

National Water Week Community

Frogwatch

Census Kit



Plains Froglet



Brown-striped Frog



Spotted Burrowing Frog



For more information contact the ACT & Region Frogwatch Coordinator at
the Ginninderra Catchment Group
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The ACT and Region Frogwatch Program is assisted by the Australian Government's
Caring For Our Country program and the ACT Government.



Australian Government

National Water Week Community Frogwatch Census Kit. Compiled by Dr Beth Mantle and produced by the Ginninderra Catchment Group for the ACT and Region Frogwatch Program, 2008.

Printed on 100% recycled paper. Cover photos: *Crinia parinsignifera* (Beth Mantle), *Limnodynastes peronii* (Lesley Alton) & *Neobatrachus sudelli* (John Wombey).



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About Frogwatch



What is Frogwatch?

Frogwatch is a community frog monitoring program that involves large numbers of volunteers of all ages to undertake frog monitoring and protect frog habitats.

In National Water Week, the 3rd week of October each year, over 250 Frogwatch participants monitor frog populations at approximately 140 sites around the ACT and Region. Frogwatch participants attend a training seminar where they learn all about the fascinating world of frogs, how to monitor them, and ways to help protect them and their habitats. Frogwatch monitoring can be done all year round, but the focus is on National Water Week in October each year. This is when the majority of ACT frog species tend to be actively calling and mating.

Why monitor frogs?

Frog species are widely recognised as indicators of environmental health and their presence can indicate good water quality and the availability of high quality habitat. Conversely, the absence or decline of frog populations can indicate unhealthy or degraded catchments.

Frogs are useful as a monitoring focus for a number of reasons:

- Frogs are sensitive to high concentrations of pollutants such as pesticides, detergents and industrial chemicals.
- Their eggs are 'naked' (i.e. they do not have a shell), and adult frogs have permeable skin, through which they 'drink' and breathe. This means that any toxic substances polluting a waterway or landscape will easily penetrate into the frogs' system.
- As frogs require water to breed, we can assume that a waterway inhabited by frogs is relatively free of toxic pollutants.
- Each species has a distinctive mating call that is relatively easy to learn and recognise. This means we can easily get an indication of the diversity and approximate abundance of breeding frog populations, without disturbing them.

Frogwatch Census Information

The Frogwatch program generates important information about the presence and approximate abundance of frog populations in the ACT and Region, and includes observations about habitat, vegetation and weather conditions.

The Frogwatch monitoring strategy has been developed in collaboration with expert staff from the ACT Government and the University of Canberra, and has been designed to compliment their existing professional monitoring program. All Frogwatch data is verified by the Frogwatch Coordinator using audio recordings, and any unusual, rare or difficult identifications are also verified by our expert technical advisors.

The data that we generate is used by a number of groups including:

- Community and Catchment Groups;
- ACT Government Wildlife Research and Monitoring Unit;
- Teachers and Students;
- ACT Commissioner for the Environment - State of the Environment Reporting.

The Community Frogwatch Census Report

An annual report is produced that presents the results of each spring census. The report includes simple maps of presence or absence of frog species along with an estimate of abundance.

Analysis of the data is currently limited to describing the occurrence and estimated abundance of each species. As a bank of information is built up, a more rigorous analysis of the data will be possible and trends may be able to be identified.

You can download copies of our past Frogwatch Reports from: www.ginninderralandcare.org.au

Frogwatch Training Events

Frogwatch training events are held in September and October in the lead up to the National Water Week Frogwatch Census, each year. Training events encompass the “Introductory Seminar” and “Field Trip”.

In an **Introductory Seminar**, participants are introduced to:

- Frog species of the ACT and their habitat requirements;
- Mating calls of local frog species and identification techniques;
- Procedures for preventing the spread of frog pathogens;
- Procedures for undertaking and recording Frogwatch observations; and
- Basic safety guidelines.

Seminars also include a short walk to a nearby pond, to practice our frog identification skills.

Frogwatch **Field Trips** are aimed at experienced Frogwatchers, who would like to further develop their identification and monitoring skills. Participants in the field trips will have the opportunity to investigate important components of frog habitat, build on their monitoring skills, and talk with expert ecologists in the field.

Details of the training events are posted to the Frogwatch email list and the Ginninderra Catchment Group website as they are arranged. To add your name to the Frogwatch email list, contact the Frogwatch Coordinator.

The Frogwatch Kit

This Kit contains all the information you need to participate in the annual Census. It is available to participants at all Frogwatch Training Events, and from the Frogwatch Coordinator on request.

The Kit includes information about procedures for participating in the Frogwatch Census, and about our local frog species and how to identify them. The Kit includes an audio CD of the mating calls of local frog species, and a thermometer which is used to take Frogwatch observations.

You will need to make an audio recording of the frog calls you hear. Most portable tape recorders or digital MP3 players with a voice record option will make a good enough recording. If you don't have either of these, you may be able to borrow one from the ACT Frogwatch Coordinator.

Frogwatch in the Classroom

The Ginninderra Catchment Group also conducts a Frogwatch Education Program for school and community groups. To find out more information, contact the Frogwatch Coordinator.

About the Ginninderra Catchment Group and the ACT NRM Network

The Ginninderra Catchment Group is an incorporated umbrella group of community volunteers working in the water catchment of the Ginninderra Creek.

The primary focus of the Group is advancing the health of the Ginninderra Catchment through effective engagement with government, agencies, business, schools and the catchment community. We have a strong commitment to community education and capacity building and seek to create diverse opportunities for people to become involved in catchment management, decision-making and on-ground action.

We are one of three Catchment Groups operating in the ACT region, alongside the Molonglo Catchment Group and the Southern ACT Catchment Group.

Our Goals

The Ginninderra Catchment Group works with all catchment stakeholders to:

- Create ecosystems that accommodate human settlement but reduce the impacts and their effects on environmental systems;
- Restore and maintain as much of the natural setting as possible within an urban environment; and
- Ensure more systematic, catchment wide sustainable environmental outcomes from the activities of volunteers.

Get Involved!

You can make a difference and help our environment. The ACT Natural Resource Management Network provides a wide range of volunteering opportunities for people from all walks of life, with different interests and skills. A range of flexible volunteering roles exist such as:

- Landcare;
- Waterwatch;
- Frogwatch;
- and more - let us know what you would like to do!

Find out More - Contact your local Catchment Group for more information:

Ginninderra Catchment Group – Belconnen, Gungahlin, Hall and Wallaroo

www.ginninderralandcare.org.au

- Julie Palmer, Catchment Coordinator, 02 6278 3309, landcare@ginninderralandcare.org.au
- Dr Beth Mantle, Waterwatch Coordinator, ACT & Region Frogwatch Coordinator, 6278 3309, waterwatch@ginninderralandcare.org.au

Southern ACT Catchment Group – Woden, Weston Creek, the Cotter, Tuggeranong and Tharwa

www.sactcg.org

- Steve Welch, Catchment Coordinator, 6296 6400, info@sactcg.org
- Dr Stephen Skinner, Waterwatch Coordinator, 6296 6400, waterwatch@sactcg.org

Molonglo Catchment Group – Mitchell, Canberra Central (inner north and south), Queanbeyan, and region

www.molonglocatchment.com.au

- Catchment Coordinator, 6128 3376, coordinator@molonglocatchment.com.au
- Waterwatch Coordinator, 6242 1191, waterwatch@molonglocatchment.com.au

The Frogwatch Monitoring Strategy



What is Frogwatch?

Frogwatch provides training, education, resources and monitoring support for community volunteers to undertake frog monitoring. The data collected by Frogwatch volunteers is verified, collated and reported back to the community and other stakeholders, to provide valuable information about frog populations in the ACT and Region.

1. WHY ARE WE MONITORING?

AIM: To conduct a community Frogwatch Census in the ACT and Upper Murrumbidgee Region that will generate significant information about the presence and abundance of frog populations.

OBJECTIVES

Census Information Objectives

- Increase understanding of frog distribution and abundance;
- Increase knowledge and understanding about the health of our wetlands, waterways;
- Monitor the impacts of bushfires and drought on our local ecosystems and catchments;
- Monitor the impacts of bushfires on local wildlife and track recovery rates;
- Provide supplementary information to the ACT Government's Wildlife Research and Monitoring Unit's professional frog monitoring program;
- Continue the collection of important frog monitoring data to enhance previous studies.

Community Capacity Building Objectives

- Provide an exciting, hands-on opportunity for community members to engage in natural resource management (NRM);
- Provide opportunities for community involvement in wildlife monitoring;
- Provide Waterwatch and CAMPFIRE (Community Assessment Monitoring Program for Fire Impacted River Ecology) groups the opportunity to broaden their monitoring activities;
- Increase community capacity to understand a range of important environmental issues such as biodiversity, problems of introduced species, water quality, habitat loss and other impacts on natural ecosystems;
- Facilitate community monitoring and evaluation of NRM on-ground works, e.g. wetland development, willow removal and revegetation projects;
- Increase awareness of frog populations and their habitat requirements;
- Ensure that Frogwatch participants do not contribute to the spread of frog pathogens.

2. WHO WILL USE OUR DATA AND HOW WILL IT BE USED?

Secondary Users	ACT Government - Wildlife Research and Monitoring	<ul style="list-style-type: none"> To provide supplementary data to existing professional frog monitoring programs.
	Teachers and Students	<ul style="list-style-type: none"> To provide research and learning opportunities for primary, secondary and tertiary students.
	ACT Commissioner for the Environment	<ul style="list-style-type: none"> To contribute to State of the Environment Reporting.
Main Users	Regional community natural resource management groups eg. Catchment Groups.	<ul style="list-style-type: none"> To generate knowledge and understanding about local frog populations, water quality and catchment health; To track changes in frog populations on a regional scale; To facilitate on-ground projects, particularly with respect to developing or restoring frog habitats; and To evaluate the effectiveness of these projects.

3. WHAT WILL WE MONITOR?

Parameter	How will this fulfill our objectives?	Importance?
Frog species detected	<ul style="list-style-type: none"> Provide indication of presence or absence of particular species of breeding frog populations. Establish records to identify medium term (5 to 10 years) changes in frog populations. 	Critical
Number of frogs present	<ul style="list-style-type: none"> Provide indication of abundance of each species. Establish records to identify medium term (5 to 10 years) changes in frog populations. 	Critical
Habitat	<ul style="list-style-type: none"> Provide explanation or context for above results 	Background
Vegetation	<ul style="list-style-type: none"> Provide explanation or context for above results 	Background
Weather	<ul style="list-style-type: none"> Provide explanation or context for above results 	Background
Site Drawing	<ul style="list-style-type: none"> Provide explanation or context for above results Enable correct location of the monitoring site from year to year 	Background
Site Photograph	<ul style="list-style-type: none"> Provide explanation or context for above results 	Background

4. WHAT DATA QUALITY DO WE WANT?

The program requires a high level of data confidence for assessing frog diversity and abundance. For Frogwatch data to be considered of high quality, the following measures are enforced.

