

**BRITISH TRUST FOR ORNITHOLOGY AND
INSTITUTE OF TERRESTRIAL ECOLOGY
(NATURAL ENVIRONMENT RESEARCH COUNCIL)
SNH/NERC Contract SNH/071/94 BD
ITE PROJECT T08051h5**

**ATLAS OF RECOVERIES OF GUILLEMOTS
URIA AALGE RINGED IN SCOTLAND**

**S R Baillie (BTO), C. Dudley (BTO) and
M P Harris (ITE)**

Final report to Scottish Natural Heritage

**Hill of Brathens
Banchory Research Station
Banchory
Kincardineshire
AB31 4BY**

March 1994

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BACKGROUND

Scotland holds internationally important breeding populations of seabirds. These birds continue to be at risk from oiling, as was most recently illustrated by the Braer disaster, and from accidental deaths in fishing nets. Large numbers are periodically killed in "wrecks" where the causes of mortality are less clear, most recently in February 1994. Their population may be affected by changes in the availability of food, as has been shown for a number of seabird species in Shetland and elsewhere. Most of these mortality factors affect the birds when they are at sea and away from the colonies. Information on which colonies would be affected by mortality factors operating in particular geographical areas is needed so that changes in breeding numbers and performance can be related to factors which operate elsewhere.

Scotland has about 80% of the UK guillemot *Uria aalge* population. Numbers are monitored on sample plots in a range of colonies around the coast by SNH, RSPB, SOTEAG and others, co-ordinated within the JNCC Seabird Monitoring Programme. Detailed biological monitoring on the Isle of May, Fair Isle and Canna provides data on demography and feeding ecology which should assist in the interpretation of population changes. Information on the distribution of birds at sea at different times of year has been provided by the work of the JNCC Seabirds Team and related projects by other European countries. Few data are available on the mortality of these auks in relation to colony of origin or wintering area.

Large scale ringing of guillemots has taken place in Scotland over the last 20 years, encouraged by free rings. No comprehensive analysis of movements has been published since Mead's (1974) analysis despite the facts that (a) there are now many more recoveries, (b) less auks are now shot but more are reported drowned in fishing nets, and (c) other analyses (e.g. Harris & Bailey 1992) indicate that wintering ranges have changed. More recent analyses have been restricted to recoveries of birds ringed in a few specific areas (Rae 1984 for Grampian, Swann *et al* 1989 for Canna, Outer Hebrides, Heubeck *et al* 1991 for Shetland, Harris & Bailey 1992 for southeast Scotland). Analyses related to two major incidents in the early 1980s showed that the value of ring recoveries for identifying the breeding populations of age classes that will be affected by specific incidents (Baillie & Mead 1982, Hudson & Mead 1984).

The specific aims of these analyses were therefore:

1. To document the movement of birds from reasonably small groups of colonies so that changes in numbers and performance at these colonies can be related to changes in the marine environment taking place elsewhere.
2. To produce an atlas of maps to show the locations of recoveries of Guillemots ringed at these colony groups.

This report provides a detailed series of recovery maps for use by those concerned with conservation problems affecting specific areas or with research into the distribution and biology of guillemots. A more detailed statistical analysis and interpretation of these data will be published elsewhere.

ACKNOWLEDGEMENTS

This analysis was funded by Scottish Natural Heritage. The provision of free rings for use on guillemots and the administration of the BTO Ringing Scheme have been funded partly by contracts from JNCC (formerly NCC) on behalf of the Countryside Council for Wales, English Nature, Scottish

Natural Heritage and the Department of the Environment for Northern Ireland. Ring costs for guillemots are currently paid by the Joint Nature Conservation Committee's Seabird Monitoring Programme.

The staff of the BTO Ringing Unit coded and computerized the recovery data. Susan Waghorn and Julie Sheldrake provided invaluable assistance with report production. This analysis would not have been possible without the enormous efforts which many volunteer ringers have put into ringing guillemots. The large number of people who have reported ringed birds have also made an essential contribution. We thank all these organizations and individuals for their help and support.

Section 1

Figure 1.1 Map showing regions of ringing used for this analysis

- 1 Sanda and Clyde
- 2 Canna
- 3 Outer Hebrides, Shiant and North Rona
- 4 Shetland and Fair Isle
- 5 East Sutherland, Caithness and North Sutor
- 6 Grampian
- 7 Firth of Forth and St Abbs

NB Orkney was not included in the analyses, as very few Guillemots were ringed there.

Figure 1.2 Map showing finding regions for Guillemots ringed in Scotland

- 1 East Scotland
- 2 East England
- 3 Channel
- 4 Irish Sea
- 5 West Ireland
- 6 North West Scotland
- 7 Iceland and Faeroes
- 8 North Norway
- 9 South Norway
- 10 Skagerrak, Kattegat and Baltic
- 11 South East North Sea
- 12 Bay of Biscay
- 13 South Europe

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Figure 2.2 Overall distributions of recoveries of Guillemots ringed on Canna and reported between 1970 and 1992.

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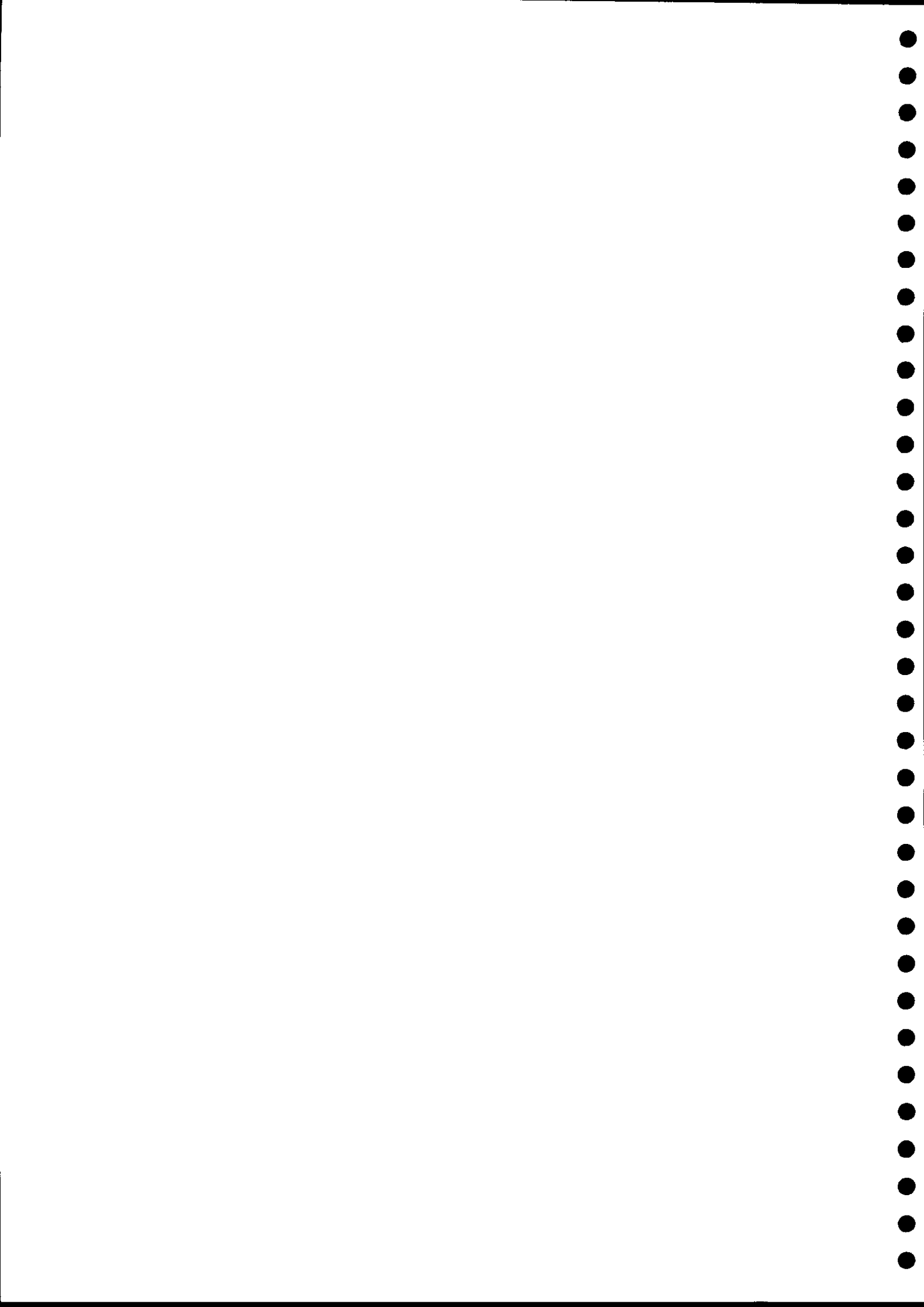
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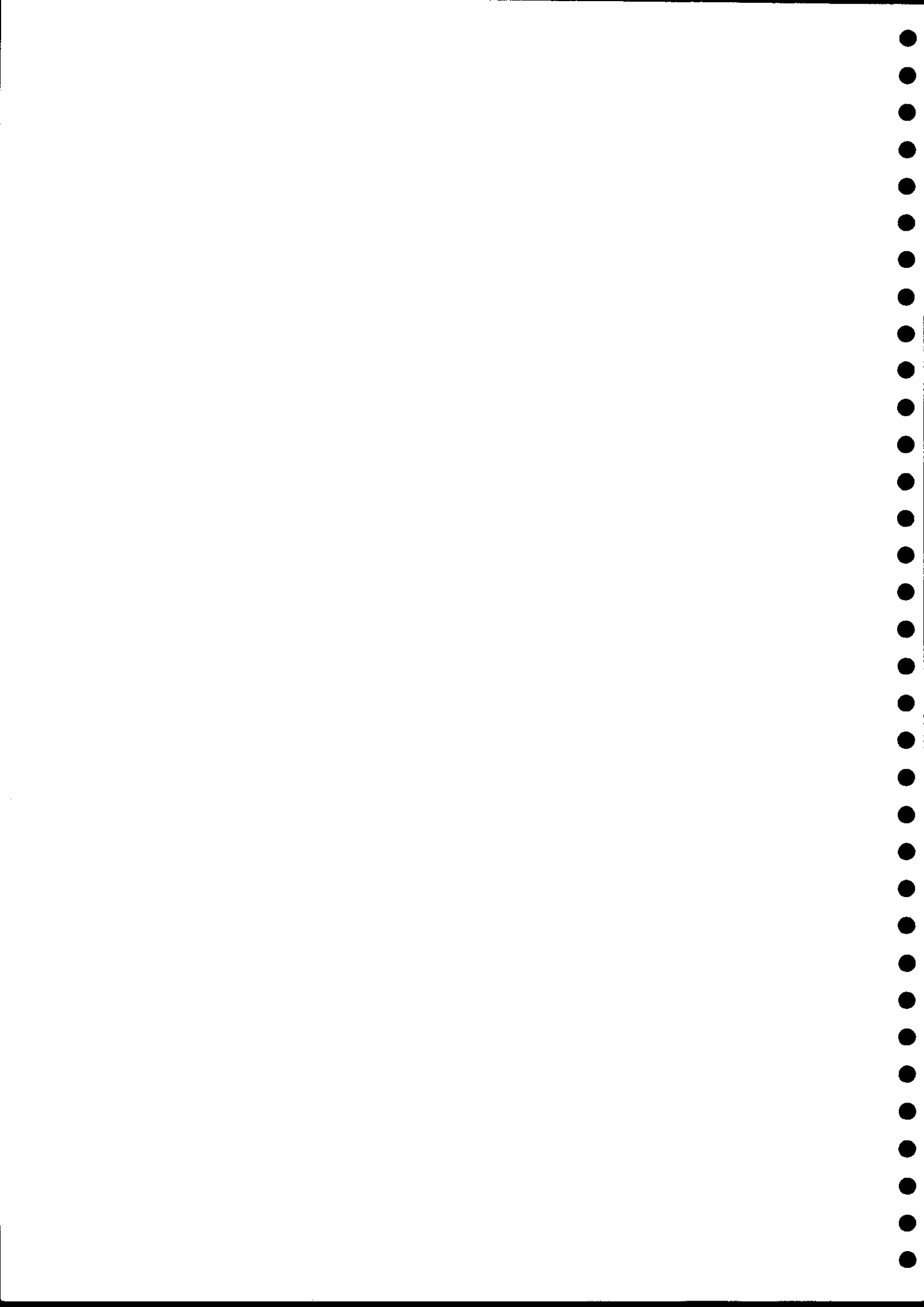
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Section 1

Methods of analysis



SECTION 1

Methods of analysis

Recoveries from each group of breeding colonies were mapped by age at recovery, season and time period (sections 3 to 9). These recovery distributions were also tabulated by age and season using a set of standard recovery regions. Single summary maps for each colony group and a table summarizing the overall recovery distributions for birds ringed at each colony group are presented in section 2. Maps of the colonies of origin of birds recovered from each recovery region are presented in section 10, together with a summary table of this information. It should be noted that many of these recovery regions also hold birds that breed in other parts of Britain and Europe, so this part of the analysis does not give a complete picture.

The seven colony groupings were as follows: Sanda and other locations in the Clyde; Canna; Outer Hebrides, Shiant and North Rona; Shetland and Fair Isle; East Sutherland, Caithness and North Sutor; Grampian; Firth of Forth and St Abbs Head. The names indicate the main ringing locations. All recoveries of birds ringed within the regions shown in Figure 1.1 were used in the analysis. Orkney holds large breeding populations of guillemots but too few birds have been ringed there to facilitate analysis. Thirteen regions were used for the analysis of recovery distributions (Figure 1.2).

Guillemots disperse widely in their first year and return progressively to their breeding colonies as they get older. The following groupings of age classes, based on attendance patterns of known age birds at Scottish breeding colonies (Halley & Harris 1993, Halley 1992) were used for this analysis:

- First year - few birds return to colony
- Age 2 and 3 - attend for short periods
- Age 4 and 5 - some breed but attendance patterns of those which do not are similar to breeders
- Age 6+ - most birds breed.

Most recoveries are of birds ringed as chicks so the age at recovery is known precisely. Recoveries of birds ringed as "adults" have been combined with the age 6+ group for all analyses presented in this report, as preliminary inspection of the recovery distributions for these two sub-groups indicated that they were extremely similar. Most birds ringed as "adults" are likely to have been breeders when they were caught. Recovery years used to assign recoveries to age categories started on 1 July.

The seasons used for this analysis were breeding (April-June), moult (July-September), early winter (October-December) and late winter (January-March).

Recoveries of birds that were sick or rehabilitated when ringed were excluded from the analysis as were records where only the ring was found. Records where the finding date was not known to within 30d were excluded but records where the date was taken from the postmark on the letter were used. Records where the finding co-ordinates could not be determined to within 30 minutes were excluded. All recoveries reported up to the end of 1992 were available for analysis.

Less than 4% of the 3453 usable recoveries were reported before 1970. These sparse data which cover a very long time period were excluded from the analyses. Analysis of them have already been reported by Mead (1974, cut off date 1 August 1971) and Birkhead (1974, cut off date 31 December 1972). Where sample sizes allowed (minimum of 10 recoveries in each category) comparisons were made between the recovery distributions for 1970-1984 (15 years) and 1985-1992 (8 years). Due to the increase in guillemot ringing more recoveries were available from the latter period even though it was almost half the length of the former (Table 1.1).

The recovery maps were prepared using data summarized by latitude/longitude grid boxes. Where a single category of data is plotted on a map the symbols are placed at the centres of the grid boxes. Where multiple categories are plotted up to four symbols may be used, one being placed in each quadrant of the appropriate box. Small symbols were used to represent up to 5 recoveries and large symbols more than this. This system avoids confusing patterns that can arise where large numbers of individual recoveries are plotted on top of each other.

The three largest data sets were for Canna, Shetland and Fair Isle and East Sutherland, Caithness and North Sutor. Individual maps for each age-class and season combination were plotted for these regions, using a grid size of 30 minutes by 60 minutes. This format was also used for all comparisons between time periods. The main sets of maps for the other four regions show four age classes on a single map for each season. In this case the grid size was 60 minutes by 120 minutes, to allow space for multiple symbols. These summary maps in section 2 also follow this format. The maps of ringing locations presented in section 10 each show four age classes and are based on a grid of 20 minutes by 40 minutes.

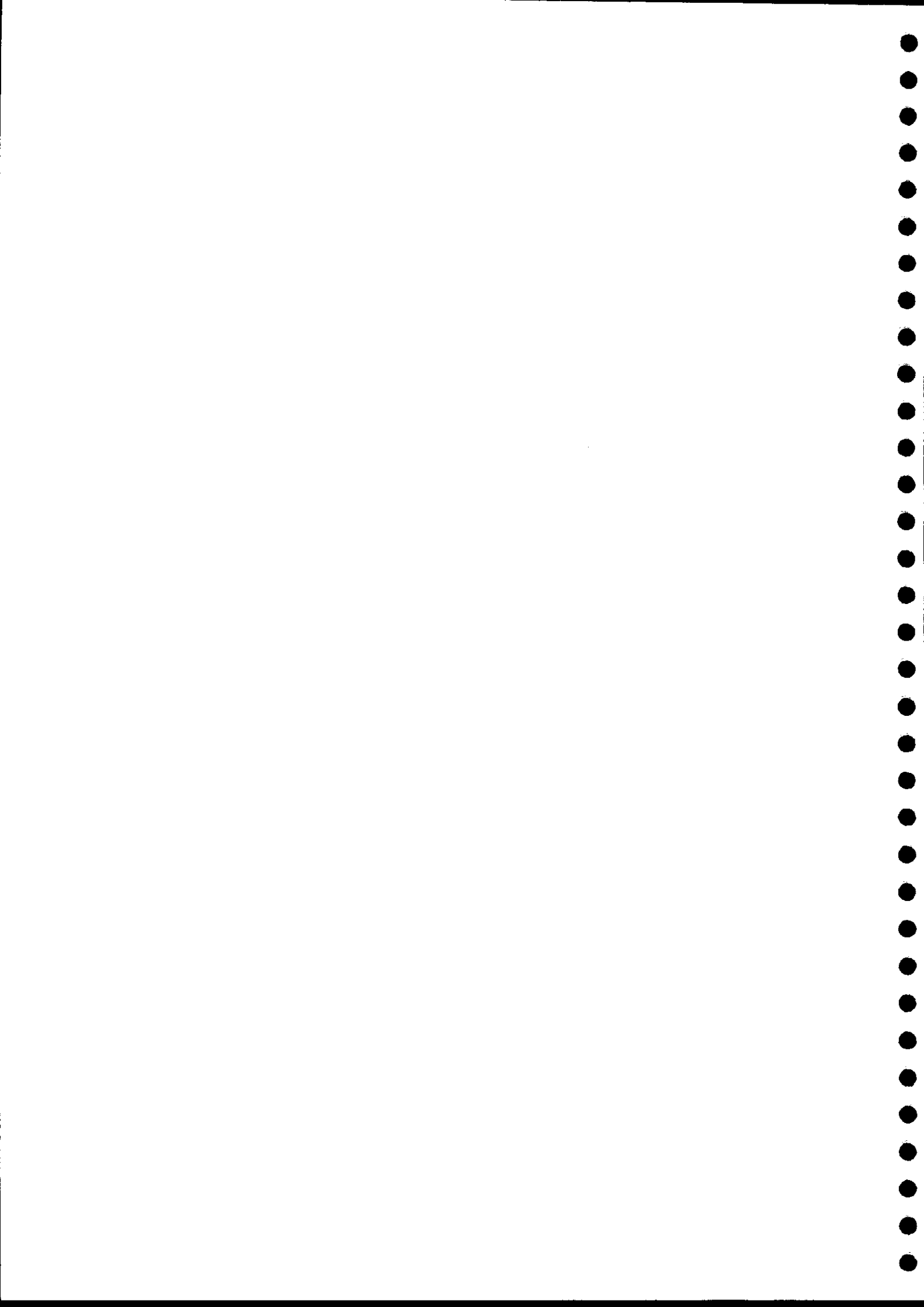


Figure 1.1 Map showing regions of ringing used for this analysis

- 1 Sanda and Clyde
 - 2 Canna
 - 3 Outer Hebrides, Shiant and North Rona
 - 4 Shetland and Fair Isle
 - 5 East Sutherland, Caithness and North Sutor
 - 6 Grampian
 - 7 Firth of Forth and St Abbs
- NB Orkney was not included in the analyses, as very few Guillemots were ringed there.

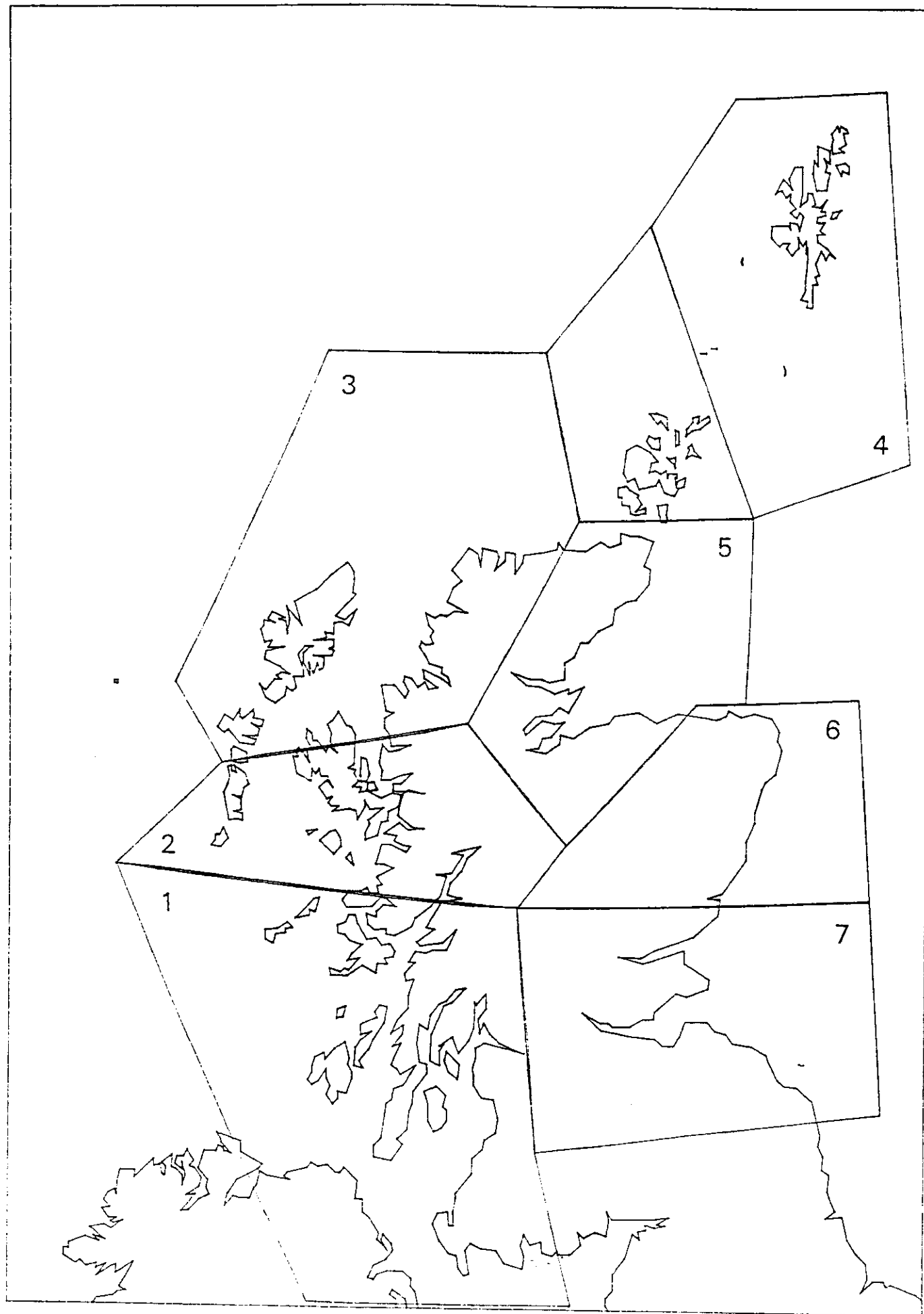


Figure 1.1

Figure 1.2

Map showing finding regions for Guillemots ringed in Scotland

- 1 East Scotland
- 2 East England
- 3 Channel
- 4 Irish Sea
- 5 West Ireland
- 6 North West Scotland
- 7 Iceland and Faeroes
- 8 North Norway
- 9 South Norway
- 10 Skagerrak, Kattegat and Baltic
- 11 South East North Sea
- 12 Bay of Biscay
- 13 South Europe

NB Ringing place regions for birds recovered in South Europe were not mapped, as only 15 records were reported.

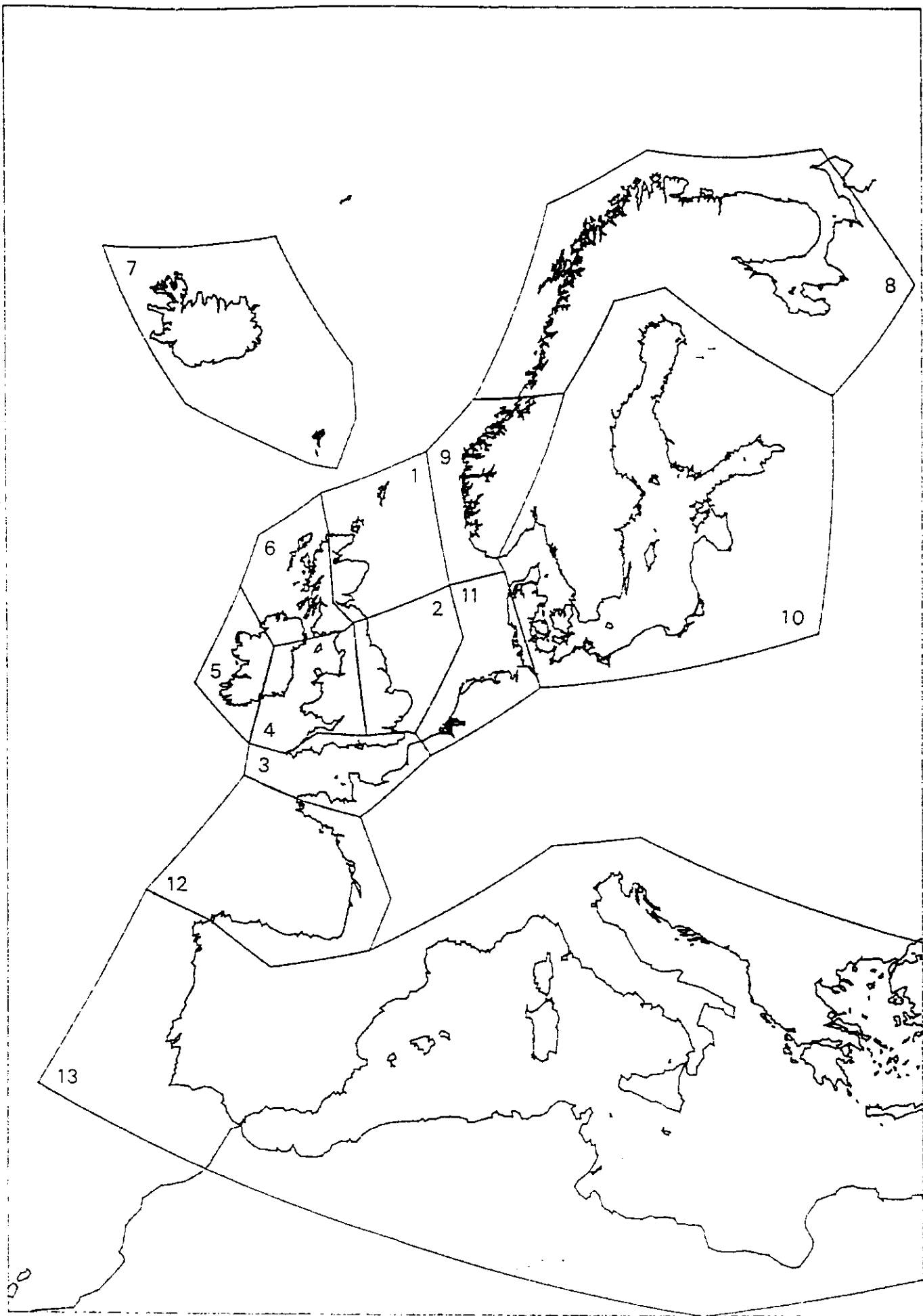
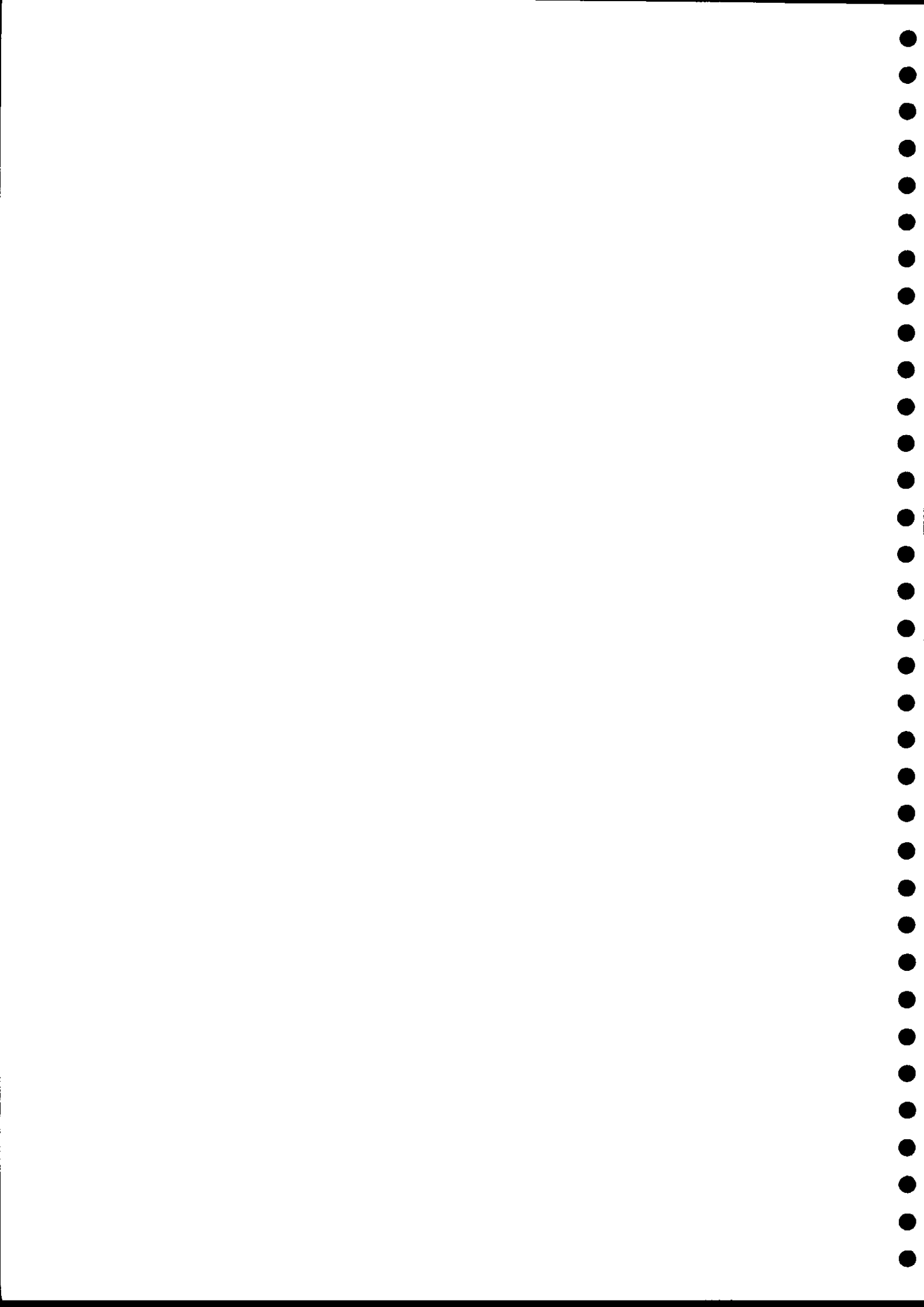


Figure 1.2



Section 2

Overall distributions of recoveries



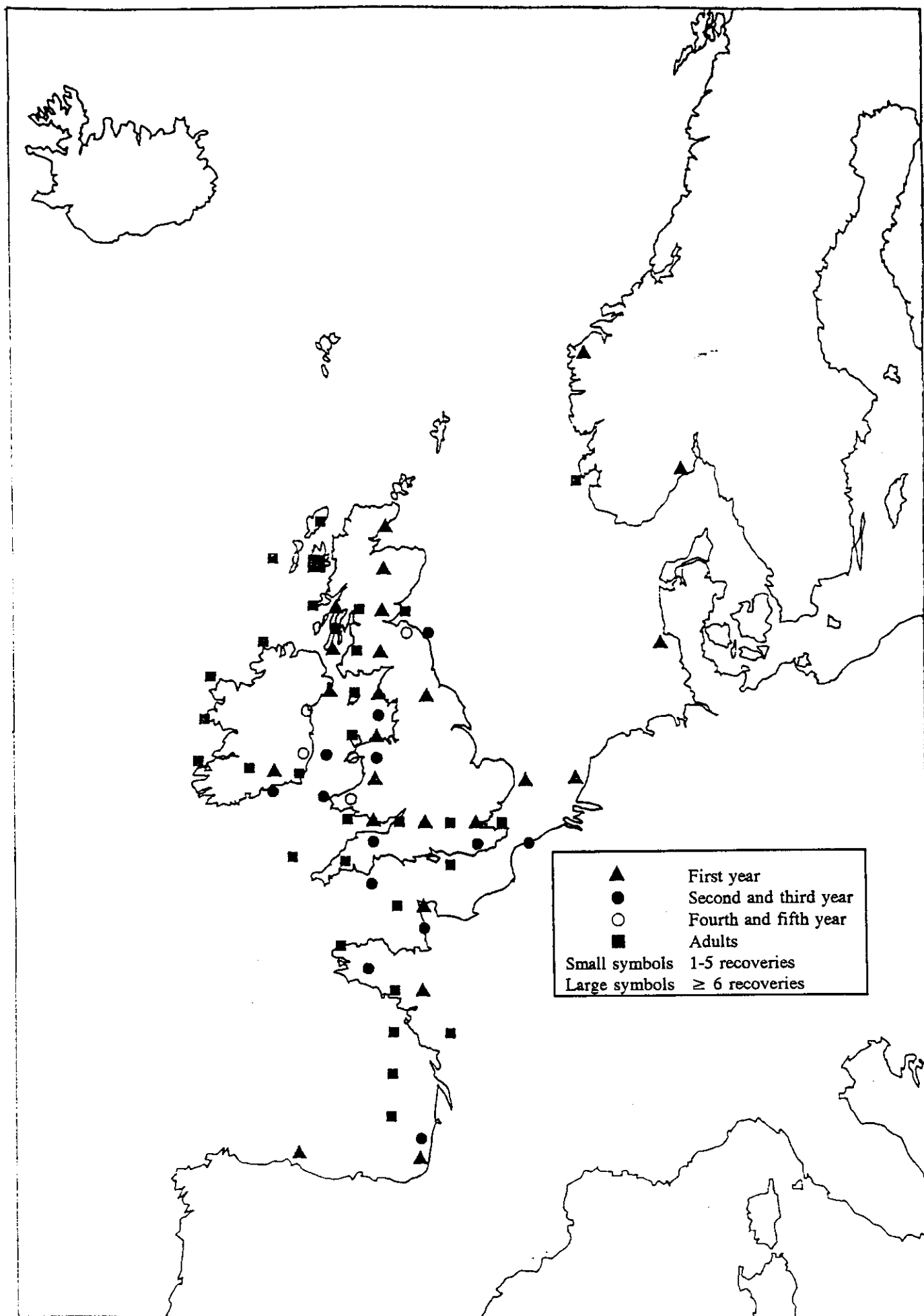


Figure 2.1 Overall distributions of recoveries of Guillemots ringed on Sanda and Clyde and reported between 1970 and 1992.

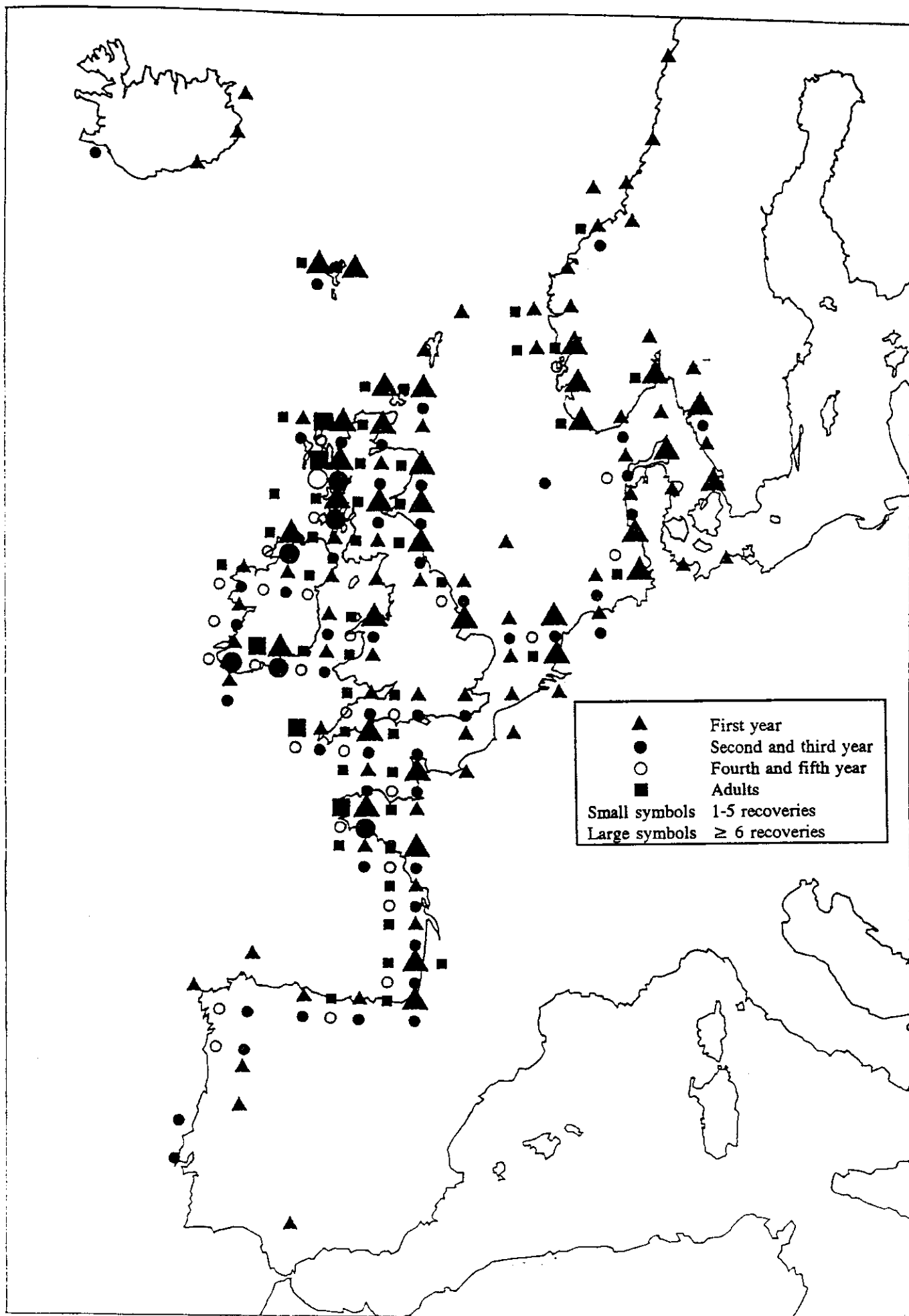


Figure 2.2

Overall distributions of recoveries of Guillemots ringed on Canna and reported between 1970 and 1992.

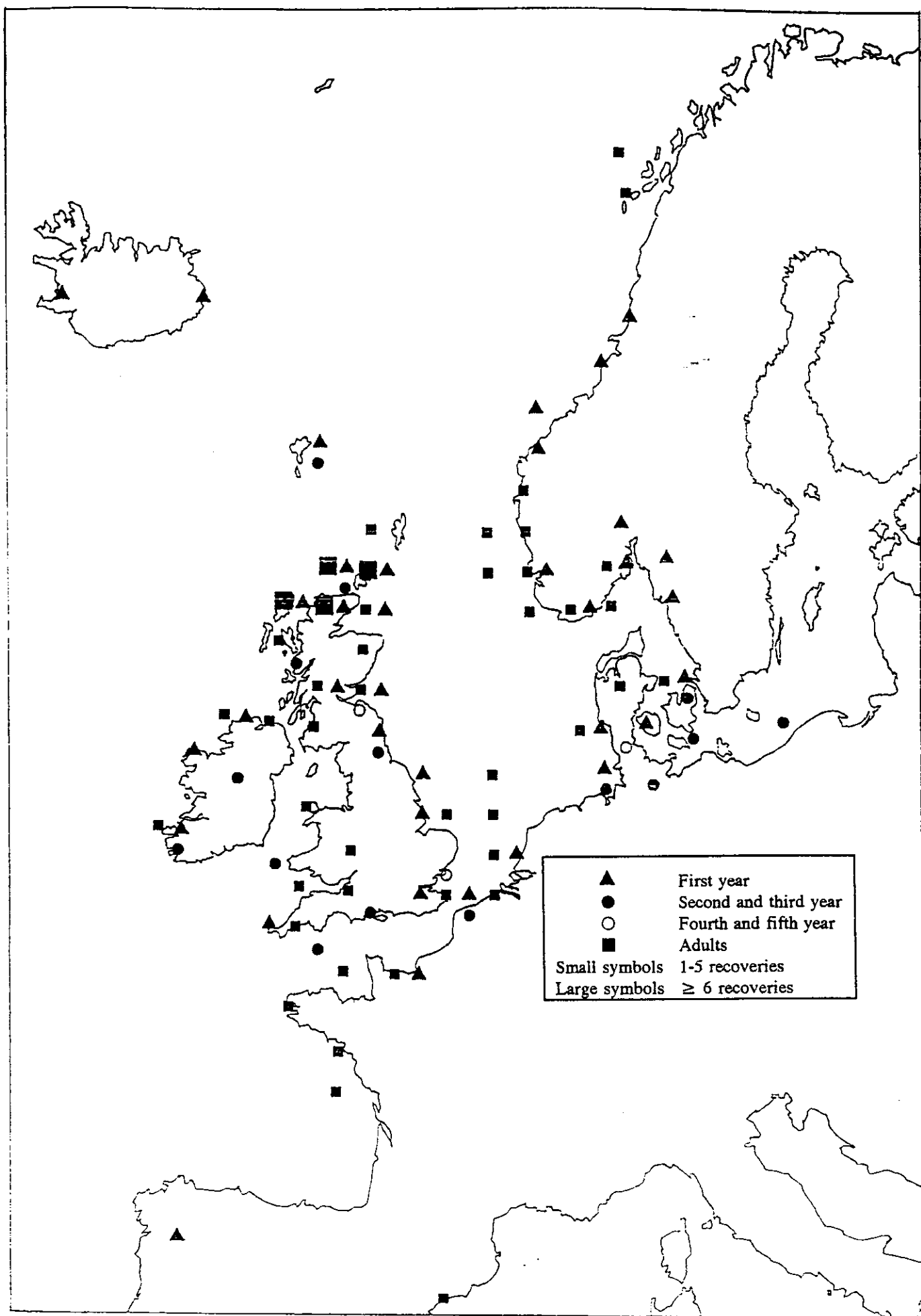


Figure 2.3 Overall distributions of recoveries of Guillemots ringed on the Outer Hebrides, Shiant Islands and North Rona and reported between 1970 and 1992.

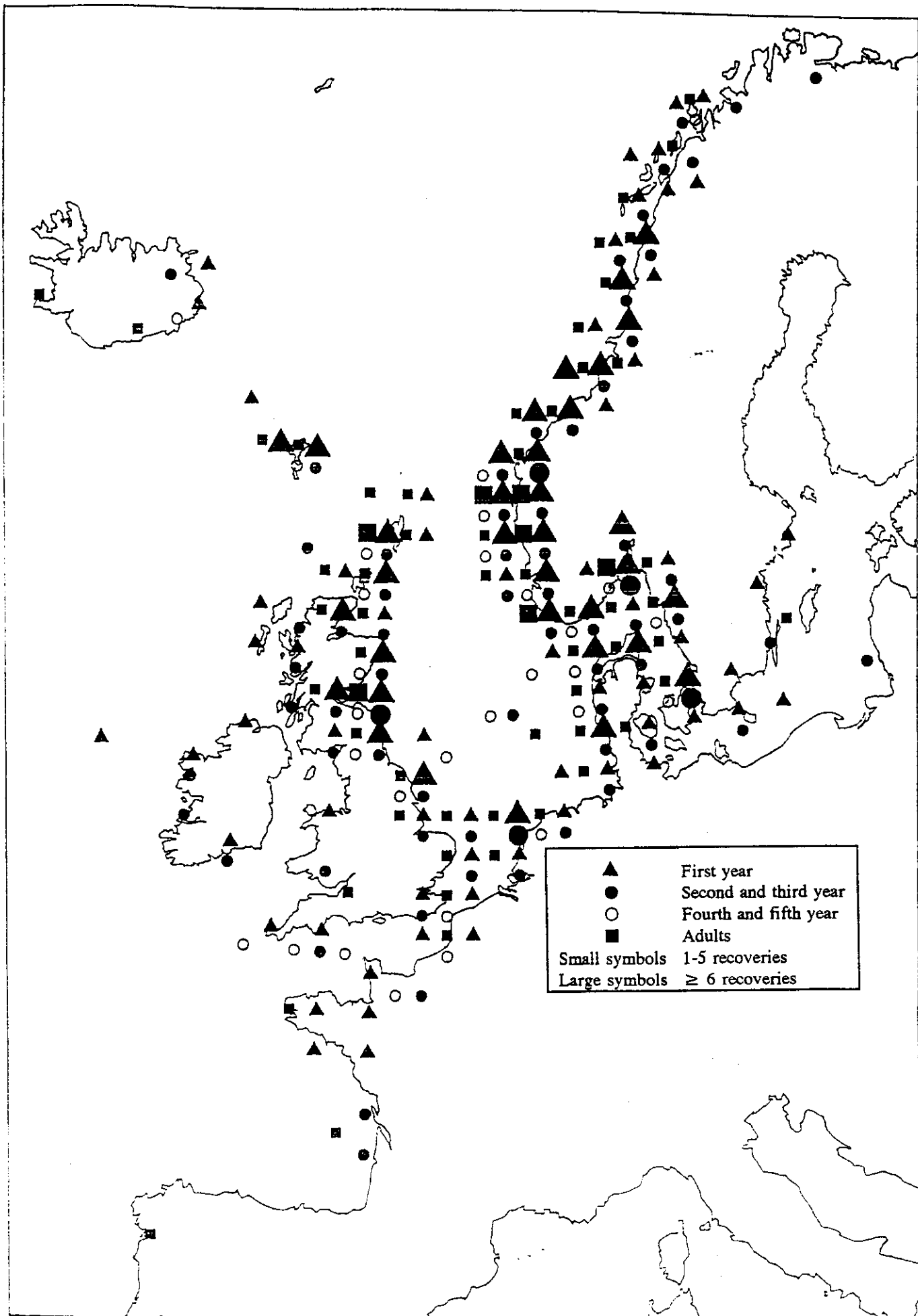


Figure 2.4 Overall distributions of recoveries of Guillemots ringed on Shetland and Fair Isle and reported between 1970 and 1992.

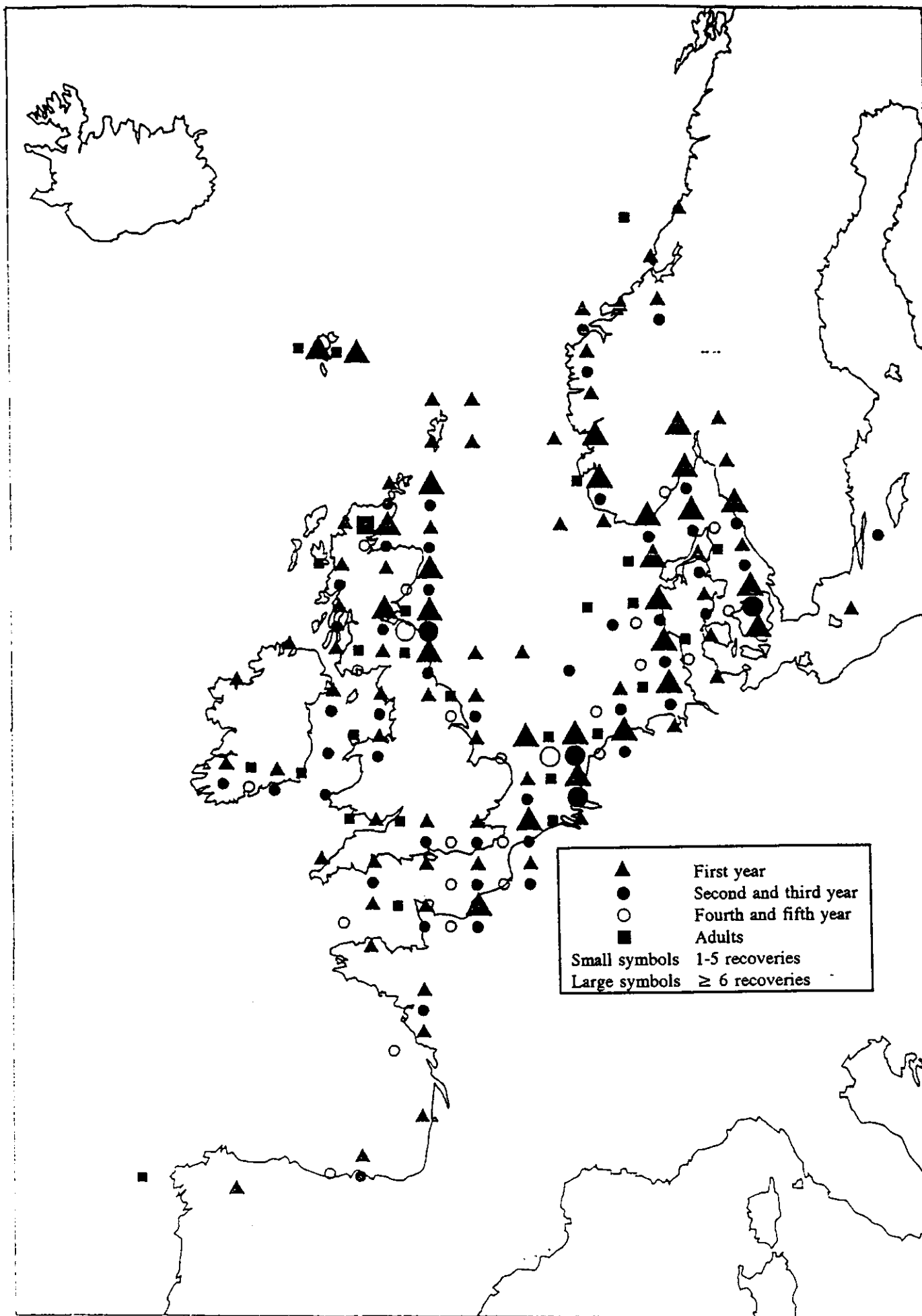


Figure 2.5 Overall distributions of recoveries of Guillemots ringed in East Sutherland, Caithness and North Sutor and reported between 1970 and 1992.

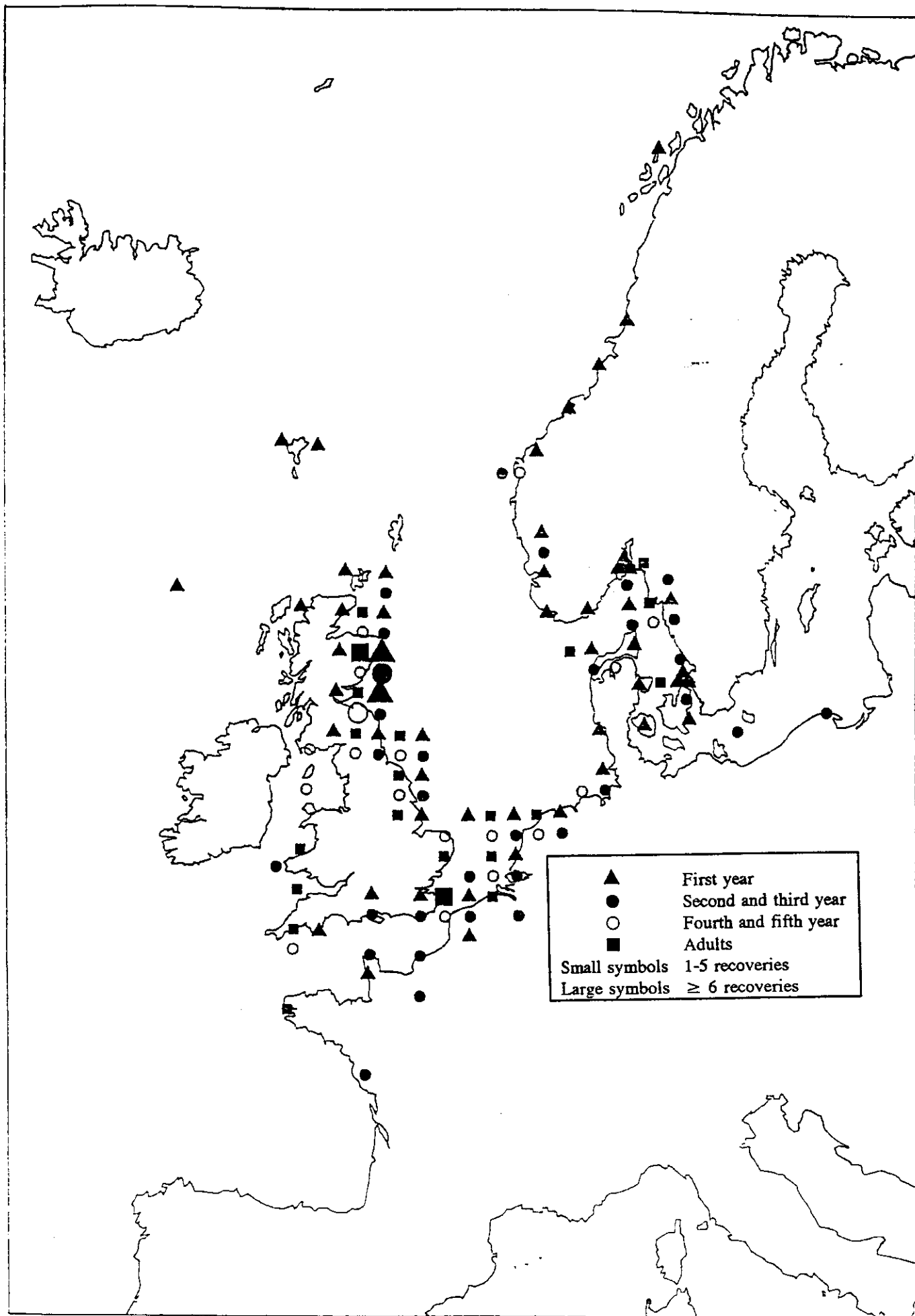


Figure 2.6

Overall distributions of recoveries of Guillemots ringed in Grampian and reported between 1970 and 1992.

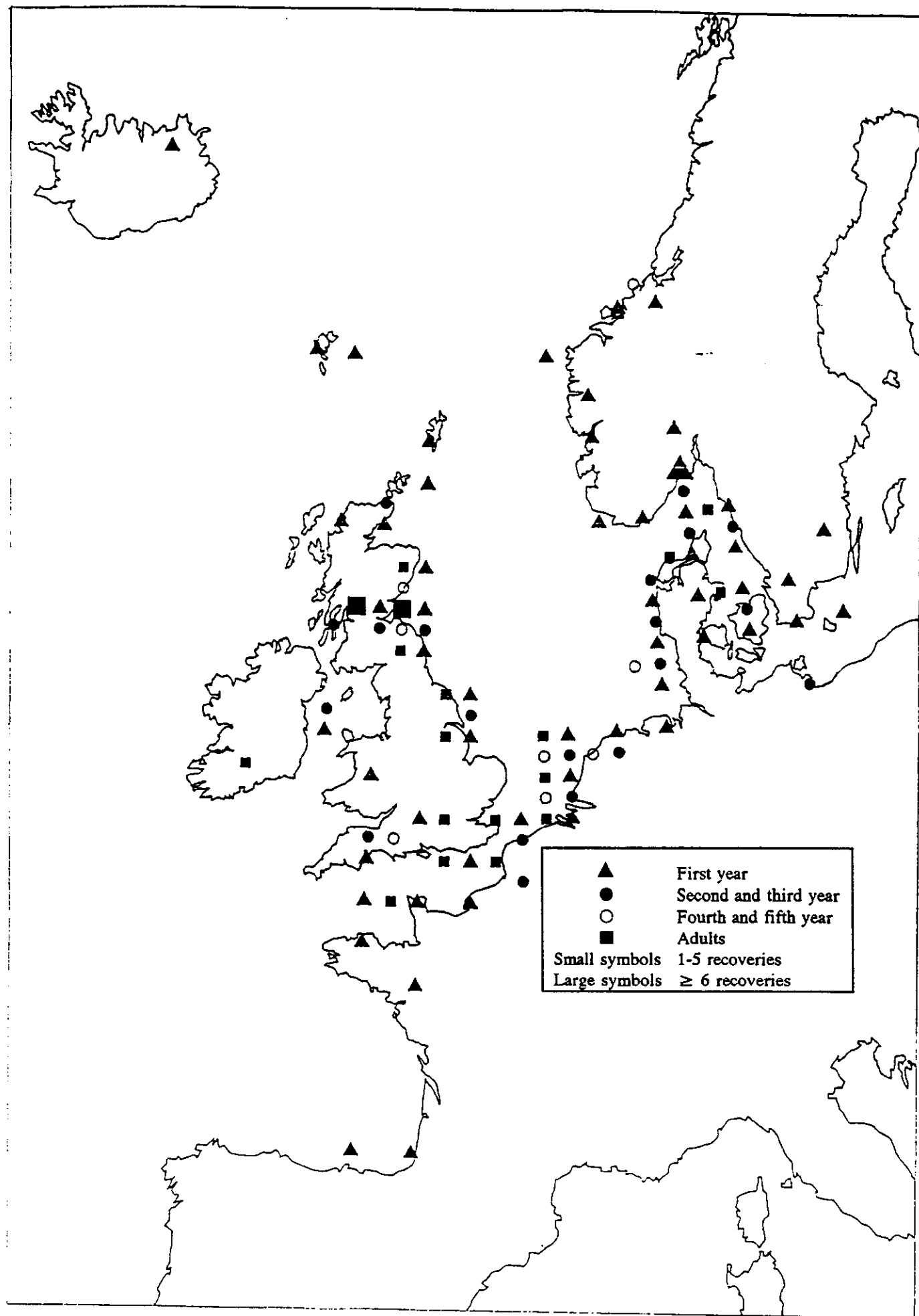
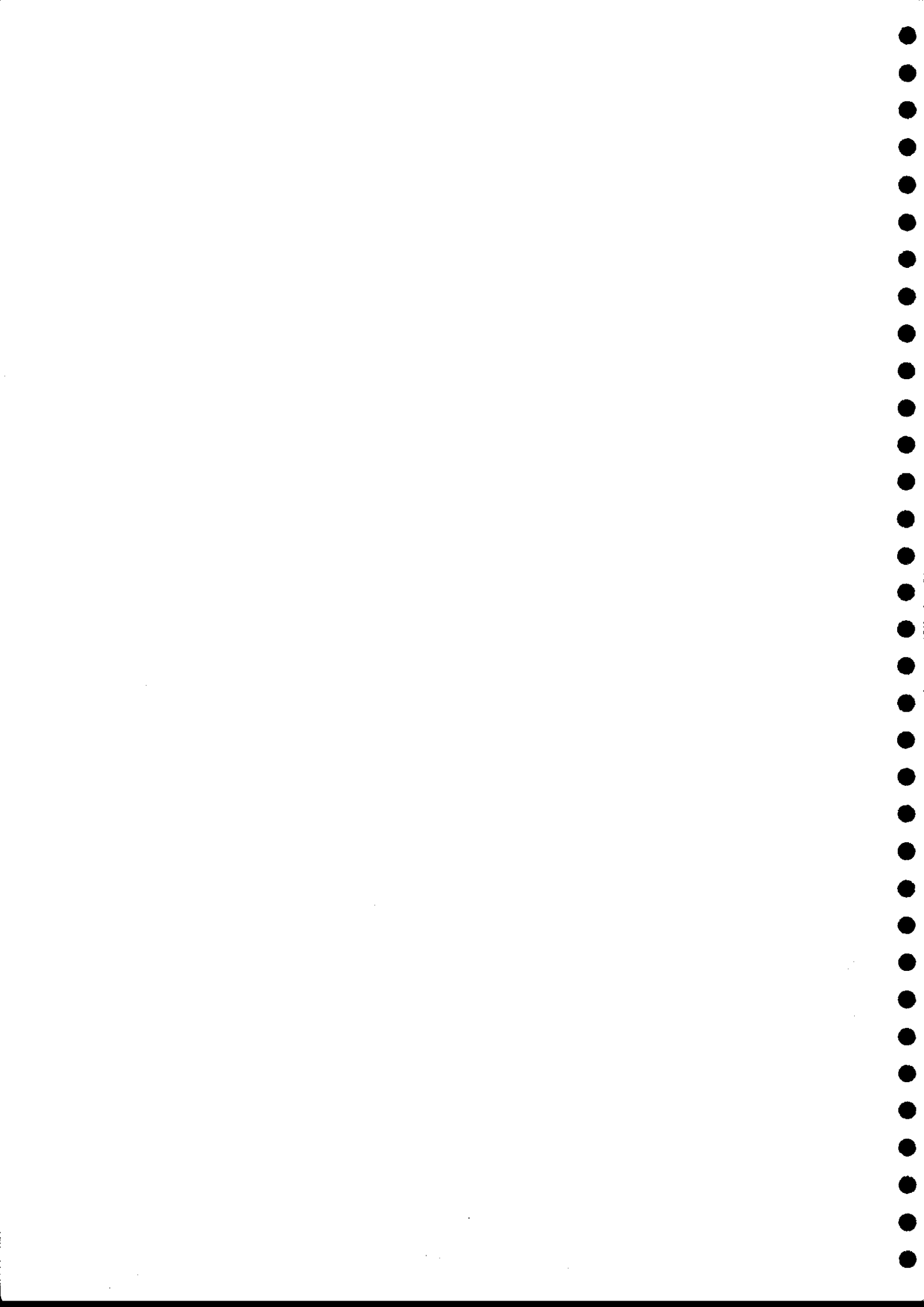


Figure 2.7

Overall distributions of recoveries of Guillemots ringed on the Firth of Forth and St Abbs and reported between 1970 and 1992.



Section 3

Recoveries of Guillemots ringed in Sanda and Clyde



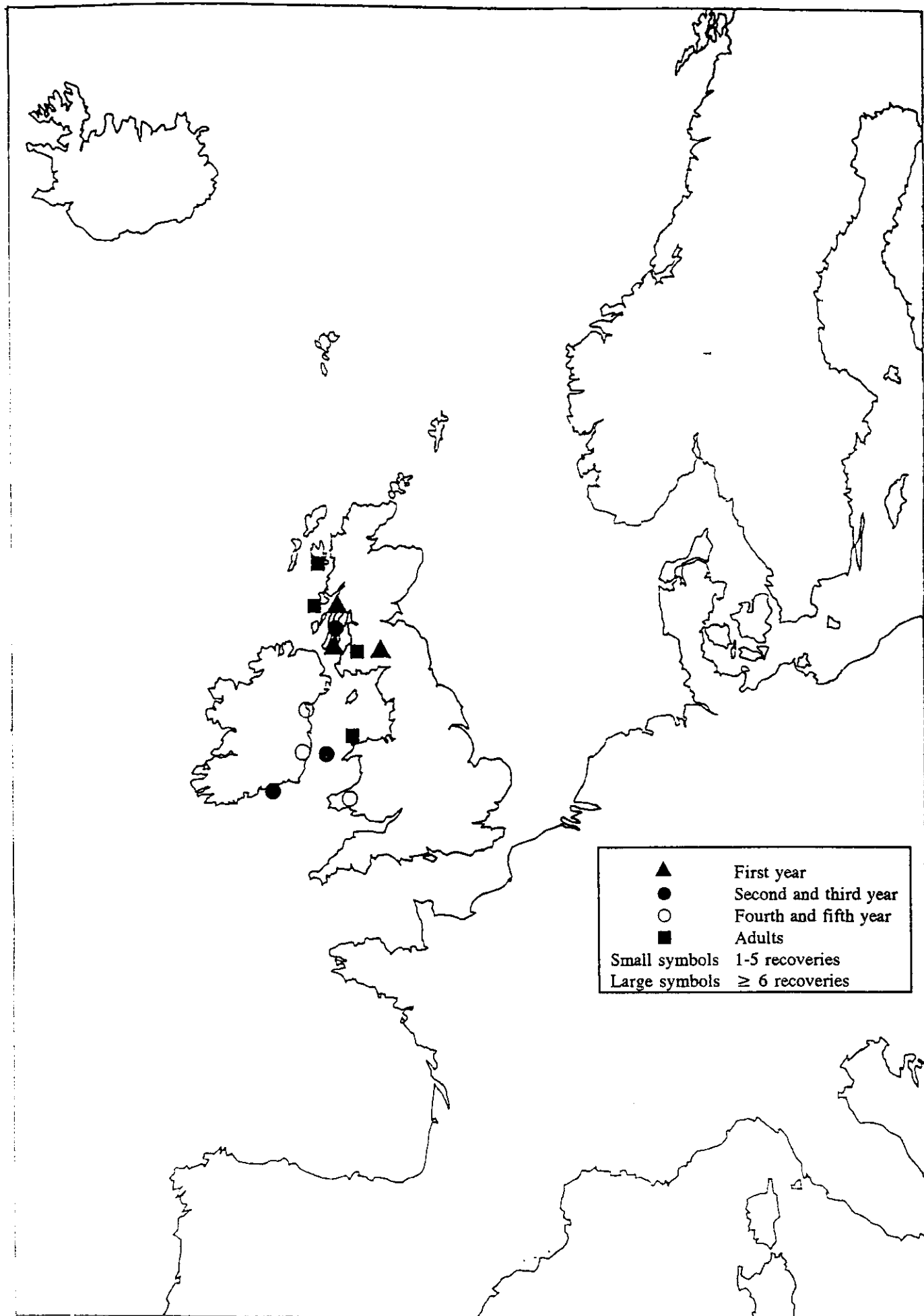


Figure 3.1 Recoveries of Guillemots ringed on Sanda and Clyde and recovered during July - September, between 1970 and 1992.

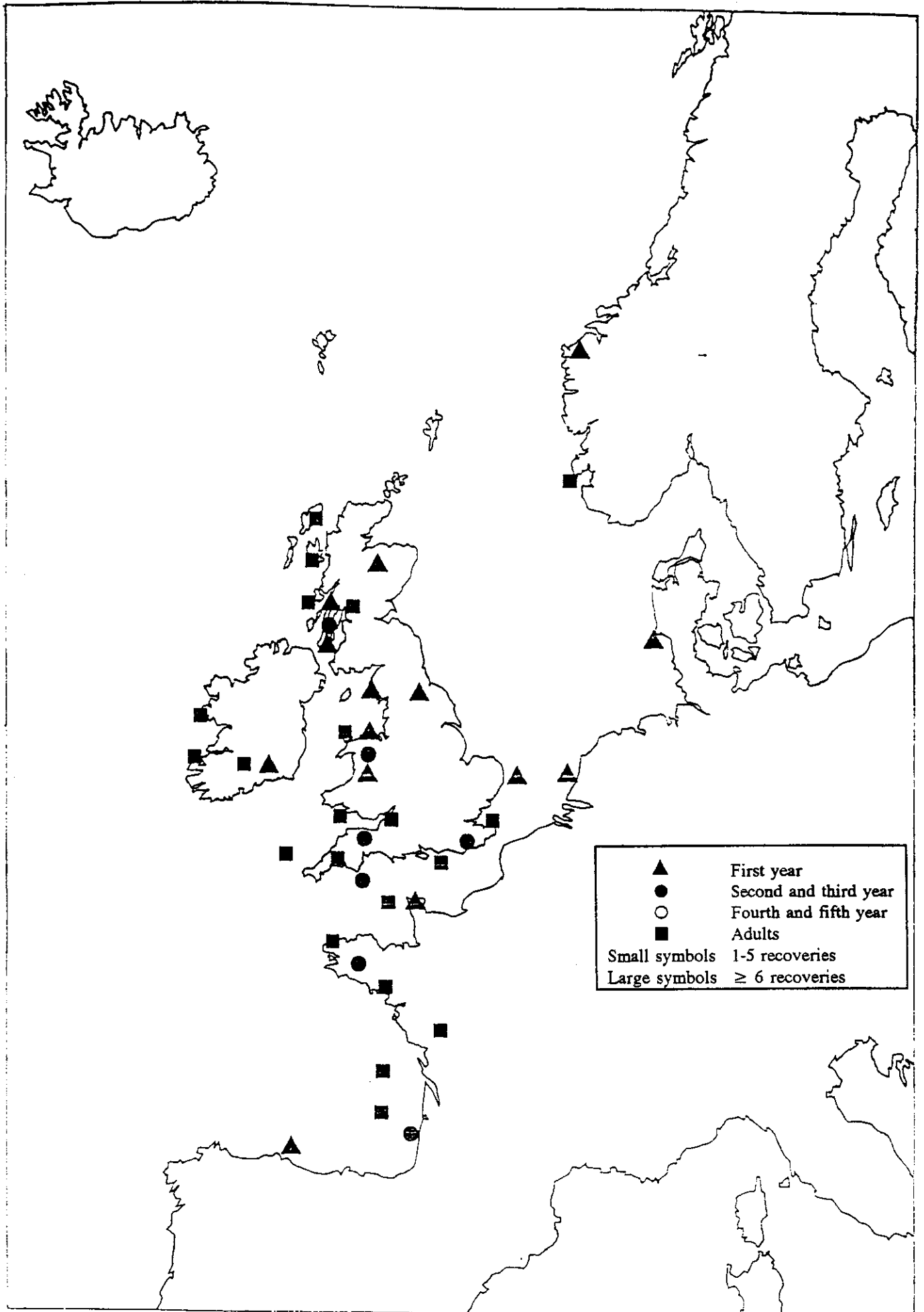


Figure 3.3 Recoveries of Guillemots ringed on Sanda and Clyde and recovered during January - March, between 1970 and 1992.

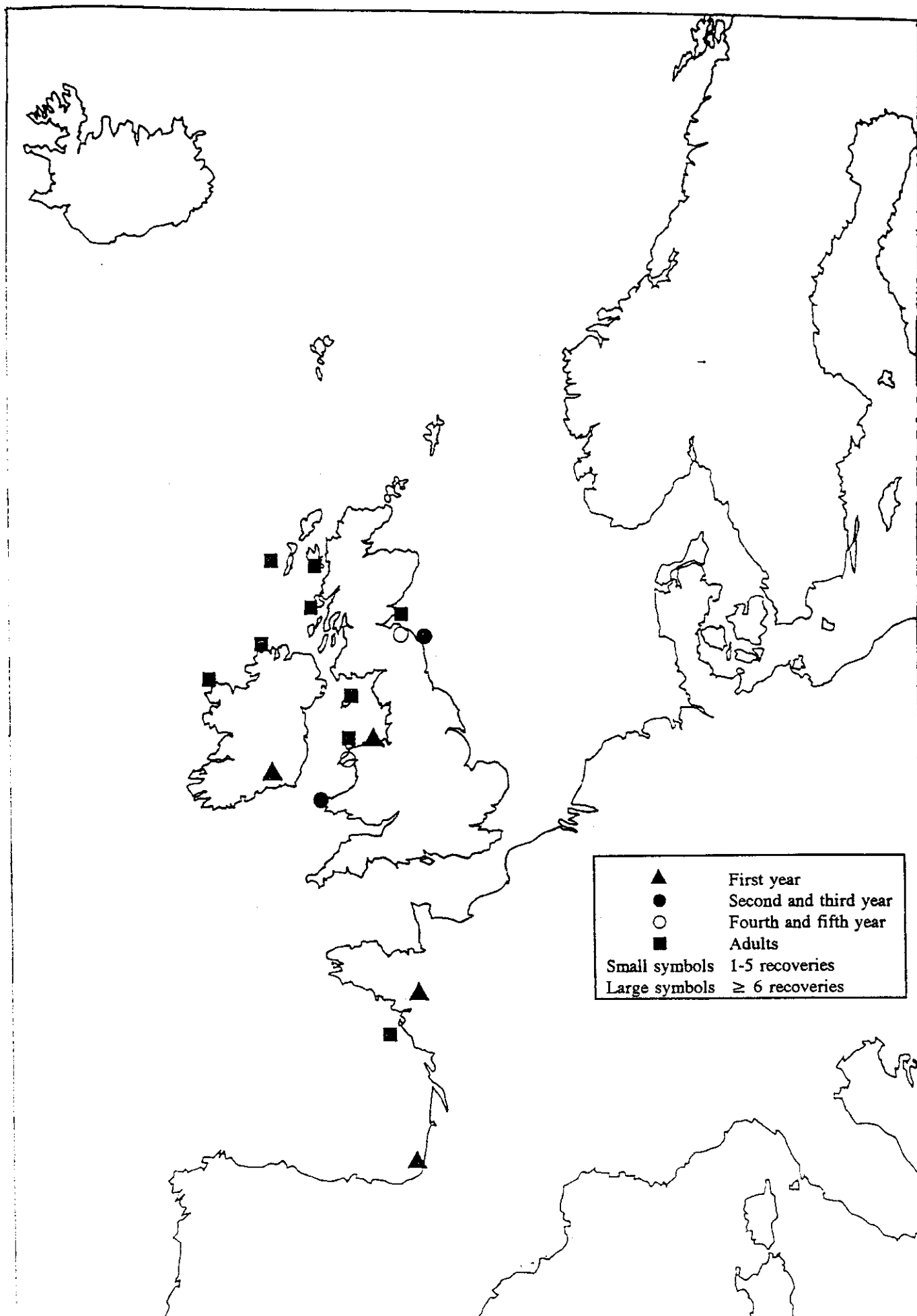
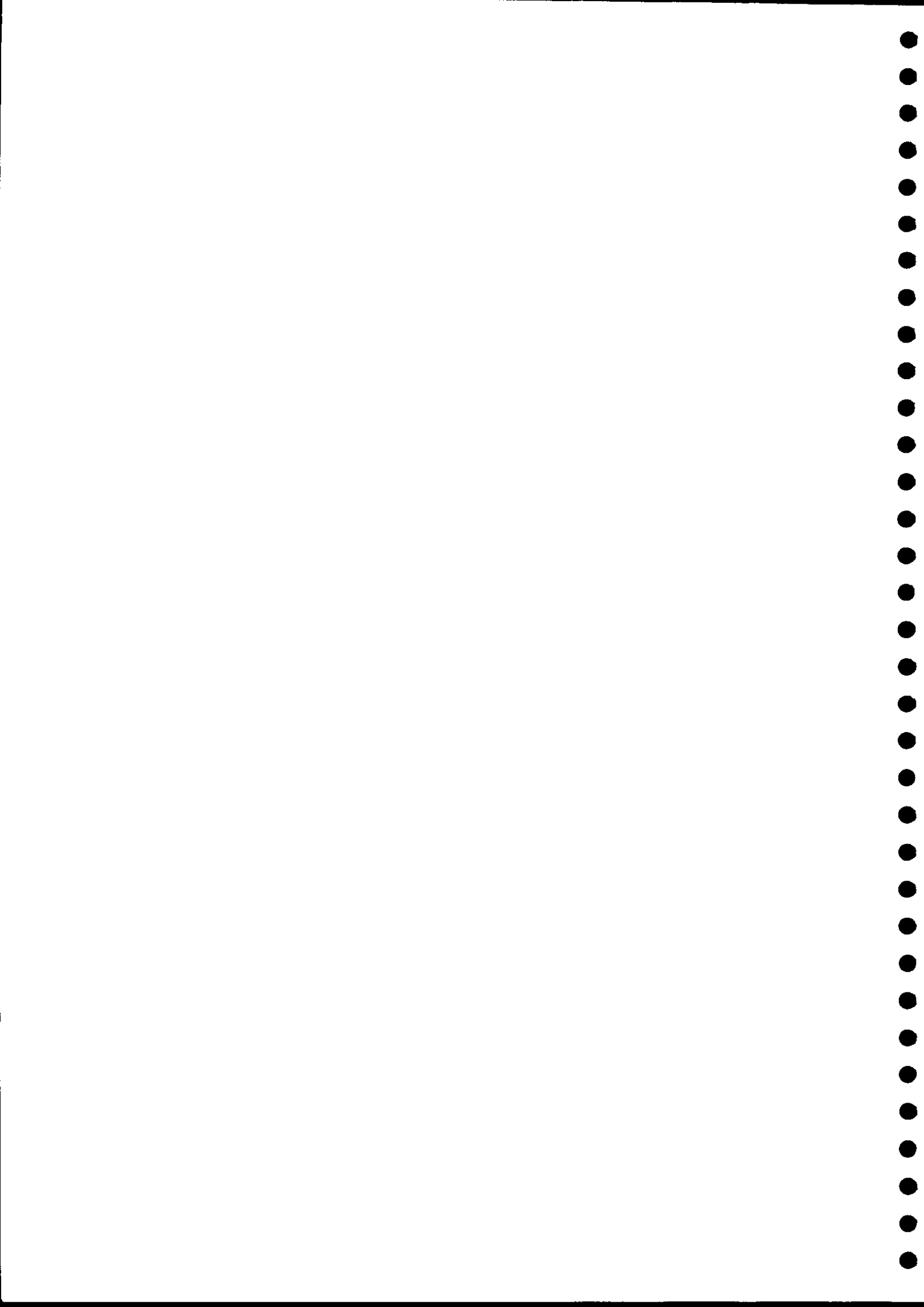


Figure 3.4

Recoveries of Guillemots ringed on Sanda and Clyde and recovered during April - June, between 1970 and 1992.

