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The Peregrine Falcon breeding population of the UK & Isle of Man in 2002

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2. Field observations aimed to assess territory occupation at the beginning of the season, to record pairs that might desert after an early failure. Estimates of occupancy of unvisited territories were based on occupancy rates from visited sites in the same region.

3. Peregrines occupied 1,415 of 1,899 visited territories in the UK; an additional 77 unvisited territories were estimated also to contain birds, giving a grand total of 1,492 occupied territories of 2,032 known breeding sites. 420 new territories were documented, including notable expansion in inland England and South Wales. National occupancy of visited territories by non-breeders was between 20% and 27%.

4. The number of breeding pairs increased from 1,283 in 1991 to 1,402, an increase of 9%. The population now stands at 160% of levels estimated in the 1930s.

5. Although most regions experienced increased territory colonisation and rising breeding density, many traditional strongholds in North Scotland became deserted, whilst parts of mid-Scotland also underwent substantial declines in territory occupancy. Additionally, there were signs of a new decline in the numbers of Peregrines in North Wales, whilst Northern Ireland populations also showed a slight decline. However, most areas of England, Southern Scotland, South Wales and the Isle of Man saw increases in Peregrine occupancy.

6. The majority of new territories were either on natural cliffs or in quarries. Other human artefacts, including power stations and pylons, were also used for nesting. There were few new ground or tree nests.

7. The continuing wave of decline from Northwest Scotland through Argyll and central regions of Scotland is of concern, as are the newly detected declines in North Wales and Northern Ireland; research is necessary to ascertain why these traditional breeding grounds are becoming depopulated.

2. INTRODUCTION

This report presents the results of the latest ten-yearly survey of breeding Peregrines (*Falco peregrinus*) in the United Kingdom & Isle of Man, co-ordinated by the BTO and supported by the Countryside Council for Wales, English Nature, the Environment & Heritage Service of the Department of Environment in Northern Ireland, the Joint Nature Conservation Committee, the Royal Society for the Protection of Birds, Scottish Natural Heritage, the Scottish Raptor Study Groups, the Scottish Ornithological Club and The Esmée Fairbairn Charitable Trust.. Peregrine numbers were first formally surveyed in 1961 and further surveys have occurred at ten-yearly intervals. This survey was originally scheduled for 2001; however, owing to the restrictions imposed by the outbreak of Foot and Mouth disease, it was deferred until the breeding season of 2002.

During the 1950s and 1960s, Peregrines suffered a disastrous population crash in the UK. Many traditional breeding territories became deserted, including those in large areas of Southern England and Wales, and only the Scottish Highlands and Islands remained near full strength. The major factors contributing to the decline were identified as secondary poisoning by organochlorine pesticides, leading to direct mortality and depressed breeding success, as well as human interference with nests and adults (Ratcliffe 1993). This crash, coupled with an initial persecution-driven decline during the wartime period 1939-1945, left the Peregrine population at less than half its former size in the UK.

As a combined result of legislative restrictions on the use of organochlorine pesticides, legal protection of the species and determined conservation effort, Peregrine numbers have since shown strong recovery in much of the UK. By 1981, re-colonisation of parts of Northern England, North Wales and Southern Scotland had taken place, although Southern England continued to support few pairs (Ratcliffe 1984). By 1991, breeding density improved further in many regions with the total breeding population climbing to a peak level, some 50% greater than the pre-organochlorine era; however, new declines were evident in the North and West of Scotland (Crick & Ratcliffe 1995).

The 2002 survey aimed to assess the fortunes of breeding Peregrines over the past decade and to provide an accurate estimate of the breeding population. The positive trends evident in 1991 were encouraging, but it is important to monitor the situation regularly so that any trend reversals can be identified. In addition, it was essential to assess whether the Scottish declines in 1991 had continued. Although recent evidence suggests that UK Peregrines have generally recovered their former status, the bird is still 'Amber-listed' as a species of conservation concern, due to an unfavourable European conservation status (Gregory *et al*. 2002); therefore, as the UK harbours approximately 15% of the European total (Greenwood *et al*. in press), it is important for UK conservation organisations and government to receive updated population estimates. At a national and regional level, it is also important to track changes in Peregrine distribution and density because, as top predators, raptors may act as indicators of the quality of the food chain and immediate environment (Ratcliffe 1970; Newton *et al*. 1999; Sibly *et al*. 2000).

The national Peregrine surveys are unique amongst population censuses of birds that are not extremely rare or restricted in range, in that they have attempted to cover all known breeding Peregrine territories within the UK and Isle of Man. In 2002 this attempt included all of those territories known in the 1991 survey, together with those that Peregrines had established since 1991 or where there were prospecting pairs or singletons. However, in parts of Scotland where the remoteness of sites and the limited number of observers prohibits a complete survey, a randomised sample of known eyries was chosen for survey, to ensure a representative and unbiased coverage of those regions.

3. METHODS

To establish occupancy of Peregrine territories, volunteer and professional fieldworkers visited known and suspected Peregrine territories throughout the breeding season. Volunteer survey effort was co-ordinated by Raptor Study Groups and BTO Regional Representatives; professional fieldwork in remote parts of Scotland was co-ordinated by the RSPB. All potentially suitable nesting locations (e.g. cliffs, crags, quarries, tall buildings and their vicinities) were checked for signs of Peregrine occupation where possible, even if the site was previously unknown as a breeding location.

First visits were made early in the breeding season (some as early as February; most (77%) in March or April; Figures 3.1 a; b) so that territory occupancy could be established. Visits tended to be later in Scotland than further South because birds usually nest later there, and weather conditions are often unsuitable for fieldwork earlier in the season (Figure 3.1a). Information was recorded on habitat type (broad classification of immediate environment (e.g. farmland, woodland, human sites, coast), plus similar classification of secondary habitat), nest position and location, altitude and aspect, as well as knowledge of whether the site was newly established since the 1991 survey. Recorders were asked to return to unoccupied sites one month after the first visit, to check for new signs of occupancy. To determine the breeding success of occupied territories, observers were requested to revisit sites in June and record the presence of any fledged young or large young in the nest. Visits to nests were carried out under Schedule 1 license. An optional intermediate visit in May was also desirable, to measure clutch sizes. Many observers were able to make further visits to territories. Where possible, causes of nest failure were documented, including assumed or actual instances of interference and persecution.

In most cases, incomplete records were treated parsimoniously when processing and analysing data forms, so that breeding and nesting successes were only reported where they were confirmed. Where sites were not monitored completely, the last observation was taken as final, so that neither breeding nor nesting successes were ever assumed without proof. However, there were several ambiguous records of territory occupation. In some instances it could not be ascertained whether occupants were singletons or pairs, and in others it was unclear whether pairs had nested. Consequently, upper and lower estimates of non-breeding territories were calculated. Lower estimates treated all ambiguous pairs as confirmed pairs, and all possible breeders as confirmed breeders. Upper estimates treated all unconfirmed pairs as single non-breeders, and all unconfirmed nesting pairs as non-breeding pairs. Therefore the ‘true’ proportion of non-breeders lies somewhere between these estimates.

During analysis, territories visited were matched to historical sites where possible. Visual inspection of site locations, plotted using ArcView GIS, facilitated site matching. If a new site was within 2 km of a known site that was not recorded as visited, they were assumed to be alternative sites within one territory. Alternate sites were often noted on survey forms; however in some cases two sites recorded separately in 2002 were clearly historic alternates and were treated as such, with the exception of those historic territories that had at sometime supported more than one pair of breeding Peregrines simultaneously. These sites were recorded as ‘former doubles’. New territories were treated separately in the analysis if breeding had never been proved on the site. Where birds were present during 2002, such territories were recorded as ‘potential future sites’ and are regarded as prospecting birds. All sites on outlying islands were treated as coastal sites, as were those mainland sites within 1.5 km of the coast, except where observers classified them as ‘inland’ on the basis of the likely hunting range of the pairs concerned. This applied to only a few sites, typically in coastal towns and cities, or where nests were close to river estuaries.

Although the survey aimed to encompass all breeding Peregrine territories, some were not visited in various parts of the UK. To calculate numbers of territories occupied in these regions, the number of unvisited sites was multiplied by the occupancy rate of visited territories within the regions. This provided an estimate of the total number of territories occupied. Similarly, an estimated quantity of notional 'Ratcliffe' pairs was calculated in the analysis of pair numbers, following the methods used in previous surveys (Ratcliffe 1963; 1972; 1984; Crick & Ratcliffe 1995). Using this procedure, the total number of occupied territories (including those estimated from unvisited territories) was adjusted to allow for the presence of singletons. Subtracting half the number of single birds from the grand total produced an approximation of pair numbers. This method makes the assumption that in 50% of sites where singletons only were observed, birds were actually part of a pair. Maximum estimates of single birds have been used in this calculation, although minimum figures do not vary sufficiently to suggest that results would differ substantially if used.