- All volunteers participate in an annual Frogwatch Training Seminar.
- Monitoring should take place at some time during the 2 hours after dark.
- For comparable results monitoring at all Frogwatch sites should occur on at least one evening during **National Water Week, 19 - 25 October 2008**. It is also recommended that for Key Sites, monitoring should occur on at least three evenings during this week.
- Extra monitoring dates should occur during the month of October.
- If monitoring at an existing Frogwatch site, monitoring should occur at the exact same location as in previous years.
- Audio recordings of frog calls are to be taken. These recordings along with **completed Field Data Sheets are to be submitted to the Frogwatch Coordinator by Friday 14th November, 2008**.
- All audio recordings will be checked by the Frogwatch Coordinator for accuracy of identification. Any difficult or unusual recordings will be referred to expert technical staff for verification.

5. WHAT METHODS WILL WE USE?

Frog calls will be monitored by community volunteers at locations across the ACT and Region during October. Frog calls will be recorded using a portable audio tape recorder or digital MP3 voice recorder, and other relevant observations will be recorded onto the specified Field Data Sheets. Volunteers will then **return both the audio recordings and Field Data Sheets to the Frogwatch Coordinator by Friday 14th November 2008** for confirmation of results and data storage.

6. WHERE WILL WE MONITOR?

There are 30 Key Frogwatch Sites that have been prioritised to ensure consistent and comprehensive monitoring of these sites from year to year. Frogwatch monitoring can also be conducted at over 100 other sites around the ACT and Region.

Participants are encouraged to monitor at one of the *Key Frogwatch Sites* if possible, in order to ensure that they are monitored effectively each year.

A list of the Key Frogwatch Sites is available from the Frogwatch Coordinator.

Frogwatch participants may also choose a site that has an intrinsic value to the program. For example a Waterwatch monitoring site, a newly constructed wetland or backyard pond, an environmentally sensitive area, waterway restoration site or proposed restoration site, farm dam, local creek or waterway, or a site of personal interest.

Participants are encouraged to monitor at the same site each year, or at one of the established Frogwatch sites if possible.

Safe access at night time is essential when choosing a Frogwatch site!

7. WHEN AND HOW OFTEN WILL WE MONITOR?

To be included in the 2008 Frogwatch Census Report, monitoring must take place during the following time period:

	Season	Dates	Time of day	How often	Duration
Key Frogwatch Sites					
Minimum monitoring	Spring	19 - 25 October (National Water Week) 2008	During the 2 hours after dark.	On at least THREE evenings during National Water Week.	Audio recording of frog calls for 2 - 5 minutes.
Extra monitoring	Spring	1 - 31 October 2008	During the 2 hours after dark.	Monitoring at the same site on a number of evenings during the specified dates is desirable.	Audio recording of frog calls for 2 - 5 minutes.
Other Frogwatch Sites					
Minimum monitoring	Spring	19 - 25 October (National Water Week) 2008	During the 2 hours after dark.	On at least one evening during National Water Week	Audio recording of frog calls for 2 - 5 minutes.
Extra monitoring	Spring	1 - 31 October 2008	During the 2 hours after dark.	Monitoring at the same site on a number of evenings during the specified dates is desirable.	Audio recording of frog calls for 2 - 5 minutes.

IMPORTANT NOTES REGARDING MONITORING TIMES:

- It is desirable for monitoring to take place 1 - 3 days prior to, during or following rainfall, if possible.
- Volunteers will be encouraged to monitor during the specified time period where possible, to ensure consistency and comparability. However, data collected outside of the specified monitoring times is still valuable, and is encouraged. This data will be stored and analysed separately and may not be included in the Frogwatch Census Report.

8. WHO WILL BE INVOLVED AND HOW?

Organisation	Partnership Roles
Ginninderra Catchment Group - ACT & Region Frogwatch Coordinator	<ul style="list-style-type: none"> • Coordination of the Frogwatch program and support for participants. • Preparation of monitoring plan, ensuring consistency with professional monitoring programs. • Development, production and distribution of Frogwatch resources. • Coordination of Frogwatch training seminars. • Collation and storage of Frogwatch data. • Verification of audio recordings. • Data analysis and production of the annual Frogwatch Report.
Community Participants	<ul style="list-style-type: none"> • Attendance at a Frogwatch training seminar. • Conducting Frogwatch monitoring in accordance with the Frogwatch monitoring strategy and procedures. • Record accurate Frogwatch observations. • Submission of records of Frogwatch observations to the ACT Frogwatch Coordinator. • Have fun!
ACT Government staff - Wildlife Research and Monitoring	<ul style="list-style-type: none"> • Provide technical advice relating to monitoring strategy and guidelines. • Provide expert presentation at Frogwatch training events. • Assist with confirmation of results.
University of Canberra staff - AERG Academic staff	<ul style="list-style-type: none"> • Provide technical advice relating to monitoring strategy and guidelines. • Provide expert presentation at Frogwatch training events. • Assist with confirmation of results.
ACT NRM Network - Molonglo Catchment Group, Southern ACT Catchment Group, ANU Green, and other groups	<ul style="list-style-type: none"> • Assistance with promotion and recruitment of participants and other advice.
ACT Government - NRM Technical Support Officer	<ul style="list-style-type: none"> • Production of Frogwatch abundance and distribution maps.
Australian National Botanic Gardens	<ul style="list-style-type: none"> • Provision of venue for Frogwatch training events.

9. TRAINING OUTLINE

A number of training opportunities are available to Frogwatch participants.

Introductory Frogwatch Training Seminar

This seminar covers all participants need to know to participate in the National Water Week Community Frogwatch Census. Essential for the first time Frogwatcher, and a good refresher for those who have participated in previous years.

Participants will learn about:

- Basic safety guidelines;
- Procedures for preventing the spread of frog pathogens;
- Frog species of the ACT and region and their habitat requirements;
- Frog call identification techniques; and
- Procedures for undertaking and recording Frogwatch observations.

This seminar includes a short walk to a nearby pond to practice frog identification skills.

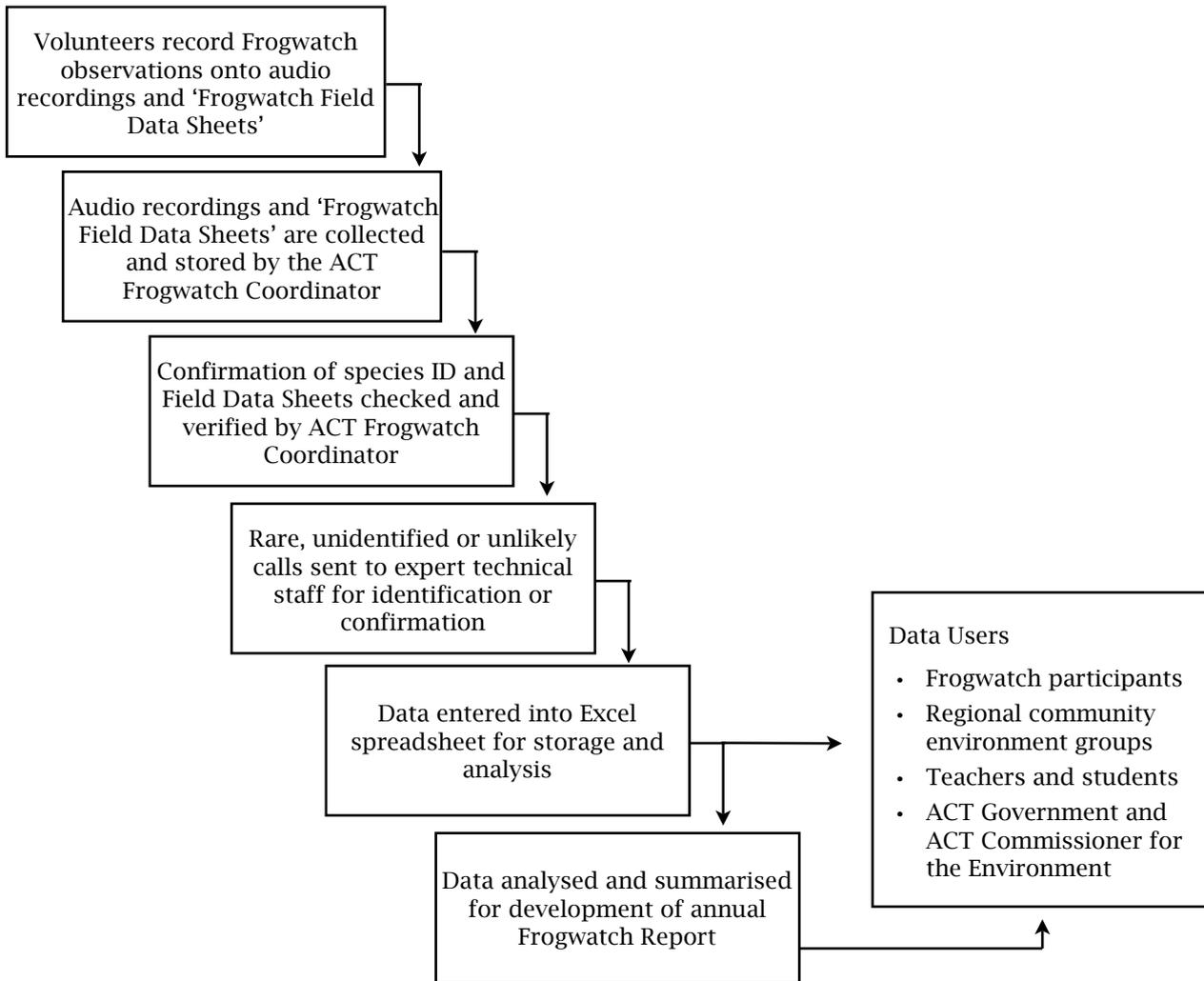
Frogwatch Field Trip

This field trip is aimed at experienced Frogwatchers who would like to further develop their frog identification and monitoring skills. Participants will have the opportunity to investigate important components of frog habitat and talk with expert ecologists in the field.

The field trip will include:

- Reminder of basic safety guidelines and pathogen control guidelines;
- Visit various frog sites and observe habitat types and frog requirements;
- Habitat requirements of specific species; and
- Advanced identification training - identifying multiple calls at one site and estimating abundance.

10. HOW WILL THE DATA BE MANAGED AND REPORTED?



Data collected as part of the ACT and Region Community Frogwatch Census will be used to develop the annual Frogwatch Census Report that outlines the distribution and abundance of frogs in the region. It is expected that data analysis will be limited to describing the occurrence and estimated abundance of each species for the first few years of the monitoring program. As a bank of information is built up, a more rigorous analysis of the data will be possible.

A annual ACT and Region National Water Week Community Frogwatch Census Report is distributed to all participants, relevant Government staff and other interested people. Past Frogwatch Reports are available at: www.ginninderralandcare.org.au

SOME FROG FACTS!



Frogs are members of a class of animals with backbones (vertebrates) which evolved almost 400 million years ago. They are split up into three Orders or main groups:

- The Caudata, or salamanders and newts, with 400 known species;
- The Anura or frogs and toads, with 3500 species; and
- The Gymnophonia, or worm-like amphibians, with 150 species.