Section 4

Recoveries of Guillemots ringed in Canna



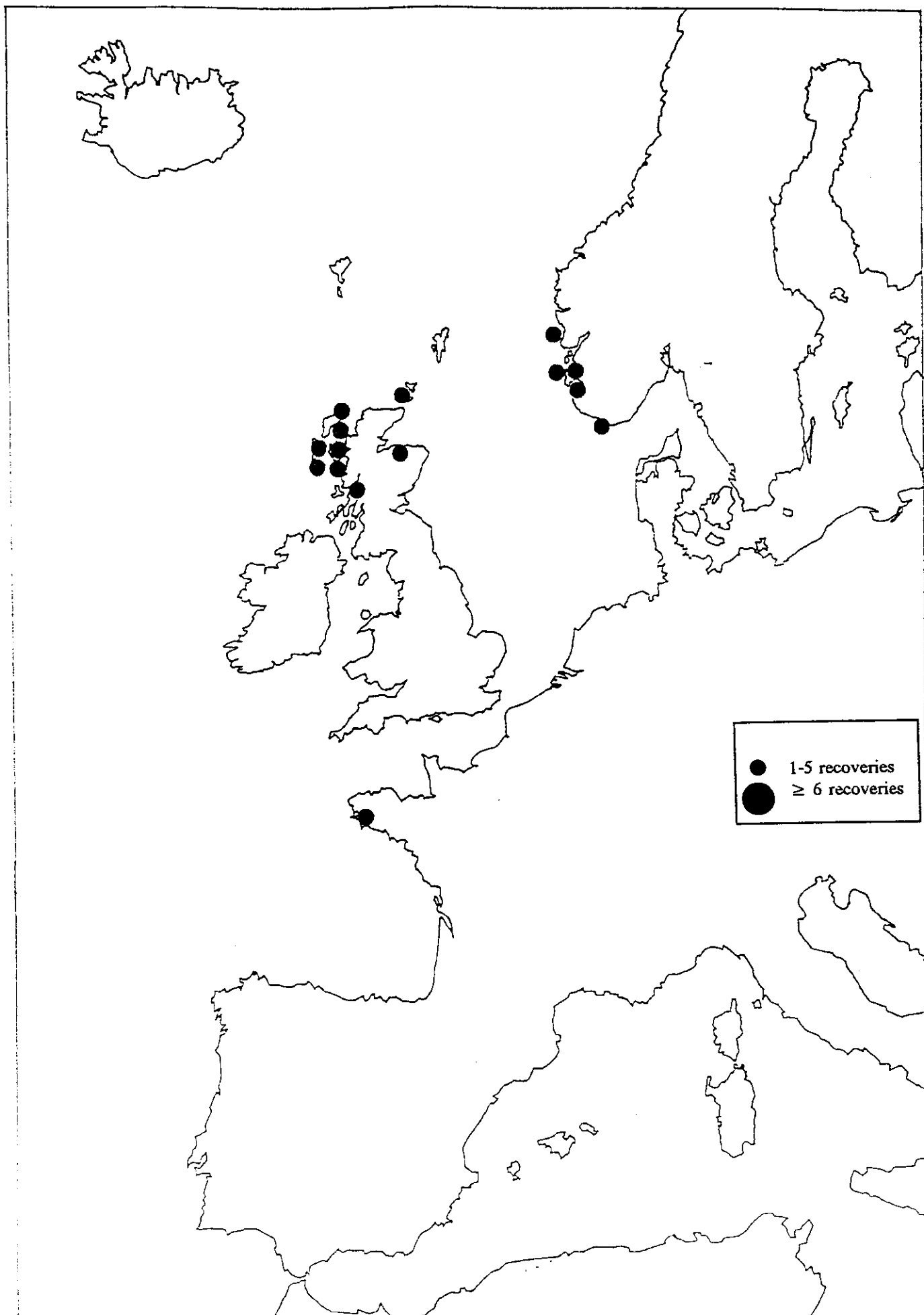


Figure 4.1

Recoveries of Guillemots ringed as chicks on Canna and recovered as first year birds during July - September, between 1970 and 1992.

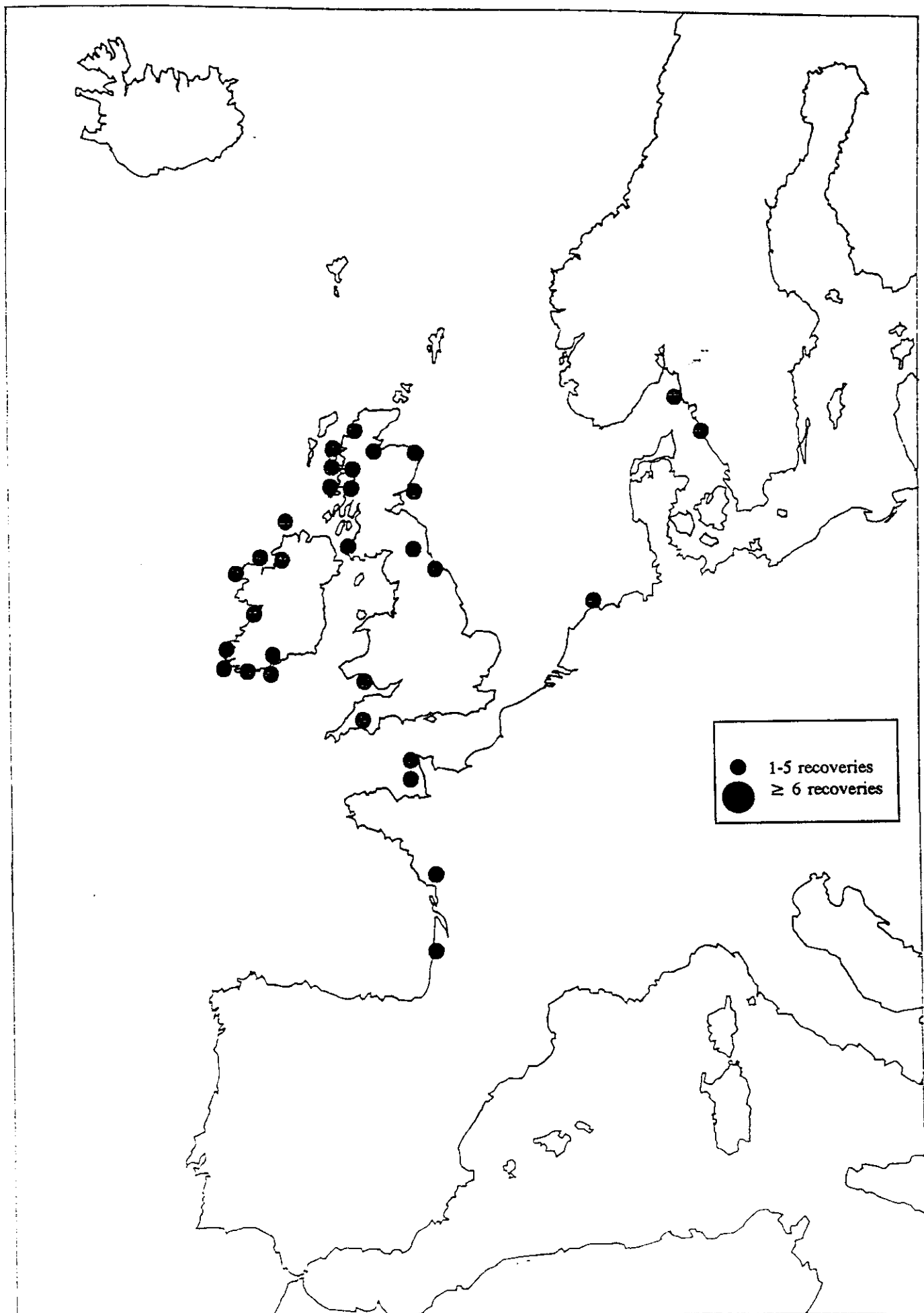


Figure 4.2

Recoveries of Guillemots ringed as chicks on Canna and recovered as second or third year birds during July - September, between 1970 and 1992.

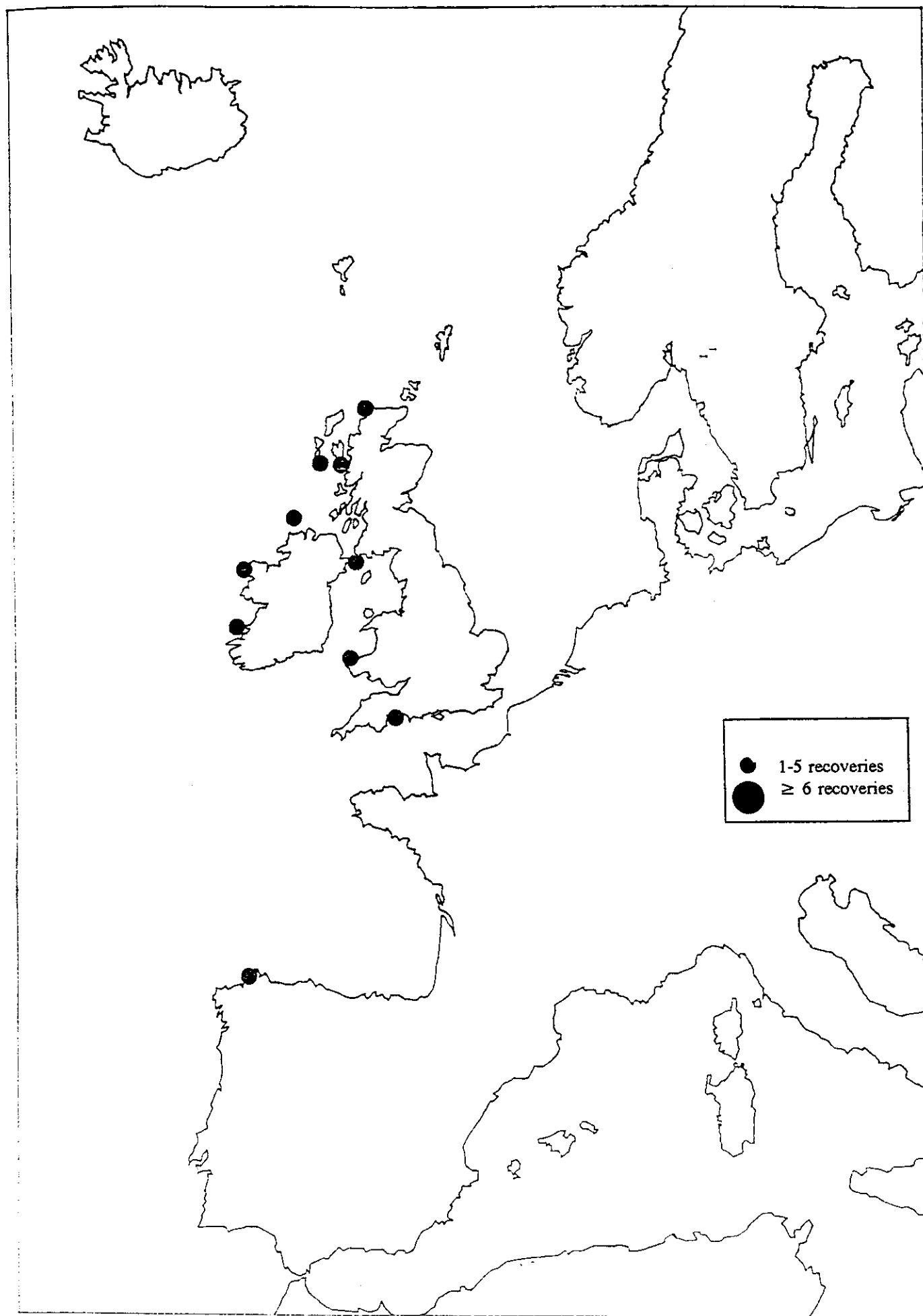


Figure 4.3

Recoveries of Guillemots ringed as chicks on Canna and recovered as fourth or fifth year birds during July - September, between 1970 and 1992.

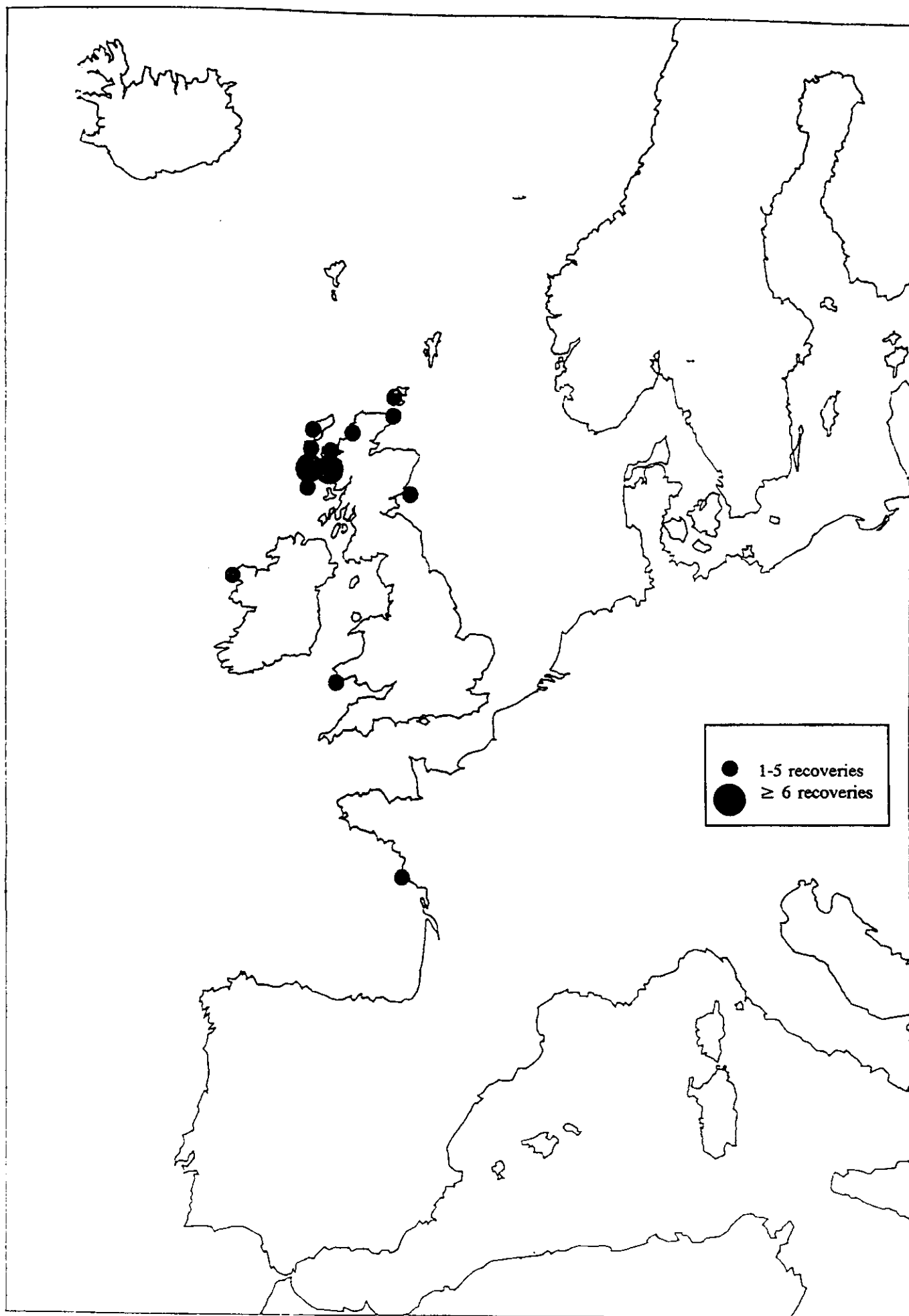


Figure 4.4 Recoveries of Guillemots ringed on Canna and recovered as adults during July - September, between 1970 and 1992. Adults include all birds ringed as full-grown birds or ringed as chicks and recovered during or after their sixth year of life.

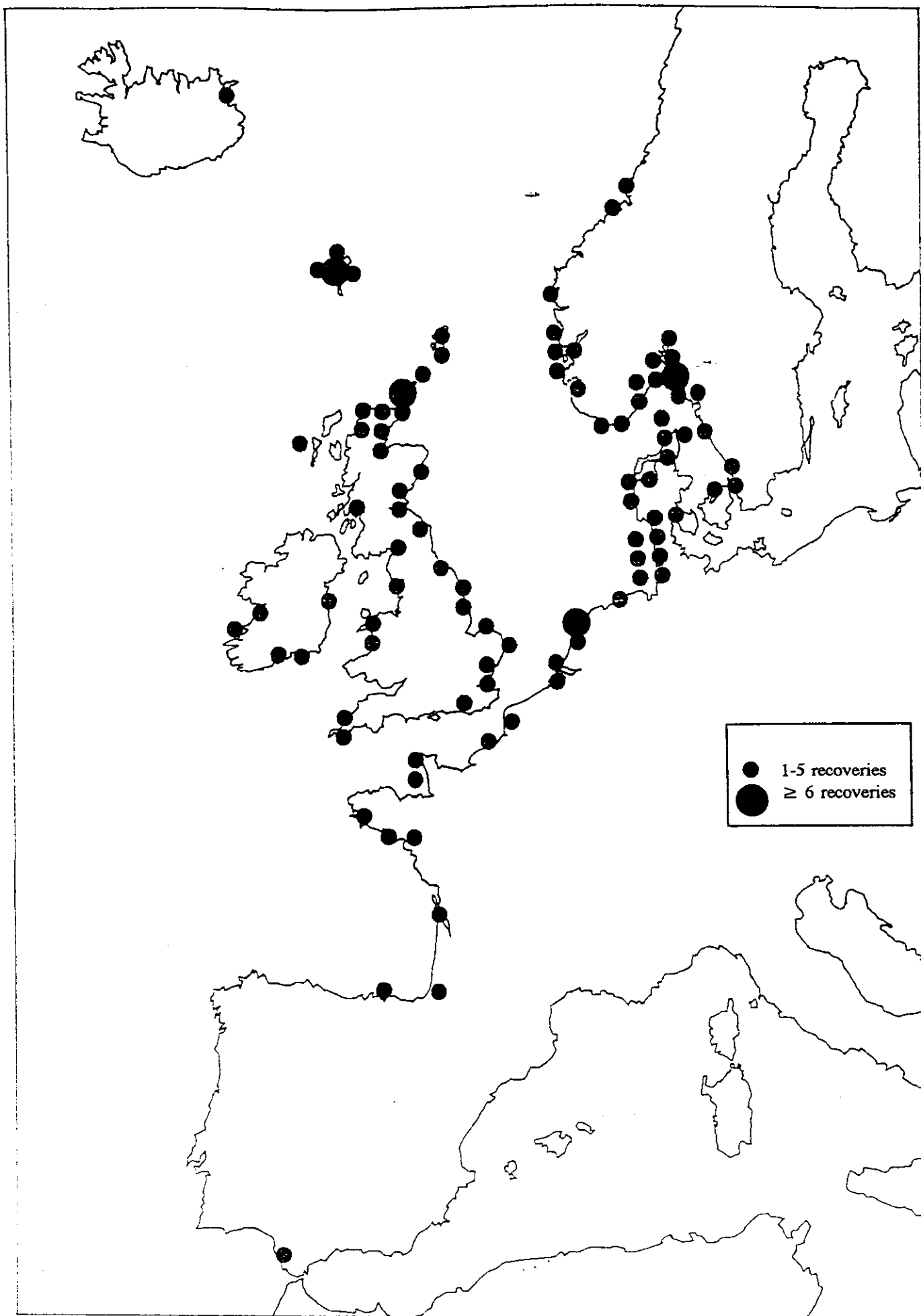


Figure 4.5

Recoveries of Guillemots ringed as chicks on Canna and recovered as first year birds during October - December, between 1970 and 1992.

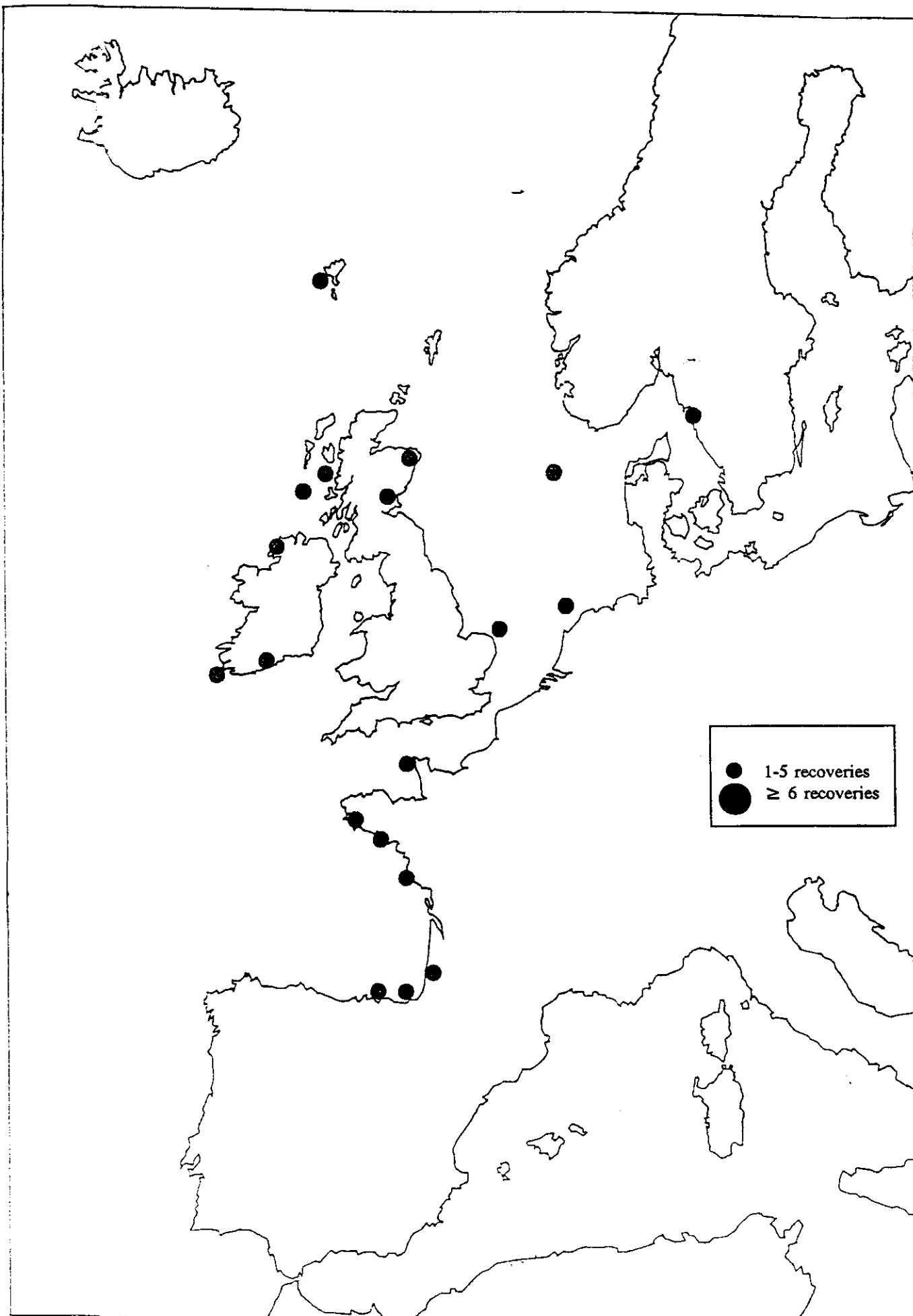


Figure 4.6

Recoveries of Guillemots ringed as chicks on Canna and recovered as second or third year birds during October - December, between 1970 and 1992.

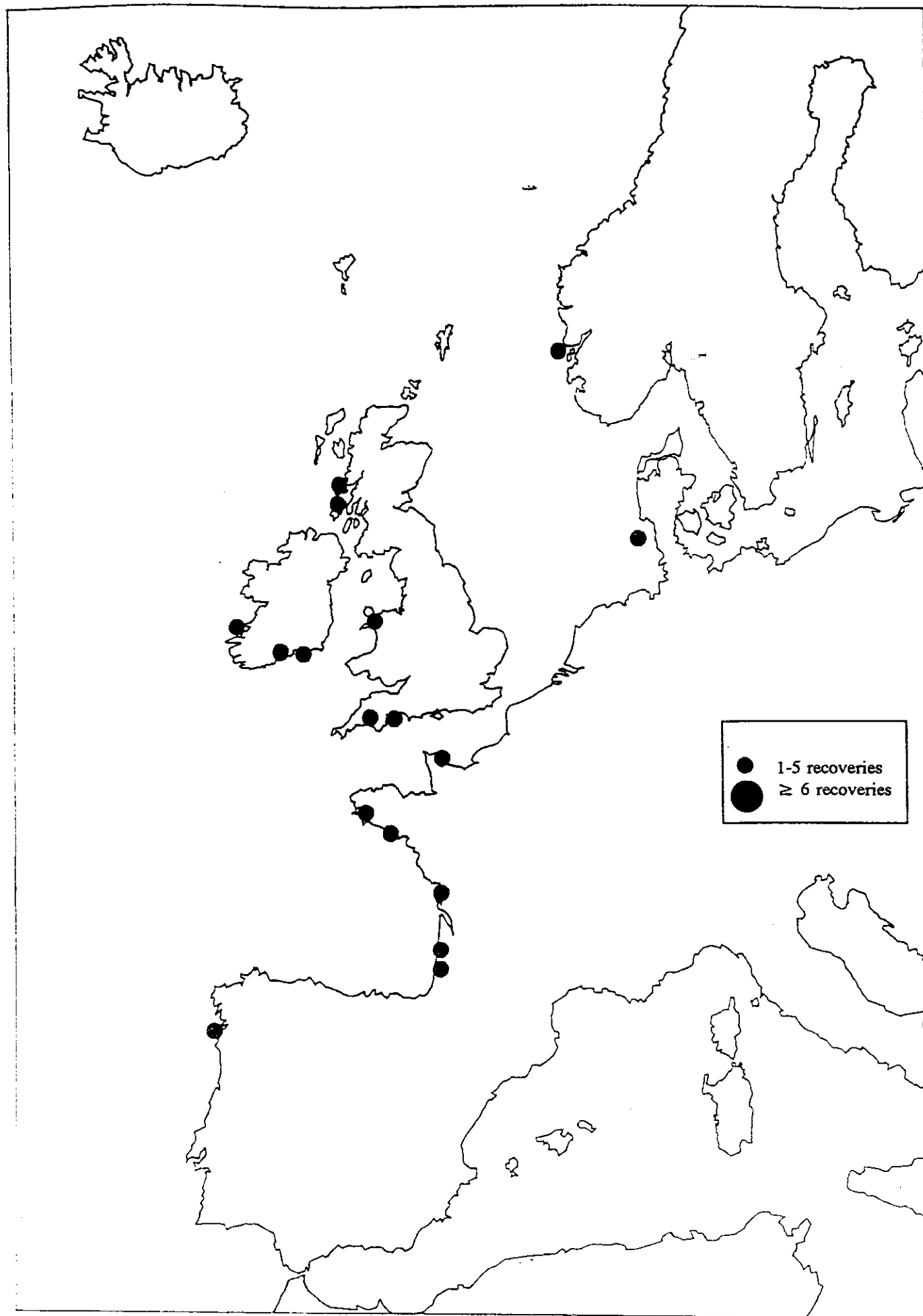


Figure 4.7

Recoveries of Guillemots ringed as chicks on Canna and recovered as fourth or fifth year birds during October - December, between 1970 and 1992.

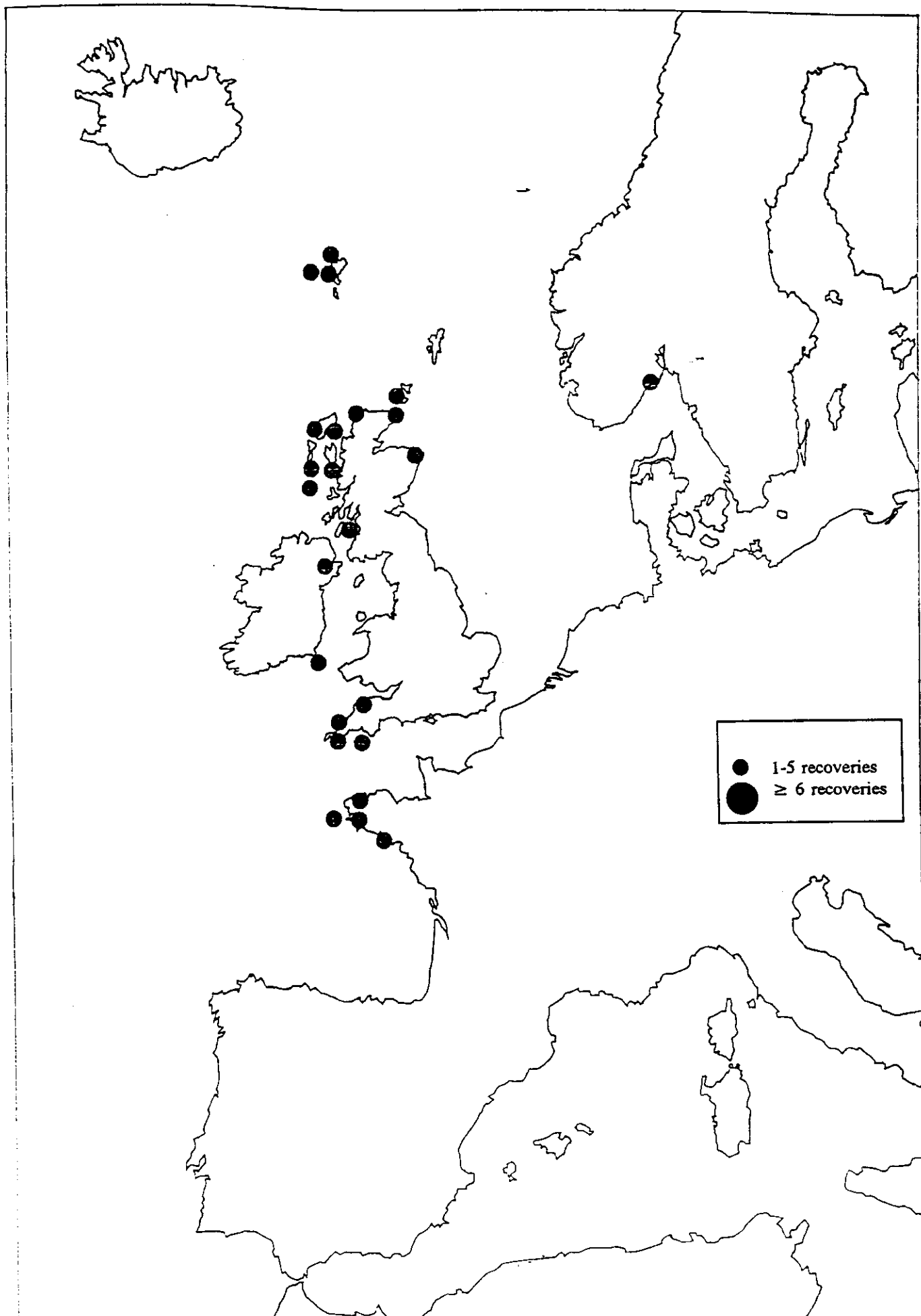


Figure 4.8

Recoveries of Guillemots ringed on Canna and recovered as adults during October - December, between 1970 and 1992. Adults include all birds ringed as full-grown birds or ringed as chicks and recovered during or after their sixth year of life.

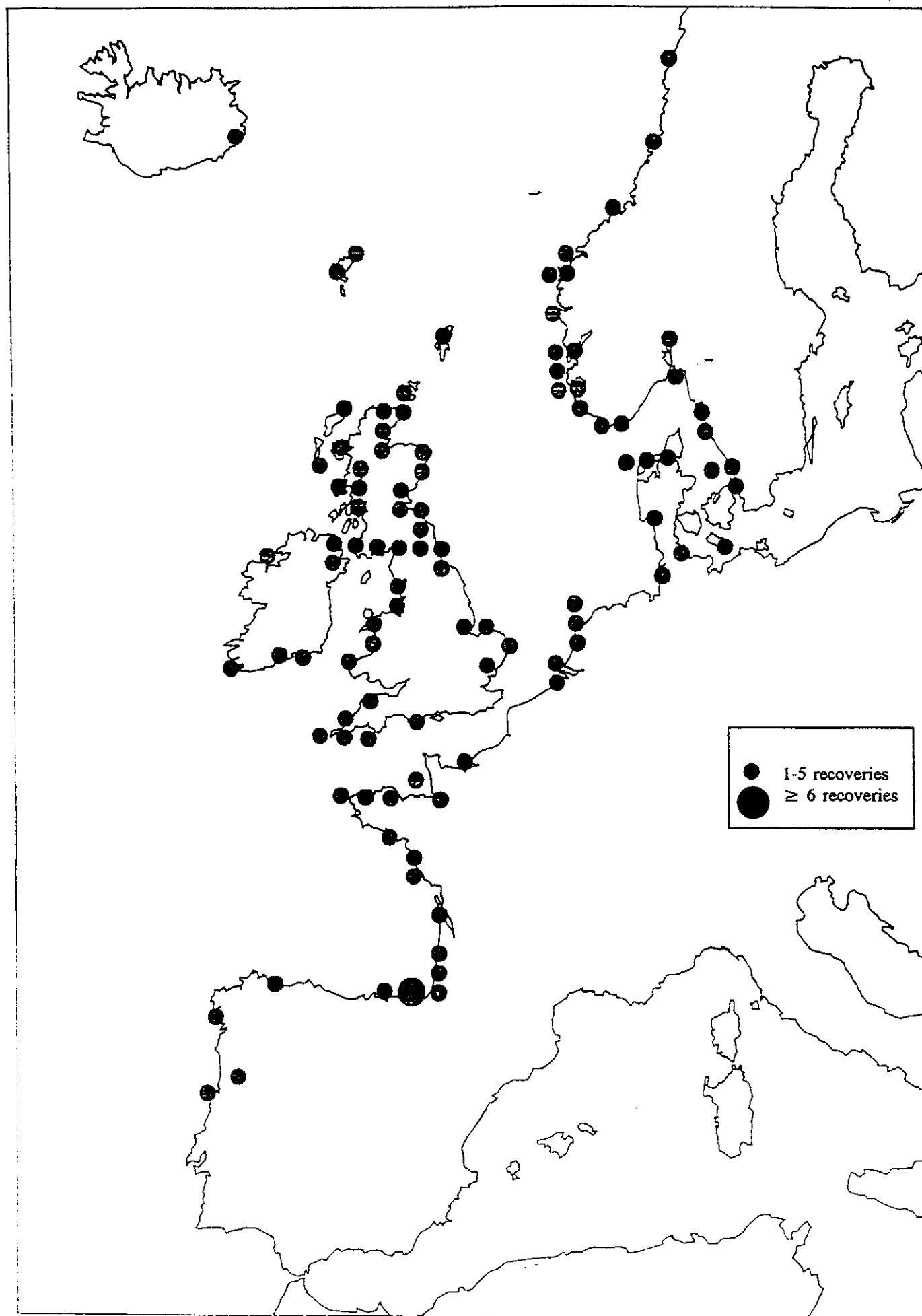


Figure 4.9 Recoveries of Guillemots ringed as chicks on Canna and recovered as first year birds during January - March, between 1970 and 1992.

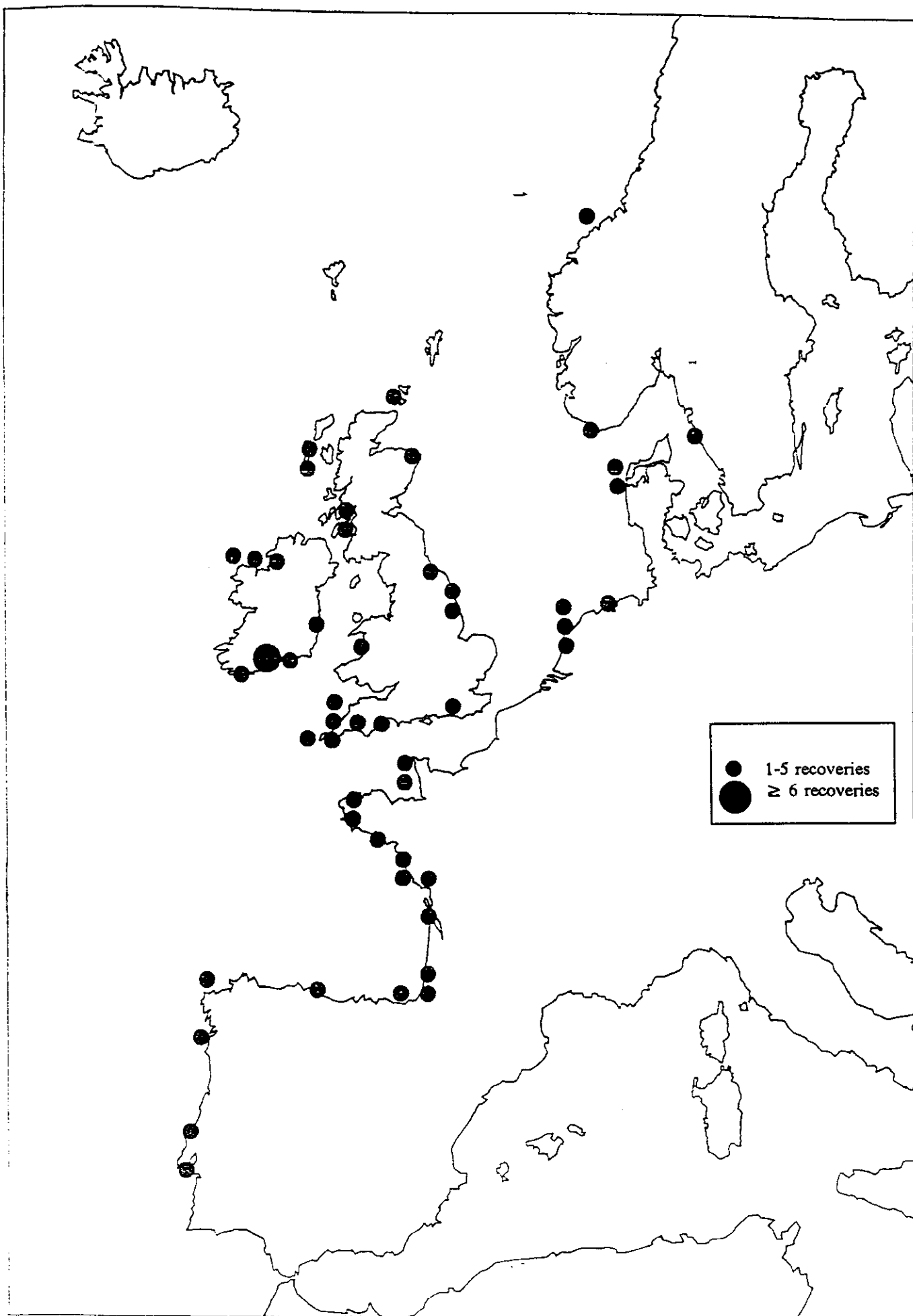


Figure 4.10 Recoveries of Guillemots ringed as chicks on Canna as chicks and recovered as second or third year birds during January - March, between 1970 and 1992.

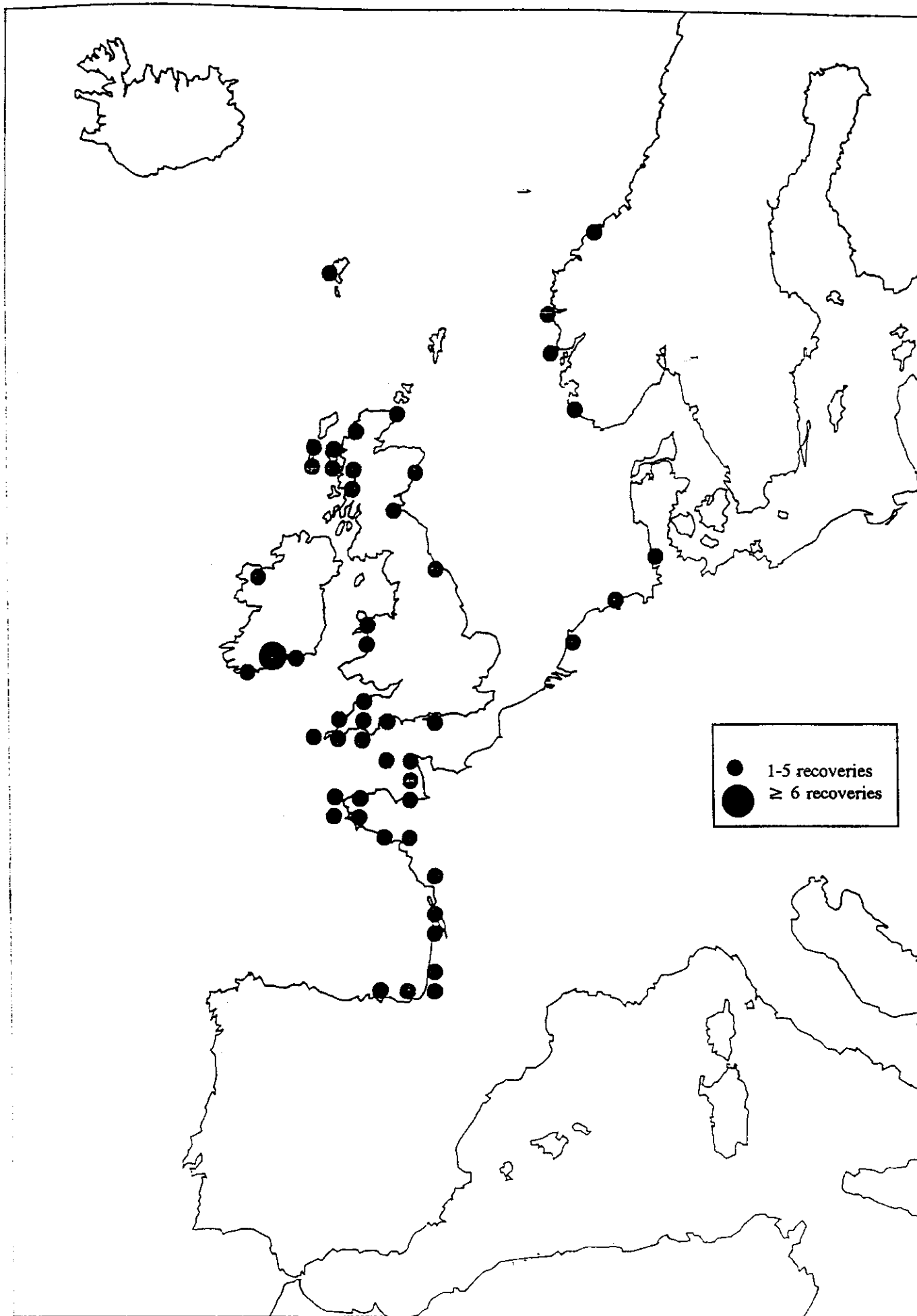


Figure 4.12

Recoveries of Guillemots ringed on Canna and recovered as adults during January - March, between 1970 and 1992. Adults include all birds ringed as full-grown birds or ringed as chicks and recovered during or after their sixth year of life.

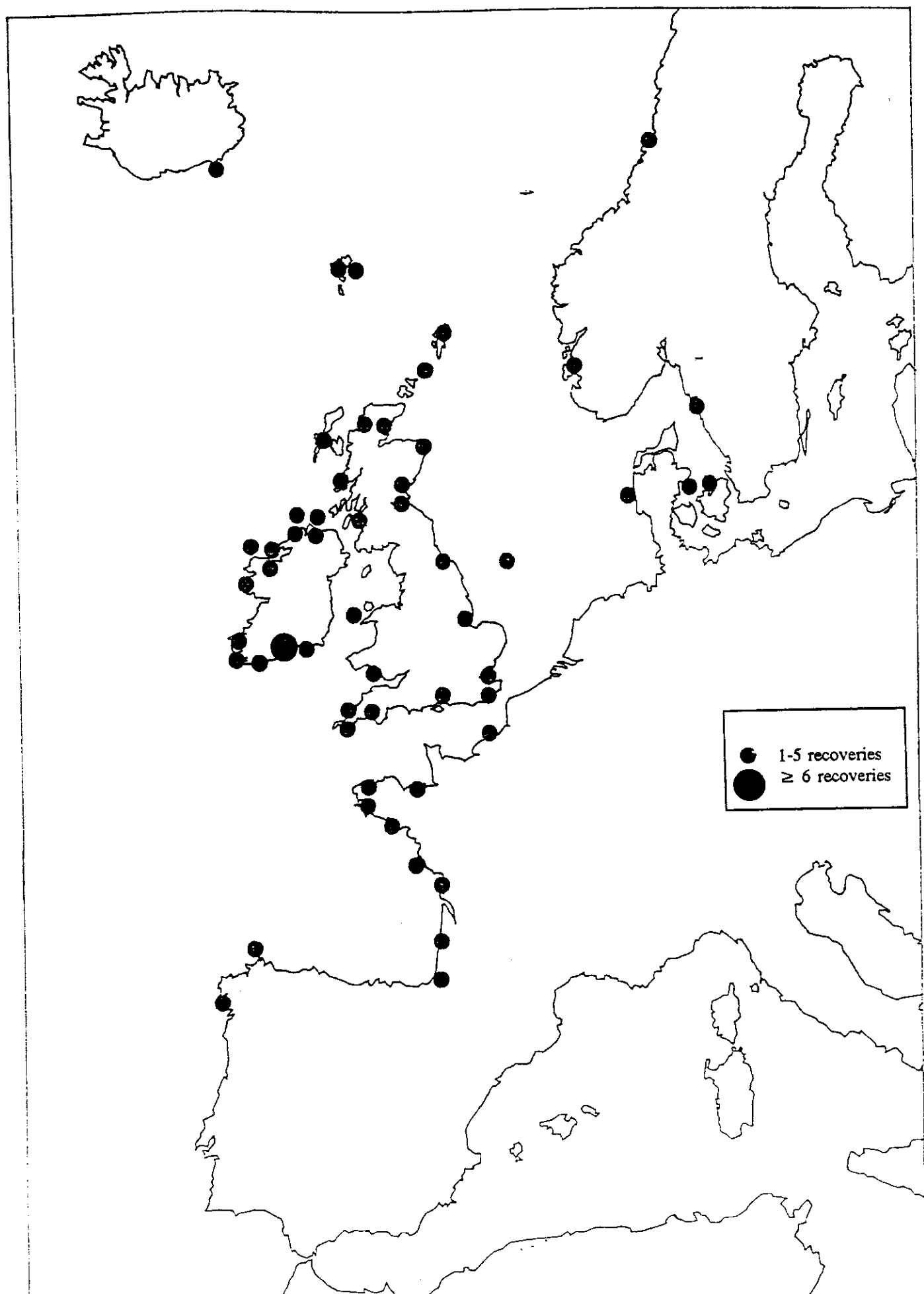


Figure 4.13 Recoveries of Guillemots ringed as chicks on Canna and recovered as first year birds during April - June, between 1970 and 1992.

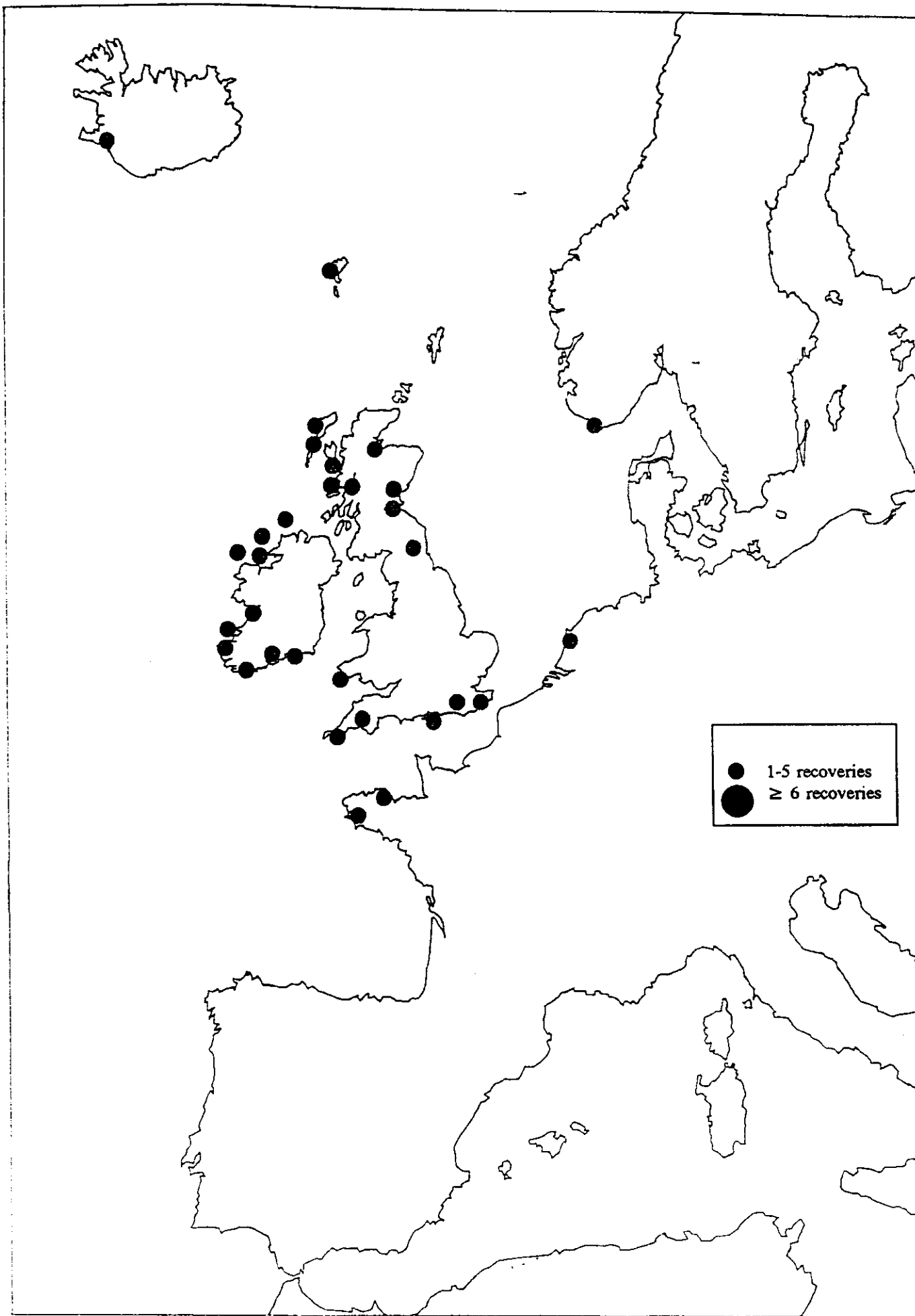


Figure 4.14 Recoveries of Guillemots ringed as chicks on Canna and recovered as second or third year birds during April - June, between 1970 and 1992.

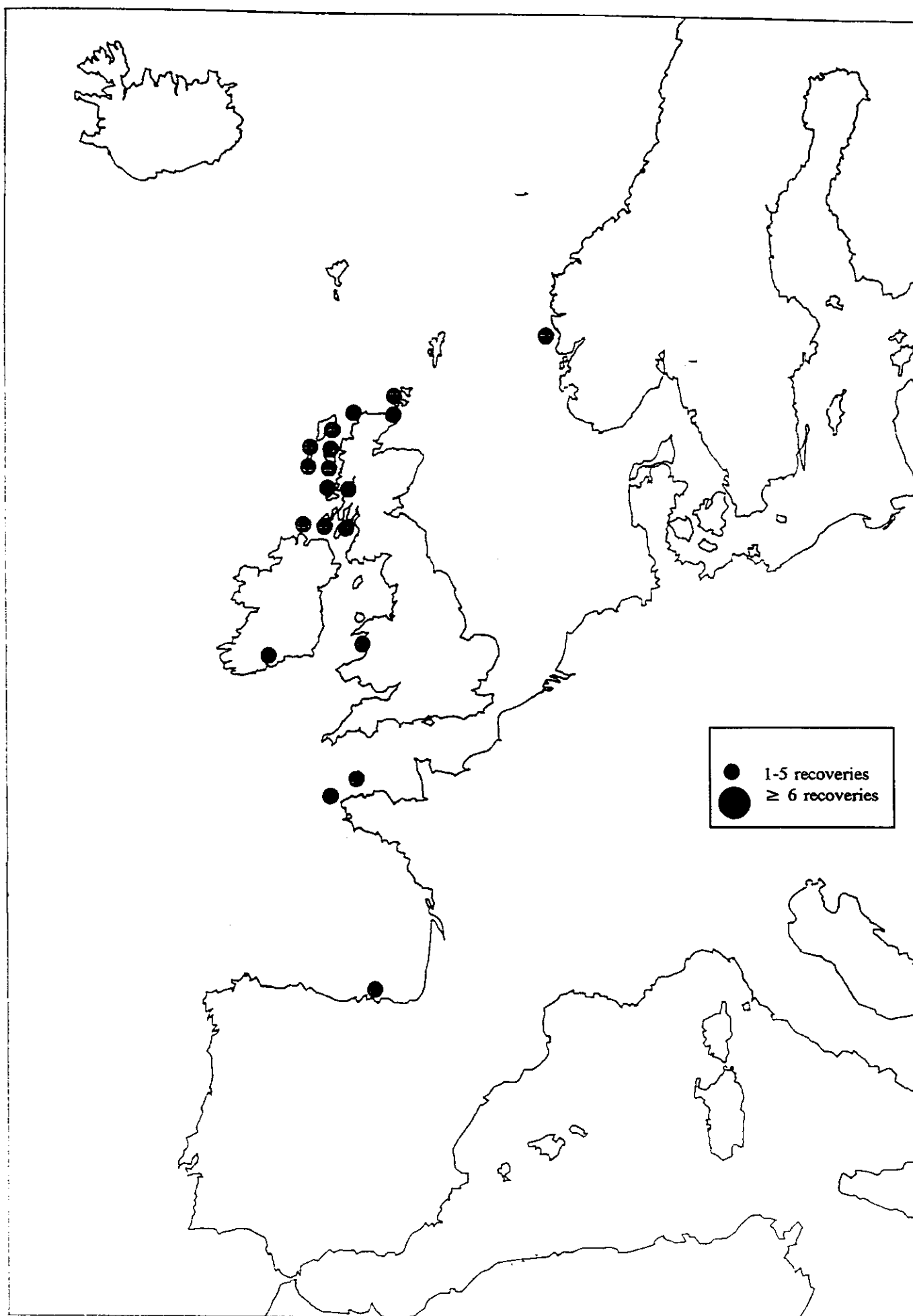


Figure 4.16

Recoveries of Guillemots ringed on Canna and recovered as adults during April - June, between 1970 and 1992. Adults include all birds ringed as full-grown birds or ringed as chicks and recovered during or after their sixth year of life.

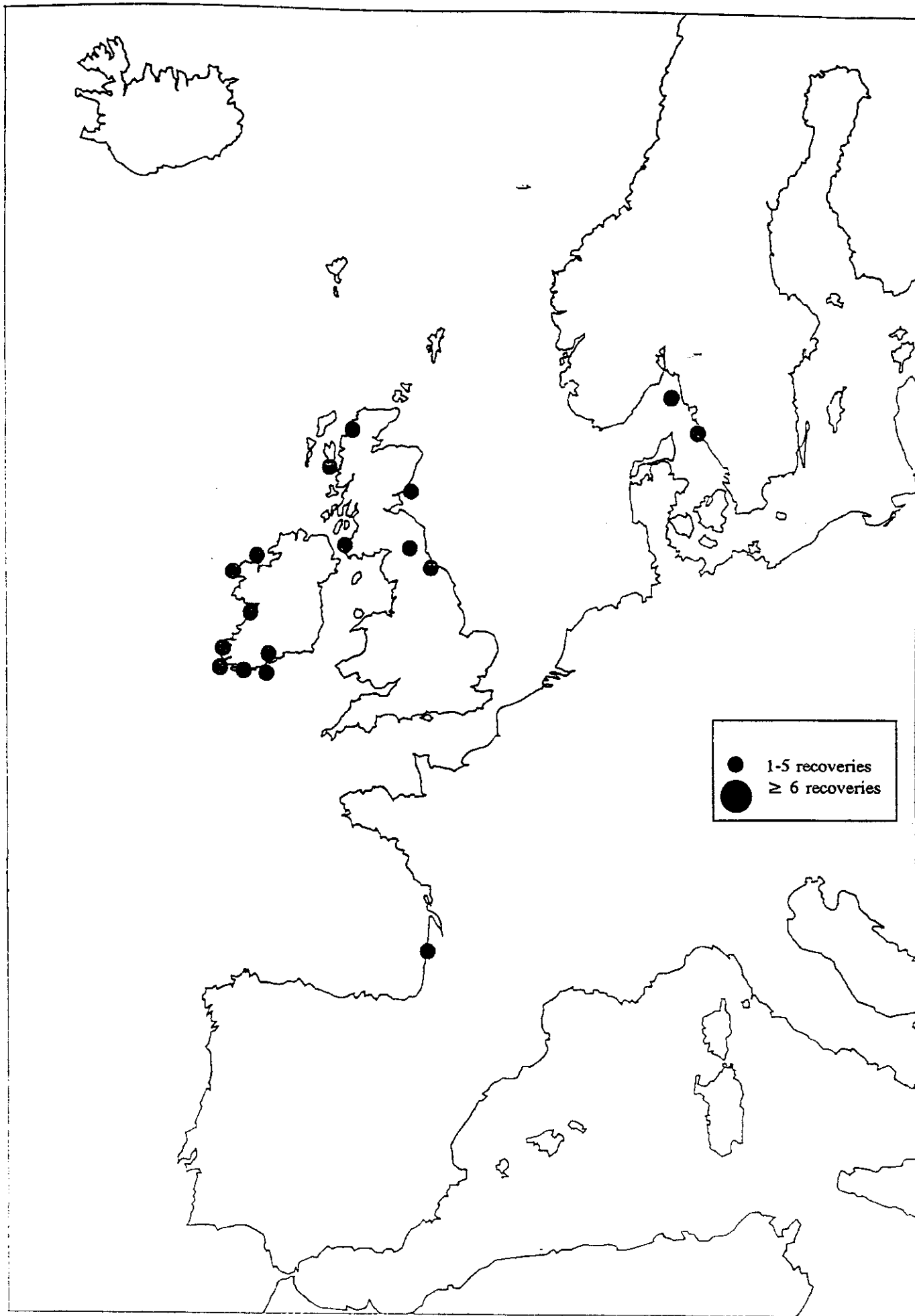


Figure 4.17 Recoveries of Guillemots ringed as chicks on Canna and recovered as second or third year birds during July - September, between 1970 and 1984.

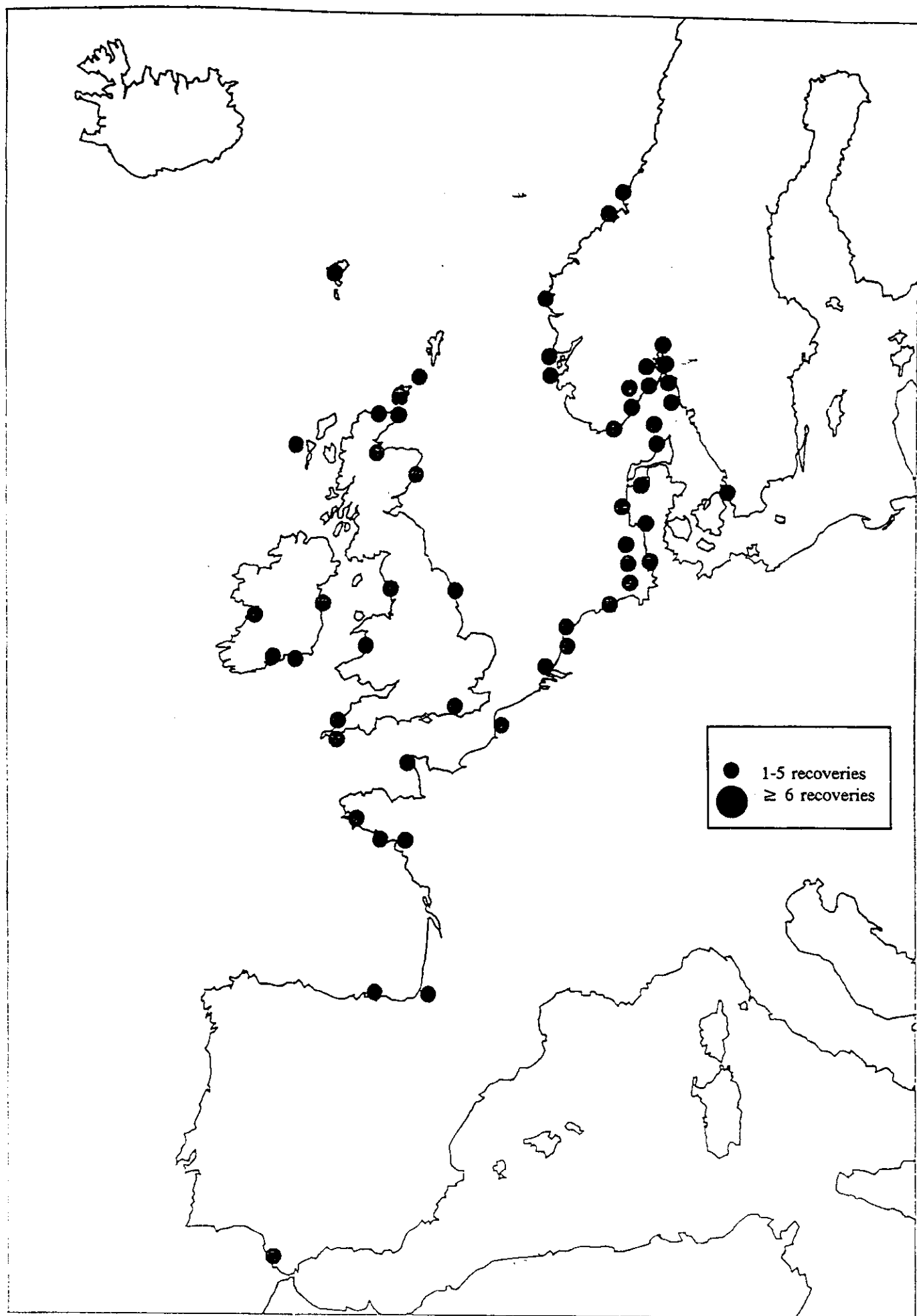


Figure 4.19 Recoveries of Guillemots ringed as chicks on Canna and recovered as first year birds during October - December, between 1970 and 1984.

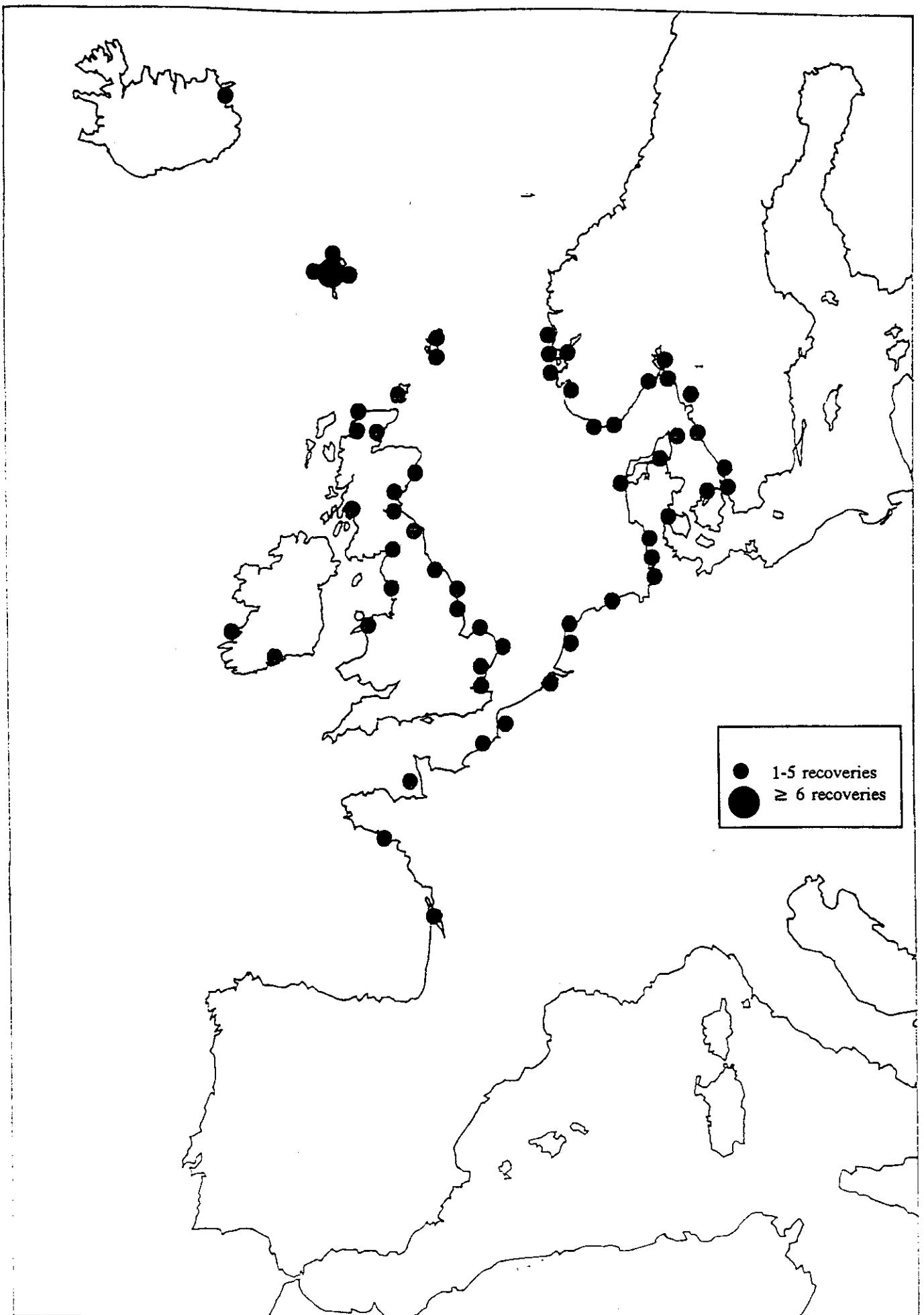


Figure 4.20 Recoveries of Guillemots ringed as chicks on Canna and recovered as first year birds during October - December, between 1985 and 1992.

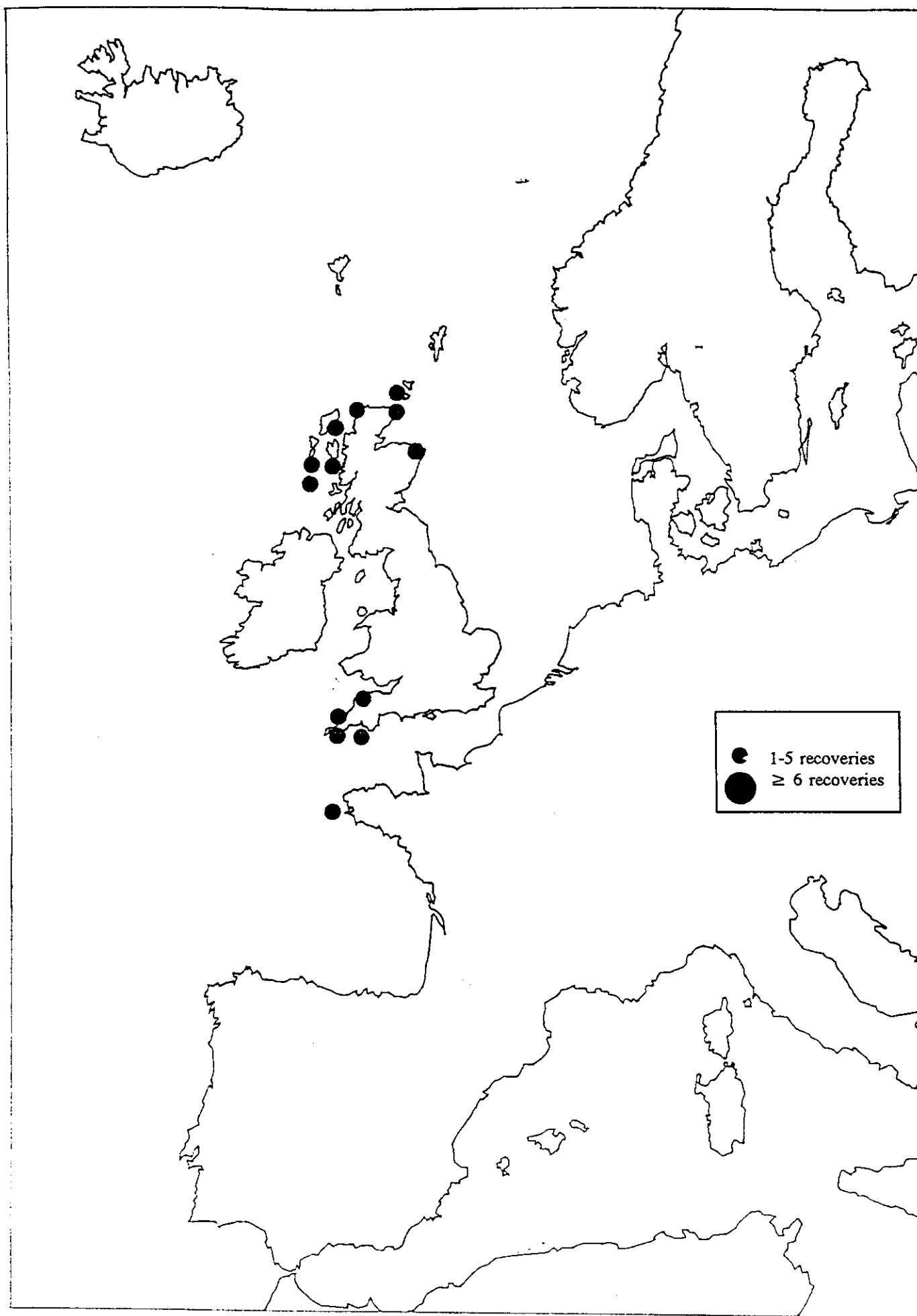


Figure 4.21 Recoveries of Guillemots ringed on Canna and recovered as adults during October - December, between 1970 and 1984. Adults include all birds ringed as full-grown birds or ringed as chicks and recovered during or after their sixth year of life.