For comparison with previous surveys, and to examine geographical differences, the UK was divided into regions. Many of these regions correspond to the 'Ratcliffe regions' used in previous surveys (e.g. Crick & Ratcliffe 1995), often with division between coastal and inland sites. Wales, for instance, was divided horizontally along the road from Shrewsbury through Newtown to Machynlleth, and Northern Ireland was considered as one region. Southeast England included the Isle of Wight, Kent and Sussex, plus new territories in Hampshire. All other English regions were broadly the same as Crick & Ratcliffe (1995), with the exception of one new region named Central East England, where no breeding Peregrines had been recorded previously (Table 3.1; Figure 3.2).

Changes were introduced to regional analysis in Scotland, to correspond to Scottish Raptor Study Group (RSG) regions, and the 1991 data were reanalysed to fit these new areas. It should be noted that some minor differences exist between figures reported here for 1991 and those appearing in Crick & Ratcliffe (1995). These have arisen as a result of new information received, and the need to ensure consistency of approach between the two surveys. The ten regions analysed were: Shetland; Orkney; Western Isles (incorporating Uist RSG and Lewis & Harris RSG); Highland; Northeast Scotland; Tayside (incorporating Angus & Fife); Central; Argyll (incorporating Islay & Jura); South Strathclyde; Dumfries & Galloway; and Lothian & Borders (Table 3.1; Figure 3.2).

To compare with previous surveys, these regions of England, Scotland and Wales were combined to match those in Ratcliffe (1984). This allowed direct comparison between the latest survey and populations in the 1930s.

4. RESULTS

4.1 National changes

The population of Peregrines in the UK has continued to increase since 1991, albeit at a slower rate than that shown between 1981 and 1991. The pattern of increase includes the completion of recovery to pre-1939 levels in previously deserted territories in Southeast England, and expansion into completely new lowland areas (Figure 4.1). However, such increases have been partly offset by continuing declines in North and West Scotland.

Overall, 2,032 Peregrine territories are now known across the United Kingdom and Isle of Man, of which nearly 50% are in Scotland (Table 4.1.1i, 4.1.1ii). Breeding birds occupied 1,415 of these territories and a further 77 occupied territories were estimated to exist across the UK, providing a grand total of 1,492 occupied breeding territories (Table 4.1.1i). This represents a national increase of 13% over the 1991 figure (Table 4.1.2i). 1,899 of all known territories were visited, giving coverage of 93%. The biggest gaps in coverage were in inaccessible areas of the Scottish Highlands and inland Northern Ireland. However, more territories were visited in 2002 than in previous surveys in all regions, except Northeast England and the Highlands.

When numbers of 'Ratcliffe pairs' (see methods) were compared between years, the total of 1,402 pairs is at 160% of pre-1939 levels. Numbers of pairs have increased further from 1991, the population standing at 109% of the previous census (Table 4.1.2i; Table 4.1.3i). However, although UK-wide trends are encouraging, there are distinct differences between national trends.

Occupancy rates in England and the Isle of Man have increased from 87% in 1991 to 89% (Tables 4.1.1ii, 4.1.2ii), continuing the pattern of increase found in the previous survey (Crick & Ratcliffe 1995). The combined total of breeding pairs for England and the Isle of Man now represents 285% of the pre-1939 level; this increase is mainly due to the inland population increase, as pair numbers now stand at 644% of that estimated for 1930-39 (Table 4.1.3ii).

Wales revealed a similar pattern to England and the Isle of Man, featuring a large inland population increase to swell numbers to 208% of those recorded during 1930-39 (Table 4.1.3ii). A 10% increase in the number of occupied territories over the 1991 figure is positive, although the occupation rate of visited eyries was down by the same figure (Table 4.1.2ii). This negative trend is compounded by estimates of territories held by non-breeding birds, which exceed the UK maximum and minimum estimates (Table 4.1.1ii).

Moderate declines characterised the Northern Irish population, both on coasts and inland. Current estimates put the breeding population in Northern Ireland at 91 % of that recorded in 1991, although this is still in excess of the historical 1930-39 level (Table 4.1.3ii). Although the numbers of known territories increased, the proportion occupied dropped from 88% to 70%. As in Wales, more non-breeding pairs and singles held territories than was recorded for the UK as a whole (Table 4.1.1ii).

Finally, the recent negative trends witnessed in Scotland (Crick & Ratcliffe 1995) prevailed. Only 61% of visited territories were held by breeders (Table 4.1.1ii) and as many as a quarter of these were estimated occupied by non-breeding birds. Although 132 more sites were visited than in 1991, 50 less were found occupied (Table 4.1.2ii). Scotland is unusual in that the coastal population is the only national population to fall below pre-1939 estimates (Table 4.1.3ii). The Scottish population as a whole now stands at 106% of this historical figure, whereas in 1991 it stood at 122% (Table 4.1.3ii).

Although these national trends can be instructive, closer analysis reveals subtle differences even at an intra-national level.

4.2 Regional changes

Sections are numbered to correspond to regions described in Figure 3.2 and Table 3.1. Regional trends are outlined in Tables 4.1.1.i, 4.1.2i and 4.1.3i.

4.2.1 Southeast England

In common with much of England, large-scale inland territory expansion occurred. Twelve new inland sites were visited, all of which were occupied, mostly by breeding pairs. Peregrines bred in parts of Hampshire, which supported no territories in 1991, and also colonised areas of Sussex. The majority of coastal sites visited were occupied, and more marine territories were reported than in 1991. Re-colonisation of the Sussex and Kent coasts was incomplete in 1991, but the present number of pairs corresponds to 109% of the pre-1939 total.

4.2.2 Southwest England

The majority of territories visited along the coasts of Cornwall, Devon, Dorset and Somerset were occupied by Peregrines, as was the case in 1991, although a marked increase in numbers of territories, particularly of inland sites, was noted in 2002. A 279% increase in known inland territories was recorded over the 1991 total, with nearly all visited territories in occupation. Most of these sites were quarries, both working and disused, sustaining the increase noted in 1991.

4.2.3, 4.2.4 North & South Wales

Prominent differences were observed between North and South Wales. In the South, more territories were occupied both coastally and inland than in 1991. In North Wales, the coastal population remained stable, but the number of breeding pairs at inland sites had dropped, resulting in a 15% decline in territory occupancy from 1991. Numbers of non-breeding birds were also particularly high in North Wales. The decline in this area is counterbalanced by the increases in the South, leaving the inland Welsh population at about the same level as in 1991 and still in a stronger position than in the pre-1939 era.

4.2.5 West Midlands & Lancashire Lowlands

Unknown as a breeding region before 1961, this area now harbours increasing numbers of Peregrines. The majority (96%) of visited sites were occupied in 2002, and known territories rose 240% from 1991 to 51. Population expansion has largely occurred in quarries and other man-made structures, especially in the Welsh border counties. A pair of Peregrines also utilised a tree nest in this area.

4.2.6-4.2.11 Northern England & Isle of Man

As with the rest of England, territory numbers increased in both coastal and interior areas, especially in the Pennines. The number of pairs also increased further: 55% more than in 1991 on the Northwest coast and rising appreciably inland. More occupied territories now exist in coastal Northwest England and the Isle of Man than in 1991, although the equivalent inland region saw a slight decline in occupancy. However, this pattern in the Lakes is more than compensated by major increases in territory occupancy throughout the Pennines and Cheviots.

The 1991 survey highlighted the apparent inertia of the Peregrine population on the coast of Northeast England and the North York Moors. This pattern prevailed in 2002; only one new territory was visited and there remain only four known breeding sites in inland Northeast England, possibly due to persecution.

4.2.12 Central Eastern England

Following the pattern of inland expansion in Southern England, nine new sites were described in central Eastern England. All of these nest locations were on human artefacts, typically quarries or tall buildings, and were often in urbanised areas including Greater London. These areas have never historically supported breeding Peregrines.

