

1 **J. Species-specific provisions for reptiles**

2

3 **1. Introduction**

4

5 According to morphological systematics, reptiles include the main orders  
6 *Rhynchocephalia* (tuatara), *Squamata* (lizards, snakes), *Chelonia* (tortoises,  
7 turtles, and terrapins), and *Crocodylia* (alligators, crocodiles, caimans, and  
8 gavials). They differ greatly in their patterns of geographic distribution and in  
9 the diversity of living types.

10

11 In contrast to the more or less smooth and moist skin seen in amphibians,  
12 reptiles have a skin protected by overlapping scales (snakes, lizards), by a  
13 box-like shell (chelonians), or by bone plates in the skin (crocodiles, alligators,  
14 and caimans). The thick skin is an adaptation to better protect reptiles from  
15 the water loss that occurs with the permeable skin of amphibians.

16

17 **Table J.1.** lists two very general habitat categories of reptiles and examples of  
18 species of each habitat frequently used for experimental and other scientific  
19 purposes. The following provides details of the basic housing and care  
20 conditions recommended for species found within these habitats. Specific  
21 procedures may require the use of certain other species which do not fall into  
22 these categories, such as semi-aquatic, arboreal or rock-climbing reptiles.  
23 Should behavioural or breeding problems occur, or should further information  
24 on specific requirements for other species be required, advice should be  
25 sought from experts specialised in the species concerned and care staff, to  
26 ensure that any particular species' needs are adequately addressed.  
27 Additional background information on species, and habitats is available in the  
28 background information document elaborated by the [Group of Experts](#).

29

30 Where possible, reptiles used for experimental or other scientific purposes  
31 should be procured from reputable suppliers.

32

33

34 **Table J.1. Two habitat categories and examples of reptile species of**  
 35 **each habitat frequently used**

Habitat	Species	Size (cm)	Original geographic distribution / Biotope	Optimal temperature	Relative humidity	Main period of activity
Aquatic	<i>Trachemys scripta elegans</i> Red-eared terrapin	20 to 28	Mississippi Valley drainage / Quiet water with muddy bottom	20°C to 25°C	80 to 100%	Day
Terrestrial	<i>Thamnophis sirtalis</i> Common garter snake	40 to 70	North America / Woodland, wet areas	22°C to 27°C	60 to 80%	Day

36

## 37 **2. The environment and its control**

38

### 39 2.1. Ventilation

40 Enclosures for reptiles should be adequately ventilated. To prevent escape,  
 41 ventilation holes should be screened.

42

### 43 2.2. Temperature

44 Reptiles are ectothermic. In order to maintain their body temperatures, under  
 45 natural conditions they will select microenvironments in which they can gain or  
 46 lose heat. Therefore, enclosures should offer animals areas of different  
 47 temperatures (temperature gradient) if research-biasing stress and distress  
 48 arising from inappropriate environmental conditions are to be avoided.

49

50 Temperature requirements of different species vary considerably and may  
 51 even fluctuate in the same species at different times of the year. In the  
 52 laboratory, room and water temperatures should be controlled. In many  
 53 reptiles, sex determination and gonadal differentiation are temperature-  
 54 dependent.

55

56 An incandescent lamp positioned over the platform provided as a resting area  
57 will allow basking reptiles to increase their body temperature. When the lights  
58 are turned off or are not used, a flat heating device may be inserted into the  
59 enclosure on which basking reptiles can lie to maintain body temperature.  
60 Where such heat sources are used and which allow direct contact between  
61 the animal and the source, the source temperature should not exceed 40°C.  
62 Care should always be exercised when direct heat sources are used because  
63 even when there is the opportunity to move away from a focal heat source  
64 within an enclosure it is not uncommon for reptiles to remain in direct contact  
65 until third degree burns are inflicted. For this reason, heating devices should  
66 be thermostatically controlled to prevent animals from overheating and  
67 burning.

68

69 Terraria for snakes or lizards from tropical biotopes should be furnished with  
70 at least one warm area on which to lie.

71

### 72 2.3. Humidity

73 Humidity levels are best controlled by alterations to the ventilation rate. A  
74 relative humidity of 70 to 90% can be maintained. The provision of areas of  
75 different humidity (humidity gradient) is beneficial.