Amphibians are specialised in two ways:

- Most have 2 distinct body phases in their life. They start as an aquatic tadpole living in water. Then they undergo a period of change, or metamorphosis, which leaves them as land living animals, with internal gills.
- Their skin is very thin and moist. This lets them absorb oxygen and water through their skin, with a large network of blood vessels (capillaries) under the skin to transport gases and moisture.

Frogs depend on water to breed, with most frogs breeding in shallow ponds, marshes and streams. However, some species live in areas where water is scarce or far away, for example tree frogs in tropical rainforests. These frogs lay their eggs in tree hollows or in the cup-like bases of certain plants (like bromeliads) where water collects. The eggs hatch in the watery pools and often the female frog comes back to lay feeder eggs to nourish the tadpoles as they grow.

Some frogs can live in very dry areas, such as arid places and deserts. They take advantage of rain as it falls and can survive dry periods by storing water in their bodies and secreting mucus to waterproof their skin. Buried in the sand like this, they can survive until the next rains.

The skin of some frogs is specialised in more ways – their brightly coloured skin advertises the fact that they can produce toxins or poisons which can taste nasty or even kill! Some frog toxins are powerful drugs, used by humans as weapons and even heart disease treatment. Some scientists have called frogs ‘chemical treasure houses’ due to their great potential in providing drugs to help combat human illnesses.

When frogs breed, the male will call to attract a female and to let other males know his territory. Different species have different calls so they don’t attract the wrong species! Calls can be told apart by pitch, frequency, duration, and the arrangement of tones and notes that make up the call. By studying the frog calls heard in an area, we can tell how many frogs are there and how many species live in a particular area.

Studying frogs is important because frogs are sensitive to environmental change. Their sensitive skin absorbs pollution as well as water, so they can tell us how polluted an area is. Their skins also absorb UV light and one theory for frog numbers decreasing around the world is due to increased levels of UVB radiation, which damages frogs just as it damages humans.

Frogs are fascinating and an integral part of any wet habitat. The decline in their numbers around the world should act as an alarm call to us to look at how we are affecting the environment. Why not have a look in your local area, see how many frogs you can find and what species are living there? Maybe you can find records of other frog studies. Have numbers increased or decreased? Can we make a difference? The loss of frogs doesn’t just mean no tadpoles to watch and no calls in the evening – it also means no-one to eat insects like mosquitoes and nothing to feed the birds, reptiles and mammals that use frogs as food. Let’s look after our frogs now – before it’s too late!

Frogs in the ACT Region



There are approximately twenty-two frog species occurring in the ACT region. Many of these are commonly found in our suburbs, backyards, urban open spaces and nature parks, while others occur only in isolated locations or are rare or have experienced population declines in the region.



During their breeding season, frogs can be found in and near all types of water bodies. Most species in the region prefer water bodies with little or no water flow such as swamps, marshes and ponds (and to a lesser extent, lakes and reservoirs). Ephemeral wetlands in particular (those that have an annual wet / dry cycle) tend to have the highest diversity of frog species inhabiting them, as they provide standing water for tadpole development, but have lower numbers of predators such as fish and invertebrates.

There are some local species that are stream or river specialists. These species have particular adaptations to cope with the challenges of the stream environment

such as seasonal, and sometimes unpredictable high water levels and fast flows and the presence of predatory fish species. For example, tadpoles of these species have broad fins and sucker-like mouths that enable them to swim strongly in a current and to hang on to rocks.

While all species require water for breeding and tadpole development, some move annually into terrestrial areas well away from their breeding sites, even up to several kilometres away for some species. This means that a whole catchment approach to land management is required to protect frog species.

The majority of our most common local frog species breed during the warmer, wetter months of spring to summer. During winter or dry periods, they seek shelter to escape dehydration, extreme temperatures and predators. Suitable shelter sites include: deep cracks in the soil, abandoned burrows, tussock grasses and other thick native vegetation, fissures in bark or fallen timber and underneath rocks.

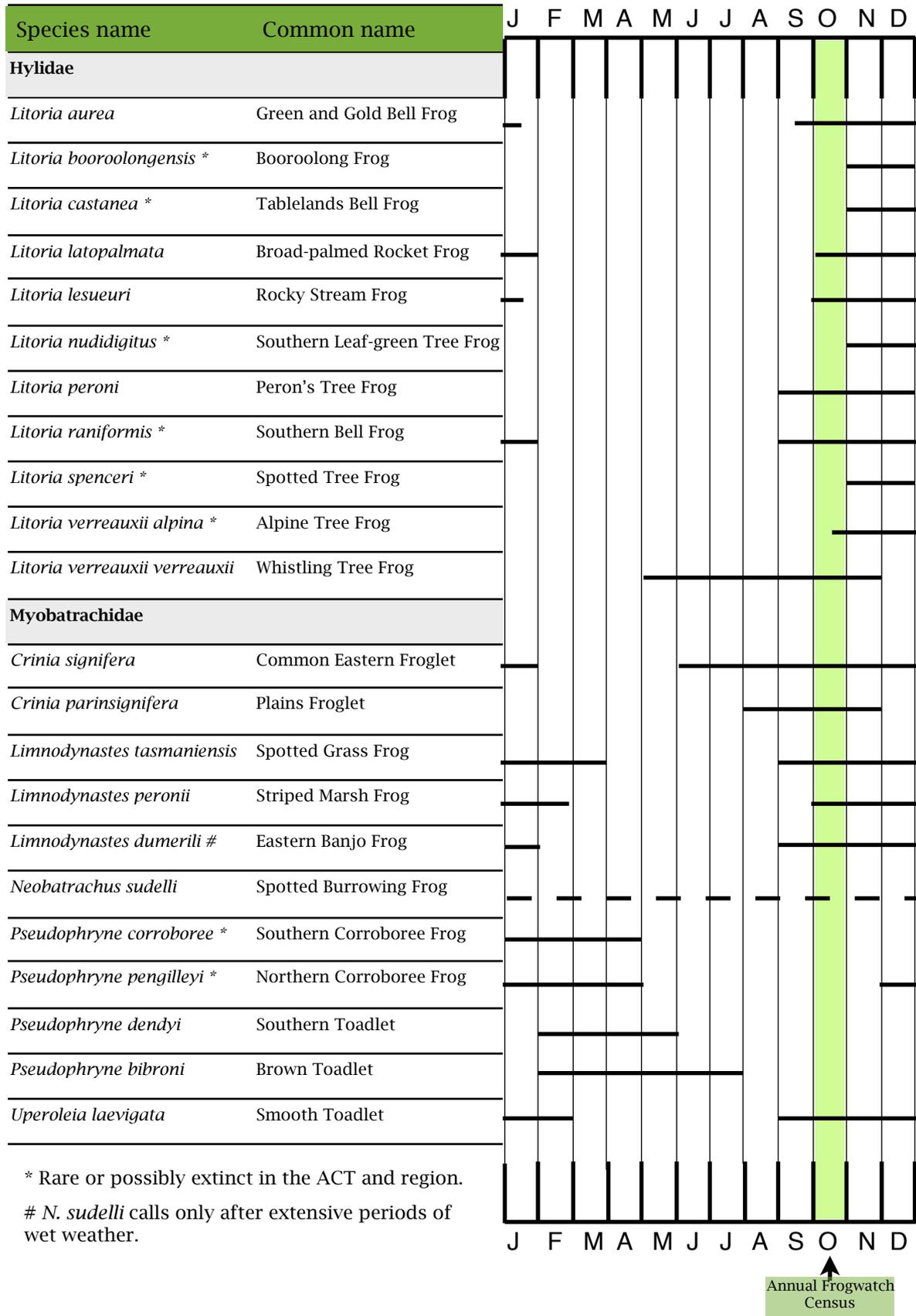
You can find out more about creating or protecting frog habitat from our leaflet, "Creating a Frog Friendly Habitat in the ACT region".

The fact sheets in this section are provided for common species found in the ACT and region, that are likely to be encountered whilst conducting the October Census.

The sites monitored in the annual Frogwatch Census in October are generally located in or adjacent to urban areas or on private rural properties. Ten species have been detected during the Frogwatch Census in previous years. These species are listed in detail in the following section.

The other species may not have been detected by the Census for a number of reasons. Their breeding season may not occur during spring time when the Census is conducted; they may occur only in remote or high altitude locations, where it is not practical for Frogwatch volunteers to monitor; or they may have experienced population declines and are only present at distinct locations that are not monitored. Summarised information is provided for these species at the end of this section.

Approximate Calling Seasons (ACT and Region Frog Species)



Crinia parinsignifera (Plains Froglet)



Fact Sheet Series



Crinia parinsignifera

Above photos from top: D. Flynn
(www.en.wikipedia); L. Fucsko
(www.frogs.org.au); J. Bentley
(www.frogs.org.au).

Family: Myobatrachidae

Appearance: Adults grow to approximately 3 cm in length.

This species is very similar in appearance to *Crinia signifera*.

Colour ranges from light coloured to dark. The pattern on the back is variable, ranging from individuals that are smooth and unpatterned to strongly marked raised longitudinal ridges and bumps.

Call: A slightly drawn out 'wrrreekk', repeated regularly.

Breeding: Throughout the year, but mainly from August to November.

Habitat: Prefers to breed in deep, permanent pools. It has benefited from the proliferation of farm dams in the region and can be found around the edges of dams, swamps and other wetlands. This species prefers standing water, but may sometimes be heard calling from slow moving stretches of some streams and rivers.

Local Distribution: Very common in the region, and is particularly associated with farm dams. It is distributed predominantly in the open country and plains, and is found only below about 800m altitude.

Biology: Male frogs call from amongst vegetation at the waters edge or emergent vegetation. Within these habitats they shelter under logs and other debris, usually in moist depressions or near water. It is not uncommon to find dozens of individuals under one log or rock. Eggs and tadpoles are aquatic and can be found in ponds, dams, swamps, flooded grassland, ditches and hollows.

Status:

Local region - Very Common

ICUN - Least Concern

References:

Lintermans, M. and Osborne, W. (2002) Wet & Wild. A Field Guide to the Freshwater Animals of the Southern Tablelands and High Country of the ACT and NSW. Environment ACT.

Amphibian Research Centre - Frogs of Australia database. <http://frogs.org.au/frogs/species/Crinia/parinsignifera>. Downloaded 2 August 2007.



Crinia signifera (Common Eastern Froglet)

Fact Sheet Series



Crinia signifera

Above photos from top:
www.en.wikipedia.org; L. Fuckso
(www.forgs.org.au); J. Bentley
(www.frogs.org.au);

Family: Myobatrachidae

Appearance: Adults grow to approximately 2.5 - 3 cm length.

Their colour is variable, ranging from grey-brown to reddish and can be smooth or covered in a series of ridges. All individuals have dark, triangular markings on the upper lips and darker bands on the hind legs. The underside of the body is granular with a black and white blotched pattern.

Call: A characteristic repeated clicking, "crick...crick...crick...crick...".

Breeding: Breeds mainly during spring and winter (June to January). Calling is continuous throughout the day, but activity decreases considerably on cold nights.

