

THE CARE AND BREEDING OF THE GRASS SNAKE (*NATRIX NATRIX HELVETICA*) IN CAPTIVITY

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INTRODUCTION

The Grass Snake (*Natrix natrix helvetica*) is Britain's largest reptile attaining an overall length of up to 2 metres although 110cm - 130cm is a more normal size.

It has the distinction of being our only egg laying snake. Furthermore it is the only subspecies to represent Britain, all the other reptiles and amphibians indigenous to the U.K. are of the nominate form.

Colouration is very variable, general ground colour is greyish brown, olive-grey or greyish green above with dark brown or black spots which form vertical bars along its sides. There are also two rows of smallish black or dark brown spots arranged alternately on its back. The underside is patterned with black or grey and white usually irregular and the throat region is off-white or pale yellow. The main distinguishing feature is the collar marking of various shades of yellow, cream or pale orange behind the head. It is usually interrupted in the centre of the neck and bordered posteriorly by two quite large concentric dark patches. Females grow much larger than males. Any specimen above 95cm will definitely be a female.

The Grass Snake occurs throughout England and Wales but is absent from Ireland and the whole of Scotland with the exception of the border counties. They are very fond of water and in sunny weather they like to bask on sun-warmed vegetation near the water's edge. If surprised or frightened they will slip quietly into the water and swim away with their heads held just above the surface. They are strong swimmers which assists them to catch their main prey of amphibians and fishes.

If cornered or trapped a wild Grass Snake will sometimes rear up and strike at its adversary with its mouth closed, very rarely attempting to bite but hissing loudly and appearing quite aggressive. If these tactics fail it may feign death, rolling over onto its back, becoming flacid with mouth wide open and tongue hanging out limply. If handled it may "come to" suddenly, thrashing about wildly, expelling a foul-smelling fluid from its glands situated near the vent. The fetid odour produced is very strong, persisting for some time on the hands or clothing even after several vigorous attempts to remove it!

Grass Snakes can often be encountered in open country at considerable distances away from the nearest pond, lake or river. Favoured habitats are hedgerows with a dense base, open woodland, heaths, commons, meadows or scrub. Damp habitats are preferred throughout their range; in the south they can be found at altitudes of up to 2,400 metres.

ACCOMMODATION

Grass Snakes are best kept outdoors in surroundings which simulate natural conditions. This will enable their behaviour to be observed at close quarters. A greenhouse or walled enclosure of at least 4 square metres would be suitable; the former should have adequate ventilation to prevent overheating and the latter should have a perimeter wall at least 1 metre high to prevent escape. A cover of stout wire mesh should also be provided to prevent predation by cats and large birds.

Whichever accommodation is chosen it should be positioned to receive the sun's rays for most of the day. The floor should have a covering of fine soil to a depth of at least 45cm to allow the snakes to burrow for winter hibernation. A reasonable sized pond is essential, this should be large enough for the snakes to submerge themselves and swim in, certainly no smaller than 1 square metre in surface area.

The floor can be furnished with some rotten logs half-buried in the soil; these will provide retreats for the inmates to hide under. Ground cover can be provided by planting various ornamental grasses which can be readily obtained from garden centres. The best varieties are those which form good-sized tussocks on which the snakes will bask. Care should be taken not to introduce couch-grass as this looks unsightly, spreads rapidly and is very difficult to eradicate.

An area of deep leaf litter or a small compost heap should be maintained in one corner to provide an egg-laying medium. If the vivarium is open to the elements a dry retreat should be available such as a small wooden box about 20cm x 20cm x 20cm with a 3cm x 3cm entrance hole in the front. This can be filled with hay and raised slightly above ground level to ensure it stays dry. A hinged lid on top allows the hay to be inspected regularly for the presence of mites. If any are discovered a vapona block can be placed in the box for 3 days after the hay has been removed and the entrance hole sealed. The bedding should always be removed when it becomes soiled.

FEEDING

As well as amphibians and fish, which constitute the main diet, wild Grass Snakes will also eat lizards (including Slow Worms), newborn mice and voles; and fledgling birds. In captivity the food should consist mainly of amphibians, especially frogs and newts. Garden colonies of Common Frogs and Smooth Newts can be established and maintained quite easily (Billings 1983 and 1985) so that a ready supply of adults, juveniles and tadpoles are present. Adults of both can be introduced into the snakes' enclosure where they will survive until eaten. Invertebrates such as earthworms, woodlice and slugs can also be introduced for the frogs and newts to feed upon.

A large adult Grass Snake will eat a fully grown frog each week (sometimes more) or half a dozen newts per week in high summer. Small goldfish can be put in the vivarium pond; these will also eventually be captured and eaten but fish should not be the sole diet or vitamin B deficiency (which can be fatal) may result (Mattison 1982). Dead mice can be given occasionally (they can be obtained deep-frozen from pet shops). It may be necessary to rub the mouse with a dead frog or fish to transfer the scent and encourage it to eat such unusual prey. Pieces of fish can also be offered.

As long as amphibians constitute the bulk of the diet in captivity there should be no problems. Non-living food should be dusted with a multi-vitamin powder.

HIBERNATION

Loss of appetite will usually occur during late September and the Grass Snakes will seek their hibernation quarters during October, re-emerging the following April. Exact dates will vary with the weather conditions. They can be left to hibernate naturally when housed outdoors; on no account should they be disturbed or moved during this period as this may prove fatal. Breeding success depends on a hibernation period.

