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# Froglife Advice Sheet 10

## REPTILE SURVEY

### An introduction to planning, conducting and interpreting surveys for snake and lizard conservation

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#### WHY SURVEY FOR REPTILES?

All of Britain's six native species of snakes and lizards are declining to some degree, and conservation measures to counter this trend are dependent on reliable and up to date information on their distribution. Unfortunately, in many areas details about where snakes and lizards are found are severely lacking for several reasons:

- reptiles are relatively challenging animals to find as they tend to be secretive, camouflaged, occur in comparatively low numbers on a given site, and may be inactive for long periods during winter or hot, dry summers
- the number of people actively interested in native reptiles has been comparatively low
- there has been a lack of easily available and workable guidance on how to survey reptiles.

In recent years there has been increasing interest in conservation of snakes and lizards, and a growing need for more specific guidelines on how to survey for them. Information on the local abundance and distribution of reptiles can be used for the following:

- help protect sites from damage or destruction
- compiling lists of important local sites (Key Reptile Sites)
- assisting with habitat management plans
- learning about the importance of different land use types and management methods
- assisting with enquiries about where reptiles are found
- generating records of reptile occurrence to send to local record centres and herp groups
- compiling local and regional atlases
- adding to the national database to help determine more widespread trends
- helping to determine trends in status.

This leaflet is aimed primarily at surveys for the four widespread reptile species (adder *Vipera berus*, grass snake *Natrix natrix*, common lizard *Lacerta vivipara* and slow-worm *Anguis fragilis*), but much of it also applies to the sand lizard *Lacerta agilis* and smooth snake *Coronella austriaca*.

#### PLANNING A REPTILE SURVEY

1. Decide the kind of information you want to obtain as a result of the survey. Your reason for conducting the survey will probably be to achieve one or more of the three following objectives:

- to determine the presence or likely absence of reptiles on a site you know little about (*presence/absence survey*)
- to determine the distribution of reptiles within a site, and/or obtain a basic idea of their relative abundance (*detailed survey*)
- to measure apparent changes in abundance of reptiles on a site (*monitoring*).

The methods you choose to employ will depend upon which of these questions you are trying to answer (as well as more practical considerations such as how much time you have to do it in.)

2. Obtain permission (preferably in writing) from the landowner, tenant or manager and make sure they are aware of the activities you will carry out. If surveying on a nature reserve, special permits or consents may be required. Licences may be required if the sand lizard or smooth snake are present on the site and the survey involves disturbing them (e.g. by placing refuges - see *Reptile surveys and the law*).

**Produced by:**

**FROGLife**



3. Do some research to find out whether there are any recent or historical records for the site

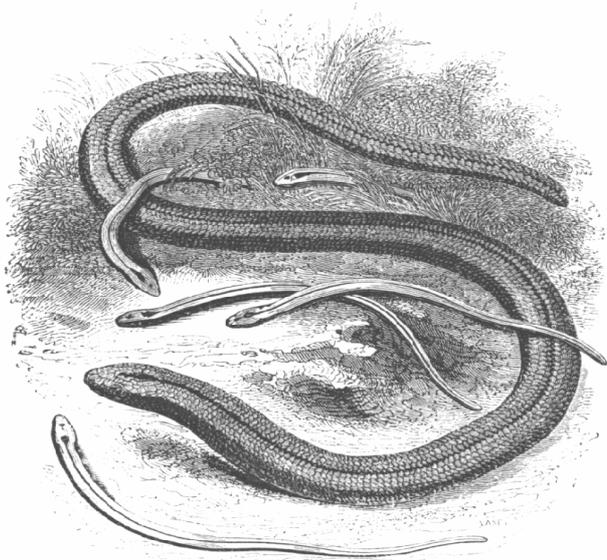
and its surroundings. County museums, Wildlife Trusts, local reptile and amphibian groups and naturalists societies may have written records. Ranger services may also be able to provide useful up to date information on sightings.

4. If you will be conducting a detailed survey or monitoring exercise, and especially if several people will be contributing, draw up a survey form upon which to record sightings (essential information: date, species seen, numbers, location). This will help with collating sightings and related information.

5. Draw up a base map upon which to mark sightings whilst in the field. This could be hand-drawn, or you can base it on an Ordnance Survey 1:25,000 or 1:10,000 map. If you are using artificial refuges to help with the survey, a map will be needed so that you can mark their locations. It may also be useful to mark habitat features and historical records.

6. If several people are involved in the survey, it may be helpful to assign people to different areas of a site, or draw up a rota to determine when the various surveyors will visit the site.

7. Make sure that the surveyors are sufficiently competent at reptile identification (see *Further reading* for appropriate guides; for information on training courses contact your local amphibian and reptile group or Froglife - see *Useful contacts*).



Slow-worm (*Anguis fragilis*).

## HOW TO SURVEY

The first step is to decide on the reason for the survey: what are you trying to achieve by carrying out the work. This will influence the kind of methods to be used. For presence/absence surveys, including casual visits to sites to look for reptiles, effort can be directed most efficiently towards pinpointing suitable microhabitats that are potential reptile "hotspots" and examining them closely. When conducting a detailed survey, it is useful to look at most of the site in more depth, carefully recording the numbers and characteristics of all animals seen, along with the most important habitat features identified (see *What to record*, below). For monitoring visits, it may be best to establish a set, repeatable walk around the site, perhaps selecting a route which visits certain key areas.

