



BTO Research Report No. 348

**Peregrine Survey
Validation Exercise 2003**

Authors

Andy Wilson and Humphrey Crick

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1. EXECUTIVE SUMMARY

- 1) The 2002 Peregrine Survey revealed a 9% increase in the Peregrine *Falco peregrinus* population in the United Kingdom since 1991. The northwest of Scotland was one of the few areas where the number of birds and level of territory occupancy decreased between 1991 and 2002. During the 2002 survey, most Peregrine territories were checked by experienced Raptor Study Group workers. In northwest Scotland however, due to the large number of territories to be checked, professional fieldworkers were employed to assist in the survey.
- 2) A validation exercise in 2003 was designed to evaluate whether professional fieldworkers were significantly less likely than more experienced Raptor Study Group workers to record Peregrine occupation at territories that were likely only to be occupied by singletons or non-breeding birds. It was considered very unlikely that either type of observer would fail to record occupation at territories where Peregrines regularly bred.
- 3) A total of 30 territories in the northwest of Scotland were chosen for the study, 17 that were recorded as occupied in 2002 (all but two by singletons) and 13 that were not occupied. These were checked independently in 2003 by both an experienced Scottish Raptor Study Group (SRSG) fieldworker from another region and a “naïve” professional fieldworker.
- 4) The SRSG fieldworker found 15 territories occupied while the professional fieldworker found 11 occupied. Eighteen territories were found to be occupied in total, 10 of which by only one observer.
- 5) There was *c.* 50-60% chance of detecting occupancy at an occupied territory on a single visit. Recorded occupancy increased markedly (to between 60-80%) for both types of observer with two visits to a territory and then less so with subsequent visits.
- 6) In 2003, the professional fieldworker recorded occupancy at *c.* 25% fewer territories than the SRSG fieldworker, although there appeared to be less difference between the two types of observer at the same territories in 2002. Some of the difference in 2003 may have been due to less time spent at each territory by the professional fieldworker than the SRSG fieldworker. In addition there are likely to be other differences due to individual working methods employed by the two fieldworkers, possibly related to their experience of surveying for Peregrines.
- 7) Despite the greater recording efficiency of the SRSG fieldworker, the professional fieldworker found Peregrines at some territories not detected by the SRSG fieldworker. There is likely to be an element of chance involved in recording a non-breeding bird at a territory, which could be partially dependent on the weather, but could also be due to the ranging behaviour of non-breeding birds.
- 8) These results suggest that although there were differences between the occupancy rates recorded at more marginal Peregrine territories by the professional fieldworker and the voluntary fieldworker experienced in Peregrine fieldwork, these could be kept to a minimum if the fieldworkers follow standard fieldwork protocols and have similar visit schedules. In particular, future survey methods should provide

recommendations on the minimum time to be spent watching an apparently unoccupied territory and fieldworkers should make at least two visits to a territory, and if possible three, as the probability of detecting occupancy is strongly related to the number of visits made.

2. INTRODUCTION

The fifth ten-yearly survey of breeding Peregrines *Falco peregrinus* in the United Kingdom and Isle of Man was carried out in 2002. The survey was co-ordinated by the British Trust for Ornithology (BTO) and supported by the Countryside Council for Wales, English Nature, Environment and Heritage Service for Northern Ireland, Joint Nature Conservation Committee, Royal Society for the Protection of Birds, Scottish Natural Heritage, Scottish Raptor Study Groups, Scottish Ornithological Club and The Esmée Fairburn Charitable Trust.

The survey showed an overall increase in the Peregrine population since 1991 with a notable expansion of range in southern Britain (Banks *et al.* 2003). The population was estimated at 1,402 breeding pairs in 2002, an increase of 9% since 1991. A continued decline in the northwest of Scotland gave cause for concern. Reported occupancy rates in the Highland Raptor Study Group region was only 45% at coastal territories and 48% at inland territories in 2002, lower than any other region in the UK (out of 36), with the exception of Shetland, where Peregrines had been completely lost between 1991 and 2002 (Banks *et al.* 2003). (The Highland Raptor Study Group not only covers the administrative area of Highland Region, but also Moray, west of the River Spey, and also the Ardnamurchan and Morven areas of Argyllshire).

