ENGLISH NATURE

Herptile sites

Volume 1: National amphibian survey

Final report

No. 38 - English Nature Research Reports

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HERPTILE SITES

Volume 1: National Amphibian Survey Final Report

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De Montfort University
under contract to
English Nature

Contract Number F72-15-04, Year 3

1993

English Nature Research Report No. 38

Further Copies of this report can be obtained from
Publicity and Marketing Branch, English Nature
Northminster House, Peterborough. PE1 1UA

ISSN 0967-876X

ABSTRACT

This report documents the findings of the 1989-92 Herptile Sites project with respect to the Amphibia. Data from two previous contracts (HF3-05-123 and HF3-03-332) have been incorporated. During the project the amphibian recorder network was expanded by 20% and a computerised mailing list of over 1,000 contacts was compiled. By the end of the contract the amphibian site database contained 11,059 water-body records, of which 49% included detailed site descriptions.

A wide range of water-body types was surveyed: over 50% were considered to have a use and 35% were perceived to be threatened by harmful activities. Threats and uses associated with each water-body category were identified. Systematic surveys revealed pond densities of 0.04-30.0 ponds km^{-2}, with a median for mainland Britain of 1.4 ponds km^{-2}. Eleven percent of sites were reported to be at a stage of advanced succession and 17% were reported to desiccate regularly.

The distributions and status of the five species at national, county and local levels are reported. Frogs occurred in a high proportion of 10 km squares nationally and in most counties, but were present in less than half (47%) of systematically-surveyed ponds. Toads were almost as widespread nationally; they occurred within fewer localities within counties and were found in 23% of ponds. Apart from a few small areas of overlap, the ranges of the smooth newt and palmate newt were almost mutually exclusive. Smooth and palmate newts were ubiquitous in fewer than half of the counties in which they occurred and, where present, they were found in 27% and 17% of water-bodies, respectively. The crested newt exhibited a lowland and eastern distribution, was found to be ubiquitous in approximately one third of the counties within its range, and was recorded in only two percent of ponds surveyed systematically.

Aquatic and terrestrial habitat characteristics associated with the presence of each species were identified from analyses of the pond descriptions. Terrestrial habitat diversity appeared to be important for all species. Crested newts occupied a narrower range of types of pond and terrestrial landscape then the other four species. Landscapes that were predominantly arable were particularly inimical to frogs and crested newts. Multivariate analyses indicated that the relative importance of terrestrial habitat features (as opposed to aquatic features) as correlates of species presence was greater in landscapes with low structural diversity (such as arable or improved grassland) than that in landscapes of higher diversity, such as those dominated by woodland or rough grassland.

A list of 184 candidate sites for SSSI designation was compiled on the basis of crested newt counts and species assemblage. The sites with the best species assemblages within each country agency region were also listed. Herpetofauna Recorders' Meetings were held in 1990, 1991 and 1992. Country agencies were supported throughout the contract, and data were transferred to the Biological Records Centre at Monks Wood.

The organisation, methodology and criteria for selecting sites for a long term monitoring scheme are described.

Implications of the results for the implementation of a conservation strategy for the widespread amphibians are discussed.

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INTRODUCTION

Background

Since 1983, De Montfort University, formerly Leicester Polytechnic, has been commissioned by NCC to undertake herpetological research and survey. The current project, "Herptile Sites" is the third three year contract, following on from "The Status and Ecology of the Warty Newt", RA2 (1983-6) and "Amphibian Communities", RA 201 (1986-9).

The objective of the first contract was to establish the status of *Triturus cristatus* in Britain following its inclusion in Appendix II of the Berne Convention and subsequent attainment of totally protected status under the Wildlife and Countryside Act 1981. The scope of the Amphibian Communities project was wider, including *Rana temporaria*, *Bufo bufo*, *Triturus vulgaris* and *Triturus helveticus* within its survey remit. The distributions and status of all five species were assessed, and candidate sites for SSSI notification identified on the basis of high crested newt counts or exceptional species assemblages. The framework for a national long-term monitoring scheme based on geographical zones, individual water-body characteristics and amphibian populations was also developed.

Project aims

The Herptile Sites project incorporated six main aims:

1) The conservation strategy for the commoner species adopted by the country agencies was to notify the best amphibian sites as SSSIs and to encourage NGOs to conserve other good sites. One of the aims of the current project therefore was to expand the dossiers of candidate crested newt and amphibian community SSSIs in order to maximise the number of appropriate sites ultimately notified.

2) The second, related aim was to develop the recorder network, and included hosting an annual recorders' conference which it was hoped would promote interest in the British herpetofauna.

3) The long-term monitoring programme, the framework for which was developed during the previous contract, was to be implemented.

4) The habitat requirements of the species were to be investigated and management guidelines produced.

5) The National Survey was to provide advice and data to the country agencies and the Biological Records Centre at Monks Wood, on demand.

6) A survey of the common reptile species was to be initiated.

Objectives

In order to achieve the six aims, a series of specific objectives were pursued:

1) To provide the country agencies with amphibian site dossiers which included all records on the amphibian databases.

2) To provide assessments of the status of the species at national and local levels, and to list the best sites within each region.

3) To expand the recorder network in order to achieve aims 1) and 6), and to increase the efficiency of the system by developing a computerised mailing list.

4) To organise the annual "Herpetofauna Recorders' Meeting".

5) To select a series of sites for inclusion in the long-term monitoring scheme on the basis of their national geographical

zone, immediate surrounding land-use, successional stage, amphibian populations and recorder commitment. All SSSIs and candidate sites were to be incorporated.

6) To produce a comprehensive, standardised amphibian recording methodology, principally for use by recorders participating in the long-term monitoring scheme.

7) To produce guidelines for the management of amphibian habitats, aquatic and terrestrial, by analysis of the national survey site descriptions.

8) To provide data to the Biological Records Centre (BRC) for the production of the new herpetological atlas of the British Isles.

9) To support the country agencies by providing amphibian site information and ecological advice on demand.

10) To approach BRC for information on known reptile distributions and recorder contacts at the start of the National Common Reptile Survey.

11) To develop a recording strategy for the common reptile species to produce information compatible with data systems operating at BRC.