Locating reptiles is not always a simple task. They are often well concealed by virtue of their behaviour, markings and habitat selection, and they will almost always make for cover if you approach too quickly. Sometimes, even determining the presence of a species can be arduous, let alone obtaining some idea of population size.

Two complementary methods are commonly employed to locate reptiles: direct observation and use of artificial refuges (e.g. sheets of corrugated iron, known as "tins"). Using refuges does tend to increase the likelihood of finding reptiles, but this benefit has to be weighed up against the possible disadvantages as explained below.

### 1. Direct observation

#### Where to look - general areas

Habitats favoured by reptiles tend to be sunny, open, undisturbed, well-drained and often south-facing. Typical habitats include: grass and heather heathland (wet and dry), chalk downland, coppiced woodland, sand dunes, disused allotments, suburban wasteland, road/railway embankments/cuttings, golf course roughs, rough grassland, open woodland and woodland edge, immature forestry plantations, sea cliffs, moorland, disused quarries/chalk pits/sand pits/brick pits, unintensively managed farmland and wild gardens. In addition, grass

snakes favour more damp habitats such as those associated with still and running water, grazing marshes, mires etc. Adders and common lizards in particular will also sometimes use wet areas such as bogs and mires, especially where they are adjacent to heathland, scrub or open woodland.

### **Where to look - reptile "hotspots"**

Within these broad habitat types, reptiles usually have favoured locations, which correspond to particular microhabitats, features or interfaces between habitat types (see diagram in centre pages). The success of finding reptiles will often depend on the identification and careful searching of these hotspots. Note however that by concentrating effort on these areas, numbers seen are likely to be greater than expected on other parts of the site; hence, a bias may be introduced if trying to gauge population size. These features are best targeted if the aim of the survey is simply to determine presence/absence.

The following features are often favoured:

embankments; tumuli (ancient burial mounds); gullies and slopes; log, brash or rock piles; compost heaps; boardwalks, rides or paths through scrub, grassland, woodland; woodland edge; scrub/grassland interfaces; hedgerow bases; dry stone walls; sun traps created by small open patches surrounded by dense vegetation.

In general the aim will be to look for basking animals, so sunny spots should be located. However, it is also worth searching within open vegetation (particularly gorse, heather or bramble), since reptiles will not always bask fully exposed.

Grass snakes can also be found whilst swimming in ponds and streams; occasionally they will swim after dark on warm nights. In June and July, females sometimes spend several days or even weeks around the vicinity of egg-laying sites, such as compost heaps, farm manure heaps, saw dust piles, grass cuttings heaps or piles of aquatic vegetation such as reeds. These structures can also be searched after hatching in late autumn or spring for empty eggshells (see Froglife Advice Sheet 6 for more details on grass snakes).

It is also worth carefully turning over any

potential refuges you encounter, such as logs, rocks, fallen fence posts, or discarded materials such as metal sheets and wood. Always return these to their original position after searching.

### **When to look**

*Time of year:* Reptiles are generally active from March to October, but the most profitable months for surveying tend to be April, May and September. The exact timing however will depend on temperature, rainfall and other climatic patterns (see below), as these factors will influence activity, breeding and feeding activities. Searching in March and April on south-facing, well-drained, slopes and raised areas may reveal reptiles just emerging from or resting near to hibernation sites.

*Time of day:* For the best months indicated above, the best times to search are generally between 8.30 am and 11.00 am, and between 4.00 pm and 6.30 pm. However, early in the year, reptiles are often encountered closer to mid-day when it is warmest; conversely, in very hot conditions in midsummer, reptiles may be found progressively earlier in the morning and later in the afternoon. Although reptiles may be active when the heat is at its most intense, they have a lesser requirement to bask and tend to be especially alert, which means that they are more difficult to find.

*Weather conditions:* In order to find reptiles while they are basking, it is generally best to search when the air temperature is between 9 and 18 °C. On cooler days, bright sunshine is a good sign, while hazy or intermittent sun gives the best results at the warmer end of the scale. Rainy or windy conditions are usually unsuitable. The sequence of weather conditions is significant; a hot spell after several days of cold weather will often bring reptiles out. Similarly, showery weather after a prolonged dry period are particularly productive.

### **How to look**

When searching, it is best to walk slowly, treading lightly, and scanning the area at least 3-4 m in front. Pay particular attention to potential basking spots. Shadows can disturb basking reptiles so be aware of the direction the sunlight is coming from; it is best to look with the sun behind you, so that you are looking into the basking spots.

Listen for rustles in the vegetation. The sounds produced by reptiles as they flee for cover after being disturbed are particularly useful for survey purposes. If you hear rustles in the vegetation as you walk past, or if you catch a fleeting glimpse of an animal, note the spot and return ten minutes later. The animal may have returned to bask in the same spot or close by, so approach very softly. This technique works particularly well for common lizards and adders, and is more productive than attempting to pursue reptiles escaping through the undergrowth. Lizards also tend to make more brief rustles compared to the drawn out noise caused by a snake as it brushes against vegetation while retreating into the undergrowth.