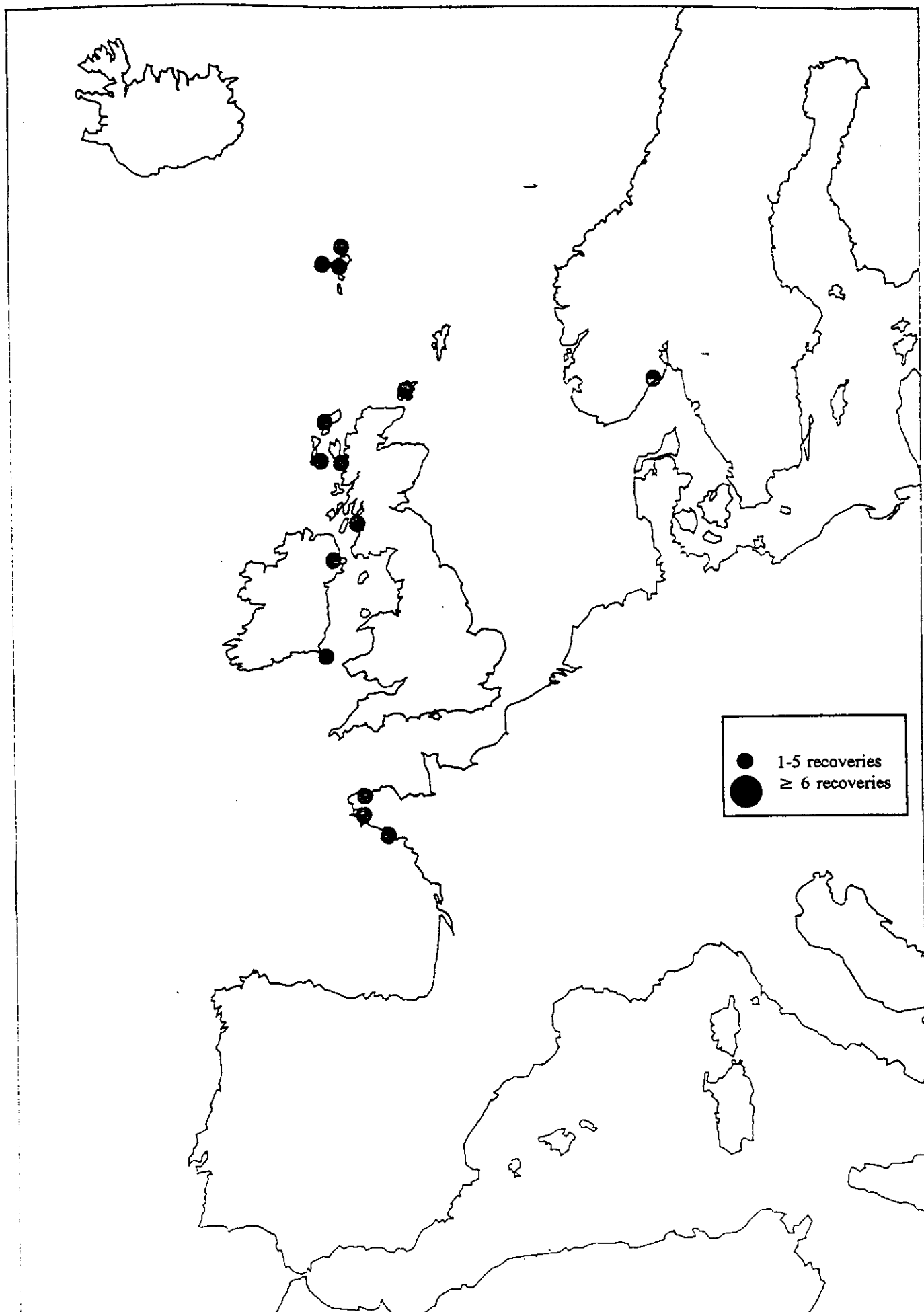


Figure 4.22

Recoveries of Guillemots ringed on Canna and recovered as adults, during October - December, between 1985 and 1992. Adults include all birds ringed as full-grown birds or ringed as chicks and recovered during or after their sixth year of life.

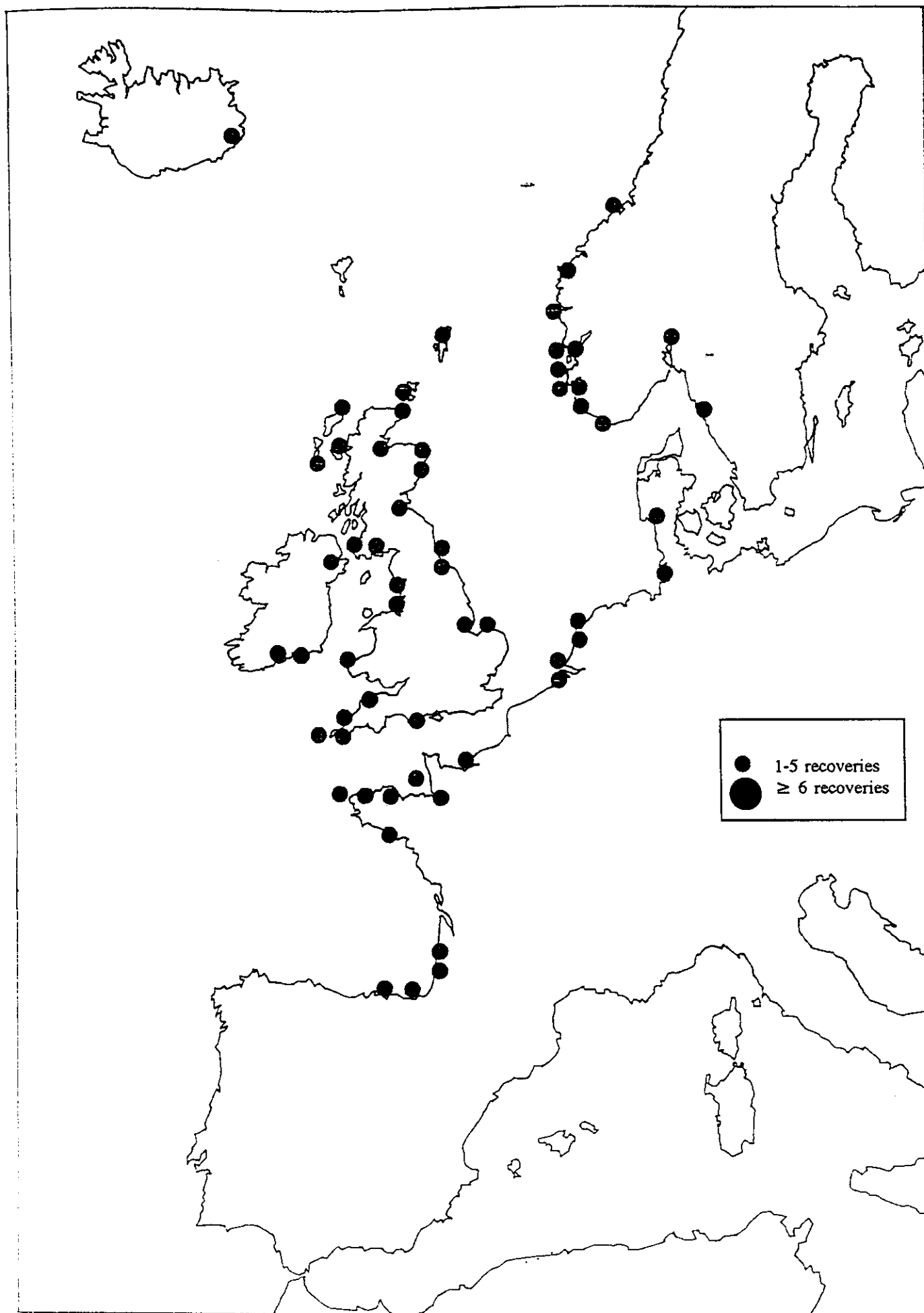


Figure 4.23 Recoveries of Guillemots ringed as chicks on Canna and recovered as first year birds during January - March, between 1970 and 1984.

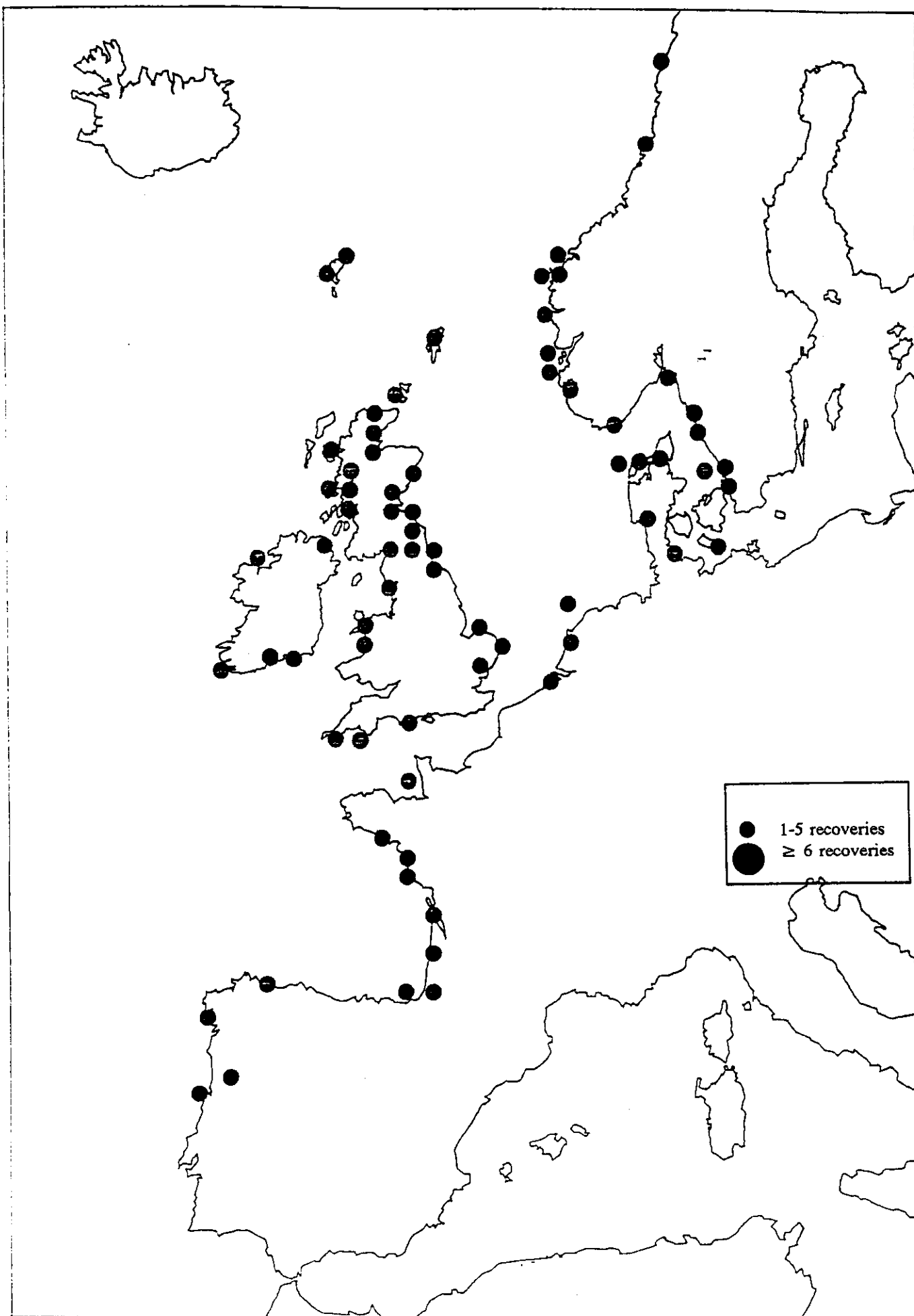


Figure 4.24 Recoveries of Guillemots ringed as chicks on Canna and recovered as first year birds during January - March, between 1985 and 1992.

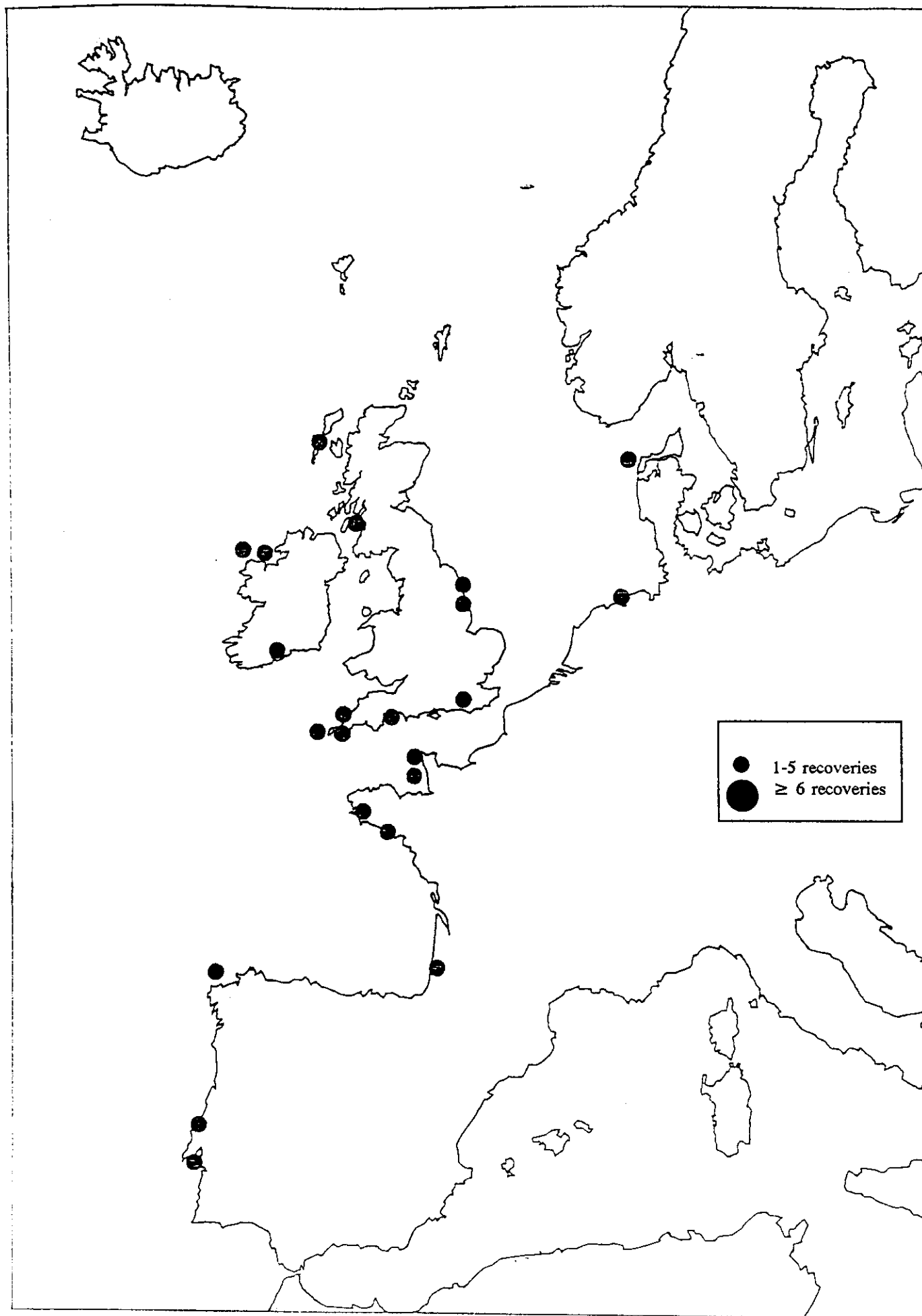


Figure 4.25 Recoveries of Guillemots ringed as chicks on Canna and recovered as second or third year birds during January - March, between 1970 and 1984.

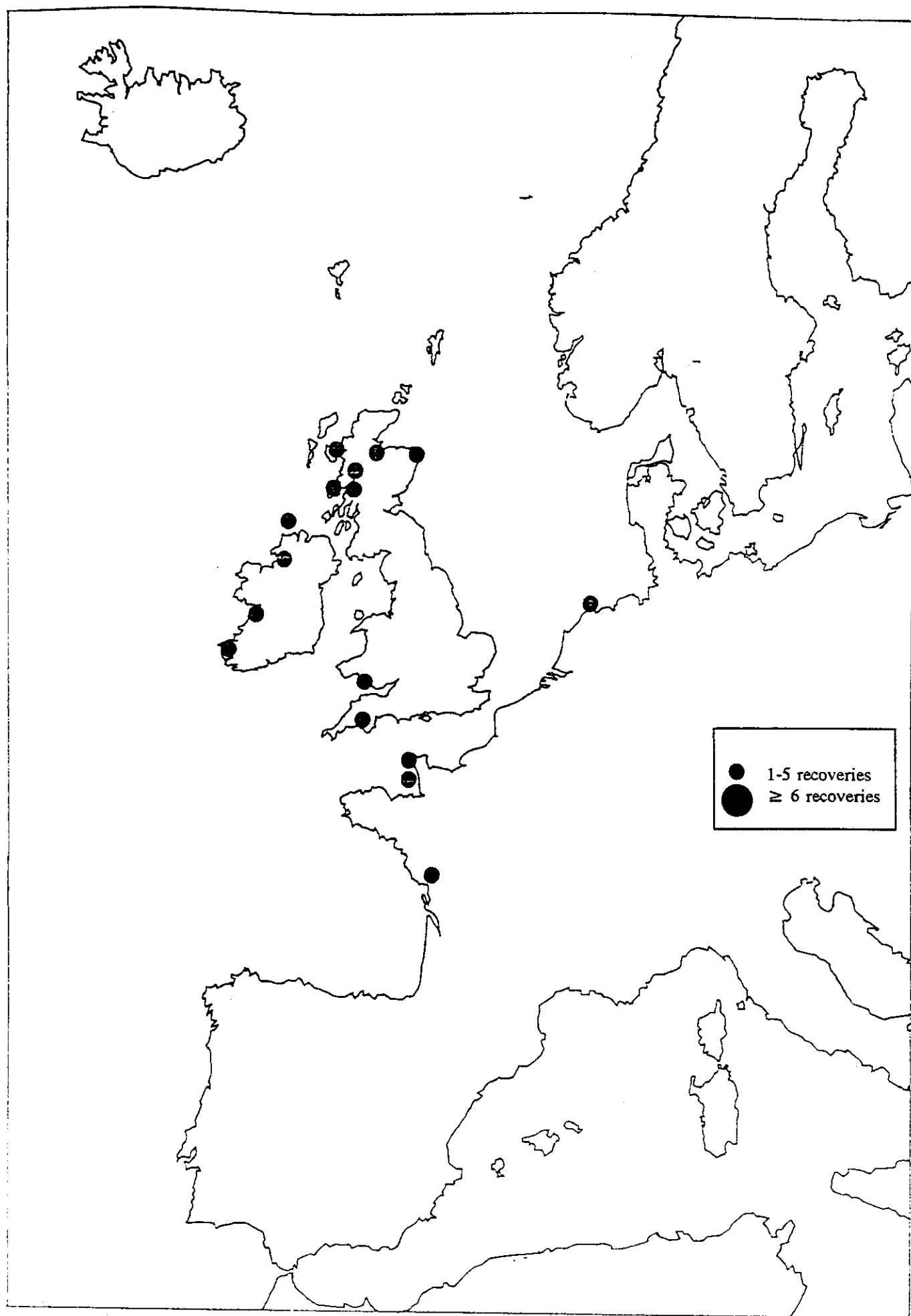


Figure 4.26 Recoveries of Guillemots ringed as chicks on Canna and recovered as second or third year birds during January - March, between 1985 and 1992.

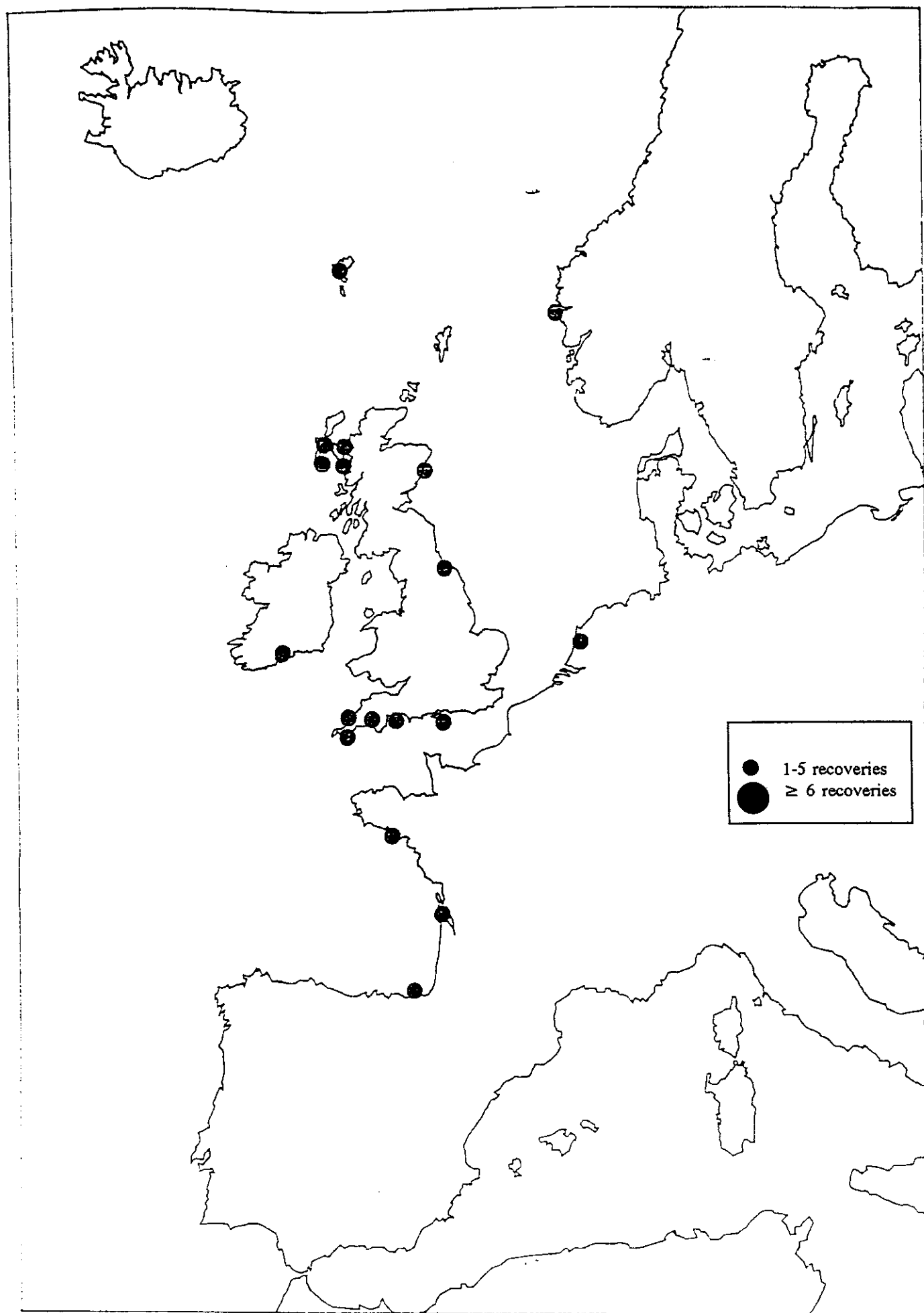


Figure 4.27 Recoveries of Guillemots ringed on Canna and recovered as adults during January - March, between 1970 and 1984. Adults include all birds ringed as full-grown birds or ringed as chicks and recovered during or after their sixth year of life.

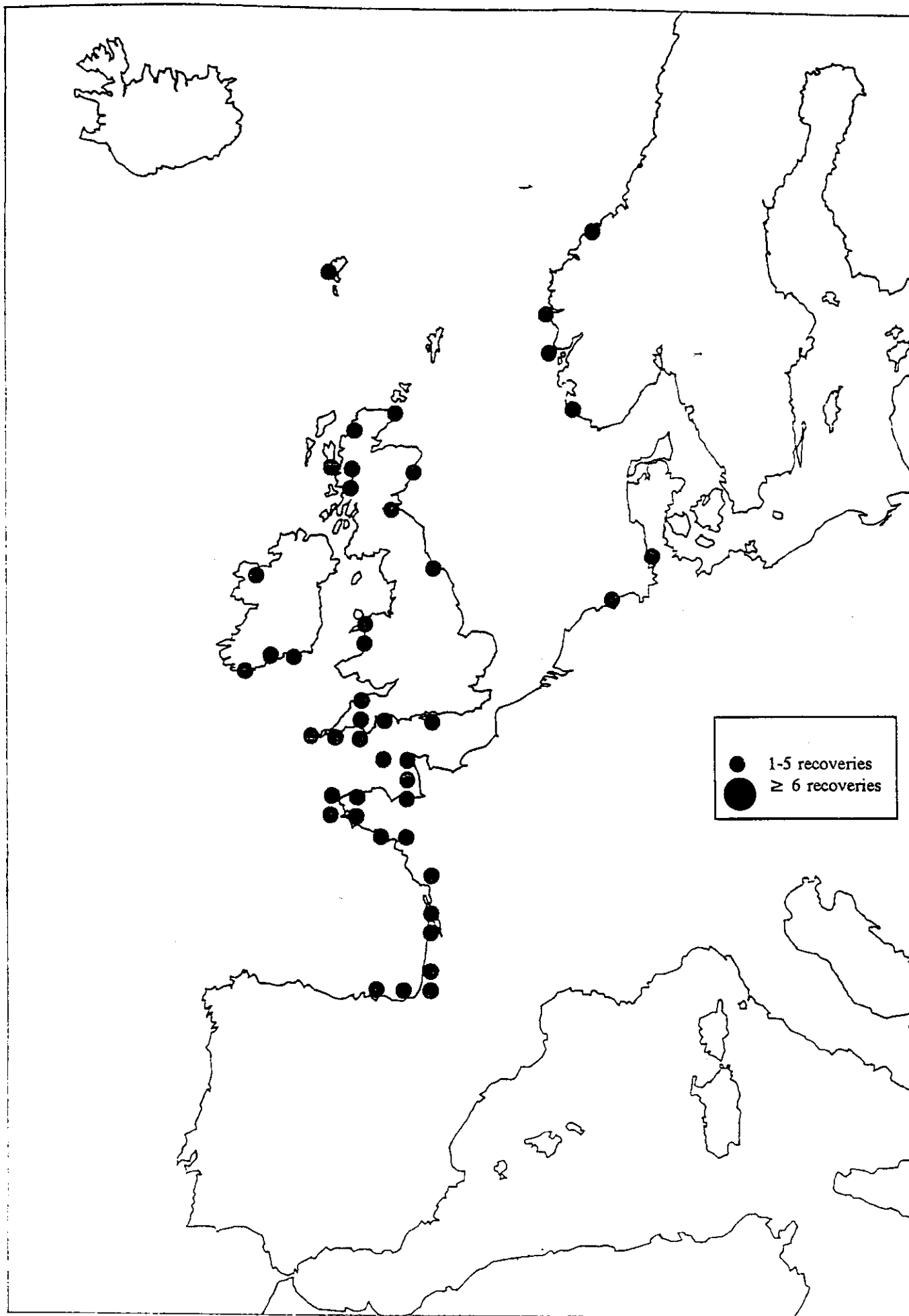


Figure 4.28

Recoveries of Guillemots ringed on Canna and recovered as adults during January - March, between 1985 and 1992. Adults include all birds ringed as full-grown birds or ringed as chicks and recovered during or after their sixth year of life.

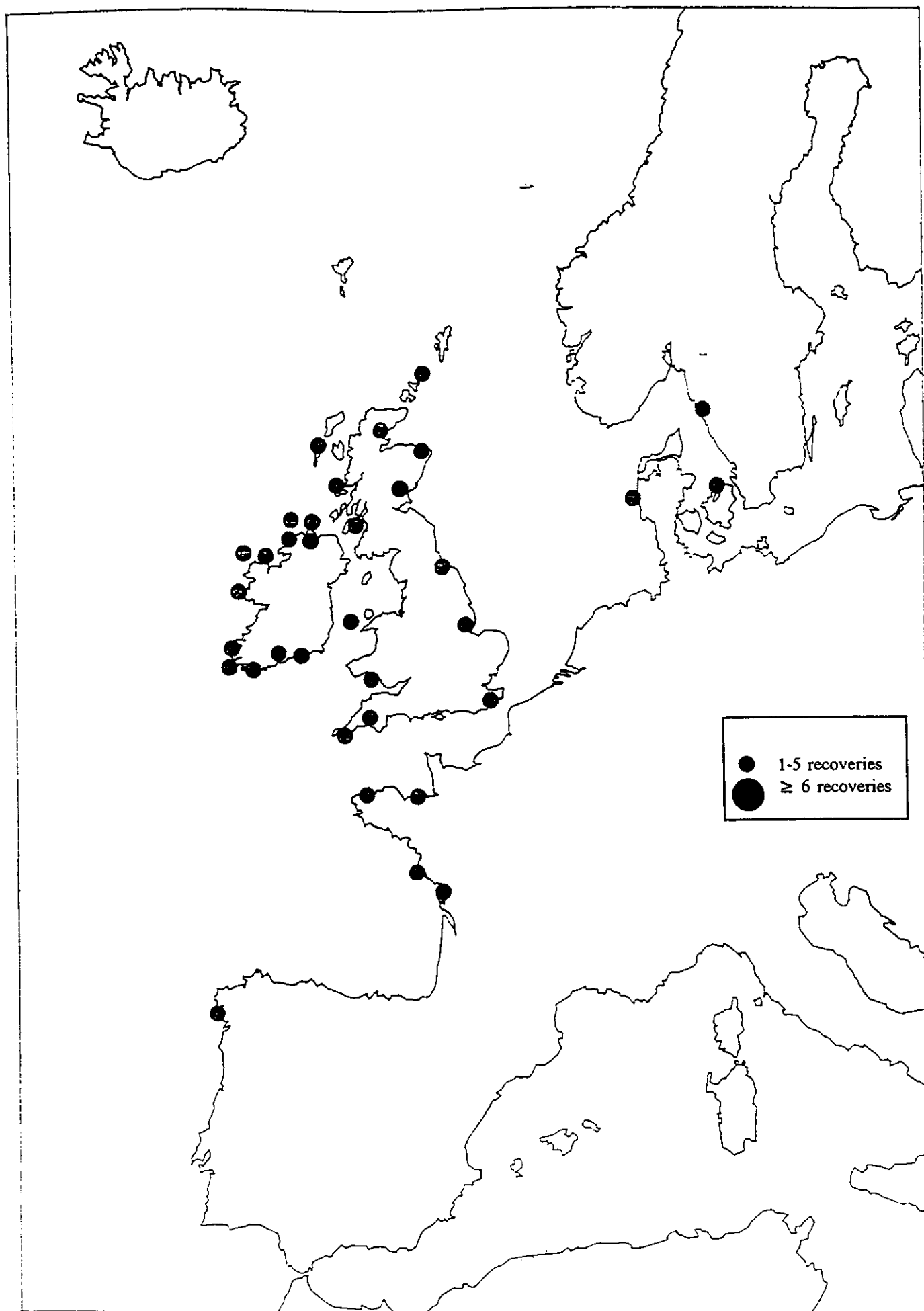


Figure 4.29 Recoveries of Guillemots ringed as chicks on Canna and recovered as first year birds during April - June, between 1970 and 1984.

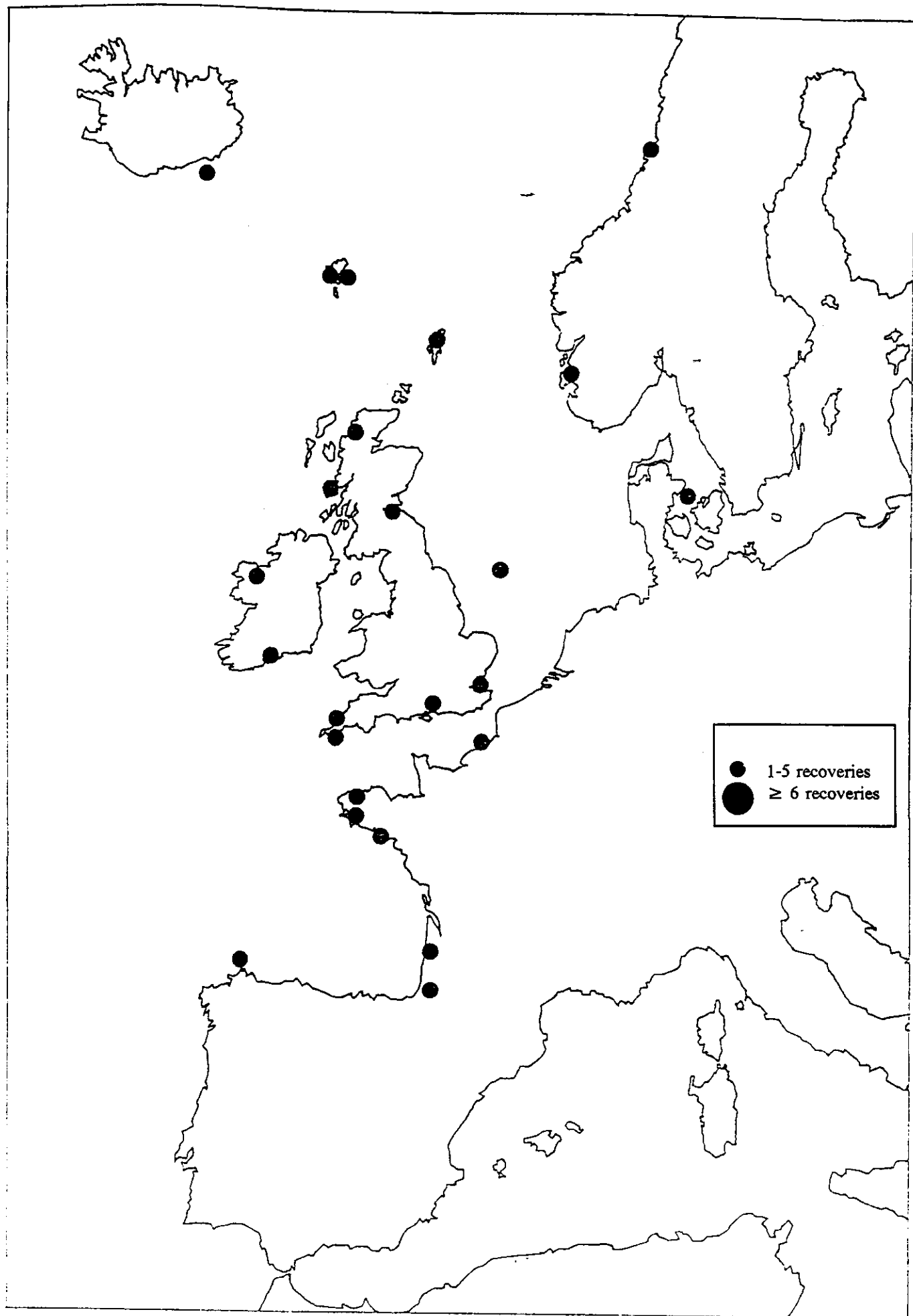


Figure 4.30 Recoveries of Guillemots ringed as chicks on Canna and recovered as first year birds during April - June, between 1985 and 1992.

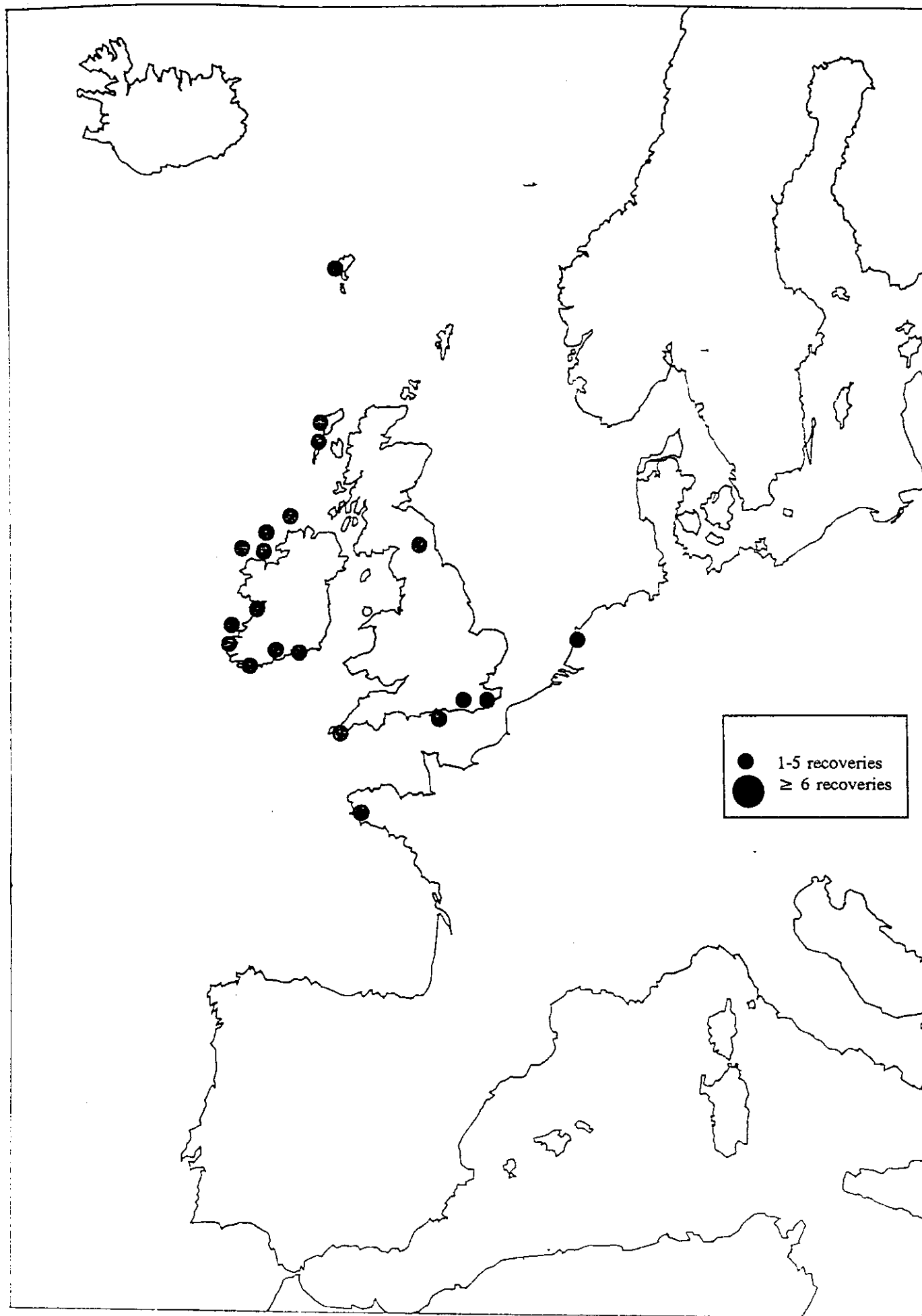


Figure 4.31 Recoveries of Guillemots ringed as chicks on Canna and recovered as second or third year birds during April - June, between 1970 and 1984.

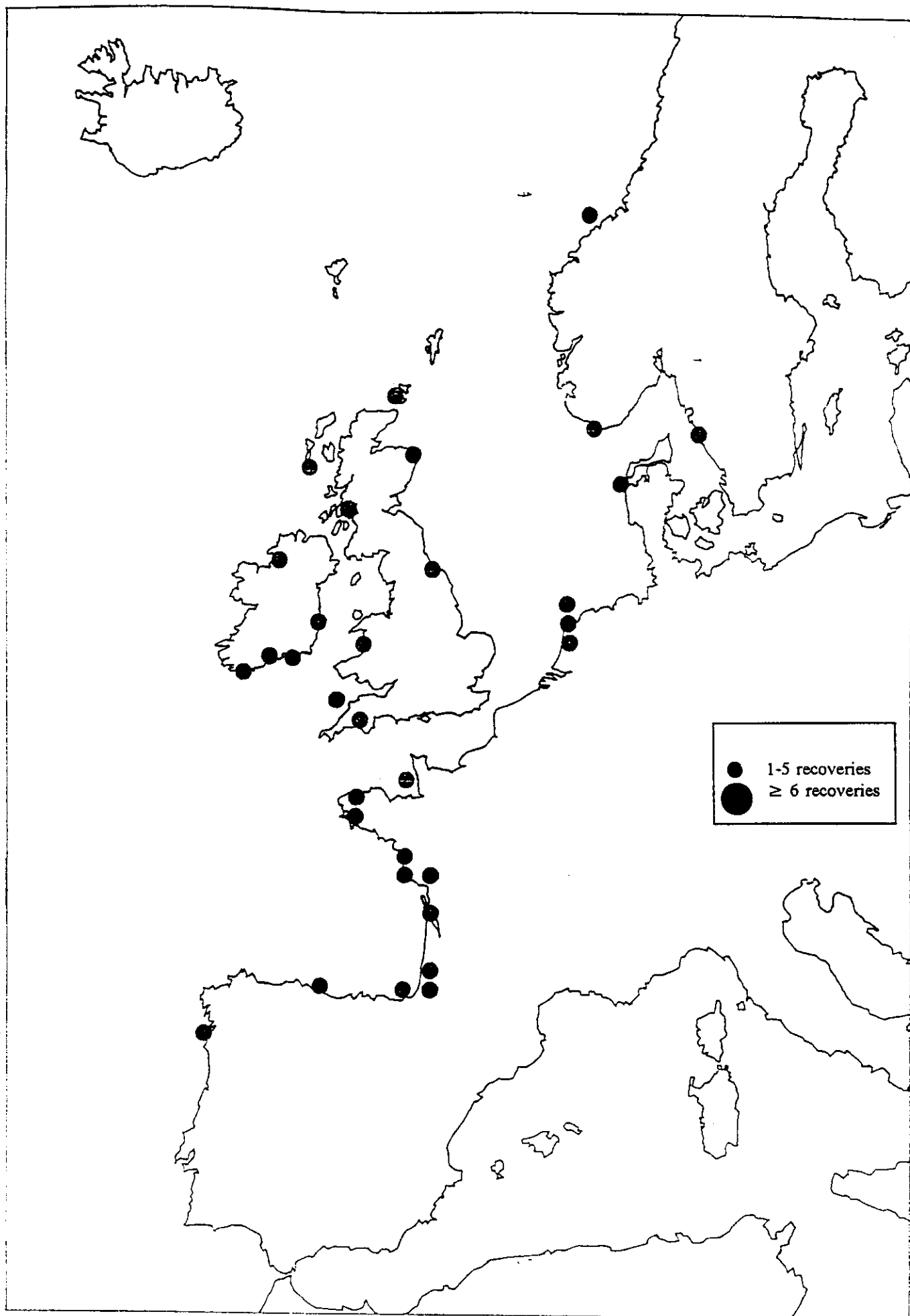


Figure 4.32 Recoveries of Guillemots ringed as chicks on Canna and recovered as second or third year birds during April - June, between 1985 and 1992.

Section 5

Recoveries of Guillemots ringed in
Outer Hebrides, Shiant's and North Rona



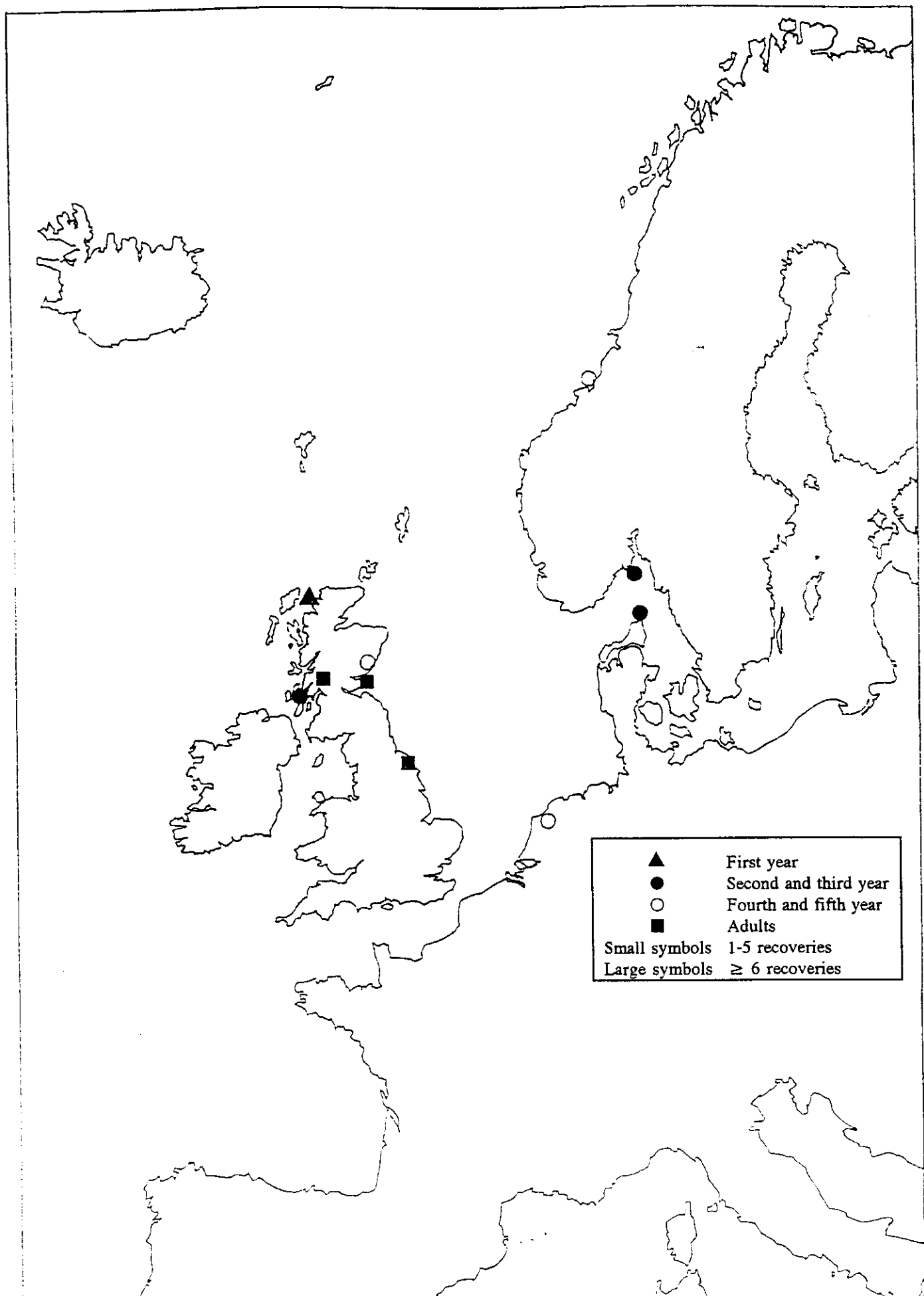


Figure 5.1

Recoveries of Guillemots ringed on the Outer Hebrides, Shiant Islands and North Rona and recovered during July - September, between 1970 and 1992.

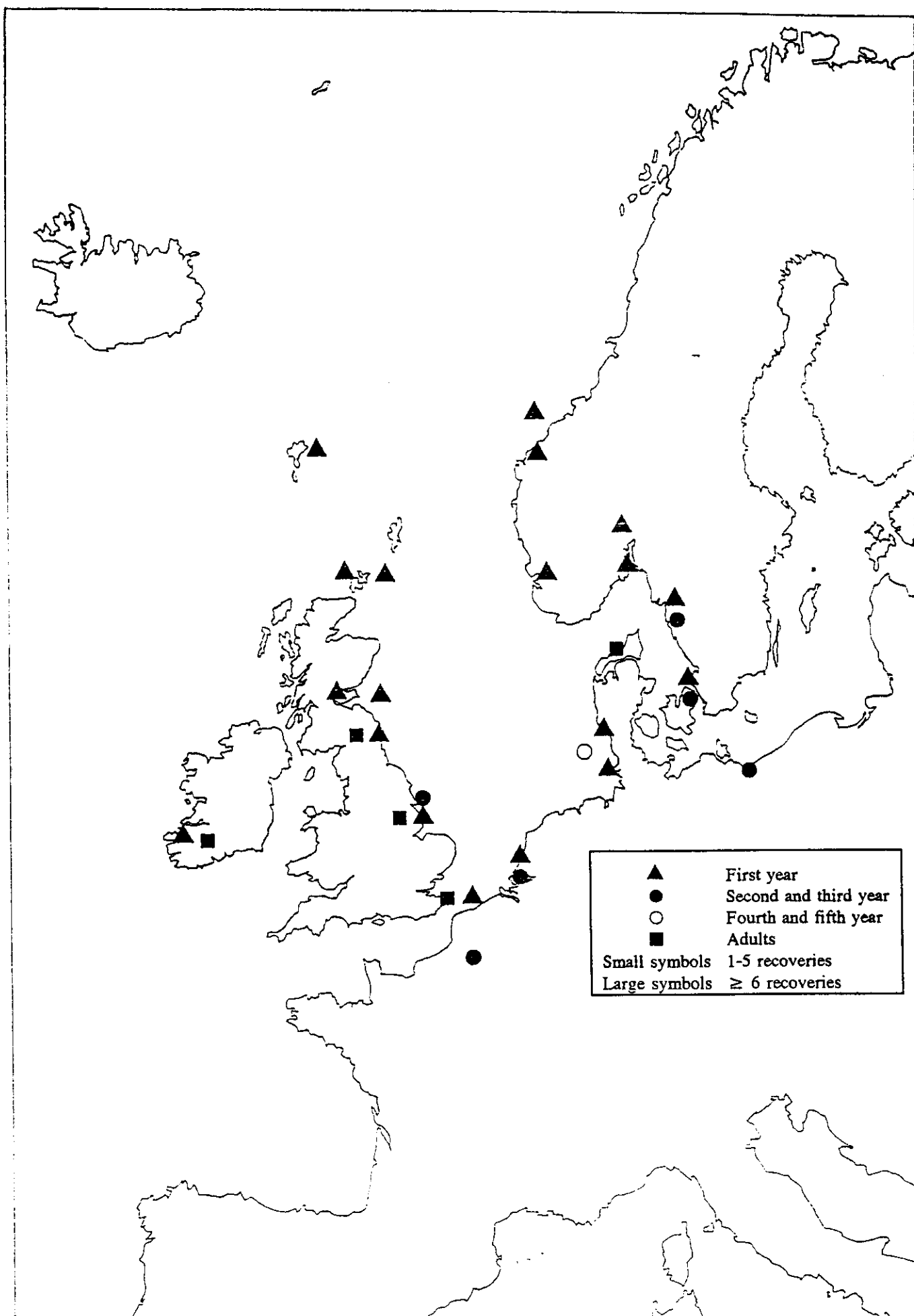


Figure 5.2

Recoveries of Guillemots ringed on the Outer Hebrides, Shiant Islands and North Rona and recovered during October - December, between 1970 and 1992.

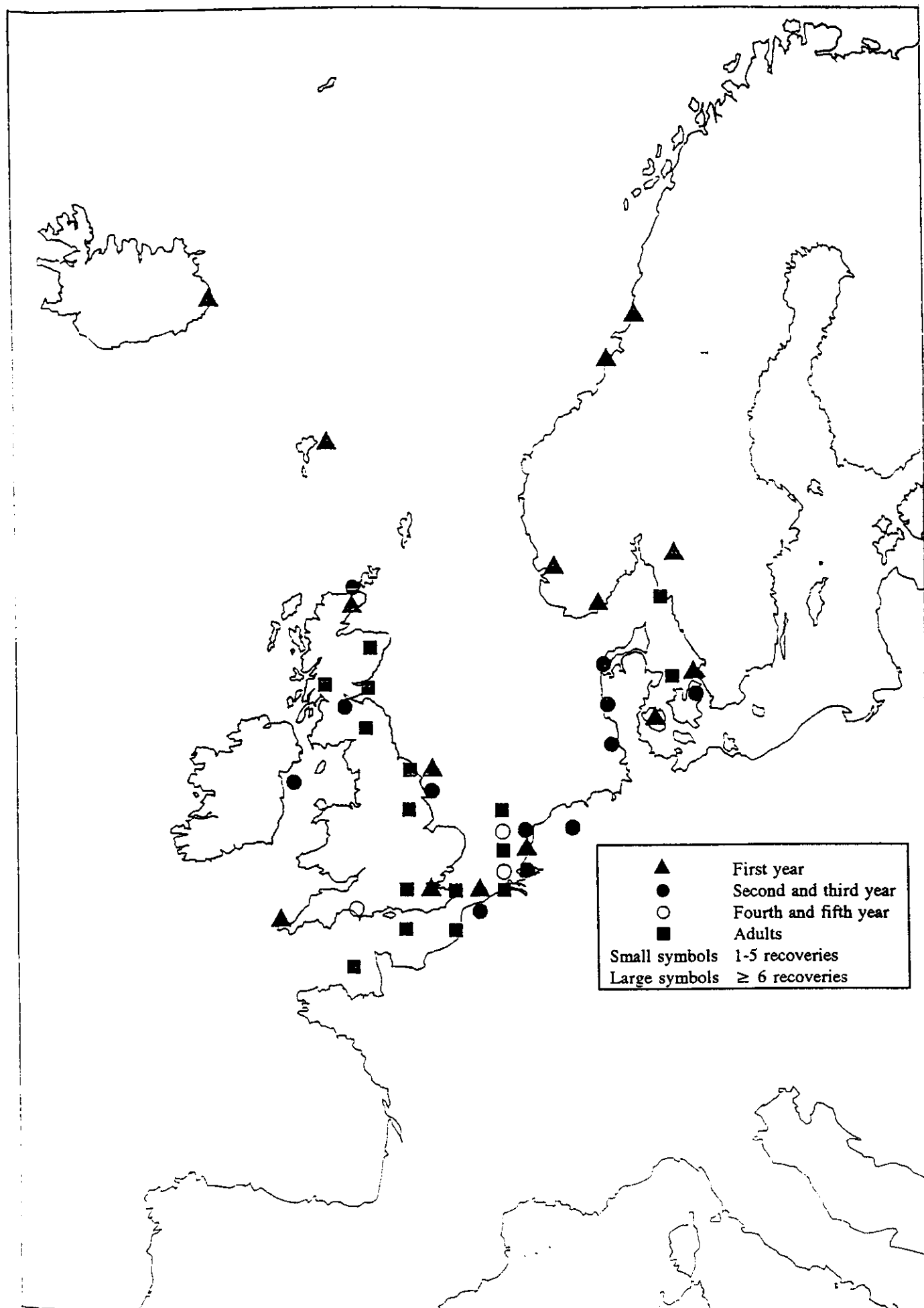


Figure 5.3 Recoveries of Guillemots ringed on the Outer Hebrides, Shiantis and North Rona and recovered during January - March, between 1970 and 1992.

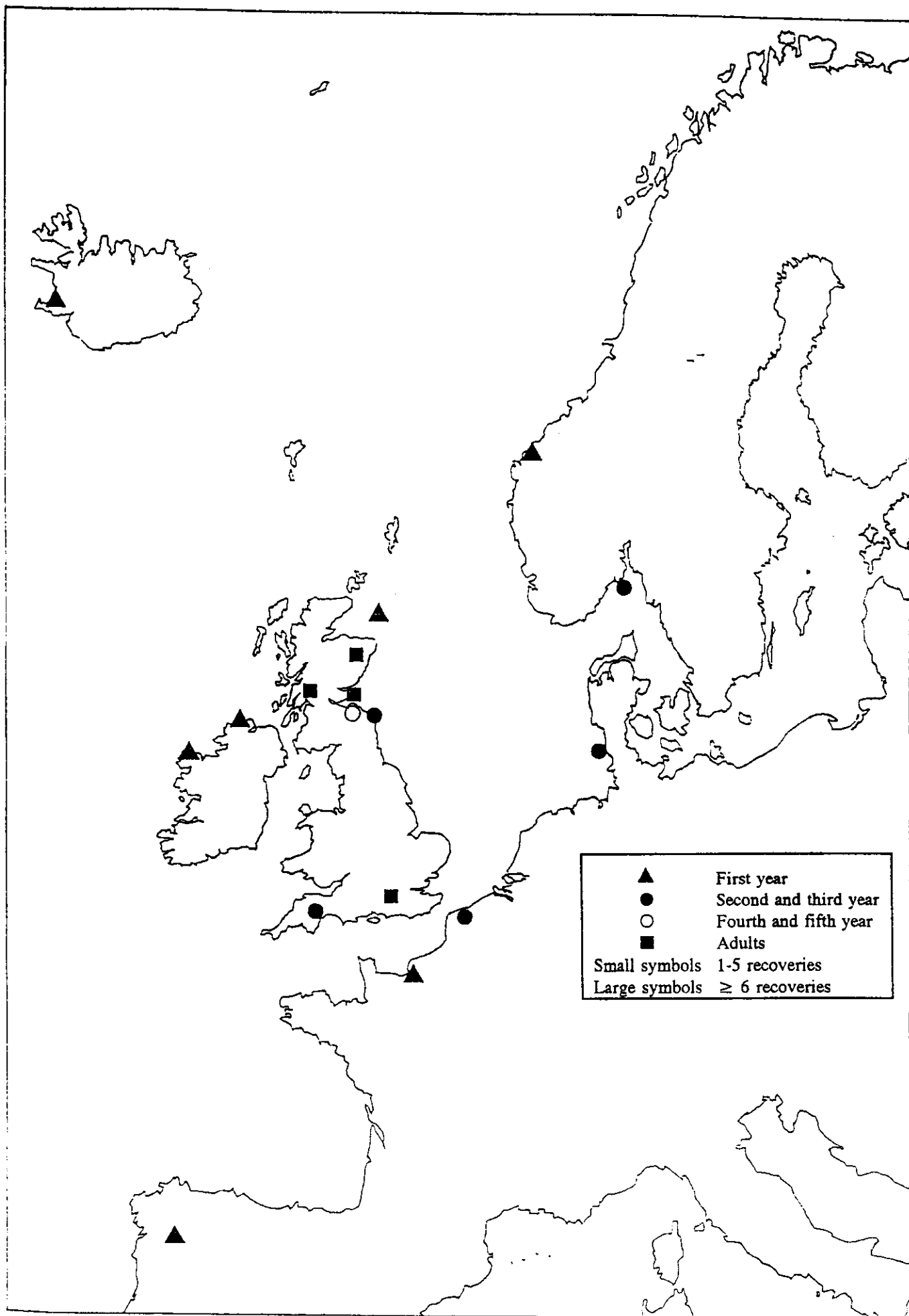


Figure 5.4 Recoveries of Guillemots ringed on the Outer Hebrides, Shiant Islands and North Rona and recovered during April - June, between 1970 and 1992.

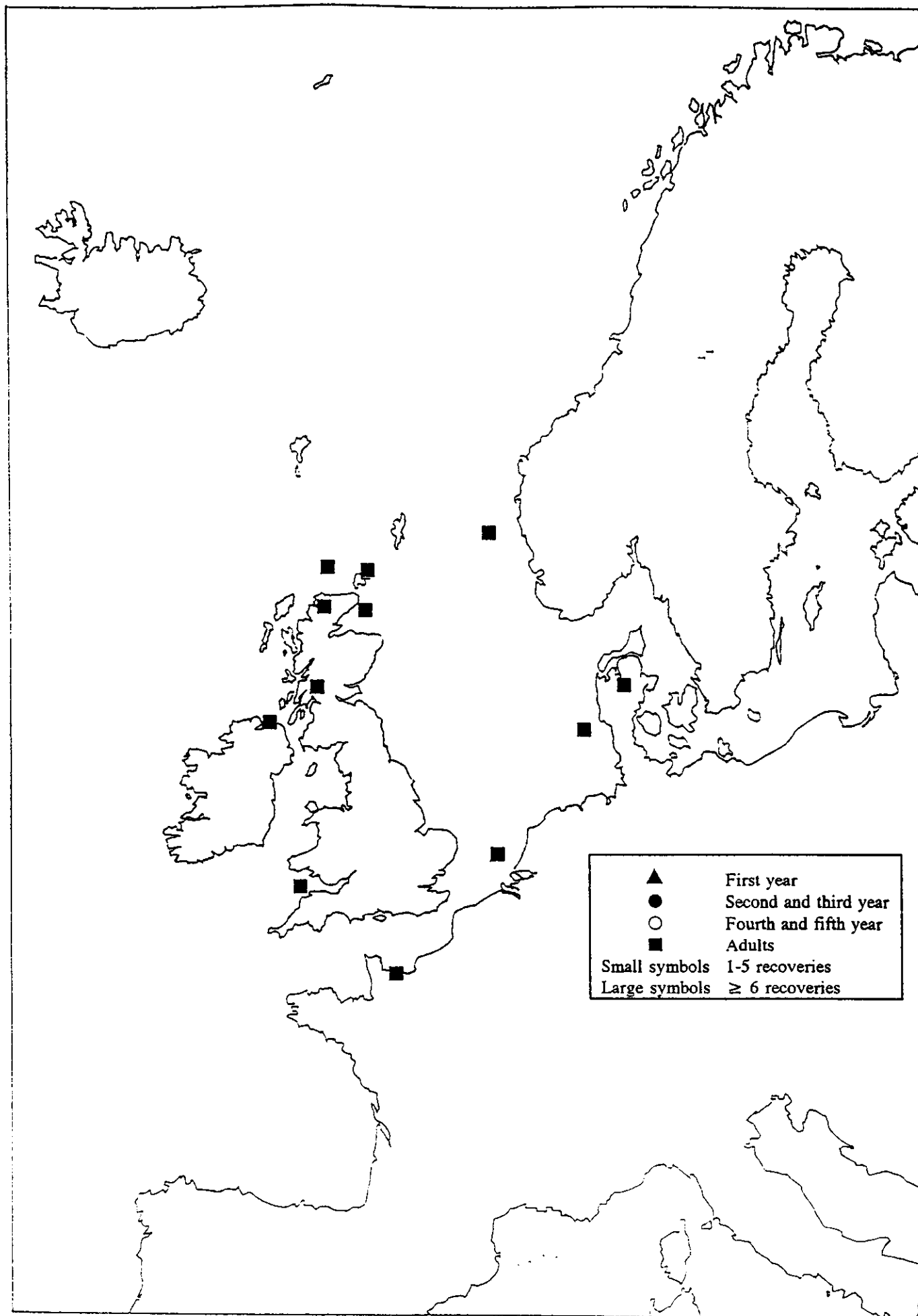


Figure 5.5 Recoveries of Guillemots ringed on the Outer Hebrides, Shiant Islands and North Rona and recovered as adults during January - March, between 1970 and 1984.

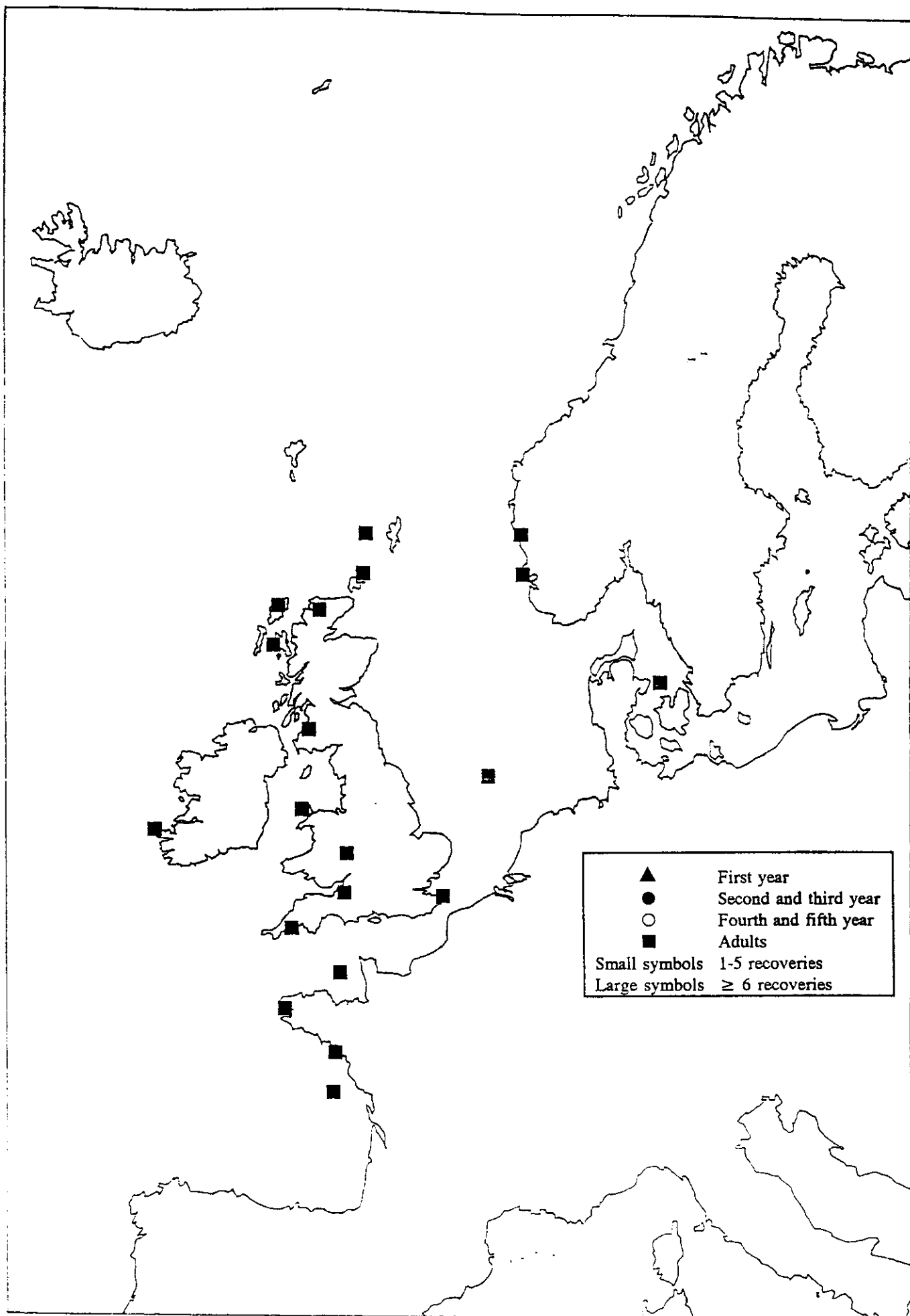


Figure 5.6 Recoveries of Guillemots ringed on the Outer Hebrides, Shiant Islands and North Rona and recovered as adults during January - March, between 1985 and 1992.

Section 6

Recoveries of Guillemots ringed in Shetland and Fair Isle



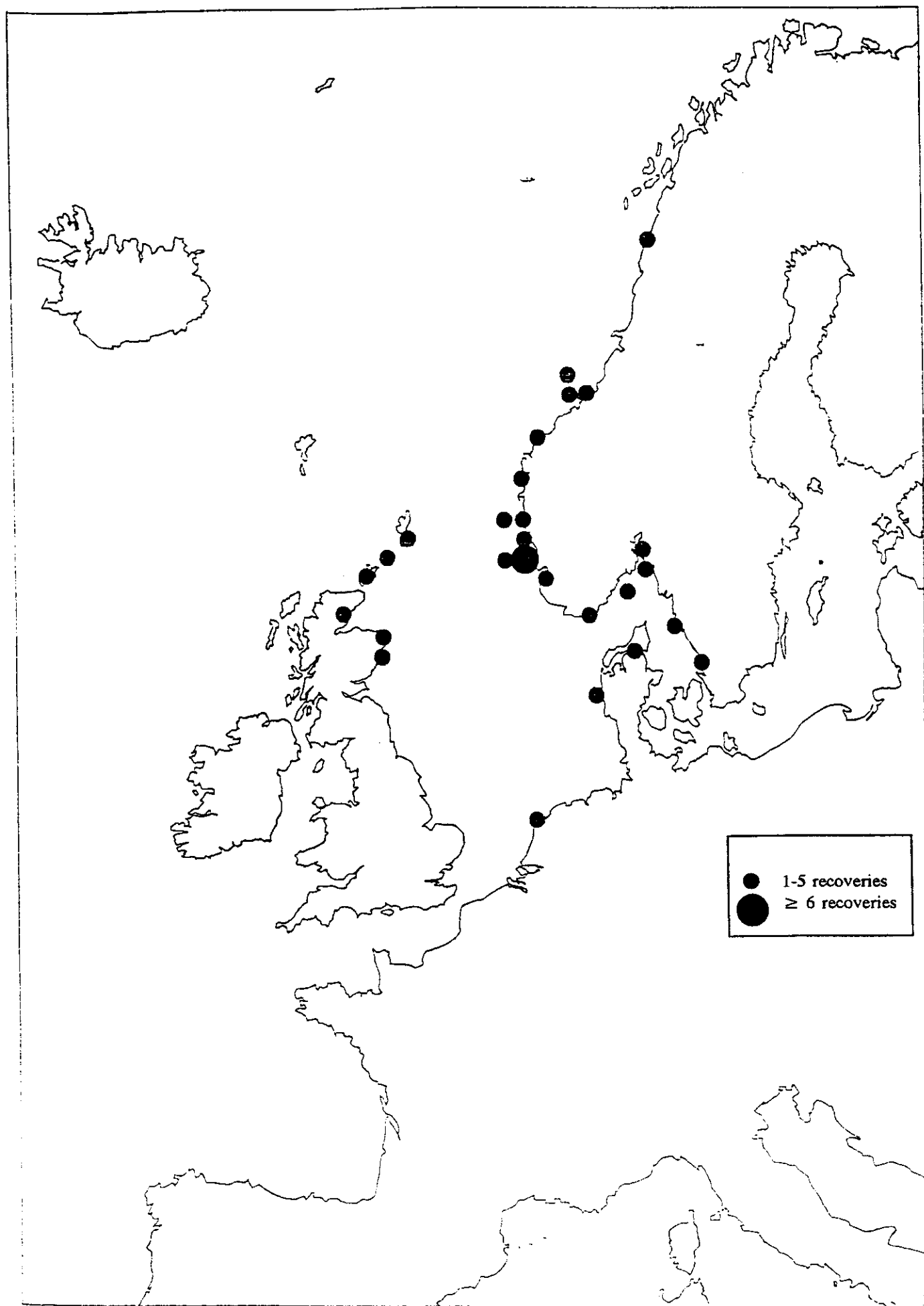


Figure 6.1 Recoveries of Guillemots ringed as chicks on Shetland and Fair Isle and recovered as first year birds during July - September, between 1970 and 1992.

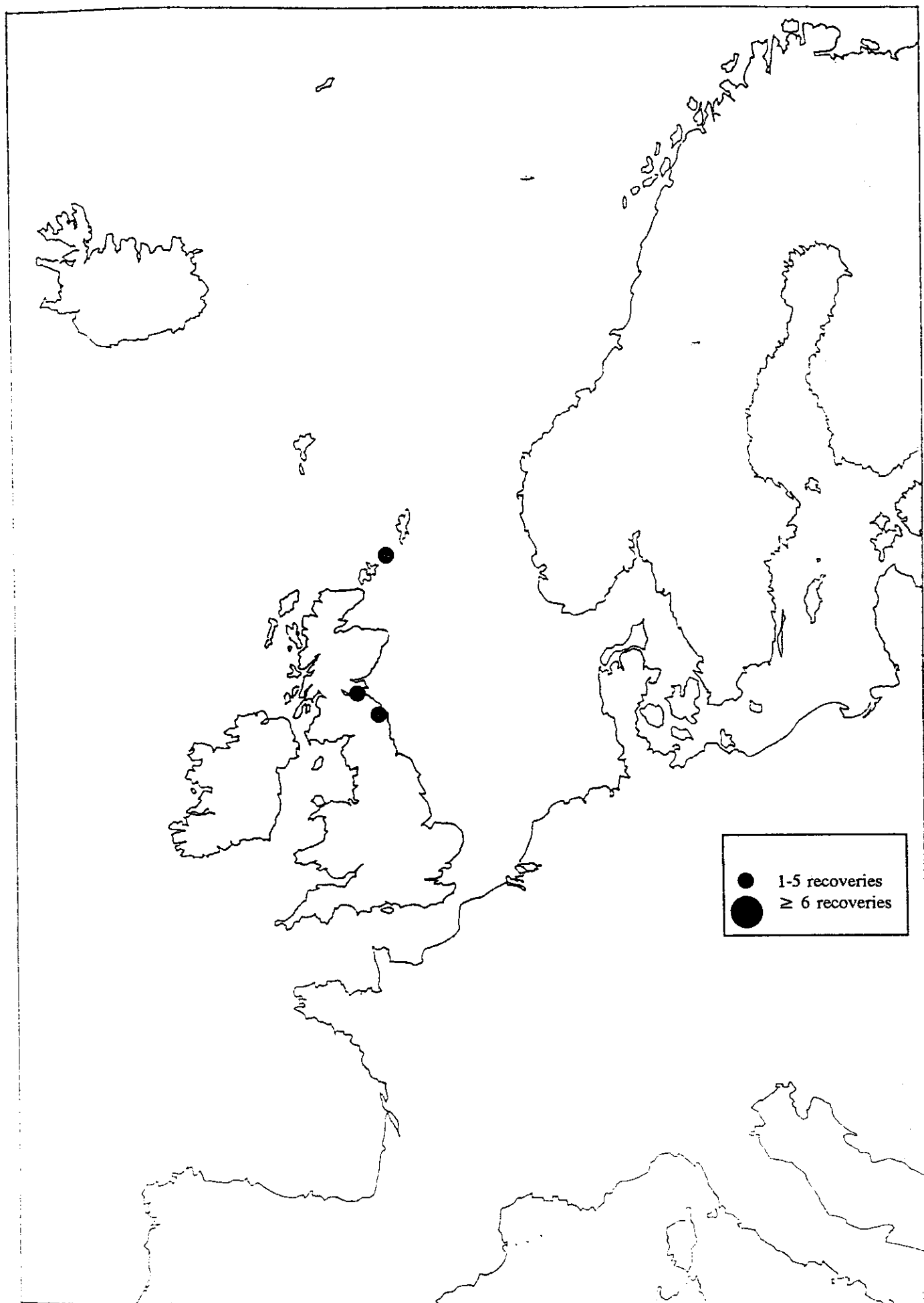


Figure 6.3 Recoveries of Guillemots ringed as chicks on Shetland and Fair Isle and recovered as fourth or fifth year birds during July - September, between 1970 and 1992.

