

**CODE OF PRACTICE  
FOR THE WELFARE OF AMPHIBIANS IN CAPTIVITY**

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## 1. Introduction

This Code of Practice for the Australian Capital Territory (ACT) has been prepared by the ACT Animal Welfare Advisory Committee (AWAC) to outline the welfare needs of amphibians kept in aquaria. Its purpose is:

- To provide minimum standards of care for keeping of amphibians in captivity; and
- To encourage the protection of wild populations of amphibians from illegal harvesting and introduction of disease and genetic contamination.

A person in charge of amphibians has a legal obligation under the *Animal Welfare Act 1992* to ensure that each individual receives appropriate care to remain in a healthy condition.

The *Nature Conservation Act 1980* requires stringent licensing criteria to be met for a person to keep amphibians.

Animal welfare considerations are becoming increasingly important in the keeping of animals. This Code is based on established experience and current scientific knowledge. Practices once considered acceptable are now being reassessed and modified according to new knowledge and changing attitudes. This document will be reviewed in the light of new knowledge.

## 2. Definitions

Amphibian – An amphibian is a cold-blooded vertebrate typically living on land but breeding in water, e.g. frogs.

Sell – For the purposes of the *Nature Conservation Act 1980* and for this Code of Practice, to 'sell' includes—

- (a) offer for sale; and
- (b) expose for sale; and
- (c) barter (or offer or expose for barter); and
- (d) exchange (or offer or expose for exchange); and
- (e) supply for value (or offer or expose for supply for value); and
- (f) supply for free (or offer or expose for supply for free), to gain or maintain custom, or otherwise for commercial gain.

### **3. Licences**

The *Nature Conservation Act 1980* makes provision for the protection and conservation of native animals and native plants. As such no trade or exchange can occur of any native fauna without receiving approval from the Conservator. Licences are required to 'take', 'keep' or 'sell' native animals within the ACT. A licence application must be lodged for all proposed transfers and exchanges of any native animals in the ACT, except those classified as "exempt" under the *Nature Conservation Act 1980*. Licences are also required to 'export' native animals from the ACT and 'import' native animals into the ACT.

All species of native amphibians are protected under the *Nature Conservation Act 1980*. Amphibians, including exempt species, may be acquired only from a person who obtained them legally. Special licences under the *Nature Conservation Act 1980* to take from the wild for an approved purpose may be granted. However, licences to take amphibians from the wild are usually only granted for scientific or educational purposes. Preferably, these animals will be released at the capture site at the completion of the scientific study or educational exercise after a suitable quarantine period.

A licence from for the Conservator is required to keep all species of native amphibian, including tadpoles and spawn, except those species classified as exempt species under the *Nature Conservation Act 1980*.

All licences issued under the *Nature Conservation Act 1980* for activities involving amphibians will be subject to conditions set by the Conservator of Flora and Fauna. All applications for licences will be subject to the normal approval process and licensing criteria that operate under the *Nature Conservation Act 1980*.

### **4. Responsible Ownership**

Since humans can alter or control a captive animal's environment, animal welfare includes the concept that people have duties and responsibilities towards animals in their care.

Responsible ownership means looking after the needs of the animal, and includes adult supervision of children who have amphibians as pets.

Account should be taken of the amphibian's potential contact with humans and other animals and provision should be made for a suitable retreat place to minimise stress from sight or sound intimidation. When taking on the responsibility for an animal its potential life span should be considered; for some species of amphibians this can be up to 30 years.

To encourage healthy offspring and to reduce the possibility of amphibians for which homes cannot be found, breeding should be limited. Owners are responsible for maintaining the care of, or rehoming (if permitted) all progeny produced by their animals. For some species of frogs, this could be many

hundreds of offspring. The *Nature Conservation Act 1980* requires a person to obtain a licence to sell amphibians. (See above definition for “sell”.)

New owners, who also must be licensed prior to obtaining an amphibian, are to be provided with information about diet, accommodation, management and general health care.

## **5. Handling**

Handling of a captive amphibian should always be minimised to ensure the amphibian is not stressed or accidentally injured.

Care should be exercised when handling to prevent injury and discomfort to the animal. The animal’s abdomen should be supported by the palm of the hand with the other hand placed over its shoulders to prevent escape. Amphibians should be held securely, but not tightly, as their bones are fragile.