76

### 77 2.4. Lighting

78 Appropriate light and dark regimes for each species, life stage, and time of the  
79 year should be provided. Reptiles should have the opportunity to withdraw to  
80 shaded areas within the enclosure. Light or sun lamps should not be the sole  
81 source of heat. The provision of ultraviolet radiation in the band width 280 to  
82 320nm is necessary to stimulate the animal's production of vitamin D.

83

### 84 2.5. Noise

85 Reptiles are very sensitive to acoustic noise (airborne stimuli) and to vibratory  
86 noise (substrate-borne stimuli) and are disturbed by any new, unexpected  
87 stimulus. Therefore, such extraneous disturbances should be minimised.

88

89

90 2.6. Alarm systems

91 Adequate alarm systems should be provided if ancillary heating devices  
92 and/or water circulation systems are used and/or aeration is required. Alarms  
93 should be “silent” so they do not disturb the animals.

94

95 **3. Health**

96

97 Care is needed when housing different species of possible different health  
98 status.

99

100 **4. Housing, enrichment and care**

101

102 4.1. Housing

103 (See paragraph 4.5.2. of the General section)

104 Accumulation of as much information as possible on the ethological needs of  
105 the species is a necessary prerequisite when planning to accommodate  
106 reptiles in groups. Few reptiles do well in groups.

107

108 4.2. Enrichment

109 The habitat of reptiles should be structured to include, for example, natural or  
110 artificial branches, leaves, pieces of bark and stones. Reptiles benefit from  
111 environmental enrichment in different ways: for example, inclusions allow  
112 animals to hide, and provide labels for visual and spatial orientation and will  
113 help to reduce stress. To prevent collision with clear glass, the side walls of  
114 the terraria should be patterned to provide a structured surface.

115

116 4.3. Enclosures – dimensions and flooring

117 Enclosures and enclosure furniture should have smooth surfaces and rounded  
118 edges to minimise the risk of injury, and in the most sensitive species opaque  
119 materials should be used.

120

121 **4.3.1. Enclosures for aquatic reptiles**

122 Aquatic reptiles should be accommodated in water-circulated, filtered, and  
123 aerated tanks. The water should be renewed about twice per week, except in

124 the case of flow-through systems. To minimise the bacterial contamination of  
 125 the water, water temperatures should not exceed 25°C. Water levels should  
 126 be sufficient for reptiles to submerge.

127

128 A platform should be provided as a resting area on which the reptiles can haul  
 129 out or shelter under. Such platforms should be made of suitable materials,  
 130 such as wood, so that animals are able to get a purchase with their claws in  
 131 order to pull themselves out of the water. Platforms should be replaced as  
 132 necessary. Platforms made of epoxy or polyurethane may not be appropriate  
 133 and are likely to deteriorate quickly under continuous warm temperatures.

134

135 **Table J.2. Aquatic chelonians e.g., *Trachemys* spp.: Minimum enclosure**  
 136 **dimensions and space allowances**

Body length* (cm)	Minimum water surface area (cm <sup>2</sup> )	Minimum water surface area for each additional animal in group holding (cm <sup>2</sup> )	Minimum water depth (cm)
Up to 5	600	100	10
over 5 to 10	1600	300	15
over 10 to 15	3500	600	20
over 15 to 20	6000	1200	30
over 20 to 30	10000	2000	35
over 30	20000	5000	40

137

138 \* Measured in a straight line from the front edge to the back edge of the shell.

139

#### 140 4.3.2. Enclosures for terrestrial reptiles.

141 Terrestrial reptiles should be kept in enclosures consisting of an appropriate  
 142 terrestrial part and an aquatic part. The water area of the terrarium should  
 143 allow animals to submerge. It is advisable to renew the water at least twice a  
 144 week, except in the case of a flow-through system.

145

146 Terraria should usually be transparent, have tight seams, with all ventilation  
 147 holes securely screened, and be provided with well-fitted lids or doors that are  
 148 securely fastened by latches, hooks or hasps. It is advisable to construct  
 149 doors and lids so that the entire top or an entire end or side opens to facilitate  
 150 cleaning (except in the case of venomous reptiles). For some species, except

151 for the front wall, all side walls including the top should be opaque. In case of  
 152 highly irritable or easily frightened reptiles, the clear wall can be provided with  
 153 a removable covering. For housing venomous snakes, certain security criteria  
 154 must be fulfilled. Walls should be constructed of a non-reflective material  
 155 rather than glass. Many species of reptiles are stressed by their own reflection  
 156 because they see it as a trespassing competitor that never goes away. Also  
 157 having other reptiles within eyesight can be very stressful because they may  
 158 see the other reptiles as predators.