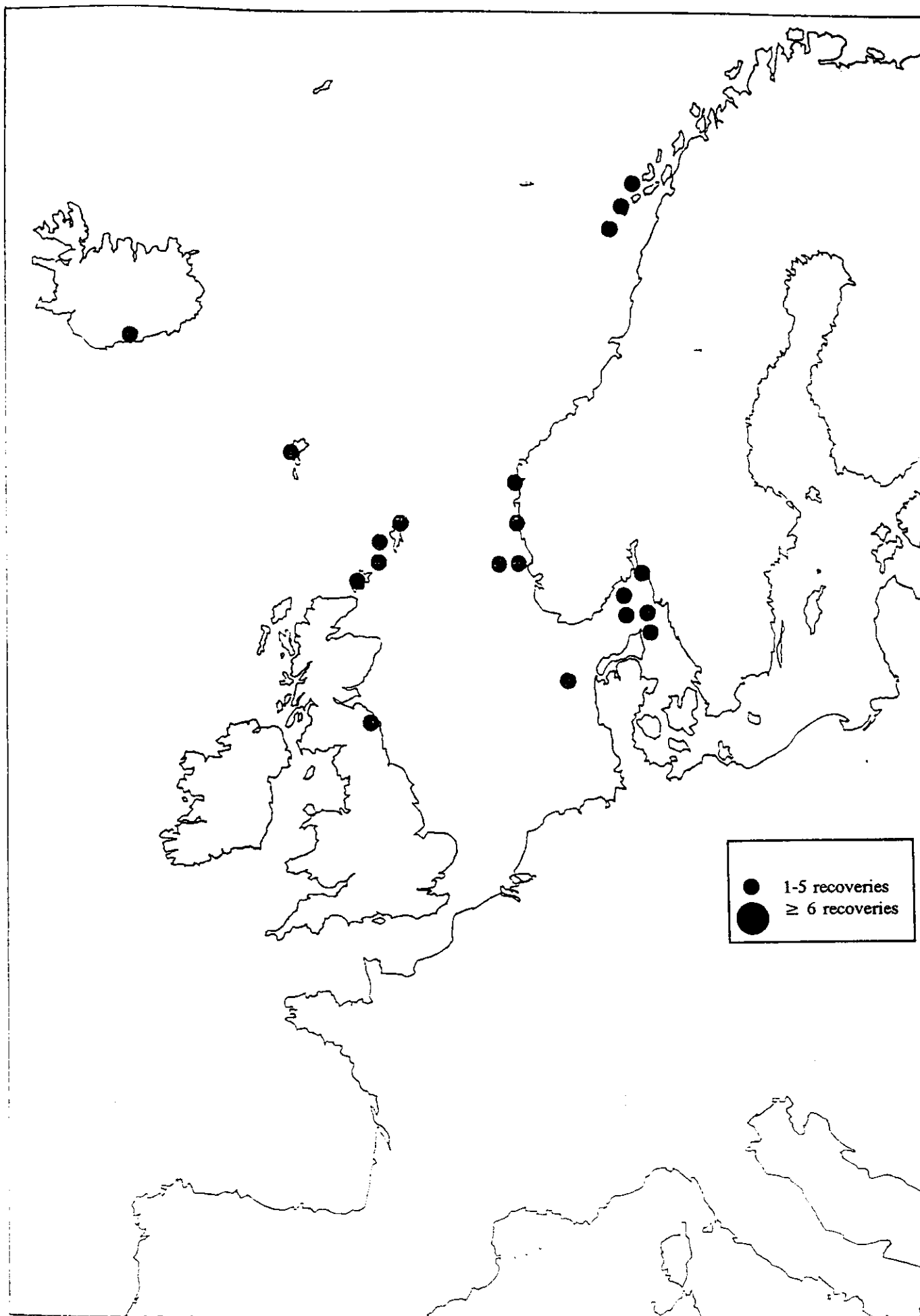


Figure 6.4 Recoveries of Guillemots ringed on Shetland and Fair Isle and recovered as adults, during July - September between 1970 and 1992. Adults include all birds ringed as full-grown birds or ringed as chicks and recovered during or after their sixth year of life.

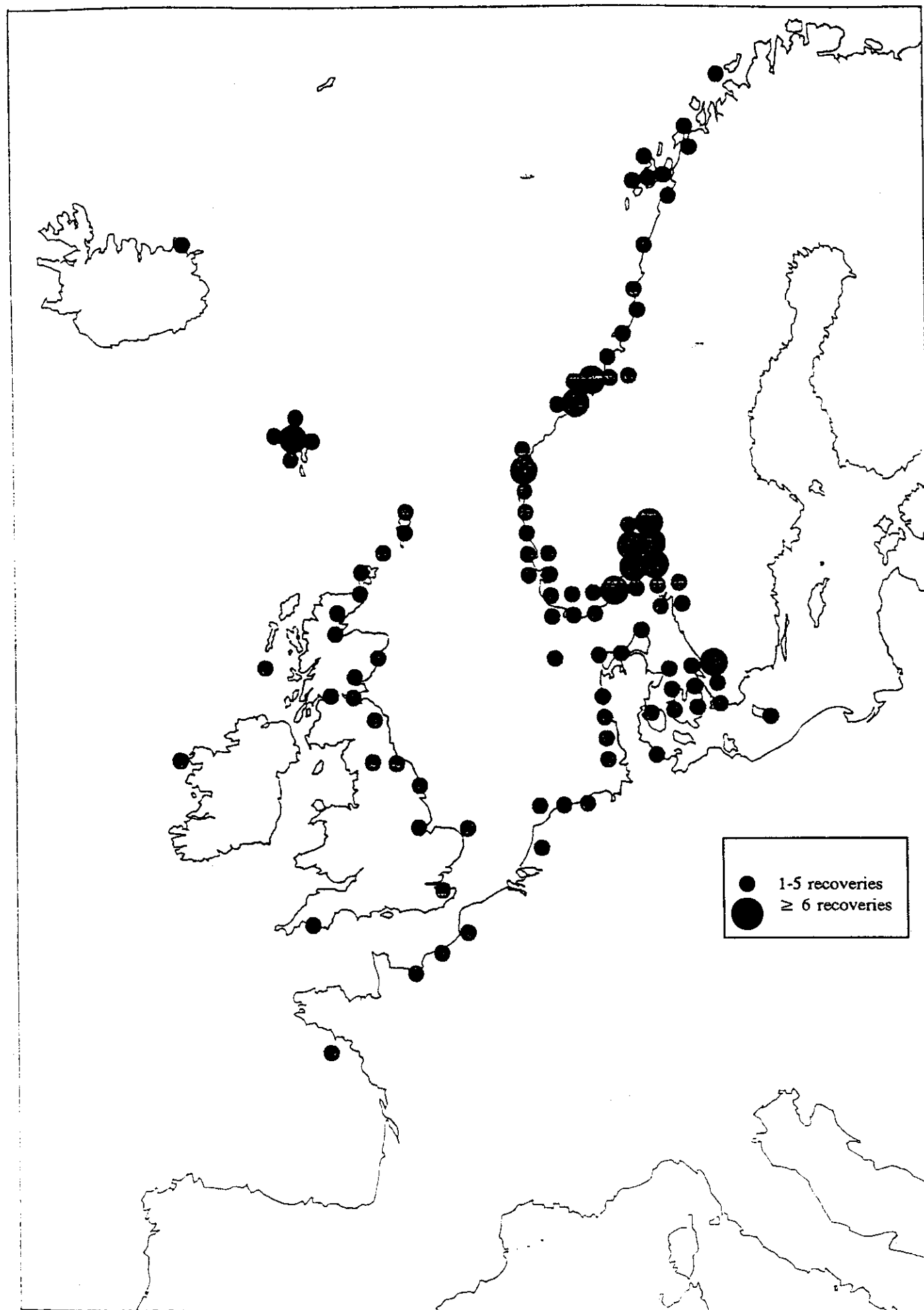


Figure 6.5 Recoveries of Guillemots ringed as chicks on Shetland and Fair Isle and recovered as first year birds during October - December, between 1970 and 1992.

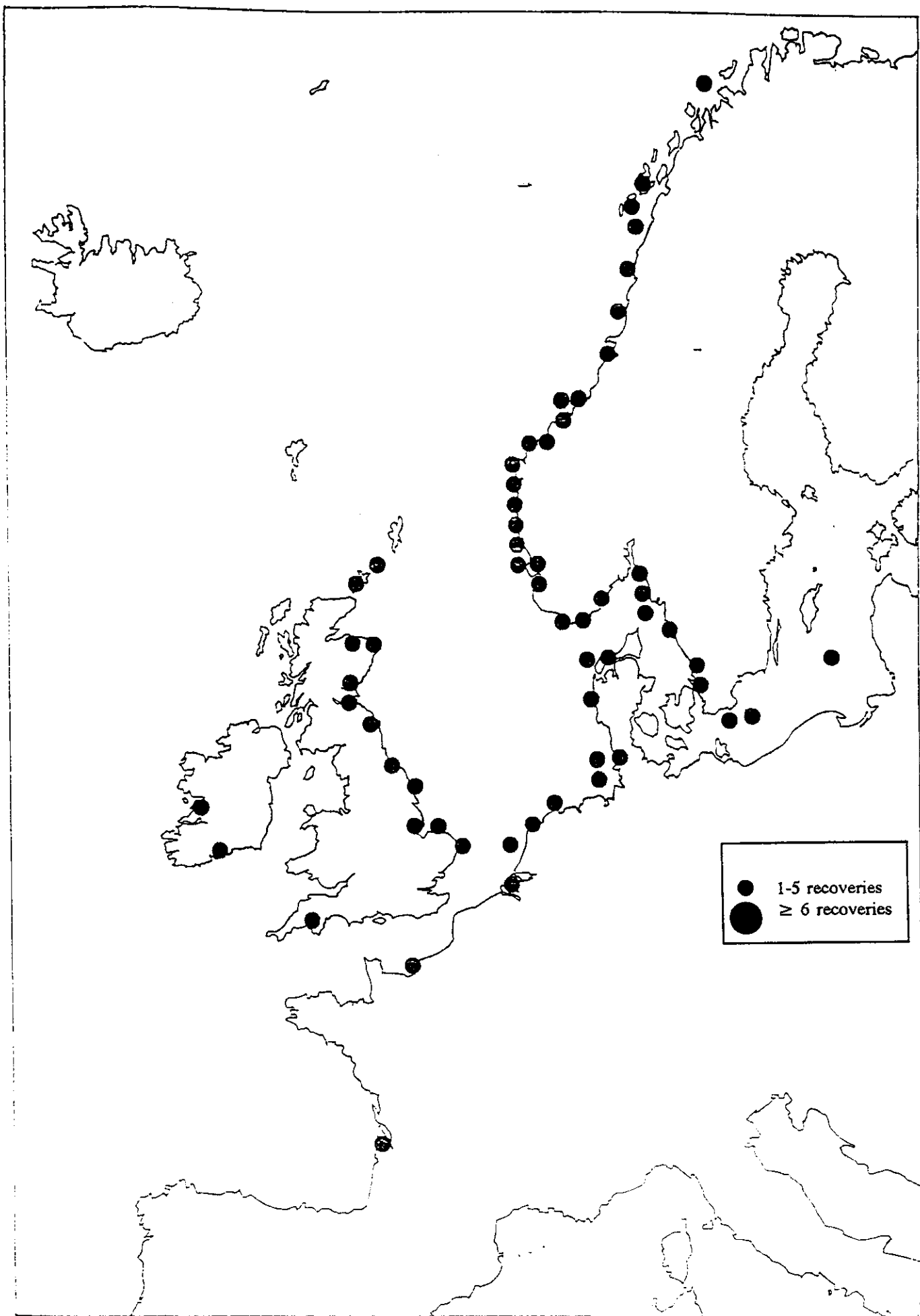


Figure 6.6

Recoveries of Guillemots ringed as chicks on Shetland and Fair Isle and recovered as second or third year birds during October - December, between 1970 and 1992.

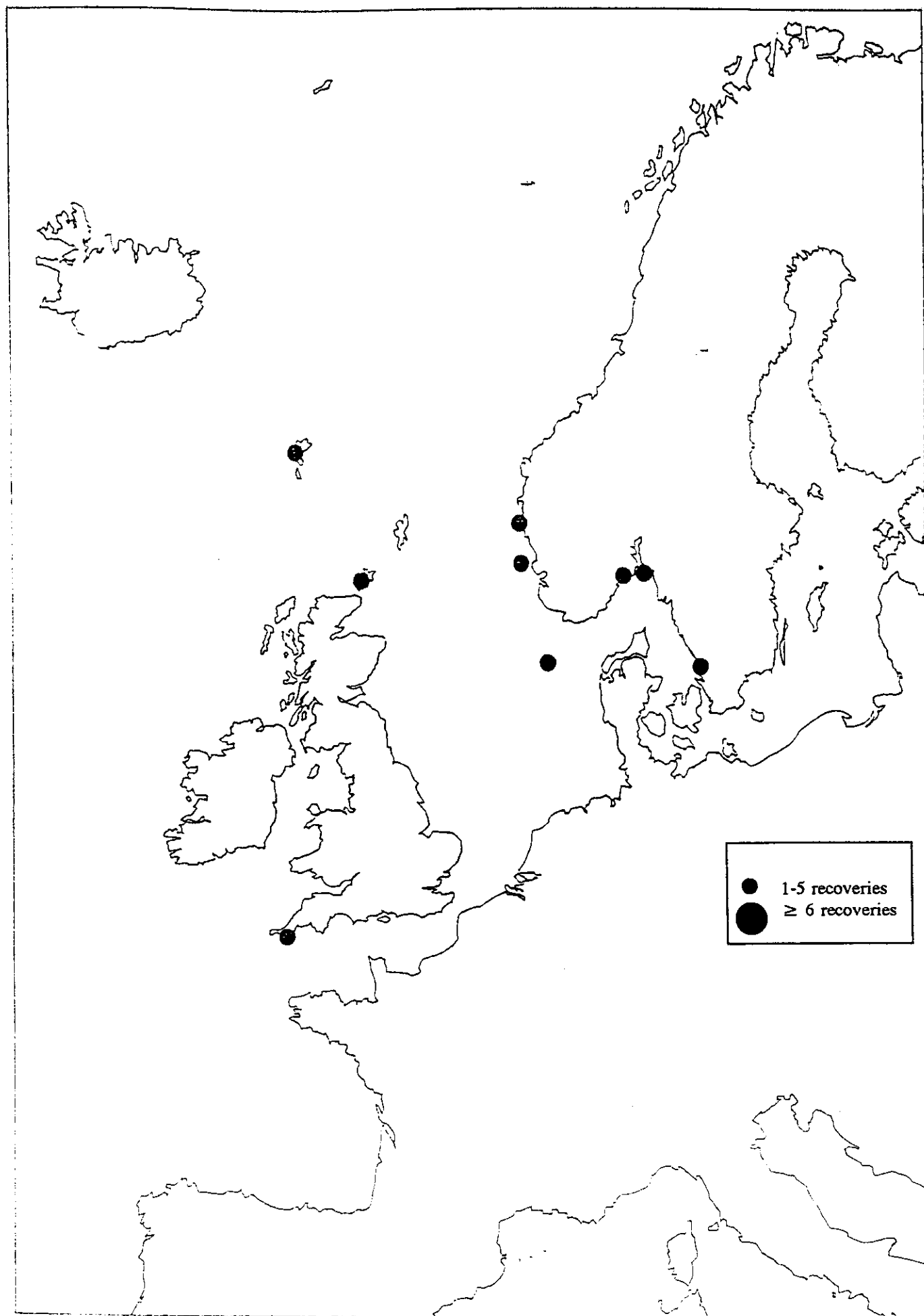


Figure 6.7

Recoveries of Guillemots ringed as chicks on Shetland and Fair Isle and recovered as fourth or fifth year birds during October - December, between 1970 and 1992.

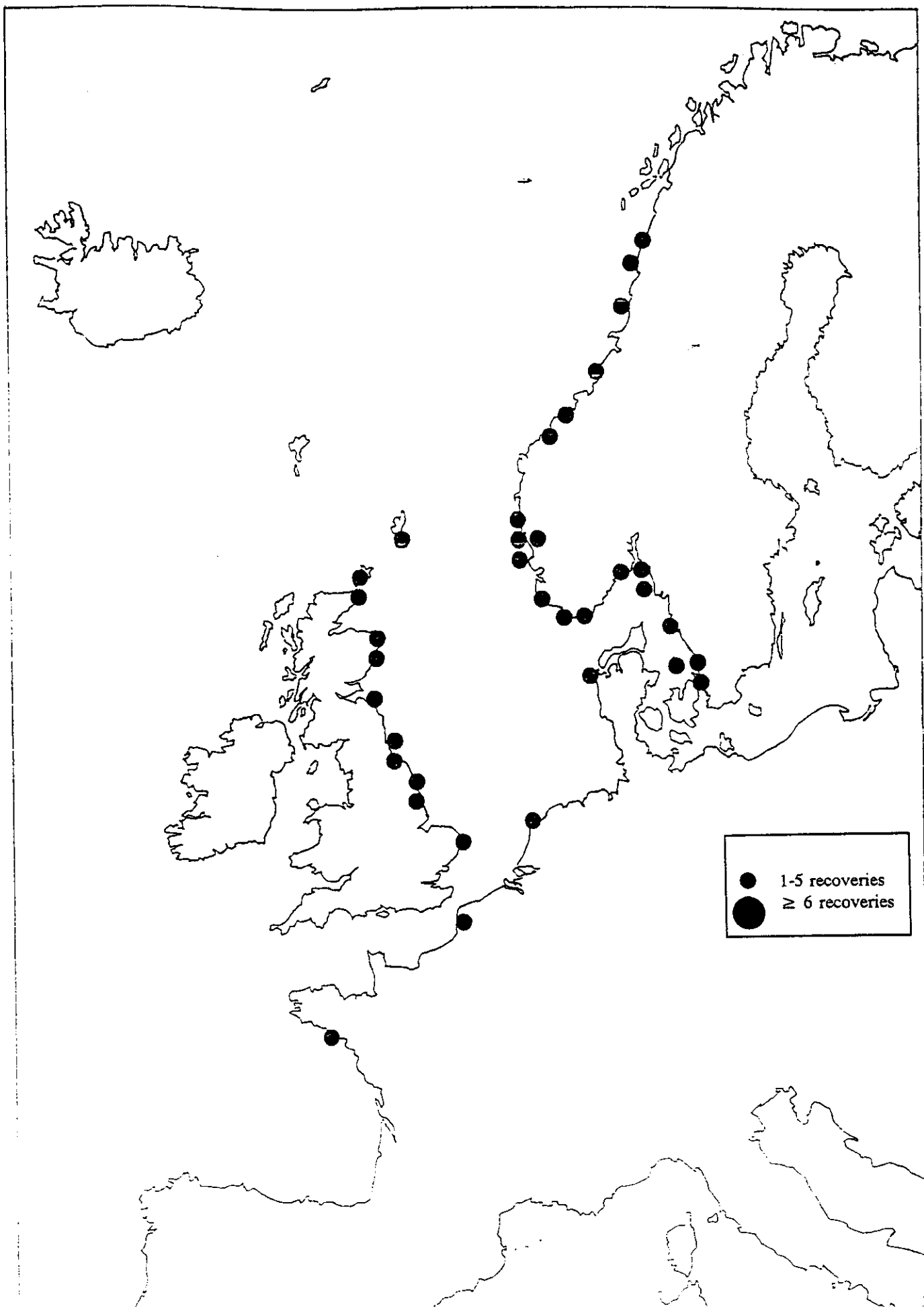


Figure 6.8

Recoveries of Guillemots ringed on Shetland and Fair Isle and recovered as adults during October - December, between 1970 and 1992. Adults include all birds ringed as full-grown birds or ringed as chicks and recovered during or after their sixth year of life.

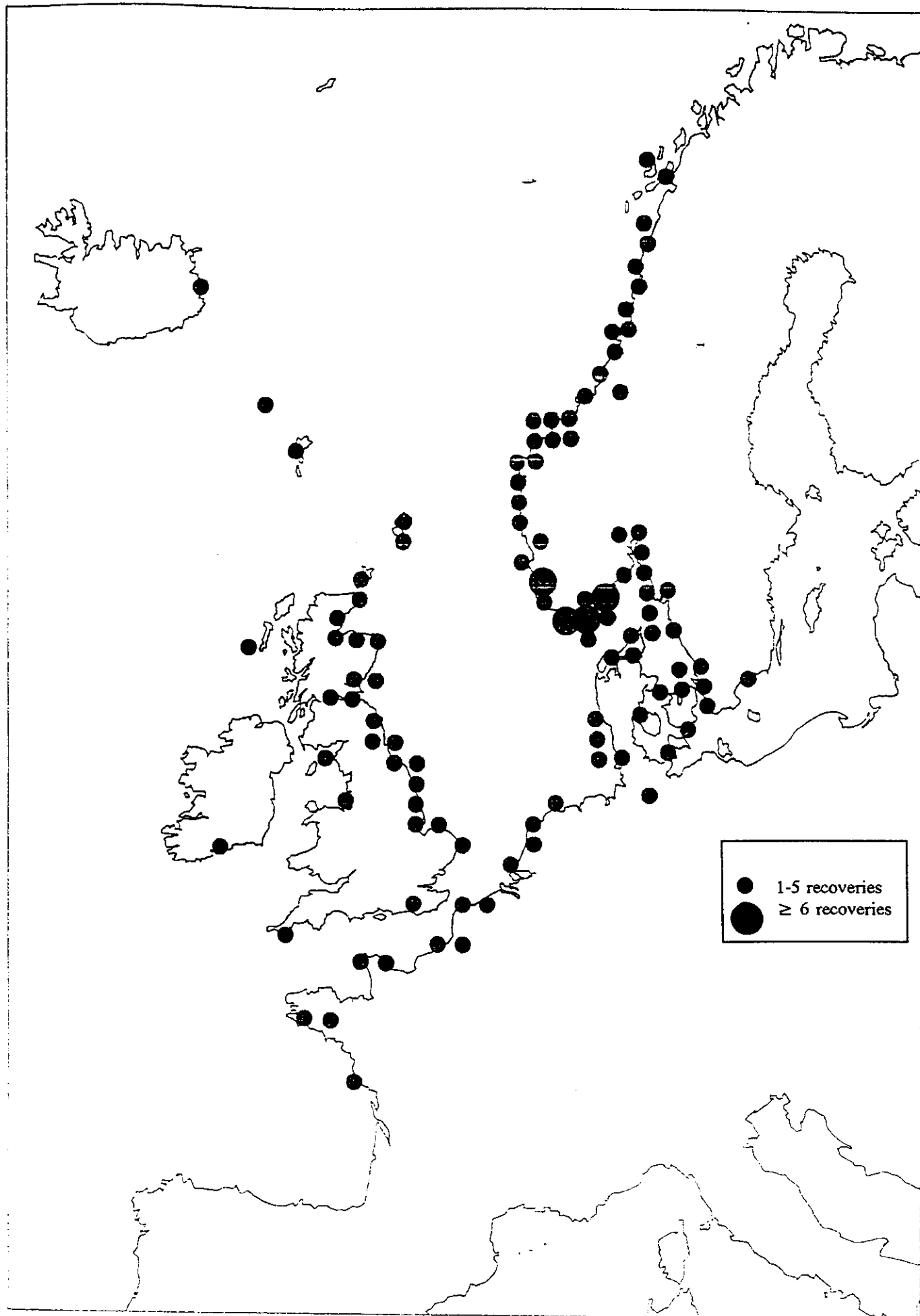


Figure 6.9 Recoveries of Guillemots ringed as chicks on Shetland and Fair Isle and recovered as first year birds during January - March, between 1970 and 1992.

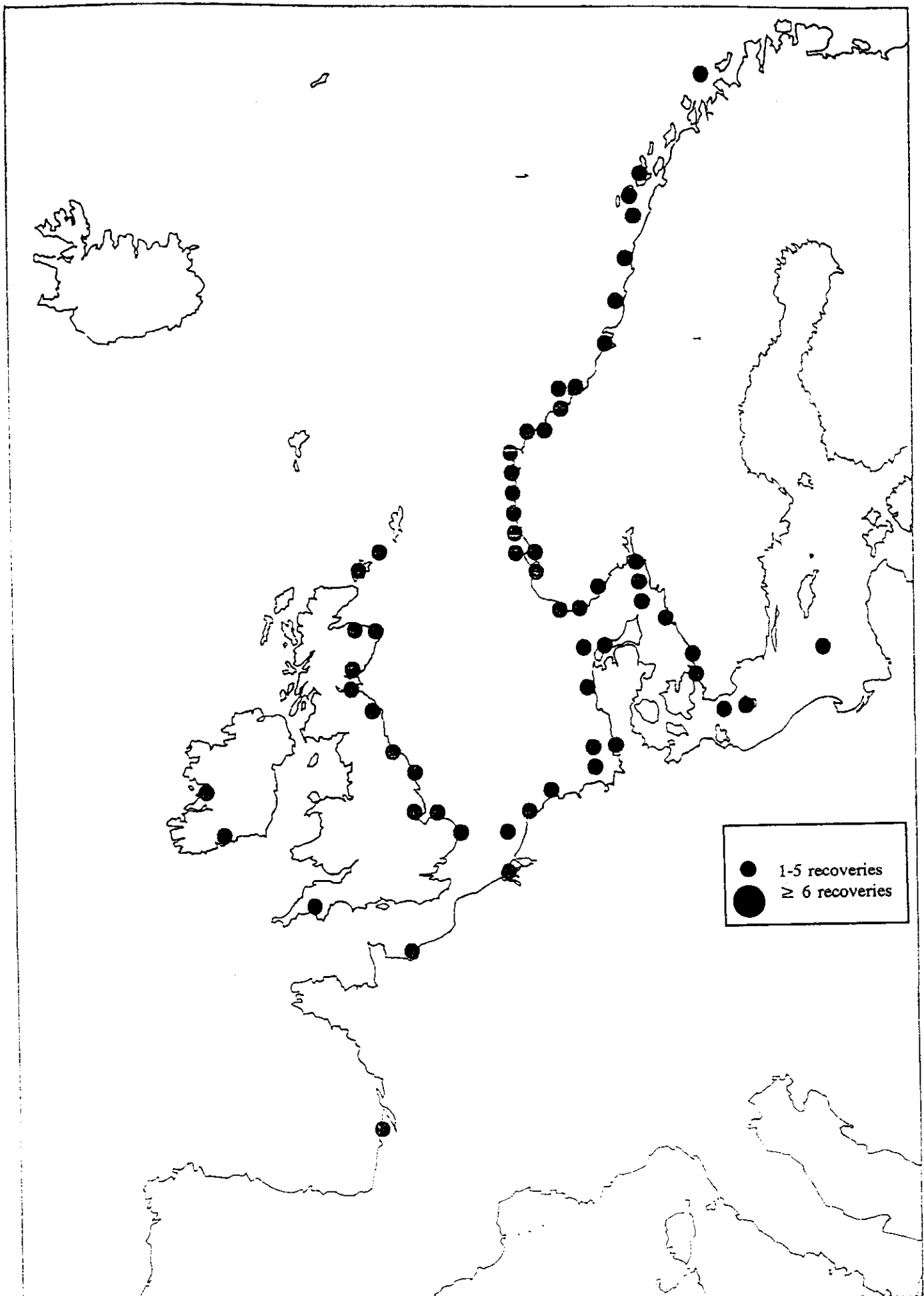


Figure 6.10

Recoveries of Guillemots ringed as chicks on Shetland and Fair Isle and recovered as second year birds during January - March, between 1970 and 1992.

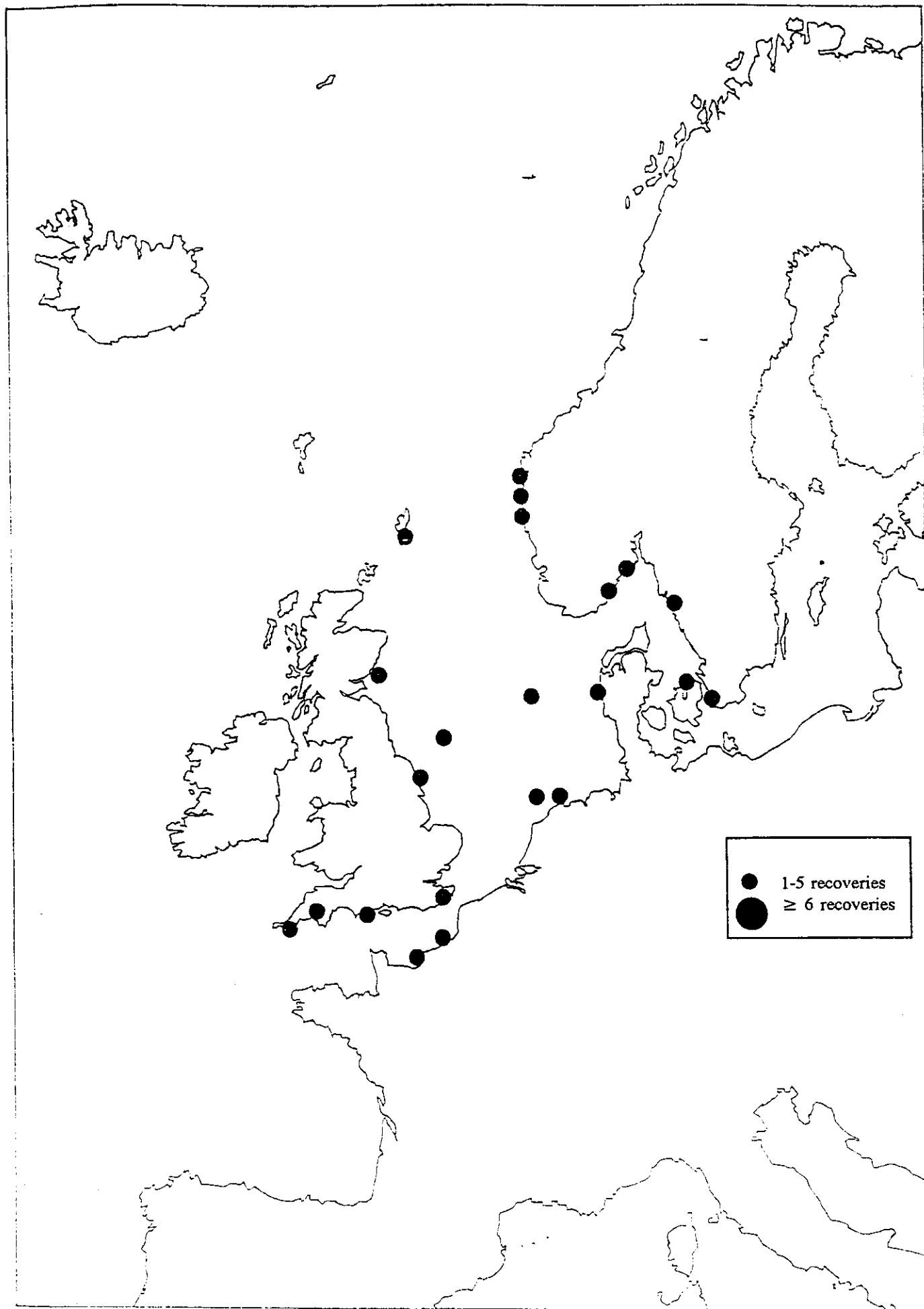


Figure 6.11 Recoveries of Guillemots ringed as chicks on Shetland and Fair Isle and recovered as fourth or fifth year birds during January - March, between 1970 and 1992.

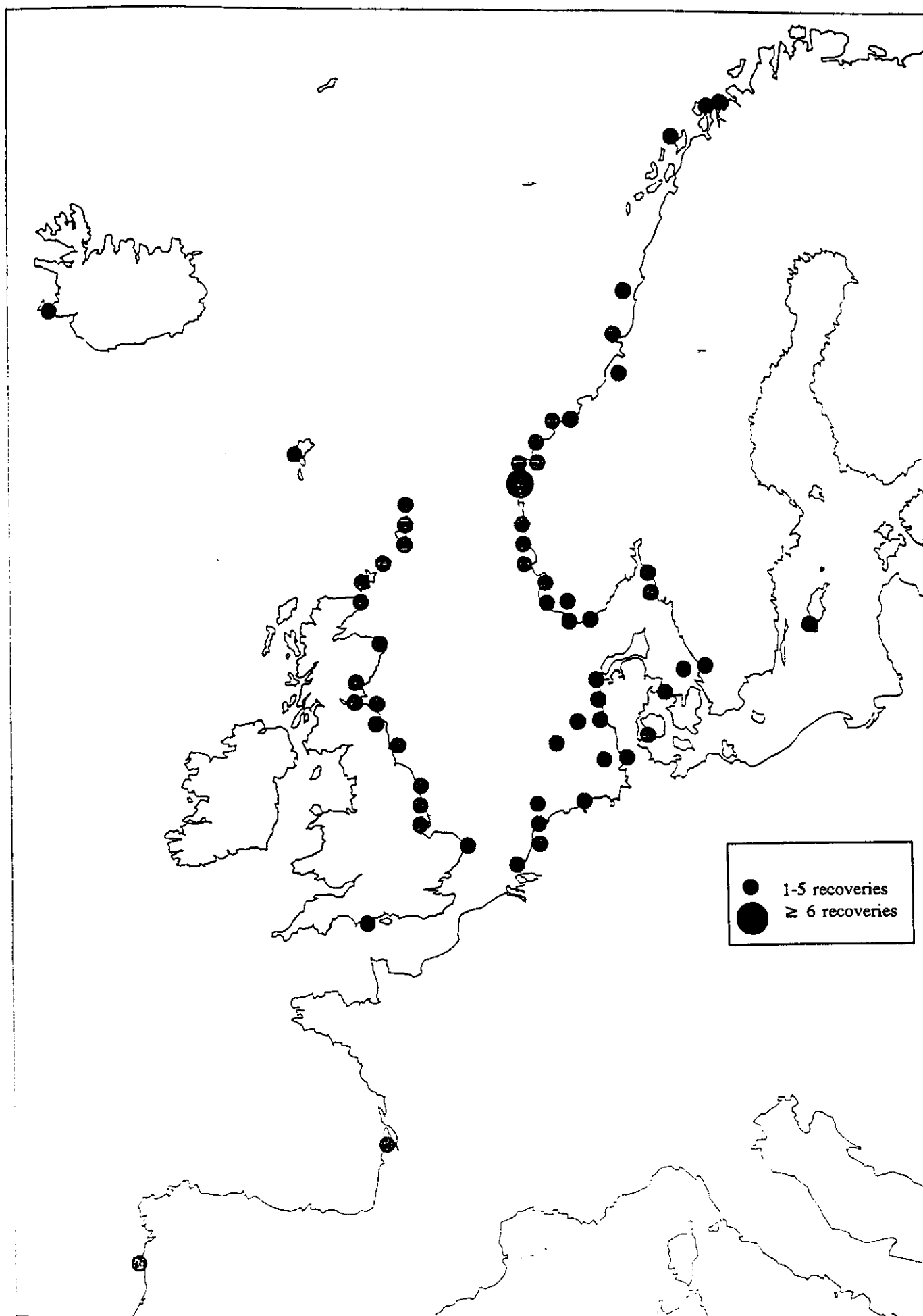


Figure 6.12

Recoveries of Guillemots ringed on Shetland and Fair Isle and recovered as adults during January - March, between 1970 and 1992. Adults include all birds ringed as full-grown birds or ringed as chicks and recovered during or after their sixth year of life.

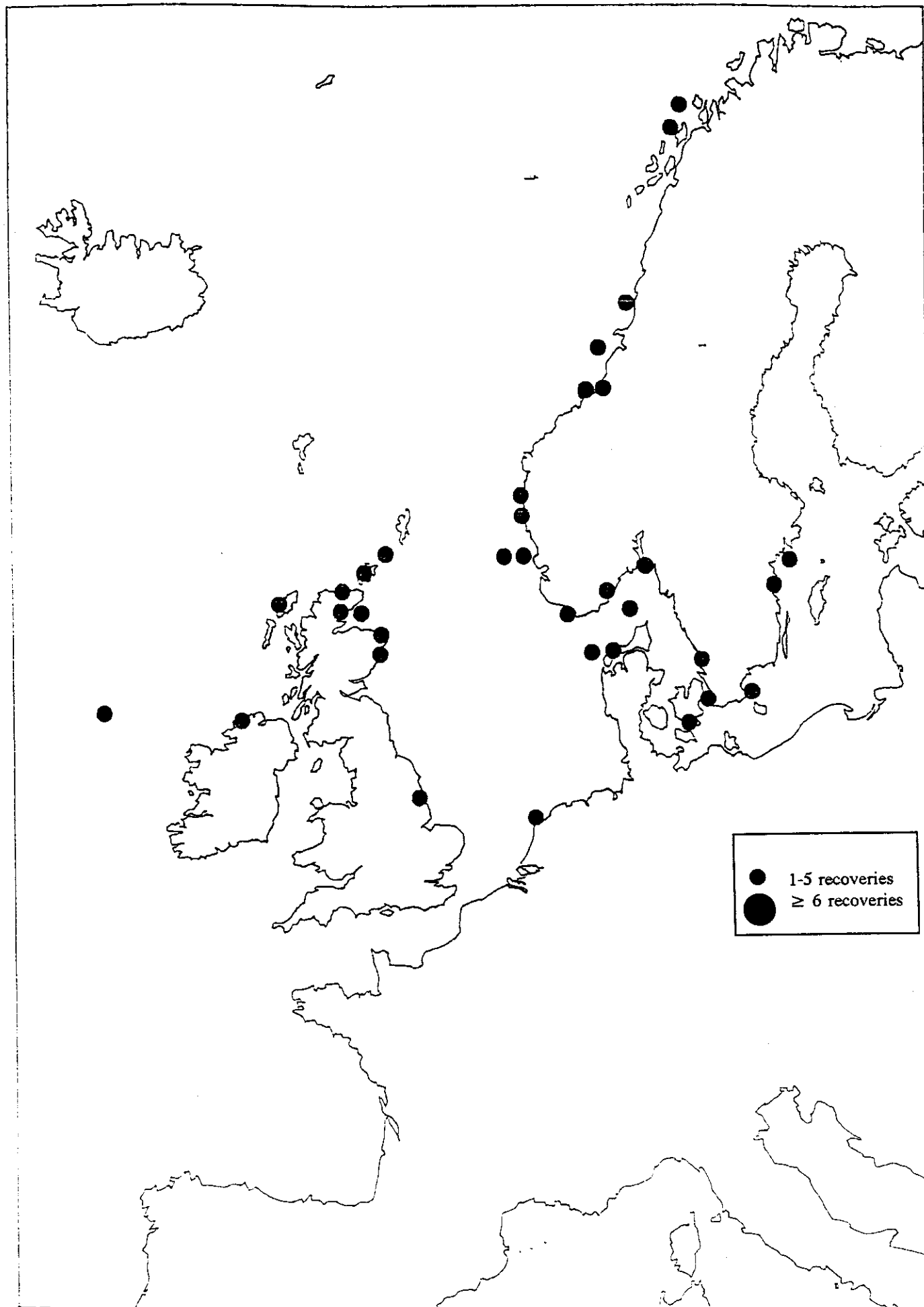


Figure 6.13 Recoveries of Guillemots ringed as chicks on Shetland and Fair Isle and recovered as first year birds during April - June, between 1970 and 1992.

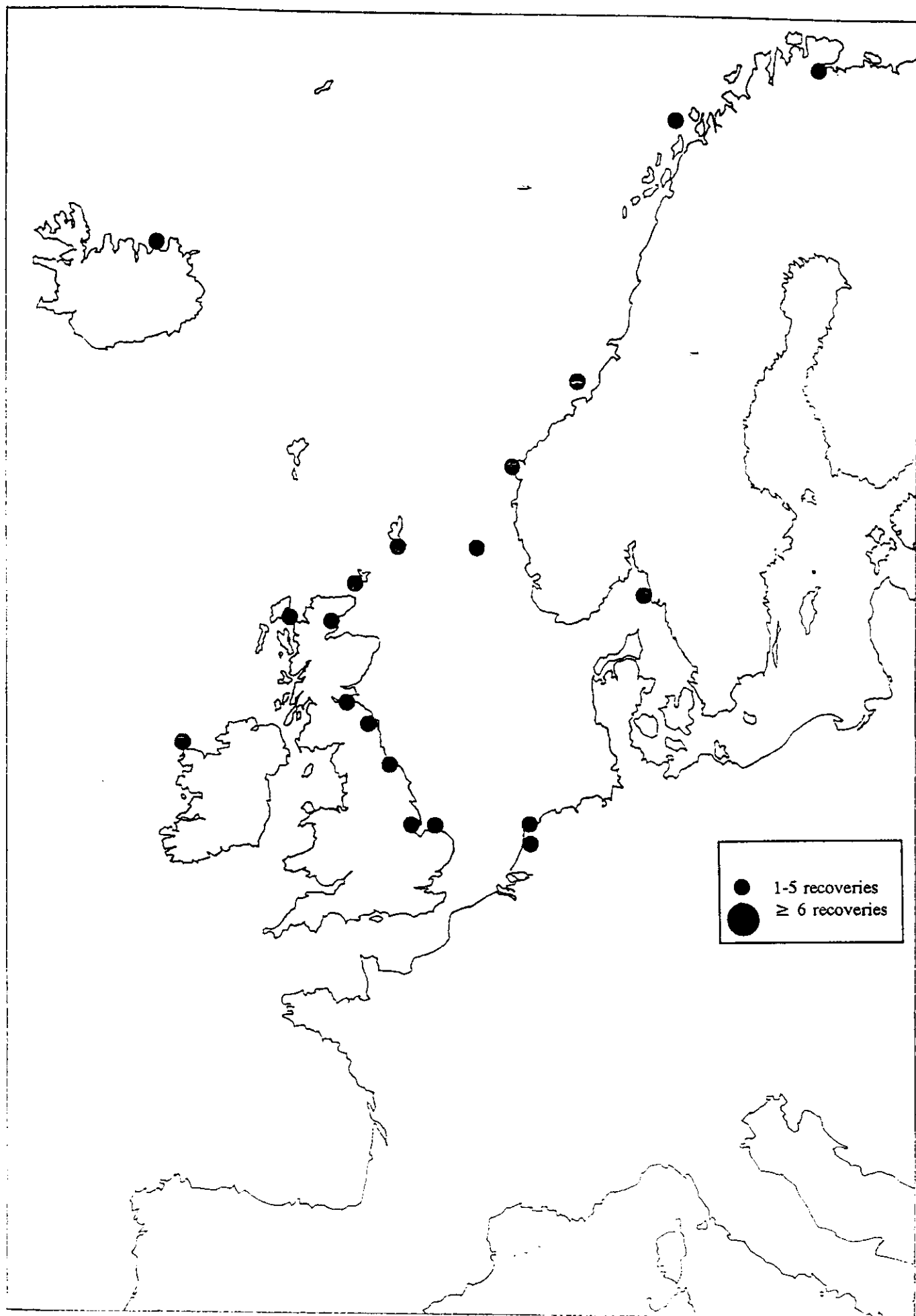


Figure 6.14 Recoveries of Guillemots ringed as chicks on Shetland and Fair Isle and recovered as second or third year birds during April - June, between 1970 and 1992.

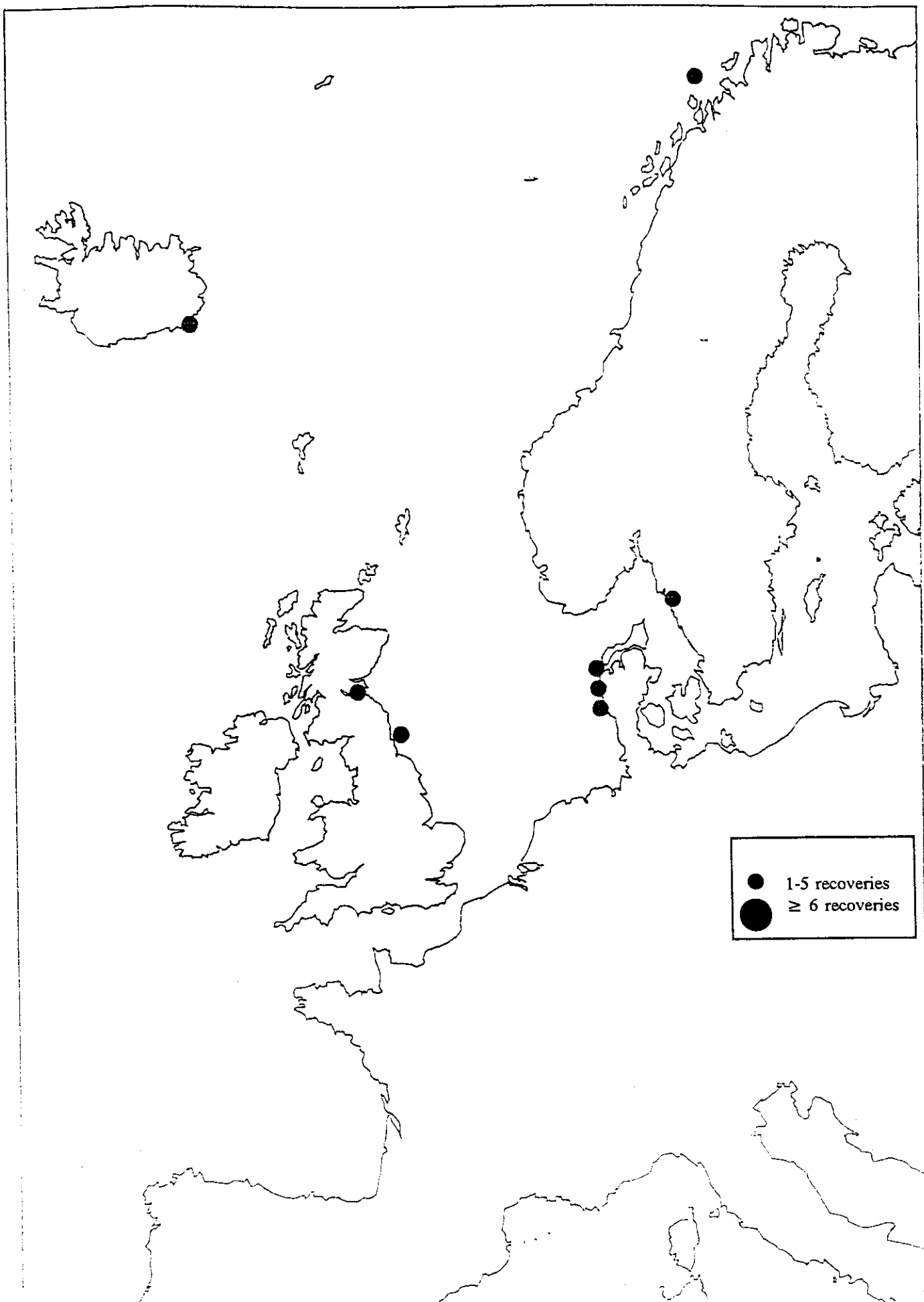


Figure 6.15

Recoveries of Guillemots ringed as chicks on Shetland and Fair Isle and recovered as fourth or fifth year birds during April - June, between 1970 and 1992.

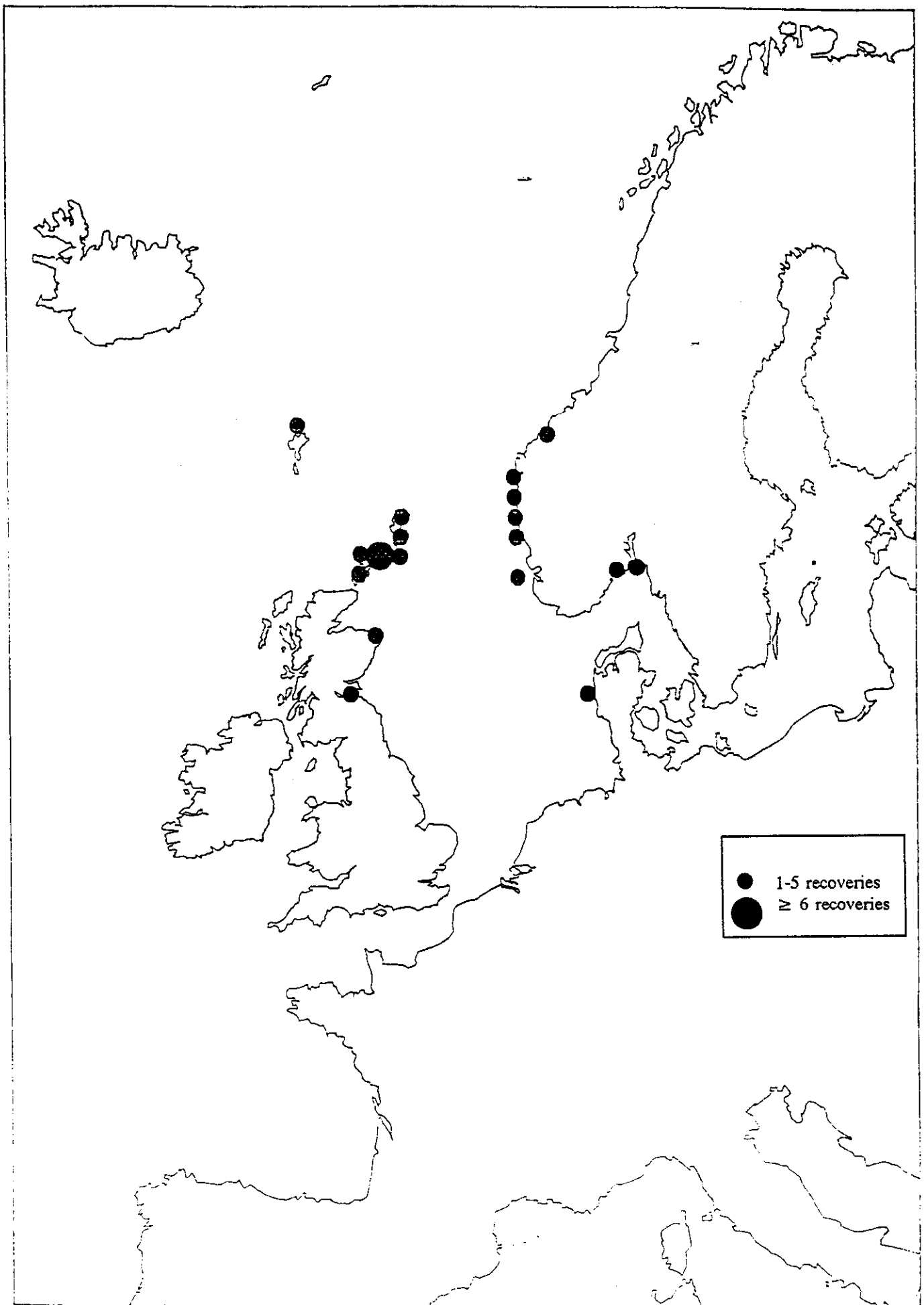


Figure 6.16 Recoveries of Guillemots ringed on Shetland and Fair Isle and recovered as adults during April - June, between 1970 and 1992. Adults include all birds ringed as full-grown birds or ringed as chicks and recovered during or after their sixth year of life.

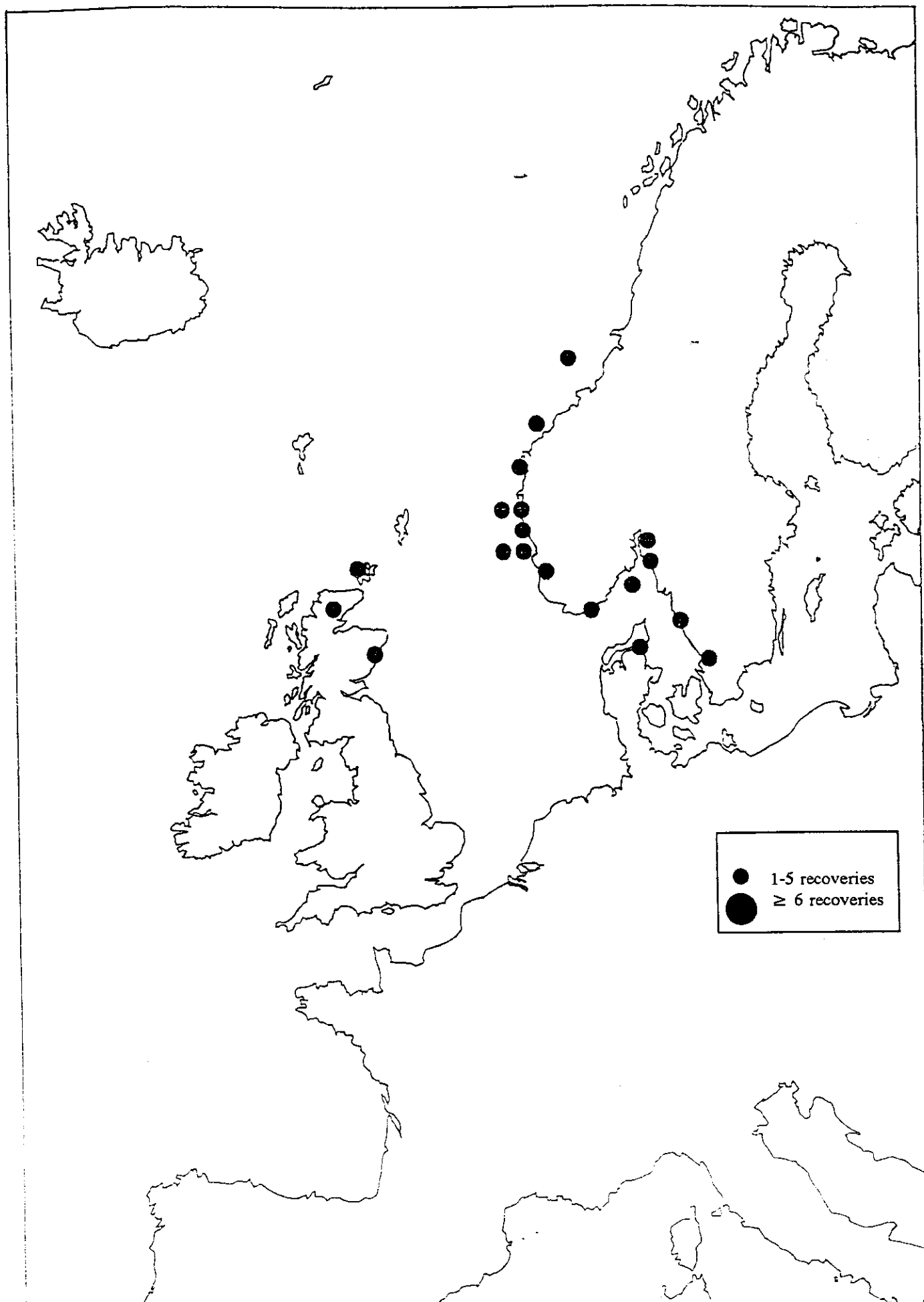


Figure 6.17 Recoveries of Guillemots ringed as chicks on Shetland and Fair Isle and recovered as first year birds during July - September, between 1970 and 1984.

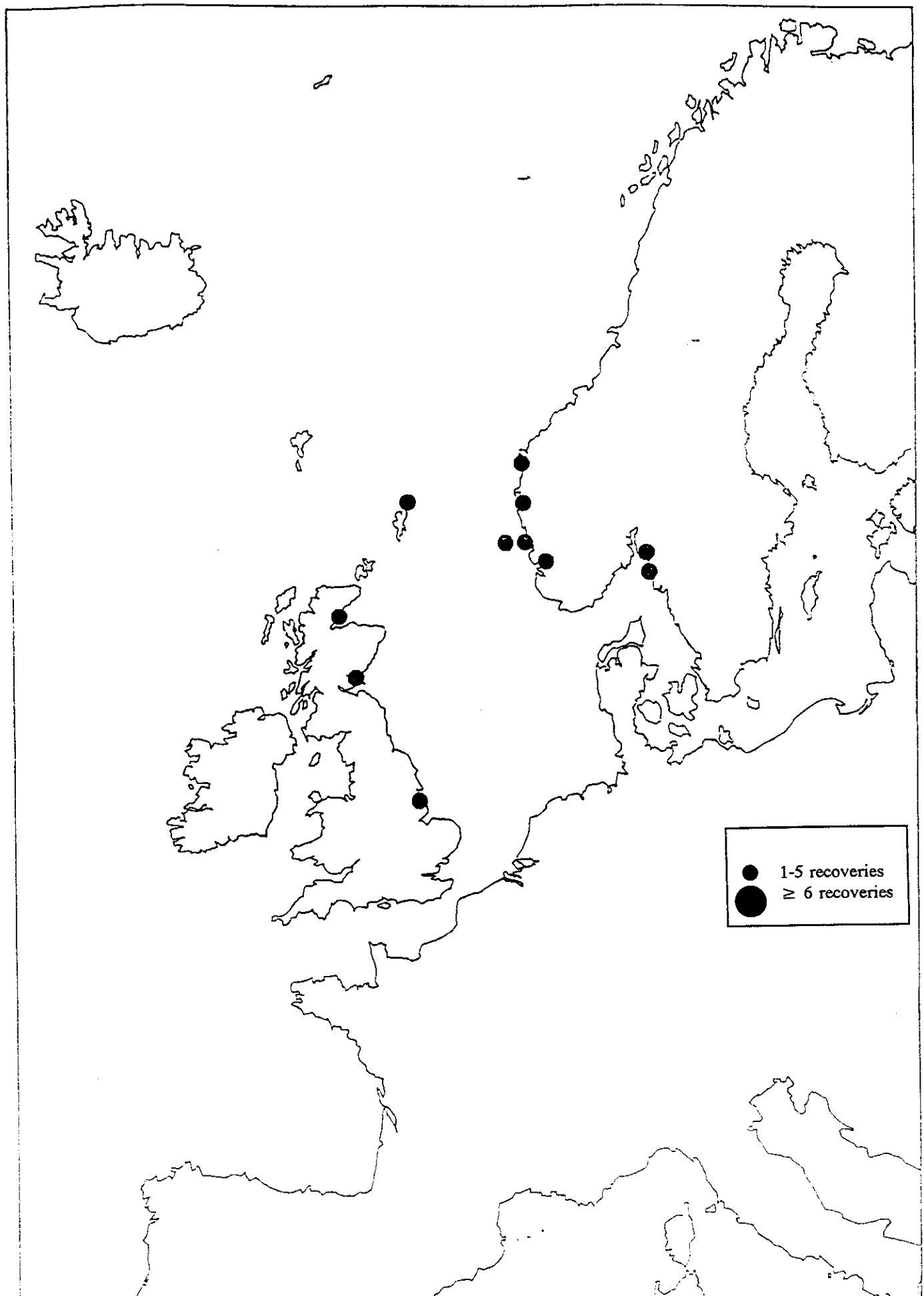


Figure 6.19 Recoveries of Guillemots ringed as chicks on Shetland and Fair Isle and recovered as second or third year birds during July - September, between 1970 and 1984.

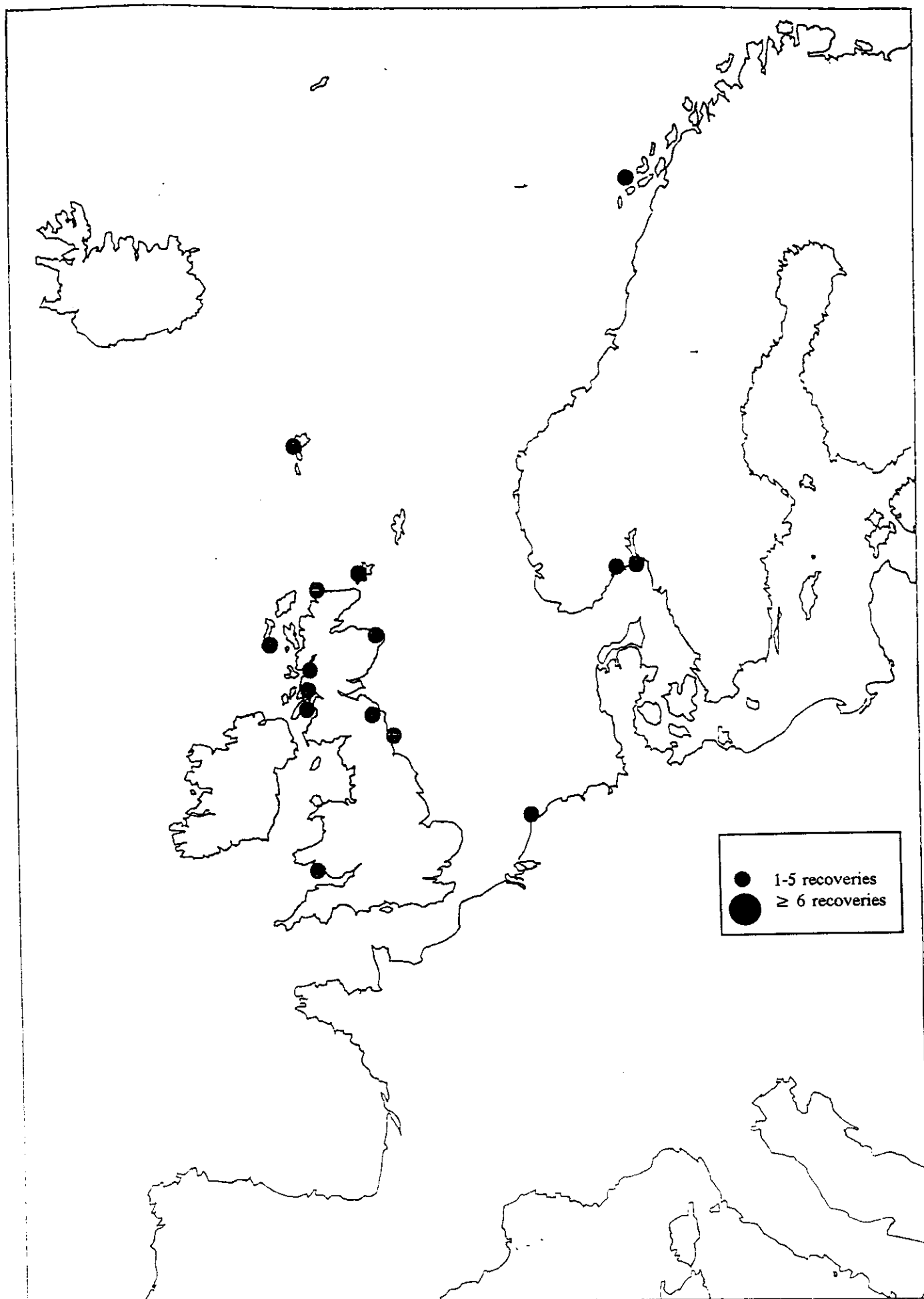


Figure 6.20 Recoveries of Guillemots ringed as chicks on Shetland and Fair Isle and recovered as second or third year birds during July - September, between 1985 and 1992.

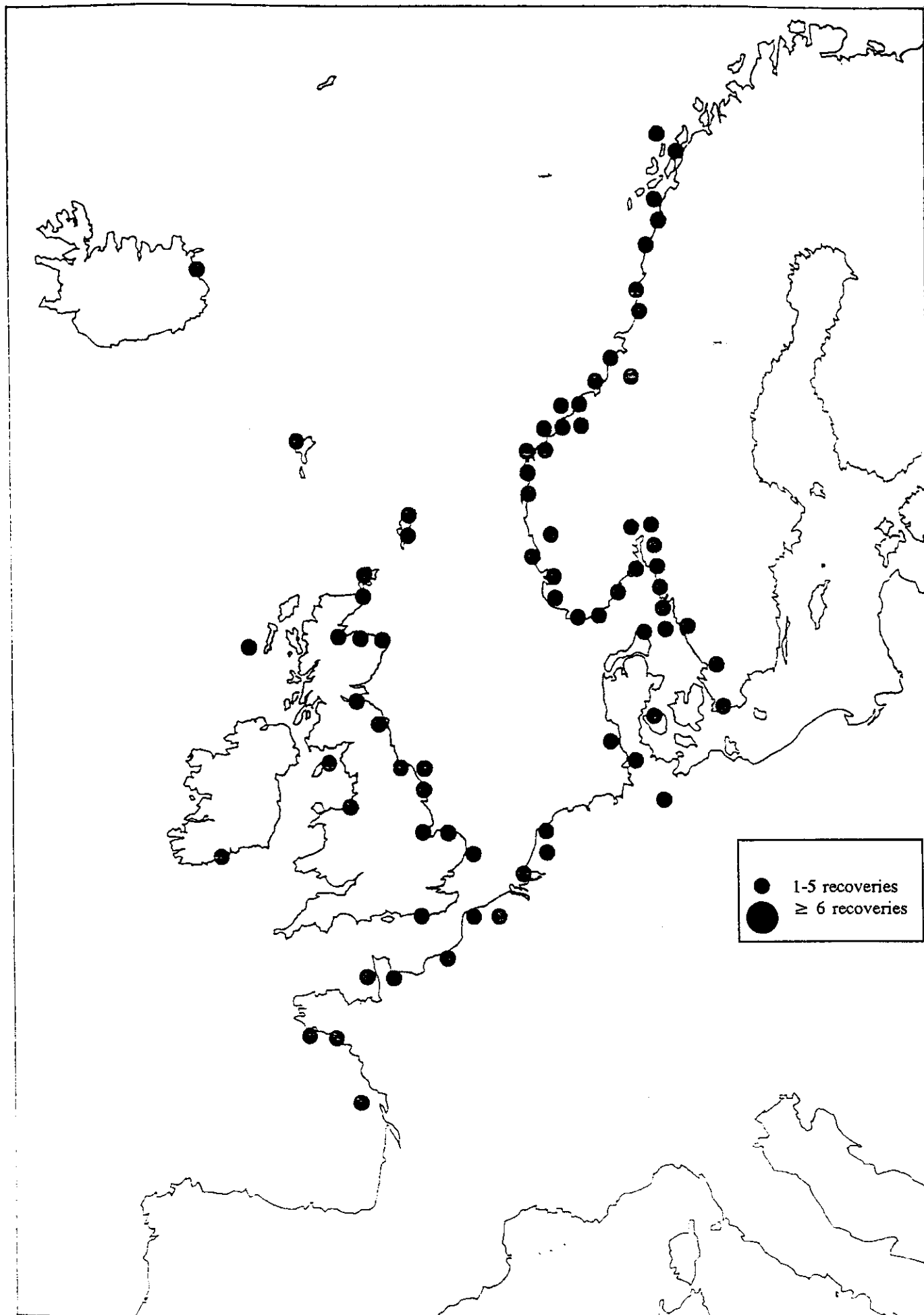


Figure 6.21 Recoveries of Guillemots ringed as chicks on Shetland and Fair Isle and recovered as first year birds during October - December, between 1970 and 1984.

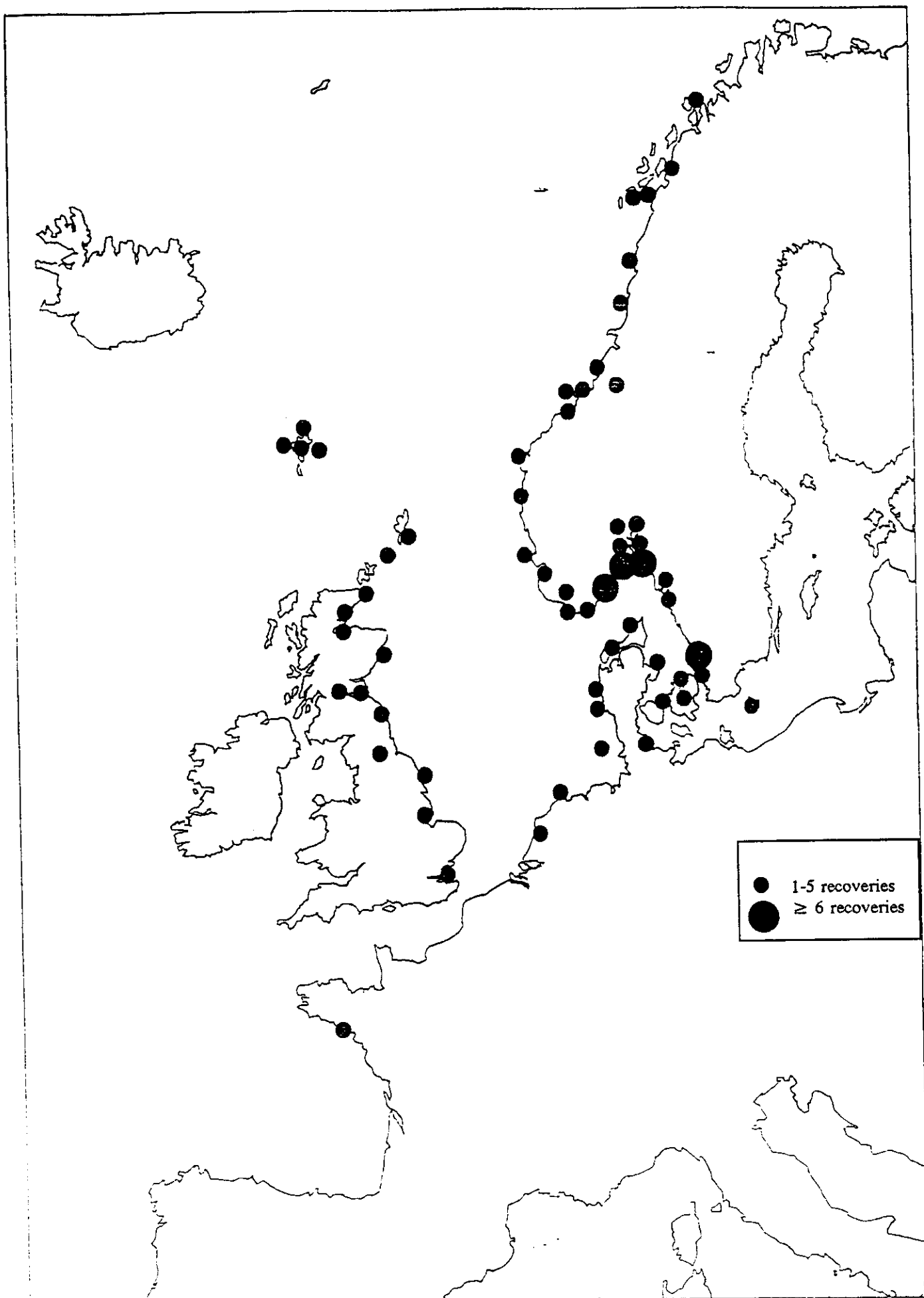


Figure 6.22

Recoveries of Guillemots ringed as chicks on Shetland and Fair Isle and recovered as first year birds during October - December, between 1985 and 1992.

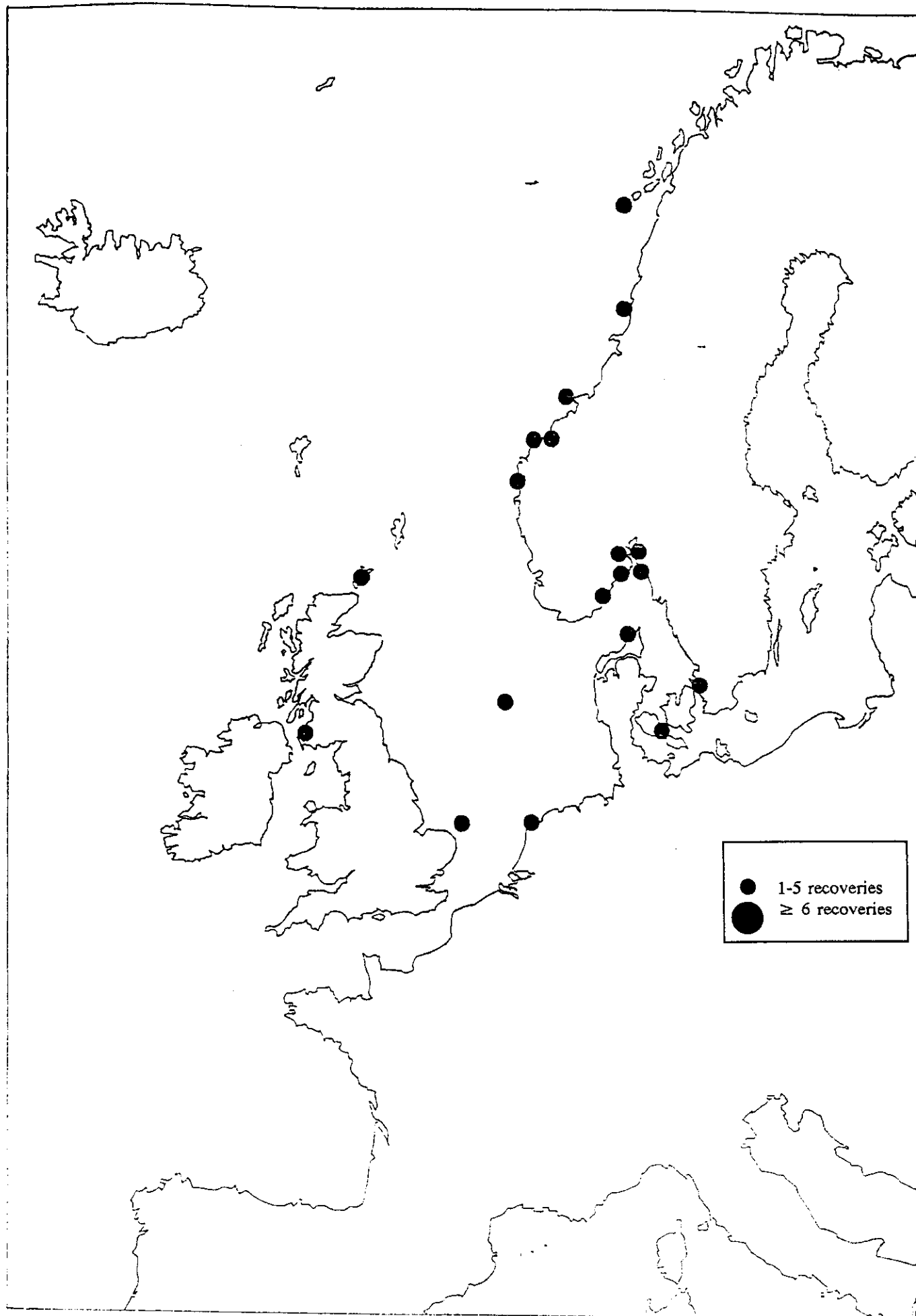


Figure 6.23 Recoveries of Guillemots ringed as chicks on Shetland and Fair Isle and recovered as second or third year birds during October - December, between 1970 and 1984.