4.2.13, 4.2.14 Southwest Scotland

In contrast to much of Northern Scotland, Peregrines in South Strathclyde and Dumfries & Galloway showed continued expansion. Twenty-five new territories were found inland, and occupancy rates were high in all areas apart from inland South Strathclyde. Non-breeding territories were comparatively rare, and abundance on coasts and internally was higher than recorded before.

4.2.15 Southeast Scotland

Lothian & Borders showed similar success to Southwest Scotland, with 18 new territories and occupancy at 100% on the coast and 76% inland. Although non-breeders typically held over a fifth of haunts, pair numbers for South Scotland were again greater than both 1991 and pre-1939 totals.

4.2.16, 4.2.17 Tayside & Central

Four territories are now known on the Tayside coast, all of which were occupied. Inland Tayside and Central regions showed little change in the numbers of territories occupied from 1991, although an 8% decline in Central region might be related to declines in the Highlands and Argyll. Occupation by non-breeders was in excess of the UK average for Tayside, and about average in Central region. Direct comparison of pair numbers with past records is problematic due to a lack of detailed location information for 2002; however, inland Northern and central Scotland (including Argyll, below) show Peregrine abundance on a par with pre-1939 levels, although at 77% of the 1991 total.

4.2.18 Argyll

Despite the existence of some new breeding territories, Argyll also demonstrated substantial declines in the number of occupied territories since 1991. Estimates of occupied territories were down 32% coastally and 25% inland. Compounding the problem, maxima of 40% and 32% of these coastal and inland locations were held by non-breeding birds respectively. Nonetheless, the coastal population is roughly equivalent to that of 1930-39.

4.2.19 Scottish Highlands

The 1991 survey revealed that the regional population had declined since 1981, in contrast to other parts of the UK, and this trend has continued to 2002. Less than half of coastal and inland sites visited were occupied, by far the lowest proportions recorded, and well below the 1991 levels. Furthermore, non-breeding birds held many occupied territories, and only one new territory was

discovered. Inland pair totals are difficult to compare with historical data, as classification of regions has fluctuated. However, the coastal population (inclusive of Shetland, Orkney and the Western Isles) is now only 45% of that in the 1930s.

4.2.20 Northeast Scotland

Traditionally a stronghold of Peregrines, additional territories were reported for both inland and coastal areas. The number of occupied eyries on the coast was 42% greater than in 1991, with most pairs nesting. However, inland territory occupancy decreased by 18% from 1991, despite an increase in the number of known territories. Detailed information was not provided for this region; therefore it is difficult to assess where new territories appear or why historical territories should have become deserted.

4.2.21-4.2.23 Shetland, Orkney & Western Isles

The Peregrine population of Shetland was thought to consist of around 30 pairs until the 1960s (Ratcliffe 1993). Since undergoing fluctuations and ultimately collapse (Crick & Ratcliffe 1995), the population has failed to re-establish itself, with the resulting absence of any birds at all. The Orkney population fared better, with just over three quarters of territories occupied; however, non-breeding birds held more than half (56%) of these haunts, compared with a maximum of 38% in 1991. A moderate increase in breeding territories was found in the Western Isles, which is encouraging.

4.2.24 Northern Ireland

Although the total number of known territories increased in Northern Ireland, there was a slight fall (6%) in the numbers of territories occupied between 1991 and 2002. In addition, non-breeders held many more of these occupied territories in this survey. Although the number of pairs fell between 1991 and 2002 (by approximately 10%), the number on coastal sites is approximately the same as that estimated for 1930-39, and the number inland is still twice the estimate from the same period. Overall, there are more pairs in Northern Ireland than in the 1930s, with expansion into inland sites following the pattern shown in much of the rest of the UK.

4.3 Persecution

Despite special protection under the Wildlife and Countryside Act (1981), instances of persecution of Peregrines persisted. Intentional disturbance of Peregrine nests was likely at 40 territories, with a further 55 suspected cases. Records of persecution ranged from removal of chicks and eggs to poisoning of adults. Across the UK and Isle of Man, 78 suspected incidences involved robbery or destruction of chicks or eggs; 17 cases concerned the apparent or actual disappearance, destruction or attempted poisoning of adult birds (Table 4.3.1ii). Levels of interference were highest in Northern England, South Wales and Southern Scotland (Table 4.3.1i).

4.4 Non-breeders

Owing to the ambiguous nature of some breeding records, the proportion of occupied territories held by non-breeding pairs or singletons lies between 27% and 20%. This compares with 14% non-breeding territories in 1991. Although the minimum number of non-breeding pairs is similar to the 1991 figure, non-breeding singletons are more than three times more prevalent in 2002. It may be significant that the greatest numbers of non-breeding territories are found in those areas where occupancy appears to be declining: Highland, Orkney, Argyll and inland North Wales (Table 4.1.1i; 4.1.1ii).

4.5 New breeding territories

Numerous new territories appeared in the types of site traditionally associated with Peregrines: natural cliff faces, crags, and other rocky outcrops. Thus, 180 new territories were established on natural rock faces (Table 4.5.1i). In England and Wales, quarries were frequently occupied by Peregrines, continuing the pattern of recent years (Table 4.5.1ii). In Southwest England alone, 46 quarries newly held Peregrines, and across the UK 171 new quarry territories were recorded. Peregrines were often prepared to tolerate high disturbance in quarries, occasionally nesting on working faces.

Other human sites were also used for nesting, providing a national figure of 48 new territories, including power stations, pylons, bridges, churches and even tower blocks. One pair has bred for five years next to operating industrial machinery, and several nest in the centre of urban conurbations, underlining the high level of tolerance to disturbance. Nesting in human sites is a prominent feature of the post-1981 increase, and 62 UK territories are now held on man-made structures (excluding quarries). Another notable change in the last two decades has been the prevalence of ground (or 'walk-in') nests; 36 nests of this type are now known across the UK.

Additionally, 27 of the new territories were formerly sites held as alternatives within a territory held by one pair (Table 4.5.1i). These 'former doubles' are indicative of rising breeding density, as pairs seek to claim parts of territories from other birds in the absence of new nesting sites. The presence of two tree nests (in old Raven nests) is very unusual in the UK, although not so in parts of Eastern Europe (e.g. Kleinstäuber & Kirmse 1988; Langgemach *et al*. 1997).

4.6 Potential future breeding territories

In addition to the new territories reported, a further 72 novel sites were found to contain non-breeding single birds or pairs. These birds were considered to be 'prospecting', and territories may become full breeding sites in future. Twenty-five singletons and 47 pairs were witnessed in such locations (Table 4.6.1i). Wales held particularly large numbers of this type of site (Table 4.6.1ii), as did those areas undergoing expansion (Central Eastern England, inland Southwest England West Midlands and Lothian & Borders).

5. DISCUSSION

The current number of Peregrines holding territories in the UK is unprecedented. 1,492 territories were estimated as occupied; this represents an increase of 13% from 1991 and is nearly double the number occupied in 1981. Although the rate of expansion has decreased compared to 1991, the current population level of 1,402 notional pairs represents a major success for the Peregrine, with national numbers now far in excess of pre-1939 totals (160%). Although the pre-1939 numbers are used as a pre-organochlorine pesticide era standard, it should be noted that the population would have been subject to varying forms of persecution, and therefore was already depressed to an unknown extent.

Conservation efforts and control of persecution are major factors in the continuing recovery of the Peregrine, although the behavioural adaptability in choice of nest sites is also important. Peregrines now nest in urban areas and active industrial zones, where populations of prey species such as Feral Pigeon *Columba livia* are likely to be high. The spread of nesting into inland Central England highlights both the recent success and flexibility of Peregrines. In inland Southern England as a whole, breeding pairs have risen from four in the 1930s to 93 in 2002, and are nearly five times as numerous as in 1991.

Along with expansion, re-colonisation of historical sites is also a feature of the 2002 survey. By 1991, Peregrines had not yet recovered in Southeast England; local numbers are now unprecedented. Twenty-five coastal sites were occupied in 2002, increasing from six in the previous survey.

It should be noted that some regions displayed rising numbers of new territories but overall decreases in the proportion of territories occupied, and these regions tend to be in areas historically associated with persecution (Pennines, inland Northeast Scotland, inland Tayside, inland Lothian & Borders, inland Northern Ireland, inland South Wales; Crick & Ratcliffe 1995). One possibility is that local population movement is occurring, driven by human interference, so that traditional eyries become deserted and new sites are chosen as replacements. Alternatively, new breeders may be irregularly using such recently established territories; there are some records of Peregrines nesting in new haunts in the mid-1990s, but not in 2002.