## **2. Using refuges ("tinning")**

### **General points**

Reptiles are often found under or on top of objects resting on the ground. These refuges can act as a place to shelter from predation and disturbance, and as an aid to absorbing heat. Certain materials, particularly corrugated iron sheets ("tins"), trap heat and provide an opportunity for animals to warm up without exposing themselves to obvious danger. Artificial refuges can sometimes act as reptile "magnets", attracting animals from the immediate vicinity, and can be a useful aid to survey if placed on the site carefully. It is worth noting, however, that using refuges alone may not be sufficient. It can be easy to fall into the habit of only checking refuges and neglecting the rest of the site; this will mean that some animals will be missed (especially common lizards, which generally use refuges less frequently than the other species). It is best to combine checking refuges with searching the rest of the habitat as described above.

### **What to use as refuges**

The lighter gauges of corrugated iron are the most popular material, but roofing felt (in particular), plywood, wooden boards, carpet and roof tiles will also work. A recommended size for refuges is 0.5m<sup>2</sup>; this size represents a good compromise between providing a decent-sized, easily locatable refuge and something which can be carried fairly easily. On sites where some

human disturbance is possible, small, well-concealed or camouflaged refuges may be used.

### **Where to place refuges**

To locate animals most quickly, position refuges in potential reptile hotspots - i.e. sunny areas near to cover (see above). Placing refuges along hedgerow bases, on grassy banks, rides, verges etc will help. Position the refuge on top of short or flattened vegetation (rather than bare ground) - this helps to trap humidity, creates a temperature gradient and gives the reptiles a more diverse hiding place. It also helps if the tin is partially overhung by vegetation. If the site is subject to high public pressure, it may be best to place refuges away from paths or other public areas, or even to avoid their use altogether. To examine the distribution of reptiles on a given site, place the tins evenly over the habitat. You may be surprised to find reptiles in unexpected locations, or demonstrate their likely absence from less suitable looking areas.

### **How many refuges to use**

This will depend on many factors, such as the likelihood of disturbance, size of site, and what the survey is attempting to achieve. In general, the more tins used, the greater the chance of finding reptiles (and the larger the number of reptiles seen). For general survey purposes, place between five and ten refuges per hectare. For detailed surveys or monitoring, it may be necessary to increase this figure.

### **How to check refuges for reptiles**

Lift one edge of the refuge to near vertical to check for reptile presence. This is best done when the weather conditions are sufficient to make the surface warm to the touch. Reptiles will sometimes use refuges even when they are seemingly too hot if there is sufficient vegetation underneath to shield them from the excessive heat. They may also hide underneath in cool weather or overnight, but this is less likely. If it is known or possible that adders are present, turn the refuges over using bite-proof gloves or a stick. Always place the refuge back in exactly the same position.

### **Hints for using refuges**

To help you record observations, number the

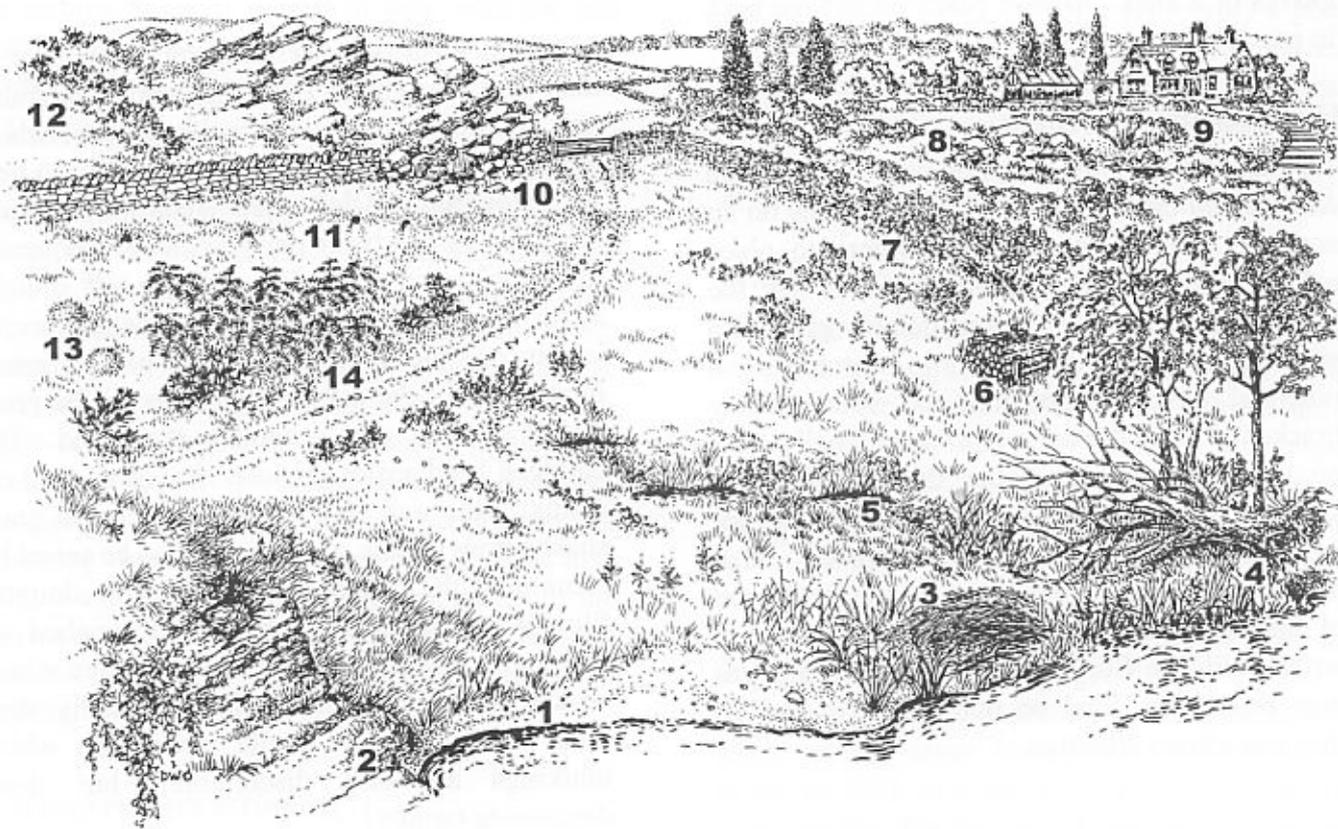
refuges and carefully mark their locations on an accurate map. When deciding where to place refuges early in the season, remember that the vegetation cover may be considerably greater in summer, so that what appears in March to be a potential basking spot may be swamped by bracken in July. It may help to put a small notice on or under the refuge stating the purpose of the survey, not to disturb it, and contact details for more information (note, however, that mentioning reptiles may increase the likelihood of disturbance at some sites - it may be better to write "Wildlife Survey" or similar). Shiny tins may be best avoided on public access sites as they can attract attention.

