

## UNDERSTANDING THE REPTILE – RESCUE AND REHABILITATION

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### Introduction

Reptiles are a significant component of Australian fauna. There are around 1,000 species that may be found across Australia. The diversity of species both in habits and habitats is an important consideration for husbandry and rehabilitation purposes. Reptiles commonly come into care for rehabilitation across all of Australia. See appendix Table 1 for common species and cause and injury types.

The aim of this paper is to provide enough basic information to get a reptile assessed and, where required, husbandry stable and further help sought.

Primarily, injuries range from gardening incidents, road trauma, entanglements and human cruelty. Recent innovations, enclosure designs and better understanding provide rehabilitators with increased potential for successful outcomes in conjunction with quality veterinarian treatments. The short-term rescue, handling, care and assessment are critical elements.

### Setup

#### RESCUE Equipment

Medicines, antiseptic creams, pain relief (where legally obtained), rescue tools.

Ideally

Handling Tools: sticks, hoops with fitting bags) restraining poles, restraining tubes, handling gloves, (Mid west Tongs – Gentle Giant style. Noose may be required for large varanids. Large blankets, muzzles (for small terriers). Restraining tubes. Hook remover for turtles. Towels are also important for wrapping injured turtles.

Transportation: Calico bags, transportation box or esky solid.

Traps: Elliot traps. Jar of (peanut butter), funnel traps, large one-entranced box, large cat/possum traps. Large aquatic nets.

Medical: Compression bandages, anti bacterial wipes, tweezers, reptile insecticide, chlorohexidine wash, betadine cream, Silvazine cream, bandages, self-adhesive bandages. Forceps, ball point feeding nozzle, cotton buds, metho bottle, alcohol swipes, syringes 1ml, 5ml, 10ml and 50ml and needles (18g – 26g). Collection containers. Scales prefer mg – 5kg.

Extra: Local reptile field guide, head torch, facemask, Collection tubes

Disposable gloves, Dual Spray bottle (70% methylated spirits or vodka with water and a water sprayer). Why? If a snake or large lizard bites and does not release – spray the meth/water liquid into the oral cavity! Instant release.

### Warning

All reptiles can bite, while most are ineffective others can cause shock or strong pressure.

Snakes: Venomous snakes are typically misidentified and dangers are extreme. Even small, supposedly harmless, snakes can cause fatalities. Therefore, it is the author's opinion that no volunteers should handle snakes. If substantially experienced and trained by an accredited venomous snake course, then they would be listed as a handler and at least would be prepared for any eventual outcomes.

Lizards: Large monitor lizards are potentially harmful, having a series of sharp teeth, powerful bite and strength. Basic and primitive venom glands produce some basic anti clotting issues. A pathogenic bacterium often associated with monitors that feed on carrion.

### **Emergency Call Assessments**

Reptiles can present themselves in myriad ways that make accurate assessment over the phone challenging. Calls will need to be placed in one of the following categories: injured, displaced, nuisance or unknown.

Ensure reports of snakes are not mistaken Blue – tongued lizards.

Pass over nuisance calls to trained wildlife controllers.

Callers need to keep an eye on reptile; distance of 3 metres or more is fine.

Never ever tell a member of the public to handle a snake or large monitor, no matter how safe you think it is (eg snake is dead or a rubber snake).

Use 21<sup>st</sup> technology, ask caller to take an image and send it to your phone.

Liaise with local reptile rescuer or professional herpetologists.

### **Rescue/Handing Lizards**

Injured lizards may still use a threat display by hissing and with mouth agape. It is essential to be quick and efficient. Grasp head, drop towel over head or entice into snake bag. Watch out for tail autonomy in geckos, legless lizards and skinks. A small towel or blanket for large monitors will assist greatly. Simply throw overhead, grab them behind the head, roll them up inside and then place in suitable transportation box. One initially distracts the lizard, the other has a noose pole and one for a blanket. The thrown blanket can work for fast moving agamids, eg Jacky dragons or Frilled lizards – throwing a snake bag or towel etc in the path just in front of a lizards head will make them run inside/under it and stay put or, rarely, your snake bag will disappear up the tree with the lizard!