Standard hygiene procedures such as hand washing should be followed. It is imperative to ensure that hands are thoroughly rinsed and no detergent remains before handling further amphibians.

When introducing new animals, or handling sick animals, it is recommended to use disposable latex gloves. The gloves should be wet prior to handling the amphibian in order to protect the amphibian’s sensitive skin. Gloves should be changed when handling animals housed in different tanks to prevent any possibility of cross-contamination.

## **6. Quarantine**

Any amphibian being introduced to an existing colony should be kept in isolation for a period of 5 weeks to reduce the risk of introducing disease such as Chytrid fungus.

Any sick animals should be removed from the parent colony to reduce risk of spread. Sick animals should be maintained in an isolation tank.

It is recommended that any new rock, soil, or gravel material should be thoroughly dried before introduction to the tank to reduce the risk of introducing a disease. This can be achieved by either drying the material in direct sunlight until no moisture remains, or heating the material for period of 2 – 3 hours in a slow oven. For either method, the soil or gravel should be regularly stirred and turned to ensure no pockets of moisture remain. These measures will ensure that no Chytrid fungus is being inadvertently introduced to an existing colony.

## **7. Environment**

Most amphibians kept in the ACT are introduced to the region from areas of Australia that may have a vastly different environment. Therefore it is imperative for an amphibian’s well being and survival that informed advice be sought as to the individual environmental needs of the given species, and that any enclosure intended to house that species be equipped or designed to provide an artificially controlled environment that satisfies its needs. Environmental factors that will need to be addressed are as follows:

In an enclosure, amphibians are vulnerable and will require protection from:

- vermin and household pets;
- escape;
- direct sunlight;
- air born contaminants such as aerosol sprays, smoke, vapours and fumes;
- chemicals such as cleaning products;
- extremes of temperature;
- excessive noise; and
- young children and rough or excessive handling.

All amphibians require adequate space to move around and an environment to explore. As a general guide, an aquarium with dimensions 60cm by 40cm by 40cm (length by width by height) one third filled with water will be required to support 20-30 small tadpoles, or 6-8 large tadpoles providing that adequate food is available and that water quality is maintained. The same sized aquarium will be the minimum size required to house 2 adult or 4 half-grown Green Tree frogs.

For smaller to moderate sized species, an enclosure measuring 40 cm by 40 cm floor area with at least 10 cm of suitable substrate will house 2 or 3 adults. Larger species will require larger cages- at least 60 cm by 60 cm floor area for 1 or 2 adults with at least 10 cm of suitable substrate.

Isolation in an area without adequate light, ventilation or social contact (where appropriate) is unacceptable. It should be noted that some species are cannibalistic.

An ultraviolet fluorescent tube designed for reptiles, attached to a timer to mimic natural (seasonal) day-night cycles, should provide appropriately balanced light. Tropical species may require an artificial heat source. (See heating).

## **7.1 Housing**

The needs of each individual species must be taken into account when establishing the holding tank or other enclosure.

Enclosures for captive amphibians:

- should be constructed of material that is easy to clean;
- should be easily accessible to the handler for maintenance;
- should have adequate space for the given individuals to move and exercise; and
- should be well ventilated.

Amphibians may be kept in a variety of situations, but whatever is chosen, care must be taken to ensure that the enclosure:

- is not placed in direct sunlight;
- provides continuous access to water;
- provides generous ventilation and is safe from fumes and vapours (chemicals including insecticides, ammonia from urine, deodorants and hairsprays);
- is safe for the occupants i.e. has no sharp projections or structures that may easily collapse; and
- provides opportunities for sufficient exercise.

### **7.1.1 Burrowing Frogs**

A burrowing frog's enclosure should be established with a greater floor space than height. The depth of soil used will depend upon the species of frog being kept and allowance for the depth of the soil should be taken into account when selecting the tank.

The type of soil is important and depends on the species of burrowing frog being kept. Informed advice should be sought on the sand or clay content required.

The amount of time a burrowing frog stays within its burrow will vary between species. Some burrowing frogs will burrow daily, returning to the surface at night. Other burrowing frogs only burrow during droughts. If the latter species is kept, further information should be sought on how long the individual frog can stay in a state of torpor (a hibernation-like state) and what environmental triggers they need to allow them to return to the surface.