During the 2002 survey, most Peregrine territories were checked by experienced Raptor Study Group workers. In northwest Scotland however, due to the large number of remote territories to be checked, professional fieldworkers were employed to increase survey coverage. While the methods for surveying breeding Peregrines are now well established, the effects of surveyor experience have, however, been little examined. The effectiveness of inexperienced professional fieldworkers in surveying raptors has, at times, been questioned, because lack of experience may lead to the missing of subtle signs of occupation and because they do not have the local knowledge acquired by Raptor Study Group (RSG) workers. After the 2002 survey season, it was decided to follow up this issue by undertaking a small piece of comparative fieldwork involving an experienced RSG worker and a “naïve” professional fieldworker who were to check the same set of territories. The aim was to evaluate whether professional fieldworkers were significantly less likely than more experienced RSG workers to record Peregrine occupation at territories that are unlikely to be occupied or are likely to be occupied by singletons. It was decided to concentrate on territories that were likely to be occupied by singletons, if at all, because it was considered very unlikely that either type of observer would fail to record occupation at territories where nesting was regular.

3. METHODS

3.1 Methods of 2002 Peregrine Survey

The National Peregrine Survey in 2002 attempted to cover all known breeding Peregrine territories, including all those occupied in the previous survey in 1991 and those known to have been established by Peregrines since 1991. Volunteers co-ordinated by Raptor Study Groups, local Peregrine coordinators and BTO Regional Representatives checked most of the territories. In some remote parts of Scotland, where there were insufficient volunteers to cover all known territories, professional fieldworkers carried out some of the surveys, co-ordinated by the RSPB.

Peregrine nesting *territories* are defended from intrusion by conspecifics and may include a number of alternate *nest sites* used in different years by the resident birds (Ratcliffe 1993). Visits were to be made to territories on two or three occasions through the breeding season: an early visit in March or April, to check occupancy and to record habitat details; occupancy was defined as the observation of at least a single Peregrine within the territory, signs such as kills or droppings were not considered definitive. A return visit to unoccupied territories was to be made approximately a month later to recheck for occupation; and a third and sometimes fourth visit later in the season (May-July) to determine breeding success at occupied nest sites (Banks *et al.* 2003).

3.2 Methods of 2003 validation

A total of 30 Peregrine territories were checked by two fieldworkers. One was an experienced Scottish Raptor Study Group worker (SRSG fw) (Hardey 2003) who had monitored a population of Peregrines in northeast Scotland for over 20 years (Hardey 1991, Hardey *et al.* 2003). The other was a professional fieldworker, an experienced birdwatcher who had just completed a PhD on aspects of Lapwing breeding performance and habitat use but who was not an experienced raptor surveyor (Prof. fw). The territories selected were all in the Highlands of Scotland where most of the professional fieldworkers in the 2002 survey were employed. The 30 territories included 17 that were recorded as occupied in 2002 (all but two by singletons) and 13 that were not occupied. For 10 territories, additional alternative nest sites (within the same territory) were also checked (Appendix 1). Occupying Peregrines may use different nest sites within a territory in different years (Ratcliffe 1993). Only 2 of the chosen territories were known to be regularly occupied by breeding pairs since 1981 (BHR98 and BHR99 – Appendix 1). It was considered very unlikely that either type of observer would fail to record occupation at regularly occupied territories. The object of the study was to assess the efficiency of each type of observers at territories that were unlikely to be occupied by breeding pairs. It should be noted that the study could only be indicative because only one of each type of observer was included in the study. Thus any differences found will be due to a combination of observer experience and individual ability, in addition to differences in the conditions and timing of visits made by each observer.

The SRSG worker was encouraged to discuss the territories selected with other SRSG workers, to gain further insights into their history of occupancy and other alternative nest sites nearby. The professional fieldworker did not discuss the territories with other fieldworkers in this way. This is considered to replicate the typical situation of sharing of knowledge between SRSG workers, while professional fieldworkers are more likely to go into an area “blind”, using only the information provided from previous surveys. Thus any

difference between the SRSG and professional fieldworker is partly due to a combination of experience and of knowledge acquired from other SRSG fieldworkers.

Fieldwork protocols were the same as in the 2002 survey, although, as the aim was to check for occupancy and not breeding success, only one or two visits were to be made to each territory. As in 2002, the second visit was only to be made around a month after the first, if nothing had been found on the first.

Some territories where birds were not detected on the first visit (see Table 2, below) did not receive a second visit, as required by the fieldwork protocol. The main reason for this was a lack of time – poor weather during May resulted in visits to some areas being aborted, especially at the time the professional fieldworker was carrying out second visits. A decision was made at the start of the season not to chase up the fieldworkers to ensure that second visits were made, as it was thought that this would have influenced their survey effort and led to a biasing of the results.

