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## A guide to keeping Great Barred Frogs

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### *Mixophyes fasciolatus* - they're great!

The fawn to rust-red "leaf litter" pattern which covers this frog's body contrasts strongly with the dark zebra-like bars which encircle its legs and give it its name. Prior to the success at the Amphibian Research Centre it had never been bred in captivity and as a consequence is one of the rarest species to be kept by hobbyists. It inhabits the central coastal regions of Queensland and extends into northern New South Wales. And adult size of well over 100mm makes this one of Australia's larger frogs. The following information comprises the most up to date information on the husbandry of this species and should help facilitate a long and happy experience with your frog.

### Enclosures

A variety of different containers may be used to house Great Barred Frogs. They must be water proof and non-toxic. Glass and plastics are the best materials but for visibility, longevity, and aesthetic appeal a glass aquarium is best. Any enclosure must be secure and escape proof. A tight fitting wooden or aluminium frame covered with fly-mesh provides the necessary ventilation and security. Use only fibreglass fly-mesh as steel or aluminium flyscreens provide abrasive surfaces on which the frogs may injure themselves. A standard 4ft (120cm) aquarium would adequately house two to three adult frogs.

### Temperature / Heating

Great Barred Frogs live in relatively cool areas of rainforest. They are most common at higher altitudes and burrow into the cool moist earth during the day. Despite the fact that they are a warm climate species, they will tolerate reasonably cool temperatures. They should be kept indoors to avoid exposure to extremes of temperature, but may be kept without supplementary heating or cooling if the area they are to be kept in is located in a well insulated part of the house. It is preferable not to let the soil temperatures drop below 10°C or rise above 25°C. Remember it is the soil temperature which determines the frequency with which your frogs become active and you should try to promote soil temperatures around 20°C. It is advisable not to expose very young frogs to low temperatures and maximum growth will be encouraged by temperatures between 20°C and 25°C. If you do need to heat your enclosure, be aware that heating the water will increase water and air temperature but have little effect on soil temperature. The best means of supplementary heating is by the placement of a very low wattage heat pad, with a thermostatic control, beneath the land area of the tank.

### Lighting

Great Barred Frogs are exclusively nocturnal and will burrow quickly when exposed to light. Any extended period of activity on the surface during exposure to light is usually an indication that there is something wrong. Their behaviour coupled with their low light rainforest habitat means that they are unlikely to be exposed to natural ultra violet (U.V.) light which is used by many animals in the production of vitamins which help them metabolise calcium. They do not seem to need exposure to artificial U.V. light in captivity and the provision of simple white fluorescent light to indicate day should suffice. If you wish to grow plants in your enclosure it is best to use a light designed for growing plants (eg. GroLux or Biolux). If you wish to breed your frogs you may need to alter your day length with the seasons.

## Water

Maintaining water quality is an important part of amphibian husbandry. Fortunately Melbourne's water supply is suitable for Great Barred Frogs, and only requires the removal of chlorine before it can be used. This can be done in two ways. Either leave the water in a bucket in the sun for a day or two (the chlorine will evaporate away) or use one of the chlorine-neutralising chemicals available from most major aquariums. Water should be changed regularly, the frequency of changes will be dictated by the amount of water, the number and size of frogs, the presence or absence of aquatic plants, and the presence (and type) or absence of a filtration system. A standard 4ft aquarium with 15cm of water over half its area, two adult frogs, and no plants or filtration may require changing weekly. When changing 100% of the water in a tank it is best to allow for the temperature change. Leave your fresh water in a bucket next to the tank overnight. This will both allow the chlorine to evaporate and the temperature to equilibrate. Do not use hot water from the tap as it will contain copper which is toxic to frogs. If hot water is needed, heat some cold water in a stainless steel saucepan. Conditioning salts from your local aquarium may be added at half the directed rate to the water, this will provide better growing conditions for your aquatic plants and help prevent fungal infections in tadpoles or fish. A healthy growth of plants in any large water body will help keep the water healthy and water changes will be needed less regularly. Filtration may be provided and this too will reduce the frequency of water changes. Most types of filtration may be used but it is important to ensure that the water is not too turbulent as this will trap tadpoles and possibly drown young frogs. It is important to provide numerous escapes from the water especially in the corners and it is preferable to have the water in the centre of your tank with ramps leading to land on both sides. This will ensure that your frogs don't swim into a corner and get stuck where they may exhaust themselves and drown. Any glass ramps should be covered with silicon which then has gravel pressed into it. When dry this provides a safe footing for frog species which may otherwise be unable to navigate wet glass ramps.

