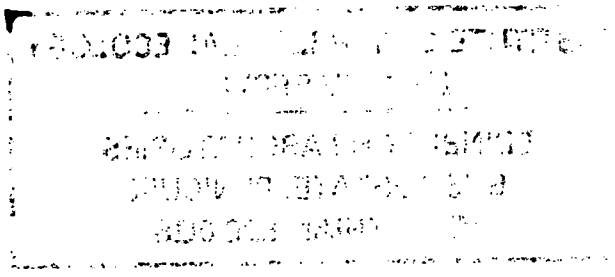
JOINT NATURE CONSERVATION COMMITTEE

Institute of Terrestrial Ecology

# Atlas of amphibians and reptiles in Britain

H R Arnold

Centre for Ecology and Hydrology
Natural Environment Research Council



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ITE research publication no. 10

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The Institute of Terrestrial Ecology (ITE) is a component research organisation within the Natural Environment Research Council. The Institute is part of the Centre for Ecology and Hydrology, and was established in 1973 by the merger of the research stations of the Nature Conservancy with the Institute of Tree Biology. It has been at the forefront of ecological research ever since. The six research stations of the Institute provide a ready access to sites and to environmental and ecological problems in any part of Britain. In addition to the broad environmental knowledge and experience expected of the modern ecologist, each station has a range of special expertise and facilities. Thus, the Institute is able to provide unparalleled opportunities for long-term, multidisciplinary studies of complex environmental and ecological problems.

ITE undertakes specialist ecological research on subjects ranging from micro-organisms to trees and mammals, from coastal habitats to uplands, from derelict land to air pollution. Understanding the ecology of different species of natural and man-made communities plays an increasingly important role in areas such as monitoring ecological aspects of agriculture, improving productivity in forestry, controlling pests, managing and conserving wildlife, assessing the causes and effects of pollution, and rehabilitating disturbed sites.

The Institute's research is financed by the UK Government through the science budget, and by private and public sector customers who commission or sponsor specific research programmes. ITE's expertise is also widely used by international organisations in overseas collaborative projects.

The results of ITE research are available to those responsible for the protection, management and wise use of our natural resources, being published in a wide range of scientific journals, and in an ITE series of publications. The Annual Report contains more general information.

The Biological Records Centre is operated by ITE, as part of the Environmental Information Centre, and receives financial support from the Joint Nature Conservation Committee. It seeks to help naturalists and research biologists to co-ordinate their efforts in studying the occurrence of plants and animals in the British Isles, and to make the results of these studies available to others.

H R Arnold
Environmental Information Centre
Biological Records Centre
Institute of Terrestrial Ecology
Monks Wood, Abbots Ripton
HUNTINGDON, Cambs PE17 2LS
Tel: 01487 773381 Fax: 01487 773467

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# INTRODUCTION

## History of amphibian and reptile recording

In 1901 Leighton published his book *The life history of British serpents and their local distribution in the British Isles*, followed in 1903 by a similar book on British lizards (Leighton 1901,1903). In these he listed many localities in which the species had been noted. A variety of other books, published around the turn of the century, such as county faunas and the Victoria County Histories, gave localities for both amphibians and reptiles, though often they described the commoner species as being 'widely distributed' or 'common everywhere'.

In the 1940s R H R Taylor began to gather together distribution records of all the amphibians and reptiles in Britain and Ireland with the aim of publishing accurate distribution maps. Many of these records were extracted from the published sources referred to above, but he also corresponded with herpetologists and naturalists. In 1948 he published vice-county maps (Taylor 1948), which were reproduced in the New Naturalist book *British amphibians and reptiles* (Smith 1951). Fifteen years later Taylor published a revised survey (Taylor 1963) in which individual records were represented by symbols.

In 1965, the Biological Records Centre (BRC) launched a recording scheme (Anon 1965) which used the system developed by the Botanical Society of the British Isles for recording flowering plants (Perring & Walters 1962). The aim was to record the distribution of amphibians and reptiles on the basis of their presence or absence in 10 km National Grid squares. All the records which had been gathered by Taylor were copied on to record cards as a starting point, and over the following years records were added gradually. Frank Perring, then head of BRC, has a particular fondness for frogs, and ran the scheme until 1973 when the co-ordination was taken over by Henry Arnold. The scheme was very informal, but, as amphibians have a wide popular following, there were often opportunities to publicise it in connection with a variety of wildlife projects, especially those relating to pond-life, and the county wildlife trusts frequently advertised the scheme.

Several separate surveys were organised to look at individual species, or pairs of species, and the records from these surveys were added to the growing BRC database. For example, between 1968 and 1971, Arnold Cooke collected information on common frog and common toad breeding sites (Cooke 1972).

In 1973 a provisional atlas was published (Arnold 1973) in an attempt to stimulate recording of amphibians and reptiles, and an updated set of maps was published ten years later (Arnold 1983).

BRC holds a considerable amount of information on the amphibians and reptiles occurring in Ireland, some of which was collated in association with the former Irish Biological Records Centre. Following consultation with the National Parks and Wildlife Service in the Republic of Ireland and the Department of the Environment for Northern Ireland, a decision was taken to limit the present Atlas to Britain. There are no immediate plans for publication of distribution maps of the amphibians and reptiles of Ireland.

In 1983 the Nature Conservancy Council (NCC), contracted Leicester Polytechnic to expand and develop amphibian (and subsequently reptile) recording. The first contract was on the status and ecology of the great crested newt, followed in 1986 by a study of amphibian communities, which included a framework for a long-term monitoring scheme.

A third contract, the Herptile Sites Project, now under the aegis of English Nature (EN), developed the recorder network and implemented the monitoring programme, initiating a survey of the common reptile species. Final reports on this work were published in 1993 (Swan & Oldham 1993a,b). As well as expanding the recorder network, these new surveys increased the amount of information collected at each recorded site, and included, for the first time for a comprehensive national scheme, detailed habitat recording for both aquatic and terrestrial habitats. This information was intended to increase the value of the survey work for scientific analysis and for conservation purposes.

## The records

There are almost 50 000 records in the BRC database. About 60% were collected by BRC and the remainder were collected by the Leicester Polytechnic surveys. The total number of records per species, and the number of distinct 10 km grid squares per species are shown in Table 1.

*Table 1.* **Number of records and number of 10 km squares for each species**

| Species | Records | Squares |
|---|---|---|
| Common frog *(Rana temporaria)* | 13697 | 2432 |
| Common toad *(Bufo bufo)* | 6930 | 1594 |
| Great crested newt *(Triturus cristatus)* | 6131 | 921 |
| Smooth newt *(Triturus vulgaris)* | 5751 | 1144 |
| Common lizard *(Lacerta vivipara)* | 4656 | 1435 |
| Grass snake *(Natrix natrix)* | 3316 | 890 |
| Adder *(Vipera berus)* | 3354 | 1014 |
| Slow-worm *(Anguis fragilis)* | 3298 | 1073 |
| Palmate newt *(Triturus helveticus)* | 2681 | 927 |
| Sand lizard *(Lacerta agilis)* | 444 | 76 |
| Natterjack *(Bufo calamita)* | 283 | 98 |
| Smooth snake *(Coronella austriaca)* | 163 | 42 |
| Edible frog *(Rana esculenta)* | 119 | 48 |
| Marsh frog *(Rana ridibunda)* | 112 | 41 |

The survey of the great crested newt has greatly increased the number of records so that it is the third most frequently recorded species, although the number of squares it is recorded as occupying puts it in only eighth place.

## The rare species

The majority of the records for the three rare, native species (sand lizard, smooth snake and natterjack) were collected by members of the British Herpetological Society's Conservation Committee in the late 1960s and early 1970s. Because the survey forms used were different from those used in the main surveys, many of the records do not have precise dates attached, or habitat information. Hence, no data are presented on these two topics for the rare species.

## The recorders

Well over 1700 people have been involved in sending records to the BRC, and records have been extracted from over 320 publications and reports. Over 870 recorders contributed to the Leicester Polytechnic amphibian survey and nearly 400 to the Leicester Polytechnic reptile survey, though there was considerable overlap between these two groups, and some overlap with the recorders who had previously sent records to BRC. None of these figures takes account of the people who contributed by sending records to someone else, such as a county recorder, who collated the records and passed them to BRC or Leicester Polytechnic.

## Recording

Amphibians are relatively well recorded. They have received much attention in the form of surveys, both locally and nationally. They are generally easy to observe and record because they concentrate in waterbodies in the spring to spawn. Both frog and toad spawn can be seen easily during the day, unless the pond is heavily overgrown with weed, and newts can usually be counted at night by torchlight. If this is not possible, they can be netted during the day.

Reptiles, on the other hand, are much less well recorded. They do not congregate to breed in the way that amphibians do and so there is no simple method for extensive surveys. They are more secretive and more agile than the amphibians, and require more diligent searching to track them down. Some success has been achieved by the positioning of metal sheets in likely habitats. Reptiles will use these sheets as refugia and can conveniently be recorded by carefully lifting the sheet.

## Channel Islands

The situation of amphibians on the Channel Islands is complex, as three species (agile frog, green lizard and wall lizard) not native in Britain are native there, and several British species do not naturally occur, but have been introduced. Table 2 lists the species and their status by island. It has not been possible to ascertain the true status of some species on some of the islands and this is indicated with a question mark. The Table does not include every recorded casual release, and some releases may not have been recorded.

*Table 2.* **Amphibians and reptiles on the Channel Islands**

| | Common frog | Agile frog | Common toad | Palmate newt | Smooth newt | Slow-worm | Grass snake | Green lizard | Wall lizard |
|---|---|---|---|---|---|---|---|---|---|
| Jersey | I | N | N | N | | N | N | N | N |
| Guernsey | N | N | I | | N | N | I | N | |
| Alderney | N? | | | | | N? | | | |
| Sark | N | N? | N? | | | | | | |
| Herm | N? | | | | | N | | | |
| Jethou | | | | | | N | | | |

N = native; I = introduced

## Format

The species accounts are in the following format.

- **Species name and scientific name**
- **Frazer**

  Page numbers of the relevant account in the New Naturalist book *Reptiles and amphibians in Britain* (Frazer 1983)

- **Protection status**

  Whether the species is protected by European legislation or under British law

All species are protected in some way by various wildlife protection acts, directives and conventions.

The relevant ones are listed below.

### EUROPE

EC Directive on The Conservation of Natural Habitats and of Wild Fauna and Flora (Directive 92/43/EEC of 21 May 1992)

Articles 3, 4 and 6 require the designation of Special Areas of Conservation for species listed on **Annex IIa**

Article 12 requires the strict protection of species listed in **Annex IVa**

Articles 14 and 15 regulate the exploitation and methods used to kill species listed in **Annex Va**

Bern Convention (The Convention on the Conservation of European Wildlife and Natural Habitats). The Convention requires that signatory States should:

i. protect the habitats of
ii. prohibit deliberate damage to important breeding and nesting sites of
iii. prohibit deliberate capture,killing, disturbance and trade in

species listed in **Appendix II**.

It also requires that signatory States should:

i. regulate the exploitation of
ii. ban certain means of capture or killing of

species listed in **Appendix III.**

Britain has its own wildlife legislation.

### BRITAIN

Wildlife and Countryside Act (1981 and later amendments)

Species listed in **Schedule 5** are given special protection, including protection against:

a) killing,injuring or taking an animal
b) damaging,destroying or obstructing access to an animal's place of shelter
c) selling or offering for sale an animal.

**Schedule 9** refers to non-native species which are currently established but for which a licence is required for release into the wild.

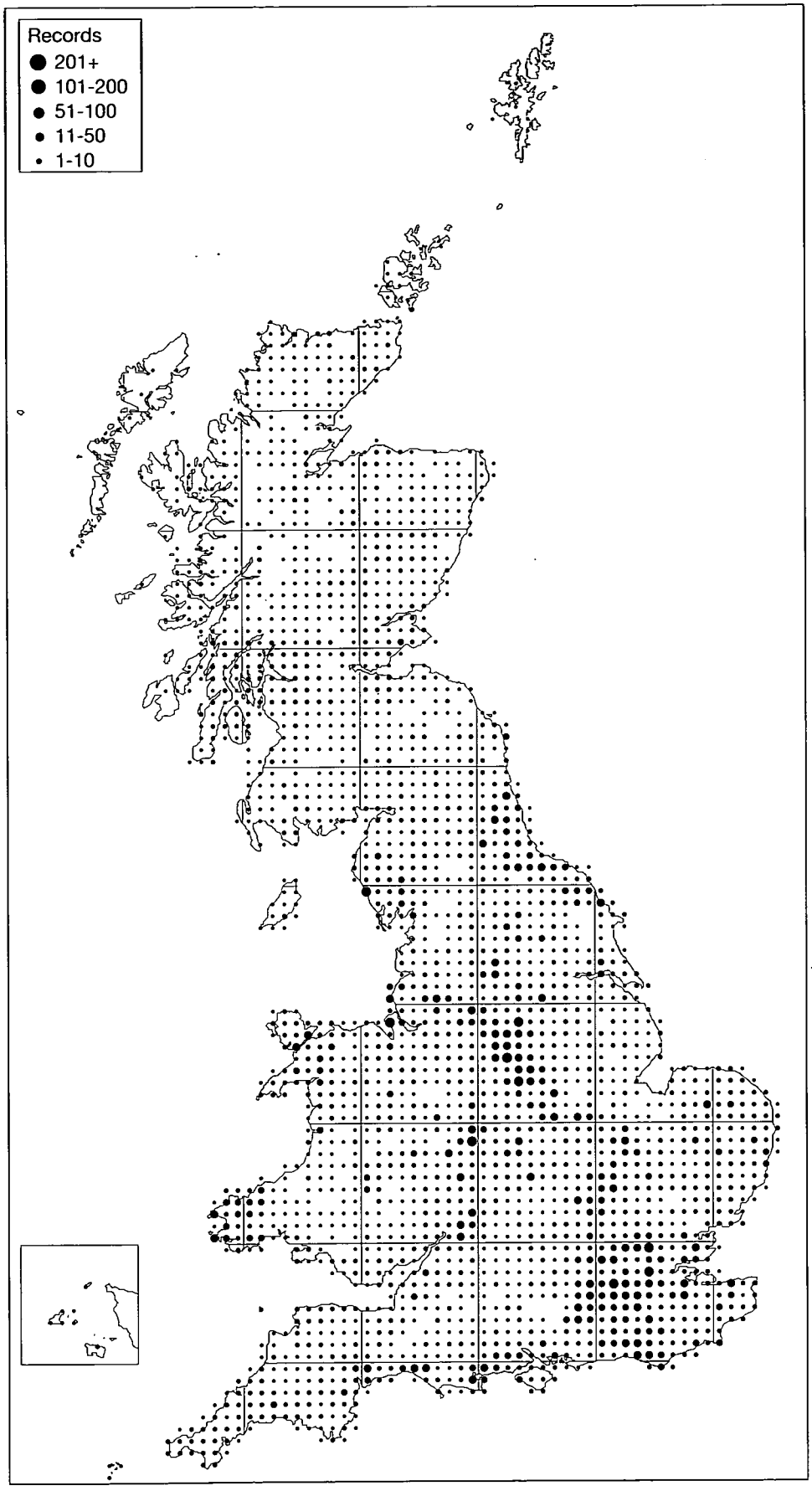
- **Description and recognition**
  Brief notes on the appearance of the species, and any particular problems with identification

Further comments follow with some information on the records used to compile the maps. The number and percentage of records from each habitat are given where available.