Habitat: This species is found in a wide range of habitats, including marshes, ponds, seepages and farm dams, from sea-level to above 2000 m altitude in the alpine zone.

Local Distribution: Very common and abundant in the region and in south-eastern Australia.

Biology: Male frogs begin calling regularly from pools during the wetter parts of winter, and spring (later at higher altitudes). Each female lays up to 250 eggs, which are deposited on the bottom of pools or are attached to aquatic vegetation or submerged moss. Amplexus (mating) pairs may sometimes be found floating in small pools during the day.

Tadpoles may be seen in high numbers in shallow pools from late spring until the end of summer. The newly metamorphosed frogs are very small, being about 7 mm in body length. They grow rapidly during the warmer months and attain adult size the following summer. Adults prey on a diverse range of invertebrates including beetles, spiders and centipedes.

Status:

Local region - Very Common

ICUN - Least Concern

References:

Lintermans, M. and Osborne, W. (2002) Wet & Wild. A Field Guide to the Freshwater Animals of the Southern Tablelands and High Country of the ACT and NSW. Environment ACT.

Limnodynastes dumerili (Banjo Frog or Pobblebonk)



Fact Sheet Series



Limnodynastes dumerili

Above photos from top: M. Ormay;
L. Fucsko (www.frogs.org.au); D.
Nelson (FATS)

Family: Myobatrachidae

Appearance: Readily distinguishable from other frogs in the region by its large body size - up to 8.5 cm in length.

They are grey - brown in colour and have a white glandular stripe from below the eye to above the base of their front leg. They also have a broad, dark band from the eye to the 'ear'. The legs are thickset and there is a large raised lump on the outside of each thigh. There is a raised lump for digging on the underside of each foot.

Call: Their call sounds like a deep, slowly repeated 'thud' or 'bonk' when calling from the water, or a loud 'toc' if calling from land.

Breeding: Breeds from September to early January, particularly after heavy rain.

Habitat: This species are rarely seen because for much of the time they remain hidden in short burrows in the ground. However, on wet summer evenings they may sometimes be observed sitting on the road surface. They are often discovered in soil delivered to suburban gardens as they have a habit of burrowing into soft soil.

Local Distribution: Widely distributed and common throughout lowland areas throughout the region, and south-eastern Australia.

Biology: Females lay up to 4,000 eggs in a conspicuous, floating, foamy mass with a diameter of about 12-18 cm. The tadpoles are large and easy to identify because of their light brown colouration and the presence of numerous pale blotches on the tail.

In high altitudes, tadpoles can take up to two summers to reach metamorphosis.

Status:

Local region - Common

ICUN - Least Concern

References:

Lintermans, M. and Osborne, W. (2002) Wet & Wild. A Field Guide to the Freshwater Animals of the Southern Tablelands and High Country of the ACT and NSW. Environment ACT.



Limnodynastes peronii (Striped Marsh Frog)

Fact Sheet Series



Limnodynastes peronii

Above photos from top: J. Bentley
(www.frogs.org.au); D. Nelson
(FATS); www.en.wikipedia.org.

Family: Myobatrachidae

Appearance: Adults grow to approximately 7 cm length.

This species resembles *Limnodynastes tasmaniensis*, but can be distinguished by the pattern of dark and light-brown stripes on the back. It has a slightly raised pale stripe running along the upper jaw edge from the snout, and below the eyes to the fore limbs. This stripe is accentuated by the presence of a dark stripe along the side of the head that passes through the eyes.

Call: A distinctive single 'pop', 'toc' or 'splut' that is monotonously repeated once every few seconds. In a chorus, the calls of many individuals combine into a more rapid continuous popping or sputtering sound.

Breeding: The breeding season of this species commences in late spring but most calling and breeding occurs in early summer. (October - February)

Habitat: Found mainly in low-lying open country that has a good cover of perennial tussock grasses. Including, lowland rivers, lowland creeks, swamps, farm dams and lakes.

Local Distribution: This species is generally uncommon in the region - the Canberra region appears to be about the western-most limit of this species' distribution in this area. It is a very common species in coastal regions of NSW.

Biology: A single floating foam nest is made during egg laying. The tadpoles are dark-coloured and graze actively on the surface of submerged vegetation and detritus. They are most commonly found in and near shallow marshes and reed beds at the edges of the urban lakes and creeks. Small populations still occur in some low-lying areas that were formerly wet tussock grasslands in the region.

Status:

Local region - Generally Uncommon (This species is at the western-most edge of its range in the Canberra region.)

ICUN - Least Concern

References:

Lintermans, M. and Osborne, W. (2002) Wet & Wild. A Field Guide to the Freshwater Animals of the Southern Tablelands and High Country of the ACT and NSW. Environment ACT.

Limnodynastes tasmaniensis (Spotted Grass Frog)



Fact Sheet Series



Limnodynastes tasmaniensis

Above photos from top: M. Evans (Environment ACT); P. Robertson (www.frogs.org.au); J. Bentley (www.frogs.org.au).

Family: Myobatrachidae

Appearance: Adults grow to approximately 5 cm length.

A relatively large frog in the region, this species is conspicuously blotched in a neat pattern of dark and light markings. Many individuals have a distinctive red or orange stripe down the centre of the back. A line of white glandular tissue occurs from beneath the eye to above the back leg.

Call: A conspicuous 'uck ... uck...uck' that sounds a bit like a toy machine gun.

Breeding: Calls from September to March.

Habitat: Prefer standing water, including roadside ditches, marshes, swamps, lakes and ponds. Situations where there is considerable flooded vegetation such as tussocks and sedges provide ideal habitat. During dry weather, they shelter in deep cracks in the clays of the dry wetlands, beneath large logs and in the base of grass tussocks.

Local Distribution: An abundant species occurring throughout farmland and lower elevation woodland throughout the region.

Biology: Male frogs call whilst floating in the water. The egg mass is distinctive, consisting of a small, round, floating, white foamy nest that is usually attached to emergent vegetation..

Status:

Local region - Very Common

ICUN - Least Concern

References:

Lintermans, M. and Osborne, W. (2002) Wet & Wild. A Field Guide to the Freshwater Animals of the Southern Tablelands and High Country of the ACT and NSW. Environment ACT.



Litoria aurea

(Green and Gold Bell Frog)

Fact Sheet Series



Litoria aurea

Above photos from top:
www.en.wikipedia.org;
www.en.wikipedia.org; J. Bentley
(www.frogs.org.au).

Family: Hylidae

Appearance: Adults grow to approximately 12 cm length.

A large green or green and brown / gold coloured frog, with fully webbed toes. They have a smooth back and bright blue or purple on the hind side of the thighs.

Call: A relatively quiet, but distinctive drawn out 'wrrraaaaaagh wrrraaaaaagh wrrrkk, wrrrkk wrk', sometimes likened to a motorbike changing gears.

Breeding: Calls from September to January.

Habitat: Found in Lowland rivers, swamps, farm dams and lakes. This species is semi-aquatic, spending much time in wetlands, either perched amongst emergent vegetation, or simply floating or swimming in the water. It is well known for its habit of basking in direct sunlight. Prior to their decline, the bell frog group were found in ponds, swamps, lakes and along slow-moving parts of some rivers such as the Molonglo. Sites that supported the species were typically thickly vegetated with reeds, sedges and rushes and contained relatively permanent water that did not contain predatory fish. Most sites were in open country, but the frogs have also been recorded in some forested areas.

Local Distribution: This is a predominantly coastal species with the western-most occurrences being near Canberra. The species has disappeared almost entirely from its former range in the Southern Tablelands, most likely as a result of infection by the amphibian chytrid fungus, perhaps acting in concert with some other unknown causes. The spread of alien fish such as the Eastern Gambusia is also suggested by some researchers to be a serious threat, because the fish have been shown to eat the eggs of bell frogs and to prey on tadpoles.

Biology: During spring and early summer, following heavy rains, the frogs lay large, gelatinous egg masses that are usually spread as a surface layer through vegetation. Because of their very large clutch size, (typically many thousands of eggs per clutch) the egg mass spreads to occupy a large area (often larger than a dinner plate), forming a transparent, floating jelly-like layer that later sinks.

Green and Gold Bell Frogs are voracious predators, capturing invertebrates and small frogs, including their own species.

Status:

Local region - Vulnerable

Nationally (EPBC) - Vulnerable

ICUN - Vulnerable

References:

Lintermans, M. and Osborne, W. (2002) Wet & Wild. A Field Guide to the Freshwater Animals of the Southern Tablelands and High Country of the ACT and NSW. Environment ACT.

Litoria peroni (Peron's Tree Frog)



Fact Sheet Series



Litoria peroni

Above photos from top: L. Fucsko
(www.frogs.org.au); M. Idnurm;
www.frogs.org.au.

Family: Hylidae

Appearance: Adults grow to approximately 5 cm length.

This species is relatively large, and has broad round toe discs, yellow and black mottling behind the back legs, tiny emerald green flecks on the back and a horizontal pupil that appears cross-shaped.

Call: A loud descending rattle or cackle. A shorter chuckling sound is also made. This frog is often referred to as the 'maniacal cackling frog', because of its call.

Breeding: Males start calling in about September / October each year, and continue until December.

Habitat: Quite common in farmland where there are scattered large eucalypt trees, or where woodland is still present, and there are farm dams or swamps in which the species can breed.

This is the most aboreal frog occurring in the region, and may be found climbing on trees or shrubs and is often reported climbing up onto window panes to catch insects at night. During the day the species may shelter in tree hollows and any loose bark or in deep fissures in dead timber. In drier regions, individuals sometimes shelter in rainwater tanks.

Local Distribution: Quite common in areas of suitable farmland in the region. In south-eastern Australia this species is widespread, occurring from the coast to the foot-slopes of the Snowy Mountains and Brindabella Range, and occurring inland as far west as the lower River Murray in South Australia.

Biology: Males usually call from dead trees, partly submerged logs, clumps of rushes and reeds and other elevated perches in the water, or at its edge. The tadpoles are very active and have a slightly striped appearance in the water. They are quite secretive, instantly dropping to a deeper depth in the water if they are disturbed.

Status:

Local region - Common

ICUN - Least Concern

References:

Lintermans, M. and Osborne, W. (2002) Wet & Wild. A Field Guide to the Freshwater Animals of the Southern Tablelands and High Country of the ACT and NSW. Environment ACT.

Litoria verreauxii (Whistling Tree Frog)

Fact Sheet Series



Litoria verreauxii

Above photos from top: D. Nelson (FATS); L. Fucsko (www.frogs.org.au); P. Robertson (www.frogs.org.au).

Family: Hylidae

Appearance: Adults grow to approximately 3 cm length.

A terrestrial species with relatively poor climbing ability. It has a dark brown or black stripe from in front of the nostrils, continuing through the eye to the base of the forelimb. A broad, brownish, mid-dorsal marking which starts between the eyes and extends to the vent is also present.

Call: A repeated whistling 'cree.... cree.... cree.... cree... cree...'.

Breeding: Males commence calling in May or June when winter rains have filled the farm dams and other breeding pools, and if the weather remains moist, breed through until October or November.