Although the overall picture is positive, there are disturbing trends in some regions, particularly Northern Scotland. Populations in the Highlands and Argyll are declining, and Peregrines are now completely absent in Shetland. Furthermore, non-breeders hold over half of the occupied territories on Orkney and the coastal Highlands. This follows a decline recorded between 1991 and 1981; traditional explanations for this trend focus on food shortage (Ratcliffe 1972; 1984), marine pollution (Newton *et al.* 1989) and the influence of Fulmars *Fulmarus glacialis* (Crick & Ratcliffe 1995). The decline in inland Northeast Scotland has been ascribed to persecution, particularly associated with grouse moors (Hardey *et al*., in press). The lowland population of Southern Scotland is flourishing in contrast, which may derive from population expansion in Northern England, or might be evidence for dispersal away from Northern Scotland.

The decline in breeding pairs in North Wales is a new phenomenon that may be linked to declines in the prey base; substantial declines have been measured in upland and moorland birds over the last decade (Lovegrove *et al*.1995). It is possible that changes in the behaviour of pigeon racers may be having an additional effect. In Cumbria, casual observations suggest that there has been a decline in the numbers of racing pigeons and a change in the timing of races, with the race season appearing to start later in the Peregrine breeding season than in previous years (G. Horne, pers. comm.). Changes in the routing and timing of pigeon training and races, as a means of mitigating the effect

of Peregrine predation, were suggested in the report of the UK Raptor Working Group (Anon. 2000). The potential causes for decline in the population in Northern Ireland are unclear, but could be associated with similar factors.

In conclusion, the UK Peregrine population has continued to increase, but is showing signs of levelling off. The overall increases witnessed since 1981 are likely due to both an increase in rising breeding density, and perhaps more fundamentally, a rapidly expanding UK distribution. Range changes are underlined by the appearance of breeding Peregrines in English counties where they have been traditionally absent. It is possible that UK Peregrines may shift to a more Southerly distribution; for instance, the widespread colonisation of Southern Britain is tempered by the vacation of traditional haunts in Northern and Western Scotland, and to a lesser extent central Scotland, North Wales and Northern Ireland. The declines in Northwest Scotland are serious and appear to be spreading South and Eastwards, and certainly warrant urgent research into their causes, as do those declines in North Wales and Northern Ireland.

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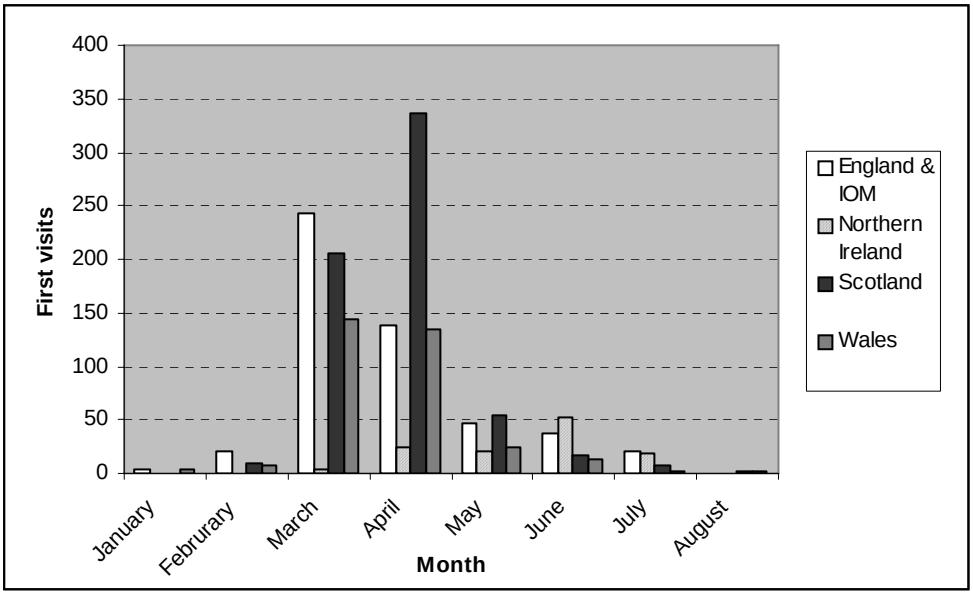
Table 3.1 Regions used for analysis, mirroring regions used in Crick & Ratcliffe (1995), except in Scotland where Raptor Study Group regions were used. Region numbers refer to those illustrated in Figure 3.2.

	Region	Counties/regions included	Notes
1	Southeast England	Hampshire, Isle of Wight, Kent, Sussex	Divided into coastal and inland
2	Southwest England	Avon, Cornwall, Devon, Dorset, Gloucestershire, Somerset, Wiltshire	Divided into coastal and inland
3	South Wales	Gwent, Glamorgan, Dyfed, Powys (South of the road from Shrewsbury through Newtown to Machynlleth)	Divided into coastal and inland
4	North Wales	Powys (North of the road from Shrewsbury through Newtown to Machynlleth), Gwynedd, Clwyd	Divided into coastal and inland
5	West Midlands & Lancs. lowlands	Cheshire (West of M6), Greater Manchester (West of M61, M56 and connecting motorways), Hereford & Worcester, Lancashire lowlands (West of M6; M61), Merseyside, Shropshire, Staffordshire, West Midlands, Warwickshire	Lowlands defined as all land <200m above sea level; all inland
6	Northwest England coastal	Cumbria, Isle of Man, Lancashire, Merseyside	
7	Northwest England inland	Lake District	Cumbria, West of M6 and South of A69
8	Pennines	All of Derbyshire, South Yorkshire, West Yorkshire; Cheshire (East of M6), Cumbria (East of M6, South of A69); parts of Durham, Northumberland and North Yorkshire (South of A69, West of line from Corbridge-Richmond and A1 Richmond-West Yorks. border, just North of Tadcaster); Greater Manchester (East of M61, M56 and connecting motorways), Lancashire (East of M6, M61)	All inland
9	Cheviots	Parts of Northumberland and Cumbria	East of River Liddel and South of Jed Water and River Tweed; all inland
10	Northeast England coastal	All Northeast coast from Flamborough Head to Holy Island	All coastal
11	Northeast England inland	North York Moors	All inland
12	Central East England	Bedfordshire, Berkshire, Buckinghamshire, Greater London, Leicestershire, Lincolnshire, Northamptonshire, Nottinghamshire, Oxfordshire, Surrey	All inland
13	Dumfries & Galloway	Dumfries & Galloway region	Divided into coastal and inland
14	South Strathclyde	Ground West of M74, including Arran and the Cumbraes	Divided into coastal and inland
15	Lothian & Borders	Lothian & Borders region, plus Strathclyde East of M74	Divided into coastal and inland
16	Central	Central region	All inland
17	Tayside	Tayside region	Divided into coastal and inland
18	Argyll	Argyllshire including Bute, Coll, Tiree and Mull, but not Ardnamurchan and Morven	Divided into coastal and inland
19	Highland	Highland region, Moray West of Spey, Ardnamurchan and Morven	Divided into coastal and inland
20	Northeast Scotland	Grampian region, Moray East of Spey	Divided into coastal and inland
21	Western Isles	Harris, Lewis, Barra and the Uists	All coastal
22	Orkney	Orkney islands	All coastal
23	Shetland	Shetland islands	All coastal
24	Northern Ireland		Divided into coastal and inland

Figure 3.1

(a)



(b)

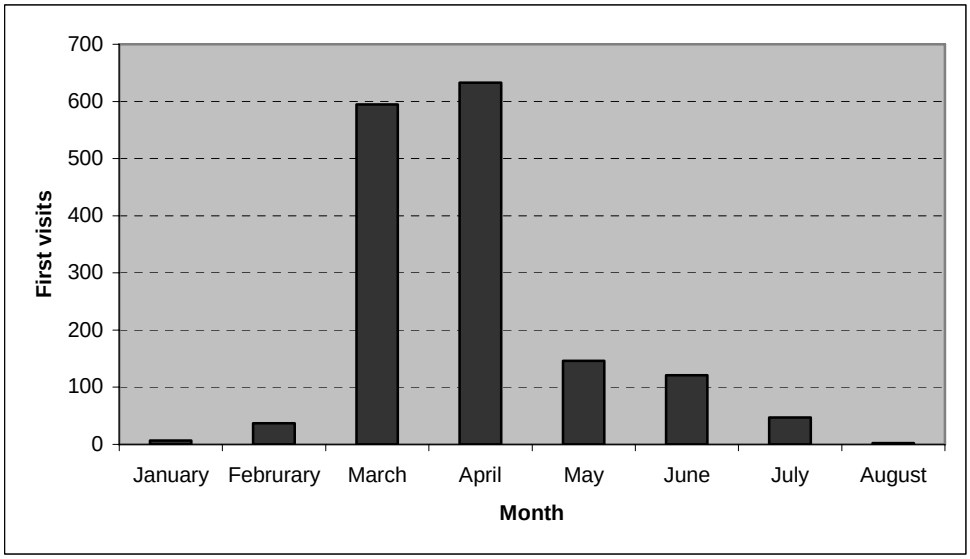


Figure 3.1 Month in which first visits to territories were recorded. Histograms show visits by country (a) and for the whole of the UK & Isle of Man (b). No data received for Dumfries & Galloway, Northeast Scotland or South Strathclyde.