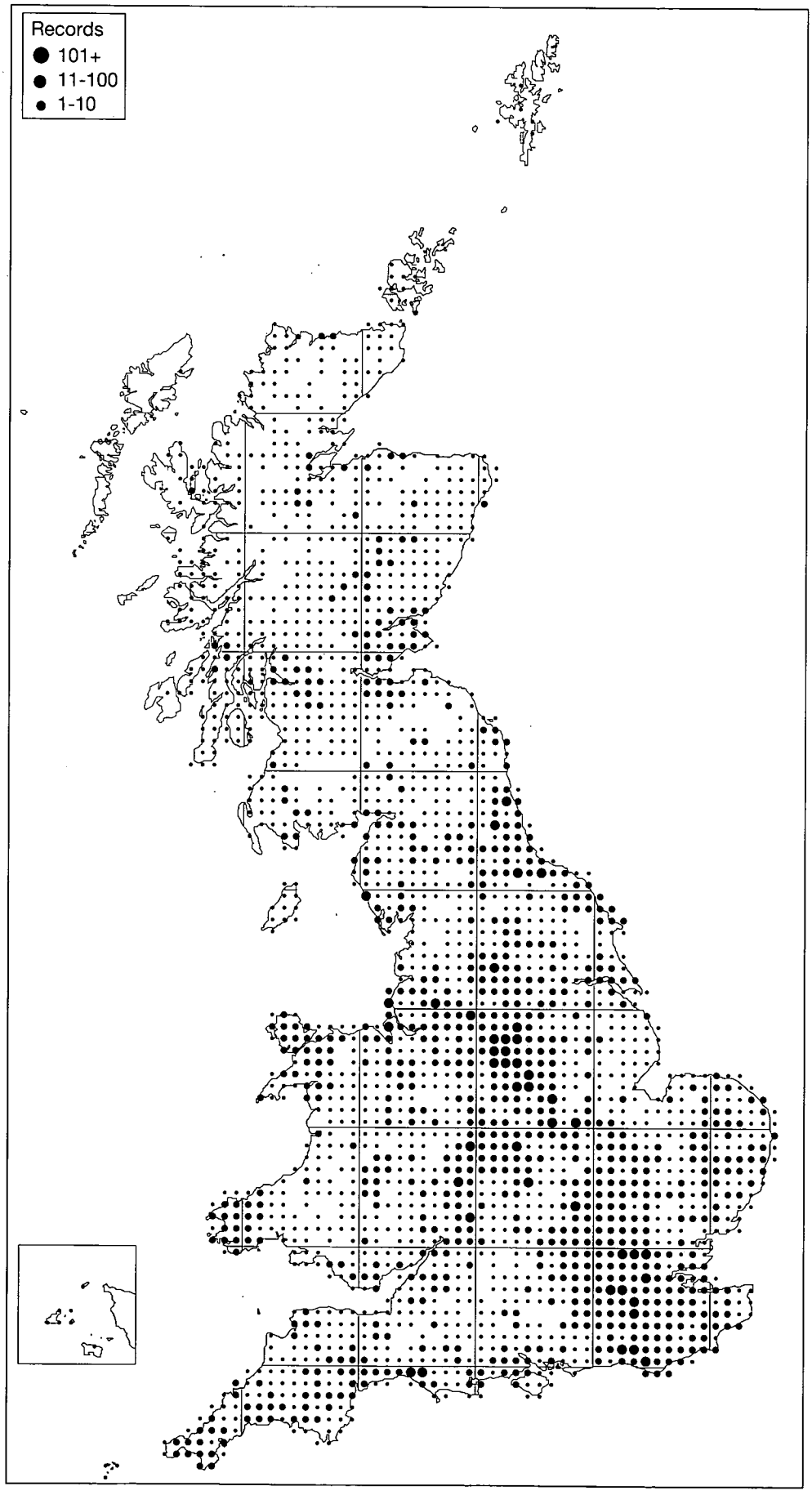
- **Map**
  A map is shown for most species which includes all the records entered on the database by June 1994. Records from the Joint Nature Conservation Committee (JNCC)/BRC survey launched in spring 1994 are not included, neither are some of the records collected through the JNCC/ Leicester Polytechnic monitoring survey in 1993.

# SPECIES ACCOUNTS AND MAPS

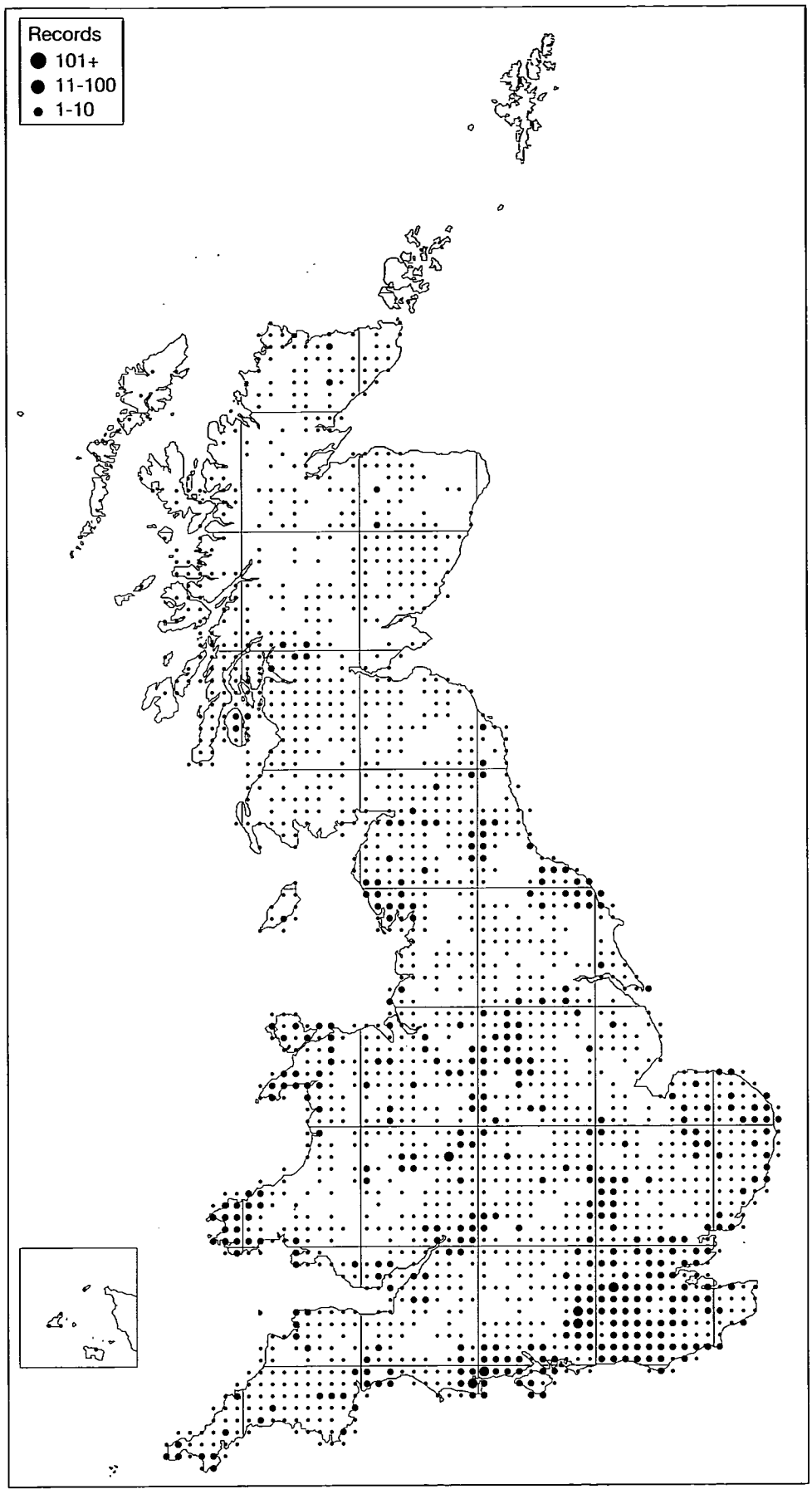
## Coverage map



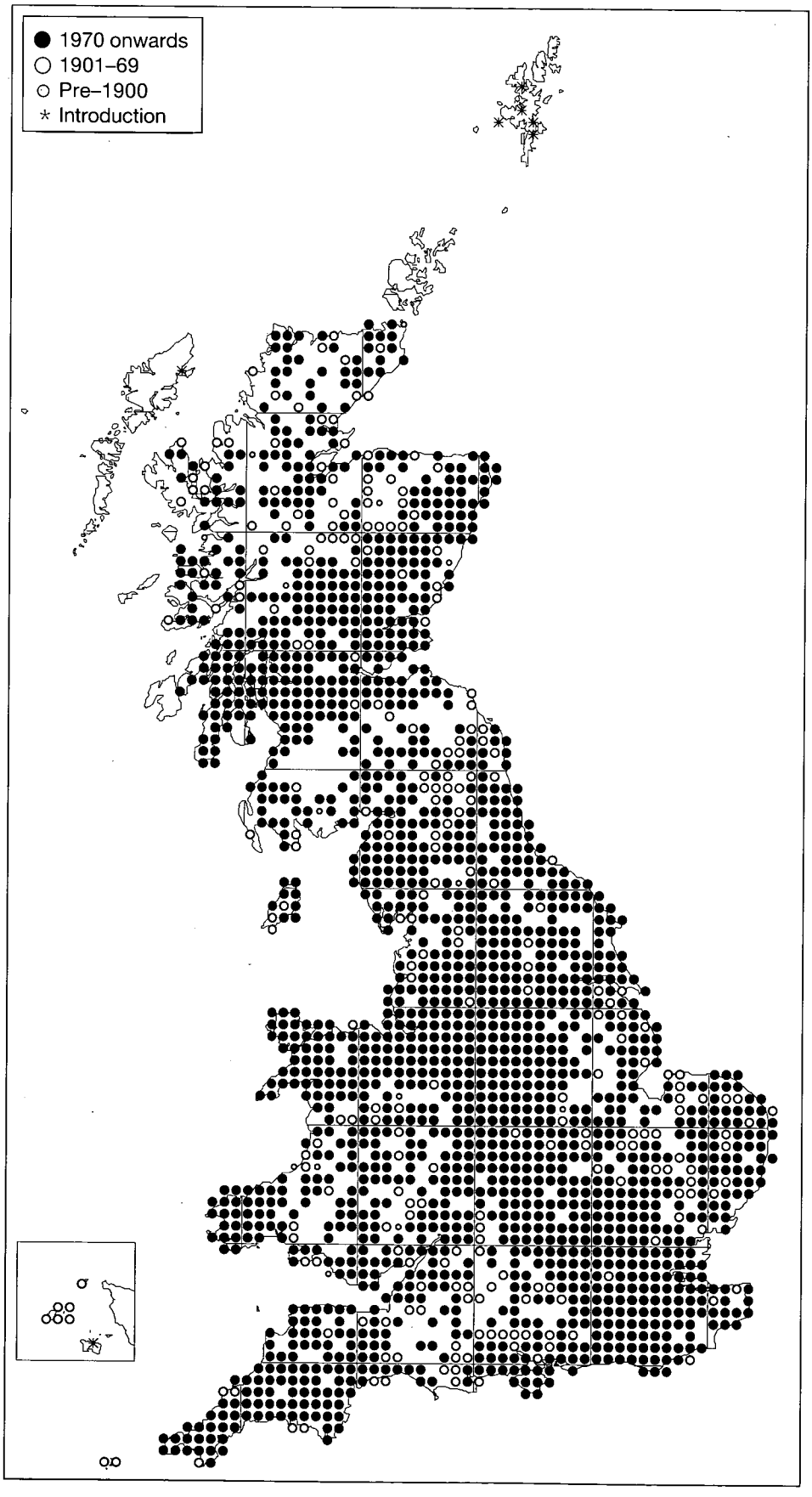
# Amphibian coverage map



# Reptile coverage map



# Common frog



# Common frog (*Rana temporaria* Linnaeus 1758)

*Frazer* 55-69

***Protection status:*** Bern Appendix III; EC Annex Va; WCA Schedule 5 (sale)

*Description and recognition*

This common amphibian is well known to most people. It is distinguished from the toads by its smooth skin and lack of parotoid glands behind the eye. In a few areas it could be confused with the introduced green frogs but the common frog has wider-spaced eyes and usually has a dark facial mask.