### **Rescue of turtles**

Turtles of the long neck species rarely bite. However, the short-necked species are very prone to bites. Care must be exercised with large specimens, especially Murray River turtles. While it's acceptable to grab them over the top of the carapace (top shell), I tend to favour the hand from behind, thumb on top the shell and four fingers (palm up) underneath. Fishing hooks inside turtles may need veterinary/surgery to remove and can also be fatal. The Hook remover can often get fresh "hookings" out.

Turtles are seen crossing roads, both at night and during the day, often for reproductive, aestivation or seasonal migration. Gravid females will cross roads to lay eggs on north-facing aspects; even laying along roadside verges is common. These turtles can often be moved across the direction they were facing. A general check of shell, notice cracks, damaged bridge, bleeding etc is required. Typically, gravid females can be felt behind back leg using a finger probe gently – lumps in cavity indicates eggs.

## **General Observations**

Eyes should be open and bright. (Watch for closed eyes, discharge or lack of response).

Mouth should be free from discharge. Often mouth parts can be difficult to open).

Legs should react to pressure or being touched.

Tails should be intact (although tail autonomy is not always a trauma).

Body should be respectively well proportioned, especially around the tail base with hip (round and firm). Loose folds in skin, sunken eyes or pale mucosa often depict a dehydrated reptile.

Note: Presence of ticks is not usually a clinical issue for healthy wild lizards.

Presence of snake mites, especially in small, underweight lizards is critical and contagious.

## **Husbandry**

### **Enclosure Design + Heating + Diet/Humidity = Success**

#### **Outdoor**

Large rainwater tanks, eg Elders, Polymaster. These tanks and older galvanised tanks when partially buried in the ground make wonderful outdoor pits for lizards and turtles.

Aviaries/Wire mesh enclosures, these will suit the outdoor pre-release set up or for long-term rehab. Aboveground swimming pools have excellent short-term or emergency potential for turtles and large skinks.

#### **Indoor**

Aquariums suit species with a semi – fully aquatic nature. In the south, species that require a cooler thermal incline are very suited. Nylon mesh vivariums: Multi-purpose, inside and outside use. These are sensational for smaller species that require excellent ventilation and/or exposure to outdoor element. Enclosed wooden enclosures:

Plywood, melamine or MDF often are used and widely available. Habitat style tanks: These little gems are great for geckos, small skinks and juvenile snakes.

#### **Heating/lighting**

An essential ingredient is to understand heating and lighting and get right. It is misunderstood that reptiles, do not overheat. They essentially run at similar body preference as mammals. The simple truth is this: heating reptiles requires heat at one end and cool at the other. In the context of this paper, heating short-term is not so hard provided a reptile is kept with a cool end. See table 2 in appendix for a rundown on some warm end temperature ranges.

#### Heating types

Screw-in or bayonet lights: pythons and basking globes for diurnal species.

Heat mats/pads or cord: Suitable for turtles, pythons.

Aquarium heaters: Turtles.

External heating: sunlight

Room temperature: suitable for blind snakes, legless lizards and geckos.

## **UVB and sunlight replication products**

Compact bulbs: These products may have excessive high UVA/UVB initially, but burn out quickly so run them for a series of hours before allowing a reptile to be under them.

Fluorescent tubes: Typical method of providing UVB access.

Outside exposure: 60 mins every two days.

Basking lamps: For diurnal species, Retapets Reptisun, Reptiglow, useful amounts of UVA and some UVB.

Mercury Vapour: Wonderful source of UVB provision, while expensive, may also be prone to breakage. High wattage may also determine whether it can be used indoors.