12) To initiate the data collection phase of the reptile survey.

CHAPTER 1

THE RECORDER NETWORK

1.1 Introduction

In the nine years during which the NCC national amphibian surveys have been based at Leicester Polytechnic, a network of volunteer recorders has been developed. The survey period spans three Nature Conservancy Council contracts :- The status and ecology of the warty newt, *Triturus cristatus* (1983-6); Amphibian communities (1986-9); and Herptile sites (1989-92). In this chapter information from all three contracts is combined. The distribution of recorders and their productivity is reported, and publicity and information circulation with respect to the requirements of the survey discussed. A herpetological mailing list has also been compiled containing contact addresses of recorders, conservation organisations and other interested parties.

1.2 Publicity

Recorders have been drawn to the survey by a variety of publicity outlets, described in detail along with the response they elicited in Oldham and Nicholson (1986) and Swan and Oldham (1989). The Herptile Sites contract required additional publicity for the launch of the Common Reptile Survey. Reptile survey publicity is described in Volume 2.

Information leaflets circulated in 1989 appealed for reptile survey participants, and invited contributions to the forthcoming Herpetofauna Recorders' Meeting. A summary of the results of the 1986-9 project with news of the future of the amphibian survey was also included. (Appendices 4 and 5). Subsequently, publicity notes concerned with the reptile survey and the continuing amphibian survey appeared in journals and newsletters of organisations on the mailing list, eg those of RSNC, Farming and Wildlife Advisory Groups (FWAG),

Forestry Commission, Biological Recording in Scotland (BRISC) etc. The 1989 report also generated publicity in the form of national and local newspaper articles (eg The Times, Daily Telegraph and Leicester Mercury), which attracted further survey inquiries from potential recorders.

The Herptile Sites project particularly targeted RSNC with the aim of adding their recent site lists to the national database, firstly by leafleting their Conservation Officers' conference in 1989. In 1991, Tony Gent of English Nature circulated the County Trusts with an appeal for information. The survey offered to pay for administrative and labour costs involved in collating the data.

Interest has also been rekindled each year by the annual Herpetofauna Recorders' Meeting and its pre-publicity which has included information on new survey initiatives.

Right up to the end of the current contract (March 31st, 1992), daily incoming correspondence continued to include new inquiries.

1.3 Numbers and distribution of recorders

The total number of recorders who have contributed data to the surveys since 1983 now stands at 874, 241 of whom contributed to both the crested newt and the widespread amphibian surveys. (Table 1.1).

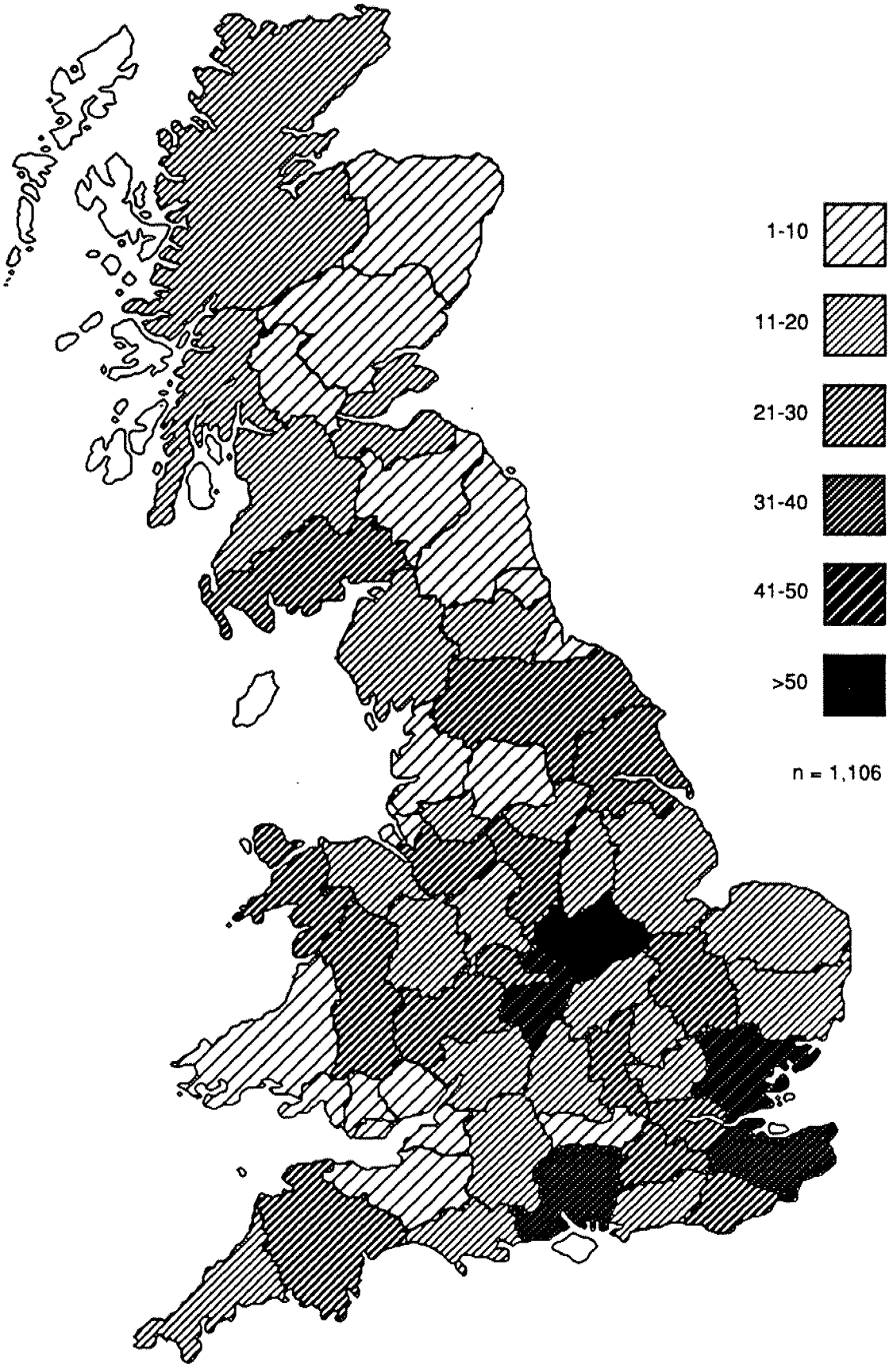
The distribution of recorders by county is illustrated in Fig 1.1. The sum of the county totals exceeds 1,000 since some recorders surveyed in more than one county. Every county contains at least one surveyor, most (69%) having between 11 and 50. Only one, Leicestershire, has over 50, due probably to regular local publicity. Nevertheless, 18 counties contain 10 or fewer surveyors. These latter border the Bristol Channel, and comprise parts of north east England and north east and central Scotland. In the more northern counties, small numbers