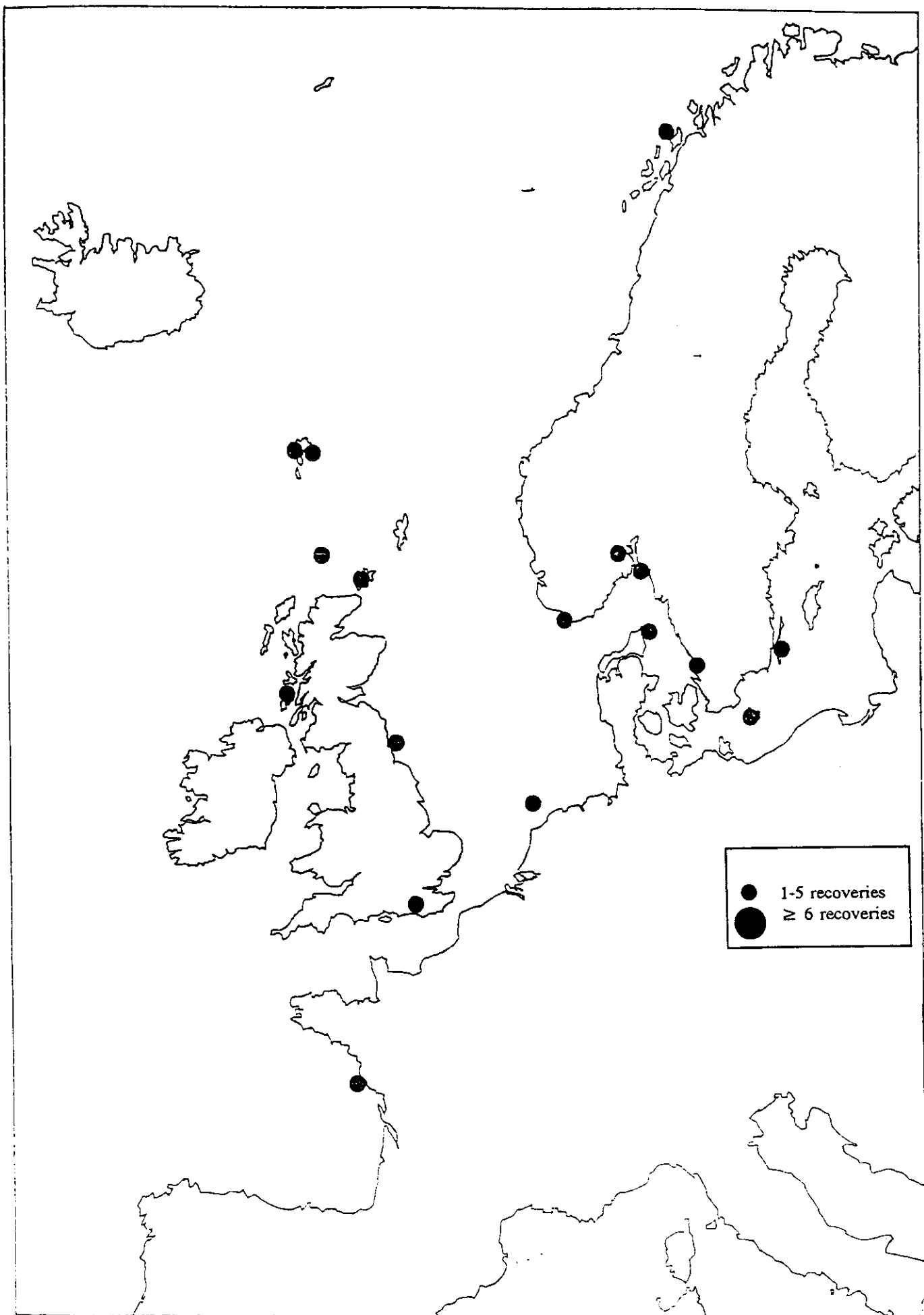


Figure 6.24 Recoveries of Guillemots ringed as chicks on Shetland and Fair Isle and recovered as second or third year birds during October - December, between 1985 and 1992.

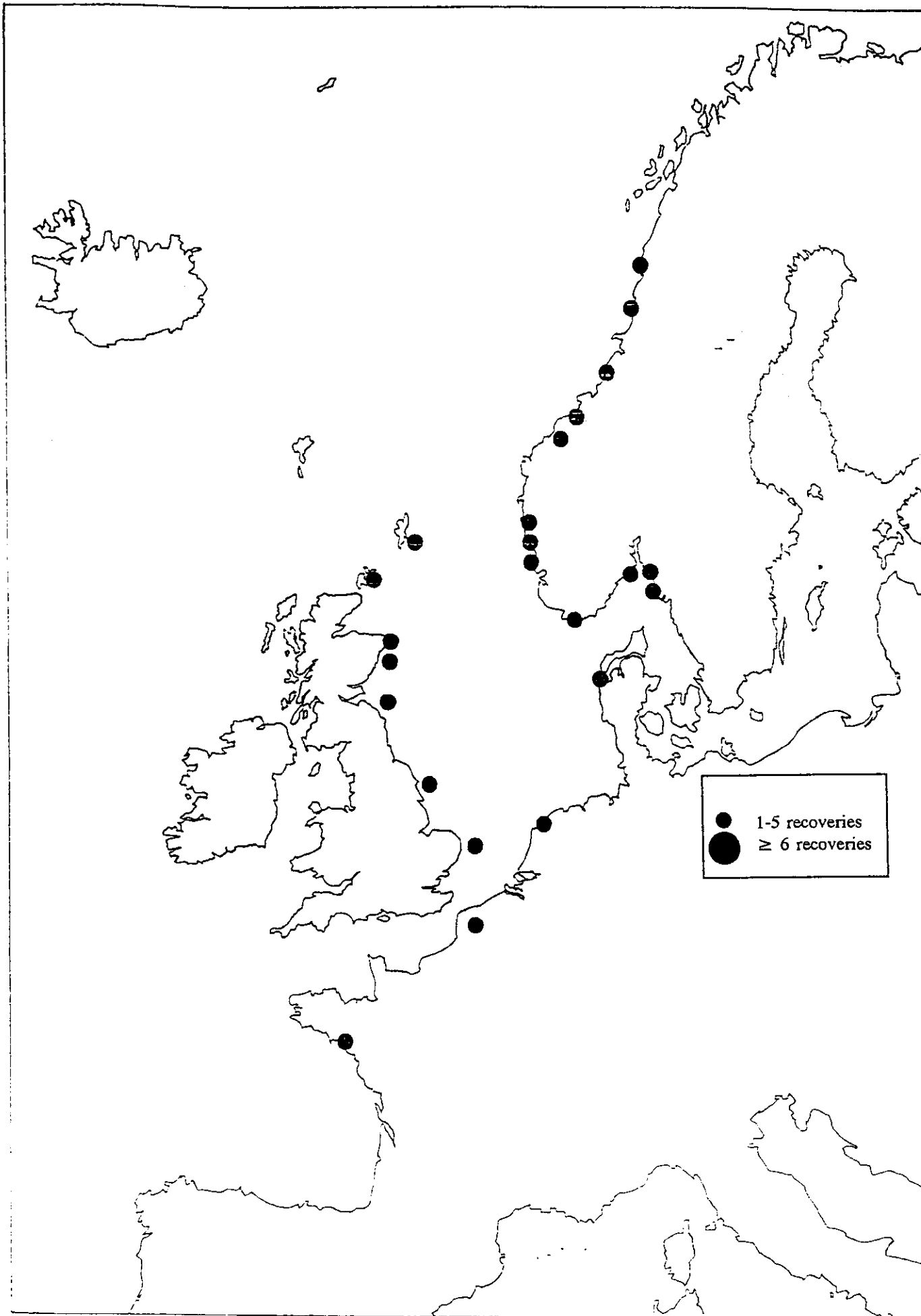


Figure 6.25 Recoveries of Guillemots ringed on Shetland and Fair Isle and recovered as adults during October - December, between 1970 and 1984. Adults include all birds ringed as full-grown birds or ringed as chicks and recovered during or after their sixth year of life.

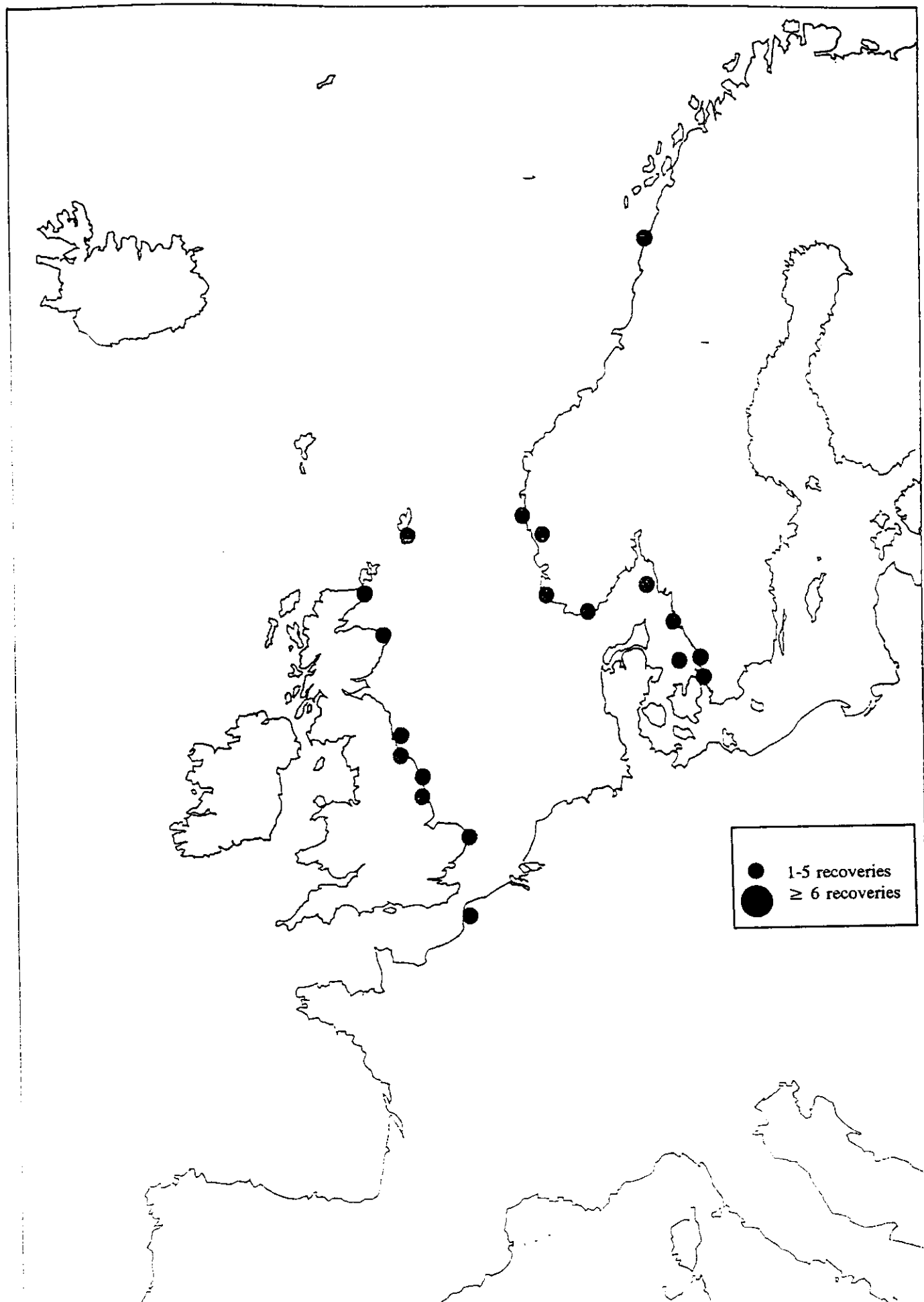


Figure 6.26

Recoveries of Guillemots ringed on Shetland and Fair Isle and recovered as adults during October - December, between 1985 and 1992. Adults include all birds ringed as full-grown birds or ringed as chicks and recovered during or after their sixth year of life.

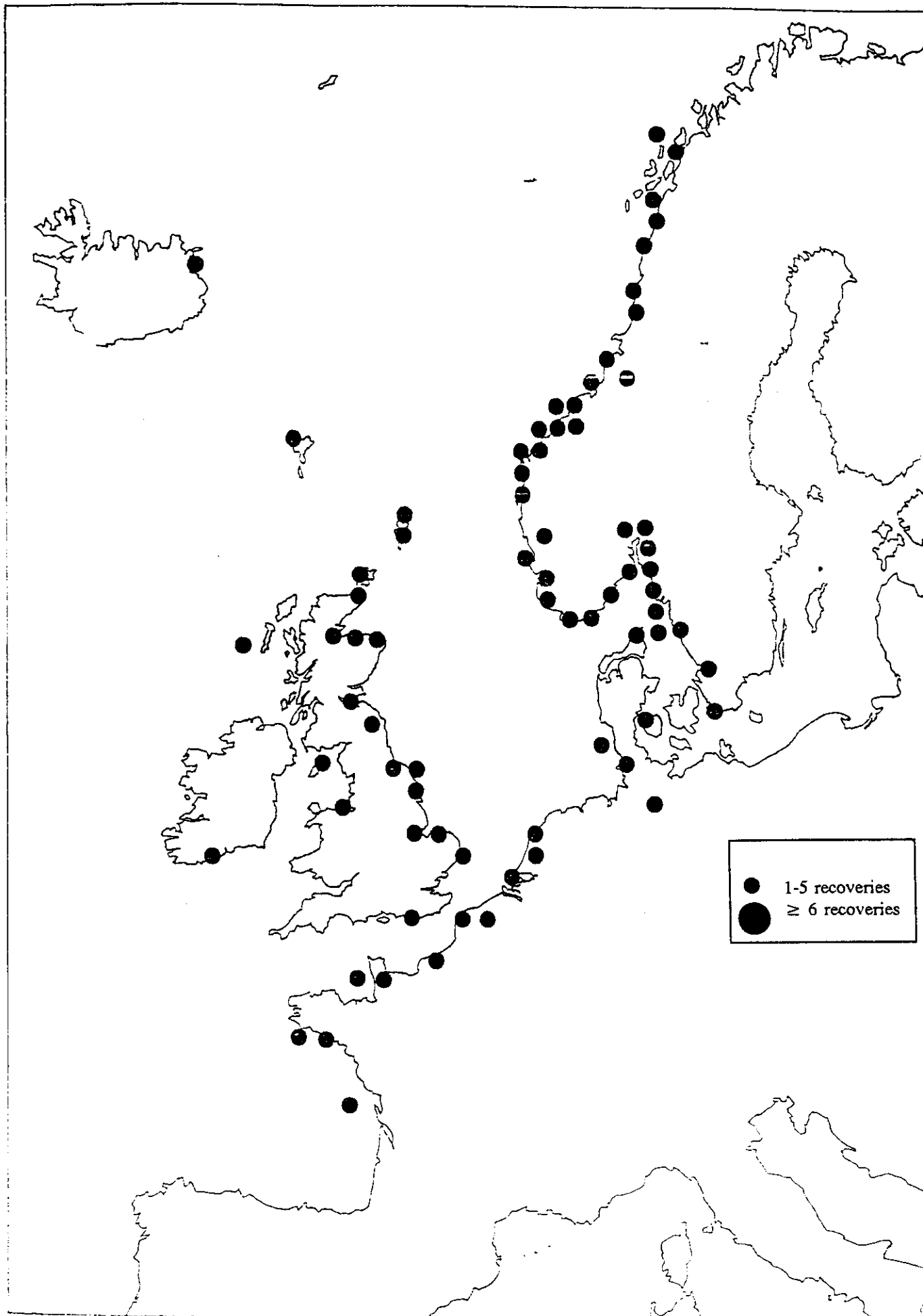


Figure 6.27 Recoveries of Guillemots ringed as chicks on Shetland and Fair Isle and recovered as first year birds during January - March, between 1970 and 1984.

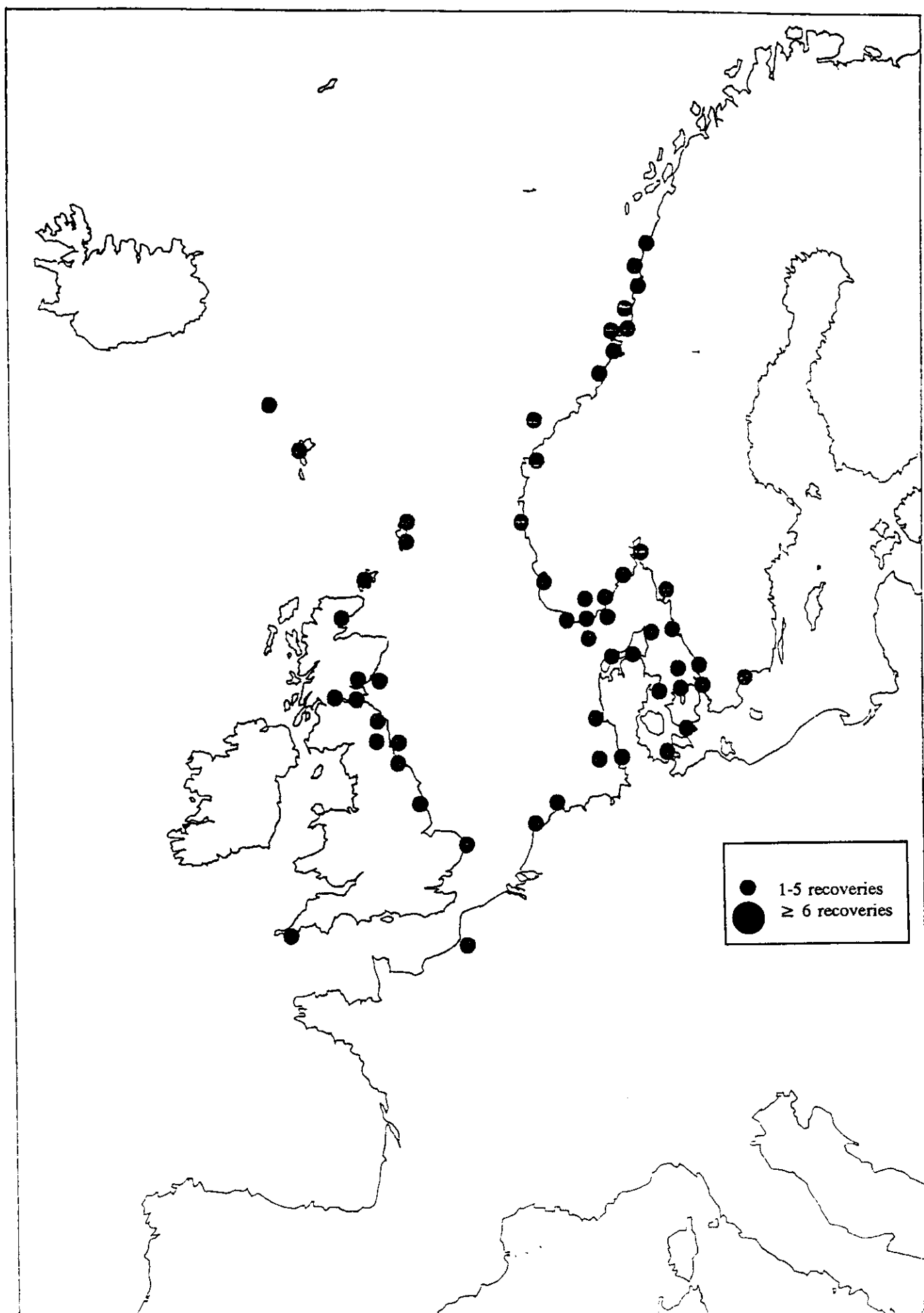


Figure 6.28 Recoveries of Guillemots ringed as chicks on Shetland and Fair Isle and recovered as first year birds during January - March, between 1985 and 1992.

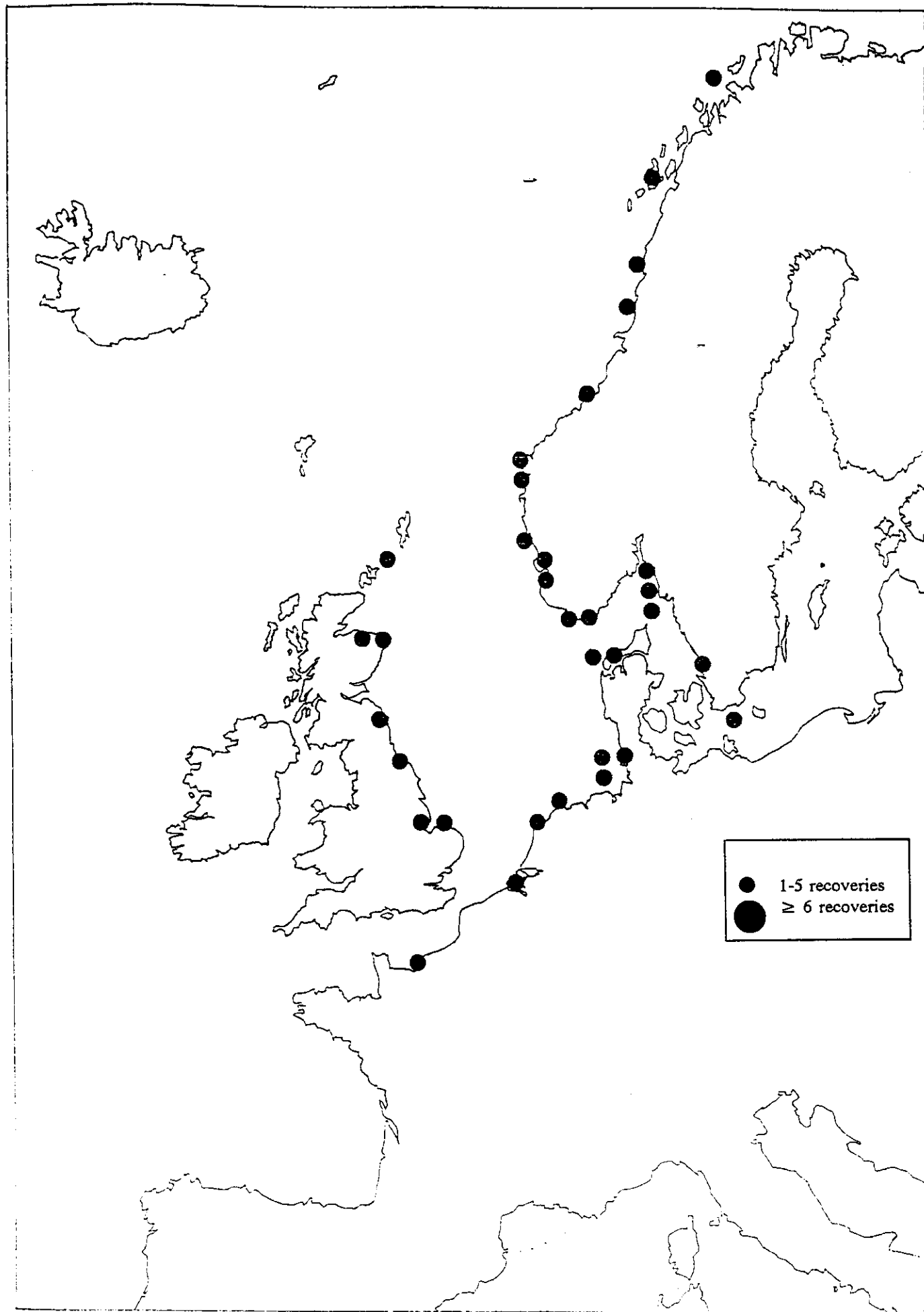


Figure 6.29 Recoveries of Guillemots ringed as chicks on Shetland and Fair Isle and recovered as second year birds during January - March, between 1970 and 1984.

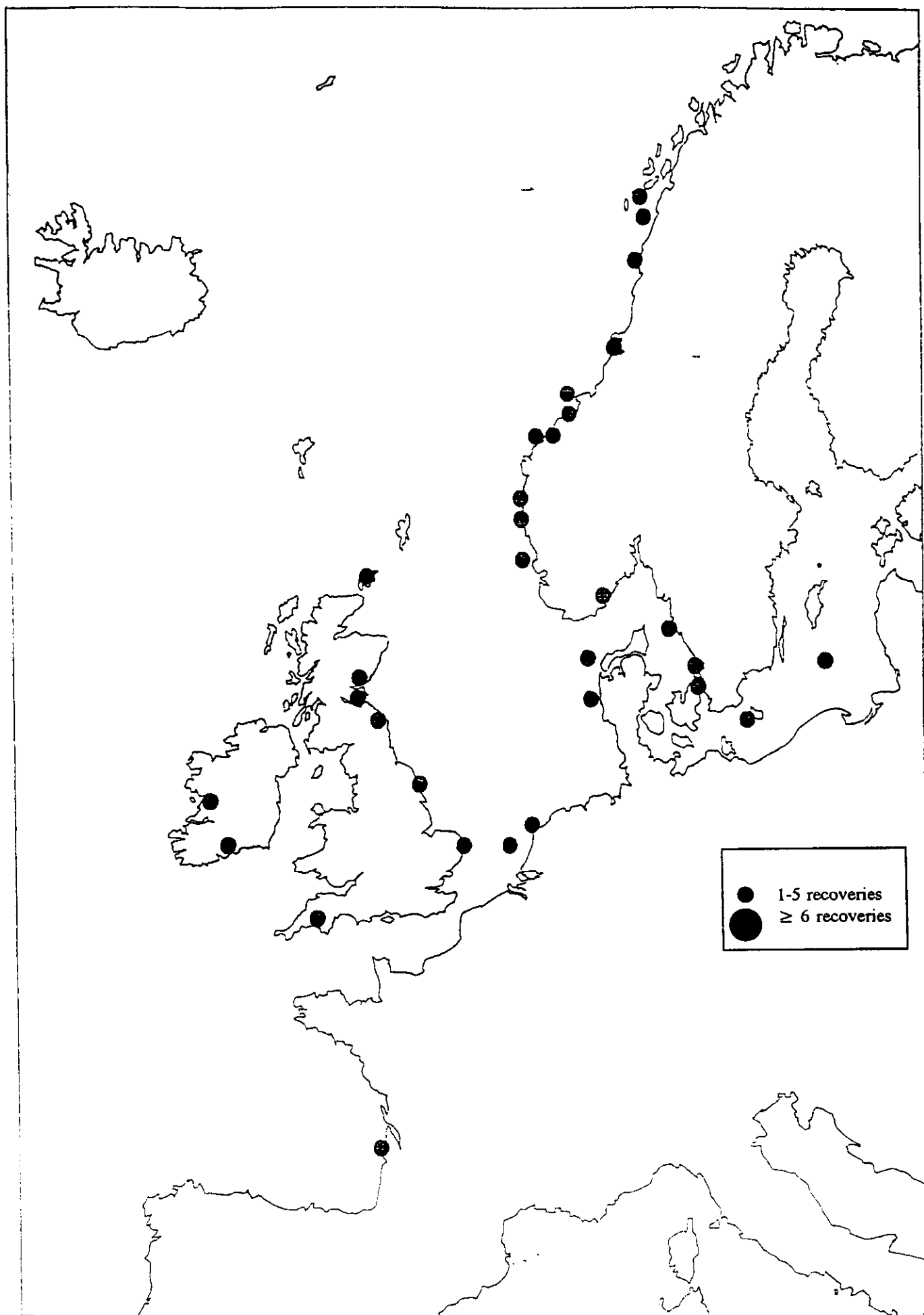


Figure 6.30 Recoveries of Guillemots ringed as chicks on Shetland and Fair Isle and recovered as second or third year birds during January - March, between 1985 and 1992.

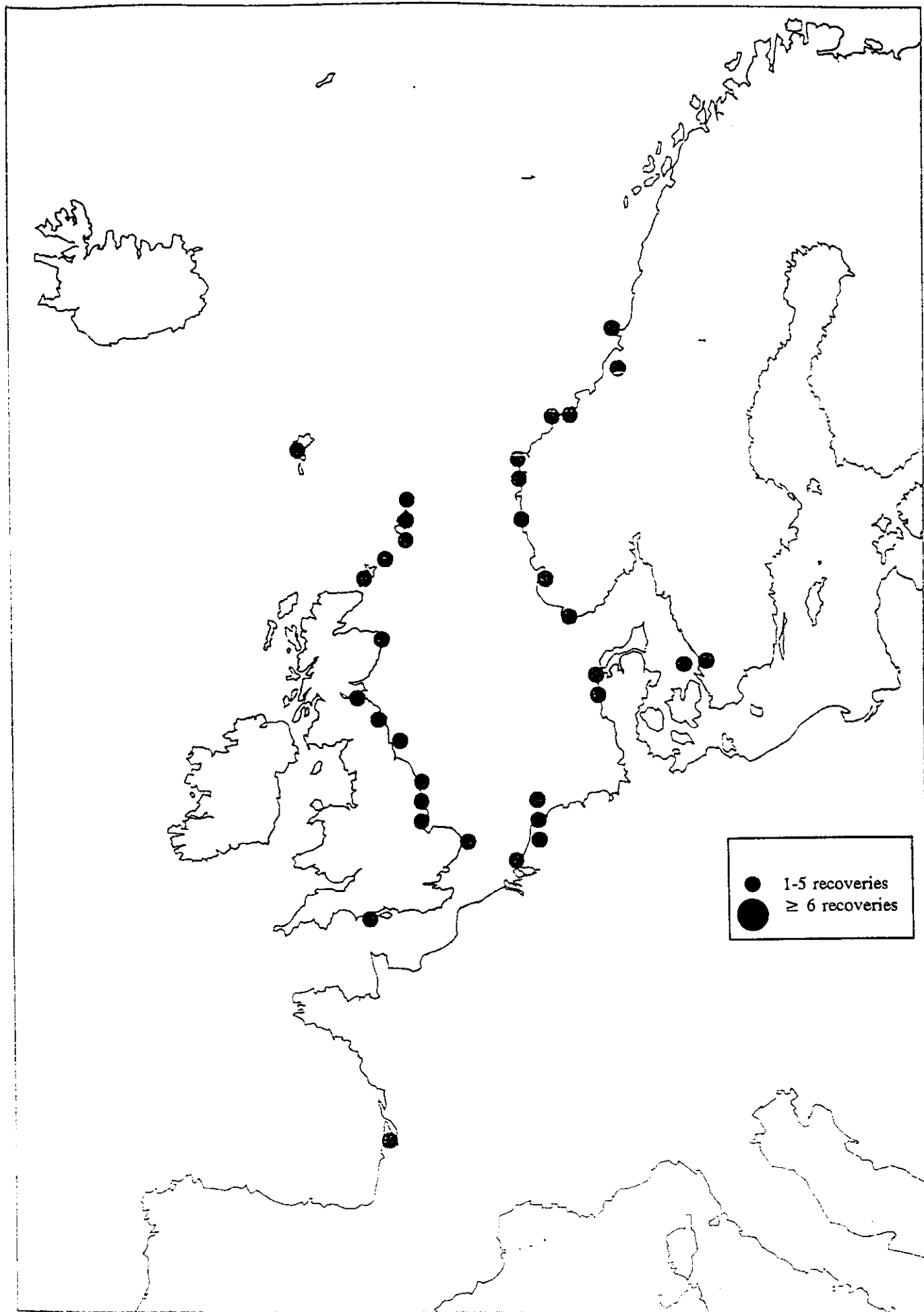


Figure 6.31 Recoveries of Guillemots ringed on Shetland and Fair Isle and recovered as adults during January - March, between 1970 and 1984. Adults include all birds ringed as full-grown birds or ringed as chicks and recovered during or after their sixth year of life.

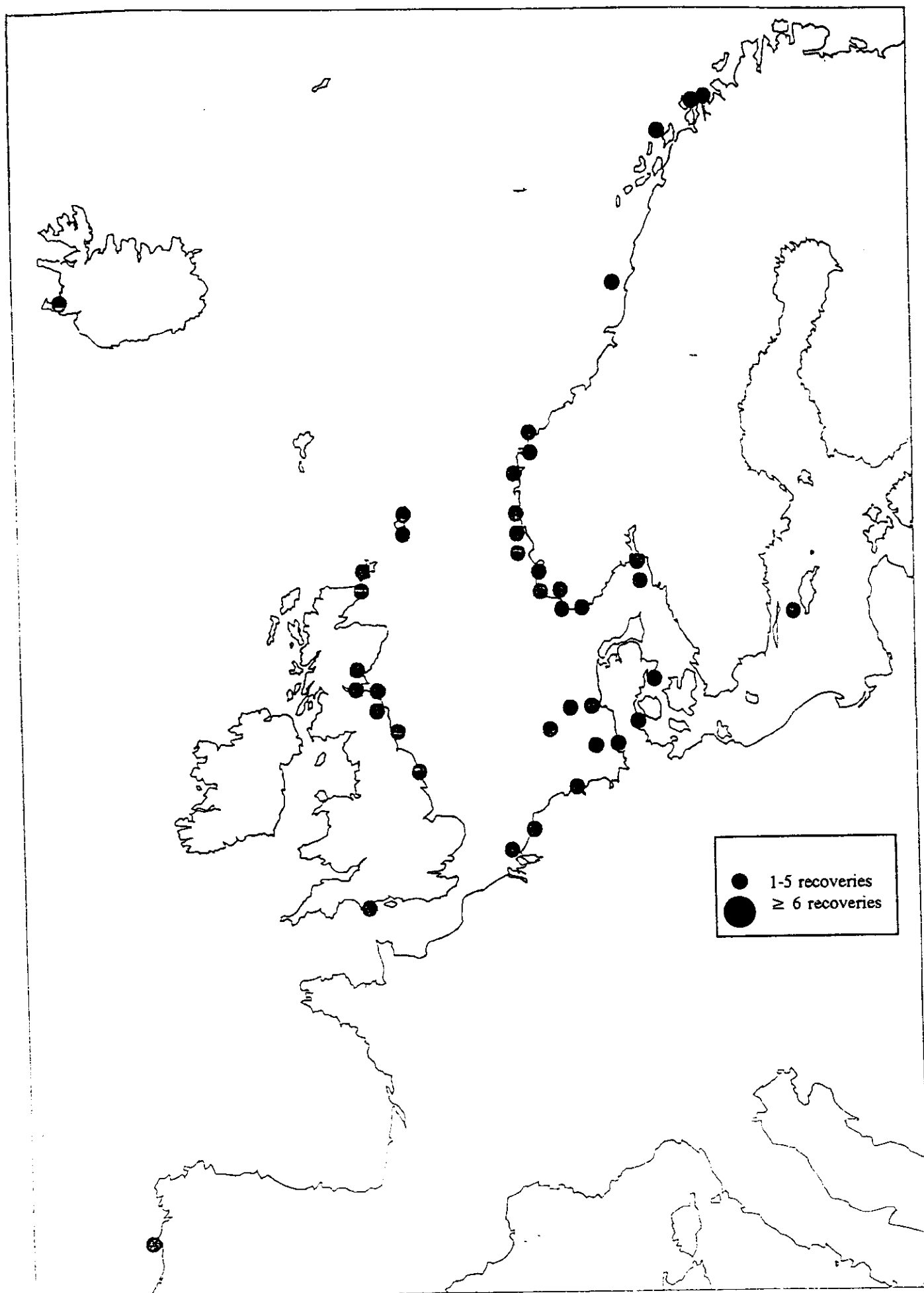


Figure 6.32

Recoveries of Guillemots ringed on Shetland and Fair Isle and recovered during January - March, between 1985 and 1992. Adults include all birds ringed as full-grown or ringed as chicks and recovered during or after their sixth year of life.

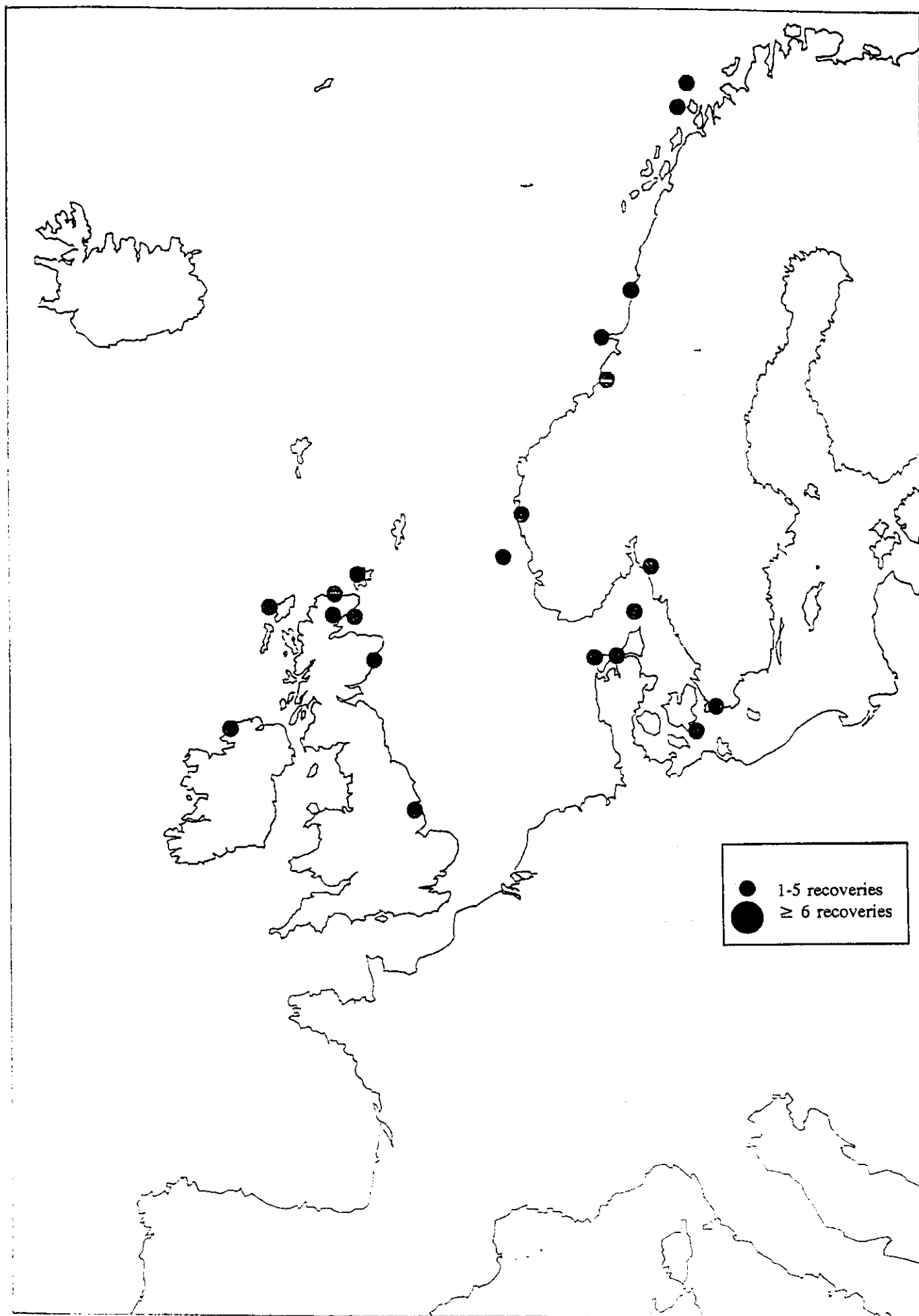


Figure 6.33 Recoveries of Guillemots ringed as chicks on Shetland and Fair Isle and recovered as first year birds during April - June, between 1970 and 1984.

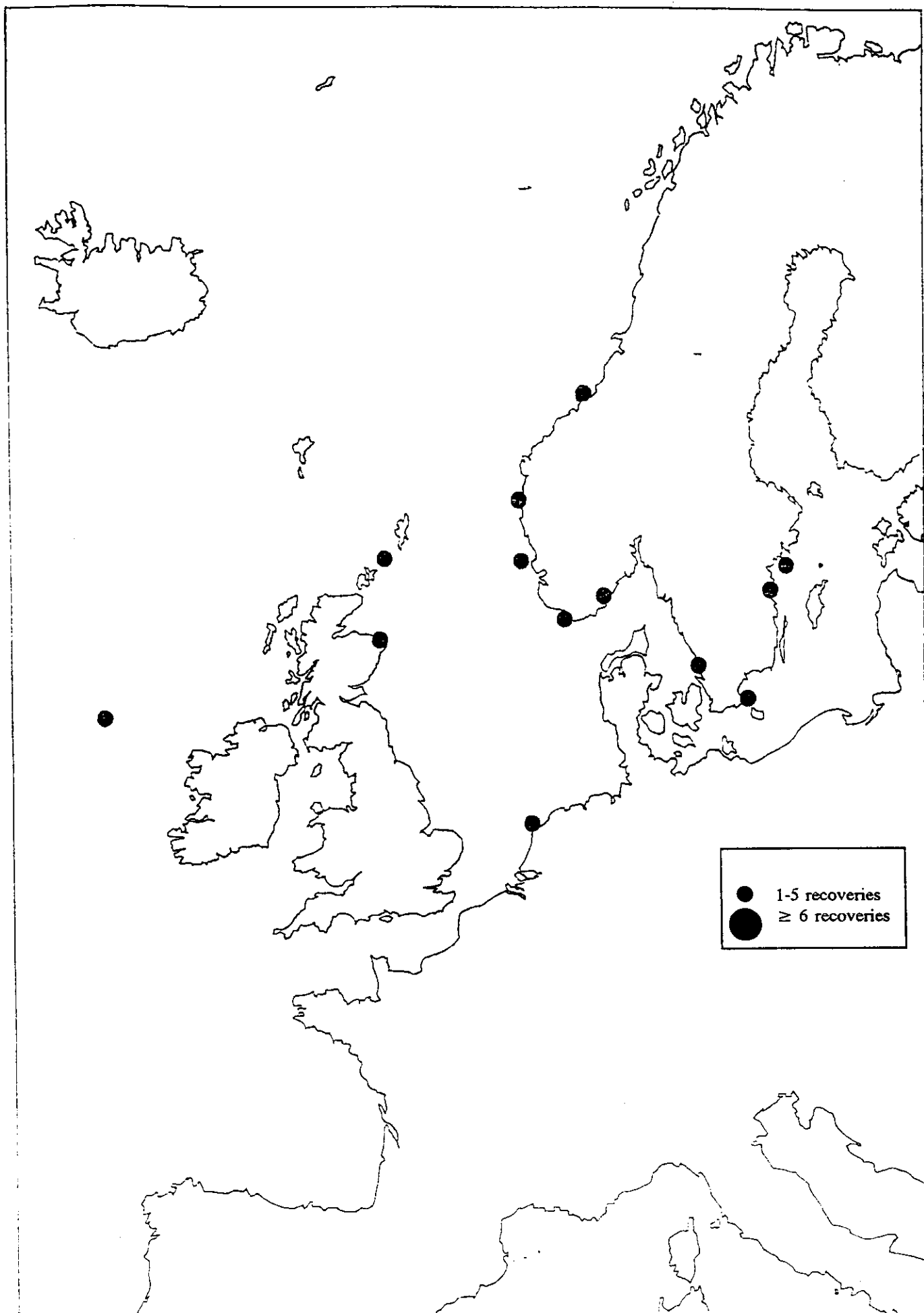


Figure 6.34 Recoveries of Guillemots ringed as chicks on Shetland and Fair Isle and recovered as first year birds during April - June, between 1985 and 1992.

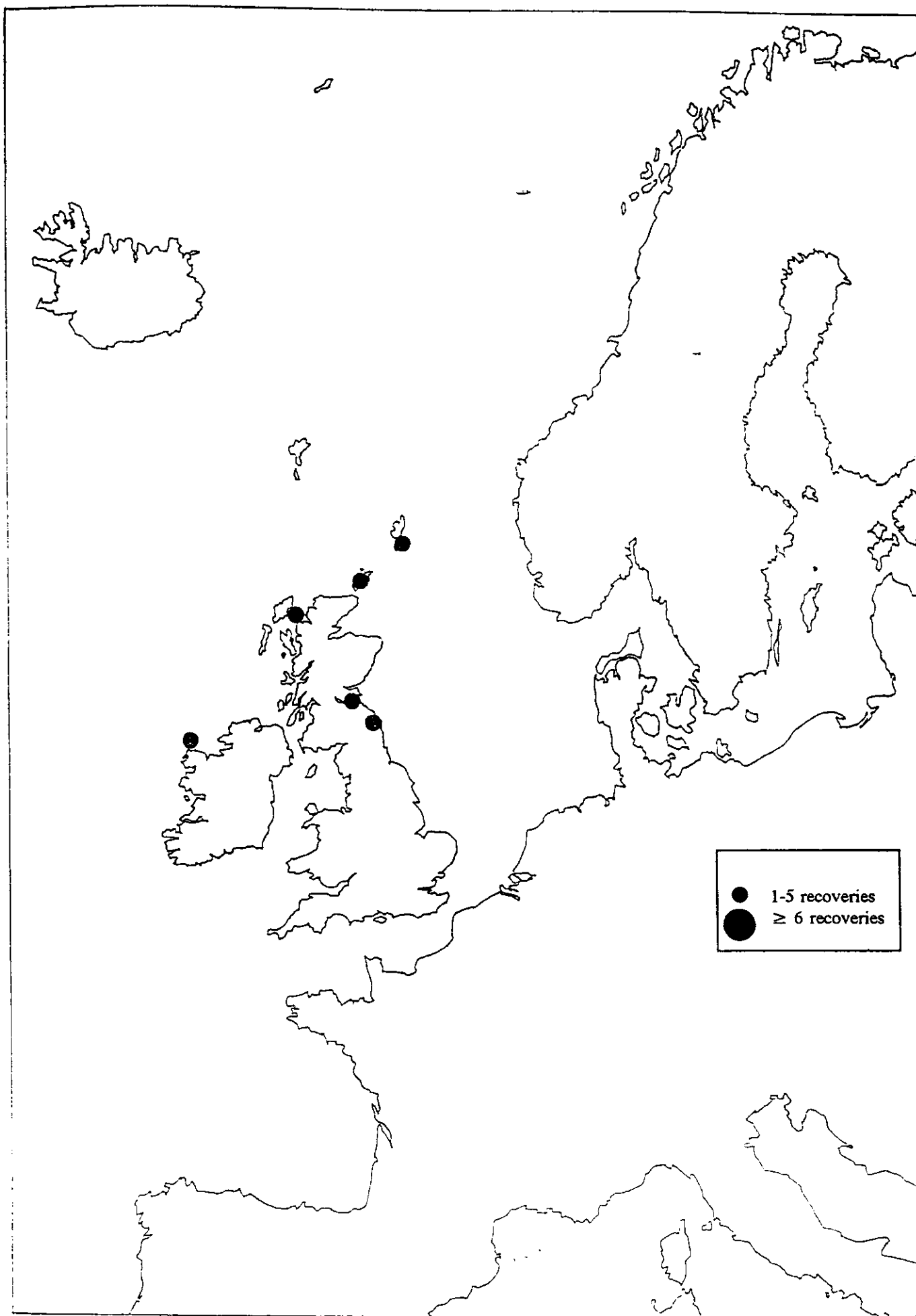


Figure 6.36 Recoveries of Guillemots ringed as chicks on Shetland and Fair Isle and recovered as second or third year birds during April - June, between 1985 and 1992.

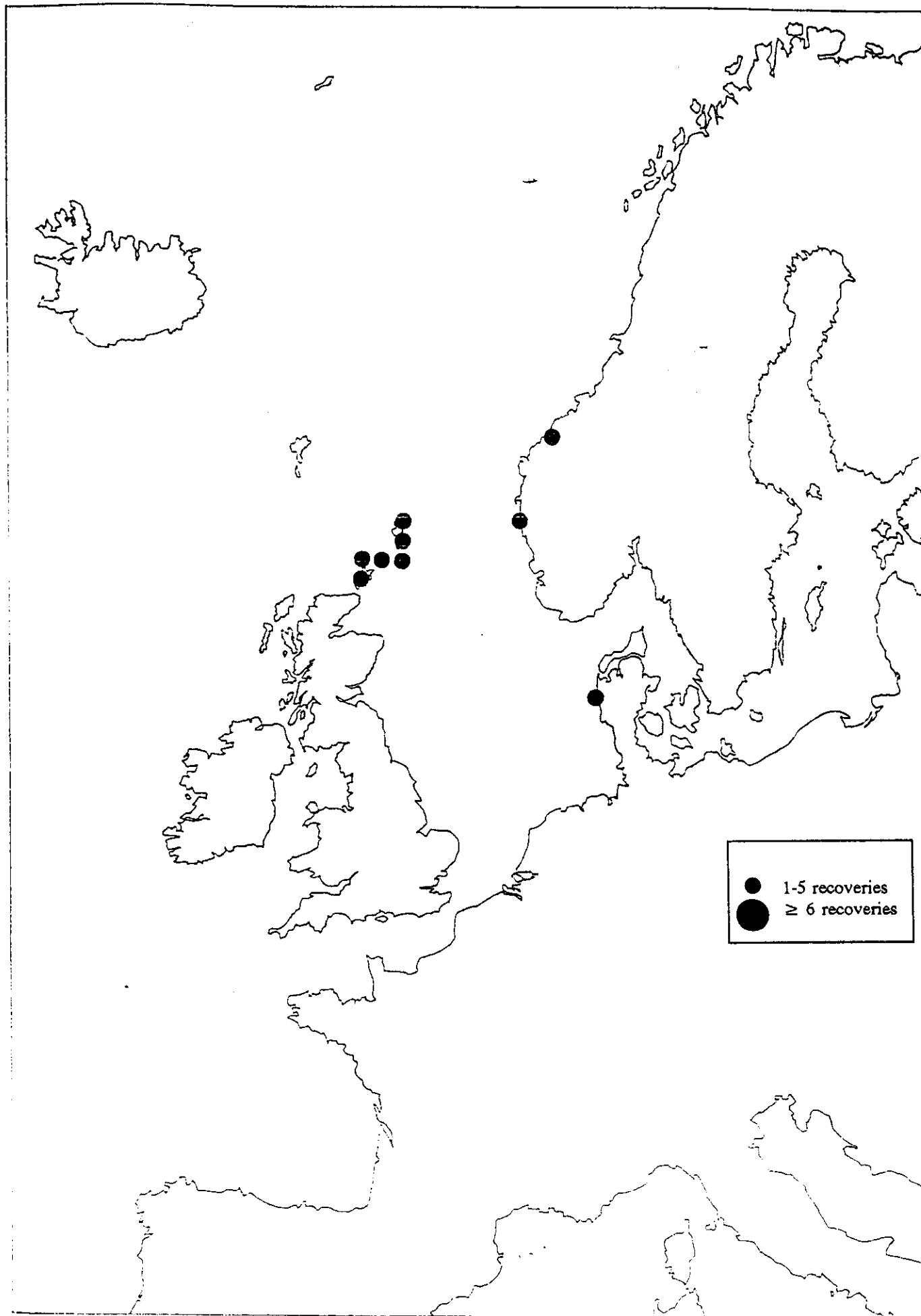


Figure 6.37 Recoveries of Guillemots ringed on Shetland and Fair Isle and recovered as adults during April - June, between 1970 and 1984. Adults include all birds ringed as full-grown birds or ringed as chicks and recovered during or after their sixth year of life.

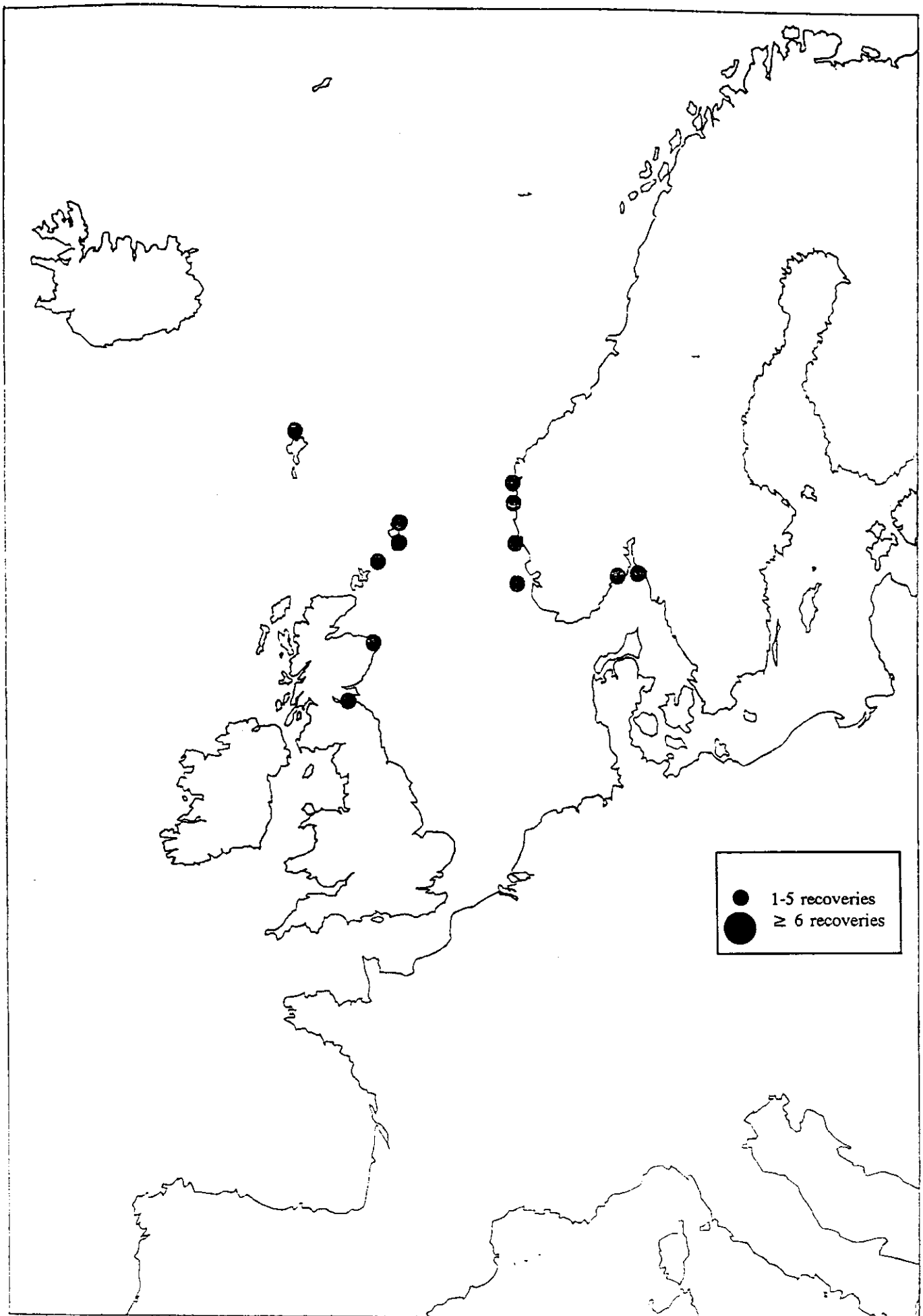
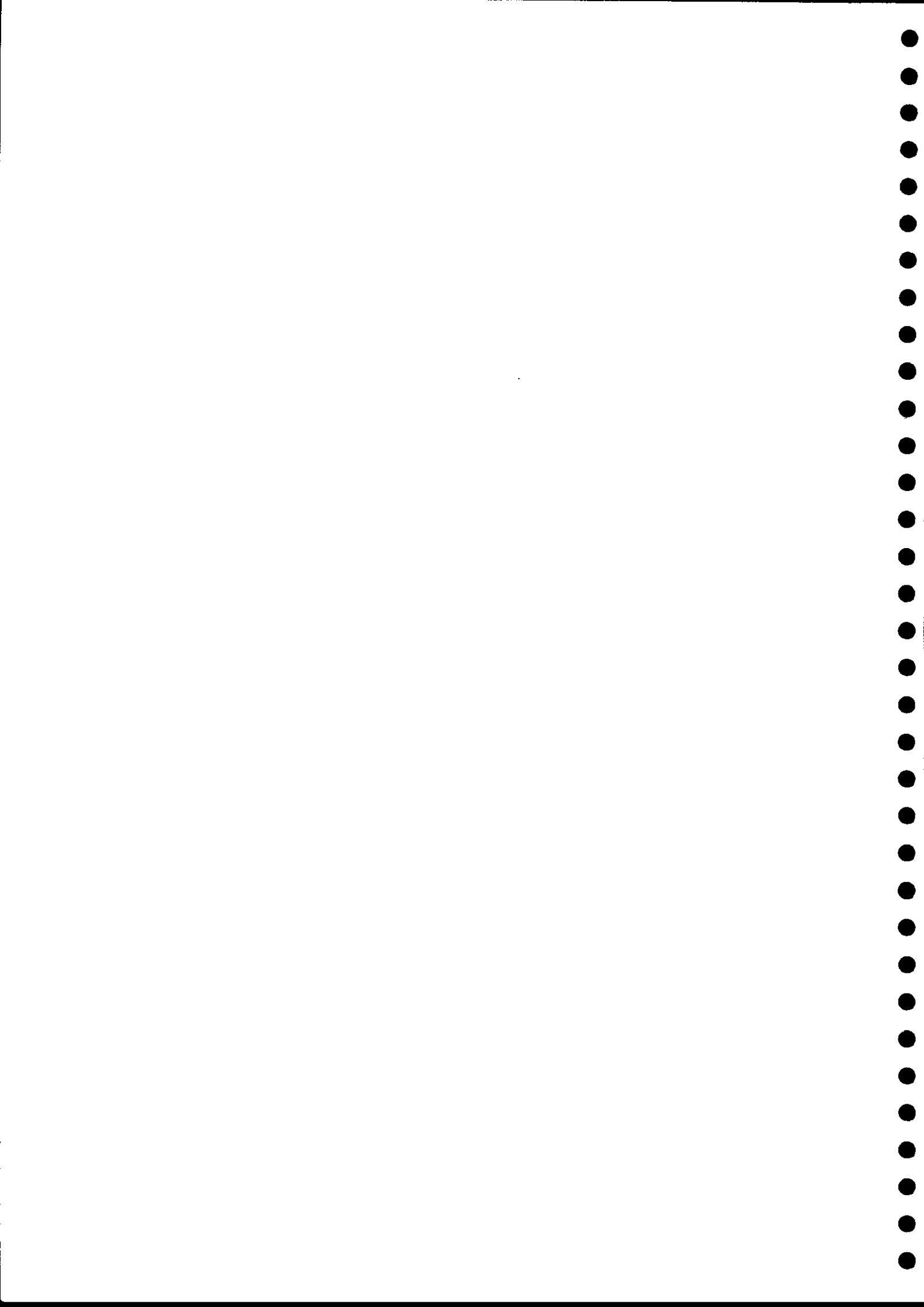


Figure 6.38 Recoveries of Guillemots ringed on Shetland and Fair Isle and recovered as adults during April - June, between 1985 and 1992. Adults include all birds ringed as full-grown birds or ringed as chicks and recovered during or after their sixth year of life.

Section 7

Recoveries of Guillemots ringed in
East Sutherland, Caithness and North Sutor



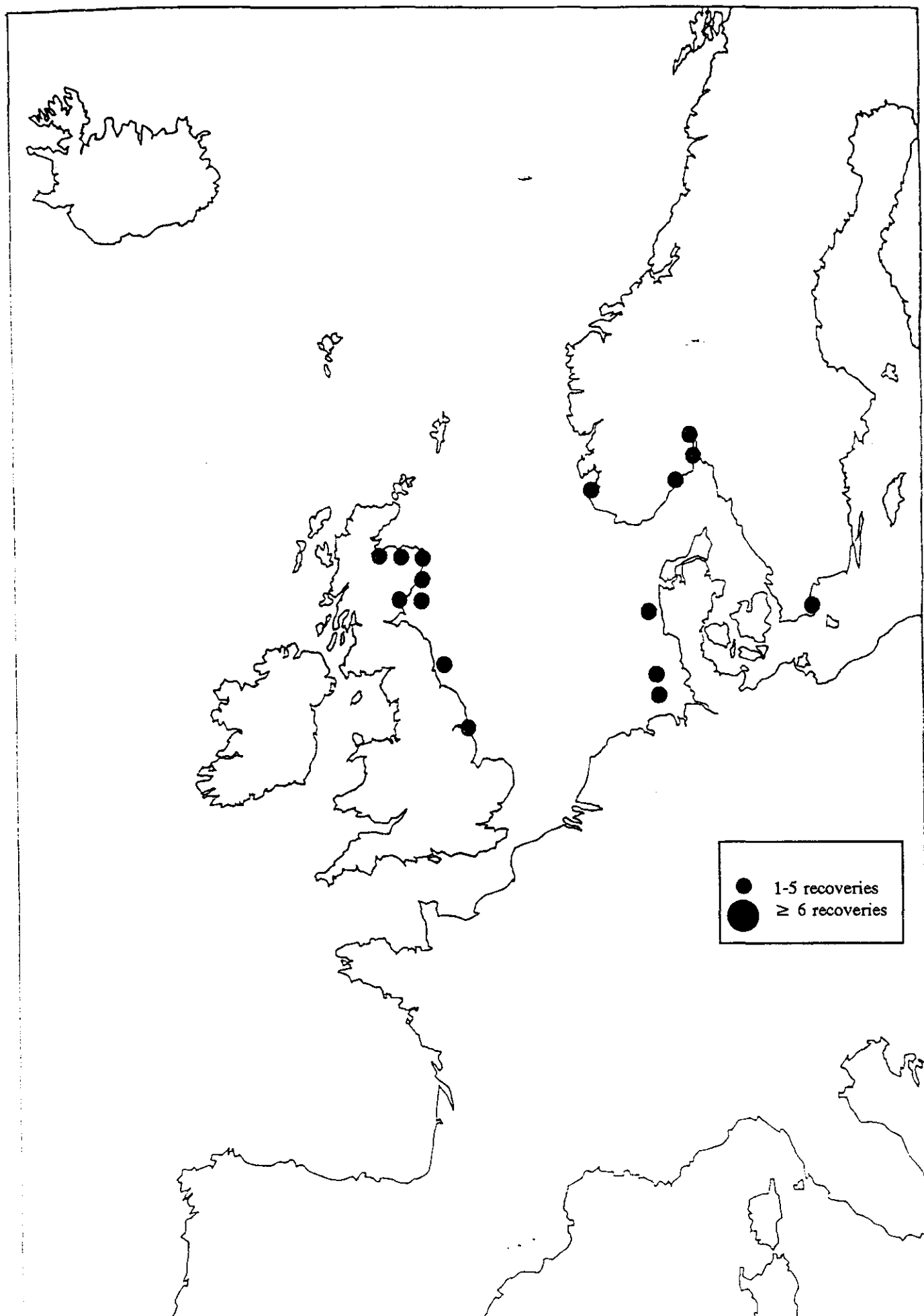


Figure 7.1 Recoveries of Guillemots ringed as chicks in East Sutherland, Caithness and North Sutor and recovered as first year birds during July - September, between 1970 and 1992.

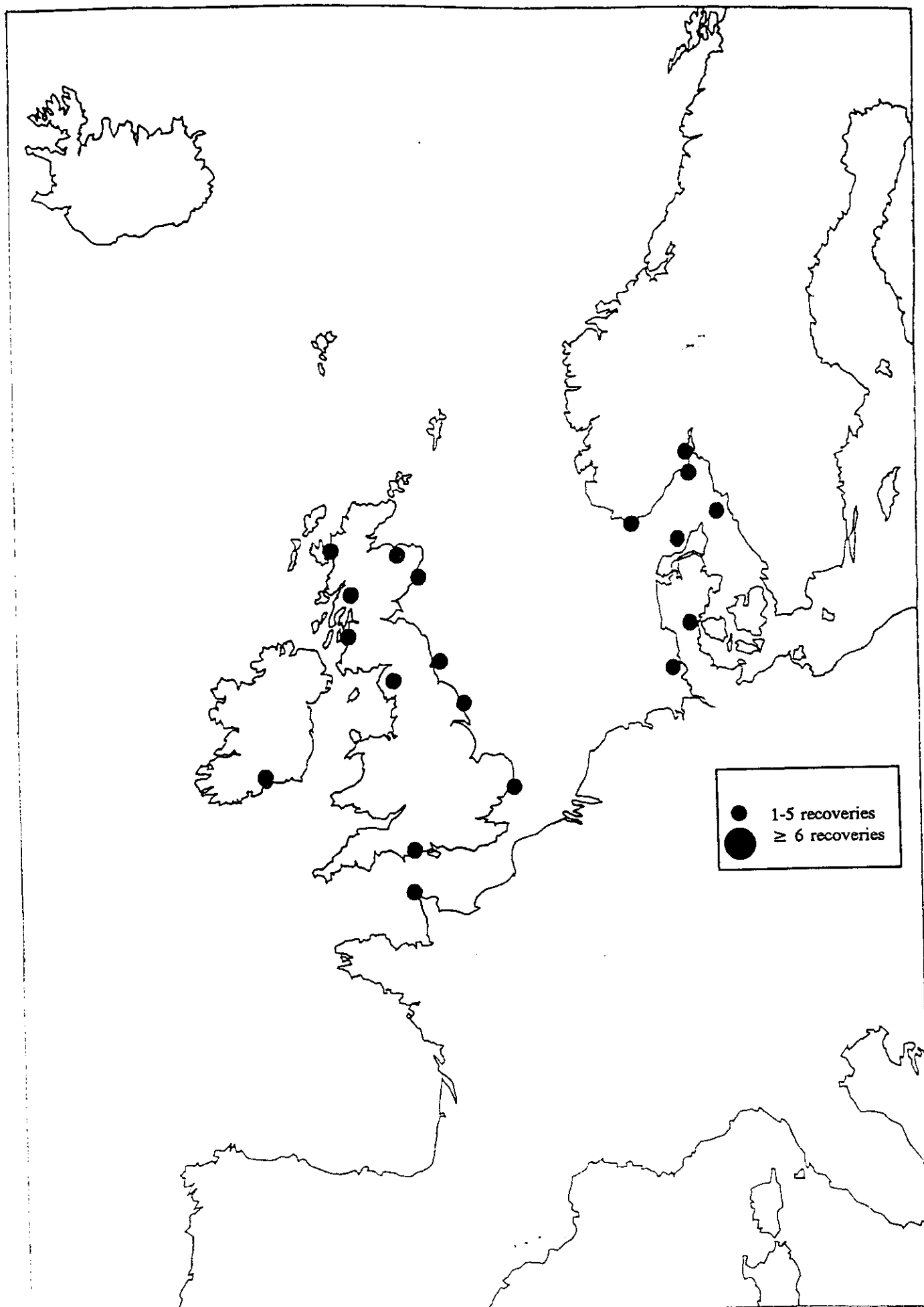


Figure 7.2 Recoveries of Guillemots ringed as chicks in East Sutherland, Caithness and North Sutor and recovered as second or third year birds during July - September, between 1970 and 1992.

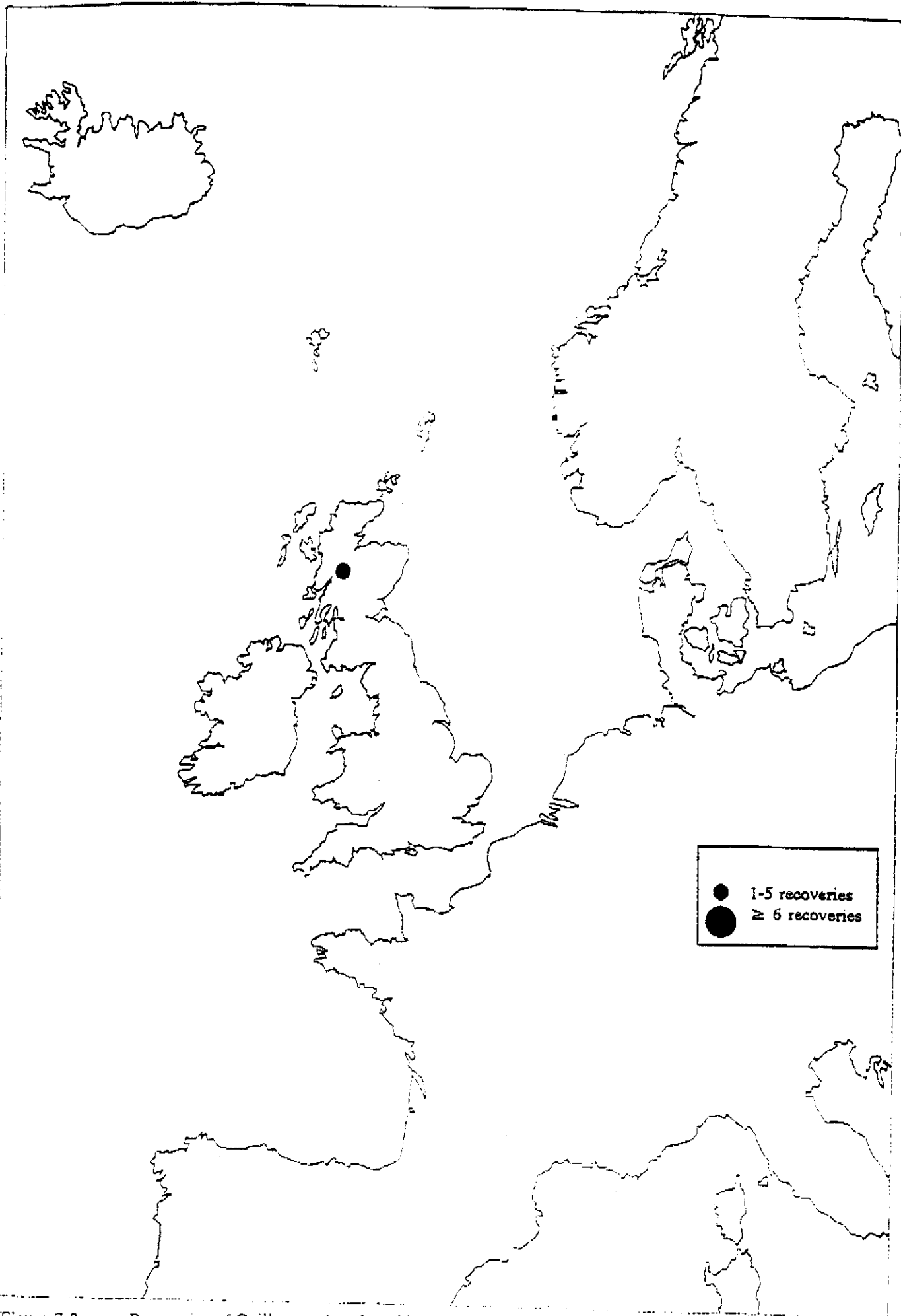


Figure 7.3 Recoveries of Guillemots ringed as chicks in East Sutherland, Caithness and North Sutor and recovered as adults during July - September, between 1970 and 1992.

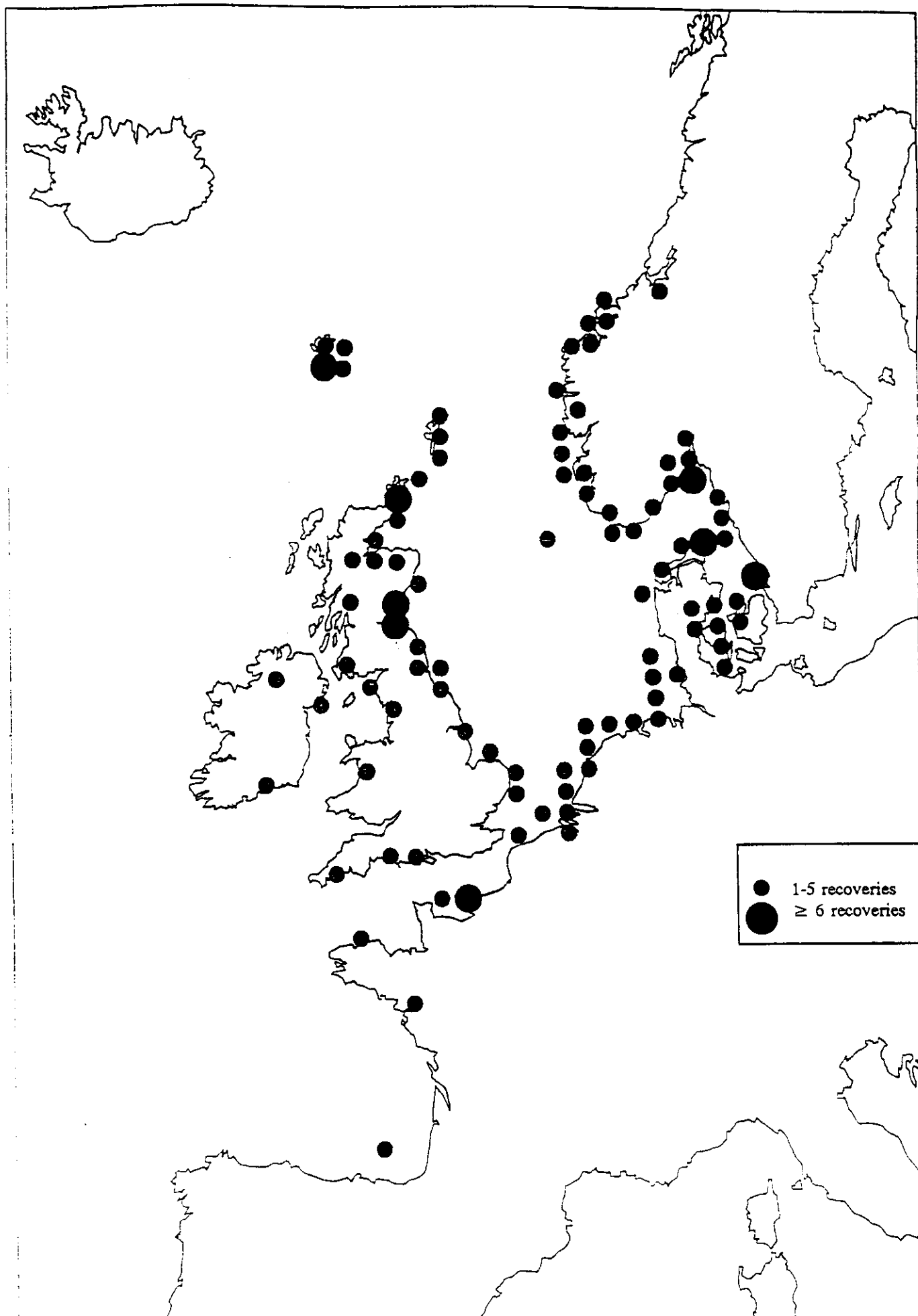


Figure 7.4

Recoveries of Guillemots ringed as chicks in East Sutherland, Caithness and North Sutor and recovered as first year birds during October - December, between 1970 and 1992.