---

The common frog is still widespread throughout the British mainland, despite loss of breeding habitat and some evidence of declines in numbers (Cooke 1972). It seems likely that it is in fact present in all mainland 10 km squares in Britain (Swan & Oldham 1993a). It is replaced by the agile frog (*Rana dalmatina*) on Jersey (not mapped), though common frogs have been introduced to that island.

There is a peak in the number of records in March, reflecting the fact that frogs, like all amphibians, are easiest to record whilst spawning.

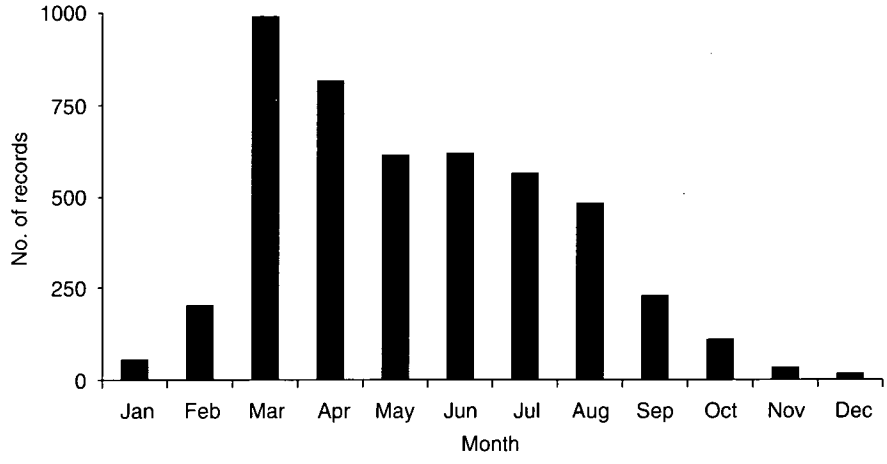
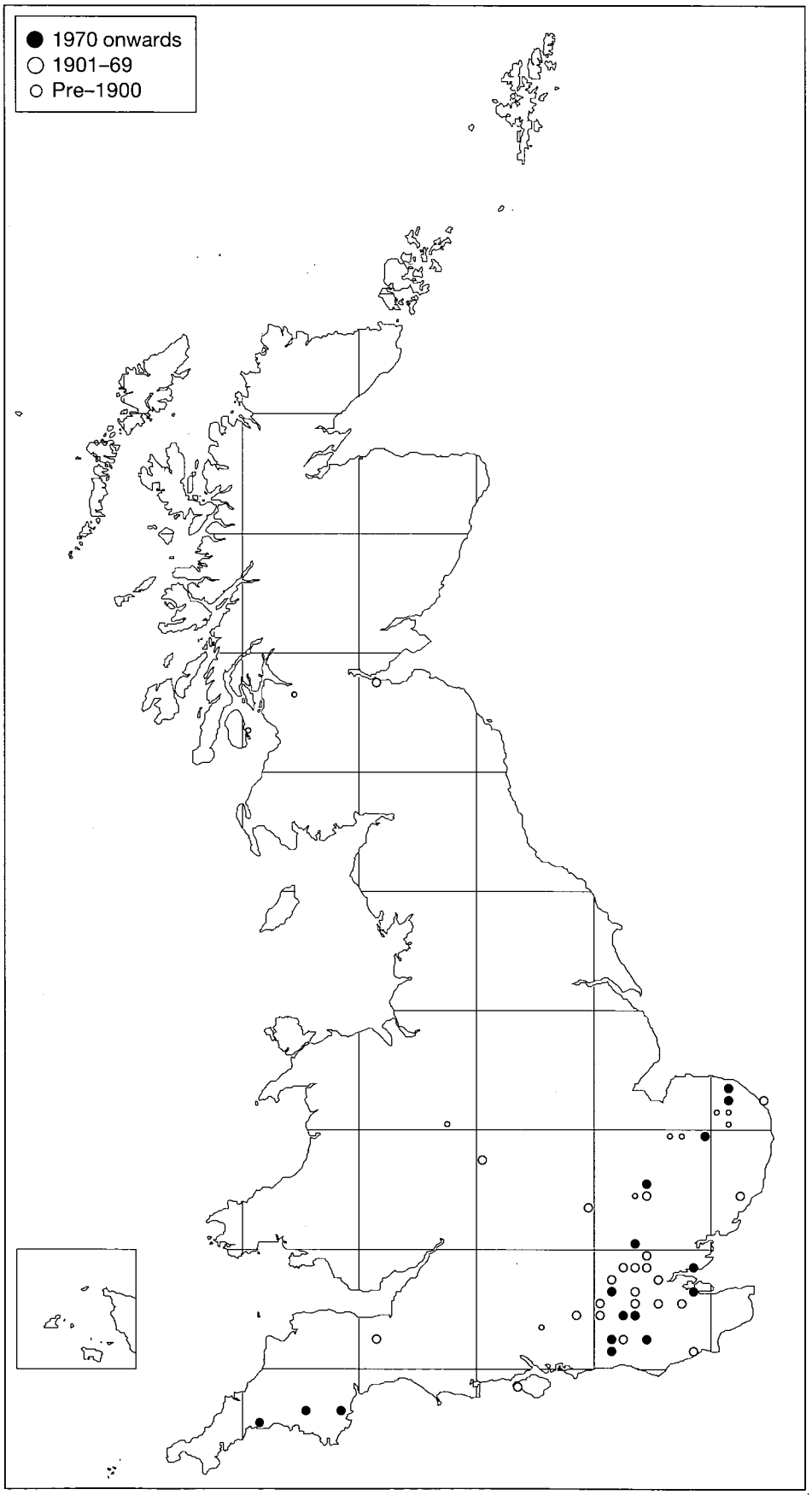



*Figure 1.* **Total number of records of the common frog for each month**

Of the 3029 records where clear habitat information was given, the categories were as follows:

| | | |
|---|---|---|
| Waterbody | 1636 | 54% |
| Garden | 508 | 17% |
| Woodland | 189 | 6% |
| Marsh | 176 | 6% |
| Moor/heath | 134 | 4% |
| Quarry/pit | 130 | 4% |
| Other | 256 | 8% |

# Edible frog



## Green frogs: edible frog (*Rana esculenta* Linnaeus 1758), pool frog (*Rana lessonae* Camerano 1883), and marsh frog (*Rana ridibunda* Pallas 1771)

These three species are difficult to distinguish from each other, and indeed the status of *R.lessonae* in this country is uncertain; some of the records mapped as *R.esculenta* may refer to this species. The taxonomic status of the three is complex; *R.lessonae* and *R.ridibunda* can hybridise to produce *R.esculenta*. These hybrids are not sterile, but can interbreed with either of the parent species and produce more *R.esculenta*. They can also occasionally interbreed with each other and produce any of the three forms (Arnold & Burton 1978).

## Edible frog (*Rana esculenta* Linnaeus 1758) (including pool frog *Rana lessonae* Camerano 1883)

*Frazer* 73-79

***Protection status:*** (*esculenta*) WCA Schedule 9

*Description and recognition*

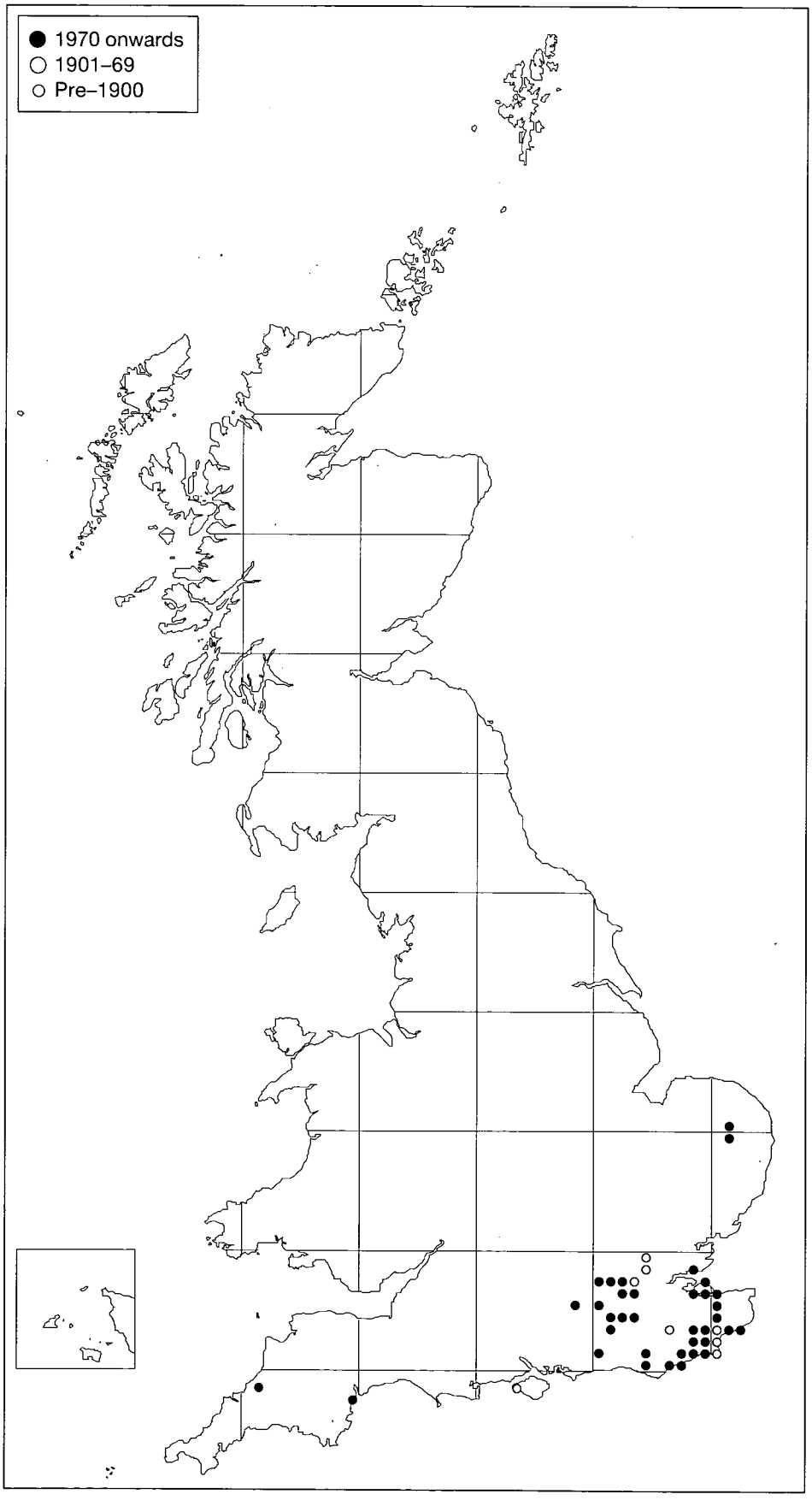
The edible frog and the pool frog are very similar to the common frog, and to the marsh frog (*q.v.*), but the eyes are closer together than those of the common frog and the males have vocal sacs at the corners of the mouth. The edible frog is often bright green dorsally.

---

This species occurs, or has occurred, in a number of scattered localities in Britain. The majority of sightings and colonies can be traced to introductions, which have usually been deliberate but occasionally accidental.

The first published record of a proven edible frog was that from Foulmire (now Fowlmere) Fen in Cambridgeshire in 1843 (Bond 1844), but it later transpired (Newton 1859) that an introduction to Norfolk in 1837 was known. The origin of the Foulmire frogs is not known. Bell (1859) maintained that they were native but there is no definite evidence to support this view.