Do not set up the enclosure for a burrowing frog with soil only. Rocks, water and plants should also be included.

### **7.1.2 Tree Frogs**

A tree frog's enclosure should have more height relative to volume to allow for climbing. Tree frogs need to have their size and weight taken into account when furnishing their enclosure with plants. A large tree frog will require suitably sized climbing structures.

Frogs are not to be given roses, or other plants with thorns, spines or sharp edges to climb on. Frogs have soft sensitive skin and thorns will penetrate their skin. Artificial plants maybe used within the enclosure.

Tree frogs benefit from having a lot of branches within their enclosure for climbing as well as an abundance of fresh green leafed plants for hiding in. One suitable variety is Spathyphylum, an aquarium variety of plant that is also suitable to dry conditions.

A wooden framed tight-fitting lid with an insert of plastic mesh, secured to the top of the tank with latches is recommended for the enclosure. Some pet shops can supply a purpose made plastic mesh that is used to prevent skin damage, or supply a suitable lid. Tree frogs can be strong enough to push a glass lid off their tank and escape. Lids must be tight fitting or secured or frogs will escape.

### **7.1.3 Stream dwelling frogs**

Stream dwelling frogs should be kept in an enclosure that has free flowing water which is pumped from one end to the other. This can be set up as a cyclic system.

The enclosure should have varying sizes of rocks to allow frogs to hide. Care should be taken with the positioning of the rocks to ensure that the rocks can not collapse and trap or injure the frog. Plants should also be included within this environment.

### **7.1.4 Axolotls**

Axolotls should be housed in a tank with either no gravel, or with gravel large enough that it cannot be swallowed. The water within the enclosure should be filtered. The turnover rate for the water should be approximately 4 to 5 times an hour. Axolotls should only be housed with other Axolotls of equal size.

## **7.2 Lighting**

Because of a frog's sensitivity to light and the role ultra violet radiation plays in its behaviour it is recommended that light be artificially provided by means of a fluorescent light fitting on a timer. (Household light bulbs do not produce the correct wave lengths).

All amphibians require a "normal" day / night cycle (12 hours of light in the warmer months with an option of 8 hours a day in winter).

An essential vitamin, (Vitamin D), is produced in the skin when exposed to ultraviolet rays in sunlight. Due to the dangers of allowing direct sunlight onto an enclosure and the filtering effect of glass it is necessary to use special "reptile" Ultra Violet fluorescent light tubes as part of the day cycle. Exercise caution and seek professional advice when purchasing UV lights as some are dangerously strong; and do not produce the correct wavelengths.

## **7.3 Temperature:**

Individual species of amphibians have particular temperature requirements, and the keeper should seek professional informed advice on the requirements of their particular species.

Tropical and semi tropical frog species will require artificial heating during the cooler months. Tropical species should be kept at a temperature of at least 20 degrees celcius and semi tropical species should be kept at a temperature of at least 15 degrees celcius. The maximum temperature for any species of frog should be obtained from an informed source.

One or a combination of the following may achieve artificial heating:

- Ambient temperature, (heating the room in which the enclosure is placed keeping in mind that the temperature should remain constant).
- “Reptile” heat pad placed under or behind the enclosure.
- Aquarium water heater placed in a water section. This will also increase humidity.
- Radiant heat source—spot or “heat lamp”. These sources of heat will require a protective cage to prevent frogs from burning themselves. Spot-lights will need to be infra red to maintain a day/night cycle.

It is highly recommended that a thermostat is attached to any of the previous heating appliances to maintain a constant temperature and that a thermometer is used for monitoring.

#### **7.4 Humidity:**

The correct humidity levels are required to ensure that amphibians do not dehydrate, but poor ventilation or over “wetting” an enclosure will create saturated humidity, (often seen as condensation), which may induce respiratory and bacterial complications. Humidity can be monitored with a hygrometer.

Tropical species of frogs should be maintained at 60% to 80% humidity. Semi-tropical species of frogs should be kept at 50% to 70% humidity. Cooler climate frogs can be maintained at 30% to 60% humidity.

Humidity can be raised by:

- Spraying the enclosure with water;
- Increasing the number of live plants;
- Reducing ventilation; and
- Increasing the body of water, agitating or heating it.

Humidity can be decreased by:

- Increasing ventilation; and
- Reducing the body of water.