Habitat: Found in the open valleys and cleared pasture country in the region, particularly in areas where there are large shallow pools and stock ponds. During the non-breeding season, they are secretive and rarely seen. Individuals may sometimes be found beneath logs and tussocks or under flat stones in streambeds, or in rocky areas near streams.

Local Distribution: Abundant in the region. In the 1980s, the species became quite rare in the ACT, perhaps as a result of the severe drought experienced at this time, or from the amphibian chytrid fungus. However, the species has now made a comeback and is now quite common in much of the region. The species occurs along the coastal plains and Great Dividing Range of south-eastern Australia, from Melbourne to near Brisbane.

Biology: Males usually call whilst partially submerged, or floating in water. Amplexus takes place in the water and the eggs are wound around submerged vegetation in large jelly-like clumps. Tadpoles can be found in the pools during late spring and early summer. Metamorphosis occurs in early summer with newly emerged froglets being about 15 mm in length.

Status:

Local region - Common

ICUN - Least Concern

References:

Lintermans, M. and Osborne, W. (2002) Wet & Wild. A Field Guide to the Freshwater Animals of the Southern Tablelands and High Country of the ACT and NSW. Environment ACT.

Neobatrachus sudelli (Spotted Burrowing Frog)



Fact Sheet Series



Neobatrachus sudelli

Above photos from top: P. Robertson (www.frogs.org.au); G. Marantelli (www.frogs.org.au); L. Fucsko (www.frogs.org.au).

Family: Myobatrachidae

Appearance: A small, squat, short-legged species, growing to approximately 3.5 - 4 cm in length.

They can be distinguished from other frogs of the region by several features:

- The back of the frog has numerous small, raised wart-like bumps that give it a rough, sandpaper-like appearance.
- They have a broad pattern of greenish-brown and darker brown blotches and patterns on the back.
- The pupils of the eyes form vertical slits.
- There is a prominent black tubercle under each foot.

Call: A soft, rapidly repeated, lengthy sequence of evenly spaced clucking or soft popping sounds.

Breeding: Calling can occur at any time of the year, but only after extensive periods of wet weather.

Habitat: The most terrestrial frog found in the region, spending most of the year sheltering in deep burrows in the soil. Individuals are usually only found active on the ground at night after periods of very heavy rainfall, when the ground is completely soaked.

Local Distribution: Widespread in the region, occurring to near Jindabyne and Bombala.

Biology: The ecology of this species has not yet been studied.

Status:

Local region - Common

ICUN - Least Concern

References:

Lintermans, M. and Osborne, W. (2002) Wet & Wild. A Field Guide to the Freshwater Animals of the Southern Tablelands and High Country of the ACT and NSW. Environment ACT.



Uperoleia laevis (Smooth Toadlet)

Fact Sheet Series



Uperoleia laevis

Above photos from top:
www.en.wikipedia.org; S. Eipper
(www.frogs.org.au);
www.frogs.org.au.

Family: Myobatrachidae

Appearance: A small frog, growing to 2 - 3.5 cm in length.

It has a noticeable warty appearance, and can be identified by the presence of a conspicuous orange patch behind and in front of each thigh. These patches may be 'flash markings' intended to frighten potential predators. Paratoid glands are often noticeable as swellings on either side of the head above the forearms. A pale triangular-shaped patch is usually obvious on the head between the eyes and the tip of the snout.

Call: A low-pitched, monotonous sounding 'wvhhrrkkkkk' repeated at intervals of a few seconds. The call sounds a little like that of *Crinia parinsignifera*, but is deeper and longer.

Breeding: Males call from September to February.

Habitat: Found in swamps, farm dams and lakes, in a range of drier habitat types. They appear to avoid low-lying pasture, unless drier, rocky or tussock-covered hillsides are nearby. They occur in forest, woodland and tussock grassland in the Canberra region.

Local Distribution: Very common in the Canberra region, and occurring throughout the southern tablelands at least as far south as the Jindabyne area and into the lower parts of Kosciuszko National Park and Namadgi National Park, up to about 1100 m elevation.

Biology: Males call from sheltered positions well back from the water's edge, often as much as 10 m away from the breeding pond. The males usually call from partially hidden positions amongst grass tussocks, fallen branches or leaf litter. When a male has attracted the female, and clasped her in amplexus, the female then carries the male to the water and, with the male clinging on to her back, swims out and lays the eggs beneath the surface of the water by attaching them to submerged vegetation and twigs or the bottom of the pond.

Status:

Local region - Common

ICUN - Least Concern

References:

Lintermans, M. and Osborne, W. (2002) Wet & Wild. A Field Guide to the Freshwater Animals of the Southern Tablelands and High Country of the ACT and NSW. Environment ACT.

Frogs in the ACT Region



The following species are not likely to be encountered whilst conducting the spring Frogwatch Census, but may be present in particular locations across the ACT and region.

Information contained in this section is taken from:

Lintermans, M. and Osborne, W. (2002) *Wet & Wild. A Field Guide to the Freshwater Animals of the Southern Tablelands and High Country of the ACT and NSW.* Environment ACT.

<p><i>Litoria booroolongensis</i> (Booroolong Frog)</p>  <p>Photo: NP&WS/Dave Hunter</p>	Found in	Upland rivers, Montane creeks, Lowland rivers and Lowland creeks.
	Mating Call	A soft, repeated purring sound very similar to that of the Rocky Stream Frog. Calls from November to December.
	Biology and Habitat	Associated with rocky streams and rivers, occurring in undisturbed locations in National Parks as well as in farmland. Breeding occurs during late spring and early summer.
	Distribution and Abundance	Recorded from parts of the Northern and Central Tablelands of NSW, as well as along the western fall of the Southern Highlands between Tumut and the Victorian border. It has not been recorded in the ACT. It is now exceptionally rare, having disappeared from much of the region. The largest remaining populations occur near Tumut.
	Potential Threats	The clearing of stream-side vegetation, the spread of blackberries and siltation of the riverbed are threats to local breeding populations. Some individuals have been found infected by the amphibian chytrid fungus but the overall threat to this species is not yet known. The tadpoles are relatively unpalatable to trout.

<p><i>Litoria castanea</i> (Tablelands Bell Frog or Spotted-thighed Bell Frog)</p>  <p>Photo: G. Grigg</p>	Found in	Lowland rivers, Swamps, Farm dams and Lakes.
	Mating Call	Similar to the Green and Golden Bell Frog, but lacks the long drawn out growls of the other 2 species of bell frog.
	Biology and Habitat	The ecology of this species is poorly known but believed to be quite similar to that of the Green and Golden Bell Frog and Southern Bell Frog. Unfortunately, it appears to have become extinct before any detailed studies could be detected.
	Distribution and Abundance	Occurred throughout much of the Southern Tablelands, but also occurred in parts of the Central and Northern Tablelands where it apparently was fairly localised in its occurrence.
	Potential Threats	Believed to be extinct, most likely as a result of infection by the amphibian chytrid fungus, perhaps acting in concert with some other unknown causes.

***Litoria
latopalmata***
(Broad-palmed Frog)



Photo: www.frogs.org.au

Found in	Lowland rivers, Lowland creeks and Farm dams.
Mating Call	A very distinctive, repeated, duck-like quacking that typically starts slowly and builds to a rapid crescendo. Calls from September to December.
Biology and Habitat	Very little is known about the ecology and field behaviour of this species in the region. They may prefer open country interspersed with rocky areas and woodland. Most breeding populations near Canberra have been found in steeply dissected landscapes supporting small rocky streams with occasional still pools. Male frogs have been heard calling from hollows among grass and on rocky benches at the edges of these pools. Individuals have also been found breeding in farm dams.
Distribution and Abundance	Uncommon in this region. It occurs mainly along parts of the Murrumbidgee River and some larger tributary streams and creeks, between Kambah Pool in the ACT and Lake Burrinjuck in NSW.
Potential Threats	Threats are not known, but may include over-grazing and trampling by livestock along. Construction of farm dams in some areas may have helped the dispersal of this species.

Litoria lesueuri
(Rocky Stream Frog
or Lesueur's Frog)



Photo: P. Robertson, www.frogs.org.au

Found in	Upland rivers, Montane creeks, Lowland rivers, Lowland creeks and Lakes.
Mating Call	A soft, repeated purring sound. Calls from October to December / early January.
Biology and Habitat	A stream-dependent species associated mainly with rocky streams and rivers that have a permanent flow. Breeding takes place from about November to late December or early January.
Distribution and Abundance	Widespread and common along the coast and ranges of eastern Australia, at altitudes up to about 1200m. Uncommon in cleared agricultural country.
Potential Threats	The clearing of stream-side vegetation, the spread of blackberries and siltation of the riverbed are threats to local breeding populations. Some individuals have been found infected by the amphibian chytrid fungus but the overall threat to this species is not yet known. The tadpoles are relatively unpalatable to trout.

***Litoria
nudidigitus***
(Southern Leaf-green
Tree Frog)



Photo: J. Bentley, www.frogs.org.au

Found in	Upland rivers.
Mating Call	A series of short repeated creaking sounds 'eeeeek cruk! cruk! Not particularly loud. Calls from November to December.
Biology and Habitat	Associated with rivers and larger mountain streams which contain deep, slow-moving pools with banks covered densely with ferns, shrubs and tussock grasses. In the early summer males may be heard calling from elevated positions on overhanging vegetation at the edges of deeper pools where water flow is fairly slow.
Distribution and Abundance	Quite rare in the region, confined to the densely vegetated edges of larger mountain streams such as along parts of the Cotter River in the ACT and Goodradigbee and Geehi rivers in Kosciuszko National Park. It is however, quite common along streams in the coastal ranges of south-eastern Australia south of Sydney.
Potential Threats	The clearing of stream-side vegetation, the spread of blackberries and siltation of the riverbed are threats to local breeding populations. Some individuals have been found infected by the amphibian chytrid fungus but the overall threat to this species is not yet known. The tadpoles are relatively unpalatable to trout.

***Litoria
raniformis***
(Southern Bell Frog or
Warty-backed Bell Frog)



Photo: P. Robertson. www.frogs.org.au

Found in	Lowland rivers, Swamps, Farm dams and Lakes.
Mating Call	Consists of a long introductory note (growling sound) followed by a series of shorter grunts. Similar to the Green and Golden Bell Frog. Calls from September to January.
Biology and Habitat	A semi-aquatic species, spending much time in wetlands, either perched amongst emergent vegetation or floating or swimming in the water. On occasions it has been noticed basking, although in areas where predatory water birds are common it may remain hidden in thick vegetation. The general ecology and breeding biology is similar to that of the Green and Golden Bell Frog.
Distribution and Abundance	The Southern Bell Frog is primarily a southern and inland species, which had its eastern-most populations between Lake George, Cooma and Bombala. It formerly occurred at altitudes up to about 1200 m. At some stage during the early 1980s, the entire Southern Tablelands population of this species vanished, and to date no remnant have been found.
Potential Threats	This species is now believed to have disappeared from the southern Tablelands region, most likely as a result of infection by the amphibian chytrid fungus, perhaps acting in concert with some other unknown causes. The spread of alien fish such as the Eastern Gambusia is also suggested by some researchers to be a serious threat because the fish have been shown to eat the eggs of bell frogs and to prey on tadpoles.