159

160 The provision of appropriate shelter is important for all terrestrial reptiles, both  
 161 in which to hide and also sometimes to feed. A shelter-box, such as a tube of  
 162 clay, simulates the darkness of a burrow.

163

164 **Table J.3.: Terrestrial snakes, e.g., *Thamnophis* spp: Minimum enclosure**  
 165 **dimensions and space allowances**

Body length* (cm)	Minimum floor area (cm <sup>2</sup> )	Minimum area for each additional animal in group-holding (cm <sup>2</sup> )	Minimum enclosure height ** (cm)
Up to 30	300	150	10
over 30 to 40	400	200	12
over 40 to 50	600	300	15
over 50 to 75	1200	600	20
over 75	2500	1200	28

166

167 \* Measured from snout to tail.

168 \*\* Measured from the surface of the land division up to the inner part of the top of the  
 169 terrarium; furthermore, the height of the enclosure should be adapted to the  
 170 interior design including, e.g., shelves and large artificial branches.

171

#### 172 4.4. Feeding

173 Captive reptiles should be maintained on their natural foods or commercial  
 174 diets approximating those of their natural diets. Many reptiles are carnivores  
 175 (all snakes and crocodiles, most lizards, and some turtles), but some are  
 176 vegetarian and others are omnivores. Some species exhibit very narrow and  
 177 specific feeding habits. Reptiles, except for some snakes, can be trained to  
 178 feed on dead prey. Therefore, it should normally not be necessary to feed live  
 179 vertebrates. When dead vertebrates are used, they should have been  
 180 humanely killed using a method that avoids the risk of toxicity to the reptiles.

181 Feeding regimes should be appropriate to the species, stage of development  
182 and husbandry system.

183

#### 184 4.5. Watering

185 Drinking water should be provided for all reptiles. Water should be changed  
186 daily. Water plays an important role in skin shedding and some reptiles drink  
187 from droplets on foliage so misting may be required. The [Expert Group](#)  
188 provided an Appendix of humidity preferences for reptiles.

189

#### 190 4.6. Substrate, litter, bedding and nesting material

191 A variety of substrates may be used for terraria, depending on the  
192 requirements of the species. Fine sawdust and any other small-particle  
193 substrate should be avoided, as this may cause serious mouth or internal  
194 injuries or bowel obstruction, particularly in snakes.

195

#### 196 4.7. Cleaning

197 (See paragraph 4.9. of the General section)

198

199 In order to avoid disease, the terrestrial and aquatic areas in the enclosure  
200 should be carefully cleaned to remove dirt, excrement and food particles.  
201 Aggressive detergents should be avoided. Reptiles explore their enclosures  
202 and will choose a favourite place (e.g. a stone or piece of bark) for drinking  
203 from or sleeping on. Reptiles become used to their enclosure. Therefore after  
204 cleaning it is important to return all enrichment to its original position.

205

#### 206 4.8. Handling

207 Care is needed when handling reptiles, as they can be easily injured. For  
208 example, some lizards may shed their tails (autotomy) if handled in an  
209 inappropriate way, and other species can easily be traumatised.

210

#### 211 4.9. Humane killing

212 (See paragraph 4.11. of the General section)

213

214

215 4.10. Records

216 (See paragraph 4.12. of the General section)

217

218 4.11. Identification

219 Where animals need to be identified individually a number of suitable methods  
220 are available: transponders; enclosure labels for individually housed animals;  
221 monitoring individual skin patterns (according to colour, skin damages, etc.);  
222 topically applied dye markings require renewal after skin shedding. Toe  
223 clipping is deleterious and should not be done.

224

225 **5. Transport**

226

227 During transport reptiles should be provided with adequate air and moisture  
228 and, if necessary, consideration should be give to the provision of devices  
229 designed to maintain the required temperature and humidity.

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