## Reptile skins (sloughs)

All reptiles periodically shed the outer layer of their skin. Shed skins (sloughs) tend to be found next to rough vegetation, rocks or logs, which the animal has rubbed up against in order to help with sloughing. Adult grass snakes and adders generally slough twice per year (more frequently in young snakes), and it is easy to tell sloughs apart, especially as they often remain more or less in one piece. Adder sloughs usually retain faint traces of the zig-zag markings whilst grass snake sloughs are generally unmarked. The enlarged head scales, divided anal scale, and (in adults) large size also help to distinguish grass snakes from adders. Snakes can also be sexed by examining the caudal scale counts on sloughs. Slow-worm sloughs often form scrunched up rings, and lack the enlarged belly scales which snakes possess. Common lizards usually shed their skins in many fragile pieces (on which markings are still discernible), but these degenerate rapidly.

### *Refuges - Dos and Don'ts*

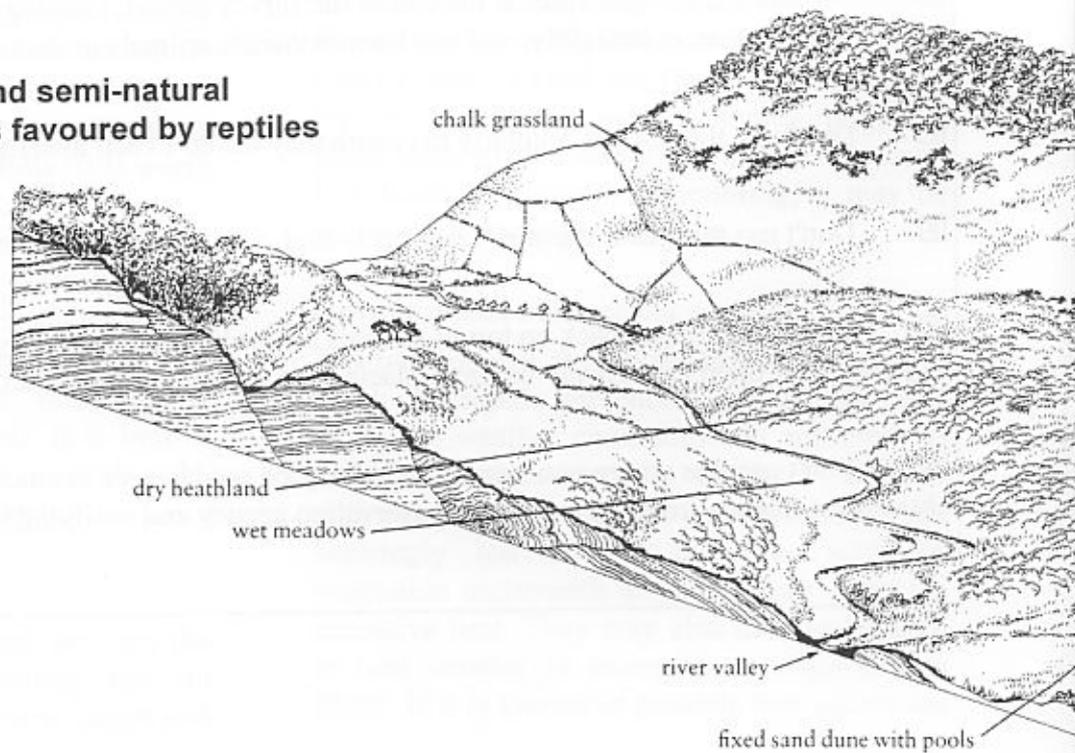
- Do provide the landowner with a map of the where the refuges are positioned.
- Do take the refuges away at the end of the survey period. Leaving them behind could put animals at risk of collection, is unsightly, and can harm domestic animals or damage machinery.
- Do check the refuges regularly to ensure they haven't been interfered with.
- Don't use refuges if the site is subject to high public pressure - it may put the animals at risk.
- Don't put refuges back on top of animals unless you are absolutely sure they won't be injured; it is better to let them crawl away before replacing the refuge, as hot tin can trap and burn reptiles.
- Don't use tins where you suspect there may be sand lizards or smooth snakes without first obtaining a licence from the statutory conservation agency and notifying the local office.