Litoria spenceri
(Spotted Tree Frog)



Photo: G. Gillespie. www.frogsaustralia.net.au

Found in	Upland rivers and Montane creeks.
Mating Call	A short series of short repeated 'whirrs' and 'cruks' (not particularly loud). Calls from November to December.
Biology and Habitat	Occurs along larger streams and rivers in the montane tract of the Eastern Highlands of Victoria and southern NSW. Within these streams it is restricted to areas where the bed of the stream is dominated by riffles and cascades with exposed rock beds. A feature of this species is the very obvious basking behaviour of adults and smaller frogs. During sunny weather the frogs actively perch on damp boulders in direct sunlight. Breeding occurs during spring.
Distribution and Abundance	This nationally endangered species is largely restricted to the northern and western slopes of the Great Dividing Range between Lake Eildon in Victoria and Bogong Creek near Mount Kosciuszko. It is known in only 19 streams, only one of which occurs in NSW (Bogong Creek in Kosciuszko National Park).
Potential Threats	Disturbance to streams from land clearing, timber harvesting, altered flow regimes, and spread of weeds such as blackberry and European broom brush. Alien trout are likely to have reduced populations extensively. The amphibian chytrid fungus, which probably caused the loss of the Bogong Creek population in Kosciuszko National Park, poses a very strong threat.

***Pseudophryne
bibroni***
(Brown Toadlet)



Photo: www.frogs.org.au

Found in	Upland bogs, Montane seepages, Swamps and Farm dams.
Mating Call	Identical to call of the Southern Toadlet and similar to the Corroboree Frog, but is shorter and sharper, sounding like a short, sharp 'ek' repeated infrequently. Calls from February to July.
Biology and Habitat	The ecology of this species is very similar to that of the Southern Toadlet. The diet and breeding biology appear to be identical in these closely related species. This species generally occurs at lower altitudes than the Southern Toadlet. However, in the Fiery Range and Bogong Mountains west of Canberra, it occurs at some high montane locations. It previously occurred in drier forests and woodlands near Canberra.
Distribution and Abundance	Found throughout much of south-eastern Australia except for coastal areas south of Jervis Bay where it is replaced by the Southern Toadlet. In the region, it occurs on the plains north and west of Canberra and in the Tumut district where it is still reasonably common. It once occurred in bushland in suburban Canberra but has disappeared and is now only known from a few scattered sites in the foothills south-west of Canberra.
Potential Threats	Disappearance of ephemeral wetlands may have affected many populations. It is not known if this species is affected by the amphibian chytrid fungus.

<p><i>Pseudophryne</i> <i>corroboree</i> (Southern Corroboree Frog or Corroboree Frog)</p>  <p>Photo: H. Cogger, www.iucn.redlist.org</p>	Found in	Upland bogs.
	Mating Call	The advertisement call is a short and nasal 'wrrankk ... erkkerkk' repeated infrequently. The threat call is a drawn out erhkkk'. Calls from January to April.
	Biology and Habitat	Restricted to subalpine areas that contain small, semi-permanent pools and seepages that provide suitable sites for tadpole development.
	Distribution and Abundance	Found only in the Snowy Mountains between Smiggin Holes and near Round Mountain in Kosciuszko National Park, occurring at elevations between 1300 and 1760 m. This species is now extremely rare and has disappeared from most areas where it previously occurred.
	Potential Threats	Demonstrated to be susceptible to drought, particularly during autumn and winter when tadpoles are still in the nest sites or pools. In the long term, like other alpine species, it may be affected by global warming. Recently the amphibian chytrid fungus has been found in this species, and may be the major cause of the decline. Researchers believe that this striking species will be extinct in the wild within the next five to ten years and as a safeguard the species is now the focus of a captive breeding program.

<p><i>Pseudophryne</i> <i>dendyi</i> (Southern Toadlet or Dendy's Toadlet)</p>  <p>Photo: www.frogs.org.au</p>	Found in	Upland bogs and Montane seepages.
	Mating Call	Very similar to that of the Corroboree Frog, except shorter and sharper, sounding like a short, sharp 'ek' repeated infrequently. They also make threat calls that are very similar to those of both species of Corroboree Frogs. Calls from February to May.
	Biology and Habitat	Very similar to the Corroboree Frogs, but tends to be found in drier habitats than the Corroboree Frogs. It breeds in shallow seasonal depressions and seepages in wet heaths, grassland and woodland.
	Distribution and Abundance	Confined to the south-eastern corner of Australia where it occurs at altitudes up to about 1700 m. Present throughout the Snowy Mountains and along the Brindabella Range where it is quite rare. It is very common still in the ranges and coastal forests east of Cooma and Braidwood.
	Potential Threats	Populations at high elevations have declined and may have been affected by the amphibian chytrid fungus. Disappearance of ephemeral wetlands may have affected many populations.

<p><i>Pseudophryne</i> <i>pengilleyi</i> (Northern Corroboree Frog or Corroboree Frog)</p>  <p>Photo: NP&WS/Dave Hunter</p>	Found in	Upland bogs and Montane seepages.
	Mating Call	The advertisement call is a short and nasal 'wrrankk ... erkkerkk' repeated infrequently. The threat call is a drawn out erhkkk'. Calls from December to April.
	Biology and Habitat	Very similar to the Southern Corroboree Frog. It breeds in a wider range of wetland types including moss or herb dominated areas, seepages along drainage depressions, and in pools in bogs and wet heaths. Some populations have persisted in small clearings that are now in pine plantations. It is not known if the frogs actually move into the pine forest once breeding is completed.
	Distribution and Abundance	Restricted to a mountainous region west of Canberra with the range including the Bogong Mountains, Fiery Range, Brindabella Range and Bimberi Range. Much of the species range occurs in Kosciuszko National Park, Bimberi Nature Reserve and Namadgi National Park, particularly at altitudes between 900 and 1800 m. In the ACT, this species has declined dramatically in the last few years.
	Potential Threats	May be susceptible to drought, particularly during autumn and winter when tadpoles are still in the nest sites or pools. In the long term, like other alpine species, it may be affected by global warming. Recently the amphibian chytrid fungus has been found in this species, and may be the major cause of the decline at high elevations.

Procedures for Frogwatch Monitoring



The following guidelines are intended to ensure your safety while conducting Frogwatch activities. They are also intended to ensure the integrity of the data that we collect.

Please read through them carefully, and be sure to follow instructions as closely as possible.

Contact the Frogwatch Coordinator on 6278 3309 or waterwatch@ginninderralandcare.org.au if you have any queries.

1) Safety and Other Points to Remember

Please take note of the follow points while you are participating in Frogwatch monitoring.

- A pre-visit to your site(s), during the day is essential. Plan where you are going to do your monitoring, and take note of any potential hazards.
- Hazards to look for include: holes in the ground; banks that are undercut and may collapse; sharp objects such as tree branches or logs; and slippery rocks.
- Make sure you have safe and easy access to the waterway. Select a site that has safe access, taking into account the likely level of any floodwaters. Do not choose a monitoring site that is prone to floods without warning.
- Never monitor alone, and make sure that someone responsible knows where you are going. Arrange a time to be back and stick to it! (Or let them know if there is a change in your plans.)
- You must complete your Volunteer Activity Record Sheet for all activities you undertake that are related to the Frogwatch Program. Please return this record sheet with your Field Data Sheets.
- Do not handle or disturb frogs in any way - they have very sensitive skin and pathogens may be transmitted very easily. Some frogs can also secrete toxins that may harm you.
- Try to avoid coming into direct contact with any water-bodies.
- Ensure that footwear is thoroughly cleaned and sterilised before going out into the field. Refer to the Pathogen Control Guidelines contained in this Kit. This is especially important if you are traveling between different frog monitoring sites, and / or have accidentally come into contact with the water.
- If any equipment that you are using has been in contact with aquatic environments outside the ACT or the upper Murrumbidgee catchment, ensure that it is cleaned and sterilised before taking it into the field (eg thermometer). Equipment must also be cleaned at each site if traveling between different frog monitoring sites, or keep different footwear for each site in separate plastic bags, sterilised before allocating them to a site. Refer to the Pathogen Control Guidelines contained in this Kit.
- Be prepared! Frogs live in wet places, so make sure you have sturdy waterproof shoes with a good grip, a raincoat, and possibly a waterproof bag to cover your notes with.
- Take a strong torch so that you can see what you are writing, and you don't fall into any streams.
- Be wary of passing traffic if you are monitoring near a road or from a bridge.
- Keep a fully stocked first aid kit handy.
- Take nothing but notes, leave nothing but footprints.
- Do not go onto private land without the owner's permission.

2) Identify Your Frog Monitoring Site(s).

There are 30 Key Frogwatch Sites that have been prioritised, in order to ensure the consistent and comprehensive monitoring of these sites from year to year. Frogwatch monitoring can also be conducted at over 100 other established sites around the ACT and Region. Participants are encouraged to monitor at one of the Key Frogwatch Sites if possible, in order to ensure that they are monitored effectively each year.

A list of the Key Frogwatch Sites is available from the Frogwatch Coordinator.

Frogwatch participants may also choose a site that has an intrinsic value to the program. For example a Waterwatch monitoring site, a newly constructed wetland or backyard pond, an environmentally sensitive area, waterway restoration site or proposed restoration site, farm dam, local creek or waterway, or a site of personal interest.

Safe access at nighttime is essential when choosing a Frogwatch site!

Contact the Frogwatch coordinator to confirm your availability to monitor at your Frogwatch site from last year, or to discuss the suitability of a site of your choice. The Frogwatch coordinator will assign a site code for any new sites.

You may like to monitor calls at a number of sites; if so, a separate Field Data Sheet should be filled out for each site, each time you do the monitoring.

It is important that the Site Description section on your data sheet is filled out accurately and with plenty of detail, so that the exact monitoring site can be found by different people year after year.

3) A Day Time Visit To Your Site(s)

A day visit to your site(s) is essential.

Check for any safety hazards and plan your access route to the site, remembering that it will be dark when you come to do your monitoring.

Take a photograph of your site, showing the water level and vegetation condition. A photograph is a valuable record to show changes at the site over time, and may help to explain any changes in frog populations. Please return a copy of the photographs with your Field Data Sheets to the Frogwatch Coordinator. Electronic or printed formats are both acceptable.

The following sections of your Field Data Sheet(s) should be filled out during your day visit. Detailed instructions about each of these sections are included in section 7 of this handout.

- SITE DESCRIPTION:
 - Site Code
 - Site Name
 - Site Location
 - Street Directory Reference
 - Altitude
 - Easting
 - Northing
- HABITAT DETAILS
- VEGETATION
- SITE PLAN - DRAWING

Don't forget to sign on and off on your Volunteer Activity Record Sheet when you are doing your daytime site visit.