Figure 3.2

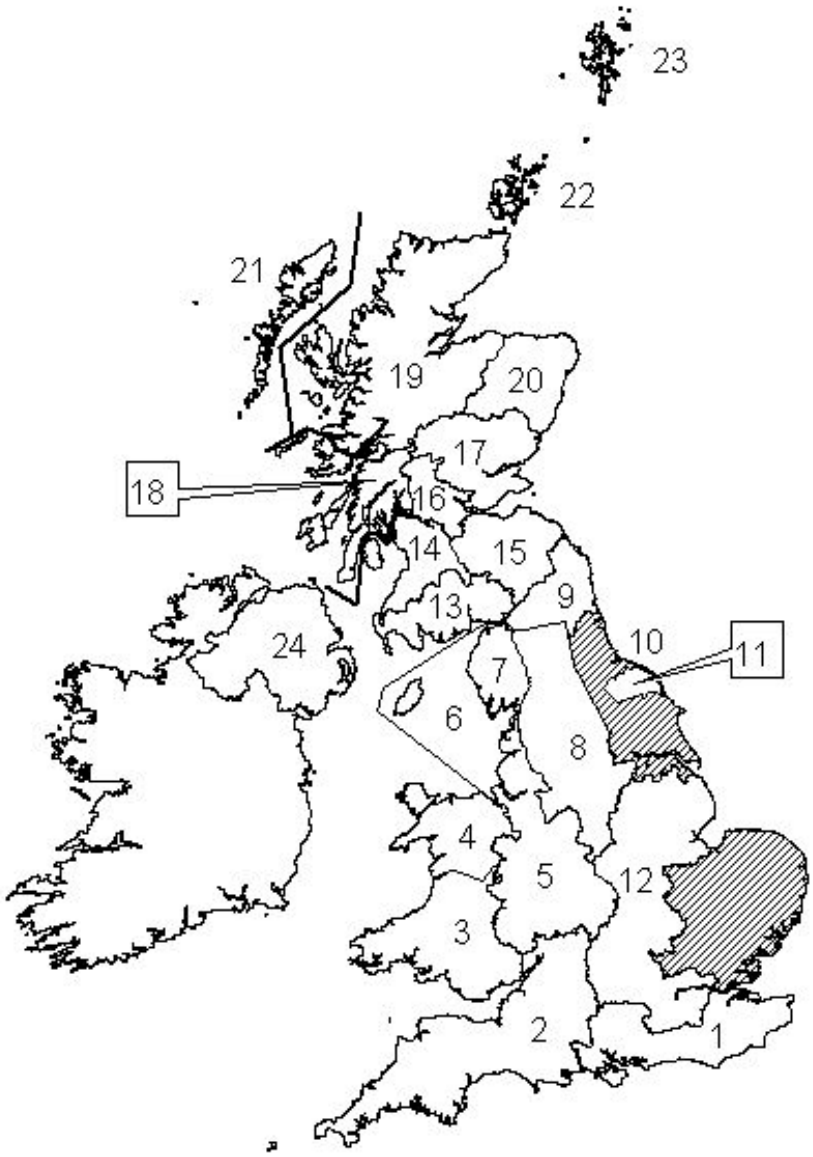


Figure 3.2 Map of UK showing regions for analysis. See Table 3.1 for further information. 1- Southeast England. 2- Southwest England. 3- South Wales. 4- North Wales. 5- West Midlands & Lancashire lowlands. 6- Northwest England coast & Isle of Man. 7- Northwest England inland. 8- Pennines. 9- Cheviots. 10- Northeast England coast. 11- Northeast England inland (North York Moors). 12- Central Eastern England. 13- Dumfries & Galloway. 14- South Strathclyde. 15- Lothian & Borders. 16- Central Region. 17- Tayside Region. 18- Argyll. 19- Highland Region. 20- Northeast Scotland. 21- Western Isles. 22- Orkneys. 23- Shetlands. 24- Northern Ireland. Hatched areas- regions lacking breeding Peregrines and thus not surveyed.

Figure 4.1

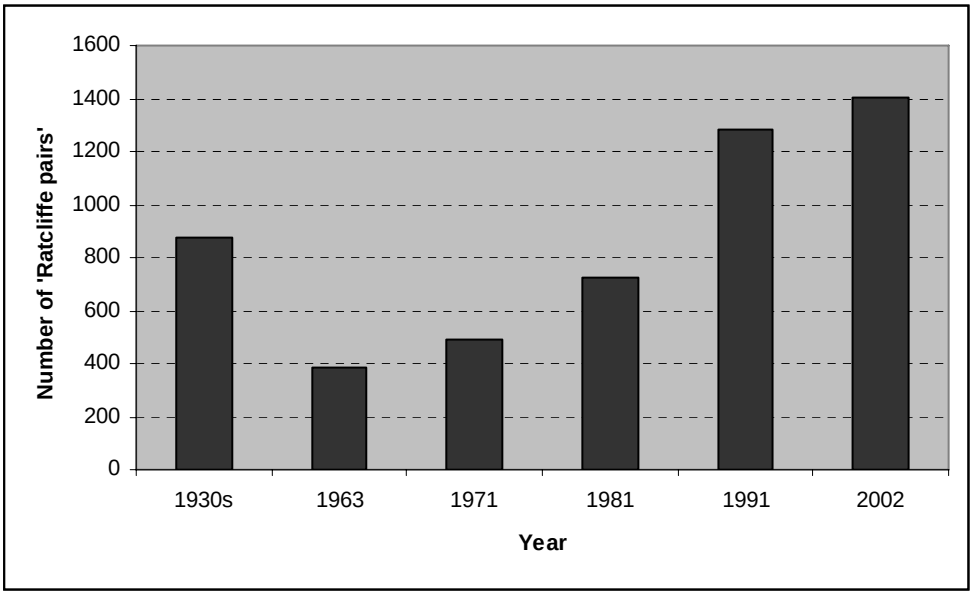


Figure 4.1 Estimated number of 'Ratcliffe pairs' breeding in the UK and Isle of Man from the 1930s to 2002. For calculation of 'Ratcliffe pairs', see Methods section.

Table 4.1.1i Peregrine territory occupancy 2002. Regions defined in Table 3.1. Column 1: 'Number of known territories' includes all areas where Peregrines have been known to nest. Column 4: 'Estimated extras' are determined by the equation (column 1-column2) x (column5/100) and represent predictions of occupancy in unvisited territories. Columns 8, 11: 'Prop. Terr. occupied by non-breeders' refers to the proportion of occupied territories occupied by non-breeders only. See methods for estimation of pair numbers.