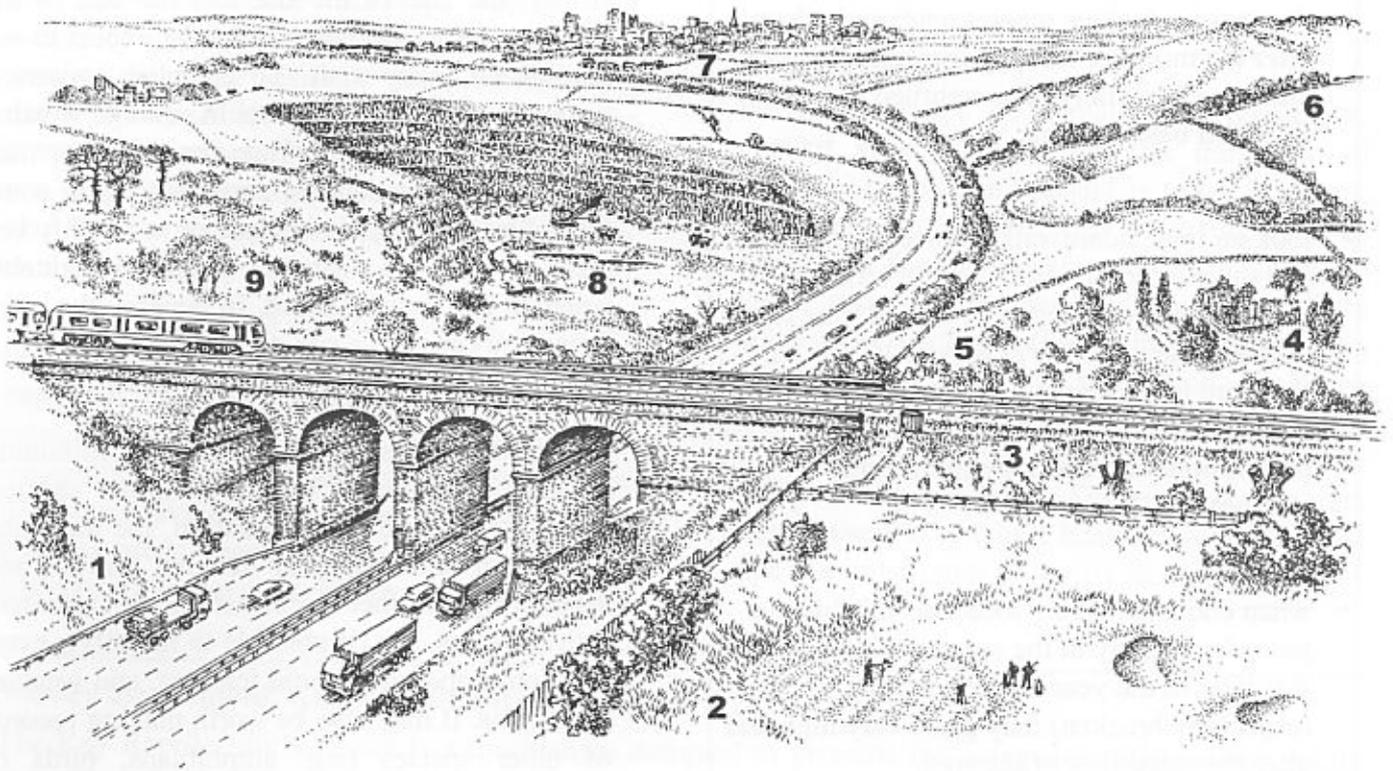


▲ **Natural and semi-natural features**

1: River edge, especially vegetated banks. 2: cliff bases. 3: piles of cut or flood-line vegetation. 4: fallen trees and exposed root systems. 5: vegetated streams and pools. 6: log and brash piles. 7: hedgerow bases. 8: rock outcrops and rockeries. 9: "wildlife gardens" - ponds, compost heaps, rough grass areas. 10: rock piles, dry stone walls. 11: mammal burrows. 12: shrubby vegetation and rough grassland. 13: tussocky grassland. 14: sunny track edges, especially next to cover such as bramble or bracken.