Make sure that your footwear has been thoroughly cleaned and sterilised according to the guidelines set out in the 'Important Pathogen Control Guidelines' contained in your Frogwatch Kit, before entering a Frogwatch site.

4) Monitoring Times

IMPORTANT NOTES REGARDING MONITORING TIMES:

- It is desirable for monitoring to take place 1 - 3 days prior to, during or following rainfall, if possible.
- Volunteers will be encouraged to monitor during the specified time period where possible, to ensure consistency and comparability. However, data collected outside of the specified monitoring times is still valuable, and is encouraged. Data can be collected at any time throughout the year and sent to the Frogwatch Coordinator. This data will be stored and analysed separately and may not be included in the annual Frogwatch Census Report.

To be included in the Frogwatch Census Report, monitoring must take place during the following time period:

	Season	Dates	Time of day	How often	Duration
Key Frogwatch Sites					
Minimum monitoring	Spring	19 - 25 October (National Water Week) 2008	During the 2 hours after dark.	On at least THREE evenings during National Water Week.	Audio recording of frog calls for 2 - 5 minutes.
Extra monitoring	Spring	1 - 31 October 2008	During the 2 hours after dark.	Monitoring at the same site on a number of evenings during the specified dates is desirable.	Audio recording of frog calls for 2 - 5 minutes.
Other Frogwatch Sites					
Minimum monitoring	Spring	19 - 25 October (National Water Week) 2008	During the 2 hours after dark.	On at least one evening during National Water Week	Audio recording of frog calls for 2 - 5 minutes.
Extra monitoring	Spring	1 - 31 October 2008	During the 2 hours after dark.	Monitoring at the same site on a number of evenings during the specified dates is desirable.	Audio recording of frog calls for 2 - 5 minutes.

5) Before You Set Out

Before you set out to do your monitoring, make sure you have the following equipment:

- This Instruction Sheet;
- Field Data Sheet with Site Description, Habitat and Vegetation sections completed;
- Volunteer Activity Record Sheet;
- Blank tape, clearly labeled with the Site Name, Site Code and Date;
- Portable tape recorder or MP3 player with voice record option (don't forget batteries!) - you can borrow a recorder from us if necessary;
- Thermometer;
- Sterile Footwear (see "Important Pathogen Control Guidelines");
- Torch (preferably head torch). You may find it useful to use a 'red light torch'. A red light enables you to keep your night vision. Make your own red light from a torch covered in several layers of cellophane or a red balloon;
- Map;
- Something to sit on ;
- Pen or pencil; and
- A friend or group of friends.

6) At the Site

1. Walk to the site quietly pointing your torch beam at the ground - not at the area where the frogs are.
2. Sit down and take the air temperature, and then the water temperature.
3. Fill in the environmental parameters on the data sheet including:
 - date and time
 - air and water temperature
 - wind speed
 - cloud cover
4. If your torch is bright, don't shine it directly onto your data sheet as it will temporarily blind you, but beside it so that you can see well enough to write.
5. When you've finished writing, turn your torch off or keep the light concealed from the area where the frogs are - the light can scare some species and stop them from calling.
6. By this time the frogs should have resumed calling as before and you can enter the species and numbers calling on your data sheet.
7. Now start your tape recorder and state clearly:
 - your name
 - site code
 - location
 - time
 - date and
 - weather conditions.
8. You may feel silly, make mistakes and have to do it a couple of times before you are happy with it. Don't be too fussy with it - it is a scientific record, not a work of art!
9. Leave the tape recorder running for 2 to 5 minutes after you have finished talking, and point the microphone towards the frog calling area.

7) Filling out your Field Data Sheet

Much of the Field Data Sheets can be filled out prior to or after taking your recordings. However, please be sure to complete the section on 'WEATHER' at the time you undertake the monitoring.

SAMPLING DETAILS AND SITE DESCRIPTION

Site Code	If monitoring at the same site as last year, use the same site code. If you are monitoring at a new site, or are not sure of your site code, contact the Frogwatch Coordinator to confirm the correct site code. Site codes consist of three letters and three numbers, eg. ARA100.
Date	Record the date that you undertake your audio recording of frog calls.
Time	Record the time that you undertake your audio recording of frog calls.
Observers	Include the names of all participants present. This is used to keep a record of participation in the program. It is also used to allocate Participation Certificates for volunteers, so if possible, please include full names with correct spelling.
Group Name	The name of a Landcare / Bushcare / Waterwatch or other group that you are associated with. (Or just leave blank)
Site Name	Give your site a descriptive name, e.g. "Snow Gums Dam, Aranda". If monitoring at an existing Frogwatch site, use the same name as in previous years.
Site Location Details	Describe the location of your site as precisely as possible, so that the spot can be found again in the future. Also include directions to get there. E.g. Southern side of dam, Aranda Bushland Snow Gums Reserve. Access via Caswell Drive. You might also like to attach a photocopy of a map or print out an image from 'Google Earth' to show the location of your site.
Easting and Northing	These can be easily read directly from a street directory. By convention, the eastings will have 6 digits, and the northing will have 7 digits. Refer to the sheet entitled "How to Calculate Eastings and Northings" for further instructions.
Grid Reference	Calculate the grid reference using a street directory. If in doubt, take a photocopy, with the site location marked on it, and attach this to your field data sheet.
Altitude	If you know the approximate altitude of your site, please fill this in here. Otherwise, leave this space blank, and we will determine the altitude from a topographic map for you.

HABITAT

Approximate size	Estimate the size (in m ²) of the area that you are observing. If your site is along a creek or river, estimate the width of the stream in metres.
Water depth	Indicate the maximum depth of the water body in centimeters, by ticking one of the boxes.
Type of habitat / waterbody	Tick the box which best describes the type of waterbody you are monitoring.
Land use	Tick the box which best describes the land use in the vicinity of your site.
Seasonality of waterbody	Tick the box which best describes the seasonality of the waterbody.
Water flow	Describe the speed of water flow at your site at the time of monitoring. Eg. still, slow, fast.
How long have you known about the site?	
Have you noticed any changes in frog numbers or activity over this period?	
Has the natural environment of the site changed over this period?	

GENERAL DESCRIPTION OF VEGETATION AT SITE

Aquatic vegetation	Describe any plants living in the waterbody. Include any algae, reeds/ rushes or other submerged or emergent water plants.
Overhead canopy	Are there any trees, shrubs or grasses hanging over the waterbody? Eg, Willows, Eucalypts, Casuarinas, grasses along the bank.
Bank vegetation	Describe the vegetation on the banks of the waterbody. Eg, native or exotic grasses, trees, shrubs, rocks.
Surrounding landscape vegetation	Describe the vegetation in the vicinity of your site. Eg, open woodland, dominated by eucalypts, parkland, whether it is regularly mown or not.

WEATHER

Wind conditions	Place a tick next to the box that best describes the wind conditions at the time of monitoring.
Sky conditions	Place a tick next to the box that best describes the sky conditions at the time of monitoring.
Air temperature	Record the air temperature in the box provided. To ensure an accurate reading, allow the thermometer to stabilise for at least a minute before taking the reading. Ensure the thermometer is completely dry when taking air temperature reading.
Water temperature	Record the water temperature in the box provided. To ensure an accurate reading, allow the thermometer to stabilise for at least a minute before taking the reading.

SITE PLAN - DRAWING

A space is provided to draw a simple plan of your site. Please include:

- a cross at the point where you sit to take the recording
- the area of creek or water body
- any access route to the site and the name of any access roads
- any permanent landmarks that would assist someone reading this sheet in the future to find the exact spot that you sampled from (e.g. stands of trees, telegraph poles, pathways, rock outcrops etc.)
- a north arrow to indicate direction

INVENTORY OF SPECIES

- If you are able to immediately identify frog species on-site, record the species that you can hear. Otherwise, you can check your audio recording against the reference CD when you get back home.
- For each species you can hear, estimate the number of individuals calling. Use the following groupings: 1 to 5, 5 to 20, 20 to 50 or 50 to 100.
- If you are having trouble identifying the calls, the Frogwatch Coordinator will be able to help. Just make a note on your data sheet.

ADDITIONAL COMMENTS

Please include any extra comments that may be relevant. For example, you may like to comment on water quality, bank stability, other organisms and wildlife or unusual odours. It is also useful to note any Landcare or other on-ground works that you know have occurred at or near your site, including weed spraying, construction or other land disturbance, removal or planting of vegetation.

8) Return Documentation

Please return your:

- Completed Field data sheet(s);
- Site photographs;
- Audio recording of frog calls - please ensure that each audio recording is clearly labeled with your name, the site code and the date and time of recording. For a cassette tape write these clearly on the label. For digital MP3 recordings, you can put this in the file name information, or make a note of the relevant file name on your data sheets.;
- Completed Volunteer Activity Record Sheet and Participant Survey; and
- Ginninderra Catchment Group membership form if you have not already completed one - you only need to do this once.

Your results can be either posted to:

Dr Beth Mantle

ACT & Region Frogwatch Coordinator

Ginninderra Catchment Group

PO Box 446

Holt ACT 2615

Or dropped off at:

Ginninderra Catchment Group (office)

Kippax Health Centre

Kippax Place

Holt

Ph: 6278 3309

Electronic files of photographs and MP3 audio recordings can be emailed to the Frogwatch Coordinator at:

waterwatch@ginninderralandcare.org.au

(Please try to keep the size of individual files to <1MB. Alternately, electronic files can be burnt to a CD and mailed in as above.)

DUE DATE FOR RECEIPT OF DOCUMENTATION: FRIDAY 14TH NOVEMBER 2008

To have your results included in the Frogwatch Report, please ensure that we have your documentation by this date.

(But if for some reason, you do not get your results in by the due date, please do send them in anyway! The data will still be useful, and included in our records.)

Results will be collated from sites around the whole of the ACT, and put onto a map depicting distribution. All participants will be sent a copy of the final results. The information you have collected will be extremely useful for providing a snapshot of ACT frog populations, and for comparing with past and future surveys.



IMPORTANT

Pathogen Control Guidelines

Australia's native amphibians are threatened by **amphibian chytrid fungus**, or *Batrachochytrium dendrobatidis*, which causes the infection known as chytridiomycosis. Chytrid fungus is associated with amphibian population declines in eastern Australia, New Zealand, USA, Panama, Ecuador, Venezuela and Spain, and is now present in the ACT.

There are serious implications when Chytrid fungus is introduced into frog habitats!

The potential impact of **Chytrid** fungus in the ACT is of concern. It has been associated with the recent disappearance of the Spotted Tree Frog (*Litoria spenceri*) in the Kosciuszko National Park, and is listed as a 'key threatening process' under the *Environment Protection and Biodiversity Conservation Act 1999*.

Measures to reduce the threat of Chytrid fungus and other frog pathogens are essential!

Chytrid fungus can be easily spread, so it is essential for all Frogwatch participants to minimise the potential for the introduction and spread of this and other pathogens. Please read these guidelines and take care to follow them while you are participating in the ACT Frogwatch Census.