Table 1.1

Numbers of recorders contributing to the crested newt and the widespread amphibian surveys

	crested newt survey (1983-6)	amphibian survey (1986-92)	contributors to both
number of recorders	385	730	241

Fig 1.1
Number of contributors to the English Nature / De Montfort University national amphibian surveys between 1983 and 1992, by county.



of participants may be attributable to low human population densities, but in South Wales and south west England, insufficient or inappropriate publicity may be the cause. Swan and Oldham (1989) suggest that locally orientated publicity elicits more response than national outlets in some areas, Wales amongst them.

1.4 Distribution of amphibian records

Recorders provided two kinds of information: "simple" data, recording site location, species present and year of survey only, (Appendix 6); or they filled in descriptive "pond questionnaires", providing habitat details, (Appendix 7). The number of records received between 1983 and 1992 totalled 11,059 of which 5,369 were "pond questionnaires", (Table 1.2). The distribution of records by county is illustrated in Fig 1.2. The full site dossiers listing location and species occurrence are contained in separate Appendices - 1, (All species, non-garden sites); 2, (All species, garden sites only); and 3, (Crested newt site list).

Britain now has a more even distribution of records than that illustrated in Swan and Oldham (1989), but areas of shortfall persist. Data on amphibian occurrence are now available for over 50 water-bodies in 53 of the counties on mainland Britain (85%), and totals of less than 10 water-bodies pertain in only four.

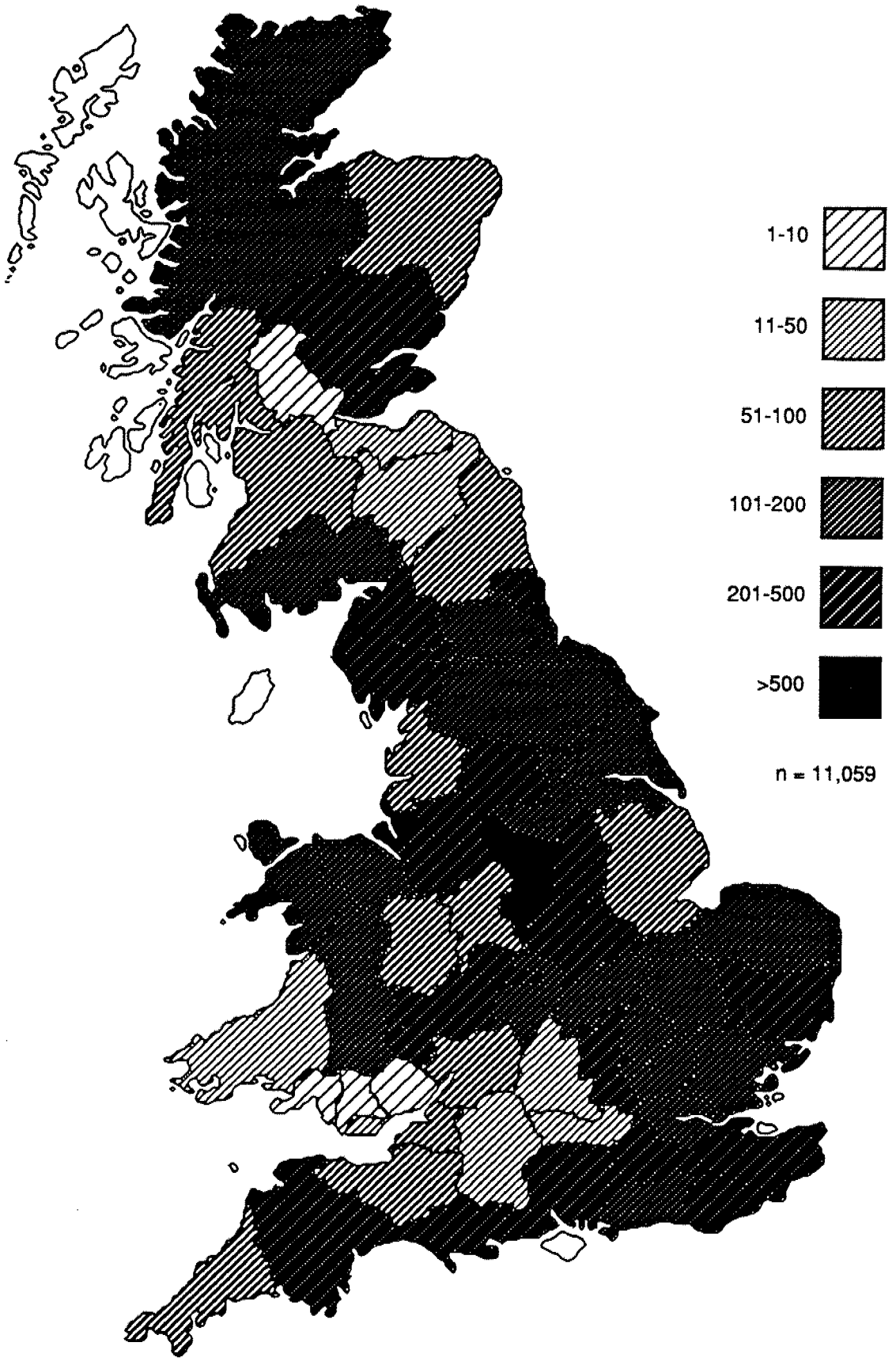
However, although the database continues to expand (the number of records has increased by 35% since the end of the Amphibian Communities contract in 1989) it must be regarded as a sample, rather than a catalogue of the nation's small water-bodies. The site list amounts to less than three percent of the lowest of two estimated national water-body totals (390,000) - see Chapter 4.