## Plants and substrates

The choice of substrates is one of the most important considerations for burrowing species. Any substrate must be friable, resistant to compacting and have good moisture retention properties. Any land area MUST be well drained. Soil in aquariums tends to get waterlogged, and will both drown your plants and provide an ideal breeding ground for bacteria that produce wastes that can be harmful to your frogs. This is especially important for burrowing species that are exposing themselves to bacterial wastes that accumulate in undrained or waterlogged soils. It is best to get a hole drilled in any land areas of your tank, cover them over with mesh or an under gravel filter plate then crushed rock or gravel followed by substrate as you would in a pot-plant. Place a bucket under the hole to collect any water that drains through the substrate. The substrate of choice is palm peat and is available in dry compressed bricks from the gardening section at many supermarkets. It is clean, cheap, relatively sterile and requires only the addition of water to expand into a moist friable substrate. Palm peat drains well and if you pour good quantities of water through your substrate about 2-3 times a week you will be washing out most of the wastes, keeping the substrate clean and encouraging your frogs to become more active. A layer of leaf litter should be placed above the palm peat. The best plants for your enclosure are usually rainforest understorey species that will survive low light conditions. Bella palms, species of *Ficus*, *Spathophyllum*, and *Lomandra* as well as some orchids will do well in the temperature conditions provided. If you wash the soil off the roots of Bella palms and *Spathophyllum*, they will actually grow in water.

## Feeding

In nature most frogs are almost totally insectivorous. The most common dietary problems seen in frogs are related to lack of calcium or too much protein in the diet. In nature Great Barred Frogs are known to eat other frogs and as a consequence probably have a diet high in calcium. Their tendency to hide from light also indicates that this species probably does not utilise UV light to enhance calcium absorption. In captivity it is likely that Great Barred Frogs require a diet high in calcium and as a consequence it is recommended that all feed insects be dusted with calcium/multivitamin powder. Calcium powders are available at many pet stores and should be mixed in equal quantities with a multivitamin powder then dusted on food before feeding. Place your insects in a plastic bag with a pinch of calcium/multivitamin powder and shake it till the food is well coated. By doing this each time you feed your frogs, calcium deficiency should be avoided. Do not mix large quantities of this mixture at a time. It does not store well after mixing as the calcium can denature the vitamins (refrigeration will slow this process). Most frogs have not evolved to cope with a diet high in protein and the tendency to feed them mice or strips of meat on tweezers often puts extra strain on the frogs organs, particularly the kidneys. If these foods are used regularly they can lead to gout, irreversible kidney damage and ultimately death in some frog species. Whether Great Barred Frogs are able to better cope with vertebrate prey and the high protein levels they yield is unknown. Young frogs raised at the ARC on a variety of insects and invertebrates all dusted with calcium have not displayed any signs of calcium deficiency. Juveniles will happily eat blow flies and small crickets and should have food available to them AT ALL TIMES. Adults will eat a variety of vertebrate and invertebrate prey items. They should be offered about 10-20% of their own body size in food each week. It is important to try to make food availability coincide with active periods and this may require deliberate feeding after the enclosure has been moistened. Remove drowned insects so as not to foul the water.

## Licensing and legal matters

Almost all of Australia's frogs are currently, or are soon to be, protected. In Victoria it is an offence to remove from the wild, or interfere with, any frog, tadpole or spawn (frogs' eggs). It is also necessary to have a licence to keep most frogs and it is a condition of the licence that such frogs must be obtained from a legal source (usually captive breeding). To keep Great Barred Frogs requires a Category 2 Licence. The licence application forms are available from the Department of Sustainability and Environment. The forms are available online - you can find links from the Licensing section of the ARC website. [<http://frogs.org.au/arc/>]. It is necessary to purchase your licence before obtaining your frogs.