# Marsh frog



# Marsh frog (*Rana ridibunda* Pallas 1771)

*Frazer* 70-73

***Protection status:*** WCA Schedule 9

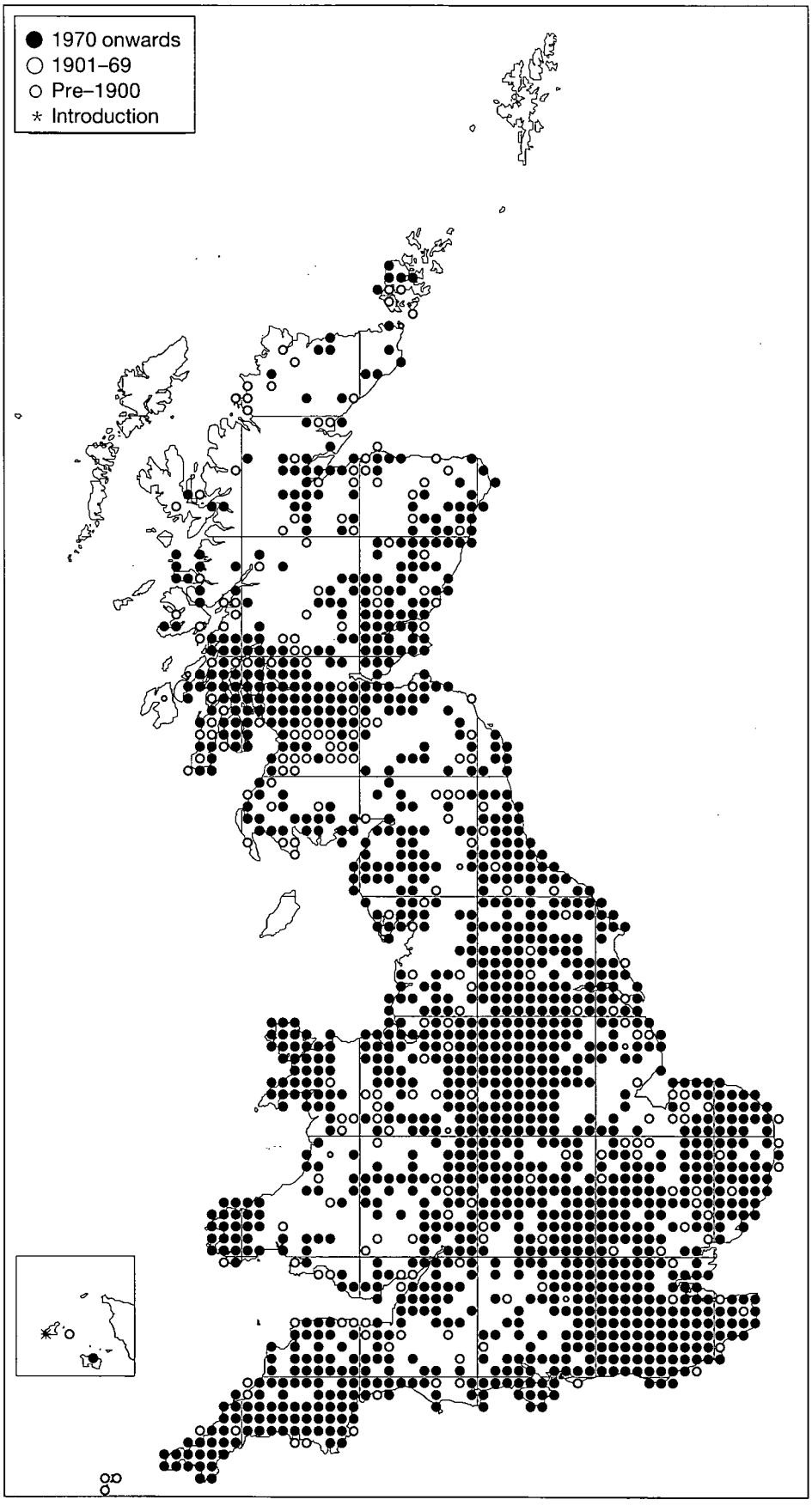
***Description and recognition***
This species is difficult to distinguish from the edible frog (*Rana esculenta*). In *R.ridibunda* the backs of the thighs are marbled black and brown with greyish white, whereas in *R.esculenta* they are black and brown with yellowish or orange. It tends to be larger than *R.esculenta* (body length up to 15 cm for *R.ridibunda*, up to 12 cm for *R.esculenta*)

---

The first introduction of this species to Britain was probably in 1884 at Chilworth and Shere, Surrey (Dalgliesh 1904; Russell 1904; Fitter 1959) when a variety of types of green frog was introduced. Little is known of the fate of this attempt, though some individuals were known to exist at Shere until 1904 (Russell 1904). Also in 1904, green frogs were found some six miles away at Ockham (Dalgliesh 1904). However, because the taxonomy of green frogs was not fully understood, the original introductions were all recorded as 'edible' frogs, with some noted as being of the subspecies '*ridibunda*', and the identification remains uncertain. Those found in 1904 seem to have been '*esculenta*'.

The most successful introductions of definite *R.ridibunda* occurred in the 1930s, though they were still described as '*Rana esculenta* (the Hungarian variety)' (Smith 1939). In the winter of 1934-35 they were introduced into East Kent, on the edge of the Romney Marshes, into which the animals soon spread. There have been several other introductions, mainly in the south-east, frequently using stock from the Romney Marsh area.

# Common toad



# Common toad (*Bufo bufo* (Linnaeus)1758)

*Frazer* 80-98

***Protection status:*** Bern Appendix III; WCA Schedule 5 (sale)

*Description and recognition*

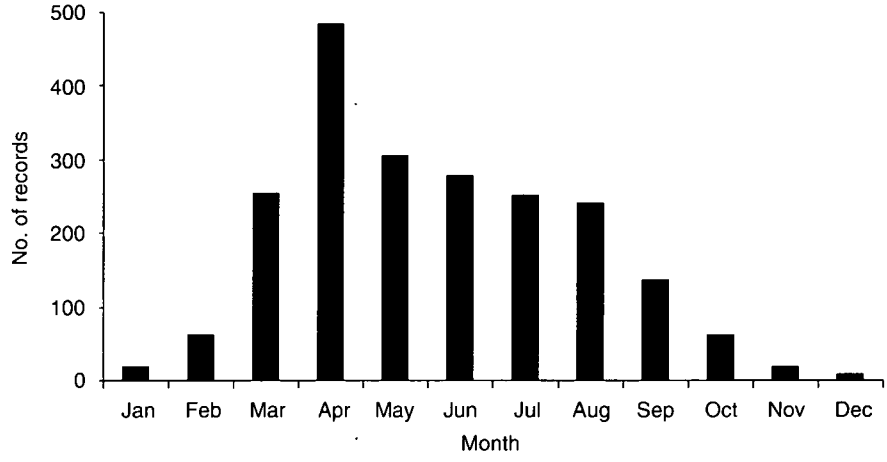
This common amphibian is well known to most people. It is distinguished from the frogs by its warty skin and the presence of bulging (parotoid) glands behind the eye. The natterjack is generally smaller and almost always has a yellow stripe down the middle of its back.

---

Although widespread throughout mainland Britain and probably ubiquitous, it is less frequently recorded than the common frog.

The peak number of records is in April, reflecting the slightly later spawning time of this species compared to the common frog (Cooke 1977).

*Figure 2.* **Total number of records of the common toad for each month**

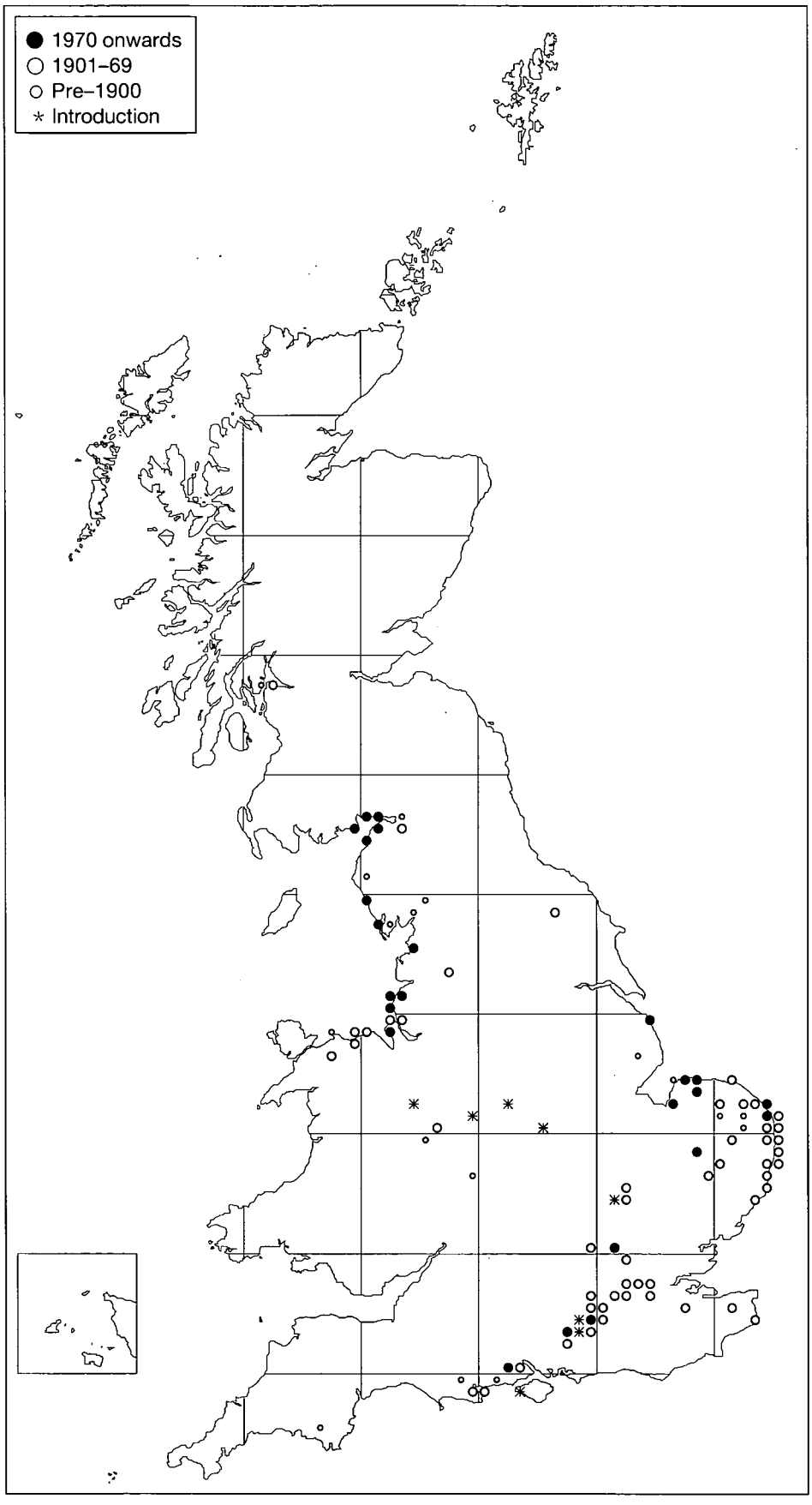



Of the 1721 records where clear habitat information was given, the categories were as follows:

| | | |
|---|---|---|
| Waterbody | 701 | 41% |
| Garden | 364 | 21% |
| Woodland | 145 | 8% |
| On road | 96 | 6% |
| Quarry/pit | 89 | 5% |
| Marsh | 50 | 3% |
| Under tin/stone | 48 | 3% |
| Moor/heath | 46 | 3% |
| Other | 188 | 11% |

The high proportion of toads recorded on roads demonstrates the vulnerability of this species as it migrates to and from its traditional breeding sites. A 'Toads on Roads' project is managed on behalf of the Department of Transport by Herpetofauna Conservation International Limited, and over 400 sites are currently registered with the project, which helps provide warning signs, fencing or tunnels as appropriate (Arnott & Beckett 1993).

# Natterjack



# Natterjack (*Bufo calamita* Laurenti 1768)

*Frazer* 98-105

***Protection status:***
EC Annex IVa;
Bern Appendix II; WCA Schedule 5

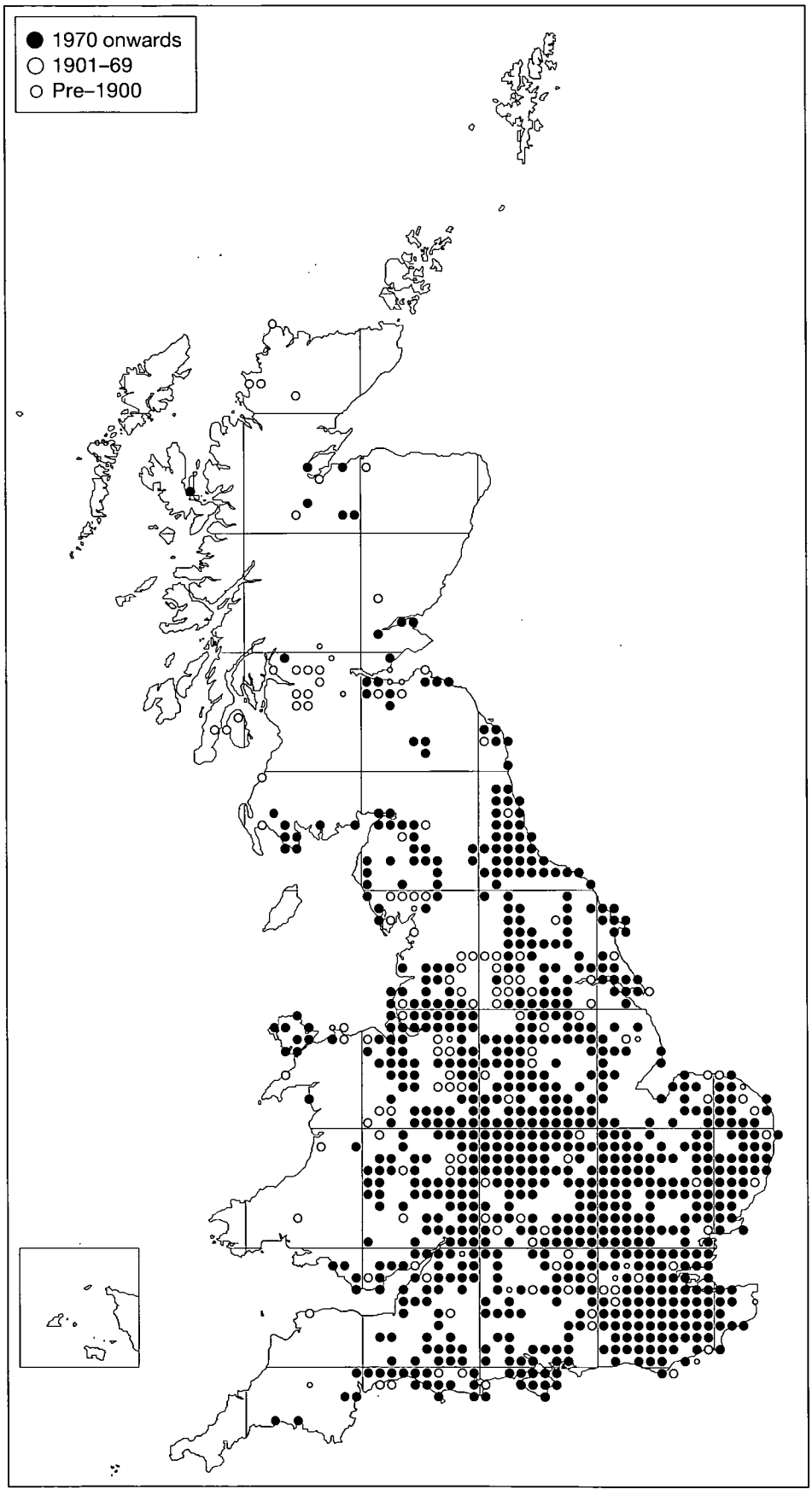
*Description and recognition*
This rare toad is usually smaller than the common toad, and generally has a yellow stripe down its back. It also runs, rather than crawls or hops.