Region	1Total no. territories known 2002	2 No. visited	3 No. occupied	4 Estimated extras	5 Prop. occupied (%)	6 No. of single birds on territory (max)	7 No. of non-breeding pairs (max)	8 Prop. terr. occupied by non-breeders (%) (max)	9 No. of single birds on territory (min)	10 No. of non-breeding pairs (min)	11 Prop. terr. occupied by non-breeders (%) (min)
SE England: coastal	33	33	25	0	76%	0	3	12%	0	2	8%
SE England: inland	14	14	14	0	100%	1	1	14%	0	0	0%
SW England: coastal	134	129	123	5	95%	5	28	27%	5	13	15%
SW England: inland	72	72	71	0	99%	2	10	17%	2	6	11%
South Wales: coastal	74	74	67	0	91%	7	10	25%	6	5	16%
South Wales: inland	123	123	105	0	85%	7	18	24%	7	9	15%
North Wales: coastal	26	26	23	0	88%	6	5	48%	6	0	26%
North Wales: inland	125	125	93	0	74%	26	15	44%	24	8	34%
W Midlands & Lancs lowlands	51	46	44	5	96%	3	6	20%	3	2	11%
NW England: coastal	34	34	29	0	85%	1	6	24%	1	3	14%
NW England: inland	93	89	74	3	83%	7	10	23%	7	7	19%
Pennines	105	105	84	0	80%	4	9	15%	4	4	10%
Cheviots	27	27	23	0	85%	0	3	13%	0	2	9%
NE England: coastal	8	4	3	3	75%	0	0	0%	0	0	0%
NE England: inland	4	2	2	2	100%	0	0	0%	0	0	0%
Central East England	9	9	9	0	100%	0	2	22%	0	2	22%
Shetland	30	30	0	0	0%	0	0	0%	0	0	0%
Orkney	33	32	25	1	78%	12	2	56%	12	2	56%
Western Isles	33	28	17	3	61%	4	0	24%	4	0	24%
Highlands: coastal	91	66	30	11	45%	17	2	63%	14	0	47%
Highlands: inland	165	109	52	27	48%	15	6	40%	15	4	37%
NE Scotland: coastal	18	18	17	0	94%	0	2	12%	0	0	0%
NE Scotland: inland	60	60	42	0	70%	3	2	12%	3	0	7%

Region	1Total no. territories known 2002	2 No. visited	3 No. occupied	4 Estimated extras	5 Prop. occupied (%)	6 No. of single birds on territory (max)	7 No. of non-breeding pairs (max)	8 Prop. terr. occupied by non-breeders (%) (max)	9 No. of single birds on territory (min)	10 No. of non-breeding pairs (min)	11 Prop. terr. occupied by non-breeders (%) (min)
Tayside: coastal	4	4	4	0	100%	0	1	17%	0	1	17%
Tayside: inland	135	134	93	1	69%	14	14	30%	14	10	26%
Central	52	52	37	0	71%	4	6	27%	4	4	22%
Argyll: coastal	73	71	42	1	59%	10	7	40%	9	6	36%
Argyll: inland	54	45	25	5	56%	6	2	32%	6	1	28%
South Strathclyde: coastal	16	16	13	0	81%	1	4	38%	1	0	8%
South Strathclyde: inland	40	39	20	1	51%	2	2	20%	2	0	10%
Dumfries & Galloway: coastal	31	31	26	0	84%	1	0	4%	1	0	4%
Dumfries & Galloway: inland	73	73	52	0	71%	3	0	6%	3	0	6%
Lothian & Borders: coastal	10	10	10	0	100%	1	1	20%	1	1	20%
Lothian & Borders: inland	49	49	37	0	76%	6	4	27%	5	4	24%
Northern Ireland: coastal	33	33	23	0	70%	1	9	43%	1	4	22%
Northern Ireland: inland	100	87	61	9	70%	11	13	39%	11	9	33%
UK TOTAL	**2032**	**1899**	**1415**	**77**	**75%**	**180**	**203**	**27%**	**171**	**109**	**20%**
			= 1492 or 1402 'pairs'								

Table 4.1.1ii Peregrine occupancy in 2002 at a national level. See Table 4.1.1ii for explanations of column titles. IOM= Isle of Man.

Region	1Total no. territories known 2002	2 No. visited	3 No. occupied	4 Estimated extras	5 Prop. occupied (%)	6 No. of single birds on territory (max)	7 No. of non-breeding pairs (max)	8 Prop. terr. occupied by non-breeders (%) (max)	9 No. of single birds on territory (min)	10 No. of non-breeding pairs (min)	11 Prop. terr. occupied by non-breeders (%) (min)
England & IOM: coast	209	200	180	8	90%	6	37	24%	6	18	13%
England: inland	375	364	321	10	88%	17	41	18%	16	23	12%
ENGLAND & IOM	**584**	**564**	**501**	**18**	**89%**	**23**	**78**	**20%**	**22**	**41**	**13%**
Wales: coast	100	100	90	0	90%	13	15	31%	12	5	19%
Wales: inland	248	248	198	0	80%	33	33	33%	31	17	24%
WALES	**348**	**348**	**288**	**0**	**83%**	**46**	**48**	**33%**	**43**	**22**	**23%**
Scotland: coast	339	306	184	16	59%	46	19	35%	42	10	28%
Scotland: inland	628	561	358	34	62%	53	36	25%	52	23	21%
SCOTLAND	**967**	**867**	**542**	**50**	**61%**	**99**	**55**	**28%**	**94**	**33**	**23%**
Northern Ireland: coast	33	33	23	0	70%	1	9	43%	1	4	22%
Northern Ireland: inland	100	87	61	9	70%	11	13	39%	11	9	33%
NORTHERN IRELAND	**133**	**120**	**84**	**9**	**70%**	**12**	**22**	**40%**	**12**	**13**	**30%**
UK & IOM TOTAL	**2032**	**1899**	**1415**	**77**	**75%**	**180**	**203**	**27%**	**171**	**109**	**20%**

=1492 or 1402 'pairs'

Table 4.1.2i Peregrine populations in 2002 and 1991. 'Increase in known territories' refers to change from 1991 to 2002. 'Estimated no. occupied' is the number of territories observed to be occupied plus additional estimated extras. 'Prop. Occupied' refers to the number of territories observed to be occupied plus additional estimated extras, divided by the total number of known territories (col. 8/col. 1 and col. 9/col. 2). 'Change in estimated no. occupied' is between 1991 and 2002. 1991 totals may not correspond exactly to Crick & Ratcliffe (1995) due to re-analysis. Regional differences of up to 2% from Table 4.1.1.i are because Table 4.1.2i is based on observed + expected occupation.

Region	1 Total no. territories known 1991	2 Total no. territories known 2002	3 Increase in known territories	4 % Change in no territories	5 No. visited 1991	6 No. visited 2002	7 Change in no. visited	8 Estimated no. occupied 1991	9 Estimated no. occupied 2002	10 Change in estimated no. occupied	11 Prop. occupied 1991 (%)	12 Prop. occupied (%) 2002
SE England: coastal	26	33	7	27%	27	33	6	6	25	317%	23%	76%
SE England: inland	2	14	12	600%	2	14	12	0	14	100%	0%	100%
SW England: coastal	106	134	28	26%	100	129	29	96	128	33%	91%	96%
SW England: inland	19	72	53	279%	19	72	53	19	71	274%	100%	99%
South Wales: coastal	63	74	11	17%	63	74	11	52	67	29%	83%	91%
South Wales: inland	82	123	41	50%	82	123	41	78	105	35%	95%	85%
North Wales: coastal	25	26	1	4%	24	26	2	23	23	0%	92%	88%
North Wales: inland	112	125	13	12%	111	125	14	110	93	-15%	98%	74%
W Midlands & Lancs lowlands	15	51	36	240%	15	46	31	15	49	227%	100%	96%
NW England: coastal	22	34	12	55%	22	34	12	20	29	45%	91%	85%
NW England: inland	83	93	10	12%	83	89	6	81	77	-5%	98%	83%
Pennines	57	105	48	84%	51	105	54	51	84	65%	89%	80%
Cheviots	16	27	11	69%	14	27	13	13	23	77%	81%	85%
NE England: coastal	7	8	1	14%	7	4	-3	3	6	100%	43%	75%
NE England: inland	3	4	1	33%	3	2	-1	1	4	300%	33%	100%
Central East England	0	9	9	-	-	9	9	0	9	-	-	100%
Shetland	30	30	0	0%	30	30	0	5	0	-100%	17%	0%
Orkney	32	33	1	3%	32	32	0	22	26	18%	69%	79%
Western Isles	29	33	4	14%	14	28	14	12	20	67%	41%	61%
Highlands: coastal	91	91	0	0%	62	66	4	54	41	-24%	59%	45%
Highlands: inland	164	165	1	1%	125	109	-16	120	79	-34%	73%	48%
NE Scotland: coastal	13	18	5	38%	13	18	5	12	17	42%	92%	94%
NE Scotland: inland	51	60	9	18%	51	60	9	51	42	-18%	100%	70%