Table 1.2

Breakdown of records by survey and type of recording form. The pond questionnaires contained detailed information on pond characteristics while the simple records contained only locational information.

Record type	SURVEY: Great crested newt 1983-86	Amphibian communities 1987-92	Total
pond questionnaire	702	4,667	5,369
simple record	1,012	4,678	5,690
TOTALS	**1,714**	**9,345**	**11,059**

Fig 1.2
Total number of amphibianrecords received, by each county, 1983-1992.



1.5 Garden ponds

Garden ponds, listed in Appendix 2, comprise 13% (1,487 records) of the total number of returns; their national distribution as a percentage of county totals is illustrated in Fig 1.3. Very broadly, their percentage contributions tend to reflect human population densities, occurring more frequently in the south east and Midlands of England than in western and northern Britain and East Anglia. Some notable exceptions are West and South Yorkshire and Derbyshire where the county NCC, BRC, and urban wildlife project respectively organised their own recording campaigns based on the national survey, which drew larger than average responses from urban areas.

However, considering the non-systematic nature of most garden surveys, there are no clear indications of the densities and abundance of garden ponds relative to those of rural water-bodies. Thus, although such garden features are undoubtedly popular in Britain, there are no grounds for assuming that they contribute significantly to the conservation of amphibians nationally. Furthermore, there is no guarantee that their popularity will continue.

1.6 Recorder productivity

Most (72%) of the 874 recorders contributed less than six records to the survey (Fig 1.4), two being the median number per recorder nationally. The median number of one return per recorder applied to 50% of counties, (Fig 1.5) but high individual recorder productivity is not entirely reflected in the total number of returns for each county. Comparing Fig 1.5 with Fig 1.2 shows for example that the high level of returns from south east England was due to many recorders contributing one or two records each, whereas the generally lower total county returns for Scotland were provided by fewer, but individually more productive, surveyors. Three percent of

Fig 1.3
Percentage of records received for each county relating to garden ponds, 1983-1992.

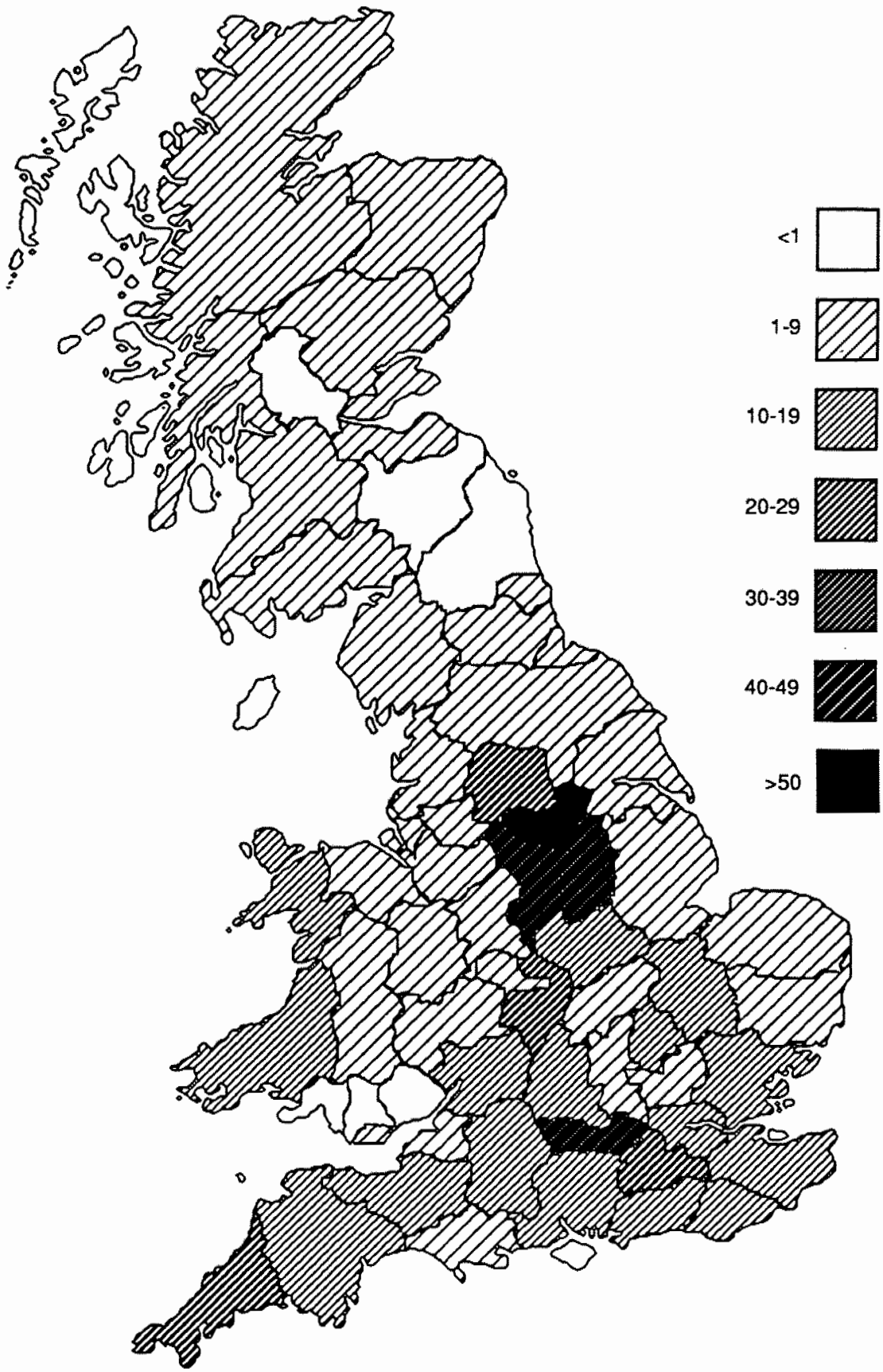


Fig 1.4
Number of records submitted per recorder.