---

In Britain, the natterjack is an animal of sandy areas, and used to be found in many sandy heath and dune sites. It has declined considerably over the past century, mainly due to habitat loss, and now only a few sites remain. The decline has been much more marked on the heathland sites (Beebee 1977). The natterjack usually spawns in shallow water, and this renders it vulnerable to desiccation of its breeding pools. It also spawns later than the common toad and competition may occur with common toad tadpoles, which appear able to prevent development of natterjack tadpoles, as well as predating on natterjack spawn and young tadpoles (Beebee 1977).

There have been some successful reintroductions into former sites.

## Great crested or warty newt



# Great crested or warty newt (*Triturus cristatus* (Laurenti) 1768)

*Frazer* 137-143

***Protection status:*** EC Annex IIa, IVa; Bern Appendix II; WCA Schedule 5

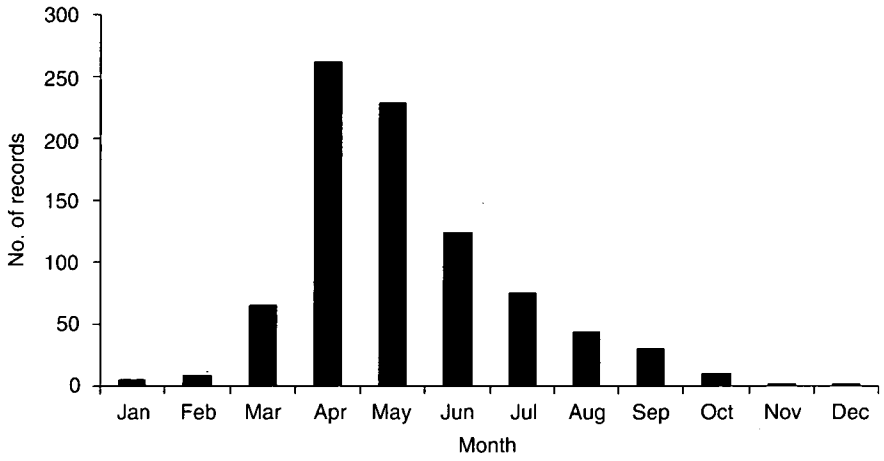
*Description and recognition*

The largest of the three native newts, the great crested newt is distinguishable by size alone (over 10 cm for adults). During the breeding season, the male has a jagged crest along the centre of the back and also along the tail. The tail has a silvery blue stripe along the centre. The female has a yellow stripe on the underside of the tail.

---

This species is still widespread in the south and east but very uncommon in the West Country, Wales and Scotland. It has been the subject of a detailed study and much of the country has been thoroughly surveyed. The peak number of records is in April and there are very few records during the months that the newts are in their terrestrial phase (September–February).

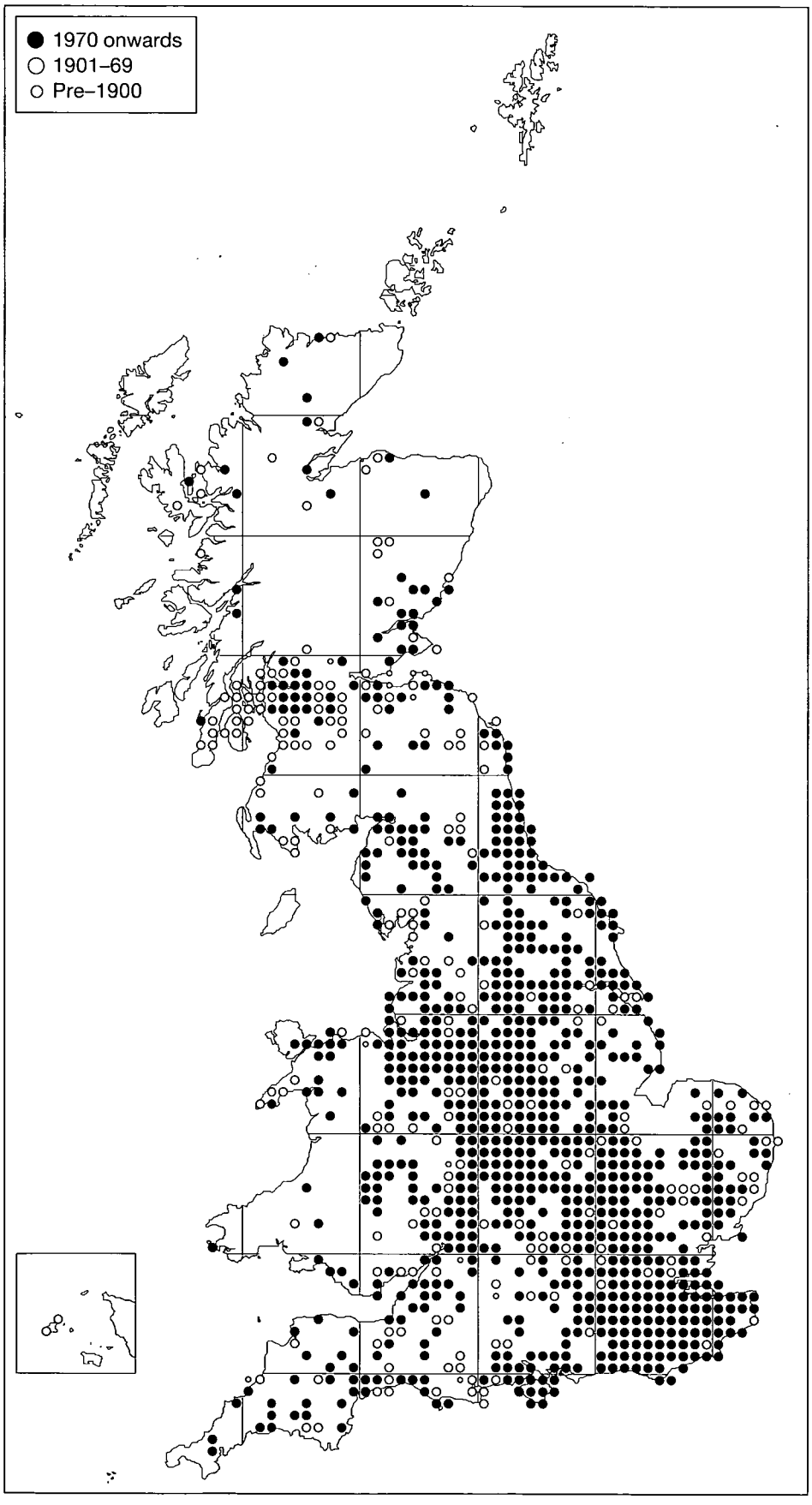
*Figure 3.* **Total number of records of the great crested or warty newt for each month**




Of the 950 records where clear habitat information was given, the categories were as follows:

| | | |
|---|---|---|
| Waterbody | 630 | 66% |
| Garden | 148 | 16% |
| Quarry/pit | 84 | 9% |
| Woodland | 28 | 3% |
| Golf course | 12 | 1% |
| Marsh | 10 | 1% |
| Other | 38 | 4% |

## Common or smooth newt



# Common or smooth newt (*Triturus vulgaris* (Linnaeus) 1758)

*Frazer* 120-132

***Protection status:*** Bern Appendix III; WCA Schedule 5 (sale)

*Description and recognition*

In the breeding season, males of the common newt have a continuous wavy crest running the length of the body and tail, and fringed hind toes. Non-breeding males and females could be confused with palmate newts, but have a larger number of more prominent spots on the underside, especially on the throat. Mean length is about 8 cm.

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This species is widespread and sometimes common throughout most of England and Wales and the southern part of Scotland. The peak of records is in April and May.

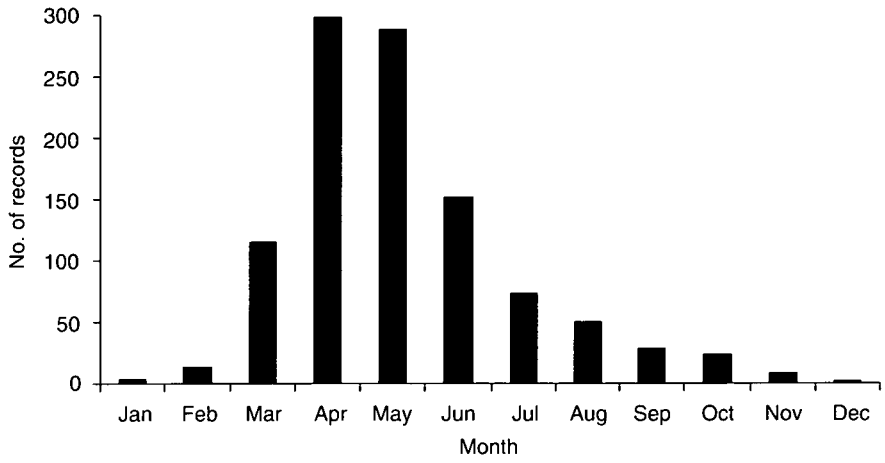
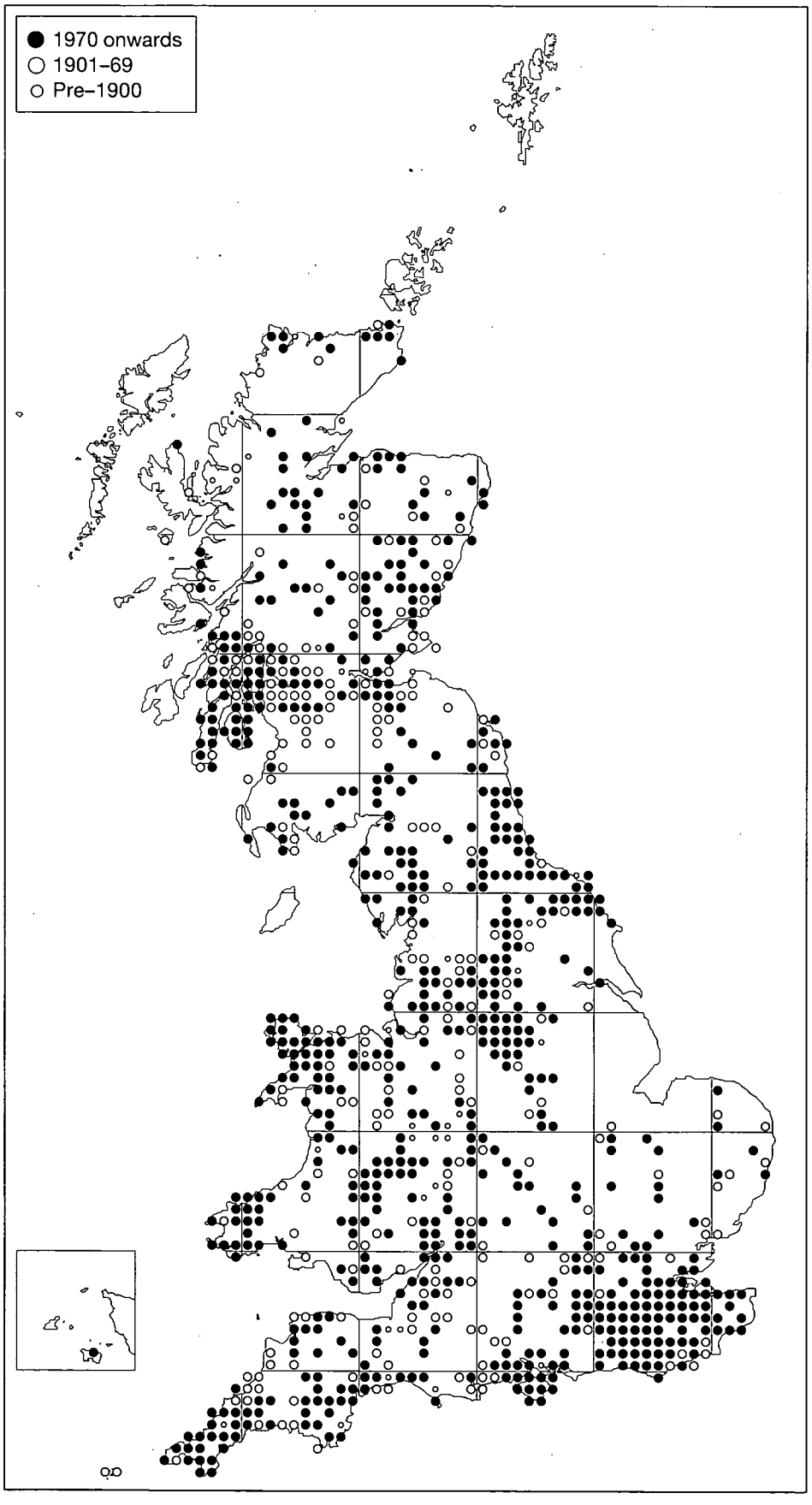



*Figure 4.* **Total number of records of the common or smooth newt for each month**

Of the 1115 records where clear habitat information was given, the categories were as follows:

| | | |
|---|---|---|
| Waterbody | 615 | 55% |
| Garden | 258 | 23% |
| Quarry/pit | 68 | 6% |
| Woodland | 52 | 5% |
| Under tin, etc | 30 | 3% |
| Marsh | 13 | 1% |
| Golf course | 11 | 1% |
| Other | 68 | 6% |

# Palmate newt



# Palmate newt (*Triturus helveticus* (Razoumoski) 1788)

*Frazer* 132-138

***Protection status:*** Bern Appendix III; WCA Schedule 5 (sale)

### *Description and recognition*

Breeding male palmate newts have a low smooth crest, webbed feet and a black tail filament. Non-breeding males and females are generally more lightly spotted than common newts, and the throat is usually pure pinkish white. Mean length is about 7.5 cm.