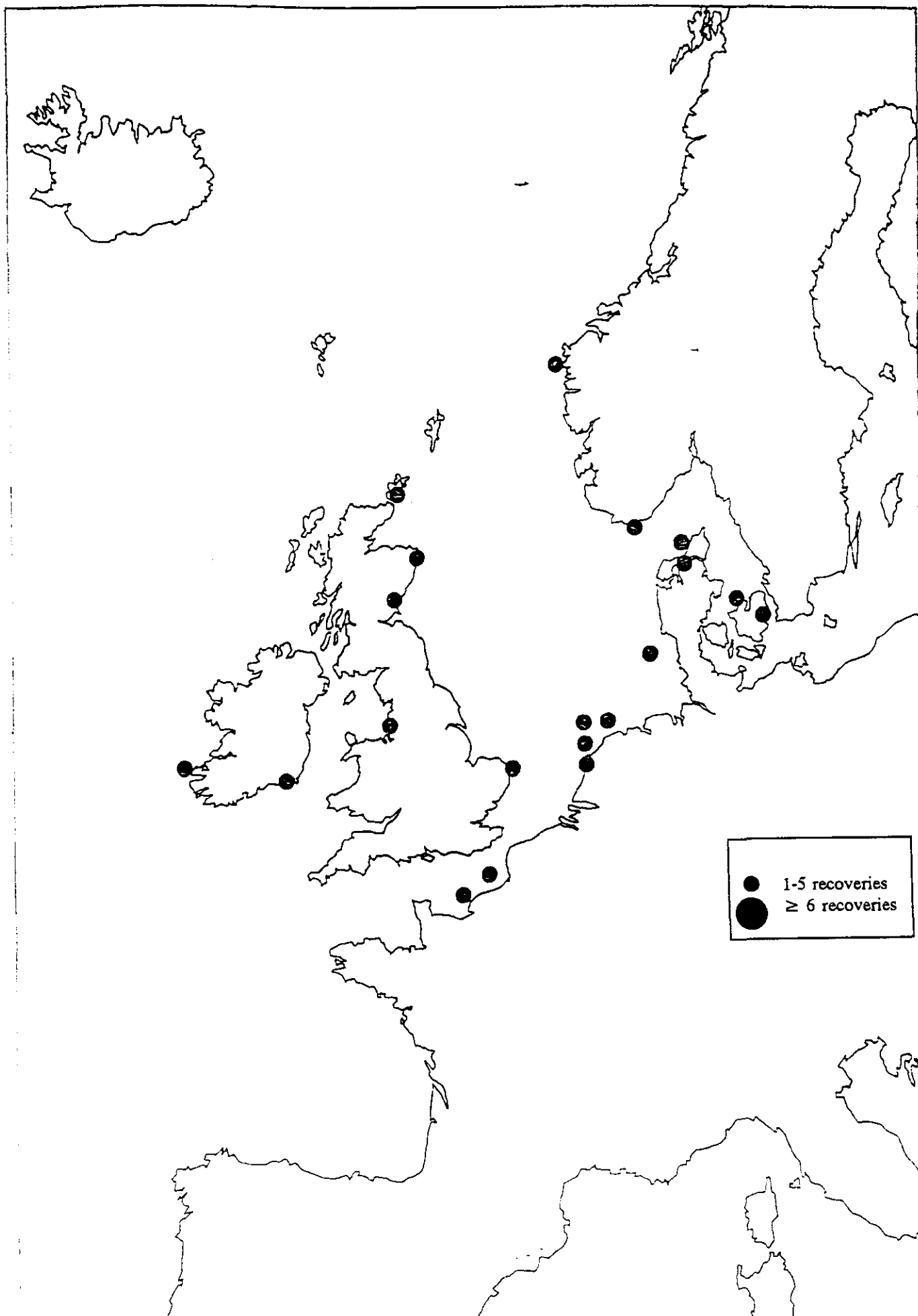


Figure 7.5

Recoveries of Guillemots ringed as chicks in East Sutherland, Caithness and North Sutor and recovered as second or third year birds during October - December, between 1970 and 1992.

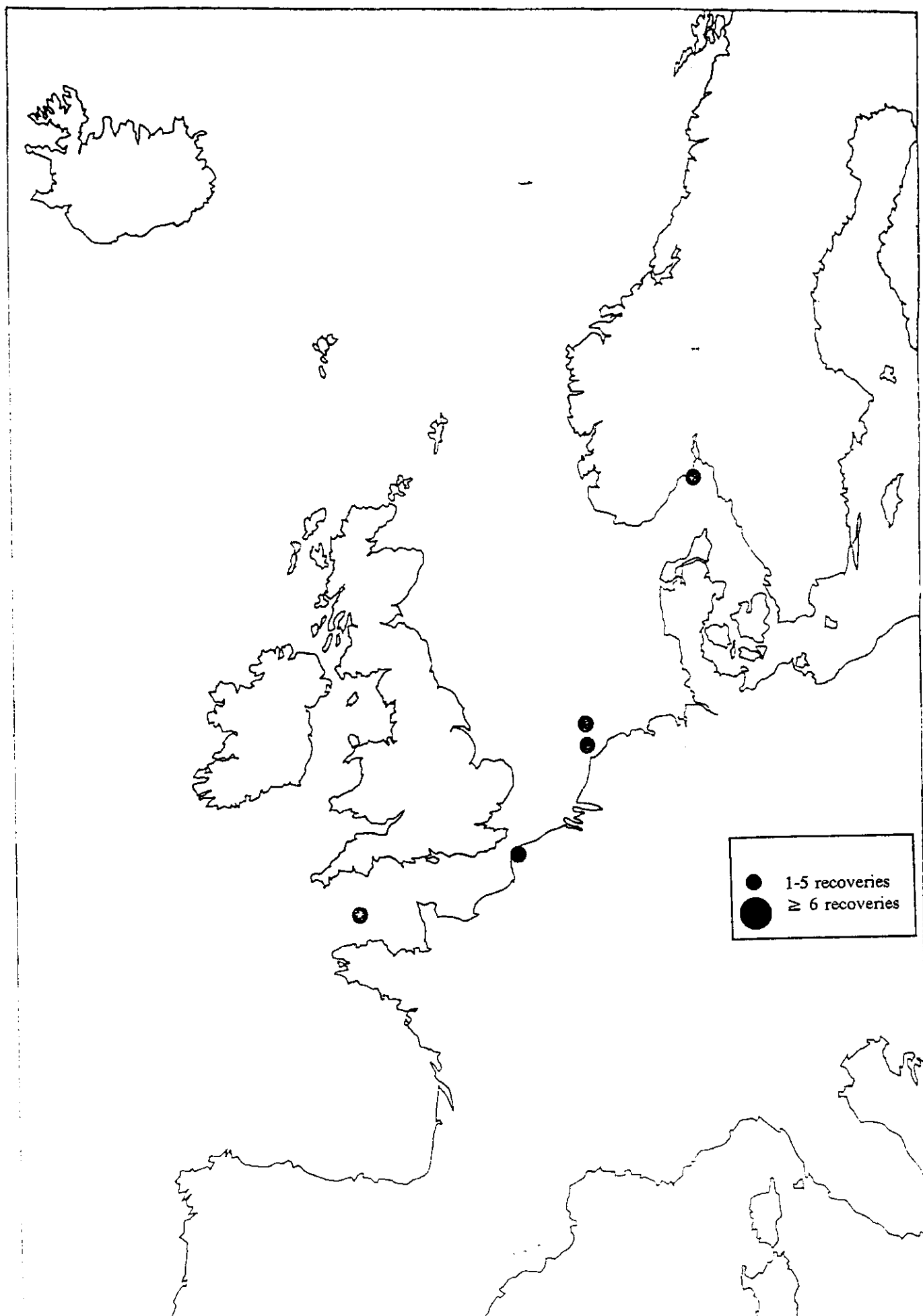


Figure 7.6

Recoveries of Guillemots ringed as chicks in East Sutherland, Caithness and North Sutor and recovered as fourth or fifth year birds during October - December, between 1970 and 1992.

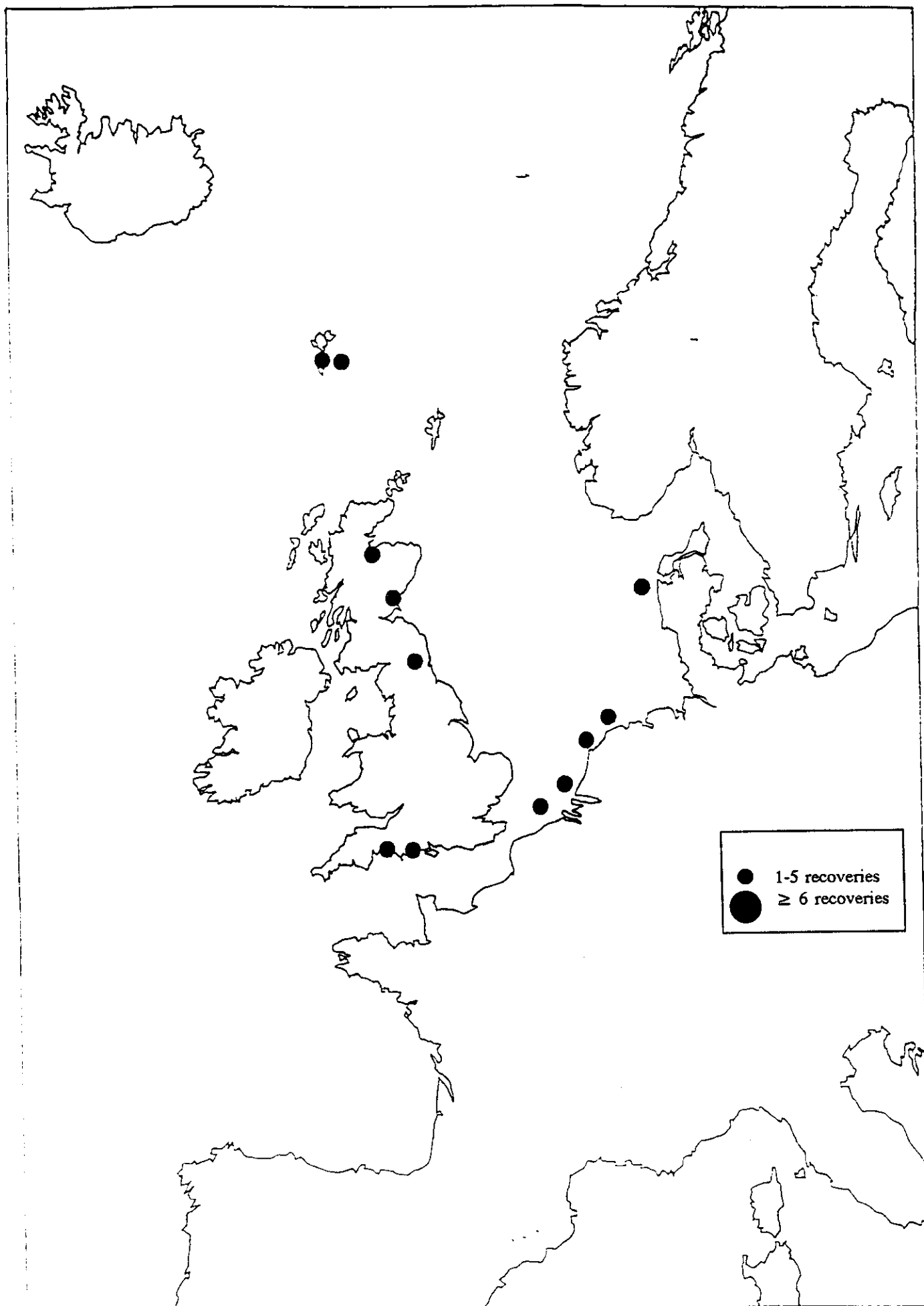


Figure 7.7

Recoveries of Guillemots ringed in East Sutherland, Caithness and North Sutor as adults, during October - December between 1970 and 1992. Adults include all birds ringed as full-grown birds or ringed as chicks and recovered during or after their sixth year of life.

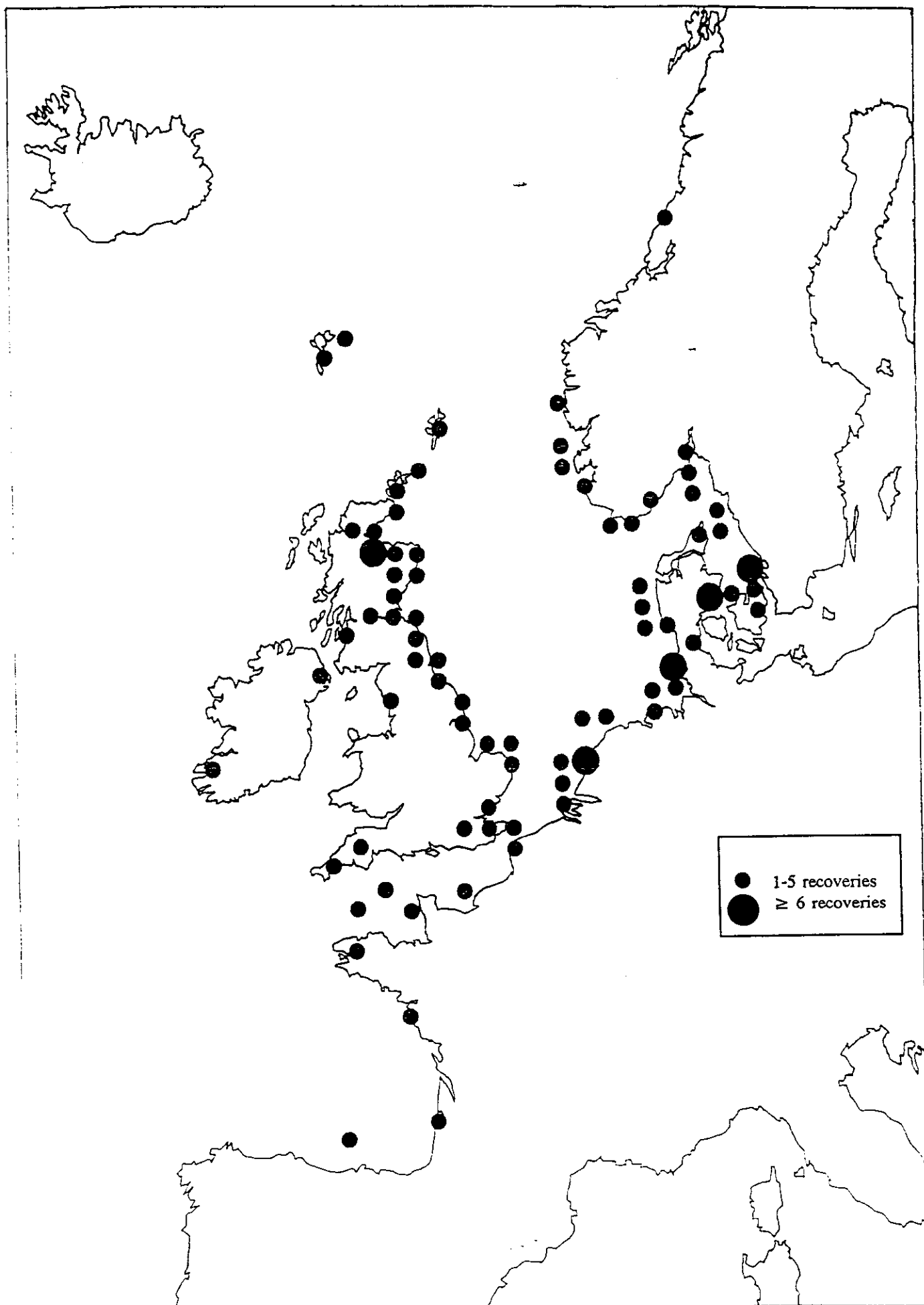


Figure 7.8 Recoveries of Guillemots ringed as chicks in East Sutherland, Caithness and North Sutor and recovered as first year birds during January - March, between 1970 and 1992.

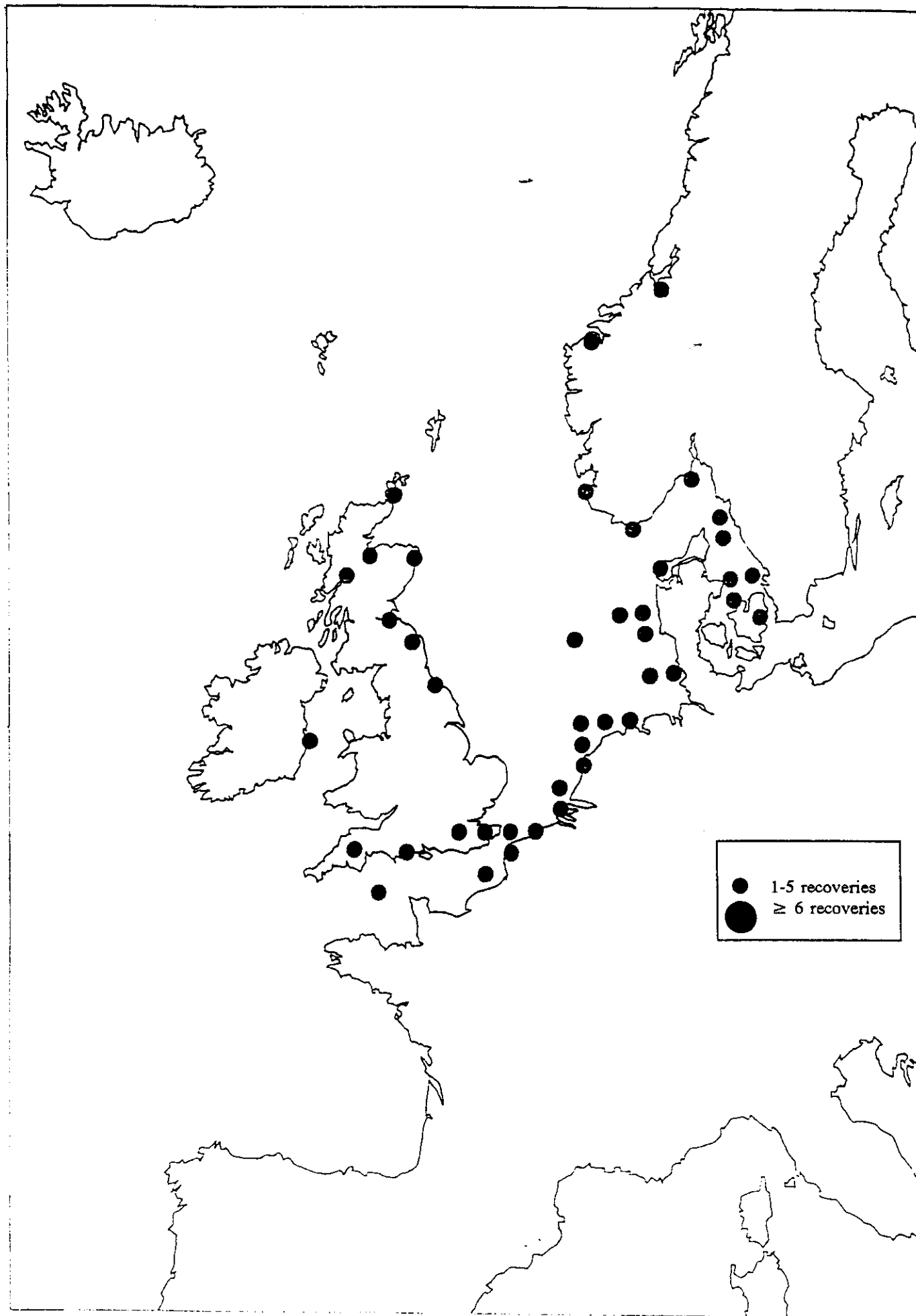


Figure 7.9 Recoveries of Guillemots ringed as chicks in East Sutherland, Caithness and North Sutor and recovered as second or third year birds during January - March, between 1970 and 1992.

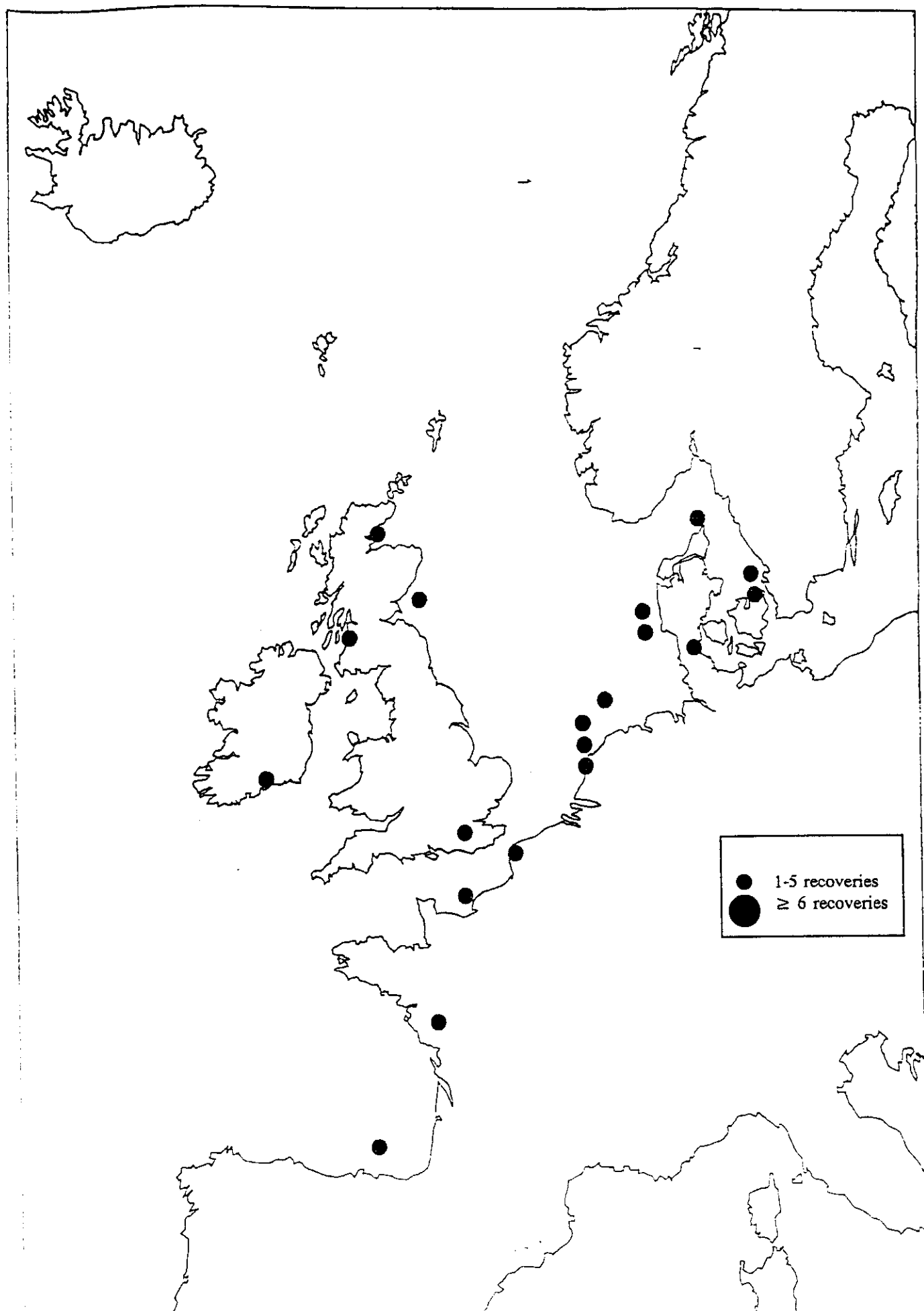


Figure 7.10 Recoveries of Guillemots ringed as chicks in East Sutherland, Caithness and North Sutor and recovered as fourth or fifth year birds during January - March, between 1970 and 1992.

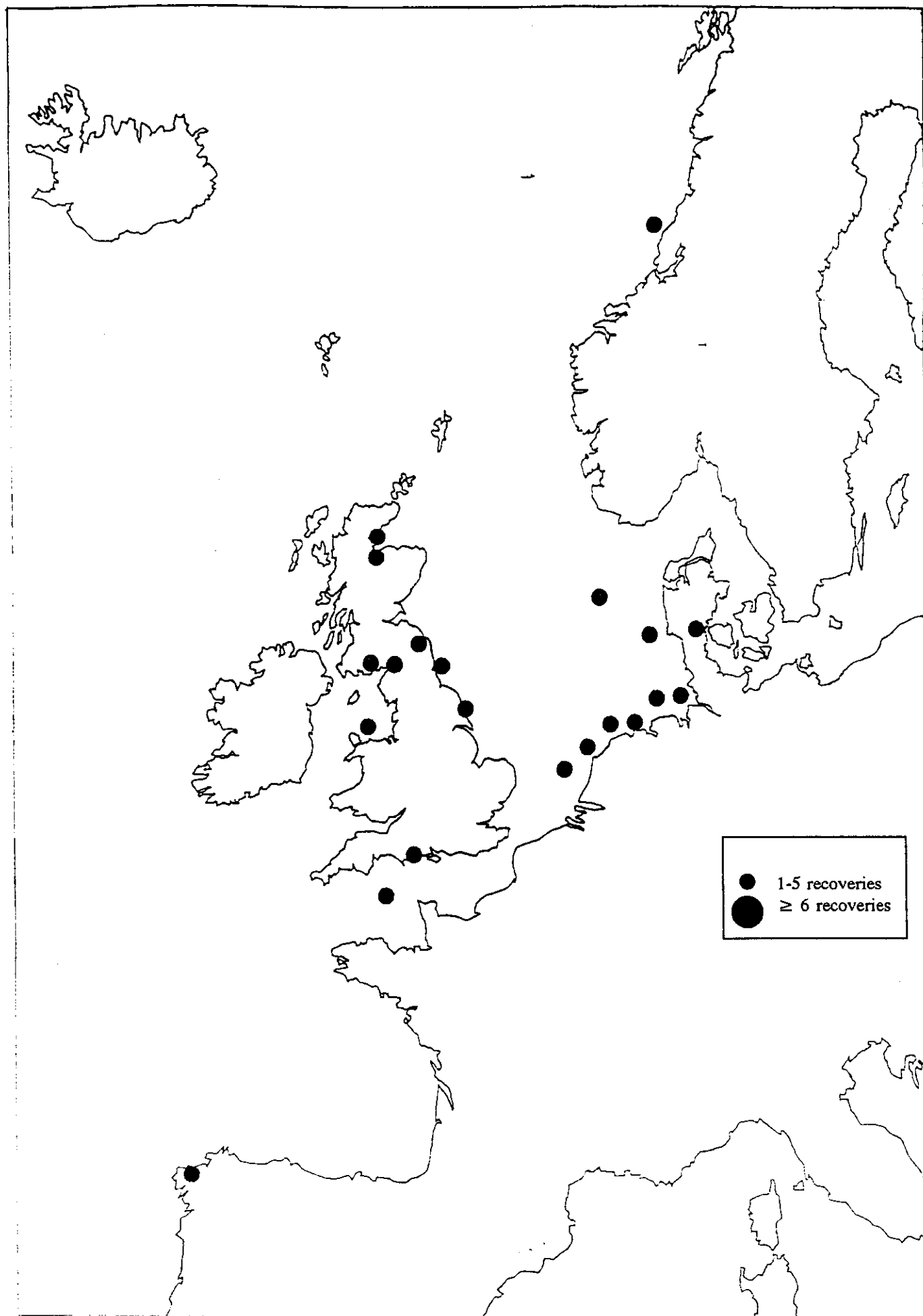


Figure 7.11 Recoveries of Guillemots ringed in East Sutherland, Caithness and North Sutor and recovered as adults during January - March, between 1970 and 1992. Adults include all birds ringed as full-grown birds or ringed as chicks and recovered during or after their sixth year of life.

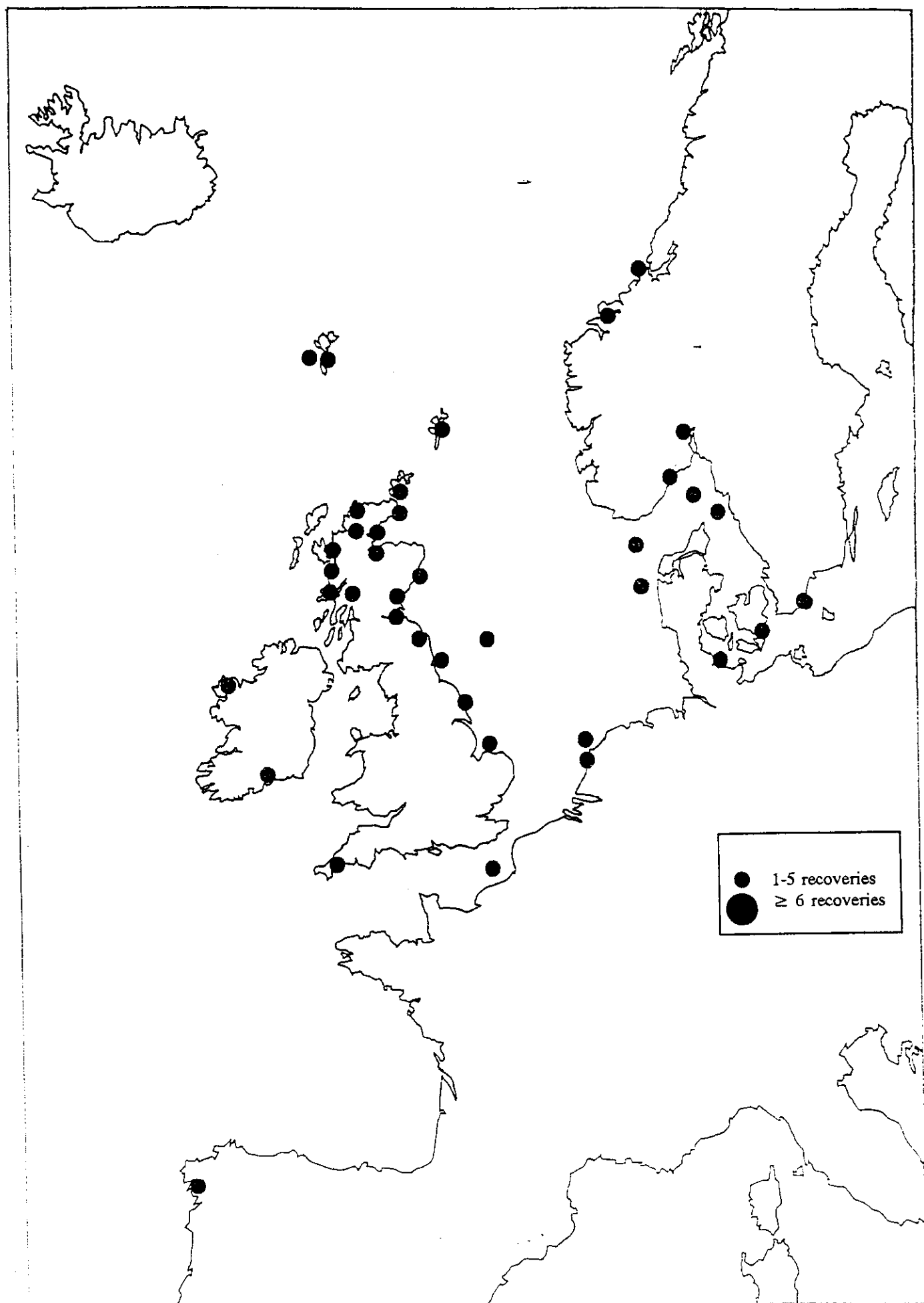


Figure 7.12 Recoveries of Guillemots ringed as chicks in East Sutherland, Caithness and North Sutor and recovered as first year birds during April - June, between 1970 and 1992.

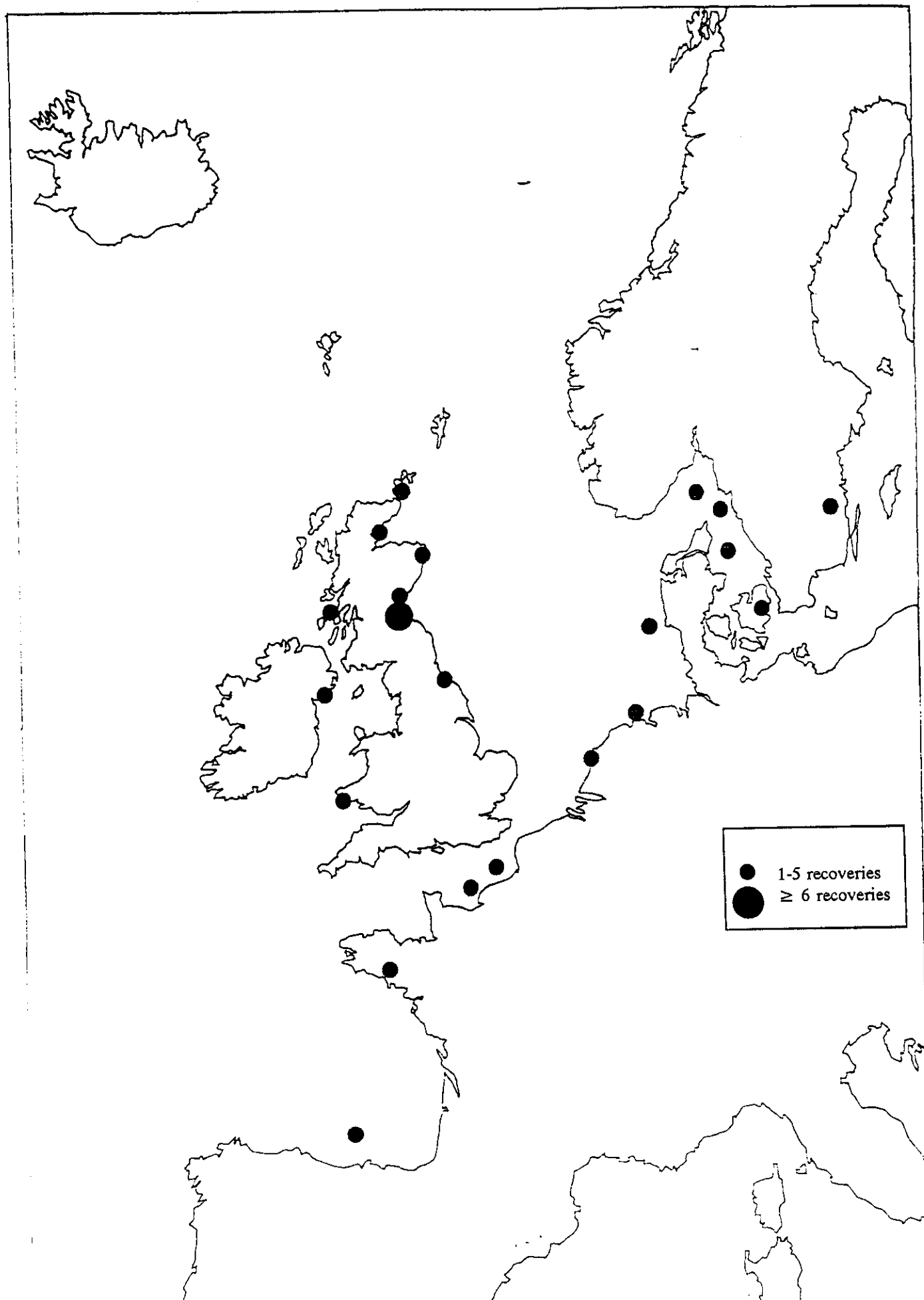


Figure 7.13 Recoveries of Guillemots ringed as chicks in East Sutherland, Caithness and North Sutor and recovered as second or third year birds during April - June, between 1970 and 1992.

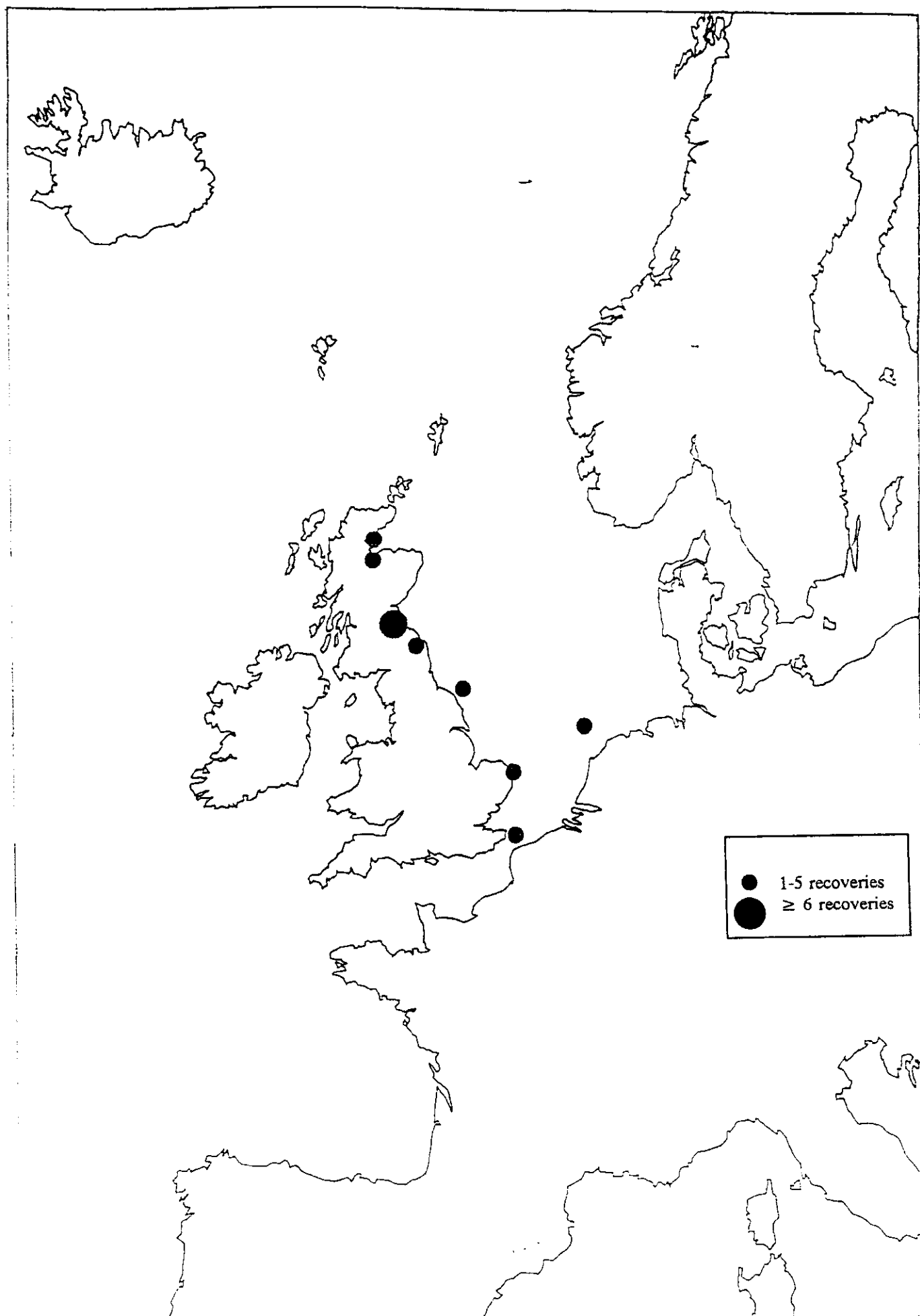


Figure 7.14

Recoveries of Guillemots ringed as chicks in East Sutherland, Caithness and North Sutor and recovered as fourth or fifth year birds during April - June, between 1970 and 1992.

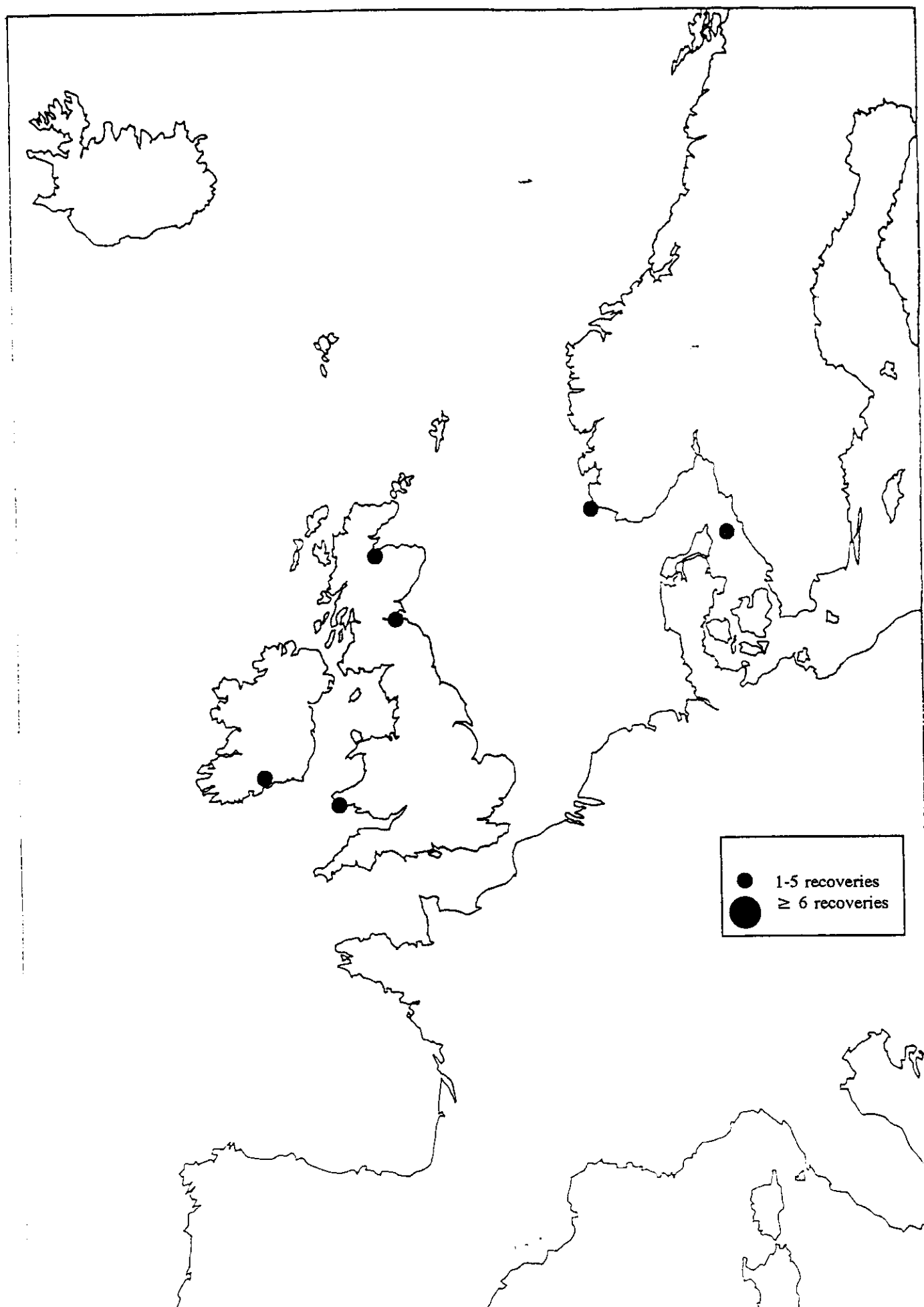


Figure 7.15 Recoveries of Guillemots ringed in East Sutherland, Caithness and North Sutor and recovered as adults during April - June, between 1970 and 1992. Adults include all birds ringed as full-grown birds or ringed as chicks and recovered during or after their sixth year of life.

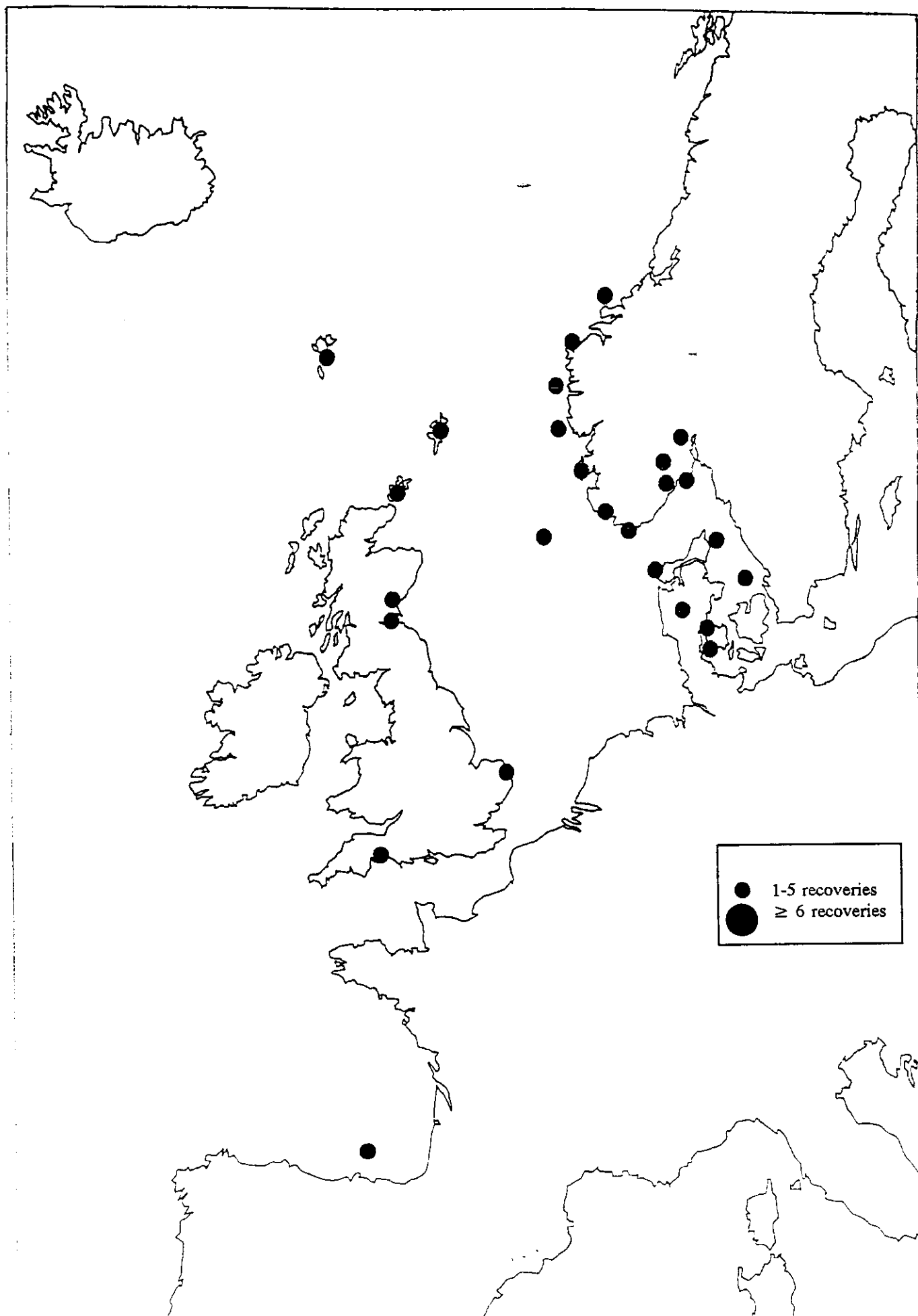


Figure 7.16 Recoveries of Guillemots ringed as chicks in East Sutherland, Caithness and North Sutor and recovered as first year birds during October - December, between 1970 and 1984.

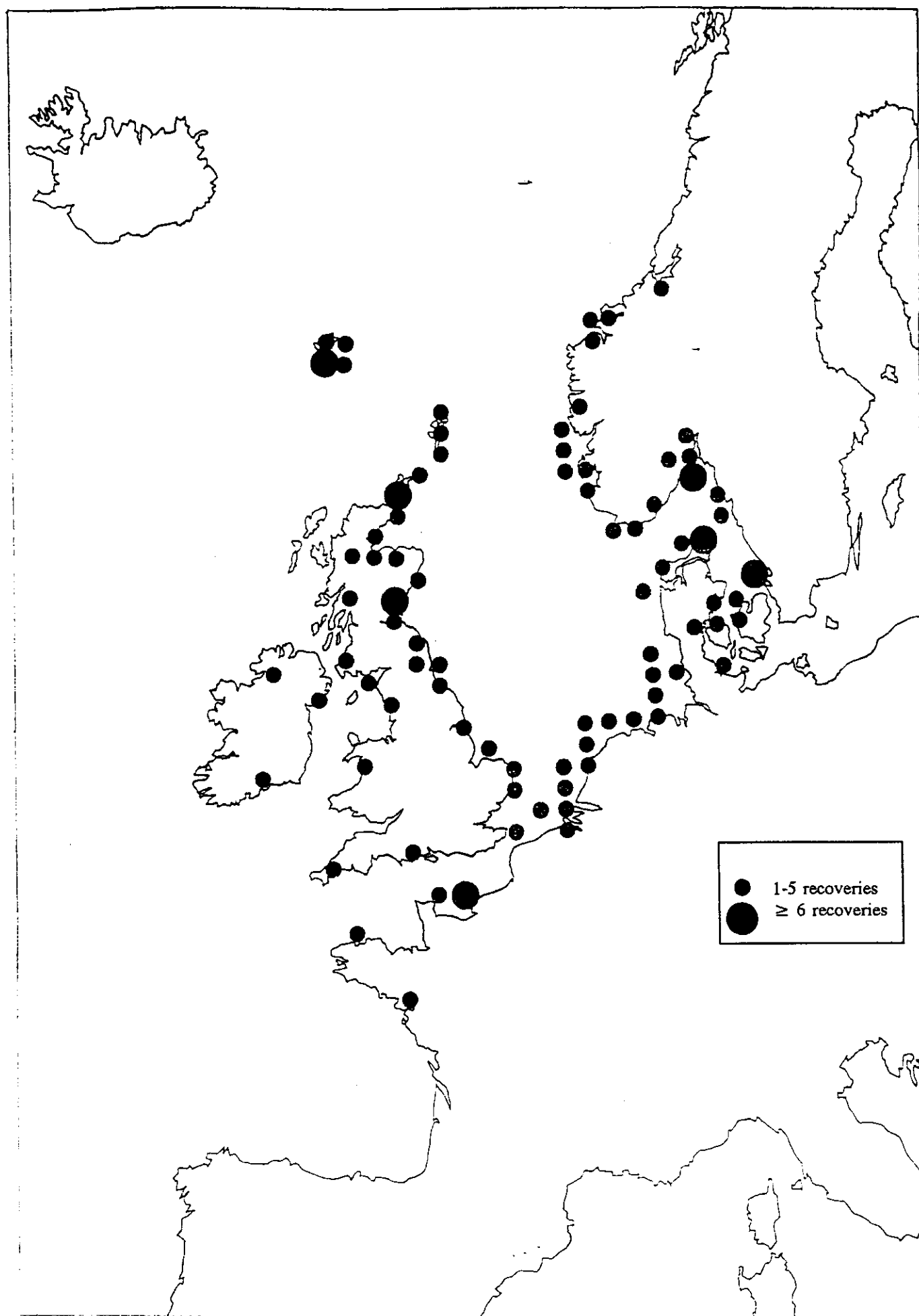


Figure 7.17 Recoveries of Guillemots ringed as chicks in East Sutherland, Caithness and North Sutor and recovered as first year birds during October - December, between 1985 and 1992.

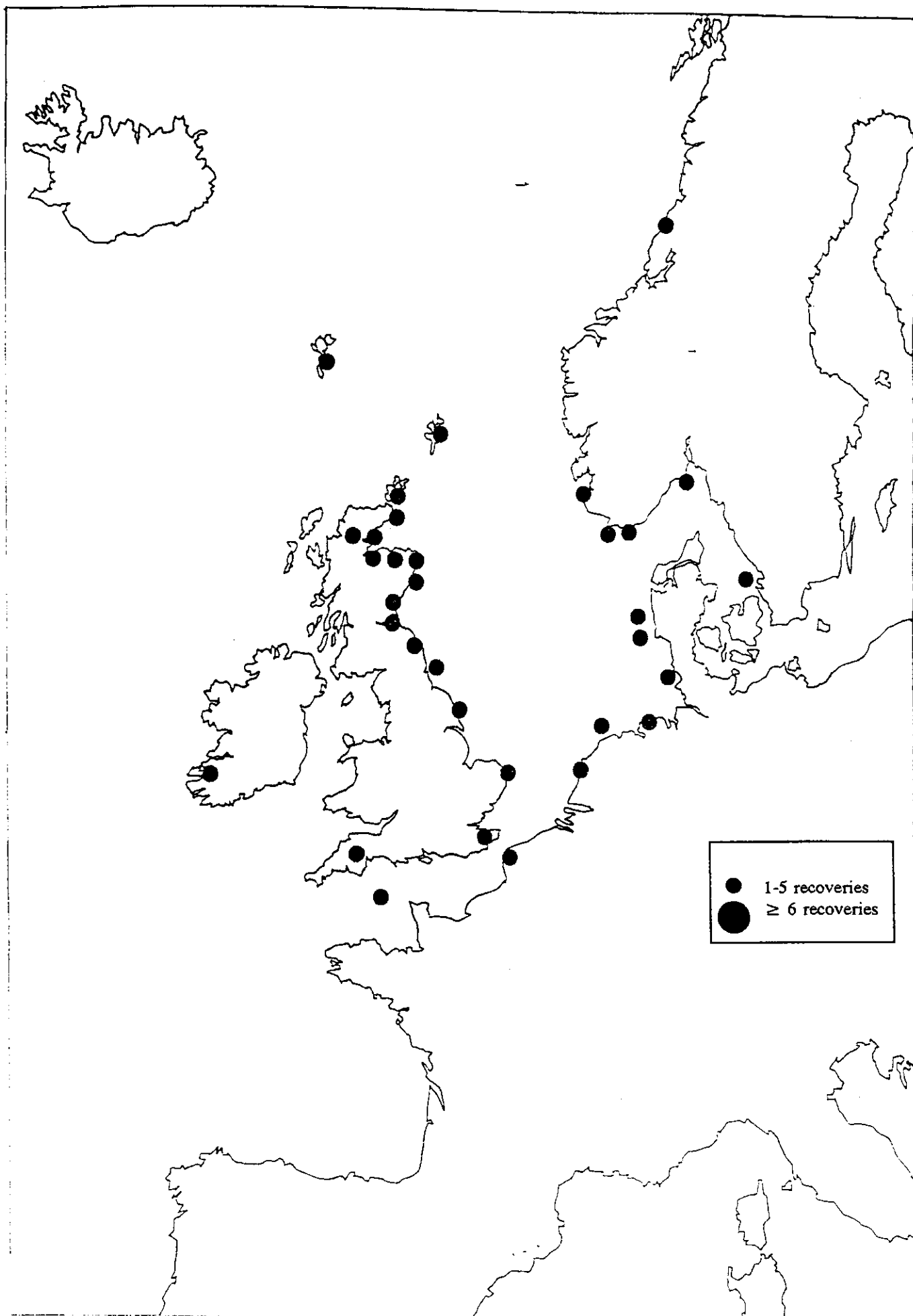


Figure 7.18 Recoveries of Guillemots ringed as chicks in East Sutherland, Caithness and North Sutor and recovered as first year birds during January - March, between 1970 and 1984.

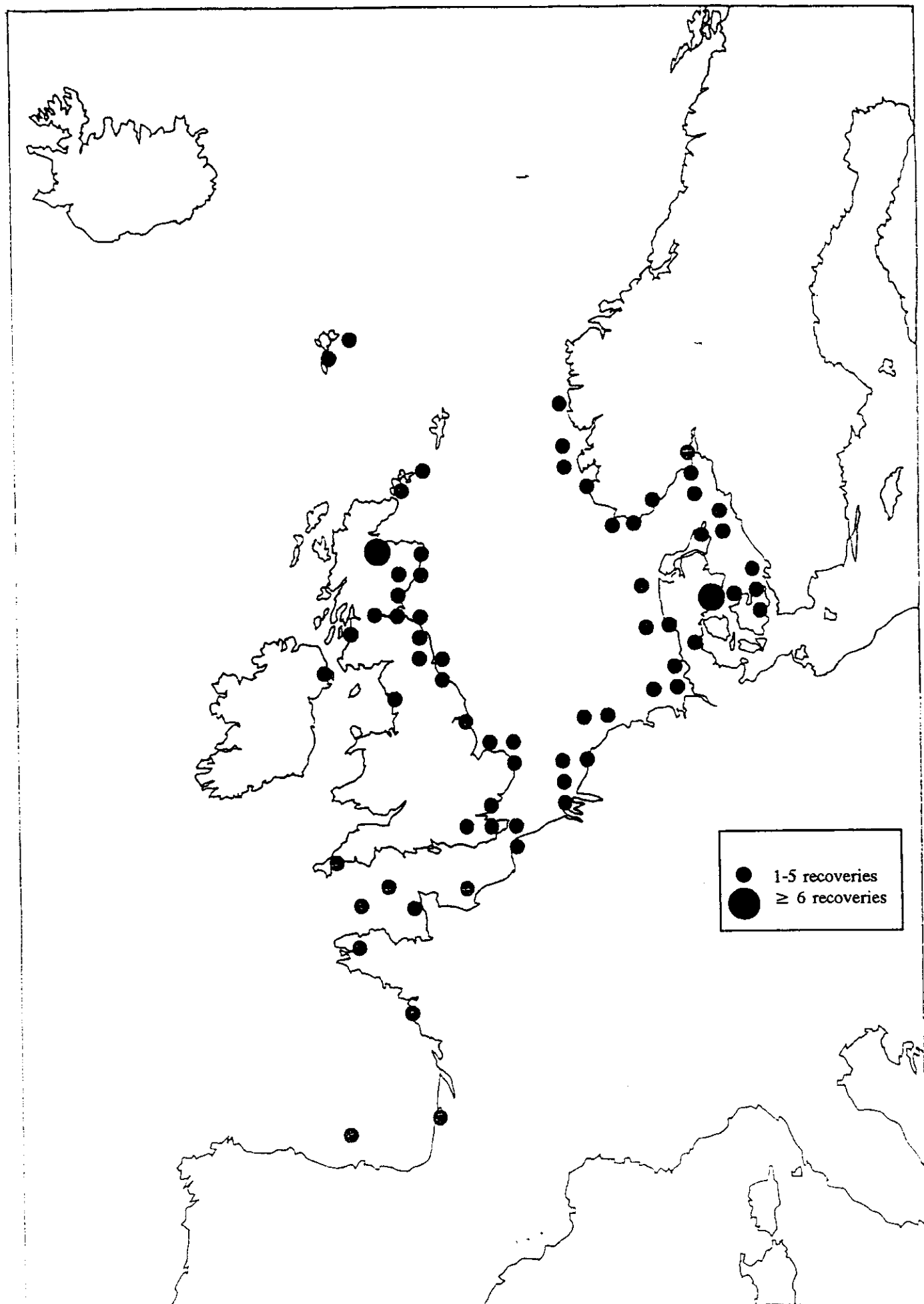


Figure 7.19 Recoveries of Guillemots ringed as chicks in East Sutherland, Caithness and North Sutor and recovered as first year birds during January - March, between 1985 and 1992.

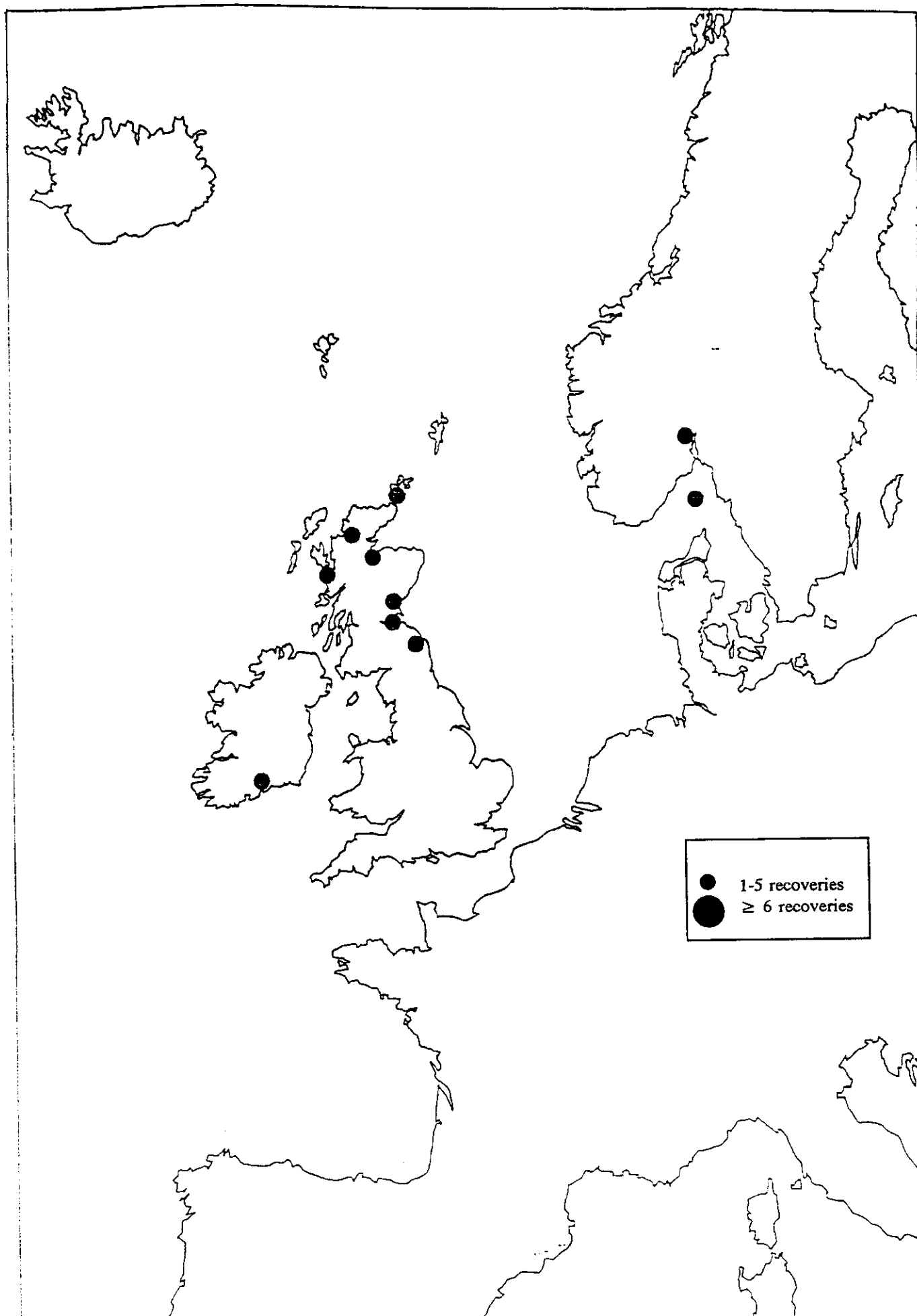


Figure 7.20 Recoveries of Guillemots ringed as chicks in East Sutherland, Caithness and North Sutor and recovered as first year birds during April - June, between 1970 and 1984.

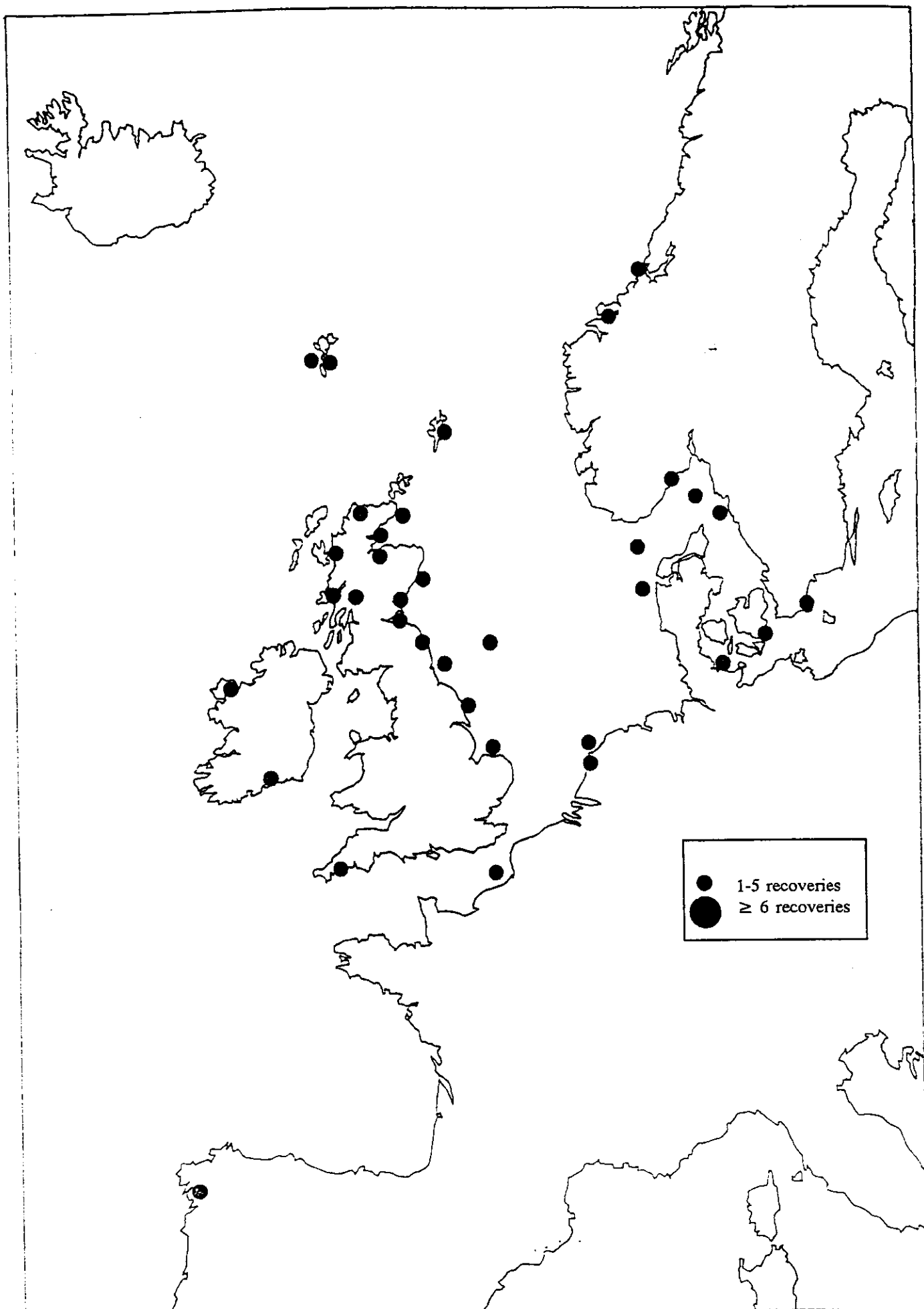
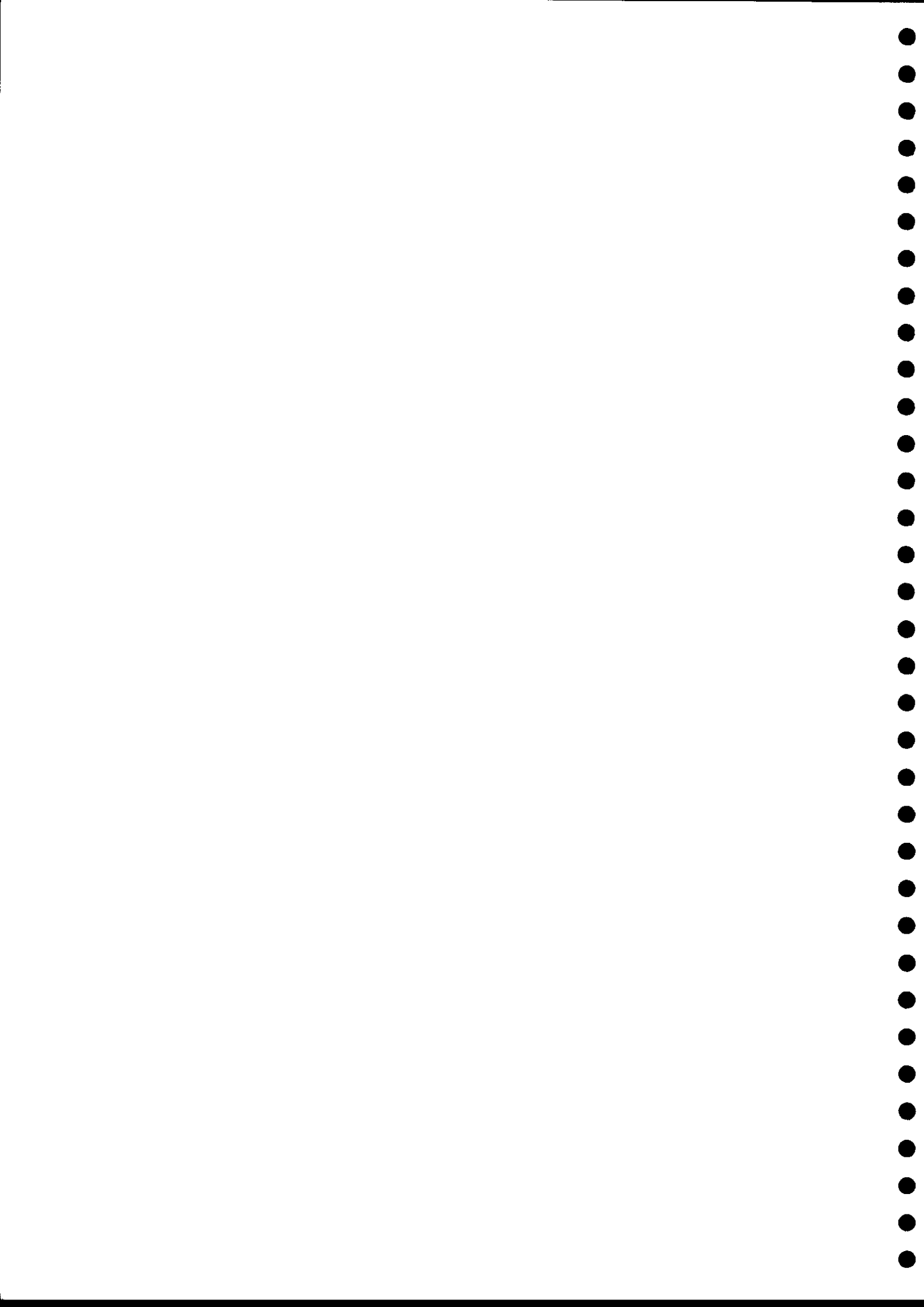


Figure 7.21 Recoveries of Guillemots ringed as chicks in East Sutherland, Caithness and North Sutor and recovered as first year birds during April - June, between 1985 and 1992.



Section 8

Recoveries of Guillemots ringed in Grampian



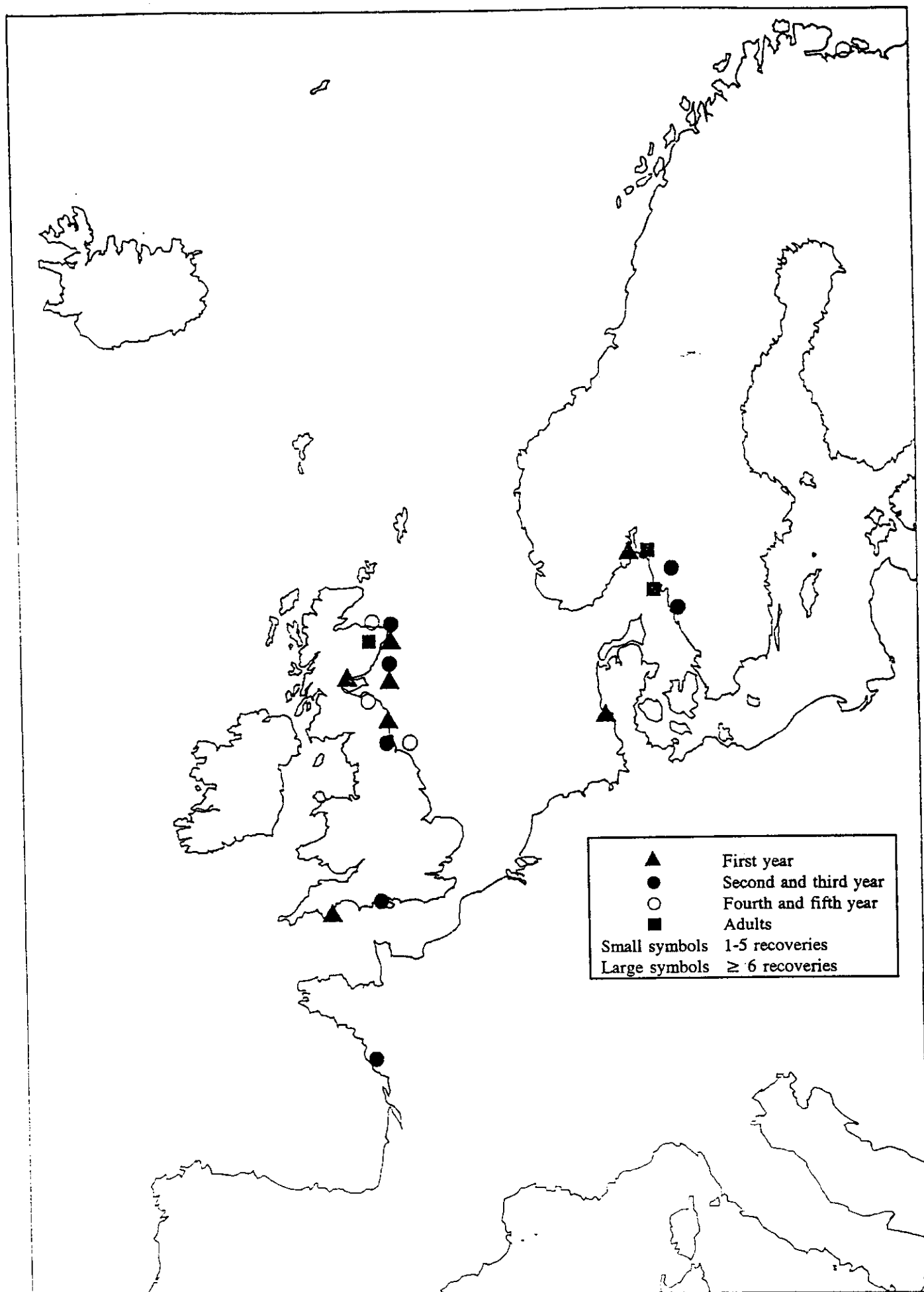


Figure 8.1 Recoveries of Guillemots ringed in Grampian and recovered during July - September, between 1970 and 1992.

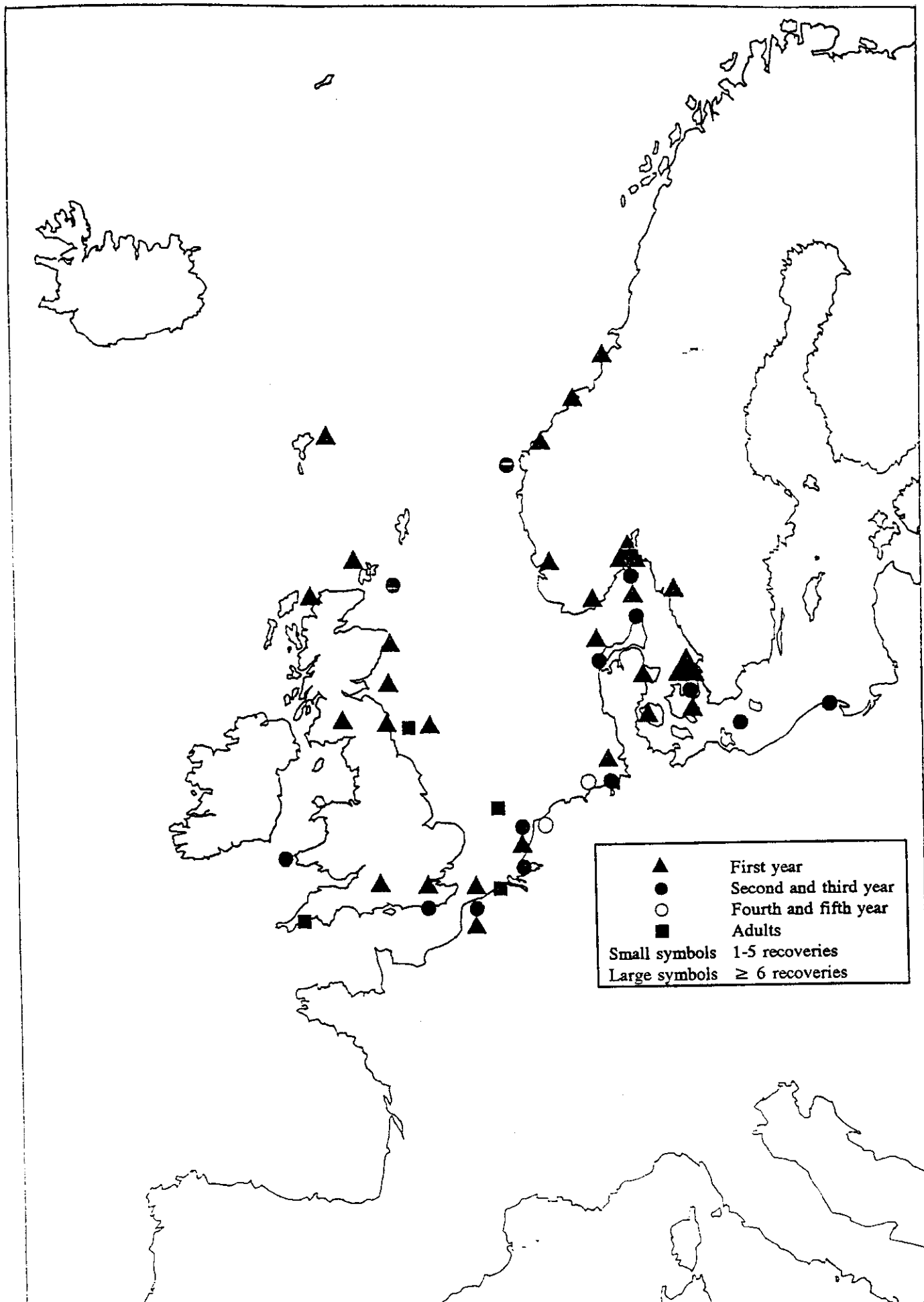


Figure 8.2

Recoveries of Guillemots ringed in Grampian and recovered during October -December, between 1970 and 1992.