## **7.5 Water:**

All amphibians require free access to water to survive. The water must be:

- Deep enough to submerge their hind legs as this is how a frog drinks;
- Clean and free of ammonia. Small bodies of water will need to be changed daily, larger bodies of water can be filtered;
- Free of chlorine. Water can be aged or dechlorination agents added; and
- Easy to find and access.

The amphibian must have the ability to get out of deep bodies of water by providing such aids as aquatic plants or partially submerged objects. Amphibians can drown if they are unable to get out of the water or when their feet are too wet to adhere to surfaces.

## **7.6 Substrate:**

Any material used on the bottom of your enclosure will need to be:

- Easy to clean;
- Free of bacteria;
- Large enough to not be swallowed and cause constipation; and
- Non-adherent.

## **7.7 Community living and compatibility:**

Some amphibians, such as the dwarf tree frog, are gregarious and need to live in groups. Other species do not require companionship. If you are intending to house more than one amphibian in a given enclosure, you must:

- Consider the final adult size as some amphibians can grow very large;
- Be aware that most amphibians are cannibalistic and will therefore eat smaller individuals;
- Seek informed advice before mixing species, as their environmental needs will have to match exactly; and
- Be aware of overcrowding and increased waste produced by greater numbers.

## **7.8 Cleaning**

Small standing bodies of water need to be changed daily. Water filters require changing as per the manufacturer's advice. Cleaning the glass should be achieved without the use of any cleaning agent or disinfectant by the use of a razor blade, cloth and warm water only.

## **8. Nutrition**

### **8.1 Tadpoles**

A tadpole will feed on decaying plant matter, algae, spirulina and fish flakes. You can provide your own decaying plant matter for your tadpoles. This can be provided by boiling lettuce for 5 minutes and allowing it to cool before introducing it to tadpoles. The boiled lettuce can be stored in icecube trays in the freezer and added, once defrosted, to the tank housing the tadpoles when required. This should be approximately every 1 to 3 days. Overfeeding leads to very dirty water. Underfeeding tadpoles can lead to cannibalism.

Water should be left to stand for a 24 hour period, or a chemical ager should be introduced to the water to quickly eradicate other chemicals such as fluoride.

### **8.2 Frogs**

Frogs are insectivorous (eat insects) and hunt by movement. When offering food it must be alive or physically jiggled about by hand.

Frogs species have distinctive feeding behaviours. Some species will gorge themselves on any available tasty morsels regardless of need, while others will only eat occasionally when hungry.

Frogs survive well on a diet that includes crickets, mealworms, waxworms, bloodworms and grasshoppers. Mealworms and waxworms should only form a minor part of the diet because they have a very high fat content.

A frog should be given a variety of insects of varying sizes within their diet. Generally, most frogs will eat all sorts of insects. If the frog is large enough, start by feeding it crickets then introduce other insects of a similar size.

Tiny frogs and froglets (of approximately 1 cm in length depending on the species) will require exceptionally small insects such as pin-head crickets, bloodworms or flightless fruitflies.

Small frogs (between 1 cm and 4 cms in length) generally can consume crickets that are approximately 2 – 3 weeks old.

Medium frogs (between 4 cm and 8 cm in length) may also be interested in eating pinkies (dead day old baby mice, available from commercial suppliers) which should only be given occasionally as they are high in saturated fatty acids.

Large frogs (greater than 8 cm in length) may also eat pinkies and early stage dead 'fuzzy' mice. A fuzzy mouse is approximately 4 to 8 days of age.

Frogs in particular require additives for healthy growth. When supplementing your frogs diet with vitamin supplements or additives such as calcium the manufacturers directions should be followed.

### **8.3 Axolotls**

Axolotls are carnivores. An axolotl diet should consist of a combination of small fish (for example, frozen whitebait that has been defrosted and soaked to remove the high salt content), worms, insects, lean beef heart strips, commercially produced pellets or commercially produced frozen axolotl dinners, once defrosted.

## **9. Health Care**

- Frogs must be acquired from a reputable and licenced source to ensure the long term health of the colony.
- Observe correct quarantine procedures when introducing new frogs to a colony.
- Fresh uncontaminated water is essential owing to the permeable nature of their skin through which water intake occurs.
- Amphibians are susceptible to toxins and environmental contaminants.
- Young, growing amphibians are particularly intolerant of poor nutrition and attention should be given to advice on nutrition under Section 8.