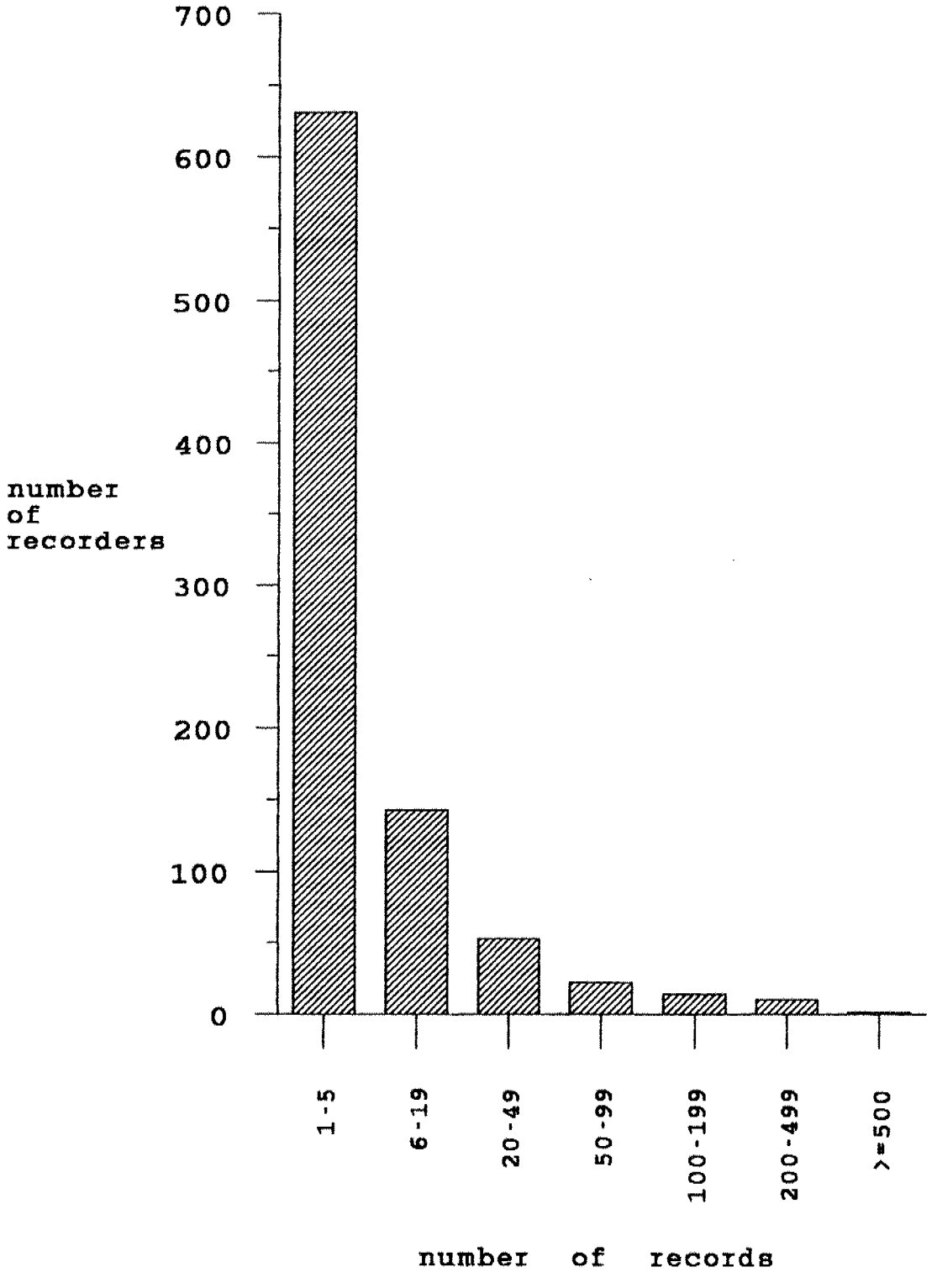
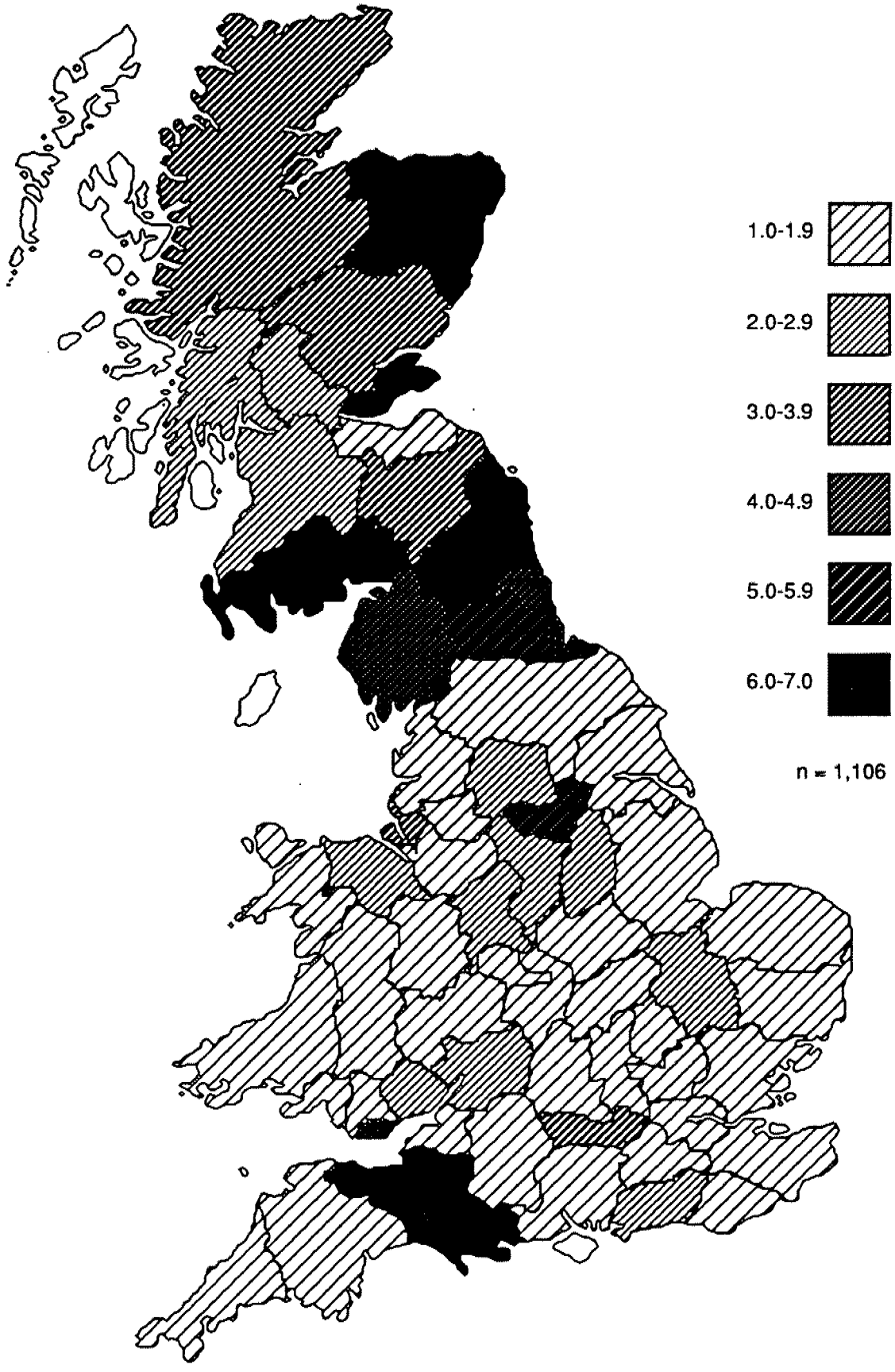