Due to heat must be kept 800mm – 1200mm from lizards. Must run without a thermostatic device; try to use with a dimmer device to reduce heat.

## **Substrates**

The snake and lizard essentially use a smooth, moisture absorbent, typically newspaper/butchers paper. But other types can be used.

Cat Litter, pellets (Breeders Choice). Good smell reduction, clumps faeces for removal.

Leaf litter, (Naturalistic, allows shelter, good for dormancy).

Palm peat, peat moss.

Artificial grass mats.

River sand and Calgrit/Turtle grit Essential for turtles.

## **Personal Keeper Hygiene**

Keepers should wear disposable gloves when cleaning and handling reptiles. Use hand cleaner, eg Vetafarm Reptihand, to create a barrier.

## **Potential Zoonosis**

Cryptosporidiosis: member of the coccidian group.

Pentastomiasis: infection via ingestion of eggs.

Amoebiasis: faecal or contaminated water.

Coccidiosis

Salmonellosis: infection caused by ingesting Salmonella spp.

Dermatophilosis: (Skin swellings around jaw in dragons and crocodiles).

Flinders Island Spotted Fever: caused by tick bites from lizard tick Aponomma hydrosauri that injects the bacterium Rickettsia honei.

Sparganosis: caused by ingesting intermediate host (frog/snake or lizard) or through an open wound/contact of a mucous membrane of proceroid Spirometra erincae.

## **Animal Hygiene**

Enclosures, water bowls and furnishings will need a disinfection routine before, during and after animals have been in enclosures.

Virkon® (Intensive farming Pty Ltd), powerful anti viral, fungi and bacterial disinfectant.

Aviclens (Vetafarm) and household bleach 5%.

**Diet/Feeding** Feed when stable or advised by vet. Feed small in the first stages, increase to increase weight and stabilise. Avoid large items. Feed more, of small prey, vary diet. Never force feed reptiles unless last resort. See appendix table 3 for listing and range of diet items to use.

Feed by day (diurnal species) and at night (Nocturnal).

Ensure all enclosure conditions are optimal.

Do not use the biggest item they can take, actually the smallest is best.

Allow them 1 – 2 weeks to acclimatize or in smaller fast-moving species, allow 2 -3 days. Do not feed live mammals or bird prey unless absolutely necessary (even then, stun them).

Watch out when feeding excitable pythons, monitors and tree snakes – they can bite. Small or juvenile snakes can be fed in calico bags or small-enclosed boxes for security. Large snakes can be fed inside large drums or rubbish bins.

Provide several feeding stations for any groups of lizards.

Monitor lizards may need feeding with long tongs.

Turtles need to be fed in water. Turtles with Injured shells can be dry docked and still fed.

### **Emergency Treatment**

Consult a vet

It is clear that reptiles are probably the most poorly understood animals. They can also intimidate staff. Liaise with herpetologists, zoo staff/vets or find a reptile vet to treat your reptile or liaise with your local vet. Do get pain relief where advised/possible for an injured reptile. Make the assessment of injury, presenting injury types and internal injuries. Reptiles will often have fatal injuries that takes weeks and sometimes months to cause death. It remains vital to assess positively but realistically. This is particularly true of freshwater turtle with severe fractured shells.

In my experience it seems that the most immediate non-veterinary related actions required are rehydration and, where required, emergency feed.

### **Rehydrating/Dysecdysis in Reptiles**

Reptiles may present with loose folds of skin, sunken eyes, distinctive pale gums and may have remnant shed skins. In most cases I use a rubbish bin or storage container. Lizards only need a depth slightly higher than their body height. Snakes will need to be covered, but enough so they can rest their head out of water. Use of slightly soapy water will deter any snake mites from reattaching. Gradually increases the temp of the water but adding small amounts of hot water. Reptiles with layers of un-sloughed skin benefit highly from these baths. When soaked for skin treatment, use a towel and hold reptile to allow them to pull through thus pulling off remnants of skin. Use tweezers to remove small patches – except from the eye, where you should seek experienced help. Many species can access small amounts of water through pores within their skin. Others will soak and slowly take water orally.