Region	1 Total no. territories known 1991	2 Total no. territories known 2002	3 Increase in known territories	4 % Change in no territories	5 No. visited 1991	6 No. visited 2002	7 Change in no. visited	8 Estimated no. occupied 1991	9 Estimated no. occupied 2002	10 Change in estimated no. occupied	11 Prop. occupied 1991 (%)	12 Prop. occupied (%) 2002
Tayside: coastal	3	4	1	33%	3	4	1	2	4	100%	67%	100%
Tayside: inland	113	135	22	19%	113	134	21	94	94	0%	83%	70%
Central	48	52	4	8%	47	52	5	40	37	-8%	83%	71%
Argyll: coastal	69	73	4	6%	59	71	12	63	43	-32%	91%	59%
Argyll: inland	51	54	3	6%	38	45	7	40	30	-25%	78%	56%
South Strathclyde: coastal	15	16	1	7%	7	16	9	7	13	86%	47%	81%
South Strathclyde: inland	29	40	11	38%	22	39	17	17	21	24%	59%	53%
Dumfries & Galloway: coastal	29	31	2	7%	29	31	2	23	26	13%	79%	84%
Dumfries & Galloway: inland	59	73	14	24%	59	73	14	51	52	2%	86%	71%
Lothian & Borders: coastal	5	10	5	100%	5	10	5	5	10	100%	100%	100%
Lothian & Borders: inland	31	49	18	58%	31	49	18	31	37	19%	100%	76%
Northern Ireland: coastal	27	33	6	22%	27	33	6	26	23	-12%	96%	70%
Northern Ireland: inland	85	100	15	18%	85	87	2	73	70	-4%	86%	70%
TOTALS	**1612**	**2032**	**420**	**26%**	**1475**	**1899**	**424**	**1316**	**1492**	**13%**	**82%**	**73%**

Table 4.1.2ii Peregrine numbers in 2002 and 1991 on a national basis. Refer to Table 4.1.2i for explanations of column headings. IOM= Isle of Man.

Region	1 Total no. territories known 1991	2 Total no. territories known 2002	3 Increase in known territories	4 % Change in no territories	5 No. visited 1991	6 No. visited 2002	7 Change in no. visited	8 Estimated no. occupied 1991	9 Estimated no. occupied 2002	10 Change in estimated no. occupied	11 Prop. occupied 1991 (%)	12 Prop. occupied (%) 2002
England & IOM: coast	161	209	48	30%	156	200	44	125	188	50%	78%	90%
England: inland	195	375	180	92%	187	364	177	180	331	81%	94%	88%
ENGLAND	**356**	**584**	**228**	**65%**	**343**	**564**	**221**	**305**	**519**	**69%**	**87%**	**89%**
Wales: coast	88	100	12	14%	87	100	13	75	90	20%	85%	90%
Wales: inland	194	248	54	28%	193	248	55	188	198	5%	97%	80%
WALES	**282**	**348**	**66**	**23%**	**280**	**348**	**68**	**263**	**288**	**10%**	**93%**	**83%**
Scotland: coast	316	339	23	7%	254	306	52	205	200	-2%	65%	59%
Scotland: inland	546	628	82	15%	486	561	75	444	392	-11%	80%	62%
SCOTLAND	**862**	**967**	**105**	**12%**	**740**	**867**	**127**	**649**	**592**	**-8%**	**75%**	**61%**
Northern Ireland: coast	27	33	6	22%	27	33	6	26	23	-12%	96%	70%
Northern Ireland: inland	85	100	15	18%	85	87	2	73	70	-4%	86%	70%
NORTHERN IRELAND	**112**	**133**	**21**	**19%**	**112**	**120**	**8**	**99**	**93**	**-6%**	**88%**	**70%**
UK & IOM TOTAL	**1612**	**2032**	**420**	**26%**	**1475**	**1899**	**424**	**1316**	**1492**	**13%**	**82%**	**73%**

Table 4.1.3i 2002 numbers compared to 1991 and pre-1939 levels. Regions are combined as shown for comparison with previous surveys.

2002 region or district	1981 region or district	Est. no. pairs 1930-39	No. of pairs 1991	1991 as % of 1930-39	No. of pairs 2002	2002 as % of 1991	2002 as % of 1930-39
SE England: inland SW England: inland Central East England	S England: inland	4	19	475%	93	489%	2325%
SE England: coastal	SE England: coastal	23	6	26%	25	417%	109%
SW England: coastal	SW England: coastal	91	94	103%	125	133%	137%
South Wales: coastal North Wales: coastal	Wales: coastal	62	72	116%	83	115%	134%
South Wales: inland North Wales: inland	Wales: inland	65	186	286%	181	97%	278%
NW England: coastal NE England: coastal	N England: coastal	14	22	157%	35	159%	250%
W Midlands & Lancs lowlands NW England: inland Pennines Cheviots NE England: inland	N England: inland	46	162	352%	229	141%	498%
South Strathclyde: coastal Dumfries & Galloway: coastal Lothian & Borders: coastal	S Scotland: coastal	26	33	127%	49	148%	188%
South Strathclyde: inland Dumfries & Galloway: inland Lothian & Borders: inland	S Scotland: inland	30	93	310%	104	112%	347%
Argyll: coastal	S & E Highlands west, coastal	36	49	136%	38	78%	106%
Tayside: inland Argyll: inland Central: all Highlands: inland NE Scotland: inland	S & E Highlands fringe, inland; S & E Highlands centre, inland; N & W Highlands, inland.	252	341	135%	261	77%	104%
Tayside: coastal NE Scotland: coastal	S & E Highlands east, coastal	14	14	100%	21	150%	150%
Shetland Orkney Western Isles Highlands: coastal	N & W Highlands west, coastal: N & W Highlands east, coastal.	157	96	61%	71	74%	45%
Northern Ireland: coastal	Northern Ireland: coastal	22	25	114%	23	92%	105%
Northern Ireland: inland	Northern Ireland: inland	32	71	222%	64	90%	200%
UK & IOM TOTAL		**874**	**1283**	**147%**	**1402**	**109%**	**160%**

Table 4.1.3ii 2002 numbers compared to 1991 and pre-1939 levels on a national basis. IOM= Isle of Man.

2002 region or district	Est. no. pairs 1930-39	No. of pairs 1991	1991 as % of 1930-39	No. of pairs 2002	2002 as % of 1991	2002 as % of 1930-39
England & IOM: coast	128	122	95%	185	152%	145%
England: inland	50	181	362%	322	178%	644%
ENGLAND & IOM	**178**	**303**	**170%**	**507**	**167%**	**285%**
Wales: coast	62	72	116%	83	115%	134%
Wales: inland	65	186	286%	181	97%	278%
WALES	**127**	**258**	**203%**	**264**	**102%**	**208%**
Scotland: coast	233	192	82%	179	93%	77%
Scotland: inland	282	434	154%	365	84%	129%
SCOTLAND	**515**	**626**	**122%**	**544**	**87%**	**106%**
Northern Ireland: coast	22	25	114%	23	92%	105%
Northern Ireland: inland	32	71	222%	64	90%	200%
NORTHERN IRELAND	**54**	**96**	**178%**	**87**	**91%**	**161%**
UK & IOM TOTAL	**874**	**1283**	**147%**	**1402**	**109%**	**160%**

Table 4.3.1i Incidences of persecution: regional level. 'Known' refers to observed or otherwise confirmed incidences of persecution; 'suspected' to evidence of interference or persecution.

			Persecution involving...	
Region	**Known**	**Suspected**	**Eggs, chicks or juveniles**	**Adults**
SE England: coastal	-	1	-	1
SE England: inland	-	-	-	-
SW England: coastal	-	2	2	-
SW England: inland	2	1	2	1
South Wales: coastal	-	-	-	-
South Wales: inland	4	8	9	3
North Wales: coastal	-	-	-	-
North Wales: inland	-	1	1	-
W Midlands & Lancs lowlands	3	1	4	-
NW England: coastal	-	-	-	-
NW England: inland	7	5	12	-
Pennines	7	8	15	-
Cheviots	3	2	5	-
NE England: coastal	-	-	-	-
NE England: inland	-	1	1	-
Central East England	-	-	-	-
Shetland	-	-	-	-
Orkney	-	-	-	-
Western Isles	-	-	-	-
Highlands: coastal	-	-	-	-
Highlands: inland	-	4	3	1
NE Scotland: coastal	-	-	-	-
NE Scotland: inland	1	-	-	1
Tayside: coastal	-	-	-	-
Tayside: inland	-	4	-	4
Central	1	2	3	-
Argyll: coastal	-	-	-	-
Argyll: inland	-	-	-	-
South Strathclyde: coastal	-	-	-	-
South Strathclyde: inland	-	-	-	-
Dumfries & Galloway coastal	-	1	1	-
Dumfries & Galloway inland	5	1	5	1
Lothian & Borders: coastal	-	-	-	-
Lothian & Borders: inland	1	8	5	4
Northern Ireland: coastal	-	1	1	-
Northern Ireland: inland	6	4	9	1
UK TOTAL	**40**	**55**	**78**	**17**

Table 4.3.1ii Incidences of persecution: national level. 'Known' refers to observed or otherwise confirmed incidences of persecution; 'suspected' to evidence of interference or persecution. IOM= Isle of Man.