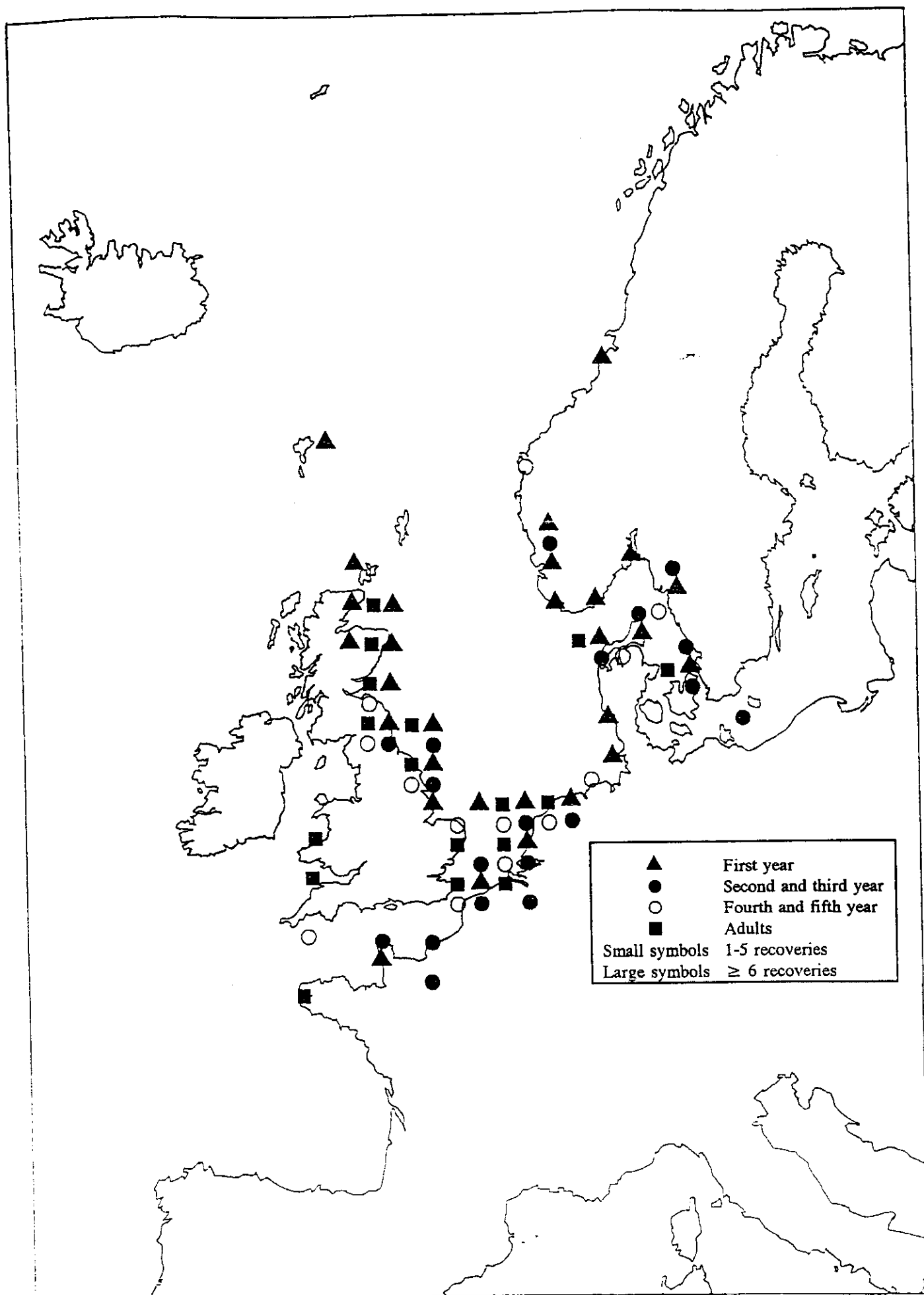


Figure 8.3 Recoveries of Guillemots ringed in Grampian and recovered during January -March, between 1970 and 1992.

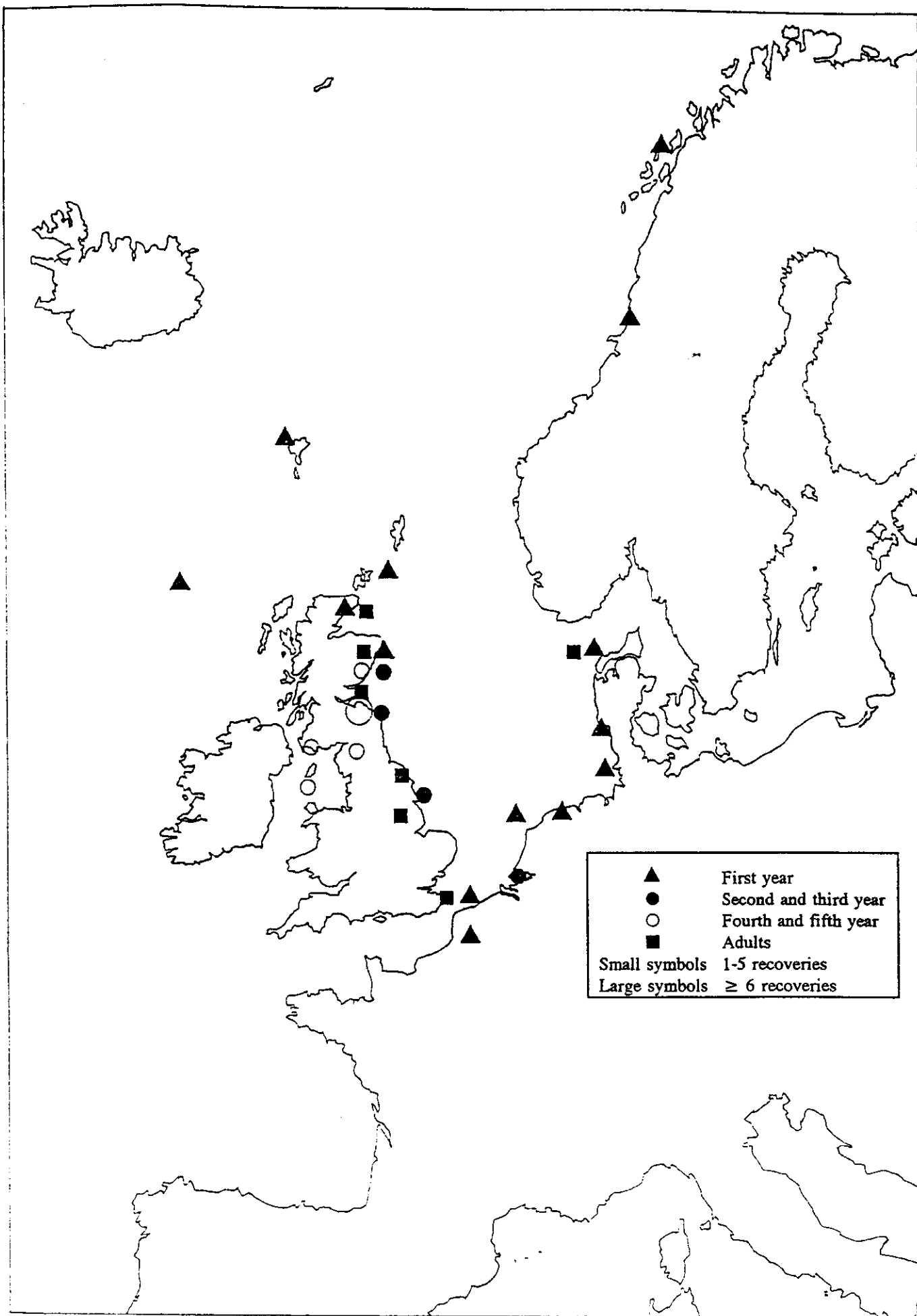


Figure 8.4 Recoveries of Guillemots ringed in Grampian and recovered during April - June, between 1970 and 1992.

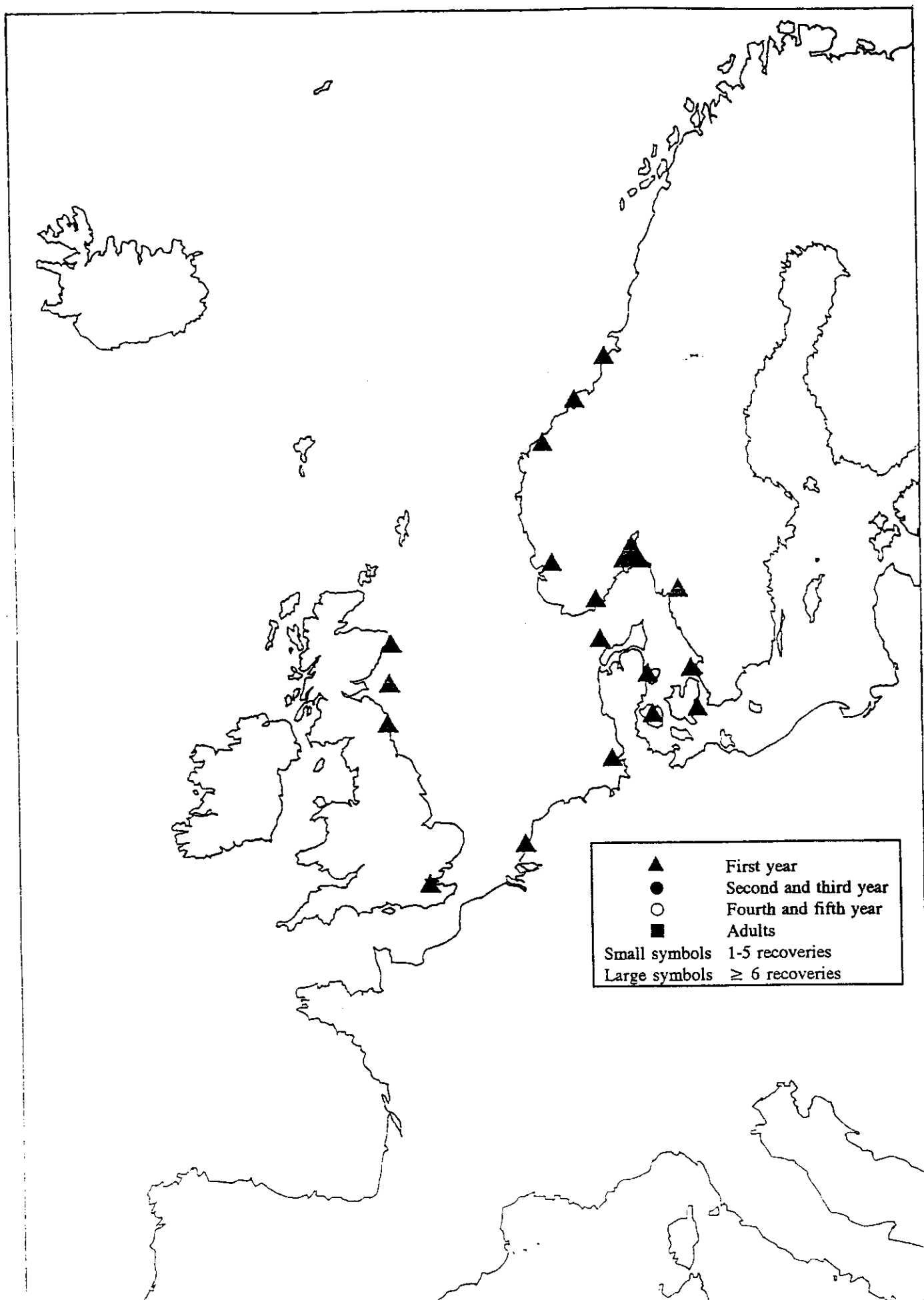


Figure 8.5 Recoveries of Guillemots ringed as chicks in Grampian and recovered as first year birds during October - December, between 1970 and 1984.

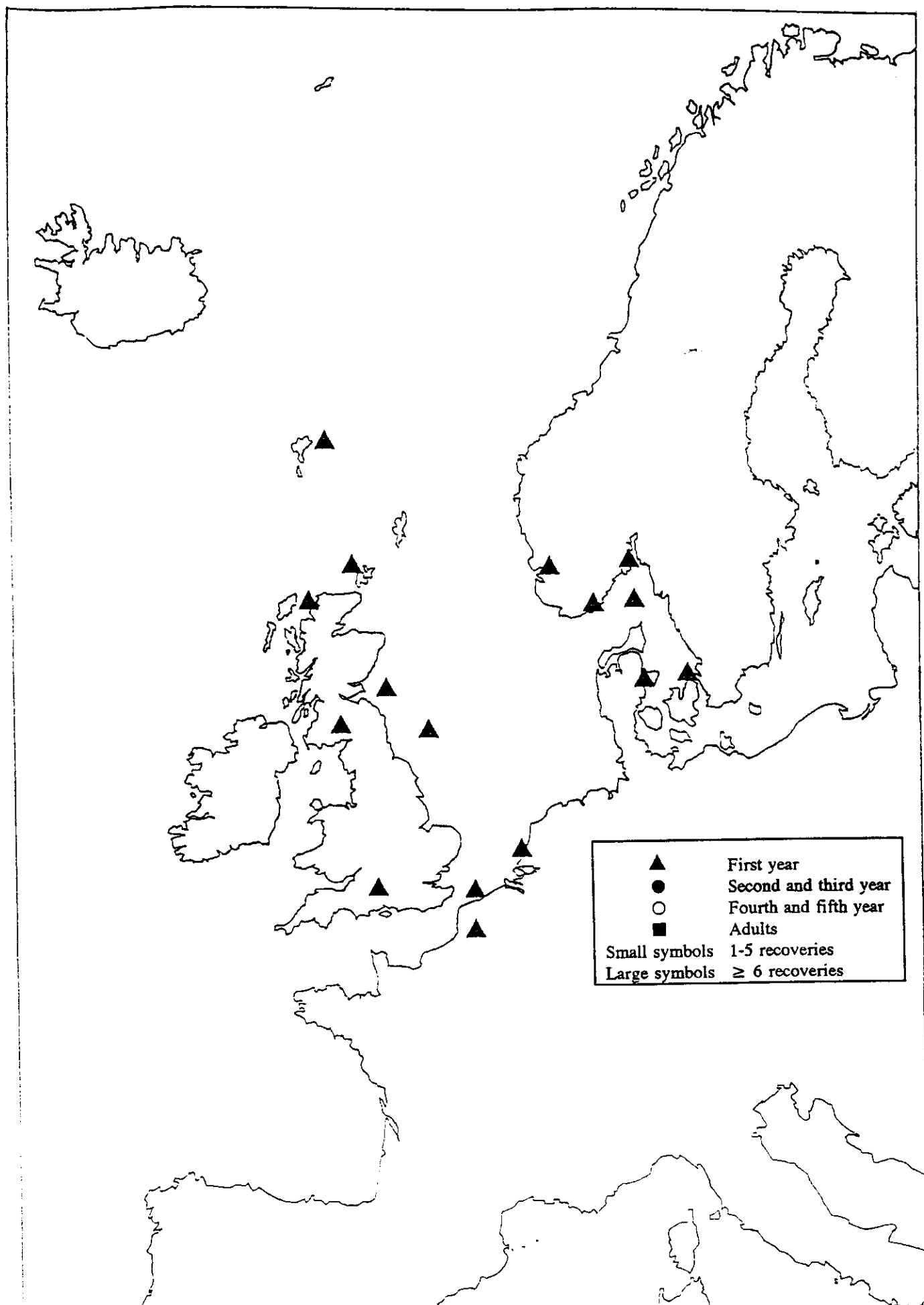


Figure 8.6

Recoveries of Guillemots ringed as chicks in Grampian and recovered as first year birds during October - December, between 1985 and 1992.

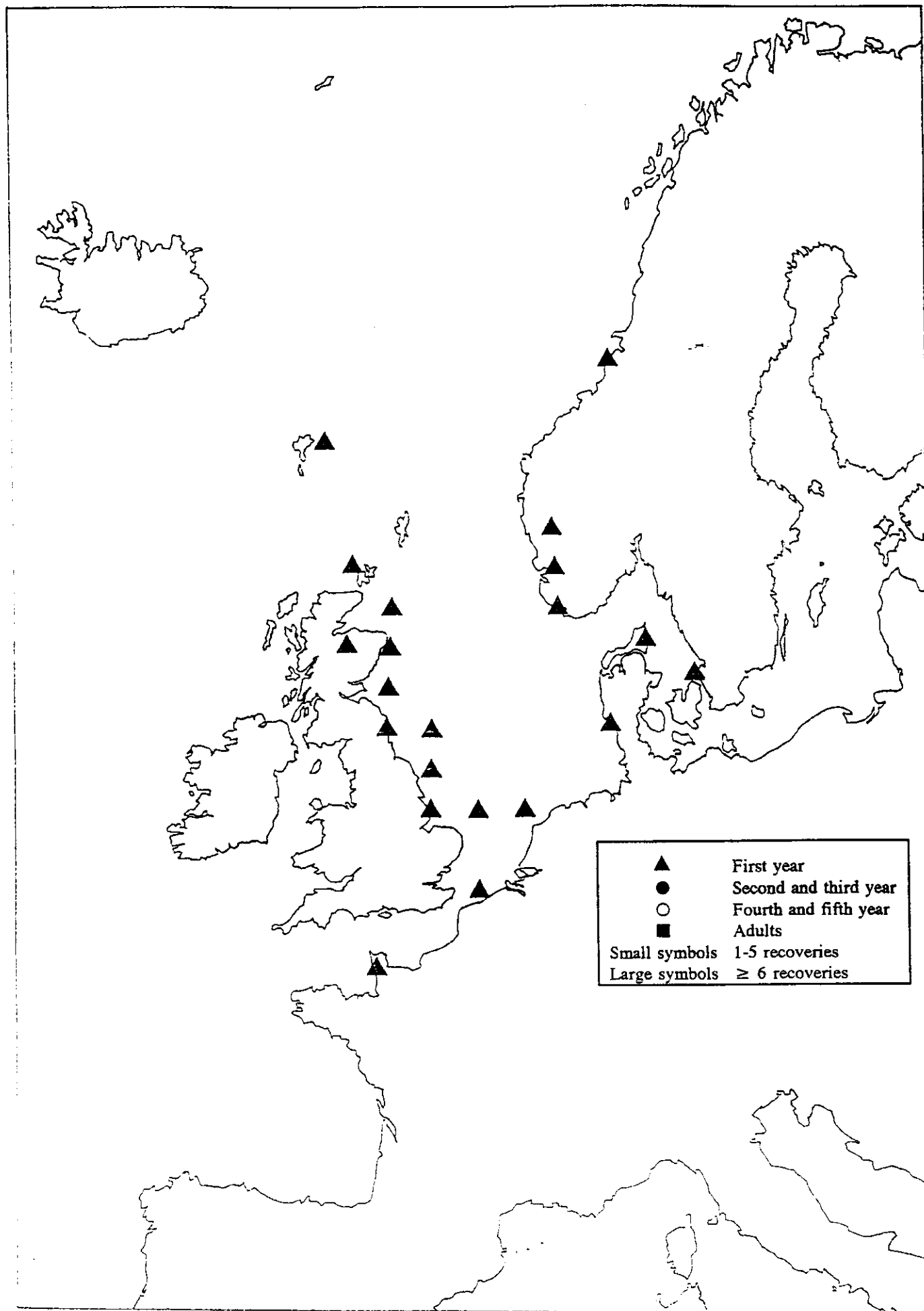


Figure 8.7

Recoveries of Guillemots ringed as chicks in Grampian and recovered as first year birds during January - March, between 1970 and 1984.

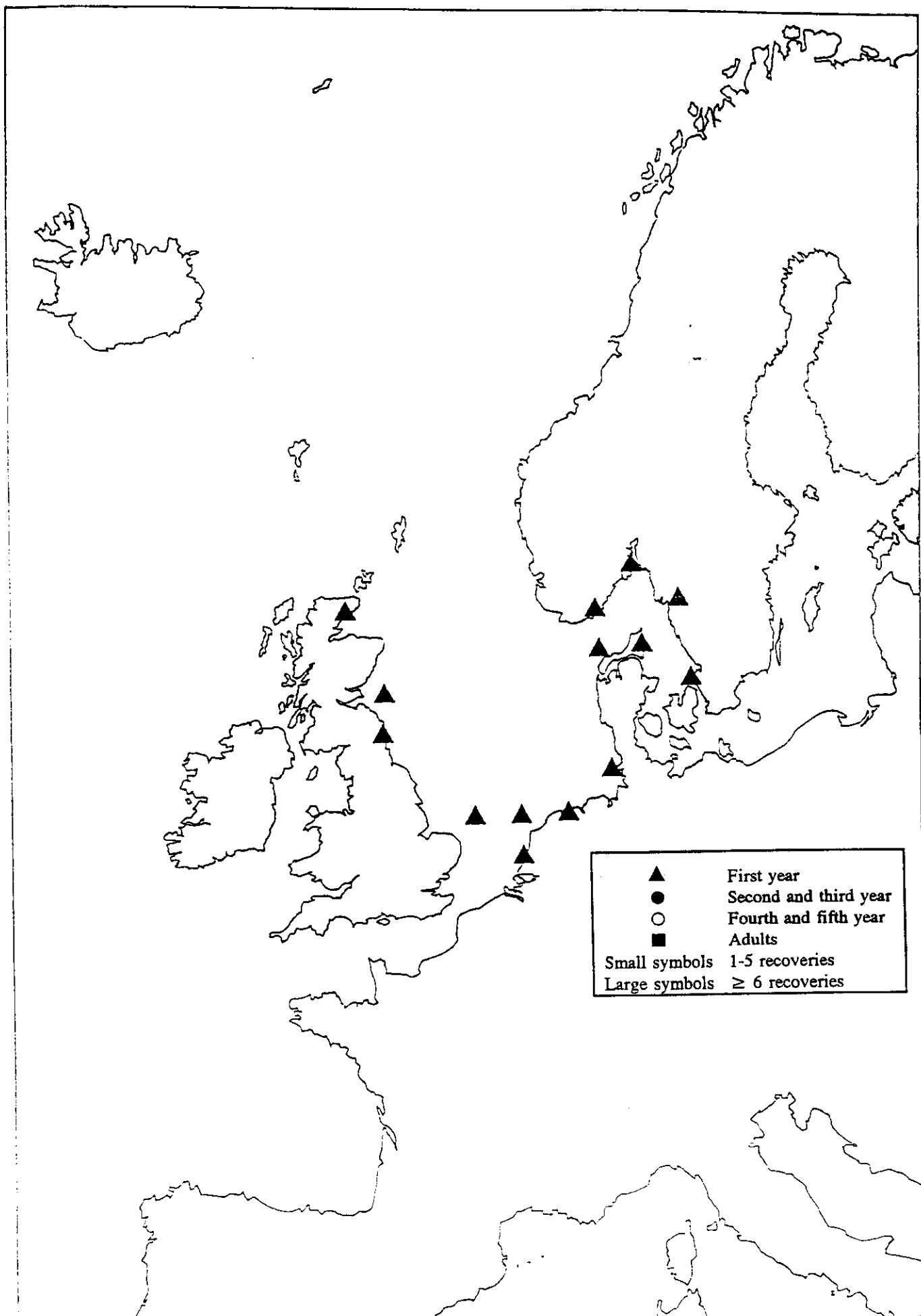


Figure 8.8 Recoveries of Guillemots ringed as chicks in Grampian and recovered as first year birds during January - March, between 1985 and 1992.

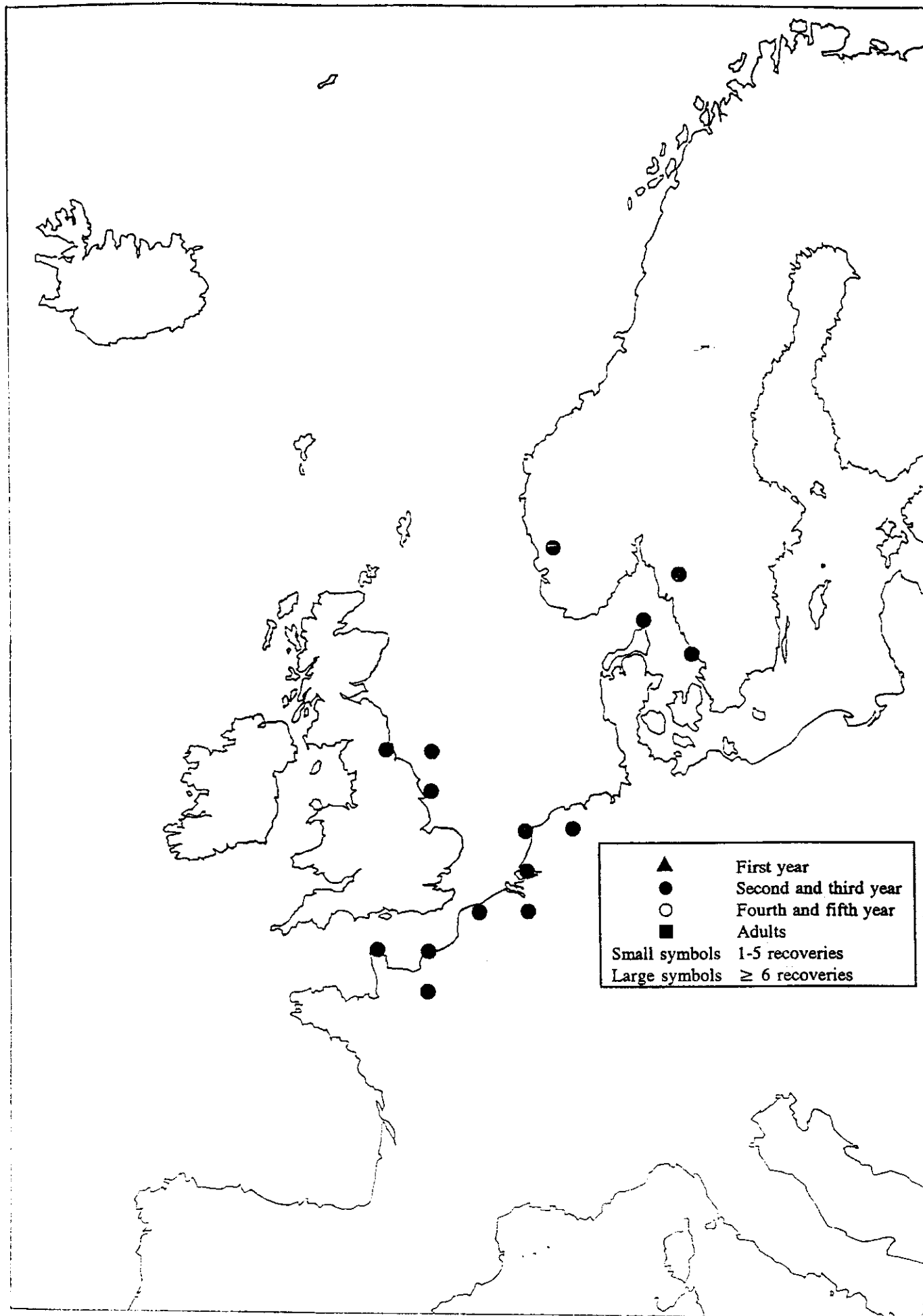


Figure 8.9 Recoveries of Guillemots ringed as chicks in Grampian and recovered as second or third year birds during January - March, between 1970 and 1984.

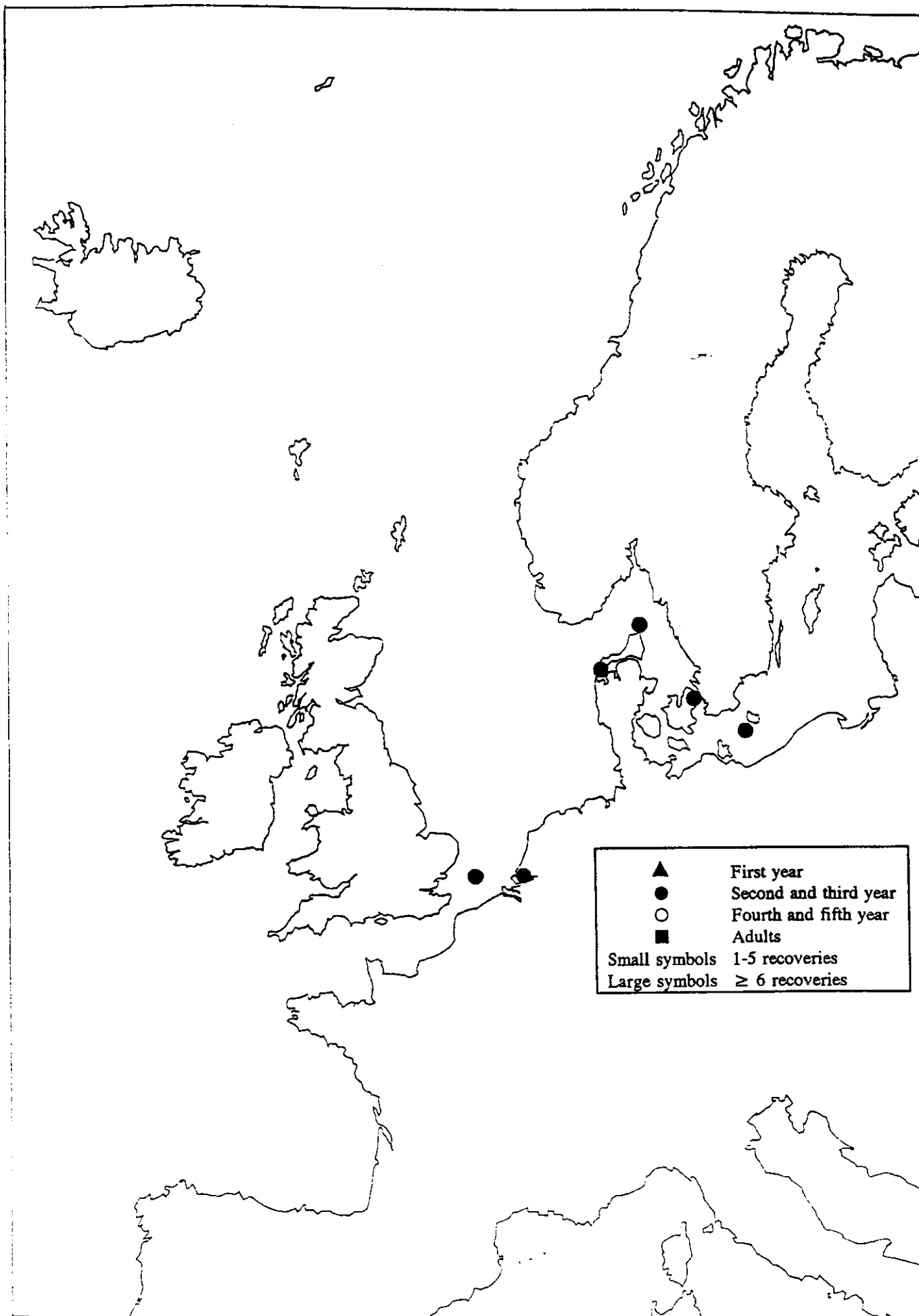


Figure 8.10 Recoveries of Guillemots ringed as chicks in Grampian and recovered as second or third year birds during January - March, between 1985 and 1992.

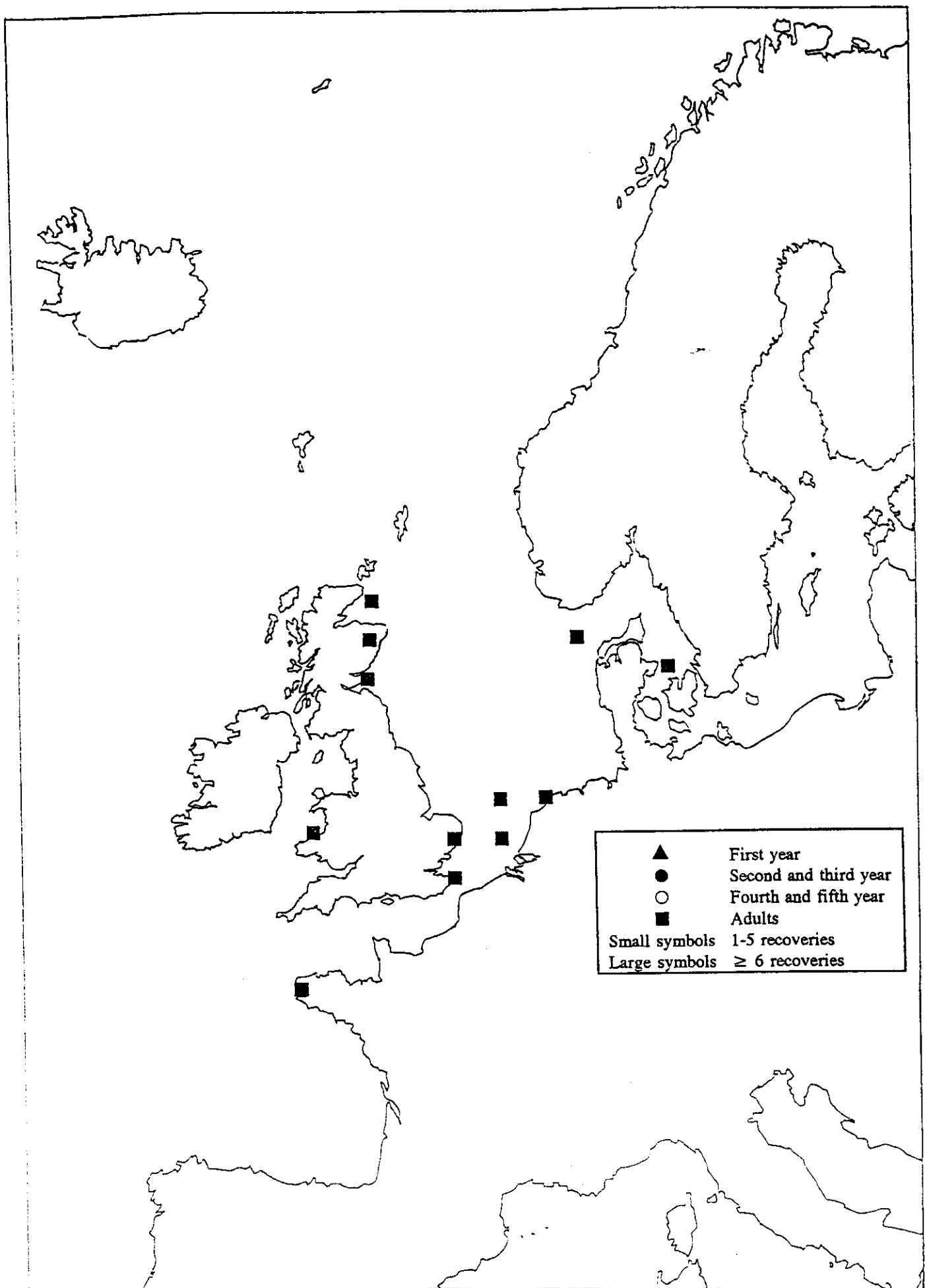


Figure 8.11 Recoveries of Guillemots ringed in Grampian and recovered as adults during January - March, between 1970 and 1984.

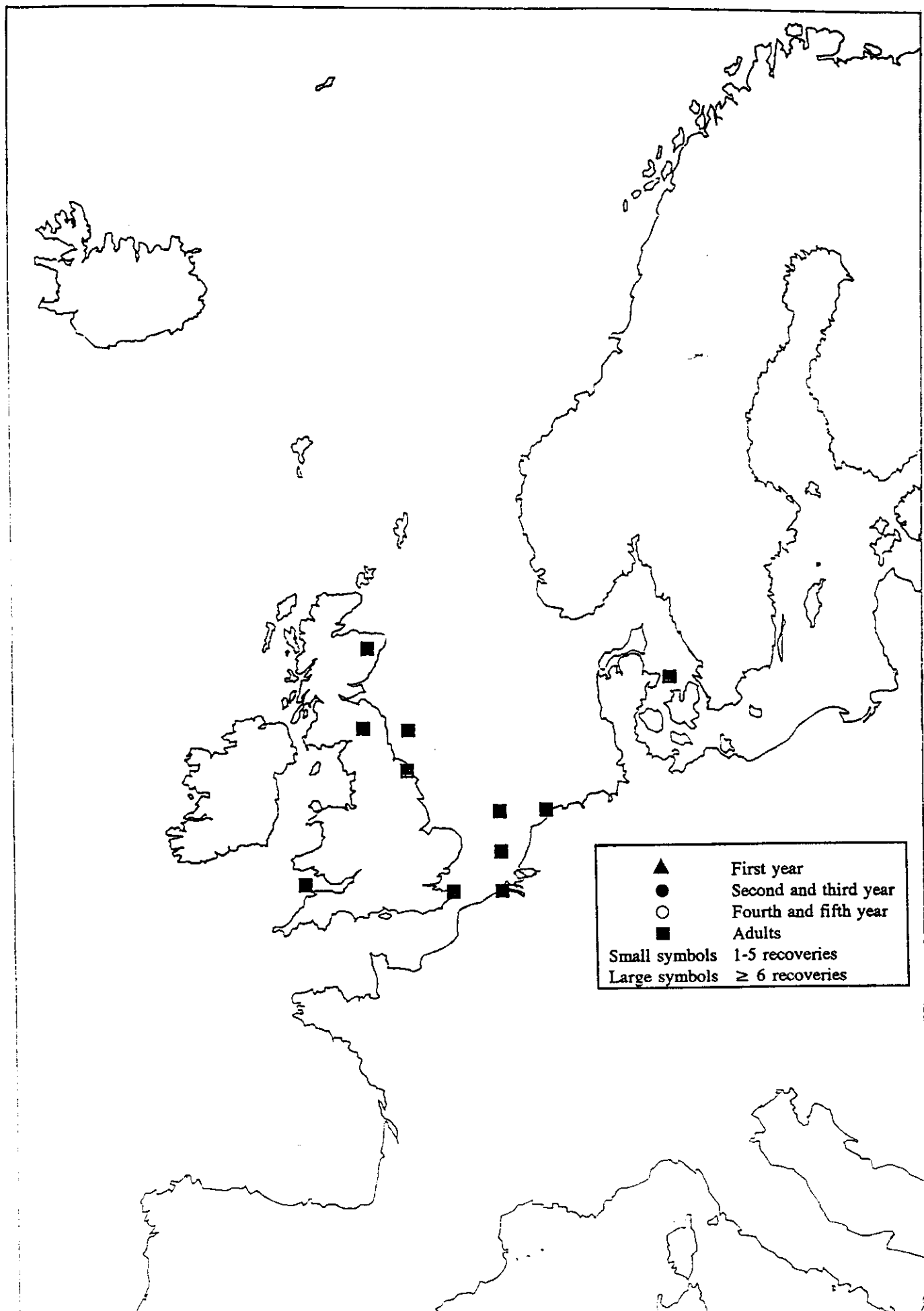
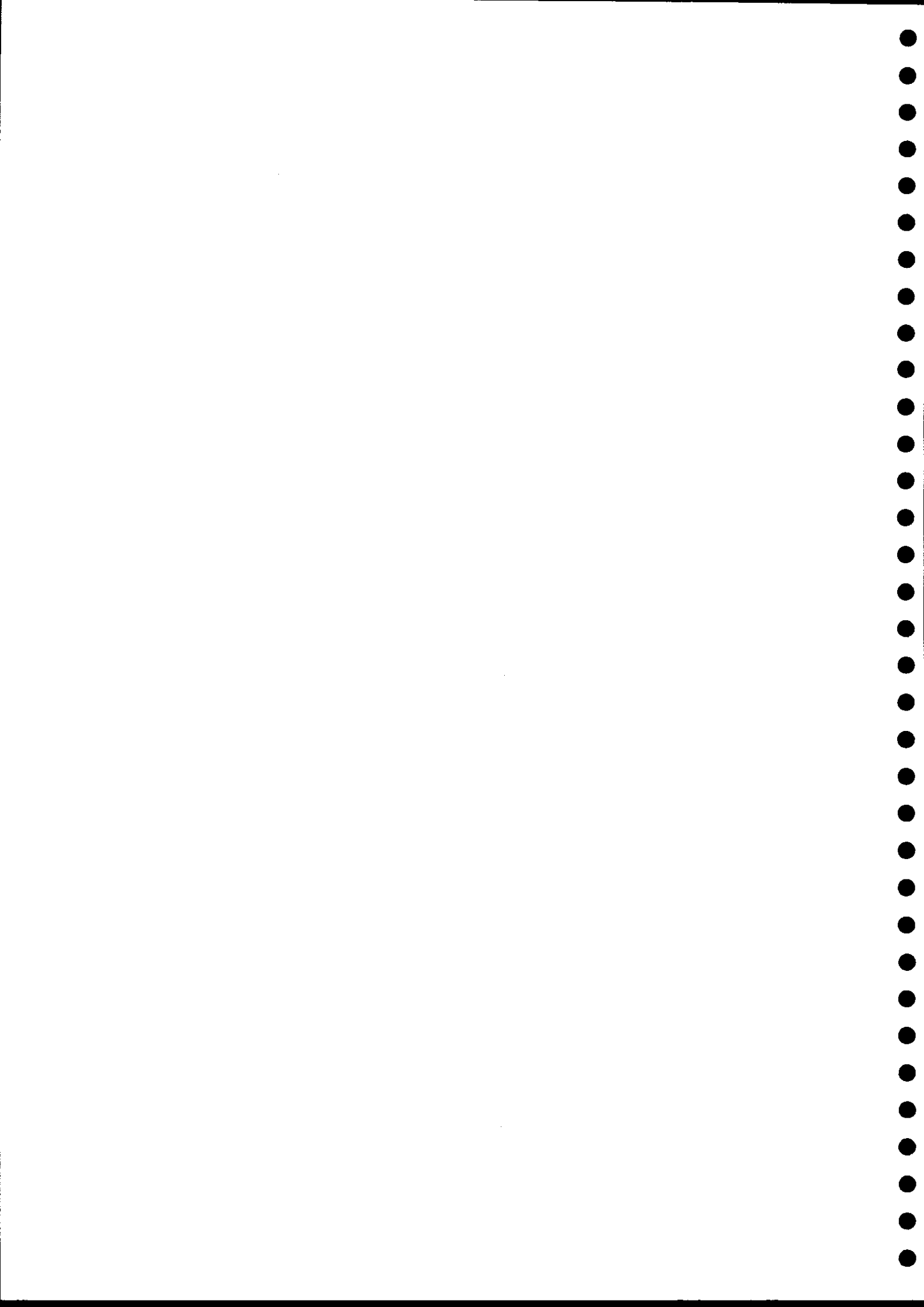


Figure 8.12 Recoveries of Guillemots ringed in Grampian and recovered as adults during January - March, between 1985 and 1992.

Section 9

Recoveries of Guillemots ringed in Firth of Forth and St Abbs



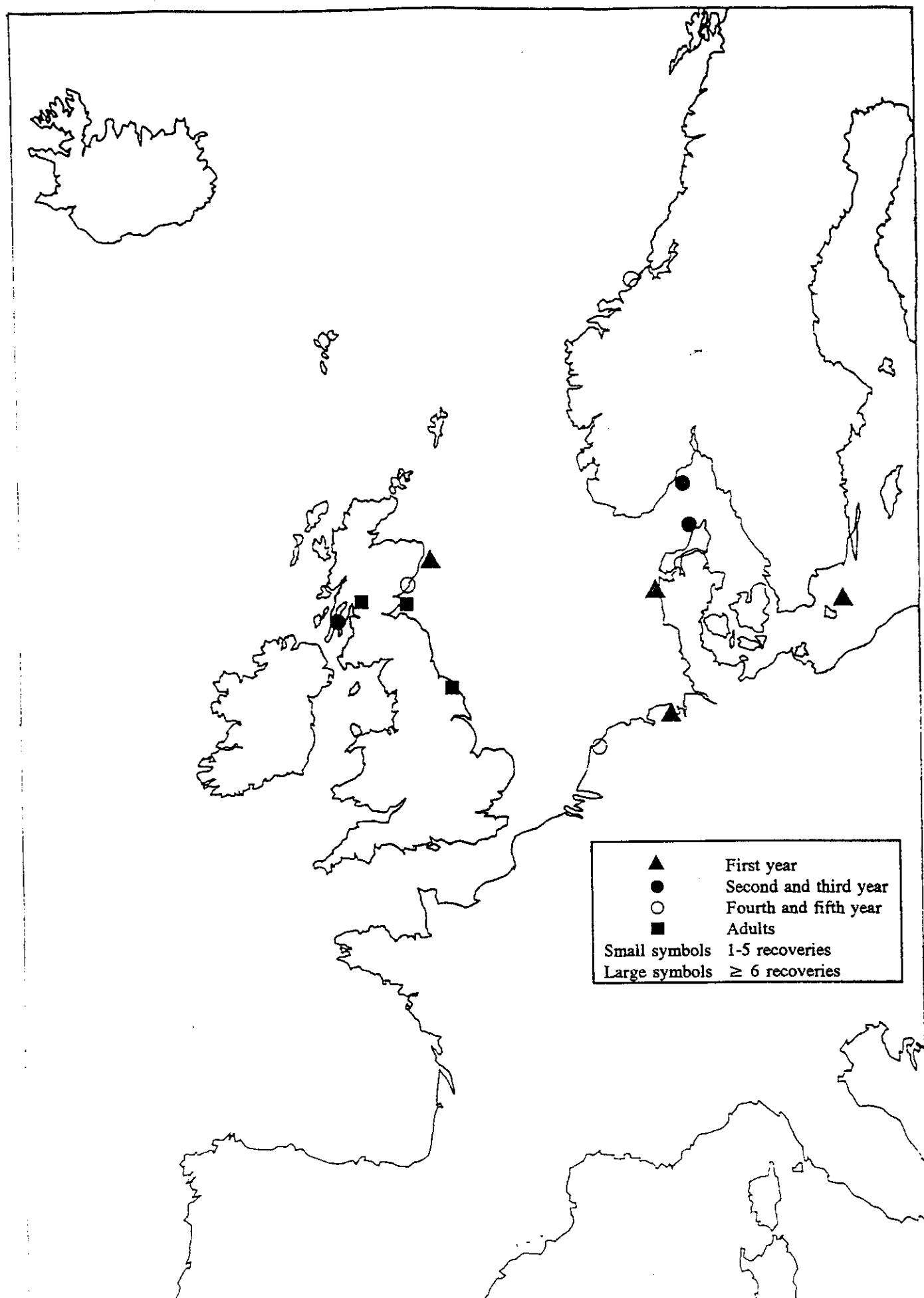


Figure 9.1

Recoveries of Guillemots ringed on the Firth of Forth and St Abbs and recovered during July - September, between 1970 and 1992.

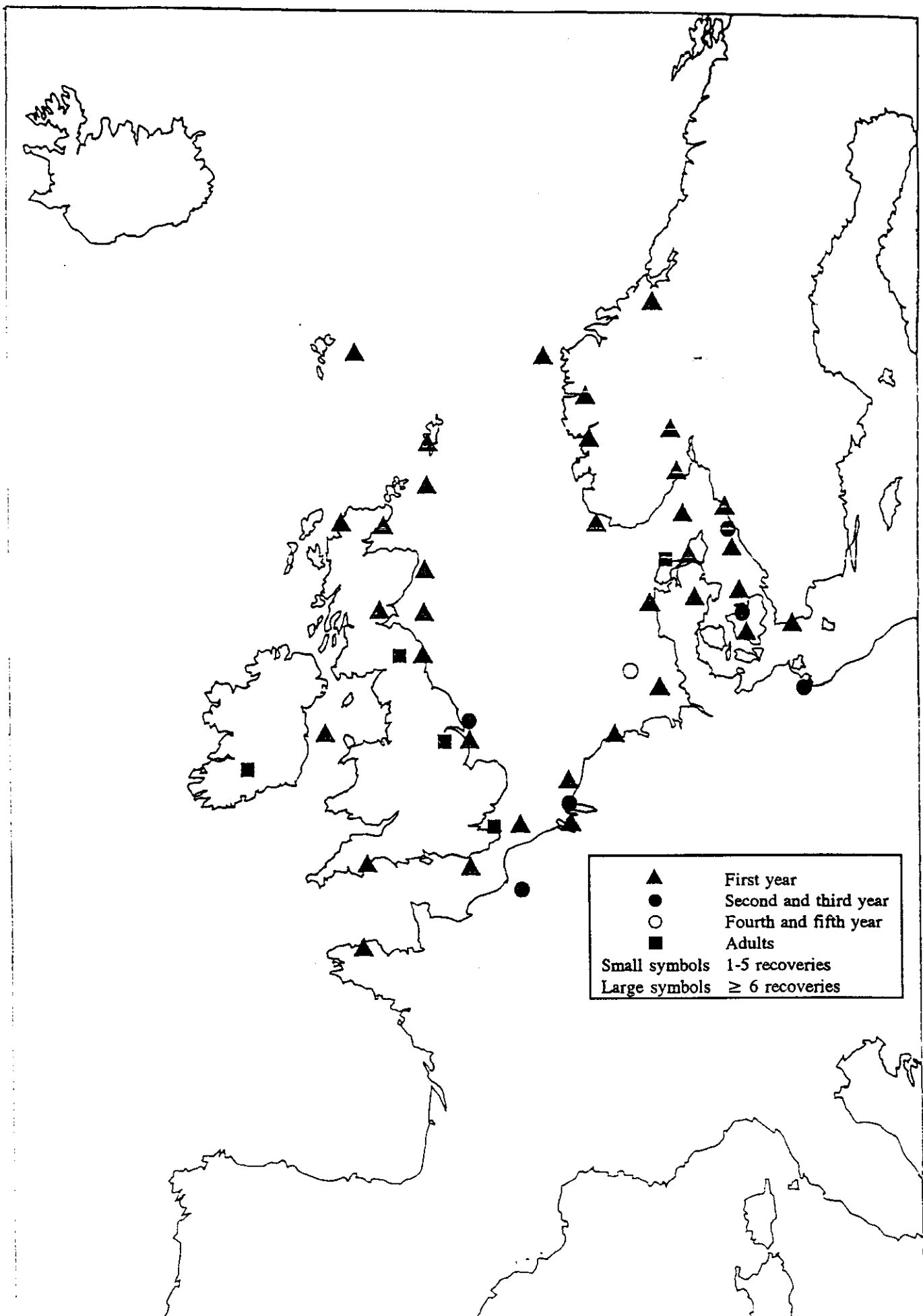


Figure 9.2

Recoveries of Guillemots ringed on the Firth of Forth and St Abbs and recovered during October - December, between 1970 and 1992.

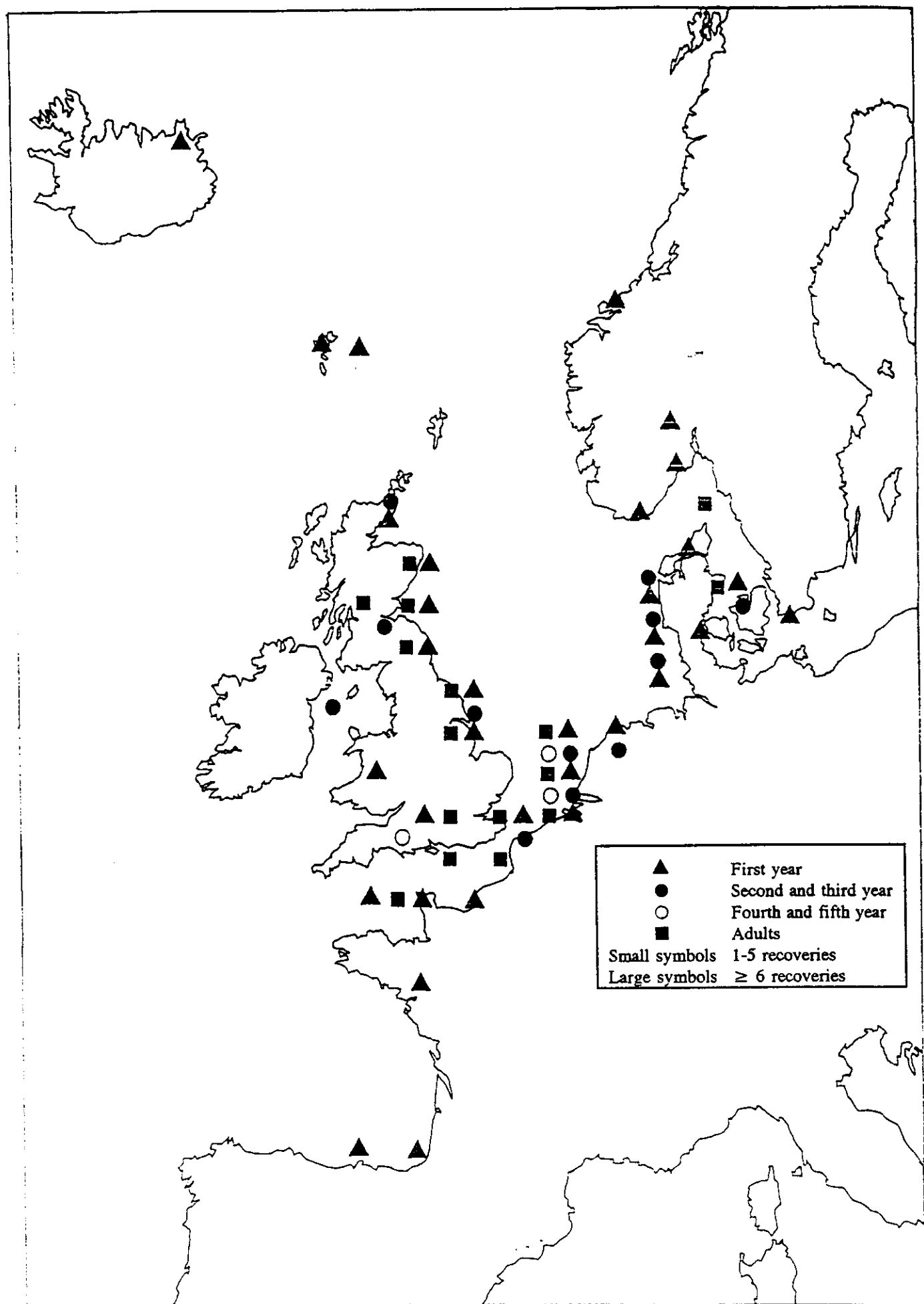


Figure 9.3

Recoveries of Guillemots ringed on the Firth of Forth and St Abbs and recovered during January - March, between 1970 and 1992.

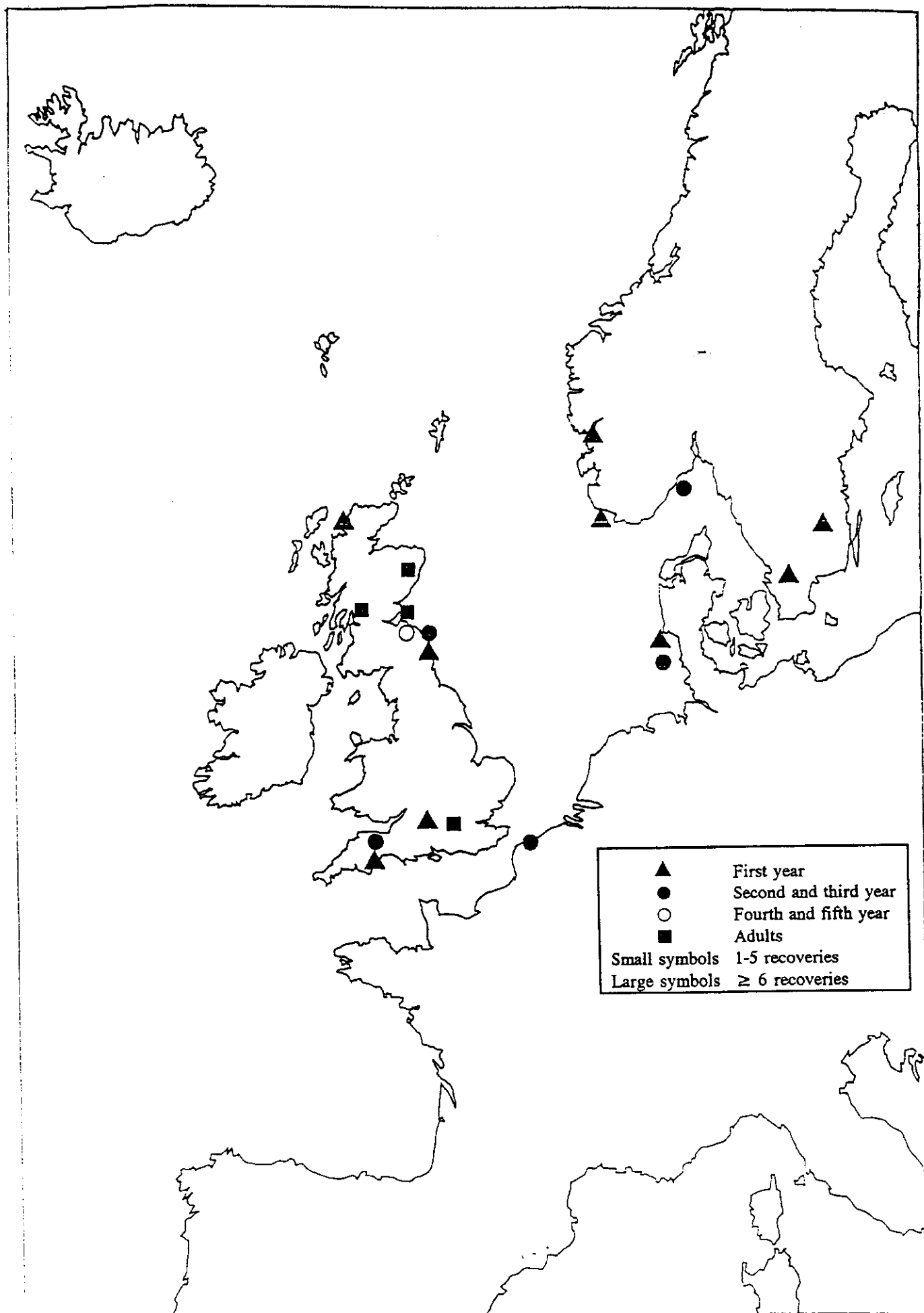


Figure 9.4

Recoveries of Guillemots ringed on the Firth of Forth and St Abbs and recovered during April - June, between 1970 and 1992.

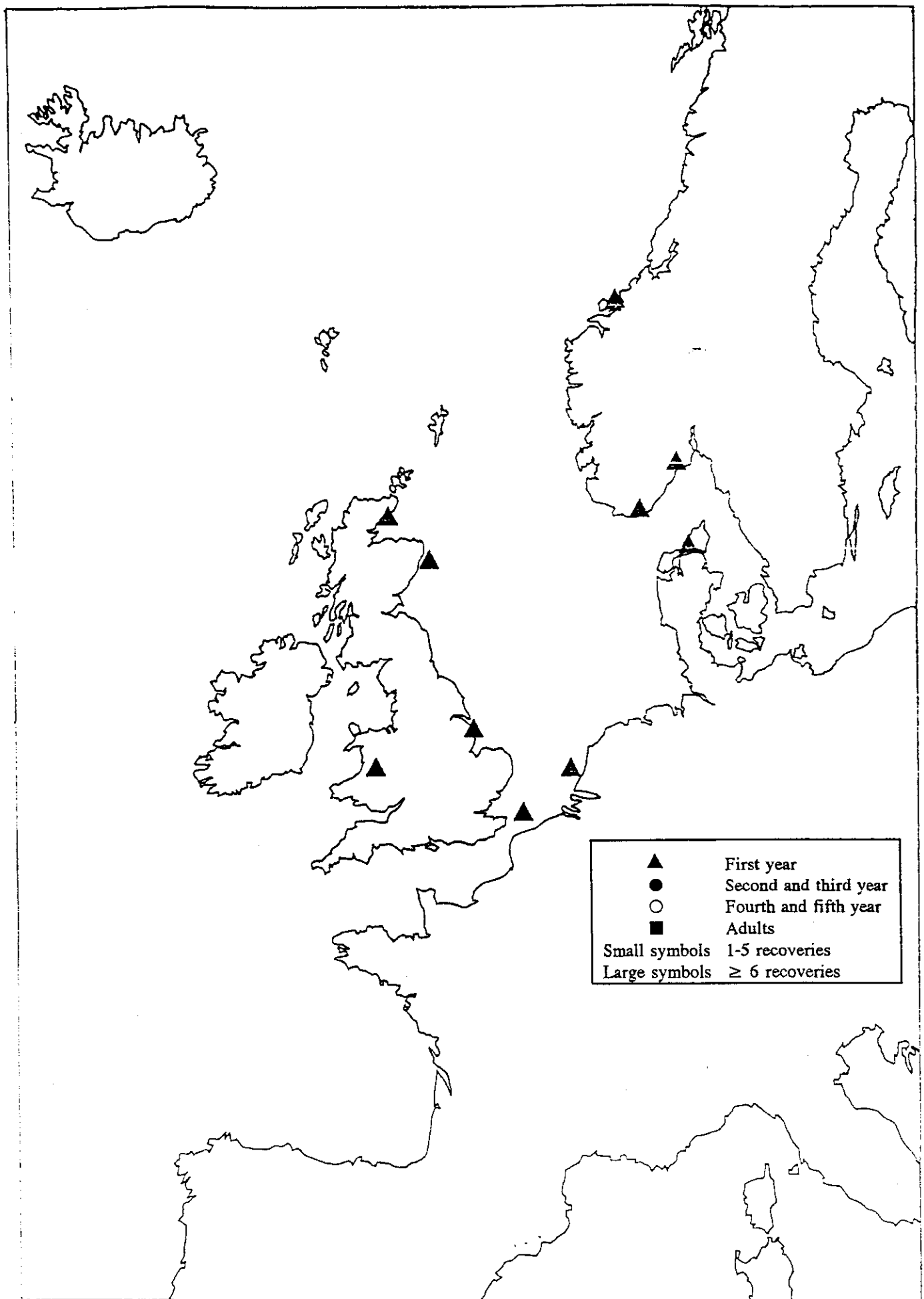


Figure 9.5 Recoveries of Guillemots ringed as chicks on the Firth of Forth and St Abbs and recovered as first year birds during January - March, between 1970 and 1984.

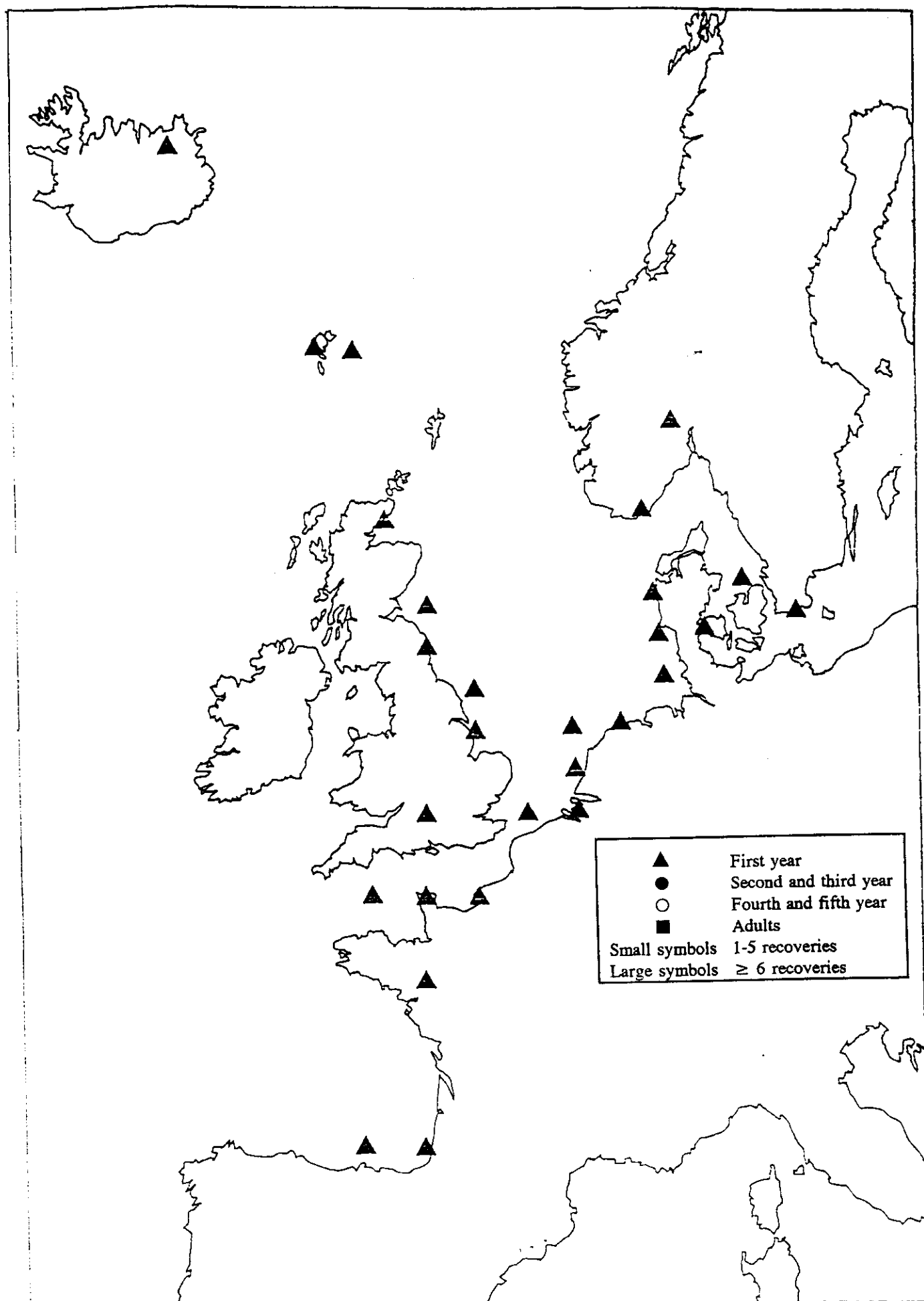


Figure 9.6

Recoveries of Guillemots ringed as chicks on the Firth of Forth and St Abbs and recovered as first year birds during January - March, between 1985 and 1992.

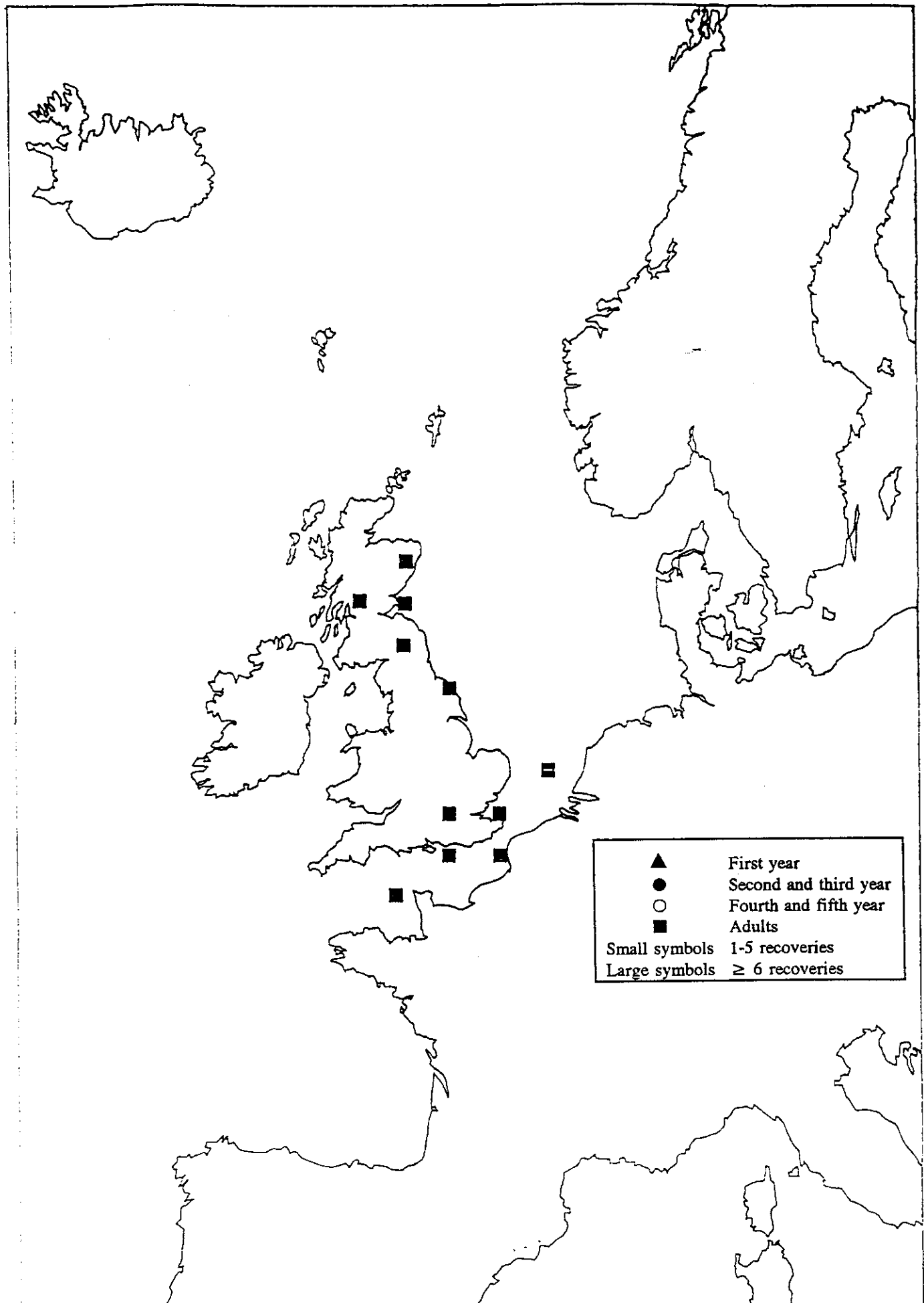


Figure 9.7 Recoveries of Guillemots ringed on the Firth of Forth and St Abbs and recovered as adults during January - March, between 1970 and 1984.