Fig 1.5
Median number of records contributed per recorder , by county, 1983-1992.



recorders sent 100 or more records, the maximum being 511, from Merseyside.

Forty percent of all records were sent in by organisations, where data from one source were, in effect, the collated efforts of many individuals. This group of participants includes biological records centres, county and urban wildlife trusts, some NCC offices and the Forestry Commission. Fig 1.6 shows that their contribution comprises a substantial proportion of the returns for many of the 62 counties; over 50% of records in 22 (35%) and over 30% in 31 (50%) of them. Thus, local recording coordination has proved important in the accumulation of the data here presented. However, with the exception of the Forestry Commission and those county trusts and NCC offices which mounted their own survey schemes using our recording forms, most (93%) of the data from these organisations have been in the form of "simple" records, lacking habitat descriptions. Therefore, the choice of project publicity sources can be partially determined by survey objectives. Our objective was to collect as large a sample as possible of both simple and descriptive data therefore the project enjoyed wide publicity. As organisations tended to provide mainly "simple" data, restricting publicity to these bodies alone would have resulted in a data set inadequate to fulfil all of the survey's objectives.

Of the 5,369 pond descriptive questionnaires returned since 1983 (49% of all records), 702 were received during the 1983-6 crested newt survey and 4,667 between 1987 and 1992 (Table 1.2). Fig 1.7 indicates a relatively even distribution of descriptive information between counties. South Wales, (especially W Glamorgan) and Central Region in Scotland remain under-surveyed. The county returning the maximum number of habitat descriptions was Merseyside with 528, but the median county value nationally was 56. Over 100 pond questionnaires are available for each of 15 counties.

Fig 1.6
Percentage of records contributed by biological record centres,natural history, conservation and other countryside organisations, by county, 1983-1992