The diagnosis of specific diseases in individual amphibians is not easy as sick animals usually show similar symptoms with a variety of causal agents. Daily observation and visual examination is the best way to establish the appearance of a healthy amphibian and at the same time allows detection of changes from normal. Avoid handling.

Do not use an antiseptic on any skin injury that your frog may have sustained. In checking the daily health of your amphibian, consideration should be given to:

- Posture and attitude in and out of water;
- Activity level in and out of water;
- Response to stimuli including handling;
- Withdrawal reflex and the ability to right itself;
- Assessment of body condition;
- Assessment of state of hydration;
- Appetite and dietary history; and
- Observing faecal matter for any abnormalities.

Local herpetological societies, specialised veterinarians, or pet shops specialising in amphibians can be approached to assess any abnormalities that are observed.

The medicine of amphibians is still an evolving discipline. Only those disease symptoms that occur with relative frequency are listed here. In disease situations, amphibian owners should consult with veterinarians and those experienced in amphibian care.

## **9.1 Red Leg**

This is not a single disease entity but the result of infection by one or a number of bacteria. Clinical signs include lethargy, skin discolouration, haemorrhages and ulcerations, and sudden death. Control is aimed at isolating and treating affected animals and, importantly, reducing environmental contamination and disease transmission. Saline baths are effective at reducing wound contamination and disease spread. A commercially produced aquarium salt can be used for a saline bath. Use the dosage instructions given for fish.

## **9.2 Chytrid Fungus Infections**

Scientific investigations in Australia are now indicating Chytrid Fungus is the most important factor in the decline in frog numbers in the wild. Amphibians affected by Chytrid Fungus show abnormal posture, skin ulceration and abnormal sloughing, lethargy, loss of righting reflexes and death. The key to preventing this disease is scrupulous attention to quarantine procedures and a stable environment with particular attention to water quality.

## **9.3 Nutritional Diseases**

Nutritional diseases are quite common in amphibians but are less likely to be seen in adults or animals kept for short periods.

Nutritional bone disease is caused by calcium and/or vitamin D deficiency, and calcium phosphorus ratio imbalances. Symptoms include curvature of the backbone, long bone deformities and fractures. Treatment includes calcium supplementation and exposure to the correct ultraviolet light. (See section 7.2)

Vitamin A accumulation may cause liver degeneration when amphibians are fed exclusively on raw liver diets.

Gout may occur in some amphibian species fed excessive amounts of protein.

Oxalate toxicity with kidney stones has been seen in tadpoles fed high oxalate diets (eg Spinach)

## **10. Transport**

Axolotls are sensitive to sunlight so it is preferable to transport them in a darkened container using its own tank water.

Do not place heavy rocks or decorations in the tank as they could move and injure the amphibian.

Frogs require constant moisture to prevent their skin dehydrating. They should be transported in a sealed plastic container with a small amount of cotton wool soaked in water. Transport time should be kept to a minimum.

If a brief stop is required during travelling, the vehicle should be left in a shady spot with fresh air circulating. If a longer stop is required, (longer than 30 minutes) remove the animals from the vehicle and keep them in a cool place.

## 11. Breeding

Unless specific conditions exist, amphibians will not breed.

To prevent unwanted tadpoles, and subsequently frogs, remove any unwanted spawn and dispose of appropriately.

## 12. Placement of Offspring and Unwanted Animals

It is recognised that there will be times when a person will be unable to keep and/or care for their amphibian. Arrangements should be made to pass the amphibian on to a new owner privately, through a herpetological group, or a petshop that specialises in the trade of amphibians. If the amphibian is subject to a licence under the *Nature Conservation Act 1980*, a licence to sell must be applied for prior to disposal.

Captive animals can never be released into the wild. This includes captive-bred spawn.

It is illegal under the *Animal Welfare Act 1992* to abandon or release an animal. Licenced animals must be dealt with in accordance with licence conditions. When efforts to have an animal rehomed have been unsuccessful, Environment ACT should be contacted. Should Environment ACT be unable to accept any additional amphibians, it may be necessary to have the amphibian euthanased. Euthanasia should be performed by a veterinary surgeon.

## 13 Exempt Amphibians

A list of exempt amphibians is attached as a schedule to the *Nature Conservation Act 1980*.