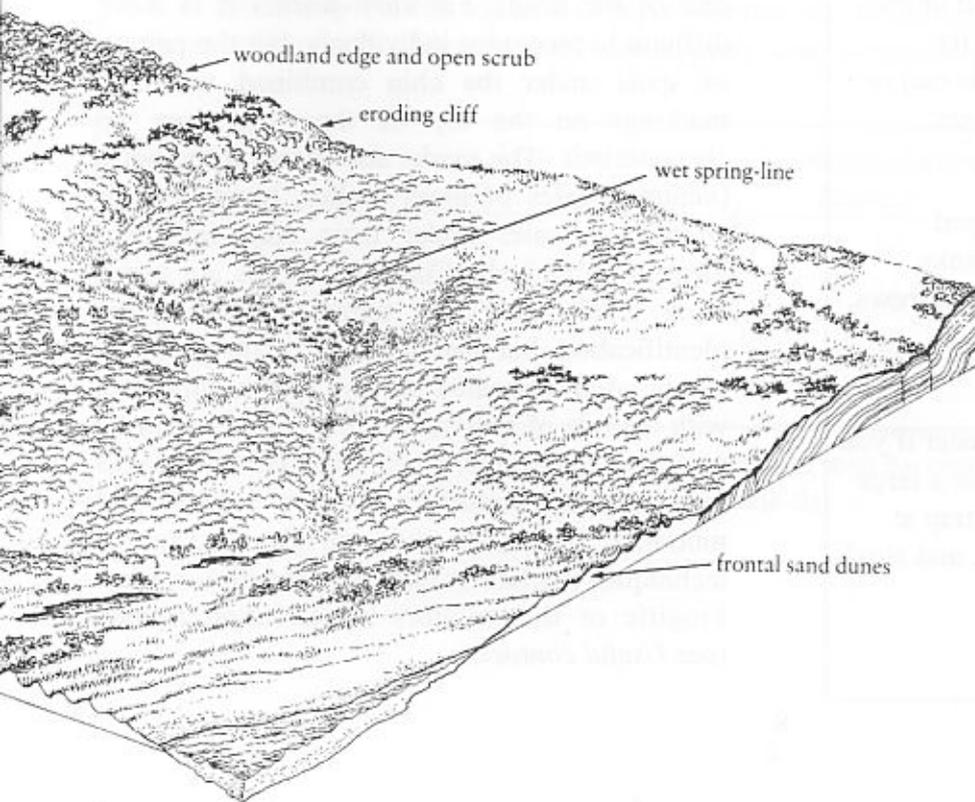
► **Natural and semi-natural habitat types favoured by reptiles**





▲ **Artificial habitat features**

1: road cuttings and embankments with mosaic of dense and open vegetation. 2: golf course rough. 3: railway cuttings and embankments. 4: derelict buildings with piles of debris. 5: abandoned orchard and garden. 6: south-facing tree-lines and hedgerows. 7: brownfield sites (derelict urban fringe such as old railway sidings). 8: scrub, grassland and pools in disused quarry. 9: nature reserve with open woodland.



## Hot tips

- if you hear a rustle in the vegetation, mark the spot (or make a mental note) and return after ten minutes, looking carefully for animals which may have returned to a favoured basking area.
- look on logs, boardwalks, fence posts, rocks and other exposed structures for basking common lizards. August is a good time to search these areas for new-born lizards. If there are few logs etc present you could introduce some to the site (subject to permission) and check them in sunny weather.
- when choosing sunny locations in which to put refuges early in the season, remember that later in the year the vegetation (especially bracken) may grow very high and alter the suitability of the spot.
- look in sunny areas around compost and manure heaps for hatchling grass snakes in late August - September.
- for adders, try looking in damper areas in the summer months.
- finding slow-worms will be difficult unless there are refuges present naturally (try looking under logs, discarded debris etc) or unless you put down artificial refuges.
- in March, look out for newly emerged animals and shed skins on sunny banks, especially where there are mammal burrows, tree roots or crevices.
- transporting tins around is much easier if you make a "tin sling" to carry them (use a large rectangle of strong cloth, attach a strap at either end to go over the shoulders, and stitch in some padding).

## How many times do I need to visit a site?

This really depends on the objective of the survey, the size of the site and the size of the reptile population. You should not expect to see reptiles on every visit. To establish presence, generally at least seven visits in suitable weather conditions at the appropriate time of year may be required. For detailed surveys to gain some idea of relative population size or to identify key areas, at least 20 visits per season, in suitable weather, are recommended. In general, the more times you can visit a site, the better.

## Where to look

For presence/absence surveys, the minimum information required would comprise species, number of animals seen, location, the date, and time spent searching. For detailed surveys and monitoring, further information is required: size/age class, sex (if possible to identify), exact location, important habitat features, and weather conditions. It may also be worth making records of other species (e.g. amphibians, birds or insects) and passing them to relevant recorders.

If a site is going to be monitored intensively and there is sufficient interest, it may be worth attempting to keep a record of individual animals. This can be useful for determining movement patterns and helping to obtain an estimate of population size. For adders, it is possible to do this by making a careful record of the head and neck markings (in particular, the apex of the dark zig-zag, where it ends on the rear of the head). For slow-worms it is more difficult to recognise individuals, but the pattern of spots under the chin combined with the markings on the top of the head may be characteristic. The marks and scars on the belly (ventral) scales of grass snakes, together with counts of scales under their tails can help identify individuals. Common lizards are much more challenging in terms of individual identification, but anal and belly scale markings can be used. Repeated surveys of the same site, with records of individuals encountered, can be useful to determine other information such as age at sexual maturity, breeding success and mortality. For further advice on advanced survey techniques (including marking animals), contact Froglife or the statutory conservation agency (see *Useful contacts*).

## INTERPRETING SURVEY RESULTS

For presence/absence surveys, results can simply be expressed as present (with maximum numbers seen per visit) or not detected. Note that it is very difficult to prove absence, but the greater the number of visits, the more confident you can be in your assessment. In most cases it may be best to express negative survey results on a site as "likely absence."