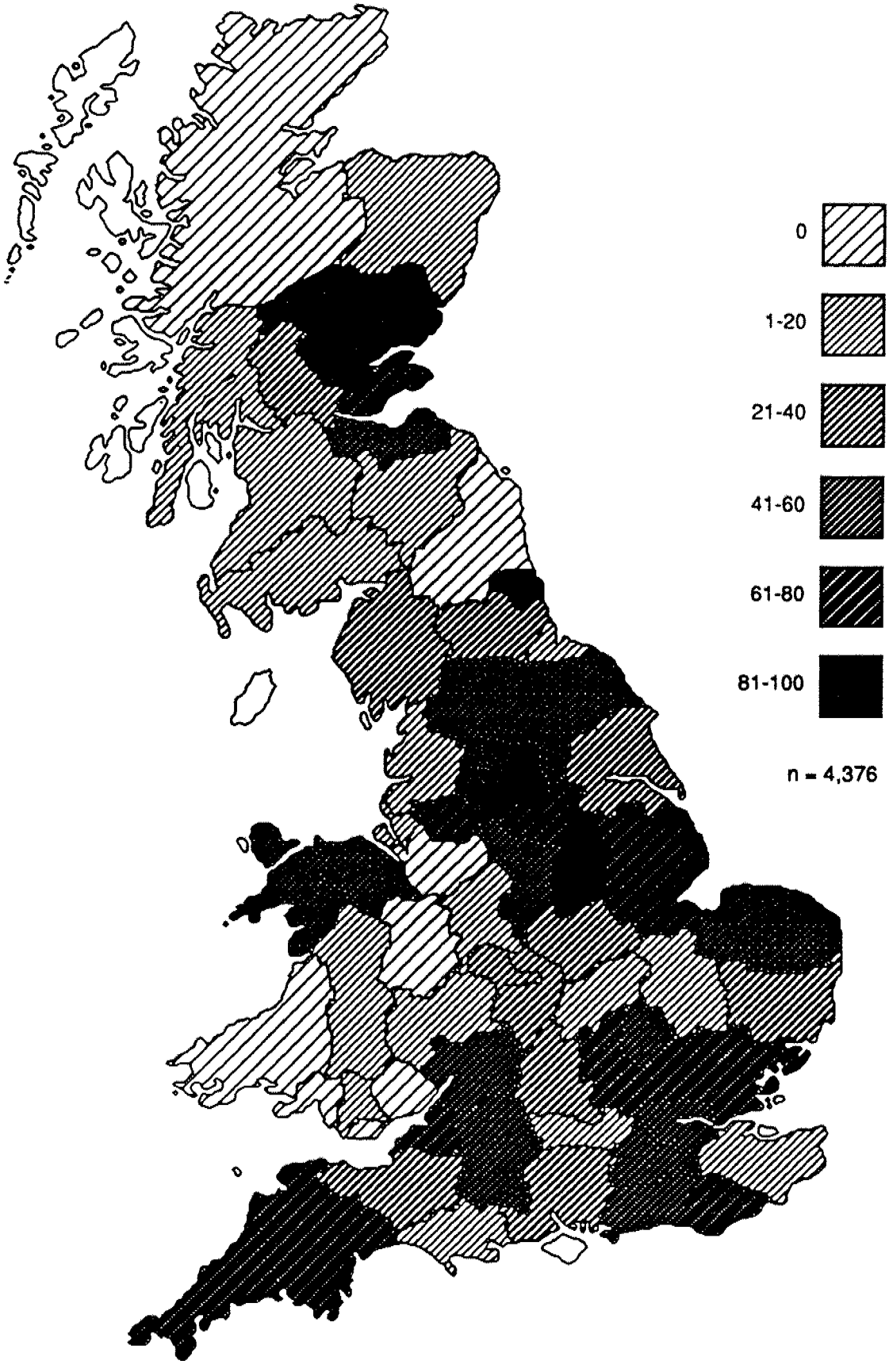
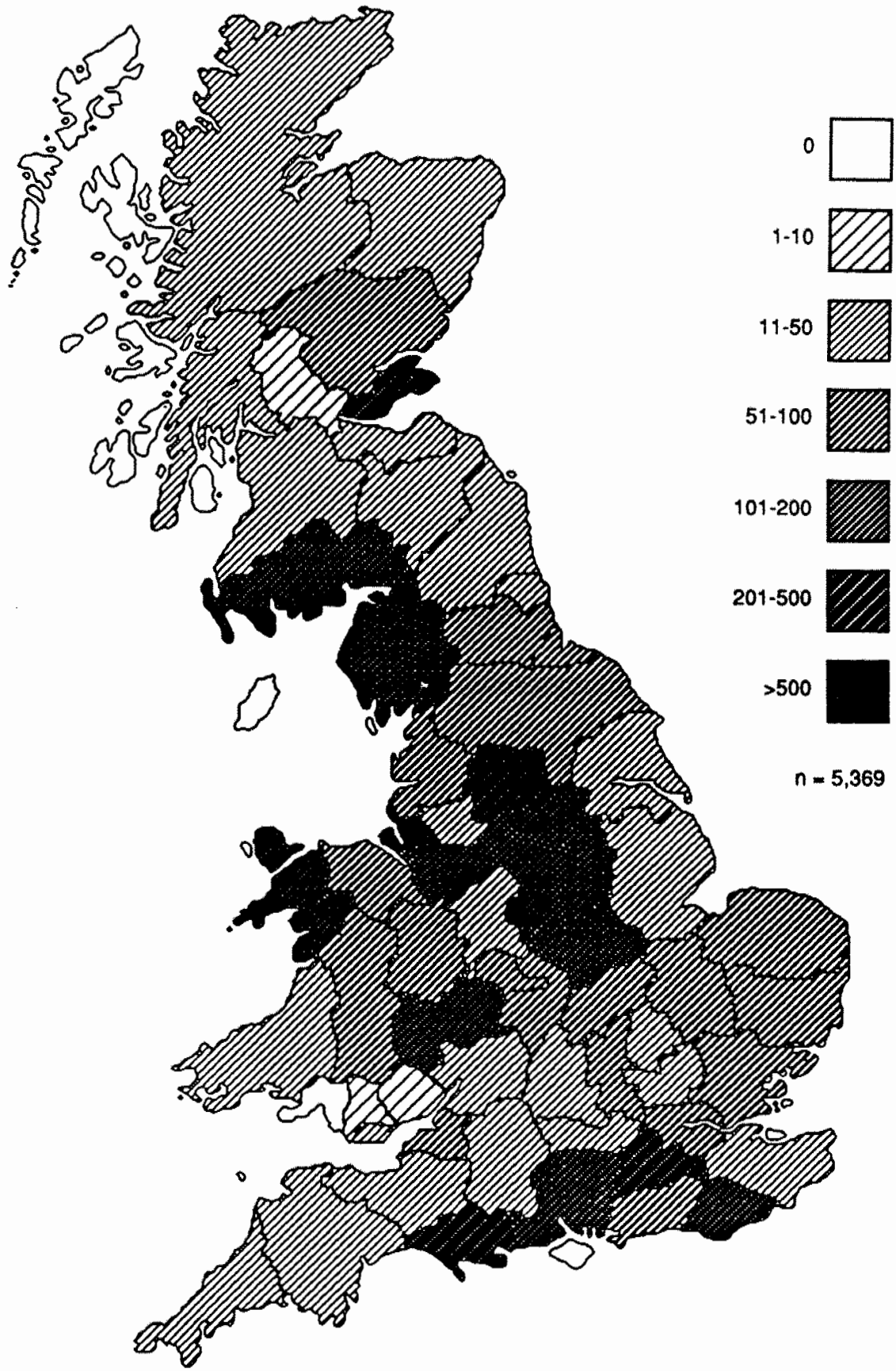


Fig 1.7
Number of descriptive pond questionnaires received for each county, 1983-1992.



1.7 Regular or repeated recording

One quarter of recorders have contributed to the survey for several consecutive years, either surveying individual ponds repeatedly or tackling new ones each year. Fig 1.8 shows the frequencies of multiple recordings. Although most (75%) recorders surveyed for only one year, over 200 individuals have showed a more sustained interest, and 37 have sent five or more years' worth of data, including some retrospective reports. This would indicate that there is sufficient interest and goodwill amongst the recorder network to sustain a national long term monitoring scheme. However, regular contact in the form of information and results summaries, with occasional meetings would be important to sustain the impetus.

1.8 Mailing list

In order to create a national directory of herpetological contacts, as well as to increase the efficiency of mailing, (especially the mounting regular mailshots), a computerised address list was compiled. Initially the list developed around a core of survey recorders: during the "Amphibian Communities" project, thank-you letters were issued in response to data received which included tear-off slips to be returned by those wishing to be added to the mailing list. The most productive recorders from the 1983-86 survey were also added. All the county BRCs, RSNC and FWAG offices plus some of the NCC offices are on the list. (As NCC were willing to distribute information to all of the offices within their own organisation, their complete address list was unnecessary.) Since 1989, reptile recorders have also been included.