### **Emergency feed**

The traditional favorite, “egg slurry” remains my preferred emergency feed. Most reptiles, including some snakes, will happily voluntarily intake slurries. Wombaroo reptile supplement (4 teaspoons with equal amount in water) also makes great slurry. It is essential to not overwhelm the intestinal tract with a heavy or larger solid meal. Vetafarm Probotic will assist to provide some balance to the unbalanced gut flora. Re-establishes natural gut flora after infections, diarrhoea, stress and the use of antibiotics. Can be mixed in water and food via either a gel or powder.

## Release

Research the animal's location; get advice from a reptile handler or advice from other wildlife rehabilitators, especially those who are reptile experienced. Reptiles do have the ability to survive in displaced situations better than birds and marsupials, but it is not advisable in their long-term interest. Generally release within 10- 500 metres from point of origin. Larger varanids can be relocated 1000 metres or more.

## Tips for release

Ensure where required that the veterinarian has signed off and given final health check. Release animal after period of exposure to outdoor conditions by using a pit or outdoor enclosure in 2-4 weeks before release. Make it feral again!

Do not feed preceding days before release, as this removes the need for obtain thermal exposure to digest food.

Ensure reptile is not due to slough (exposed scutes, grey or opaque around eye or pale skin).

Choose a release day with a successive sunny period following.

Remove any bandaging or whitish coloured reams (avoids being conspicuous).

Do not release a group of reptiles into one location.

Release early morning on warm days.

Release when times are suitable for reptile to obtain a thermal preference quickly.

Release nearby into a suitable hide/shelter site.

Carefully use torch lighting to check crevice, log or tree hollow are empty of inhabitants. In spring, north-facing aspects are preferred, in summer southern aspects are more suited.

For unusual species, eg blind snakes, consult a herpetologist for best release times; that is, during mild thunderstorms with no moon etc.

Semi-aquatic species will need to be released near waterways.

Turtles should be released early morning, not at night except for gravid females which should be released into the direction they were going at night.

## Websites

[www.vetafarm.com.au](http://www.vetafarm.com.au)

[www.fishpets.com.au](http://www.fishpets.com.au)

[www.chemicalessentials.com.au](http://www.chemicalessentials.com.au)

[www.blog.wildlifesecrets.com.au](http://www.blog.wildlifesecrets.com.au)

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## Appendix

**Table 1. Common Reptile Cause and Injury Types.**

<b>SNAKE SPECIES</b>	<b>Cause Type</b>	<b>Signs</b>
Pythons Potentially harmful Coastal Carpet Python Scrub python Water Python Olive Python Children's Python	Road traffic, active on road, attacks; dogs, cats, human, nuisance, around or in houses, enters birdcages, translocated, in roof space and escaped pets.	Stress, dysecdysis mouth and respiratory disorders, internal bleeding, vertebrae or rib fracture, no mobility. Loss of righting or stargazing. Faint and numerous whitish specks (mite faces).
Blind Snakes	Dug up in gardens or during excavation, predation by cats.	Displaced or evidence of teeth marks. Dysecdysis.
Tree Snakes Brown Tree Snake Green Tree Snake	Road traffic, active on road, dogs, cats, human, nuisance, around or in houses, enters birdcages, translocated.	Teeth marks, dysecdysis, stress and wounds.
Large venomous snakes DANGEROUS Eastern Brown Snake Red –bellied Black Snake Mulga Snake Eastern Tiger Snake Lowland Copperhead	Road traffic, active on road, attacks; dogs, cats, human, nuisance, around or in houses, enters birdcages, translocated, in roof space and escaped pets. Cane toad poisoning.	Stress, dysecdysis, internal bleeding, vertebrae or rib fracture, no mobility.
Small venomous snakes Little Whip Snake Small – eyed Snake Orange – naped Snake Swamp Snake	Attacks; cats, land or yard disturbance.	Puncture wounds. Internal damage. Stress, dysecdysis, internal bleeding, vertebrae or rib fracture, no mobility.