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The palmate newt is much more frequently recorded in Wales, the west of England and Scotland than the other two species. It is uncommon in eastern and central England. The peak of records is in April.

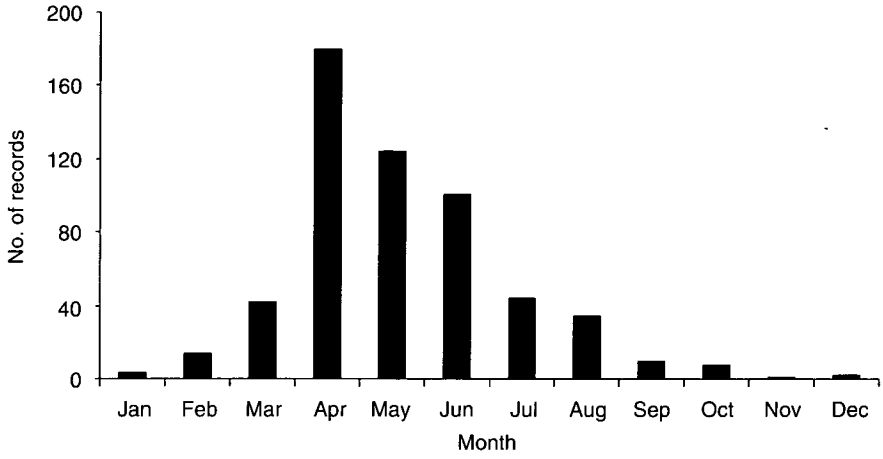
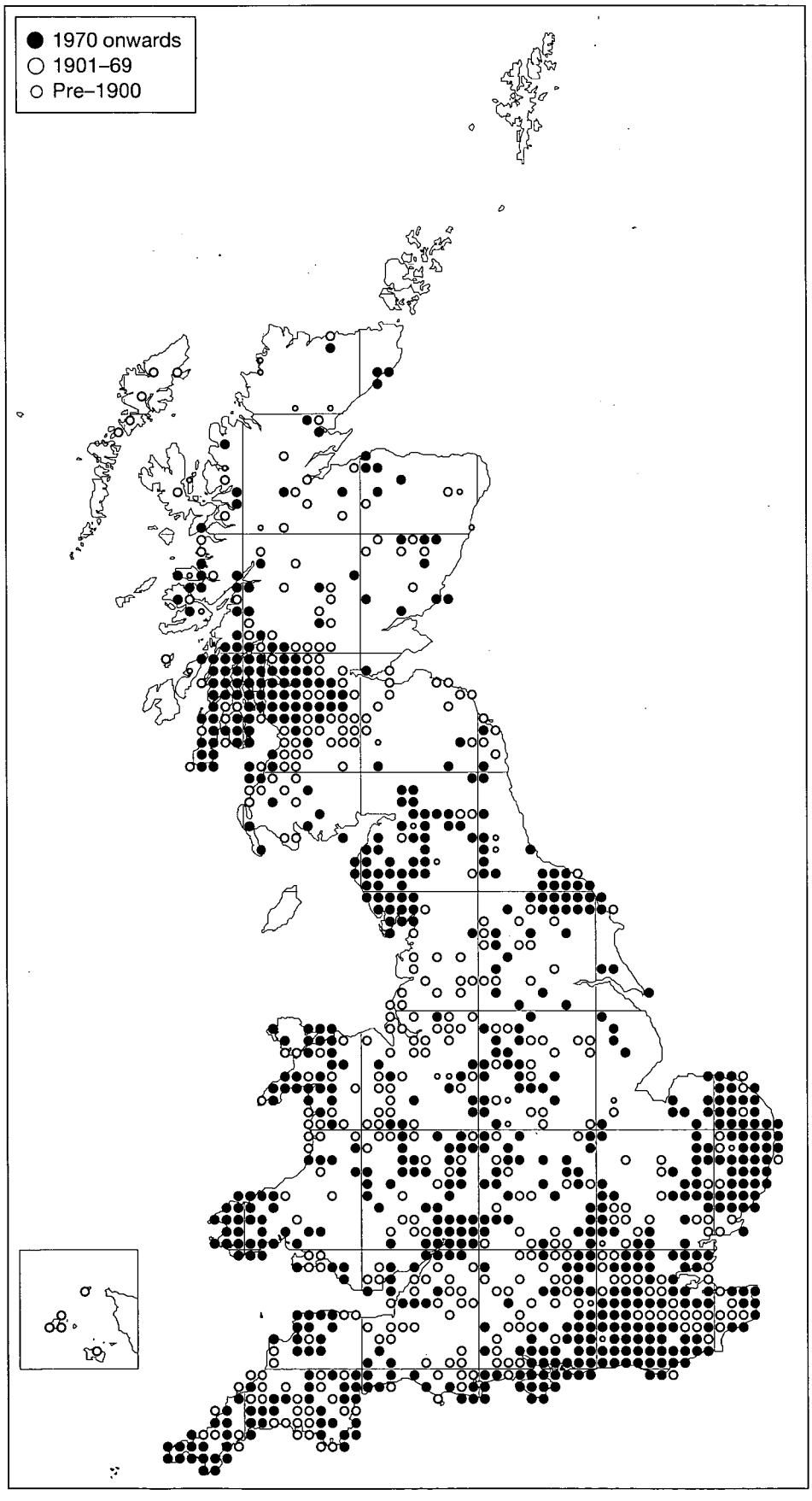



*Figure 5.* **Total number of records of the palmate newt for each month**

Of the 619 records where clear habitat information was given, the categories were as follows:

| | | |
|---|---|---|
| Waterbody | 388 | 63% |
| Garden | 99 | 16% |
| Woodland | 48 | 8% |
| Quarry/pit | 39 | 6% |
| Heath/moor | 18 | 3% |
| Other | 68 | 6% |

# Slow-worm



# Slow-worm (*Anguis fragilis* Linnaeus 1758)

*Frazer* 176-180

***Protection status:*** Bern Appendix III; WCA Schedule 5 (killing, injuring, sale)

### *Description and recognition*

Although superficially snake-like, the slow-worm is a legless lizard. It is distinguishable from snakes by having closable eyelids. It also has very smooth scales which give it a shiny appearance.

---

This species occurs throughout mainland Britain, but is under-recorded in many areas, especially Scotland. The numbers of records peak in May/June and August.

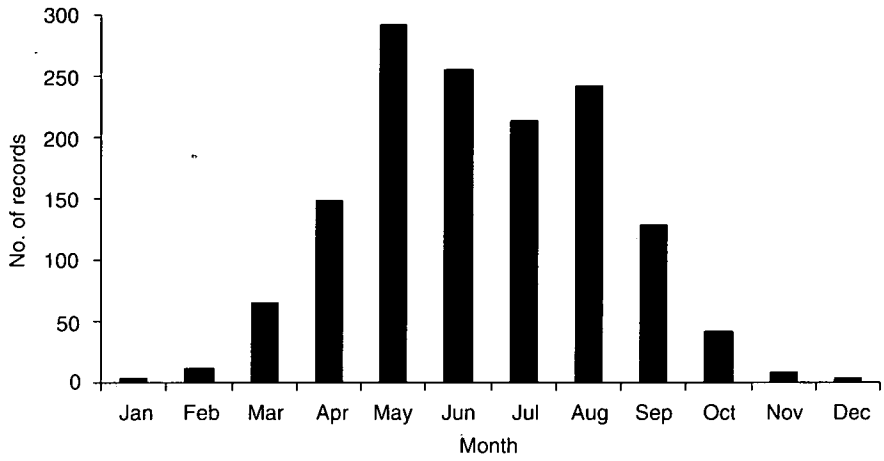
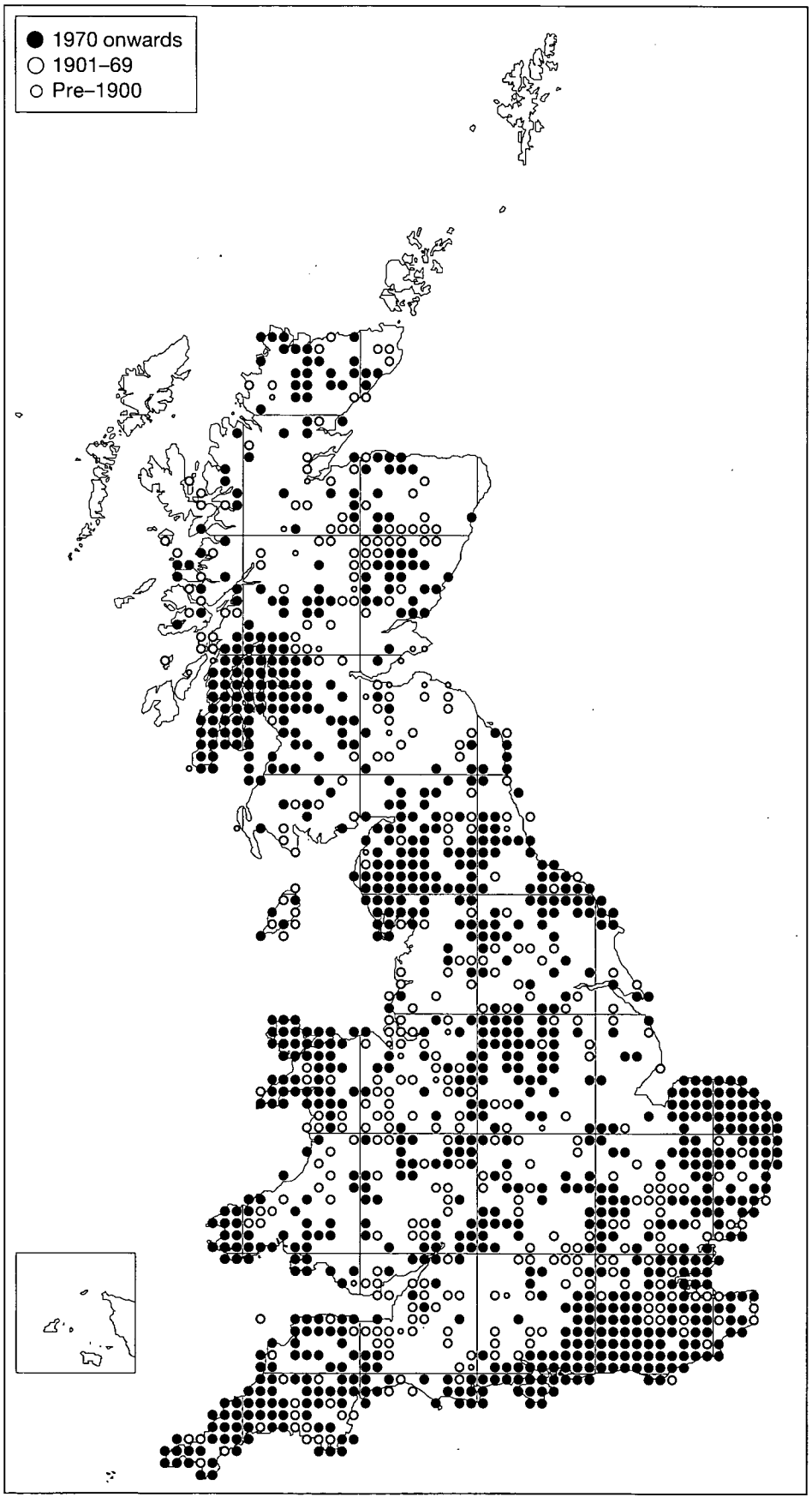



*Figure 6.* **Total number of records of the slow-worm for each month**

Of the 661 records where clear habitat information was given, the categories were as follows:

| | | |
|---|---|---|
| Woodland | 152 | 23% |
| Heath/moor | 107 | 16% |
| Garden | 78 | 12% |
| Bank | 50 | 8% |
| Scrub | 45 | 7% |
| Under tin, etc | 45 | 7% |
| Hedgerow | 20 | 3% |
| Quarry/pit | 19 | 3% |
| Road verge | 15 | 2% |
| Other | 130 | 20% |

# Common lizard



# Common lizard (*Lacerta vivipara* Jacquin 1787)

*Frazer* 170-174

***Protection status:*** Bern Appendix III; WCA Schedule 5 (killing, injuring and sale)

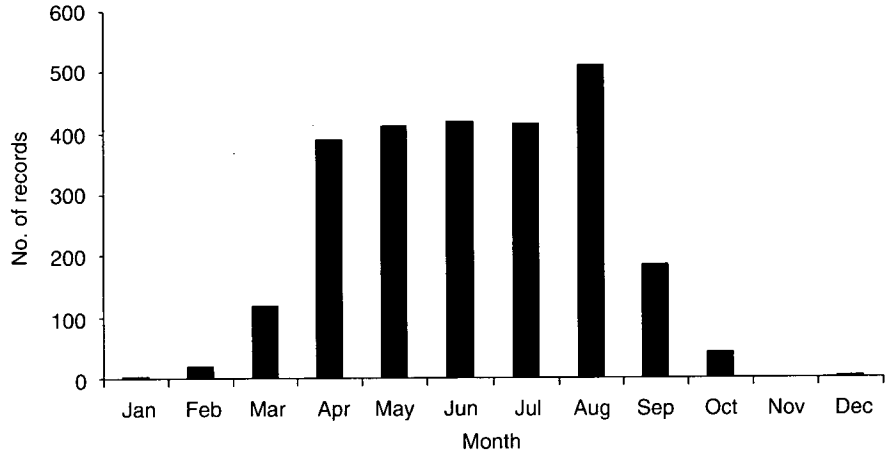
*Description and recognition*

Lizards are occasionally confused with newts, but when fully active move more quickly than the less agile newts. Lizards have scales, whereas newts do not. They also have easily breakable tails – a defence against predation. The common lizard is usually brown or yellowish, with a variable number of light or dark spots. It is smaller (up to 18 cm) than the sand lizard. Common lizards are found in a wide variety of habitats; it should not be assumed that every lizard found in a sandy area is a sand lizard.