4. RESULTS

Comparison of results from two fieldworkers in 2003

The data presented in Table 1 shows that the experienced Scottish Raptor Study Group surveyor recorded occupancy at 15 of the 30 territories while the less experienced professional surveyor noted occupancy at 11 territories. Interestingly though, while the territories recorded as occupied did show considerable overlap (Peregrines were recorded at eight territories by both fieldworkers), occupancy was noted by only one of the two fieldworkers at 10 territories.

Table 1. Territories found to be occupied and not occupied in 2003

		SRSG fieldworker		
		Occupied	Not occupied	Total
Professional fieldworker	Occupied	8	3	11
	Not occupied	7	12	19
	Total	15	15	30

Additional, alternative nest sites were to be checked at ten territories (see Appendix 1). While both fieldworkers detected occupancy by single birds at (the same) two of these, the SRSG fieldworker detected a singleton that the professional fieldworker did not, at a third.

It should be noted that the SRSG fieldworker was familiar with two of the territories from before the study (BHR155 and 156), but that this did not appear to increase the likelihood of recording Peregrine occupancy (Appendix 2).

4.2 Effects of increased number of visits on detection likelihood

The 2002 Peregrine survey required a minimum of two visits to each territory but the majority were checked more frequently than this. As birds may sometimes be missed, even when a territory is occupied, Peregrine occupancy is more likely to be recorded where there are several visits. This may be particularly true for unpaired birds, which are less likely to be tied closely to a nest site and are less likely to engage in interaction with other Peregrines. As the majority of territories that were resurveyed in 2003 were either not occupied, or occupied by only single birds in 2002, the probability of detecting occupation was likely to be much lower than for regularly used Peregrine territories.

Both the 2002 and 2003 data from the sample of 30 territories indicate that although two visits will ensure that the majority of occupied territories are recorded correctly, there are small gains to be made by having three or four visits to a territory. Although sample sizes are small, we can demonstrate from the data for these 30 territories that overall detection probabilities increase with each subsequent visit to a territory where occupancy was not previously noted (Figure 1 and Table 2).

We can take the assumed actual occupancy of territories as 60% (18 of 30 territories), from both observers combined. The SRSG fieldworker recorded occupancy at 37% of territories after first visits (61% of assumed actual occupancy), compared with 30% from the first visits

of the professional fieldworker (50% of assumed actual occupancy). After second visits, they had recorded 47% and 37% of territories occupied (78% and 61% of assumed actual occupancy), respectively. Subsequent visits (up to two extra) increased the occupation rate recorded by the SRS fieldworker to 50% (83% of assumed actual occupancy). These results suggest that for this type of territory, about 40% (7 of 18) of actual occupancies would have been missed in 2003 if only a single visit was made (Fig. 1). It is possible that some of the later records of Peregrines were due to movement of birds between territories through the season, so it is possible that extra visits late on in the season may result in a small degree of double counting. It should be stressed that all but two of the sample in this study were of territories either not occupied or occupied by non-breeding birds in 2002; hence, the large margin of error associated with single visits would not apply to territories which were occupied by breeding pairs. This is exemplified in the 2002 survey, as at 37 territories where breeding occurred in Highland Region, occupancy was recorded on the first visit at 35 (95%).

In 2002, recorded occupancy after the first visit to the 30 territories was 40% (71% of the final 2002 occupation rate), which increased to 53% after the second visit (94% of the final 2002 occupation rate). It should be noted that in 2003, the assumed actual occupancy was estimated after visits by two observers to each site, and so is relatively higher than the assumed occupancy estimated from the 2002 data which depended on the visits of one observer to each site. Thus the occupancy rates estimated from 2002 are slightly higher than those from 2003. Interestingly, in 2002, half the territories were visited by professional and half by SRS fieldworkers and the occupancy recorded was exactly the same (40% and 53% for the first two visits) for each set of territories (Table 2). Although the professional fieldworkers made marginally more visits per territory than SRS fieldworkers in 2002 (means of 3.2 visits vs. 2.5), these did not result in a greater occupation rate being recorded.

Overall, therefore, slightly more territories were recorded as occupied in 2002 than 2003, suggesting that the years were slightly different in occupancy rates. In 2003, the professional fieldworker recorded occupancy at about 25% fewer territories than the SRS fieldworker, although superficially there were no differences between the two types of fieldworker in 2002 (albeit that they checked a different subset of the territories and assuming that actual occupancy between the two subsets was at least similar). Finally, and perhaps most importantly, a single visit to such territories is likely to miss a substantial proportion of records and that at least two visits are required to achieve around a 70% chance of recording occupancy when these types of territory are occupied by a singleton or non-breeding pair.