BREEDING

Mating usually takes place during April or early May, once the weather is warm and sunny and the nights are not frosty. Eggs are produced in late June or during July. In captivity sufficient food must be available for breeding to be successful.

The eggs will be laid deep within the compost heap or leaf litter. They are leathery-shelled and measure approximately 2.5cm long and 1.5cm across when laid. They can be left *in situ* or incubated artificially. The latter option is preferable as the eggs can be inspected regularly and there is no risk of invertebrates damaging them. It is also possible to maintain an adequate temperature to ensure that the eggs do not become chilled, and there is no risk of saturation during a wet summer. This could drown the embryos or affect their development.

Gravid females bulge with eggs; a sudden slimming down will indicate that eggs have been laid.

If artificial incubation is decided upon the eggs should be searched for very carefully by removing the compost by hand until the eggs are exposed. An ice-cream container should be prepared in advance by half-filling it with a mixture of vermiculite and tap water in a ratio of 1:1 by weight. Mixtures of sand and peat can also be used as an incubation medium (Mattison 1982). Egg clutches are usually stuck together but should not be forcibly parted as the pressure exerted may cause damage to the embryos inside. The eggs should be carefully transferred to the vermiculite keeping them the same way up as deposited and they should be buried up to their mid-line to facilitate inspection.

The complete container, including the eggs, should then be weighed on the kitchen scales, the weight recorded and the container re-weighed weekly; in this way it is possible to determine exactly how much water has evaporated from the container during incubation. Tepid water from the tap can then be added plus a little extra to allow for the increase in weight of the eggs as they develop.

The container must be kept at 25°C - 30°C for the full incubation period. This can be achieved inside the airing cupboard or alternatively, a small fish-tank can be used instead of an ice-cream container. This can be heated by a 15 or 25 wattage light bulb connected to an aquarium thermostat and insulated with polystyrene ceiling tiles. In either case temperatures should be carefully monitored using a maximum/minimum thermometer and any necessary adjustments carried out immediately. A close fitting lid with holes for ventilation should be kept in place over the aquarium - this will maintain humidity and prevent escape when the hatchlings emerge. Sometimes reptile eggs develop a coating of mould but this should not do any harm and can be ignored as there is a high degree of resistance to such attacks. Hatching takes place approximately 40 days after laying although up to 47 days is not unusual.

CARE OF HATCHLING SNAKES

The hatchlings should be removed to prevent them from disturbing the remaining eggs and placed in a small vivarium. This should contain a good layer of light soil, plenty of hiding places in the form of pieces of bark and clumps of moss and a small shallow pond (to prevent drowning). The photo period should be about 12 hours per day (8.00 am to 8.00 pm) to encourage rapid growth. Newly hatched youngsters measure about 20cm in overall length and are very secretive during their first few weeks. For this reason they should be disturbed as little as possible initially. Food need not be offered until the first slough (about 14 days after hatching).

Small frogs or tadpoles will be readily eaten as will tiny fish such as guppies. In addition new born mice ("pinkies") may be accepted; these should be killed humanely and dusted (Townson, 1990) with vitamin/mineral supplement prior to being offered to the baby snakes. The pinkies may also need rubbing with a piece of raw fish and then waved in front of the snakes to attract their interest.

For anyone not prepared to resort to such measures it is best to release the hatchlings soon after emergence in a suitable site in the wild. In any case the number produced (a female usually lays between 11 and 20 eggs per clutch) will far exceed the time and resources available to most amateur herpetologists so it is best to keep no more than 3 or 4 and concentrate on these.

Baby Grass Snakes will soon learn to take dead prey provided it smells appetising but if any refuse to feed voluntarily, force-feeding should never be attempted as it will probably kill the recipient in the process. It is better to release such individuals to secure their own prey in the wild. Some baby snakes may commence hibernation without having fed since hatching, particularly where eggs have hatched late in the year.

A thick-sided polystyrene box with a layer of damp foam or moss on the base and filled with polystyrene chippings provides an adequate hibernating medium for baby snakes. The box should have a secure lid and should be placed in a frost-free shed or garage for the duration of the winter. It should be inspected at weekly intervals to ensure the inmates are safe and to allow the entry of fresh air. They can be brought out of hibernation when the first frogspawn becomes available, as spawn brought indoors develops rapidly thereby providing a good food source.

The sexes can be identified as early as six weeks after hatching, females are of larger build and grow more quickly than males. The considerably broader head is also clearly distinguishable from that of the smaller, slimmer male. Sexual maturity may be attained at two years of age under captive conditions but 3 to 4 years is more natural. At the end of their first year young Grass Snakes measure approximately 35cm if kept under artificial conditions and without undergoing hibernation, A hibernation period is only necessary to stimulate reproduction and need only be given when young snakes attain adult proportions.

CONCLUSION

The Grass Snake is a fascinating and rewarding reptile to study. Captive-breeding is a useful method of supporting wild populations but needs to be carried out in conjunction with the maintenance of excess amphibian populations from garden ponds.

ACKNOWLEDGEMENTS

Our thanks are due to Harold Inns, Mike Preston and Ed Wade for their help and assistance in providing much valuable information.

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