---

The common lizard is widespread throughout the British mainland. There is a peak in the number of records in August, perhaps reflecting increased feeding activity prior to hibernation.

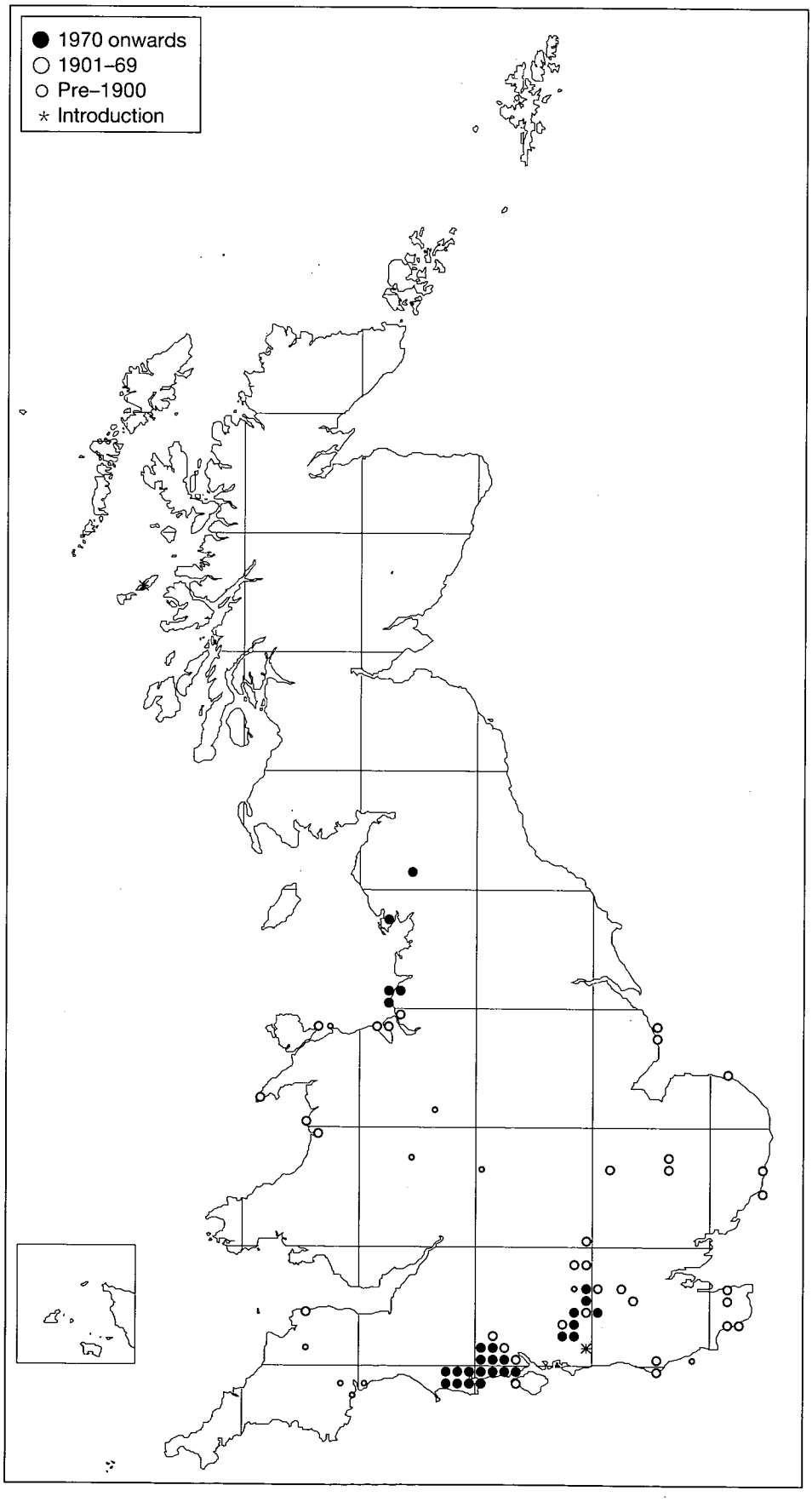
*Figure 7.* **Total number of records of the common lizard for each month**




Of the 1052 records where clear habitat information was given, the categories were as follows:

| | | |
|---|---|---|
| Heath/moor | 407 | 39% |
| Woodland | 162 | 15% |
| Sand dunes/shore | 80 | 8% |
| Scrub | 61 | 6% |
| Garden | 50 | 5% |
| Road verge | 50 | 5% |
| Quarry/pit | 49 | 5% |
| Bank | 46 | 4% |
| Hedgerow | 30 | 3% |
| Stone wall | 26 | 2% |
| Other | 91 | 8% |

# Sand lizard



# Sand lizard (*Lacerta agilis* Linnaeus 1758)

*Frazer* 164-170

***Protection status:*** EC Annex IVa; Bern Appendix II; WCA Schedule 5

*Description and recognition*

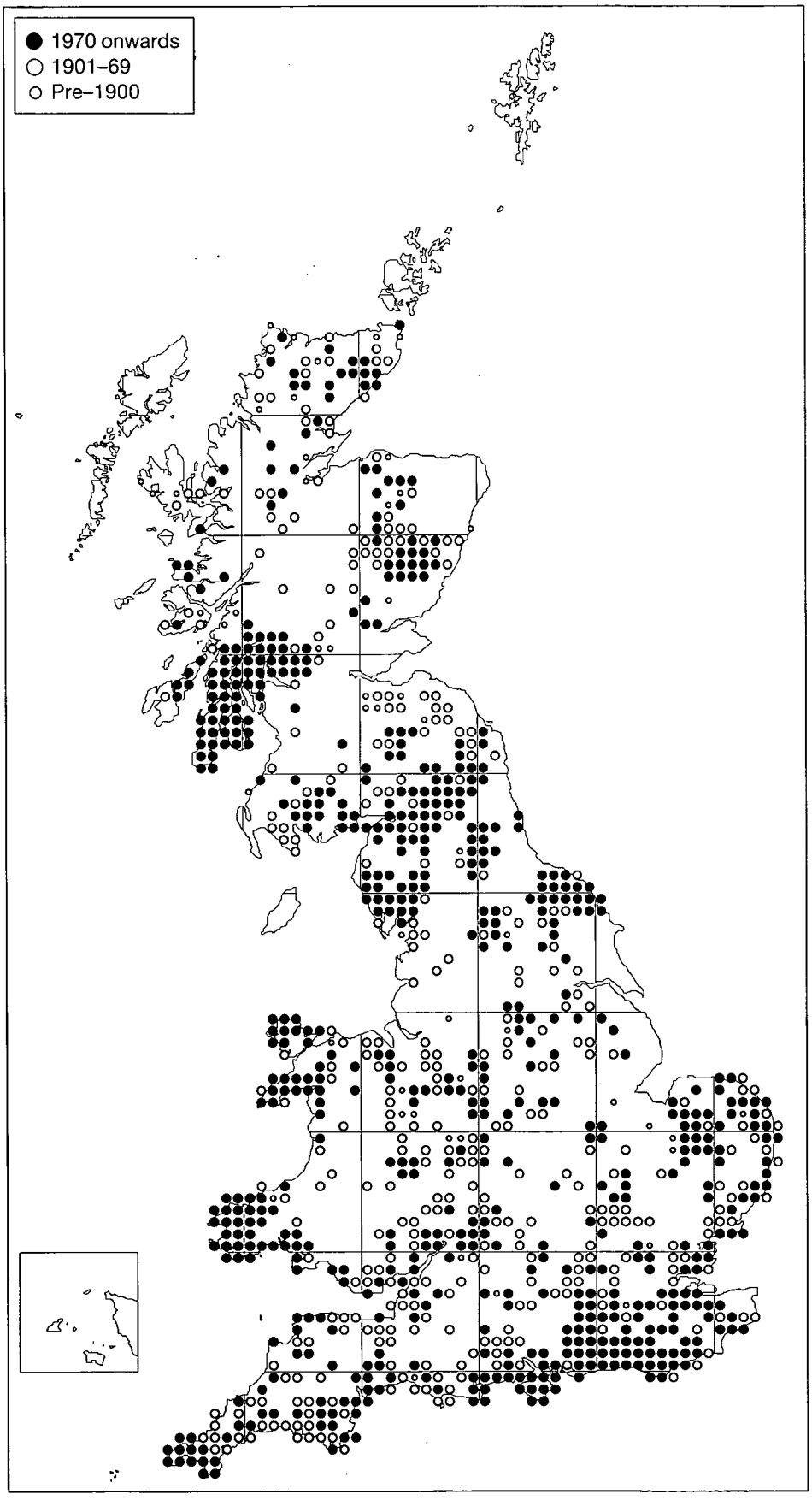
The sand lizard is a larger (up to 20 cm), more robust animal than the common lizard and has a 'heavier' head and usually has a band of narrower scales down the centre of the back. It is found in only a few areas on sand dunes (Lancashire) and sandy heaths (southern England). The males often become flushed with bright green in the spring.

---

This species has become increasingly rare during this century, due mainly to habitat loss (Prestt, Cooke & Corbett 1974). It was once more common and found on several coastal sand dune systems and dry heathland areas. An important requirement of this species is open sand for egg-laying sites; hence it is very vulnerable to the encroachment of a variety of plant species on formerly open areas, in particular birch (*Betula* sp.), gorse (*Ulex europaeus*) and pines (*Pinus* sp.).

Introductions have been made, usually to areas formerly occupied, but in 1970 51 sand lizards were introduced on to the Hebridean island of Coll. Unfortunately it was not possible to monitor this experiment, but some are thought still to be present at the introduction site.

## Adder or viper



# Adder or viper (*Vipera berus* (Linnaeus) 1758)

*Frazer* 184-196

***Protection status:*** Bern Appendix III; WCA Schedule 5 (killing, injuring and sale)

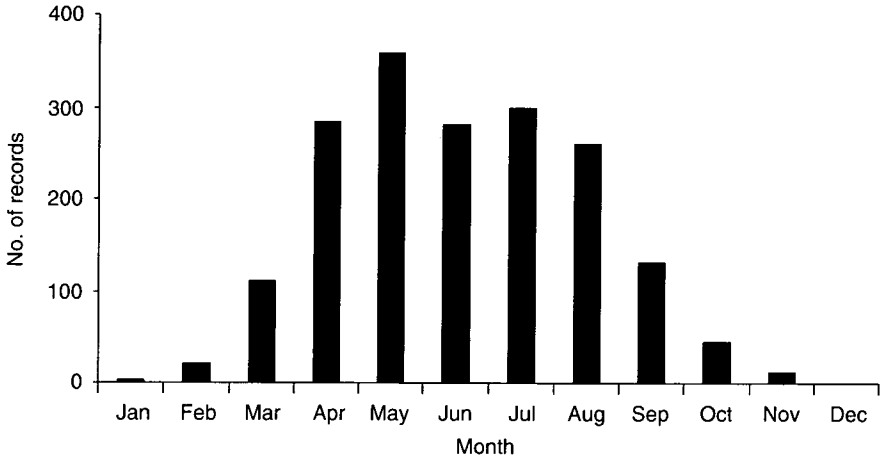
*Description and recognition*

The adder is a thick-bodied snake that usually has a dark zig-zag stripe down its back. Males are often more contrastingly marked, having very dark markings on a greyish or whitish background. Females have dark brown markings on a lighter brown or reddish background. Completely black (melanic) specimens have been recorded. The pupil of the eye is a vertical slit (in bright light).

---

Our most widespread snake, it is still quite common in some areas but is infrequently recorded in central England. There is a peak in the pattern of records in May, with some suggestion of a small one in July. The May peak is probably due to adders being more visible in the spring, when they tend to be lying out in the sun. High visibility in July is probably associated with feeding (Prestt 1971).

