 March 2017.

Hamer, AJ and Organ, AK 2008, Aspects of the ecology and conservation of the Growling Grass Frog *Litoria raniformis* in an urban-fringe environment, southern Victoria, *Australian Zoologist,* vol. 34 (3), pp. 393–407. <http://publications.rzsnsw.org.au/doi/pdf/10.7882/AZ.2008.017?code=rzsw-site>.

Heard, G, Scroggie, M & Clemann, N 2010, *Guidelines for managing the endangered Growling Grass Frog in urbanising landscapes*, <http://www.swifft.net.au/resources/GGF_Guidelines.pdf>.

Worksheet 3

Growling grass frogs in urban Melbourne

Fact sheet

Despite the impact of development, Melbourne still retains significant habitat for many species—including frogs. 16 species of frog have been found in the Greater Melbourne area. The largest of these is the growling grass frog (*Litoria raniformis*): a large green frog with a warty back that is active during the day as well as at night.

Threats

This frog was once common and widespread throughout south-east Australia including Tasmania. However, populations of the growling grass frog have suffered significant declines since 1990 because of factors such as habitat destruction, long-term drought, fire and the spread of infection by the chytrid fungus. The chytrid fungal disease has caused rapid declines in frog species globally and is thought to play a key role in the decline of growling grass frogs.

Much of the growling grass frog habitat has been lost to residential and industrial development and existing habitats have been fragmented or degraded resulting in the extinction of many local frog populations. Many of the populations that remain are found in areas still under threat from future development.

Frog eggs and tadpoles are eaten by introduced fish such as mosquitofish, trout and carp. Predation by the introduced mosquitofish may be a factor in the decline of growling grass frog populations, especially when they are faced with other environmental stresses such as unhealthy habitats. Both the red fox and cats are efficient predators of frogs.

Frogs have a special semi-permeable skin; this means certain substances like water and oxygen can pass through it. So they are particularly vulnerable to the presence of toxic pesticides and other pollutants from sources such as stormwater runoff. Also, because growling grass frogs bask in the sun, their skin may be damaged by higher ultra-violet radiation levels linked to climate change.

Habitat

Growling grass frogs are found in a wide variety of waterbodies, both permanent and semi-permanent. Research into growling grass frog habitats around Melbourne indicates that populations of frogs are more likely to occupy sites that are wetland systems with a range of still or slow-moving waterbodies such as lakes, ponds, dams, disused quarries and wetlands.

These wetland systems should include at least one large, deep permanent waterbody with good aquatic vegetation (water plant) cover and a number of close semi-permanent waterbodies to allow frogs to migrate. The semi-permanent ponds would need to retain water long enough in the breeding season for tadpoles to develop into frogs.

Growling grass frogs require three types of aquatic vegetation: floating, submerged and emergent. Adult males call from ‘rafts’ of floating water plants during the breeding season and the plants also provide cover for the tadpoles. Similarly submerged water plants protect tadpoles from predators. The tall emergent vegetation is found around the edge of the wetlands and provides protection and food for adult frogs.

Rocks, logs and dense vegetation at ground level—such as reeds and grasses around wetlands—provide cover, food and overwintering sites for growling grass frogs. The frogs also use patches of bare ground and rocks for foraging over land.

Growling grass frogs require habitat with good water quality with low levels of nutrients (nitrates and phosphates), low salinity levels and low turbidity (clear water).

Ecology

Growling grass frogs feed and move around at night during the warmer months. The species has been recorded migrating between wetlands so that if a population disappears from one wetland, individuals can recolonise an adjacent wetland—if it is a suitable habitat.

In the breeding season, the frogs tend to breed in some ponds and use other ponds for feeding. The survival of a population of frogs may be dependent on the movement of adult frogs between waterbodies—breeding and non-breeding. Barriers to movement such as fences, roads and development may adversely affect the viability of the population. Also, the construction of roads across a wetland system not only disrupts frog migrations, it can lead to road kills.

Growling grass frogs migrate between wetlands using habitat corridors to allow them to move safely. They shelter in the reeds around the edge of the ponds and under logs, debris and rocks in the area around the wetlands.

Male frogs call at night to attract mates from August to March but breeding usually only occurs between November and March, depending on the weather conditions. The males call while floating in the water. The females lay their eggs in a loose mass amongst floating and submerged water plants.

Growling grass frog tadpoles live amongst the submerged water plants, feeding on strands of floating algae and on the algae that grow on the plants.

The frogs overwinter beneath thick vegetation, logs, rocks and other debris.

Growling grass frogs eat a variety of terrestrial (dry land) insects such as cockroaches, beetles and moths. They also eat small lizards, fish and even other frogs. In turn, growling grass frog tadpoles are eaten by fish and insects such as water boatmen. The adult frogs are prey for snakes, and introduced foxes and feral cats.