For detailed surveys and monitoring, mark all sightings on a map; this will help to identify important areas. By annotating the map with dates, behavioural notes and age class information, it may be possible to determine the following: favoured basking spots, breeding and foraging areas, seasonal changes in habitat use, and overwintering sites. For example, you might find that several surveyors reported seeing grass

snakes feeding on frogs around a particular pond, which would indicate an important foraging area.

For some groups of animals, it is possible to convert survey counts into an indication of (relative) population size and an index of change in status. For reptiles, this is difficult to do because of the challenges involved in surveying them, and because their ecology is not fully understood. Each survey visit may only reveal a small sample of the population, and the proportion of animals available for survey varies according to weather, migration patterns, etc. However, the table in the *Survey assessment* box can be used to obtain a basic evaluation of the size and importance of reptile sites.

### Survey assessment: Key Reptile Sites

The Key Reptile Site Register is a mechanism designed to promote the safeguard of important reptile sites. The criteria for site selection are given below, including a table which allows the classification of the relative size of reptile populations on the basis of survey counts. Compare your survey results with the criteria given below to obtain an objective evaluation of the importance of the reptile interest on your site.

To qualify for the Key Reptile Site Register, the site in question must meet at least one of the following criteria:

- (1) supports three or more reptile species
- (2) supports two snake species
- (3) supports an exceptional population of one species (see table)
- (4) supports an assemblage of species scoring at least 4 (see table)
- (5) does not satisfy 1-5 but which is of particular regional importance due to local rarity (e.g. in the East Midlands of England, adders are very rare so even "low" populations should be designated as Key Sites)

	Low population <i>Score 1</i>	Good population <i>Score 2</i>	Exceptional population <i>Score 3</i>
Adder	<5	5 - 10	>10
Grass snake	<5	5 - 10	>10
Common lizard	<5	5 - 20	>20
Slow-worm	<5	5 - 20	>20

Figures in the table refer to maximum number of adults seen by observation and/or under tins (placed at a density of up to 10 per hectare), by one person in one day.

## USING RESULTS FOR CONSERVATION

There are several ways that you can use your results to help conserve reptiles. The following are particularly recommended.

*For all surveys, monitoring visits and sightings:*

- Convert all sightings into records, with an OS grid reference, date and name of recorder, and send to the appropriate record centre (usually the local reptile and amphibian group or environmental records centre; for further details, see Froglife Advice Sheet 5). This should mean that the reptile interest will be considered should there be any planning application which concerns the site. Landowners should also be informed.

*For detailed surveys/ monitoring:*

- If possible, determine important parts of the site (such as hibernation areas - see *Interpreting survey results*, above). Mark these, along with hotspots for frequent sightings, on a map. Once this is done, you can determine the importance of different habitat types, topographical features and other attributes of the site. Make sure that these are noted with any records you make.
- Relate current or proposed habitat management practices to reptile occupancy, and make suggestions as to how the management might be tailored to accommodate them. From looking at historical accounts or records, you may be able to pick out key changes in the history of the site when conditions were particularly favourable (or detrimental) for reptiles. Check your findings with other experienced surveyors, and inform the land managers/ owners of your conclusions.
- Write a report on your observations. Even a brief, one-page account of the survey will be useful for others interested in the site. Make sure that local conservation organisations receive a copy.
- Note any potential threats to the site, or its surrounds. Perhaps there are proposals for allotments bordering the grassland you have been surveying to be turned into a new residential area. Threats such as these should

be handled at the earliest opportunity (see Froglife Advice Sheet 9).

- Check to see if the site meets the criteria for a Key Reptile Site (see Survey assessment box). If so, inform your local reptile and amphibian group (if one exists), as well as Froglife. An attempt can then be made to ensure the site is recognised in the planning process as a particularly important reptile site.
- Try to check on the site in future years and be vigilant towards threats.

## CODE OF CONDUCT

As a general rule, do not try to capture animals for basic survey work as it invariably causes some degree of stress. For most purposes it will be unnecessary; only for more specialised monitoring will it be essential to capture reptiles so that sex or individuals can be ascertained. Never handle adders unless you are suitably experienced and equipped. Do not take animals away from - or introduce animals into - a site, unless part of a professionally guided and approved scheme. Avoid the use of refugia where it may put reptiles at risk, and follow the Dos and Don'ts given earlier. Always obtain access permission before surveying (preferably in writing from the landowner), and follow the Country Code. Health and safety considerations should be investigated before embarking on survey work (*The Herpetofauna Workers' Manual* has more information on this).

## Reptile survey and the law

The Wildlife and Countryside Act 1981 makes it an offence to intentionally kill or injure any of our native snakes and lizards. The sand lizard and smooth snake receive additional protection; for these species, it is unlawful to capture or possess them, or to damage/ obstruct access to places they use for shelter or protection, or to disturb them whilst in such a place. For these species, therefore, a licence is required for surveys which will involve, for example, using refuges. Observation without handling or disturbance is not licensable.

Specialist procedures used in marking individuals, such as toe-clipping for lizards, may require additional licensing (contact

the statutory agency for advice). Local legislation, such as by-laws relating to nature reserves (notably National Nature Reserves), may prohibit various activities which are not normally unlawful. For example, the capturing of widespread reptiles may be an offence at some sites by virtue of bye-laws, even though they are not protected in this regard under the Wildlife and Countryside Act.