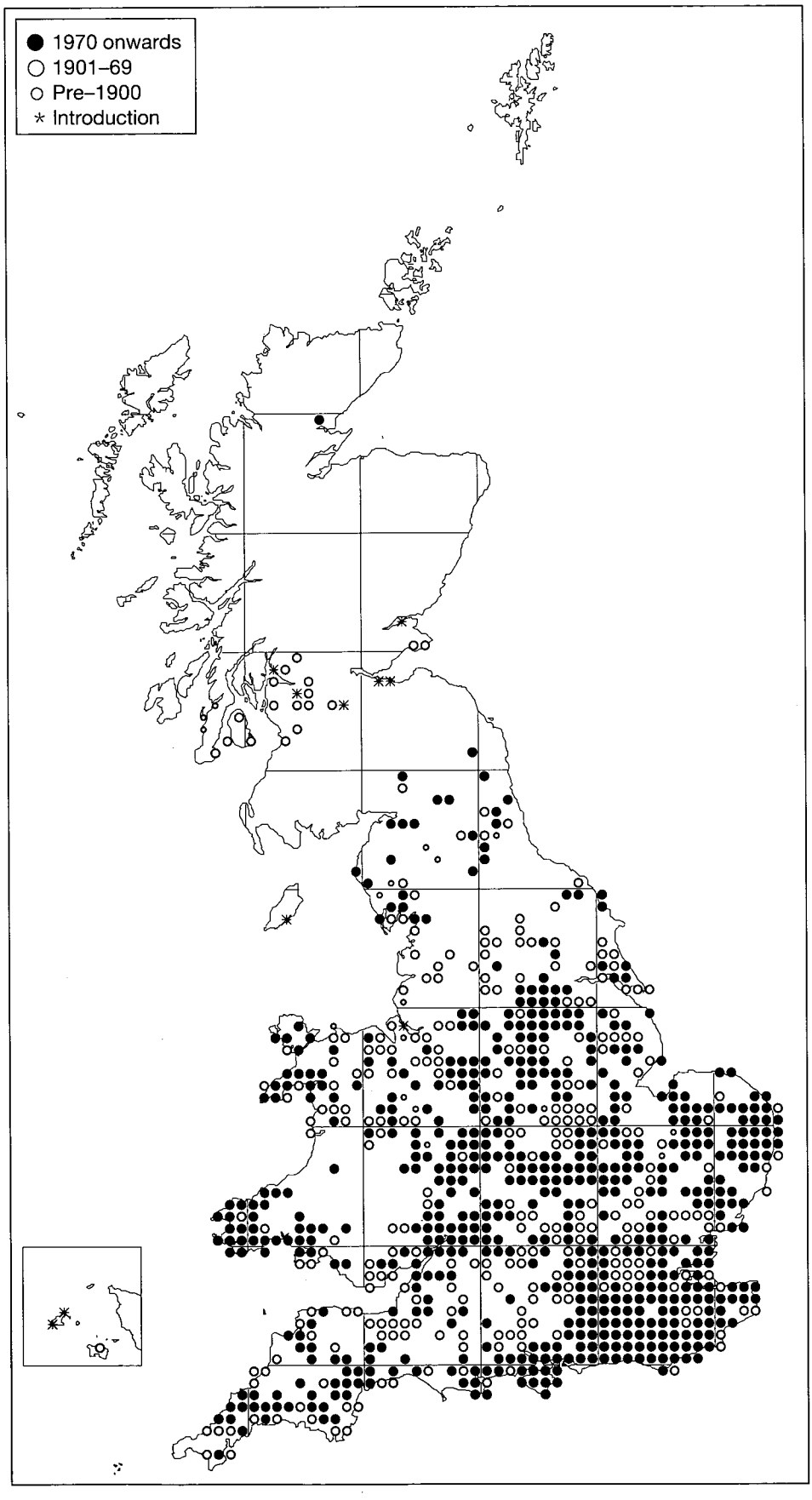
*Figure 8.* **Total number of records of the adder or viper for each month**




Of the 772 records where clear habitat information was given, the categories were as follows:

| | | |
|---|---|---|
| Heath/moor | 311 | 40% |
| Woodland | 232 | 30% |
| Scrub | 39 | 5% |
| Railway bank | 25 | 3% |
| Sand dunes/shore | 24 | 3% |
| Chalk grassland | 20 | 3% |
| Road verge | 17 | 2% |
| Other | 104 | 14% |

# Grass or ringed snake



# Grass or ringed snake (*Natrix natrix* (Linnaeus) 1758)

*Frazer* 196-201

***Protection status:*** Bern Appendix III; WCA Schedule 5 (killing, injuring and sale)

*Description and recognition*

The grass snake is usually olive-grey in colour and almost always has a collar round the neck which varies in colour from off-white to bright orange-yellow. It is longer (up to 120 cm) than the adder which is also darker. A few records of melanic grass snakes are known.

---

Common throughout most of southern England, but much rarer further north, and not extending into Scotland apart from a few, mainly 19th and early 20th century, records which are almost certainly due to introductions, or escapes of captive animals.

The Leicester Polytechnic survey was sent a record for Bonar Bridge in Sutherland Region in 1990, which is based on the sighting of a single animal in a garden. It was present for 24 hours, but has not been observed again. Its origin is not known and no pet animal was reported as having escaped.

The number of records peaks in June.

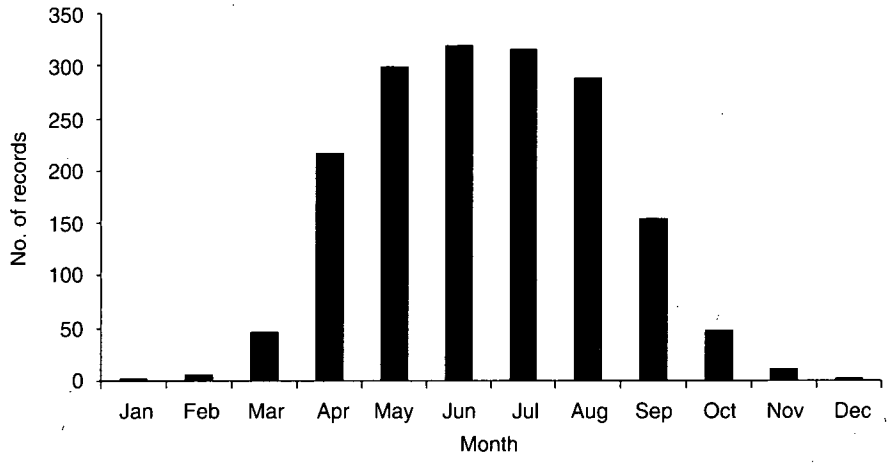
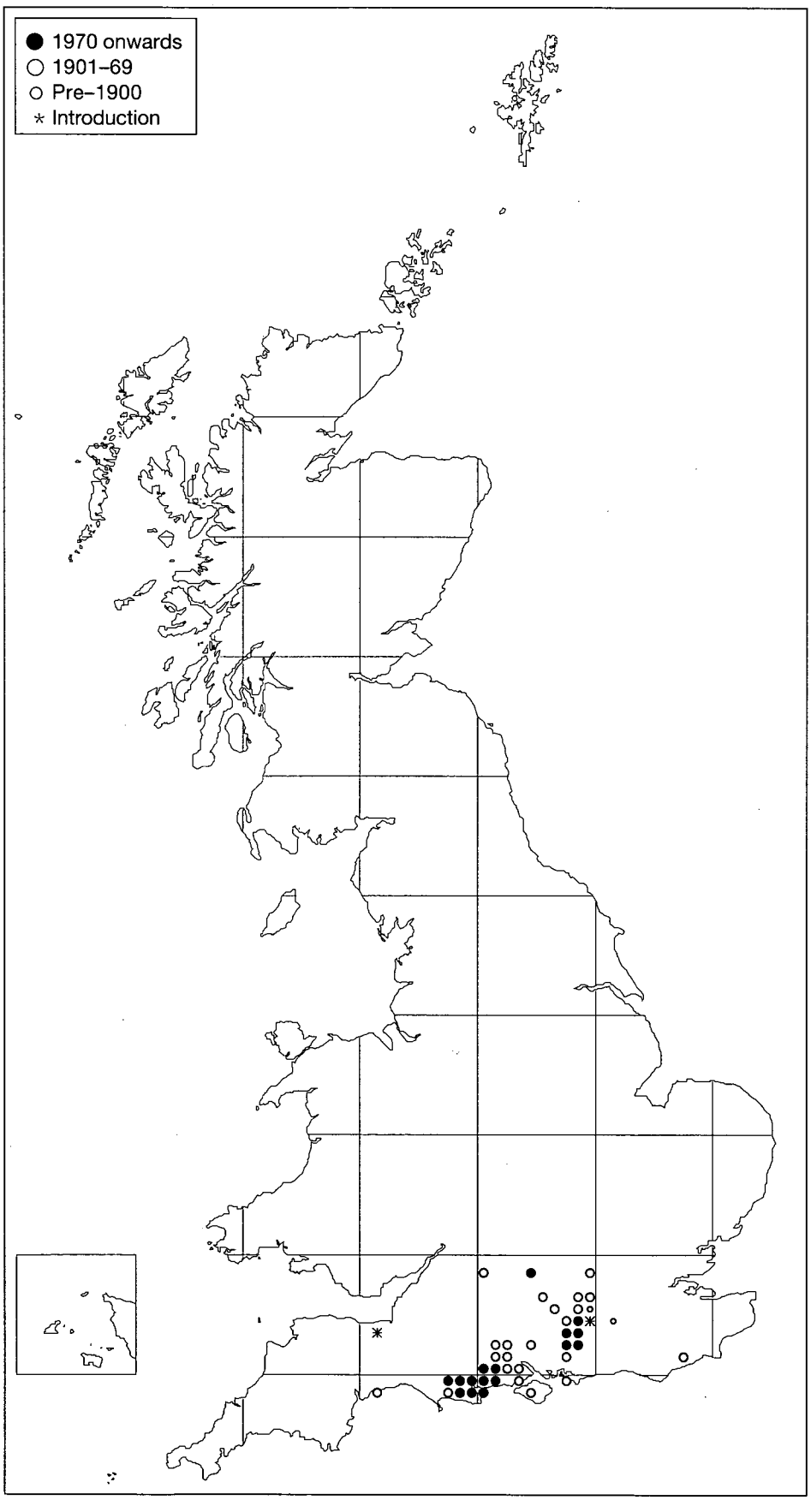



*Figure 9.* **Total number of records of the grass or ringed snake for each month**

Of the 662 records where clear habitat information was given, the categories were as follows:

| | | |
|---|---|---|
| Woodland | 165 | 25% |
| Heath/moor | 78 | 12% |
| Waterbody | 72 | 11% |
| Marsh | 67 | 10% |
| Garden | 49 | 7% |
| Scrub | 36 | 5% |
| Quarry/pit | 33 | 5% |
| On road | 28 | 4% |
| Bank | 22 | 3% |
| Heap | 15 | 2% |

# Smooth snake



# Smooth snake (*Coronella austriaca* Laurenti 1768)

*Frazer* 201-206

***Protection status:***
EC Annex IVa;
Bern Appendix II; WCA Schedule 5

*Description and recognition*
Smooth snakes are usually greyish brown, with two rows of darker markings along the back. They have a dark stripe running through the eye. The pupil of the eye is round.

---

Very rare and almost entirely confined to sandy heaths in the southern counties of Dorset, Hampshire and Surrey, the smooth snake is at the edge of its range in this country. It has declined considerably in numbers this century, due mainly to loss of habitat (Prestt *et al.* 1974).

# INTRODUCED SPECIES

Amphibians and reptiles are popular as pets, and a wide variety of species from all over the world has been imported to Britain, often in large numbers. Many escape, or are released, either because they have become too difficult or time-consuming for the owners to continue caring for them, or in an attempt to 'improve' the British fauna. Tropical species are unlikely to survive very long in the British climate, but European species have a much better chance of establishing viable wild populations. Many species may have established short-lived colonies in garden ponds, but several have either survived for longer periods, or have bred in the wild. The more significant of these are covered below.

### Tree frog (*Hyla arborea* (Linnaeus) 1761)

*Frazer* 106

*Protection status:* WCA Schedule 9

A long-established colony exists in the New Forest, which was apparently introduced about the beginning of the century. Several other introductions have been reported, including on two separate occasions (1840s, 1906) at the same site on the Isle of Wight.

### Alpine newt (*Triturus alpestris* (Laurenti) 1768)

*Frazer* 144

*Protection status:* WCA Schedule 9

One long-established colony exists in Surrey, and another exists (or existed) in Shropshire, established in 1970. In 1986 a colony was found in a garden pond in Brighton.

### Dice snake (*Natrix tessellatus* (Laurenti) 1768)

*Frazer* 206

This is one of many species of snake that are popular as pets and therefore liable to escape or be released. It was imported in large numbers in the 1960s and 1970s, but is rarely brought into this country now. Dice snakes are reported to have bred in the wild in Yorkshire in 1971 (Thompson 1972). Howes (1973) reported that nine specimens had been recorded from Yorkshire.

### Red-eared terrapin (*Trachemys scripta elegans*)

Popular as a pet, this species seems to be released frequently, but probably does not breed in the wild. The release of pets that have become too large, or too onerous for the owners, has reached problem proportions, and Terrapin Rescue Groups have been set up in some parts of the country.

### African clawed toad (*Xenopus laevis* (Daudin) 1803)

*Frazer* 105

Colonies are known to have existed on the Isle of Wight, and in south Wales. Other introductions have been recorded, and because the species is used in laboratory research, other, unreported, escapes may well have occurred.

### Fire-bellied toad (*Bombina bombina* (Linnaeus) 1761)

*Frazer* 106

One colony is known in Surrey but other attempts to establish it have proved unsuccessful.

### Yellow-bellied toad (*Bombina variegata* (Linnaeus) 1768)

*Frazer* 106

Two colonies are known to have survived for several years in Devon in the 1960s and 1970s.

## Wall lizard (*Podarcis muralis* (Laurenti) 1768)

*Frazer* 175

Native to Jersey, where it is uncommon and local, it has been introduced to Britain on several occasions, with varying degrees of success. Some colonies are known to have survived for at least 45 years. There are numerous different subspecies of this species, and the success of any introduction or escape surviving in Britain may depend on the subspecies.

## Green lizard (*Lacerta viridis* (Laurenti) 1768)

*Frazer* 174-175

This species is native to Jersey, where it is common, and to Guernsey, where it is local. It has been introduced to Britain on several occasions, but colonies do not seem to survive for more than a few years, though descendants of the 231 specimens released on the Isle of Wight in 1899 survived until at least 1936.

## Midwife toad (*Alytes obstetricans* (Laurenti) 1768)

*Frazer* 104

A colony has been known from Bedford since about 1898, and from Yorkshire since 1933. The Bedford colony was probably the result of animals being accidentally introduced with pondweed, but the Yorkshire colony was deliberately introduced. Shorter-lived colonies have been known from Nottinghamshire and Devon, and a colony may still survive in Buckinghamshire which seems to be of more recent origin. A colony has recently (1994) been reported in Northamptonshire.

# ACKNOWLEDGMENTS

This *Atlas* would not have been possible without the help of the many people who spent time in the field looking for amphibians and reptiles, and filled in record cards. I am particularly grateful to the county recorders who organised local surveys and encouraged people in their area to participate, and who collated the results of such work.

I am also grateful to my colleagues, past and present, at the Biological Records Centre for their support and assistance. Paul Harding, the head of BRC, deserves special mention, as do Val Burton and Wendy Forrest who undertook most of the data entry.

The maps were prepared using the DMAP mapping software.

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