<b>LIZARDS</b>	<b>Cause Type</b>	<b>Signs</b>
Monitor Lizards Lace Monitor Perenty Yellow – spotted Monitor Sand Goanna Black – headed Monitor	Road traffic, active on road, attacks; dogs, nuisance, around or in houses, enters chicken coops, translocated, in roof space and escaped pets. Baits: poisoning. Cane toad poisoning.	Stress, dysecdysis mouth and respiratory disorders, internal bleeding, vertebrae or rib fracture, no mobility. Burns, embedded hooks in stomach and throat, Impaction. Rolling or writhing.
Legless Lizard Burton' legless Lizard Common Scayfoot Delma sp	Attacks; cats or disturbed during garden or urban clearing. Killed due to snake like appearance.	Teeth marks, death.
Large Dragon Inland Bearded Dragon Eastern Bearded Dragon Frilled Dragon	Road traffic, active on road, attacks; dogs, cats, nuisance, around houses, and escaped pets. Cane toad poisoning.	No mobility, nasal or oral discharge, abrasions, deep cuts and/or deep tissue wounds.
Small Dragon Jacky dragon Gilberts Dragon Netted Dragons Mountain Dragon.	Attacks; cats or dogs, nuisance round house sometimes displaced or escaped pets	Teeth marks, death.
Gecko Variegated Gecko Marbled Gecko Leaf – tailed geckos Thick – tailed Gecko	Attacks; cats or dogs, nuisances round house sometimes displaced or firewood.	Teeth marks, lethargic appearance and tail loss.
Small Skinks Garden skinks Striped skinks Water skinks	Attacks; cats or dogs, nuisances round house sometimes displaced or firewood.	Teeth marks, lethargic appearance and tail loss.
Large Skinks Blue –tongued Lizards Shingleback King Skink Cunningham Skink Land Mullet	Road traffic, mowers, attacks; cats birds or dogs, nuisance round house sometimes displaced or firewood, escaped pets. Human cruelty, glue traps, entangled. Baits: snail poisoning. Cane toad poisoning. Disease: mites significantly.	No mobility, dysecdysis, internal damage, abrasions, deep cuts, deep open tissue wounds. Faint and numerous whitish specks (mite faces). Rolling, twitching or writhing.



<b>FRESHWATER TURTLES</b>	<b>Cause Type</b>	<b>Signs</b>
Marine Turtles Green Turtle Hawksbill Turtle Loggerhead Turtle	Weather affected/migration, disease, predation, entanglements, boats and nesting.	Damaged shells, discharge, lethargic, drowned, beached.
Freshwater Turtle Long – necked turtle Macquarie Turtle Kreft’s Turtle Saw – shelled Turtle	Road trauma, escaped pets, dog attack, entanglement, fishing hooks and displaced.	Cracked shells, internal bleeding, nasal or oral discharge. Inability to float or submerge. Embedded hooks inside throat and/or intestinal tract.

**Table. 2. Showing some of the thermal and habits variables between common rehabilitation species.**

<b>Reptile</b>	<b>Heating type</b>	<b>Temp range</b>	<b>Preferences</b>
Marbled Gecko	Air temp, heat pad, heat cord.	15 - 25	Nocturnal, Arboreal, hides under bark.
Thick – tailed Gecko	Air tem, heat pad, heat cord.	22 -26	Nocturnal, terrestrial – hides under rocks.
Burton’s Legless Lizard	Air tem, heat pad, heat cord.	24 - 28	Nocturnal, terrestrial, hides under rocks, inside grass tussocks.
Eastern – blue tongued Skink	Basking globe.	22 – 32 (species variations)	Diurnal, terrestrial, heliothermic. Shelters under logs, rocks, plants.
Shingleback	Basking globe.		Diurnal, terrestrial, heliothermic. Shelters under logs, rocks, plants.
Water Skink	Basking globe.	26 - 32	Semi aquatic, heliothermic, shelters in and under logs/rocks.
Inland Bearded dragon	Basking globe.	26 - 32	Diurnal, semi arboreal, heliothermic, shelters in and under logs.