Table 1.3 lists the numbers of individual contacts grouped according to affiliation, where known. Most (52%) of the individuals listed however did not claim to belong to any of the organisations represented.

Fig 1.8

Numbers of years for which recorders have returned site records, 1983-92.

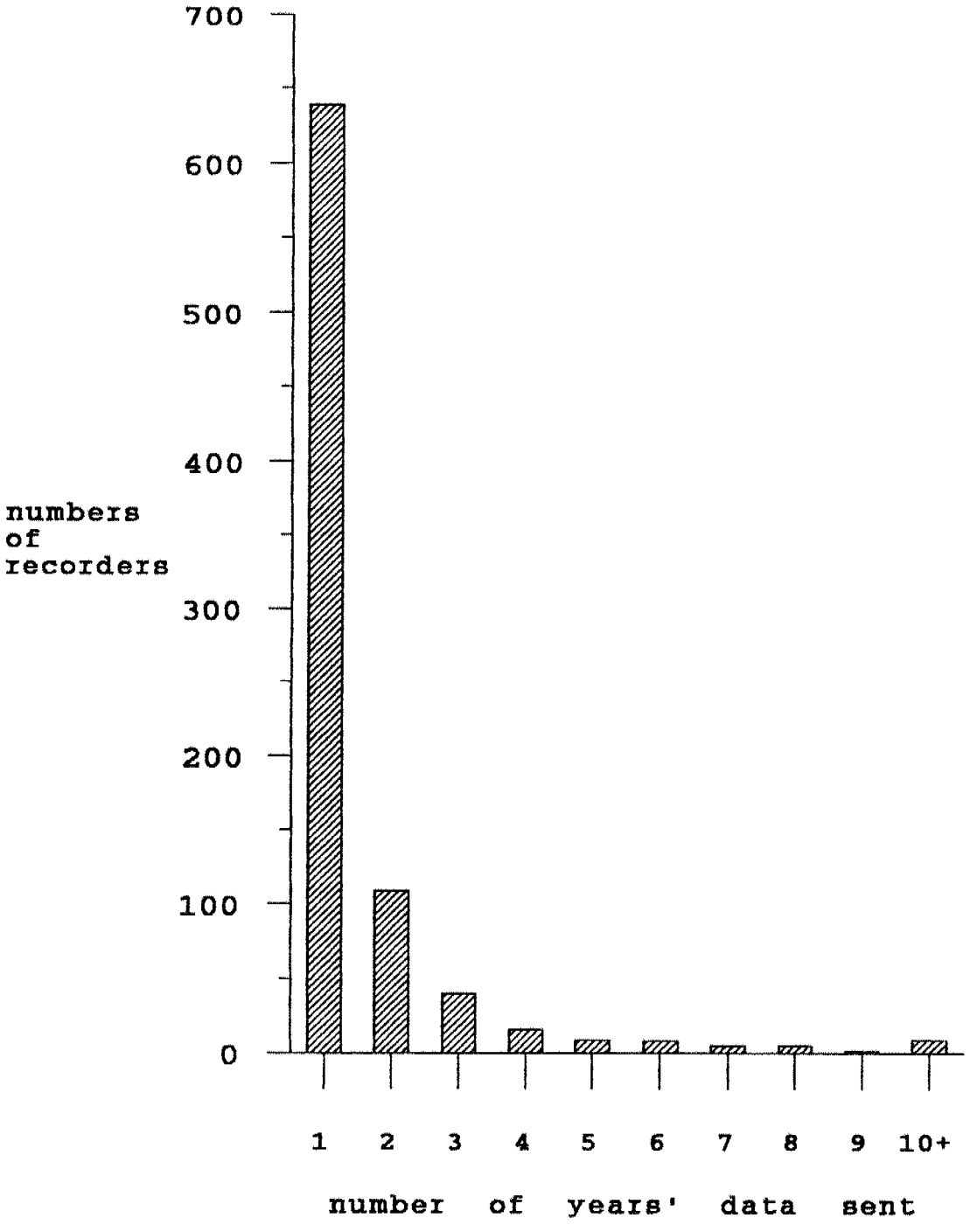


Table 1.3

Composition of the herpetological mailing list with regard to affiliation.

organisation	no of contacts	percent
None listed	521	51.6
RSNC & SWT (personnel & private members)	94	9.3
Herpetological societies : national	42	4.1
local	15	1.4
Biological records centres	52	5.1
The Nature Conservancy Councils	50	4.9
Farming organisations	45	4.4
Higher education & research institutes	39	3.8
Forestry Commission	38	3.7
Environmental consultancies	19	1.8
Nature reserve/country park staff	18	1.7
National conservation organisations	17	1.6
Local authority personnel	16	1.5
Local natural history groups	11	1.0
Press (BBC, ITV, newspaper journalists)	7	0.6
Childrens' organisations (schools, guides, scouts etc)	6	0.5
Urban wildlife groups	6	0.5
Nationalised industry	5	0.4
Wetland conservation organisations	5	0.4
Animal welfare organisations	3	0.2
TOTAL	1022	

Fifty-one percent of the 1,022 entries on the list have contributed survey data. Forty three percent were amphibian and 15% reptile recorders; an additional seven percent contributed to both surveys. The remaining 502 entries (49% of the list) include organisations, researchers, Herpetofauna Recorders' Meeting delegates, environmental consultants and other individuals and bodies whom it was deemed appropriate to keep informed of the survey developments.

1.9 Conclusions

A wide range of effort and commitment has been demonstrated during the surveys. Extensive publicity campaigns have served to draw the attention of a wide general audience to herpetological conservation matters, and to recruit a productive network of herpetological recorders. However, it is evident after nine years of survey that the volunteer network is unlikely to provide sufficient data from areas of low human population density.

The computerised mailing listing could facilitate the dissemination of herpetological contact information throughout the country agencies.

The volunteer network of recorders and associated bodies, developed on behalf of NCC over nine years, has proved to be a valuable conservation resource which, we suggest, is worthwhile maintaining.