## USEFUL CONTACTS

**Froglife.** Advises on and promotes the conservation of reptiles; advice on site threats; can offer reptile survey training courses to groups. See overleaf for address.

### **Herpetofauna Groups of Britain and Ireland.**

Local reptile and amphibian groups co-ordinate recording at the local level by running surveys and validating records before they are sent to local records centres and the national database at the Biological Records Centre (for details see Froglife Advice Sheet 5 or the *Herpetofauna Worker's Guide*). The HGBI secretariat is based at Froglife (address below), who can provide a list of current reptile and amphibian groups. These groups are also involved in a range of conservation activities for snakes and lizards, working with and advising local organisations.

**The Herpetological Conservation Trust.** The HCT focuses on the conservation of rare reptile species (sand lizard and smooth snake), especially in Dorset, Hampshire and Surrey. Contact: HCT, 655a Christchurch Road, Boscombe, Bournemouth, Dorset, BH1 4AP; tel 01202 391319.

**Statutory Agencies.** The government nature conservation advisory bodies can be contacted for advice on licensing and site threats.

English Nature, Northminster House, Peterborough PE1 1UA; tel 01733 455000.

Countryside Council for Wales, Plas Penrhos, Ffordd Penrhos, Bangor, Gwynedd, LL57 2LQ; tel 01248 385500.

Scottish Natural Heritage, 2-5 Anderson Place, Edinburgh EH6 5NP; tel 0131 554 9797.

## FURTHER READING

Arnold, EN, Burton, JA & Ovenden, DW (1978) *A field guide to the reptiles and amphibians of Britain and Europe*. Collins. [has excellent colour plates and descriptions of all European species]

Buckley, J (1982) *A guide for the identification of British reptiles and amphibians*. British Herpetological Society.

Field Studies Council (1999) AIDGAP guide to the reptiles and amphibians of Britain and Ireland. FSC, Shrewsbury. [a full colour fold-out guide, with brief descriptions and distribution maps; FSC publications: tel. 01743 850370]

Foster, J & Gent, T (1996) *Reptile survey methods: proceedings of a seminar held on 7 November 1995 at the Zoological Society of London's meeting rooms, Regent's Park, London*. English Nature Science Report No. 27. [detailed report containing papers investigating various survey methods, for all British species]

Frazer, D (1983) *Reptiles and amphibians in Britain*. New Naturalist Series, No.69. Collins.

Froglife (2000) *Herpetofauna Worker's Guide 2000: a directory of information and resources for the conservation of amphibians and reptiles in the UK and Ireland*. Froglife, Halesworth. [contains general information including a list of key contacts, reptile recorders, and references on reptile conservation]

Gent, T & Gibson, S (1998) *The Herpetofauna Workers' Manual*. JNCC, Peterborough. [reference work containing chapters on identification, legislation, survey, habitat management, etc]

Langton, T (1989) *Snakes and lizards*. Whittet books.

Smith, MA (1973) *The British reptiles and amphibians*. 5th edition. New Naturalist Series, No.20. Collins.

Stafford, P (1987) *The adder*. Natural History Series, No. 18. Shire Publications.

Stafford, P (1989) *Lizards of the British Isles*. Natural History Series, No. 46. Shire Publications.

Steward, JW (1971) *The snakes of Europe*. David & Charles.

Street, D (1979) *The reptiles of northern and central Europe*. Batsford.

This leaflet is part of a series produced by Froglife to provide practical advice on conserving frogs, toads, newts, lizards and snakes. Froglife is a charitable organisation concerned with the conservation of reptiles and amphibians, and can be contacted at:

**Froglife**  
**White Lodge**  
**London Road**  
**Peterborough**  
**PE7 0LG**  
**Tel: 01733558844**  
**Fax: 01733 558440**  
**Or visit: [www.froglife.org](http://www.froglife.org)**

**Other Advice Sheets in this series and by Herpetofauna Groups of Britain and Ireland (HGBI):**

*Froglife Advice Sheet 1: Frogs, Toads and Newts in Garden Ponds:* Guidelines to help advise on general enquiries about amphibians in gardens.

*Froglife Advice Sheet 2: Snakes Need Friends.* Advice on general enquiries about snakes in gardens.

*Froglife Advice Sheet 3: Amphibians and Roads.* Advice to help reduce injury and death of amphibians from vehicles and road drains.

*Froglife Advice Sheet 4: Signing Toad Crossings.* Guidelines for local authorities on warning signs for amphibian migratory crossings.

*Froglife Advice Sheet 5: Reptile and Amphibian Recording.* Why and how to record herpetofauna.

*Froglife Advice Sheet 6: Conserving Grass Snakes.* Information for land managers and householders.

*Froglife Advice Sheet 7: Unusual Frog Mortality.* Information and practical advice on the cause of death in amphibians.

*Froglife Advice Sheet 8: Exotic Reptiles and Amphibians in the Wild.* Information and advice on the problems of non-native species in Britain and Ireland.

*Froglife Advice Sheet 9: The Planning System and Site Defence.* How to protect reptile and amphibian habitats.

*HGBI 1: Commercial Consultancy Work: HGBI Guidelines on Amphibian and Reptile (ARG) Involvement.*

*HGBI 2: Evaluating Local Mitigation/ Translocation Programmes: Maintaining Best Practice and Lawful Standards.* HGBI Advisory Notes for Amphibian and Reptile Groups (ARGS).

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