GENERAL GUIDELINES

- Do NOT handle or disturb frogs in any way - pathogens may be transmitted very easily through their sensitive skin. Some frogs can also secrete toxins that may harm you.
- Try to avoid coming into direct contact with any water-bodies while you are recording the frog calls.
- Think safety first. Take a strong torch so that you can see what you are doing.
- If you find sick or injured frogs, please contact the Ginninderra Catchment Group immediately on 6278 3309.
- Ensure that footwear and equipment is thoroughly cleaned and sterilised before visiting your Frogwatch monitoring site, or when travelling between different Frogwatch sites - refer to the Sterilisation Techniques detailed over the page.
- Cleaning and sterilisation of footwear and equipment is particularly important if it has been worn or used outside of the ACT or if you are travelling across different water catchments or otherwise discrete sites.

STERILISATION TECHNIQUES

Ideally, it is recommended to use new footwear (eg gum boots) that has not been worn to wet areas outside the ACT before when entering potential frog habitats. Use this footwear only for this purpose.

If this is not possible, all footwear and other equipment must be sterilised before visiting your frogwatch site. Do not go to wet areas (in the Brindabellas in particular) without sterilising footwear first. Three techniques for sterilisation are described below:

Sterilisation by thoroughly cleaning and drying

- Clean footwear and other equipment by scraping, picking and washing out all dirt from the soles and sides.
- Place in direct sun, in an upright position for a minimum of 10 minutes. Then on each side and soles upward for 10 minutes each.

Sterilisation using alcohol

- Clean footwear as above, and then brush or spray sides and sole with 70% alcohol or stronger. Methylated spirits is adequate.
- Let the footwear dry, preferably in direct sunlight.

Sterilising using bleach

- Clean footwear and other equipment by scraping, picking and washing out all dirt from the soles and sides.
- Dilute bleach as directed on the bottle for floors. Wash footwear with the solution up to the lower end of the tongue (the inside need not be wetted).
- Rinse and dry, preferably in direct sunlight.

*** PLEASE NOTE: Bleach may harm leather - it is recommended to polish leather footwear once it is dry to minimise any harmful effects.

Eastings and Northings



Eastings and northings allow us to locate a particular point on a map. An easting has 6 digits and a northing has 7 digits. By convention, we state the easting, and then the northing.

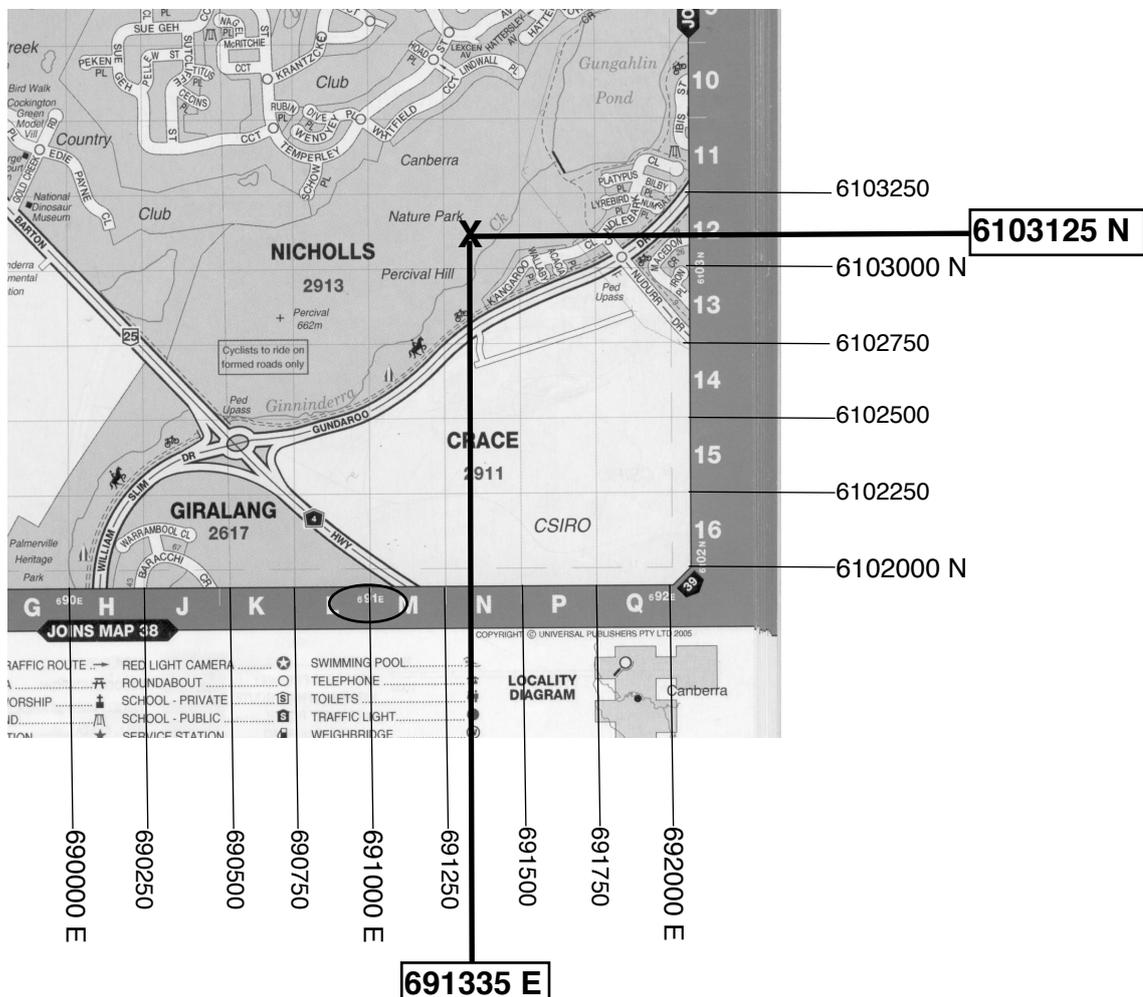
To calculate:

1. Locate your frog monitoring site on a street directory map.
2. Notice the gridlines printed across the map - these indicate increments in the eastings and northings across the map, much like a ruler indicates millimetres. On the map shown below, the gridlines are increments of 250 units. (See notes on sides of the map below.)
3. You will also notice that there are small numbers printed at regular intervals along the edges of the map according to the easting and northing gridlines (e.g. 691 E). These numbers have been abbreviated; 691 E actually represents the easting line of 691000 - see the number circled in the diagram below.
4. Remember: an easting consists of 6 numbers (e.g. 691000 E) and a northing consists of 7 numbers (e.g. 6103000 N).

EXAMPLE. For the site marked X below:

Easting calculation. The X lines up with the bottom axis at about one-third of the way between 691250 E and 691500 E. The easting is therefore 691335 E.

Northing calculation. The X lines up with the side axis at about one-half of the way between 6103000 N and 6103250 N. The northing is therefore 6103125 N.





Contacts and resources for more information

Contacts

ACT Frogwatch Coordinator, Ginninderra Catchment Group

6278 3309

waterwatch@ginninderralandcare.org.au

www.ginninderralandcare.org.au

Waterwatch ACT

6207 2246

tanya.noakes@act.gov.au

www.act.waterwatch.org.au

Ginninderra Catchment Group

6278 3309

landcare@ginninderralandcare.org.au

www.ginninderralandcare.org.au

Southern ACT Catchment Group

6296 6400

info@sactcg.org

www.sactcg.org

Molonglo Catchment Group

6128 3376

coordinator@molonglocatchment.com.au

www.molonglocatchment.com.au

Other Frogwatch Resources

These are available at Frogwatch events or by contacting the Frogwatch Coordinator.

- "Frog Calls of South East NSW and the ACT" Audio CD, by Ederic Slater.
- Frogwatch Thermometer.
- "Creating a Frog Friendly Habitat" brochure.
- Frogwatch Reports, 2002 - 2007.
- "Frogs In Your Backyard" - Frogs of the ACT & Region poster.

WEBSITES

- **Ginninderra Catchment Group** www.ginninderralandcare.org.au

This site contains information about the ACT and Region Frogwatch Program, and you can download copies of all of our Frogwatch and other resources from here. You can also find out about the other activities of the Ginninderra Catchment Group.

- **Amphibian Research Centre** www.frogs.org.au

A first stop for Australian frog enthusiasts, this site provides comprehensive and varied information on all aspects of Australian frogs. This site includes sound bites of the calls of Australian frog species, and the community frog forum, where you can chat about frogs with experts and other community members. Includes links to: Project Corroboree, The Victorian Frog Group, The Frogs of Australia Database, the Melbourne Water Frog Census, Alcoa Frog Watch, The Lost Frogs' Home ... and much more!

- **Frogs Australia Network** www.frogsaustralia.net.au

The Frogs Australia Network aims to establish itself over the coming years, providing a comprehensive 'portal' that showcases the efforts of frog conservation across Australia and directs you to the right source of information and people. The website includes the Australian Frog Database, Conservation, Resources, Community, Members, and News.

- **Frogs of the Australian National Botanic Gardens.** www.anbg.gov.au/anbg/frogs/index.html

Information about frog species that are present in the Botanic Gardens, including a description, drawing and audio bite of the mating call for each species.

- **Australian Herpetological Directory.** <http://www.jcu.edu.au/school/tbiol/zoology/herp/herp2.shtml>

A directory put together by James Cook University which provides links to Herpetological Groups and current research projects.

- **ASX Frog Focus.** www.asxfrogfocus.com

A curriculum-based education resource that will motivate and engage school students and their communities in the study of frogs.

- **Amphibian Diseases Home Page.** www.jcu.edu.au/school/phtm/PHTM/frogs/ampdis.htm

A home page for diseases of amphibians relevant to amphibian declines. Contains protocols for handling of specimens and surveys for the amphibian chytrid fungus.

- **AmphibiaWeb** <http://amphibiaweb.org/>

AmphibiaWeb is an online system enabling anyone with a Web browser to search and retrieve information relating to amphibian biology and conservation. This site was inspired by the global declines of amphibians, the study of which has been hindered by the lack of multidisciplinary studies and a lack of coordination in monitoring, in field studies, and in lab studies. We hope AmphibiaWeb will encourage a shared vision for the study of global amphibian declines and the conservation of remaining amphibians.

- **Commonwealth Department of Environment and Heritage – Australian Frogs, An Overview.** www.deh.gov.au/biodiversity/threatened/publications/frog-overview.html

Details evidence and possible reasons for frog population declines in Australia.

- **Global Amphibian Assessment** www.globalamphibians.org

The Global Amphibian Assessment (GAA) is the first-ever comprehensive status assessment of the world's 5,743 known amphibian species. This project represents the first time that all amphibians have been assessed against the ICUN Red List Categories and Criteria, and as such is an important contribution to the Red List Programme. More than 500 scientists from 60 countries contributed to the three-year study.

- **Livingunderworld** www.livingunderworld.org

"A non-profit, educational website, whose purpose is to make available accurate, and organized amphibian information for hobbyists, professionals, or curious individuals".

- **Frogland.** www.allaboutfrogs.org

From a frog-lover with too much time on her hands, Frogland seems boundless. This very, very extensive site is both a fun place to kill some spare time and a useful starting place to go about locating any frog-related information on the internet.

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