			Persecution involving...	
Region	**Known**	**Suspected**	**Eggs, chicks or juveniles**	**Adults**
England & IOM: coast	0	3	2	1
England: inland	22	18	39	1
ENGLAND & IOM	**22**	**21**	**41**	**2**
Wales: coast	0	0	-	-
Wales: inland	4	9	10	3
WALES	**4**	**9**	**10**	**3**
Scotland: coast	0	1	1	-
Scotland: inland	8	19	16	11
SCOTLAND	**8**	**20**	**17**	**11**
Northern Ireland: coast	0	1	1	-
Northern Ireland: inland	6	4	9	1
NORTHERN IRELAND	**6**	**5**	**10**	**1**
UK & IOM TOTAL	**40**	**55**	**78**	**17**

Table 4.5.1i New breeding territories for 2002. 'Cliffs' include crags and other natural rocky outcrops. 'Human sites' include buildings, pylons and other human artefacts excluding quarries. 'Former doubles' are those territories previously occupied by one pair of Peregrines and now split between two pairs. Note that sub-totals do not tally with the grand total as four regions are lacking detailed new site information; similarly information was only supplied for eight of eleven new sites in inland South Strathclyde.

		New territories					
Region	**No. of new sites**	***cliffs***	***quarries***	***tree nests***	***walk-in nests***	***human sites***	**Former doubles**
SE England: coastal	7	1	-	-	-	6	0
SE England: inland	12	2	3	-	-	7	0
SW England: coastal	28	28	-	-	-	-	4
SW England: inland	53	2	46	-	-	5	1
South Wales: coastal	11	10	1	-	-	-	3
South Wales: inland	41	19	19	-	-	3	3
North Wales: coastal	1	-	1	-	-	-	0
North Wales: inland	13	5	7	-	-	1	1
W Midlands & Lancs lowlands	36	1	21	1	1	12	0
NW England: coastal	12	10	2	-	-	-	0
NW England: inland	10	4	5	-		1	2
Pennines	48	21	23	-	3	1	1
Cheviots	11	8	2	-	-	1	0
NE England: coastal	1	1	-	-	-	-	0
NE England: inland	1	-	1	-	-	-	0
Central East England	9	-	5	-	-	4	0
Shetland	0	-	-	-	-	-	0
Orkney	1	-	-	-	1	-	0
Western Isles	4	4	-	-	-	-	0
Highlands: coastal	0	0	-	-	-	-	0
Highlands: inland	1	1	-	-	-	-	0
NE Scotland: coastal	5			NO INFORMATION			-
NE Scotland: inland	9			NO INFORMATION			-
Tayside: coastal	1	1	-	-	-	-	0
Tayside: inland	22	14	8	-	-	-	1
Central	4	2	2	-	-	-	0
Argyll: coastal	4	3	1	-	-	-	1
Argyll: inland	3	3	-	-	-	-	2
South Strathclyde: coastal	1	-	-	-	-	1	0
South Strathclyde: inland	11	5	4	-	-	2	0
Dumfries & Galloway coastal	2	2	-	-	-	-	1
Dumfries & Galloway inland	14	12	1	-	-	1	5
Lothian & Borders: coastal	5	3	-	-	-	2	1
Lothian & Borders: inland	18	9	7	1	-	1	1
Northern Ireland: coastal	6	5	1	-	-	-	0
Northern Ireland: inland	15	4	11	-	-	-	0
UK & IOM TOTAL	**420**	**180**	**171**	**2**	**5**	**48**	**27**

Table 4.5.1ii New breeding territories for 2002: national basis. 'Cliffs' include crags and other natural rocky outcrops. 'Human sites' include buildings, pylons and other human artefacts excluding quarries. IOM= Isle of Man.

Region	No. of new sites	New territories					Former doubles
		cliffs	*quarries*	*tree nests*	*walk-in nests*	*human sites*	
England & IOM: coast	58	44	7	0	0	7	6
England: inland	170	34	101	1	4	30	2
ENGLAND & IOM	**228**	**78**	**108**	**1**	**4**	**37**	**8**
Wales: coast	12	10	2	0	0	0	3
Wales: inland	54	24	26	0	0	4	4
WALES	**66**	**34**	**28**	**0**	**0**	**4**	**7**
Scotland: coast	23	13	1	0	1	3	3
Scotland: inland	82	46	22	1	0	4	9
SCOTLAND	**105**	**59**	**23**	**1**	**1**	**7**	**12**
Northern Ireland: coast	6	5	1	-	-	-	0
Northern Ireland: inland	15	4	11	-	-	-	0
NORTHERN IRELAND	**21**	**9**	**12**	**0**	**0**	**0**	**0**
UK & IOM TOTAL	**420**	**180**	**171**	**2**	**5**	**48**	**27**

Table 4.6.1i Prospecting birds presented as singletons or pairs, and classified by habitat type. Note that sub totals for habitat types do not sum to UK totals for singletons and pairs, as site data were withheld in three regions (Northeast Scotland, inland and coastal, South Strathclyde) and was incomplete in one other region (North Wales inland).

Region	Singles	Pairs	Cliffs	Quarries	Human sites
SE England: coastal	1	1	-	-	2
SE England: inland	0	1	-	-	1
SW England: coastal	0	1	1	-	-
SW England: inland	2	4	1	3	2
South Wales: coastal	1	0	1	-	-
South Wales: inland	5	5	3	5	2
North Wales: coastal	0	0	-	-	-
North Wales: inland	2	6	3	1	-
W Midlands & Lancs lowlands	1	6	-	1	6
NW England: coastal	1	1	1	1	-
NW England: inland	0	0	-	-	-
Pennines	1	1	1	1	-
Cheviots	0	0	-	-	-
NE England: coastal	0	2	1	-	1
NE England: inland	0	0	-	-	-
Central East England	0	7	-	1	6
Shetland	0	0	-	-	-
Orkney	0	0	-	-	-
Western Isles	0	0	-	-	-
Highlands: coastal	0	0	-	-	-
Highlands: inland	0	2	2	-	-
NE Scotland: coastal	0	1		NO INFORMATION	
NE Scotland: inland	1	0		NO INFORMATION	
Tayside: coastal	0	0	-	-	-
Tayside: inland	1	1	2	-	-
Central	0	2	-	2	-
Argyll: coastal	3	0	3	-	-
Argyll: inland	0	0	-	-	-
South Strathclyde: coastal	0	4		NO INFORMATION	
South Strathclyde: inland	0	0	-	-	-
Dumfries & Galloway coastal	0	0	-	-	-
Dumfries & Galloway inland	1	0	-	-	1
Lothian & Borders: coastal	0	0	-	-	-
Lothian & Borders: inland	4	2	2	2	2
Northern Ireland: coastal	0	0	-	-	-
Northern Ireland: inland	1	0	1	-	-
UK & IOM TOTAL	**25**	**47**	**22**	**17**	**23**

Table 4.6.1ii Prospecting birds presented as singletons or pairs, and classified by habitat type: national results. IOM= Isle of Man. Note that sub totals for habitat types do not sum to totals for Scotland and Wales for singletons and pairs, as site data were withheld in three regions (Northeast Scotland, inland and coastal, South Strathclyde) and was incomplete in one other region (North Wales inland).

Region	Singles	Pairs	Cliffs	Quarries	Human sites
England & IOM: coast	2	5	3	1	3
England: inland	4	19	2	6	15
ENGLAND & IOM	**6**	**24**	**5**	**7**	**18**
Wales: coast	1	0	1	0	0
Wales: inland	7	11	6	6	2
WALES	**8**	**11**	**7**	**6**	**2**
Scotland: coast	3	5	3	0	0
Scotland: inland	7	7	6	4	3
SCOTLAND	**10**	**12**	**9**	**4**	**3**
Northern Ireland: coast	0	0	-	-	-
Northern Ireland: inland	1	0	-	-	-
NORTHERN IRELAND	**1**	**0**	**1**	**0**	**0**
UK & IOM TOTAL	**25**	**47**	**22**	**17**	**23**