Eastern Water Dragon	Basking globe.	26 - 35	Diurnal, semi aquatic/arboreal, heliothermic, shelters in and under logs.
Jacky Dragon	Basking globe.	26 - 32	Diurnal, semi arboreal, heliothermic, shelters in and under logs.
Sand Monitor	Basking globe/Mercury vapour or outdoors.	35 - 45	Diurnal, terrestrial, heliothermic. Shelters under logs, rocks, plants.
Lace Monitor	Basking globe/Mercury vapour or outdoors.	37 - 45	Diurnal, semi arboreal, heliothermic, shelters in and under logs.
<b>Snakes</b>			
Blind snake		22 - 28	Subterranean/ Nocturnal, ant / egg/larva specialist.
Green Tree Snake		26 - 32	Diurnal, arboreal, heliothermic, shelters in shrubs, logs. Frog and lizard specialist.
Brown Tree Snake		26 - 32	Nocturnal, arboreal, shelters in shrubs, logs.
Children Python		26 - 32	Nocturnal, terrestrial, shelters under rocks or logs.
Carpet Python		26 - 32	Nocturnal, arboreal, shelters in logs.
Diamond Python		22 -26	Nocturnal, arboreal, shelters in logs.
Freshwater Turtles		26 - 29	Diurnal, aquatic, basking log/platform.

**Table 3. A basic analysis of food types suitable for reptile groups.**

Food Types	Skinks	Geckos/Leg Dragons less Lizards	Monitor Lizards	Snakes	Turtles
Flower	✓		✓		
Vegetation	✓		✓		
Mealworm	✓	✓	✓		
Locust	✓		✓	✓	✓
Cricket	✓	✓	✓	✓	✓
Cockroach	✓	✓	✓	✓	
Molluscs		✓			
Pinkie mice	✓		✓	✓	✓
Mice				✓	✓
Rat				✓	✓
Day old chicken				✓	✓
Bird				✓	✓
Crustacean					✓
Fish				✓	✓
Marinara					✓
Pellets	✓		✓		✓

Note: A reference for range of general diets. Species specific require attention to requirements. Cricket (*Acheta domesticus*), mealworm (*Tenebrio molitor*), Fruit: Kiwi fruit, melon (rock, water, honey), banana (small amounts), strawberries, raspberries. Vegetable: Spinach, lettuce, mushrooms, shredded carrot, broccoli, peas, corn, Vegetation: Flowers (especially yellow and white flowers), Dandelions, Hibiscus, Clematitis spp berries/Leaves, Evening primrose, rose leaves and flowers, Pellets: Rep Cal Bearded Dragons pellets and for turtles Gold Cichlid pellets. Aquatic vegetation: Elodea , Duckweed (*Vallisneria* spp), Ruffled Sword (*Echinodorus martii*), Broad Chain Sword (*Echinodorus quadracostatus*), Giant Milfoil (*Myriophyllum scabratum*), Broad-leaved Milfoil (*M.amphibium*), Hornwort (*Ceratophyllum demersum*), Azolla (floating native fern) (*Azolla pinnata*), Smooth Nardoo (*Marsilea mutica*), Narrow leaf Nardoo (*M.costulifera*), Duckweed (*Lemna* ssp), Common Nardoo (*M. drummondii*), Laceplant (*Aponogeton elongatus*), Water Lettuce (*Pistia stratioides*), Common Watercress (*Rorippa nasturtium-aquaticum*).

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