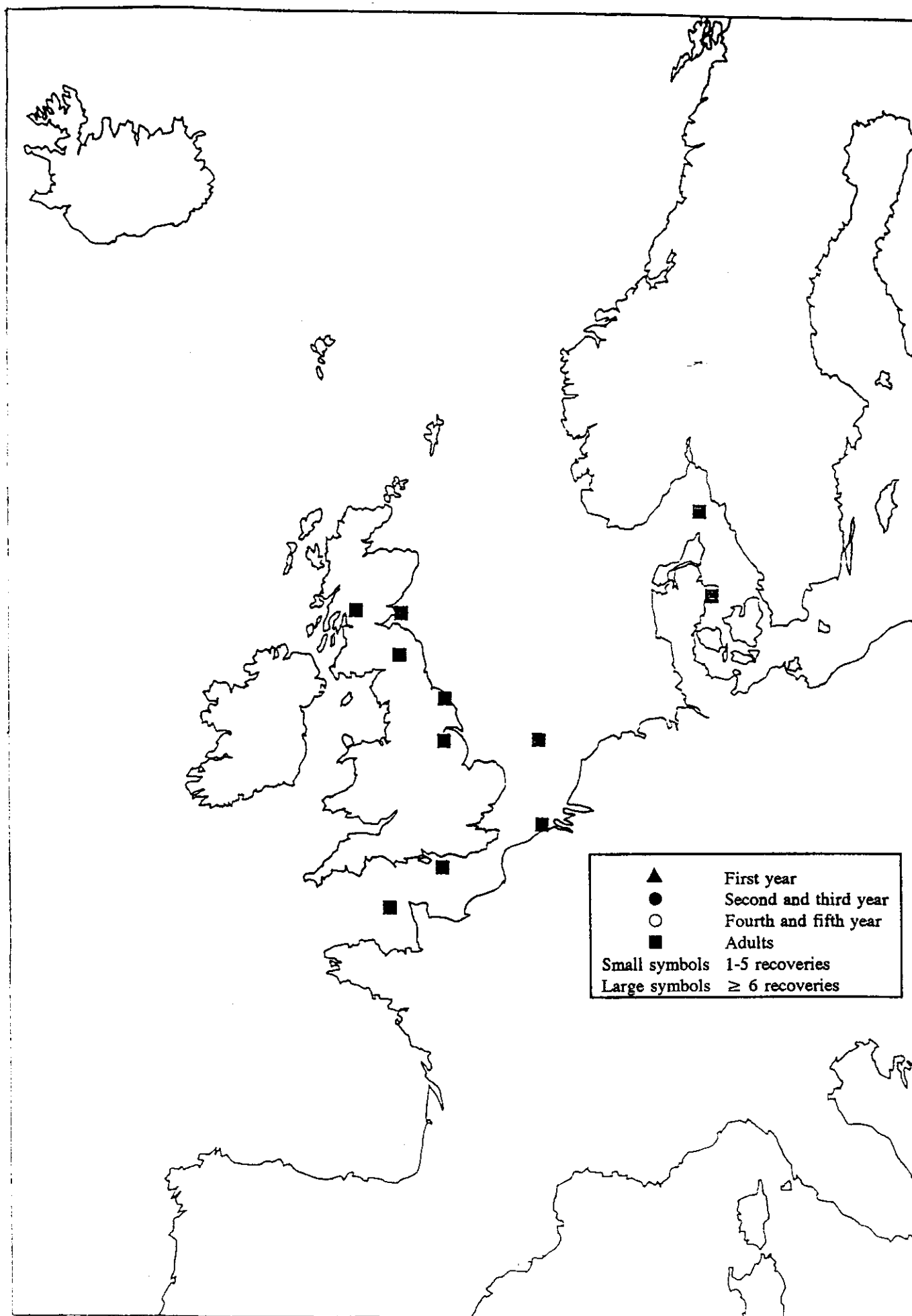
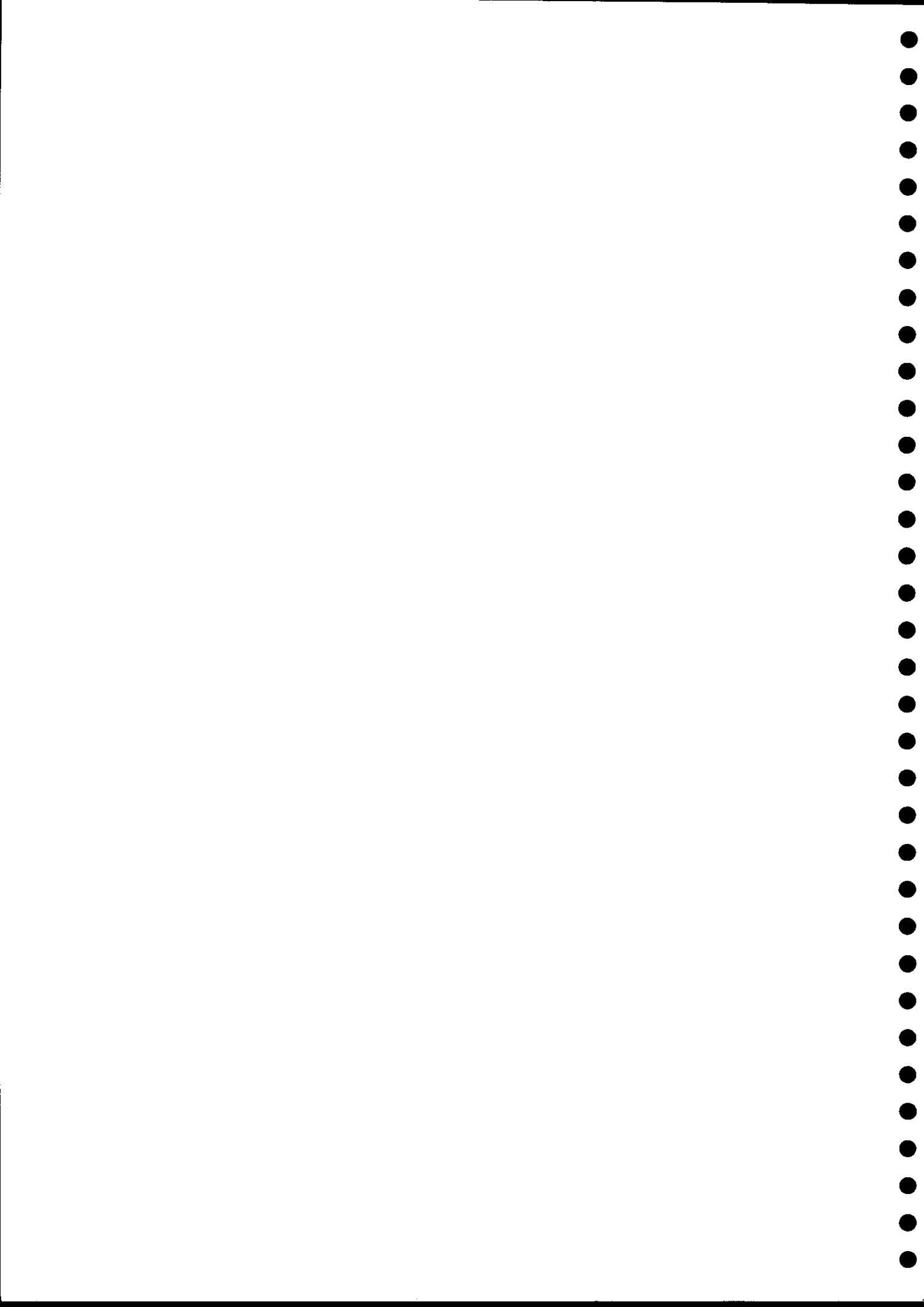


Figure 9.8 Recoveries of Guillemots ringed on the Firth of Forth and St Abbs and recovered as adults during January - March, between 1985 and 1992.

Section 10

Distributions of ringing places
for Guillemots reported from
different recovery regions



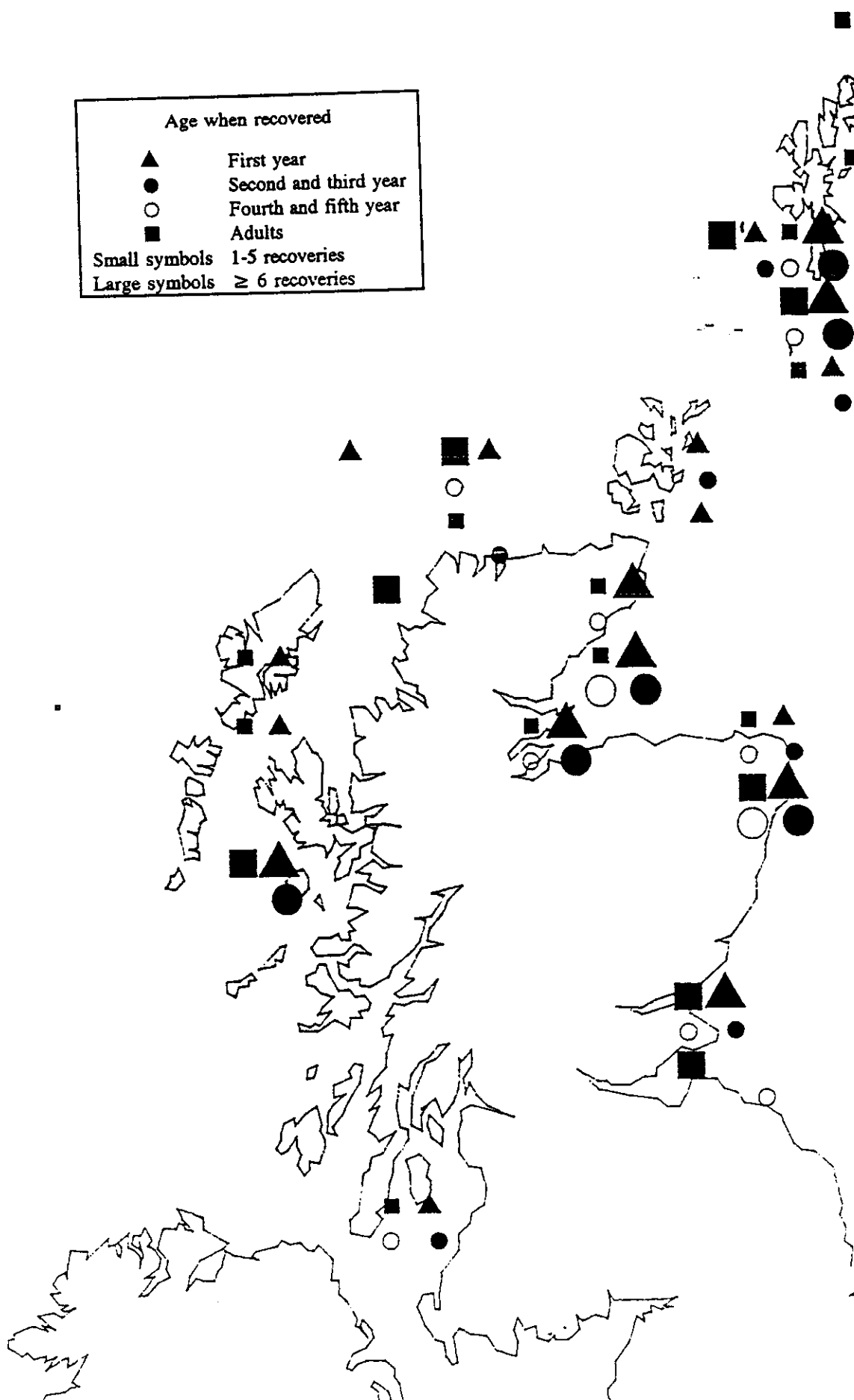
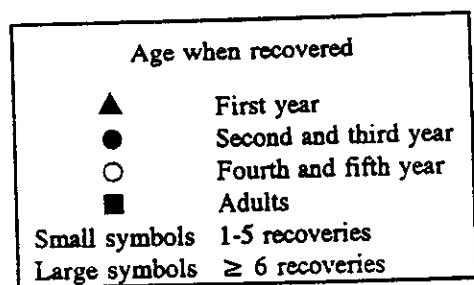


Figure 10.1 Ringing locations of Guillemots recovered in East Scotland between 1970 and 1992.

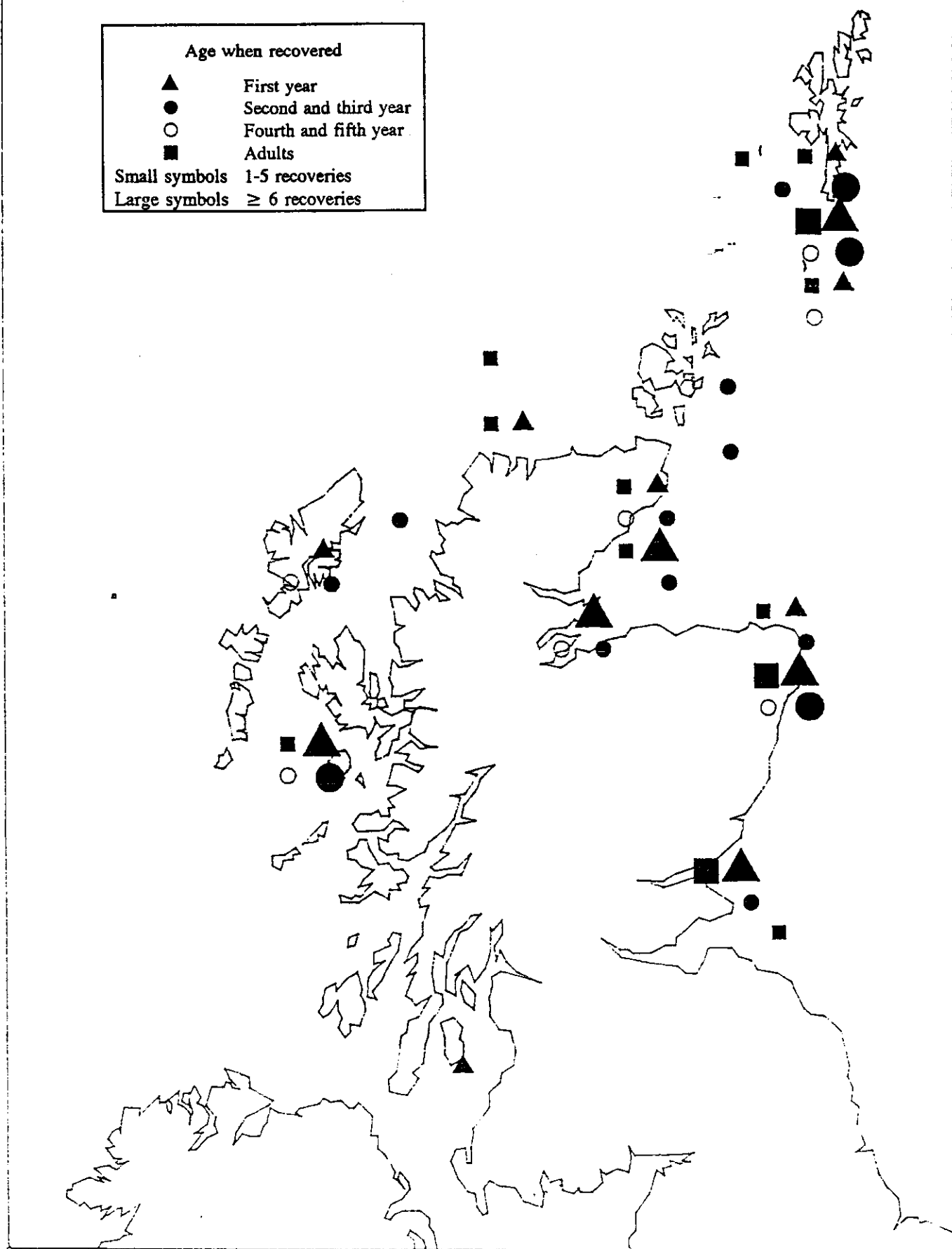


Figure 10.2 Ringing locations of Guillemots recovered in East England between 1970 and 1992.

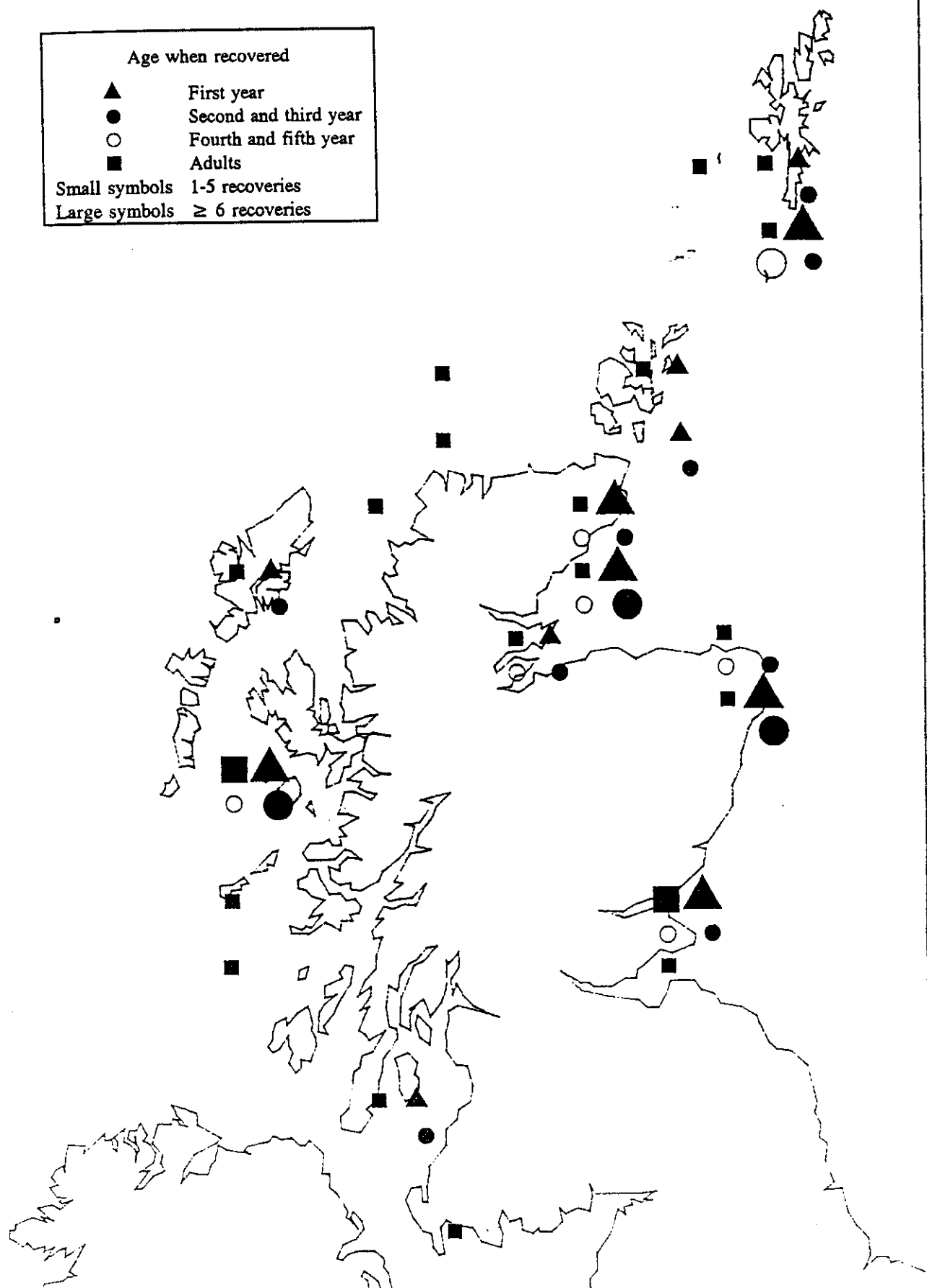
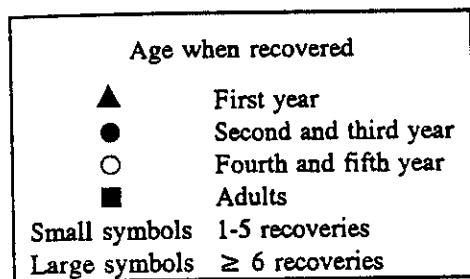


Figure 10.3 Ringing locations of Guillemots recovered in the Channel between 1970 and 1992.

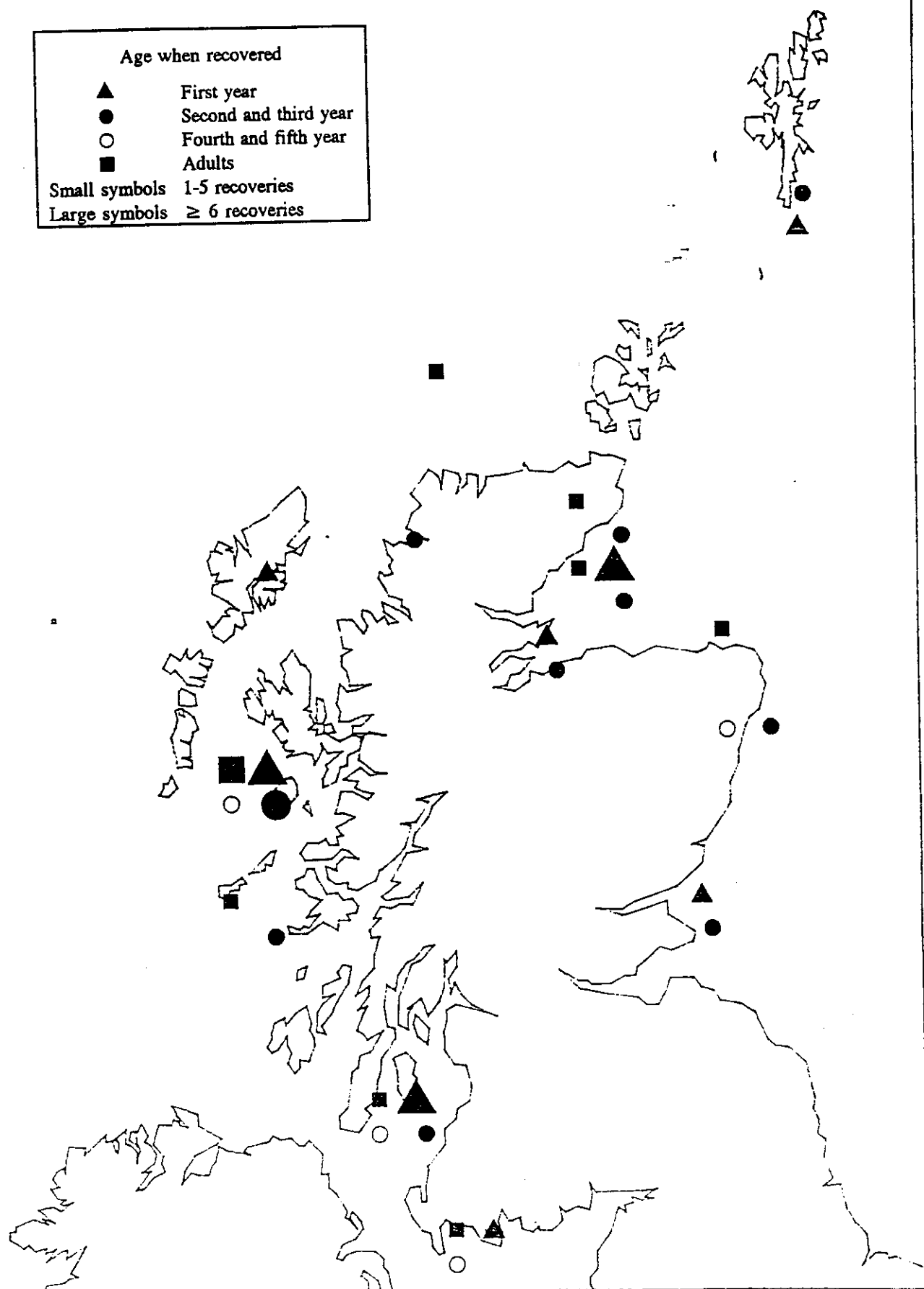
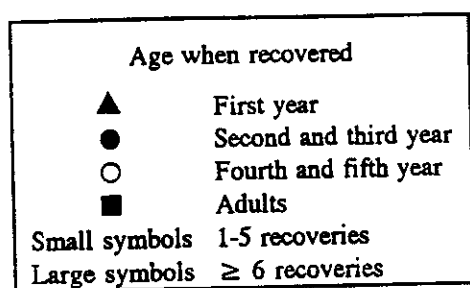


Figure 10.4 Ringing locations of Guillemots recovered in the Irish Sea between 1970 and 1992.

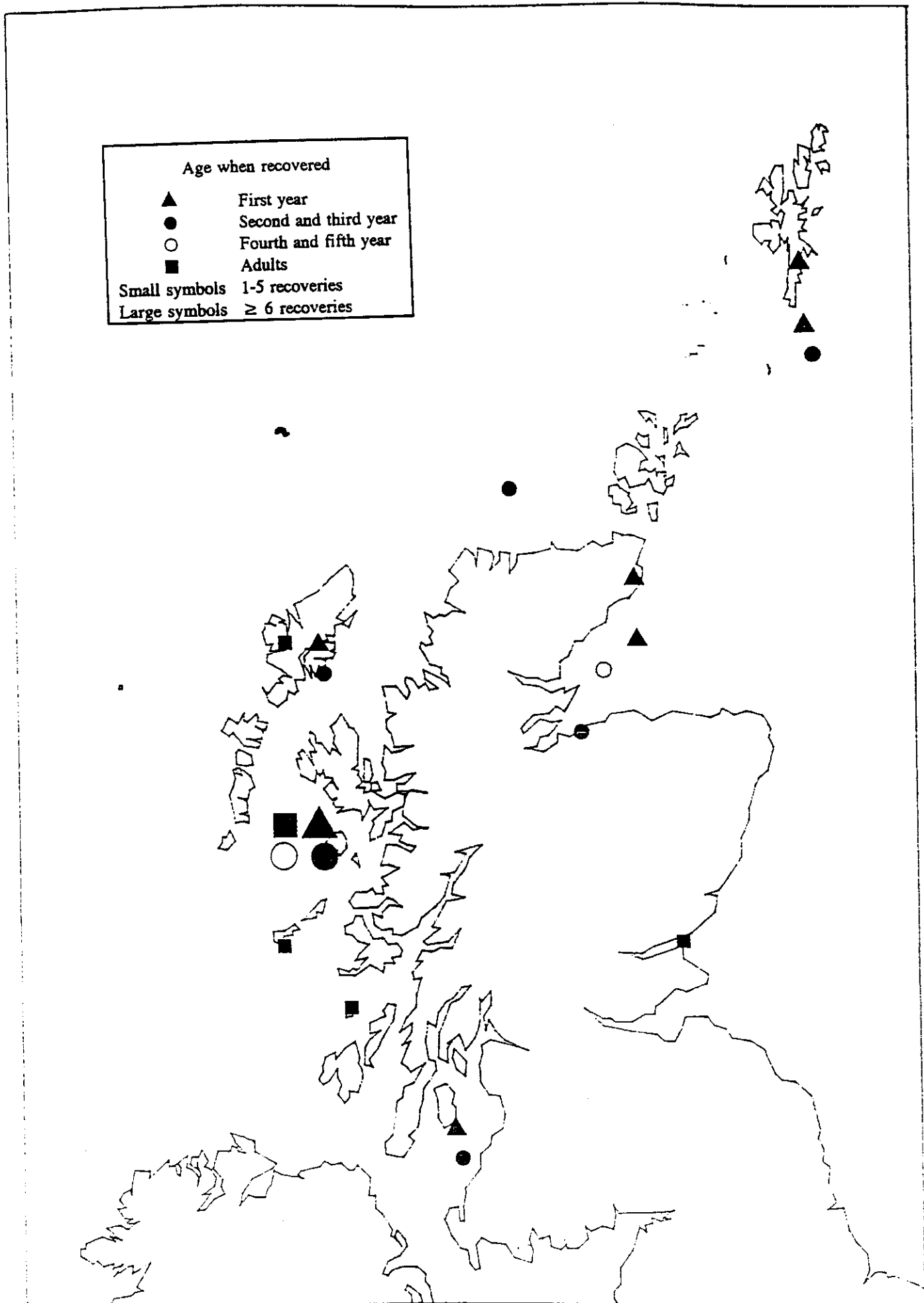


Figure 10.5 Ringing locations of Guillemots recovered in the West of Ireland between 1970 and 1992.

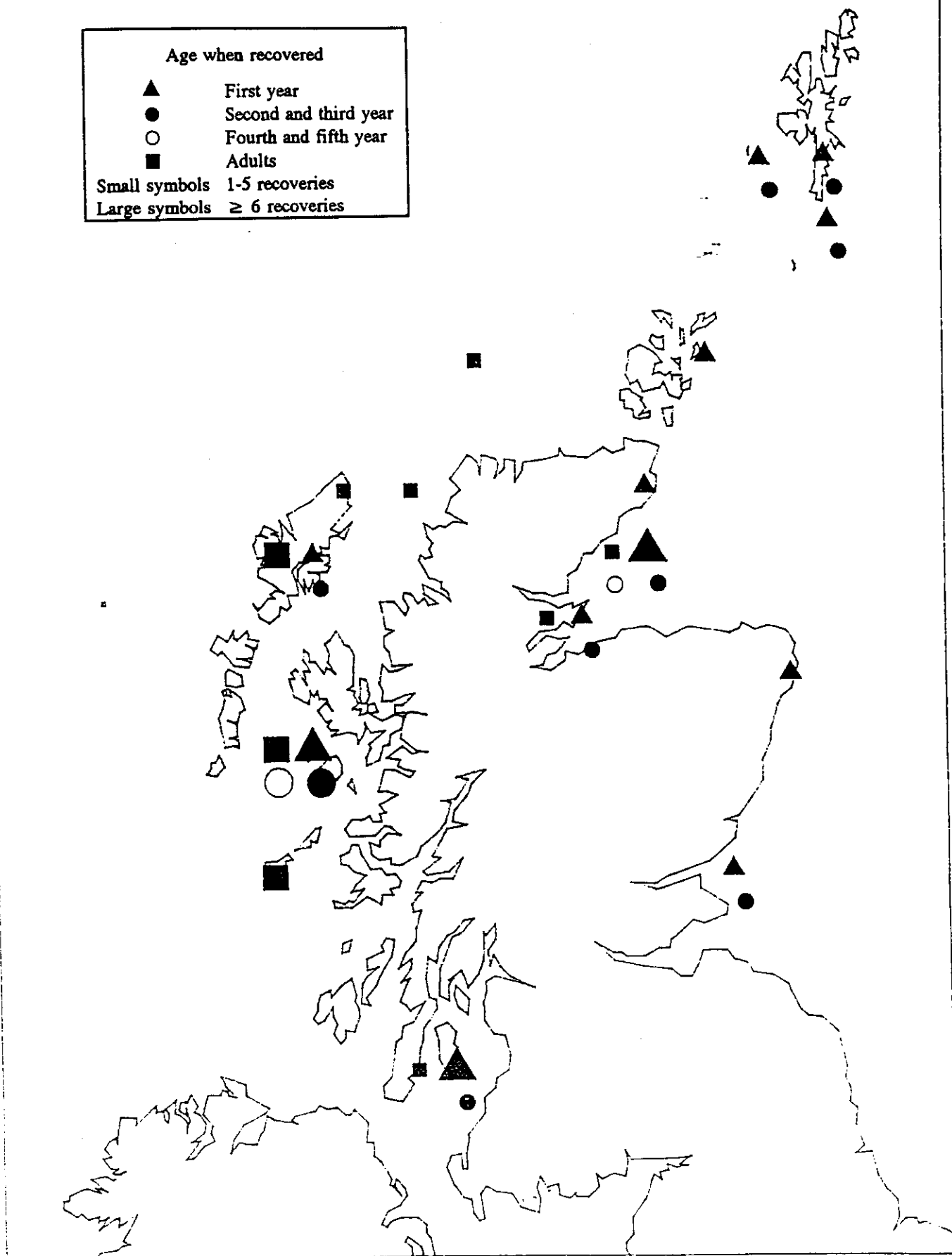
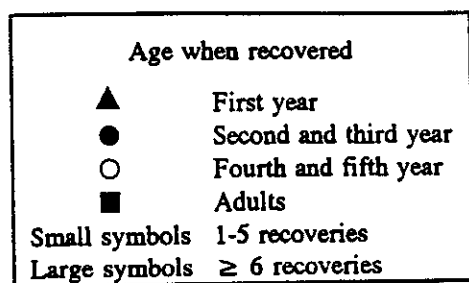


Figure 10.6 Ringing locations of Guillemots recovered in North West Scotland between 1970 and 1992.

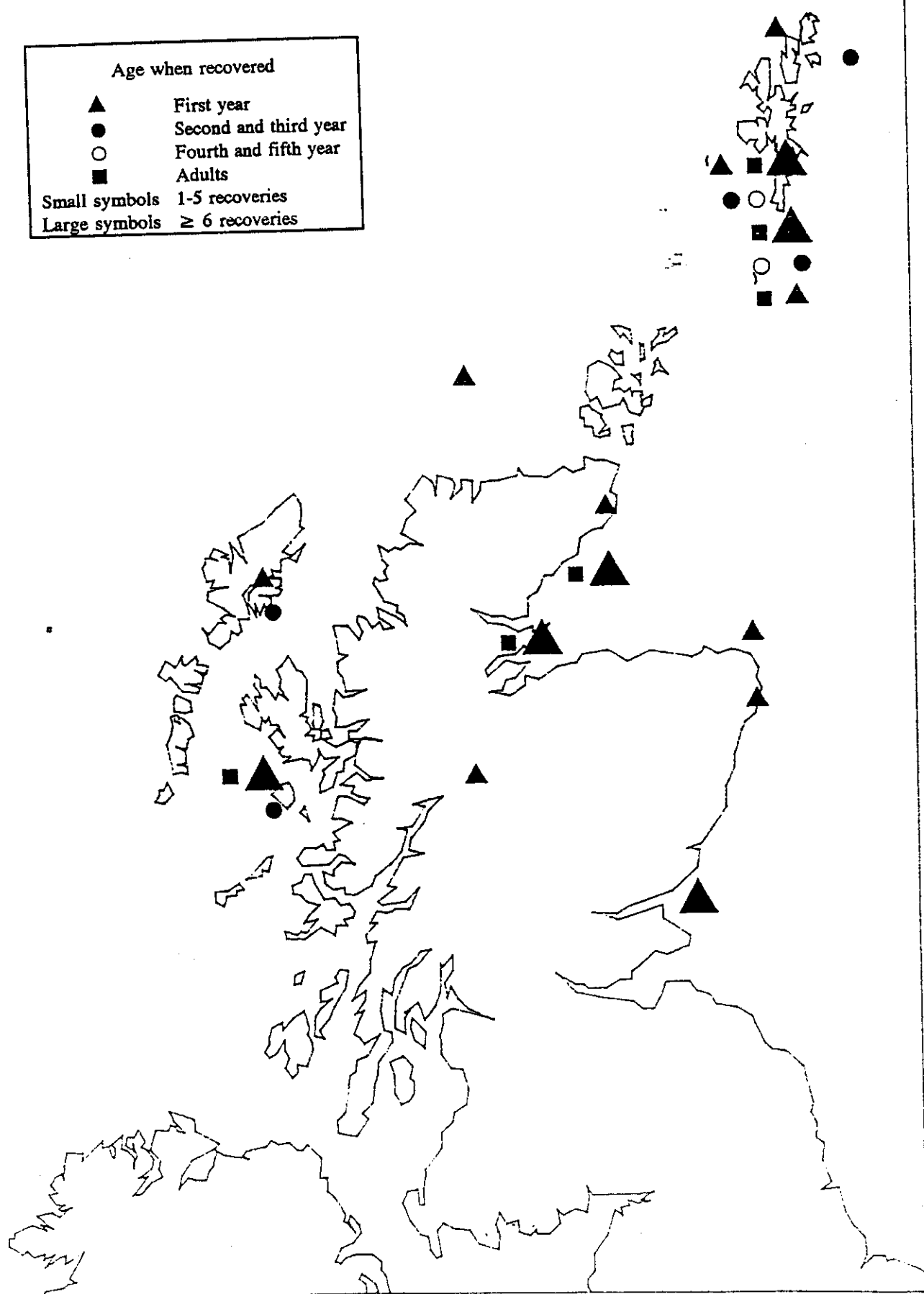
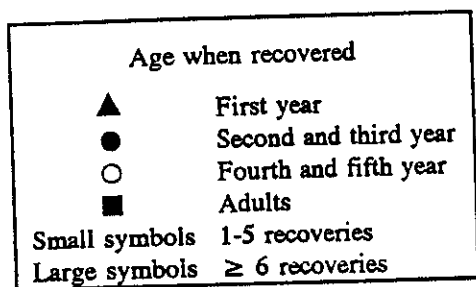


Figure 10.7 Ringing locations of Guillemots recovered in Iceland and the Faeroes between 1970 and 1992.

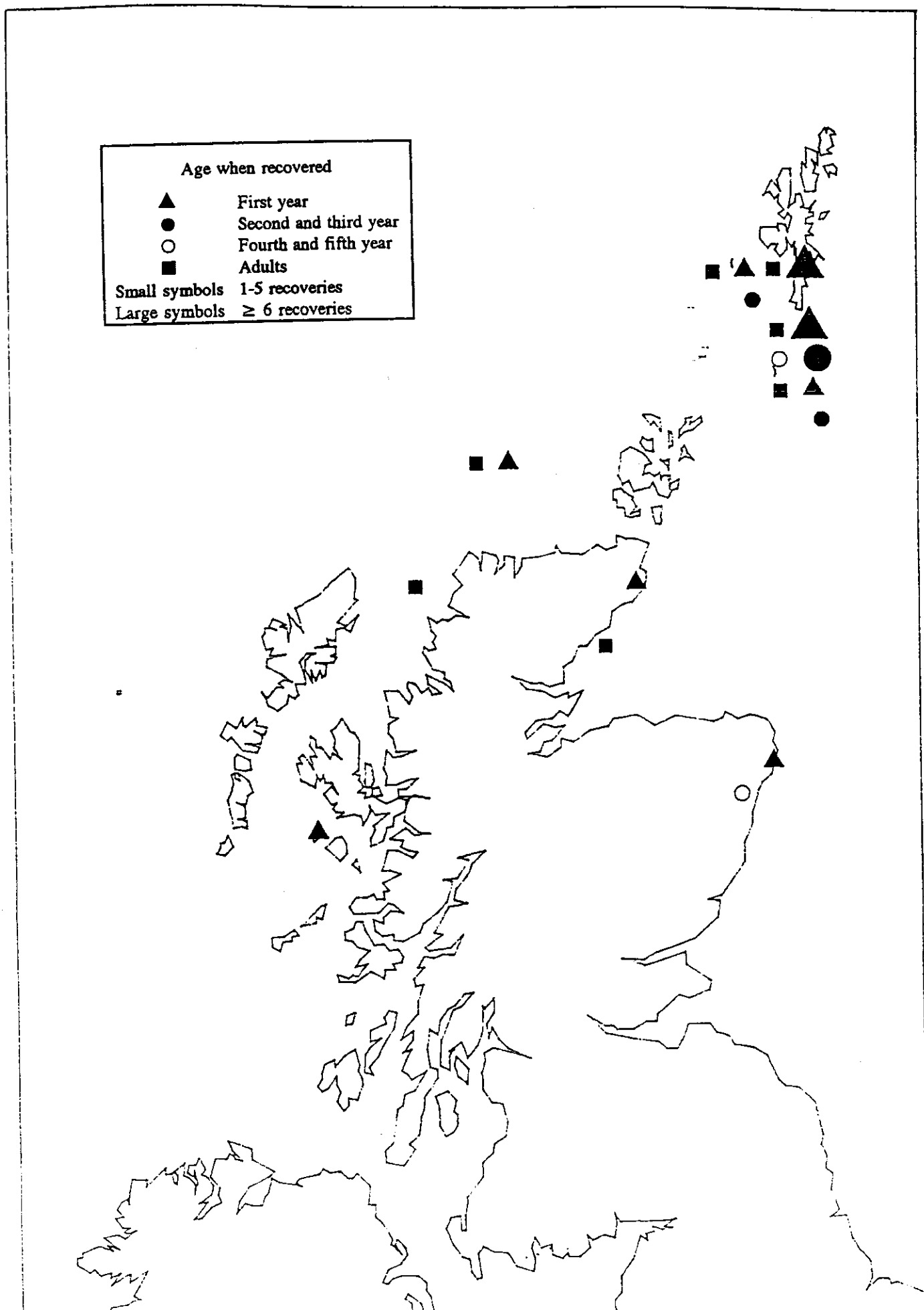


Figure 10.8 Ringing locations of Guillemots recovered in North Norway between 1970 and 1992.

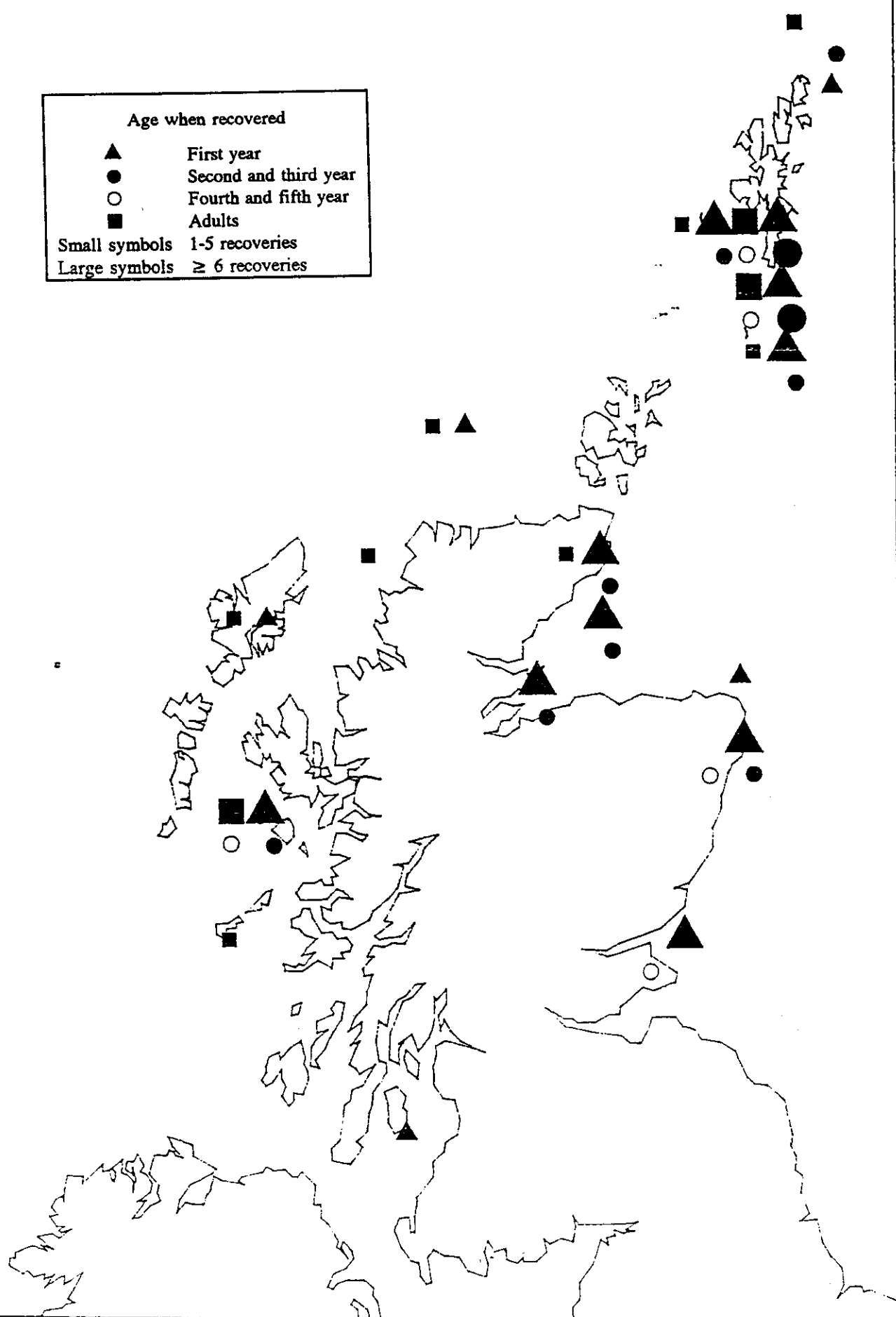
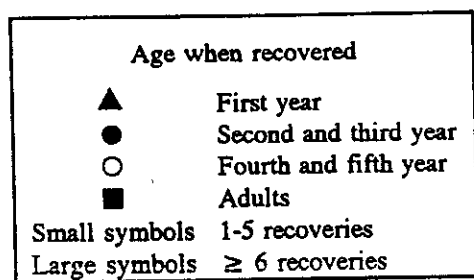


Figure 10.9 Ringing locations of Guillemots recovered in South Norway between 1970 and 1992.

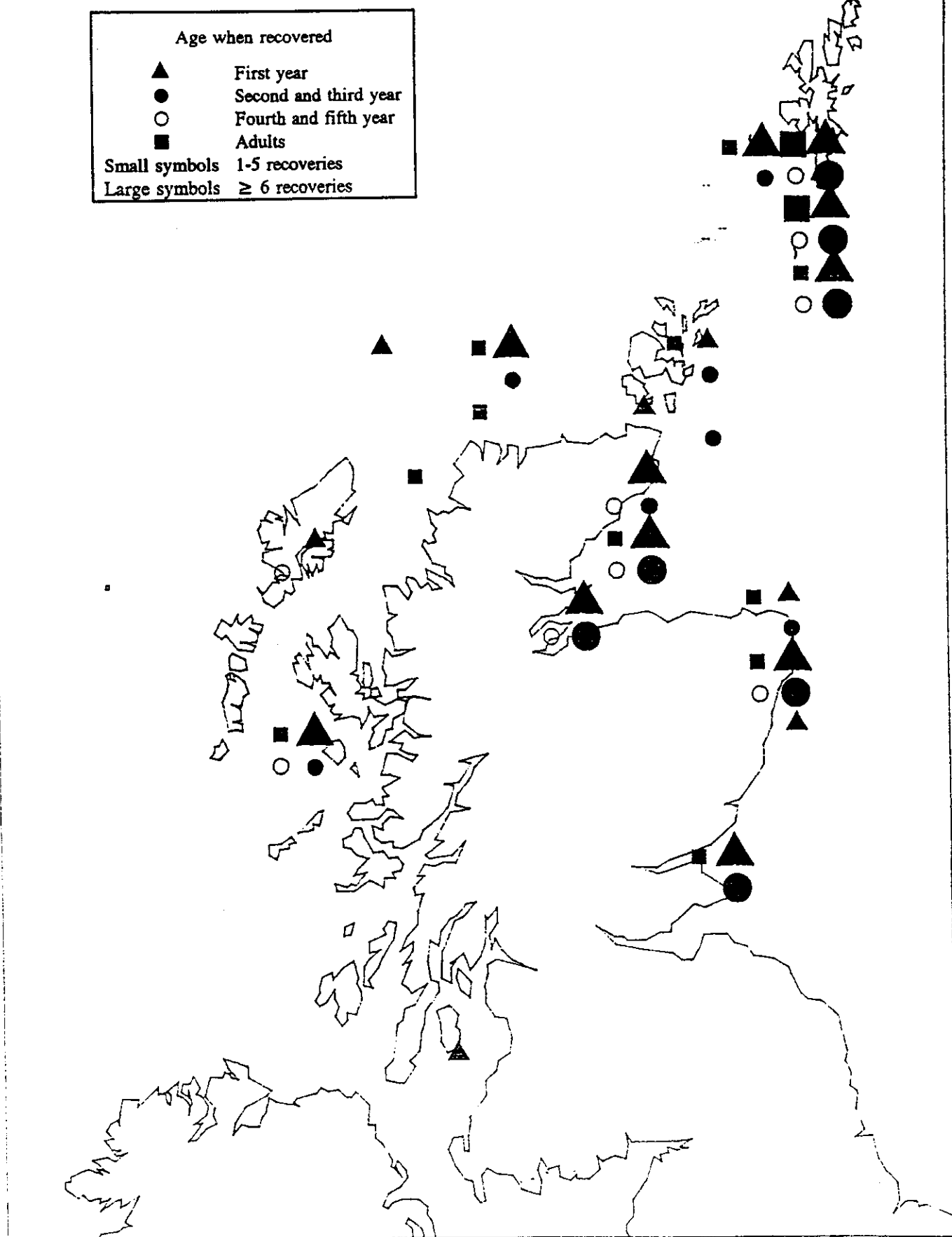


Figure 10.10 Ringing locations of Guillemots recovered in Skagerrak, Kattegat and the Baltic between 1970 and 1992.

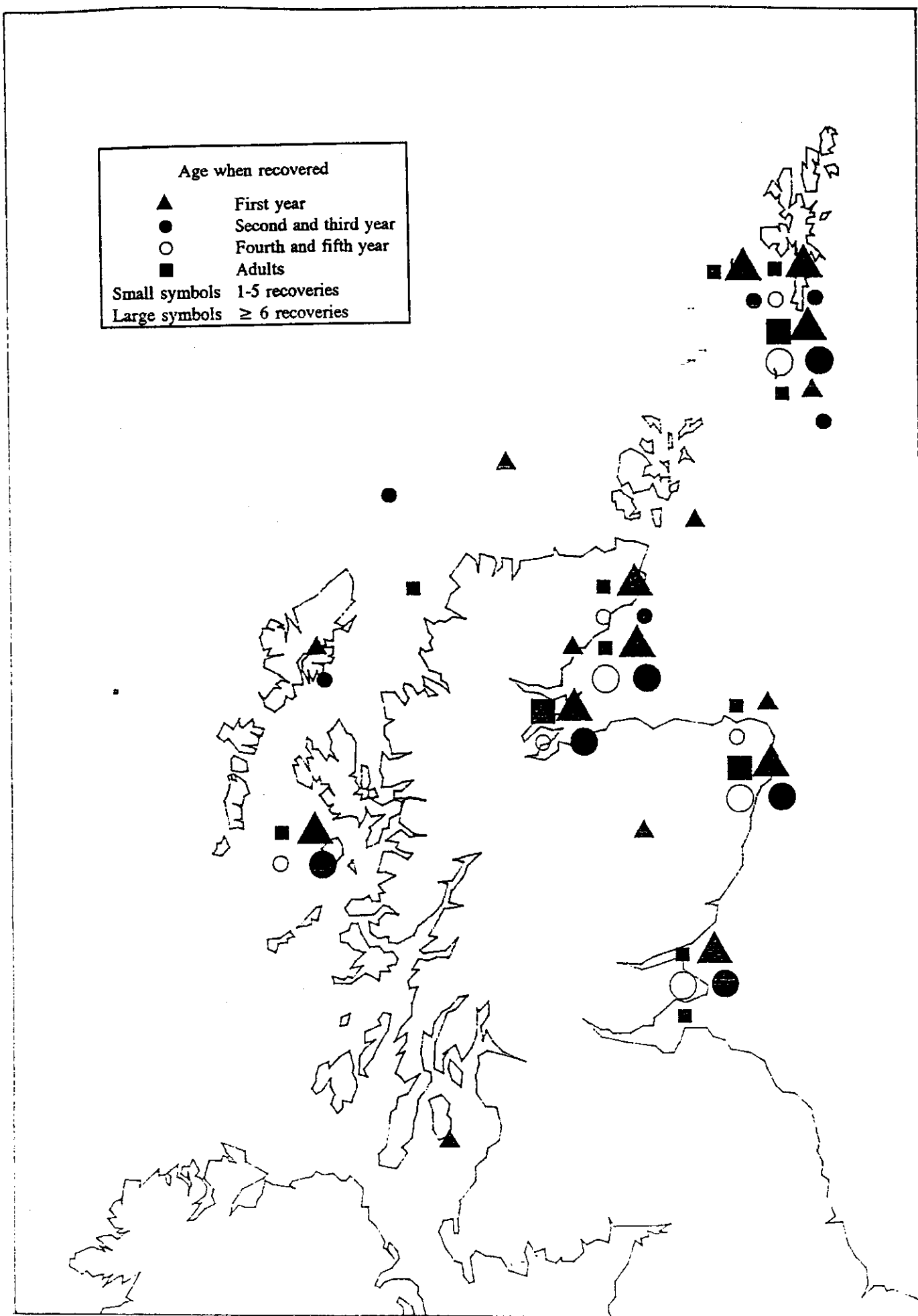


Figure 10.11 Ringing locations of Guillemots recovered in the South East North Sea between 1970 and 1992.

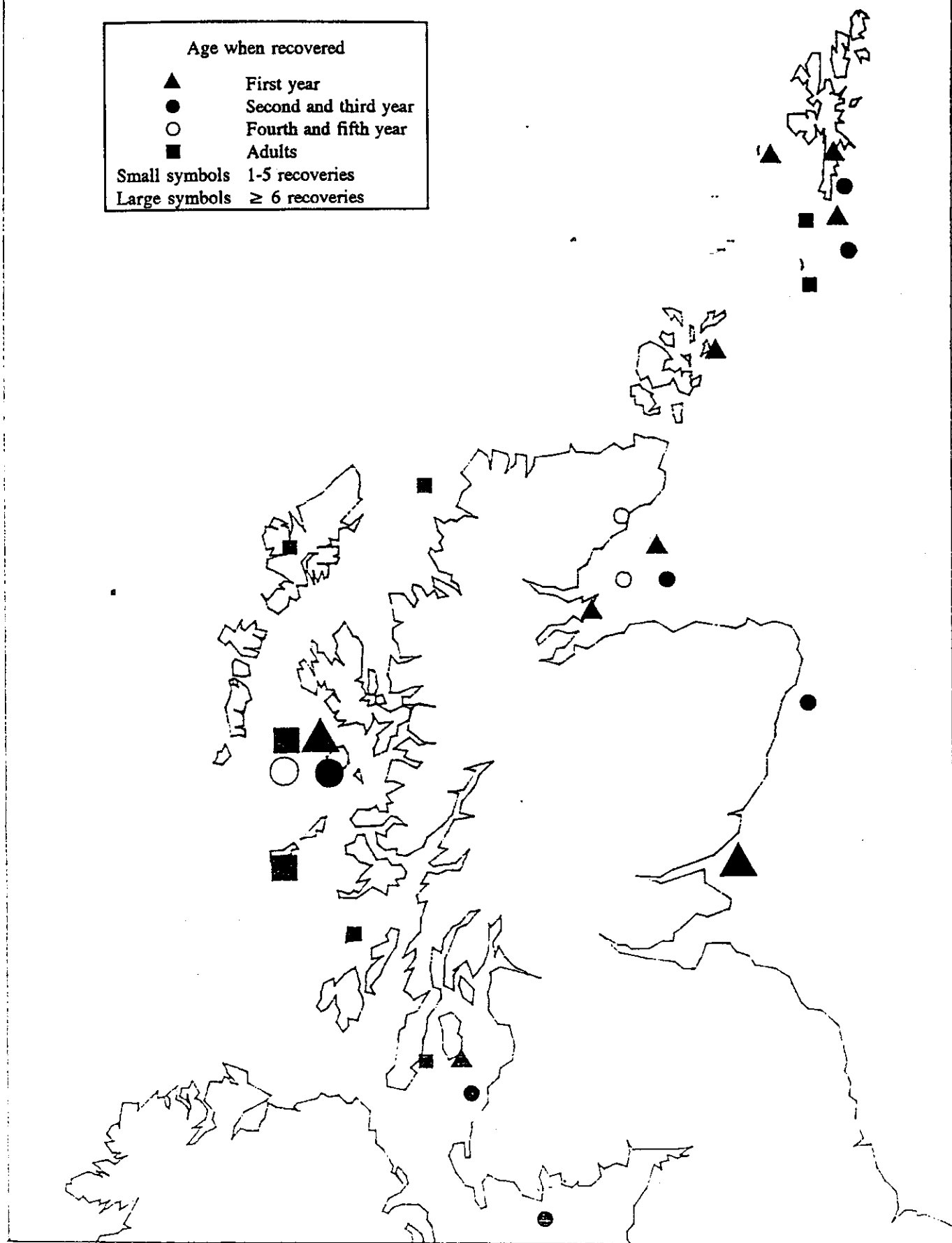


Figure 10.12 Ringing locations of Guillemots recovered in the Bay of Biscay between 1970 and 1992.

Table 1.1	Numbers of recoveries of Guillemots ringed in each region of ringing for three time periods
Table 2.1	Overall recovery distributions of guillemots marked in each region of ringing for recoveries reported between 1970 and 1992
Table 3.1	Recovery distribution of Guillemots ringed in Sanda and Clyde between 1970 and 1992 by season and age class
Table 4.1	Recovery distribution of Guillemots ringed on Canna between 1970 and 1992 by season and age class
Table 5.1	Recovery distribution of Guillemots ringed in Outer Hebrides, Shiantis and North Rona between 1970 and 1992 by season and age class
Table 6.1	Recovery distribution of Guillemots ringed in Shetland and Fair Isle between 1970 and 1992 by season and age class
Table 7.1	Recovery distribution of Guillemots ringed in East Sutherland, Caithness and North Sutor between 1970 and 1992 by season and age class
Table 8.1	Recovery distribution of Guillemots ringed in Grampian between 1970 and 1992 by season and age class
Table 9.1	Recovery distribution of Guillemots ringed in the Firth of Forth and St Abbs between 1970 and 1992 by season and age class
Table 10.1	Distributions of ringing places for Guillemots reported from different recovery regions, based on recoveries reported between 1970 and 1992



Table 1.1 Numbers of recoveries of Guillemots ringed in each region of ringing for three time periods

	Periods of years			Total recoveries
	09-69	70-84	85-92	
Ringling region				
Sanda and Clyde	24	25	92	141
Canna	1	359	501	861
Outer Hebrides, Shiantis and N.Rona	8	56	100	164
Shetland and Fair Isle	35	578	429	1042
East Sutherland, Caithness and N.Sutor	9	108	607	724
Grampian	12	141	133	286
Firth of Forth and St Abbs	28	51	156	235
All regions	117	1318	2018	3453

Table 2.1 Overall recovery distributions of guillemots marked in each region of ringing for recoveries reported between 1970 and 1992

Ringing region	Recovery region													Total recoveries
	East Scotland	East England	Channel	Irish Sea	West Ireland	North West Scotland	Iceland and Faeroes	North Norway	South Norway	Skagerrak and Kattegat	South East North Sea	Biscay	South Europe	
	%	%	%	%	%	%	%	%	%	%	%	%	%	
Sanda and Clyde	7.7	0.9	14.5	23.9	8.5	25.6	.	.	1.7	0.9	1.7	14.5	.	117.0
Canna	10.5	4.9	10.0	6.7	9.2	18.0	5.2	0.3	6.7	8.1	6.3	12.8	1.2	860.0
Outer Hebrides, Shiantis and N.Rona	24.4	6.4	10.3	2.6	3.2	10.9	3.2	2.6	10.9	14.1	7.7	2.6	1.3	156.0
Shetland and Fair Isle	16.3	6.6	2.6	0.3	0.5	1.1	4.2	7.8	22.6	28.8	8.3	0.9	0.1	1006.0
East Sutherland, Caithness and N.Sutor	23.8	8.5	8.1	2.9	0.7	2.9	3.8	0.3	6.7	21.5	18.9	1.5	0.3	715.0
Grampian	24.5	12.8	8.4	1.5	.	0.7	1.1	1.1	6.6	24.1	19.0	0.4	.	274.0
Firth of Forth and St. Abbs	21.3	10.6	11.1	1.9	0.5	1.4	3.4	.	4.8	20.8	21.3	2.9	.	207.0
All regions	17.5	7.1	7.5	3.7	3.1	7.2	3.9	2.7	11.4	19.4	11.5	4.7	0.4	3335.0

Table 3.1 Recovery distribution of Guillemots ringed in Sanda and Clyde between 1970 and 1992 by season and age class.

		Recovery region										Total recoveries
		East Scotland	East England	Channel	Irish Sea	West Ireland	North West Scotland	South Norway	Skagerrak and Kattegat	South East North Sea	Biscay	
		%	%	%	%	%	%	%	%	%	%	
Recovery period	Age when recovered											
July-September	1Y	.	.	.	.	.	100.0	.	.	.	.	4.0
	2Y+3Y	.	.	.	33.3	33.3	33.3	.	.	.	.	3.0
	4Y+5Y	.	.	.	100.0	.	.	.	.	.	.	3.0
	Adult	.	.	.	12.5	.	87.5	.	.	.	.	8.0
October-December	1Y	12.5	.	25.0	25.0	.	12.5	.	12.5	.	12.5	8.0
	2Y+3Y	.	.	66.7	33.3	.	.	.	.	.	.	3.0
	Adult	.	.	33.3	22.2	22.2	11.1	.	.	.	11.1	9.0
January-March	1Y	5.6	5.6	5.6	33.3	16.7	11.1	5.6	.	11.1	5.6	18.0
	2Y+3Y	.	.	28.6	28.6	.	14.3	.	.	.	28.6	7.0
	Adult	.	.	23.3	13.3	6.7	23.3	3.3	.	.	30.0	30.0
April-June	1Y	.	.	.	25.0	25.0	.	.	.	.	50.0	4.0
	2Y+3Y	83.3	.	.	16.7	.	.	.	.	.	.	6.0
	4Y+5Y	50.0	.	.	50.0	.	.	.	.	.	.	2.0
	Adult	8.3	.	.	25.0	8.3	50.0	.	.	.	8.3	12.0
All seasons and ages		7.7	0.9	14.5	23.9	8.5	25.6	1.7	0.9	1.7	14.5	117.0

able 4.1 Recovery distribution of Guillemots ringed on Canna between 1970 and 1992 by season and age class.

		Recovery region													Total recoveries
		East Scotland	East England	Channel	Irish Sea	West Ireland	North West Scotland	Iceland and Faeroes	North Norway	South Norway	Skagerrak and Kattegat	South North Sea	Biscay	South Europe	
		%	%	%	%	%	%	%	%	%	%	%	%	%	
Recovery period	Age when recovered														
July-September	1Y	12.0	.	.	.	.	56.0	.	.	28.0	.	.	4.0	.	25.0
	2Y+3Y	7.5	5.0	7.5	7.5	35.0	25.0	.	.	.	5.0	2.5	5.0	.	40.0
	4Y+5Y	.	.	9.1	9.1	18.2	54.5	.	.	.	.	.	9.1	.	11.0
	Adult	11.5	.	.	3.8	3.8	76.9	.	.	.	.	.	3.8	.	26.0
October-December	1Y	15.1	7.3	4.2	4.7	2.1	2.1	14.6	.	9.4	20.3	14.1	5.7	0.5	192.0
	2Y+3Y	8.3	4.2	4.2	.	12.5	25.0	4.2	.	.	4.2	8.3	29.2	.	24.0
	4Y+5Y	.	10.0	10.0	.	10.0	10.0	.	.	.	10.0	.	50.0	.	10.0
	Adult	13.3	.	13.3	10.0	.	36.7	10.0	.	.	3.3	.	13.3	.	30.0
January-March	1Y	14.1	7.9	7.3	8.5	4.0	8.5	3.4	1.1	11.9	11.9	6.2	13.6	1.7	177.0
	2Y+3Y	3.0	4.5	16.4	9.0	14.9	9.0	.	.	3.0	3.0	9.0	22.4	6.0	67.0
	4Y+5Y	.	.	13.6	13.6	13.6	9.1	.	.	4.5	.	4.5	36.4	4.5	22.0
	Adult	5.0	3.8	23.8	6.3	10.0	12.5	2.5	.	7.5	.	3.8	25.0	.	80.0
April-June	1Y	11.0	4.1	17.8	8.2	17.8	17.8	4.1	1.4	1.4	4.1	1.4	9.6	1.4	73.0
	2Y+3Y	6.8	2.3	15.9	11.4	22.7	25.0	4.5	.	2.3	.	2.3	6.8	.	44.0
	4Y+5Y	.	.	.	.	25.0	62.5	.	.	.	.	12.5	.	.	8.0
	Adult	12.9	.	6.5	3.2	3.2	67.7	.	.	3.2	.	.	3.2	.	31.0
All seasons and ages		10.5	4.9	10.0	6.7	9.2	18.0	5.2	0.3	6.7	8.1	6.3	12.8	1.2	860.0

Table 5.1 Recovery distribution of Guillemots ringed in Outer Hebrides, Shiantis and North Rona between 1970 and 1992 by season and age class.

		Recovery region													Total recoveries
		East Scotland	East England	Channel	Irish Sea	West Ireland	North West Scotland	Iceland and Faeroes	North Norway	South Norway	Skagerrak and Kattegat	South East North Sea	Biscay	South Europe	
		%	%	%	%	%	%	%	%	%	%	%	%	%	
Recovery period	Age when recovered														
July-September	1Y	.	.	.	.	.	100.0	.	.	.	.	.	.	.	1.0
	2Y+3Y	.	33.3	.	.	66.7	.	.	.	.	.	.	.	.	3.0
	4Y+5Y	.	100.0	.	.	.	.	.	.	.	.	.	.	.	1.0
	Adult	31.3	.	.	.	.	18.8	.	12.5	18.8	18.8	.	.	.	16.0
October-December	1Y	20.0	12.0	4.0	.	4.0	.	4.0	.	12.0	28.0	16.0	.	.	25.0
	2Y+3Y	.	.	50.0	25.0	.	.	25.0	.	.	.	.	.	.	4.0
	Adult	41.2	5.9	5.9	.	.	.	.	5.9	17.6	5.9	11.8	5.9	.	17.0
January-March	1Y	6.3	6.3	18.8	6.3	.	.	12.5	6.3	12.5	25.0	6.3	.	.	16.0
	2Y+3Y	.	.	14.3	.	.	.	.	.	.	57.1	28.6	.	.	7.0
	4Y+5Y	.	.	.	.	.	.	.	.	.	100.0	.	.	.	1.0
	Adult	30.0	5.0	17.5	5.0	2.5	12.5	.	.	7.5	5.0	7.5	7.5	.	40.0
April-June	1Y	14.3	.	14.3	.	14.3	14.3	14.3	.	14.3	.	.	.	14.3	7.0
	2Y+3Y	33.3	33.3	.	.	.	33.3	.	.	.	.	.	.	.	3.0
	4Y+5Y	100.0	.	.	.	.	.	.	.	.	.	.	.	.	1.0
	Adult	35.7	.	.	.	.	42.9	.	.	14.3	.	.	.	7.1	14.0
All seasons and ages		24.4	6.4	10.3	2.6	3.2	10.9	3.2	2.6	10.9	14.1	7.7	2.6	1.3	156.0

Table 6.1 Recovery distribution of Guillemots ringed in Shetland and Fair Isle between 1970 and 1992 by season and age class.

		Recovery region														Total recoveries
Recovery period	Age when recovered	0	East Scotland	East England	Channel	Irish Sea	West Ireland	North West Scotland	Iceland and Faeroes	North Norway	South Norway	Skagerrak and Kattegat	South East North Sea	Biscay	South Europe	
		%	%	%	%	%	%	%	%	%	%	%	%	%	%	
July-September	1Y	.	20.0	.	.	.	.	.	.	2.5	50.0	22.5	5.0	.	.	40.0
	2Y+3Y	.	27.6	10.3	.	3.4	.	13.8	3.4	3.4	17.2	13.8	6.9	.	.	29.0
	4Y+5Y	.	100.0	.	.	.	.	.	.	.	.	.	.	.	.	4.0
	Adult	.	20.0	4.0	.	.	.	.	8.0	12.0	32.0	20.0	4.0	.	.	25.0
October-December	1Y	.	10.3	3.2	1.4	.	0.4	0.4	8.5	6.8	21.7	42.7	4.3	0.4	.	281.0
	2Y+3Y	.	7.0	7.0	2.3	.	.	4.7	7.0	7.0	14.0	44.2	4.7	2.3	.	43.0
	4Y+5Y	.	11.1	.	11.1	.	.	.	11.1	.	22.2	33.3	11.1	.	.	9.0
	Adult	.	23.4	14.9	4.3	.	.	.	.	6.4	23.4	21.3	4.3	2.1	.	47.0
January-March	1Y	.	12.8	8.5	3.4	0.9	0.4	0.4	2.6	10.7	19.2	29.9	9.4	1.7	.	234.0
	2Y+3Y	.	9.5	9.5	2.7	.	2.7	.	.	10.8	24.3	23.0	16.2	1.4	.	74.0
	4Y+5Y	.	9.1	9.1	27.3	.	.	.	.	.	13.6	22.7	18.2	.	.	22.0
	Adult	.	22.4	9.2	2.0	.	.	.	2.0	5.1	28.6	11.2	17.3	1.0	1.0	98.0
April-June	1Y	2.3	18.6	2.3	.	.	.	4.7	.	11.6	27.9	30.2	2.3	.	.	43.0
	2Y+3Y	.	28.6	14.3	.	.	4.8	4.8	4.8	19.0	9.5	4.8	9.5	.	.	21.0
	4Y+5Y	.	22.2	11.1	.	.	.	.	11.1	11.1	.	11.1	33.3	.	.	9.0
	Adult	.	64.3	.	.	.	.	.	3.6	.	21.4	7.1	3.6	.	.	28.0
All seasons and ages		0.1	16.3	6.6	2.6	0.3	0.5	1.1	4.2	7.7	22.5	28.8	8.3	0.9	0.1	1007.0

Table 7.1 Recovery distribution of Guillemots ringed in East Sutherland, Caithness and North Sutor between 1970 and 1992 by season and age class.

		Recovery region													Total recoveries
Recovery period	Age when recovered	East Scotland	East England	Channel	Irish Sea	West Ireland	North West Scotland	Iceland and Faeroes	North Norway	South Norway	Skagerrak and Kattegat	South North Sea	East Biscay	South Europe	
		%	%	%	%	%	%	%	%	%	%	%	%	%	
July-September	1Y	37.5	12.5	.	.	.	.	.	.	6.3	25.0	18.8	.	.	16.0
	2Y+3Y	10.0	15.0	10.0	10.0	.	15.0	.	.	5.0	30.0	5.0	.	.	20.0
	Adult	.	.	.	.	.	100.0	.	.	.	.	.	.	.	1.0
October-December	1Y	18.7	8.7	5.7	2.6	0.4	1.3	7.0	.	12.6	28.7	13.0	1.3	.	230.0
	2Y+3Y	13.0	4.3	8.7	8.7	4.3	.	.	.	4.3	21.7	34.8	.	.	23.0
	4Y+5Y	.	.	33.3	.	.	.	.	.	.	16.7	50.0	.	.	6.0
	Adult	15.4	7.7	15.4	.	.	.	23.1	.	.	.	38.5	.	.	13.0
January-March	1Y	23.0	8.4	9.6	1.1	0.6	1.7	2.8	0.6	5.6	22.5	21.9	2.2	.	178.0
	2Y+3Y	9.4	7.5	17.0	1.9	.	1.9	.	.	5.7	20.8	35.8	.	.	53.0
	4Y+5Y	8.0	.	20.0	.	4.0	4.0	.	.	.	16.0	40.0	8.0	.	25.0
	Adult	13.6	13.6	9.1	9.1	.	4.5	.	4.5	.	4.5	36.4	.	4.5	22.0
April-June	1Y	24.5	17.0	3.8	3.8	1.9	13.2	5.7	.	3.8	18.9	5.7	.	1.9	53.0
	2Y+3Y	57.5	2.5	5.0	5.0	.	2.5	.	.	.	12.5	10.0	5.0	.	40.0
	4Y+5Y	84.0	8.0	.	.	.	.	.	.	.	.	8.0	.	.	25.0
	Adult	60.0	.	.	20.0	.	.	.	.	10.0	10.0	.	.	.	10.0
All seasons and ages		23.8	8.5	8.1	2.9	0.7	2.9	3.8	0.3	6.7	21.5	18.9	1.5	0.3	715.0

Table 8.1 Recovery distribution of Guillemots ringed in Grampian between 1970 and 1992 by season and age class.

Recovery period	Age when recovered	Recovery region											Total recoveries
		East Scotland	East England	Channel	Irish Sea	North West Scotland	Iceland and Faeroes	North Norway	South Norway	Skagerrak and Kattegat	South East North Sea	Biscay	
		%	%	%	%	%	%	%	%	%	%	%	
July-September	1Y	60.0	10.0	10.0	.	.	.	.	.	10.0	10.0	.	10.0
	2Y+3Y	37.5	12.5	12.5	.	.	.	.	.	25.0	.	12.5	8.0
	4Y+5Y	50.0	25.0	.	.	.	.	25.0	.	.	.	.	4.0
	Adult	50.0	.	.	.	.	.	.	.	50.0	.	.	4.0
October-December	1Y	7.7	5.8	7.7	.	3.8	1.9	.	17.3	48.1	7.7	.	52.0
	2Y+3Y	6.7	.	13.3	6.7	.	.	.	6.7	46.7	20.0	.	15.0
	4Y+5Y	.	.	.	.	.	.	.	.	.	100.0	.	2.0
	Adult	.	20.0	20.0	.	.	.	.	.	.	60.0	.	5.0
January-March	1Y	20.4	18.5	5.6	.	.	1.9	.	11.1	22.2	20.4	.	54.0
	2Y+3Y	.	23.1	15.4	.	.	.	.	3.8	34.6	23.1	.	26.0
	4Y+5Y	14.3	21.4	7.1	.	.	.	.	7.1	14.3	35.7	.	14.0
	Adult	31.0	13.8	6.9	3.4	.	.	.	.	10.3	34.5	.	29.0
April-June	1Y	29.4	.	11.8	.	.	5.9	11.8	.	5.9	35.3	.	17.0
	2Y+3Y	81.8	9.1	.	.	.	.	.	.	.	9.1	.	11.0
	4Y+5Y	70.0	10.0	.	20.0	.	.	.	.	.	.	.	10.0
	Adult	46.2	23.1	15.4	.	.	.	.	.	15.4	.	.	13.0
All seasons and ages		24.5	12.8	8.4	1.5	0.7	1.1	1.1	6.6	24.1	19.0	0.4	274.0

Table 9.1 Recovery distribution of Guillemots ringed in the Firth of Forth and St Abbs between 1970 and 1992 by season and age class.

		Recovery region											Total recoveries
Recovery period	Age when recovered	East Scotland	East England	Channel	Irish Sea	West Ireland	North West Scotland	Iceland and Faeroes	South Norway	Skagerrak and Kattegat	South East North Sea	Biscay	
		%	%	%	%	%	%	%	%	%	%	%	
July-September	1Y	20.0	.	.	.	.	.	.	.	20.0	60.0	.	5.0
	2Y+3Y	.	.	.	.	.	33.3	.	.	66.7	.	.	3.0
	4Y+5Y	33.3	.	.	.	.	.	.	33.3	.	33.3	.	3.0
	Adult	80.0	20.0	.	.	.	.	.	.	.	.	.	5.0
October-December	1Y	23.1	3.8	7.7	1.9	.	1.9	7.7	9.6	32.7	9.6	1.9	52.0
	2Y+3Y	.	12.5	12.5	.	.	.	.	.	62.5	12.5	.	8.0
	4Y+5Y	.	.	.	.	.	.	.	.	.	100.0	.	1.0
	Adult	.	50.0	16.7	.	16.7	.	.	.	16.7	.	.	6.0
January-March	1Y	10.9	13.0	10.9	2.2	.	.	6.5	2.2	21.7	21.7	10.9	46.0
	2Y+3Y	11.1	11.1	.	5.6	.	.	.	.	11.1	61.1	.	18.0
	4Y+5Y	.	.	20.0	.	.	.	.	.	.	80.0	.	5.0
	Adult	29.6	22.2	25.9	.	.	.	.	.	7.4	14.8	.	27.0
April-June	1Y	.	9.1	18.2	.	.	9.1	.	27.3	18.2	18.2	.	11.0
	2Y+3Y	16.7	.	16.7	16.7	.	.	.	.	16.7	33.3	.	6.0
	4Y+5Y	100.0	.	.	.	.	.	.	.	.	.	.	2.0
	Adult	88.9	.	11.1	.	.	.	.	.	.	.	.	9.0
All seasons and ages		21.3	10.6	11.1	1.9	0.5	1.4	3.4	4.8	20.8	21.3	2.9	207.0

Table 10.1 Distributions of ringing places for guillemots reported from different recovery regions, based on recoveries reported between 1970 and 1992

Recovery region	Ringing region							Total recoveries
	Sanda and Clyde	Canna	Outer Hebrides, Shiantis and N.Rona	Shetland and Fair Isle	Sutherland, Caithness and N.Sutor	Grampian	Firth of Forth and St. Abbs	
	%	%	%	%	%	%	%	
East Scotland	1.5	15.5	6.5	28.2	29.2	11.5	7.6	582.0
East England	0.4	17.7	4.2	27.8	25.7	14.8	9.3	237.0
Channel	6.8	34.5	6.4	10.4	23.3	9.2	9.2	249.0
Irish Sea	23.0	47.5	3.3	2.5	17.2	3.3	3.3	122.0
West Ireland	9.5	75.2	4.8	4.8	4.8	.	1.0	105.0
North West Scotland	12.6	64.9	7.1	4.6	8.8	0.8	1.3	239.0
Iceland and Faeroes	.	34.9	3.9	32.6	20.9	2.3	5.4	129.0
North Norway	.	3.3	4.4	86.7	2.2	3.3	.	90.0
South Norway	0.5	15.3	4.5	59.7	12.6	4.7	2.6	380.0
Skagerrak and Kattegat	0.2	10.8	3.4	44.9	23.8	10.2	6.7	646.0
South East North Sea	0.5	14.1	3.1	21.9	35.2	13.6	11.5	383.0
Biscay	10.8	69.6	2.5	5.7	7.0	0.6	3.8	158.0
South Europe	.	66.7	13.3	6.7	13.3	.	.	15.0
All regions	3.5	25.8	4.7	30.2	21.4	8.2	6.2	3335.0

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