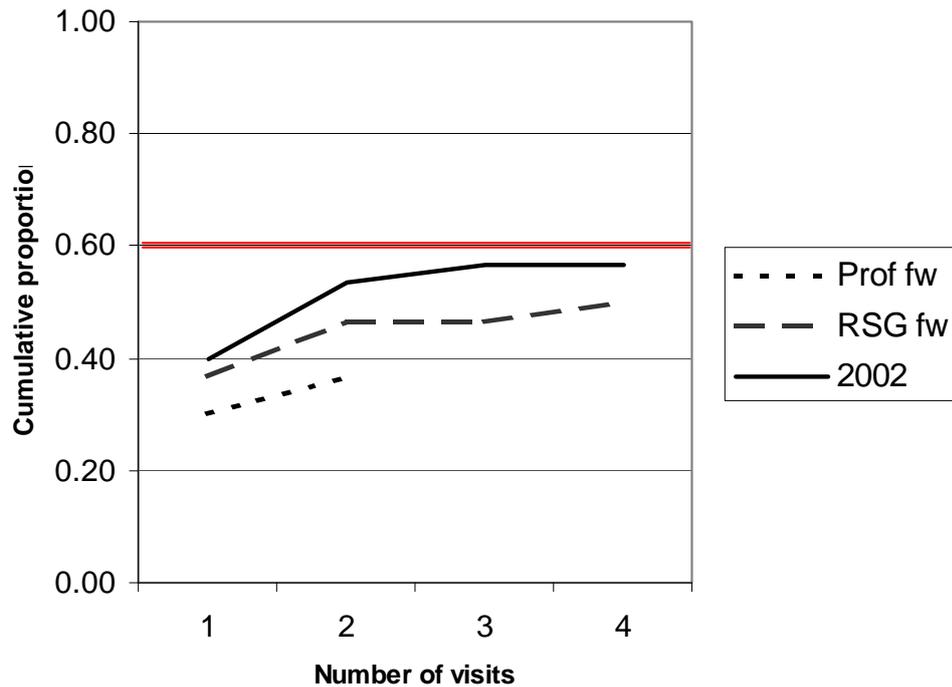


Figure 1. Cumulative proportion of territories where occupation was recorded (the double line represents assumed actual occupancy of 60%).

Table 2. Number of visits before occupation detected

	Single visit, not occupied	2+ visits, not occupied	Occupation detected for the first time (number of previously unoccupied territories checked)			
			First visit	Second	Third	Fourth
Prof. fw	8	11	9 (30)	2 (12)	0 (0)	0 (0)
SRSG fw	3	12	11 (30)	3 (16)	0 (2)	1 (1)
2002 data	3	10	12 (30)	4 (13)	1 (7)	0 (1)
2002 Prof.fw	1	6	6 (15)	2 (9)	0 (4)	0 (1)
2002 SRSG	2	4	6 (15)	2 (6)	1 (3)	0 (0)

4.3 Possible effects of weather and timing of visits

Weather can influence Peregrine detectability in two ways. First, cold or wet weather may affect breeding success, possibly leading to abandonment of clutches at the incubation stage (Norriss 1995, Ratcliffe 1993). Second, if weather conditions are poor (cold, wet or windy) at the time of the survey visit, there is greater chance that the birds will sit tight, sheltering on a cliff, and therefore be more difficult to view. (Although observers are advised to avoid such conditions, poor weather may occur quickly or in an unpredictably localised way at remote sites that take a substantial time to reach). The effects of weather on Peregrine detectability would perhaps be best investigated using the whole of the 2002 survey data but we can explore the possible impacts of weather on detectability in the Highlands in 2002 and 2003 at the territories used in this study. Data from the Met Office website (www.met-office.gov.uk/climate/uk/) indicate that the weather in the north of Scotland during April and May of 2002 was close to the long-term average for the area but that June was much wetter than average (Table 3). In 2003, April was drier and received more sunshine than the 1960-91 average but in May the region received 85% more precipitation than normal.

Table 3. Monthly Weather Summaries for north Scotland spring 2002 and spring 2003 and Peregrine occupancy detection probabilities.

	2002			2003		
	April	May	June	April	May	June
Precipitation (% of 1960-91 average)	109	101	140	70	185	93
Sunshine hours (% of 1960-91 average)	111	118	96	128	87	97
Detection probability 2002	0.53	0.36	0.30			
Detection probability 2003				0.44	0.44	0.64

The probabilities of detecting a Peregrine, in a territory known to hold at least one bird, were calculated for all visits made within each month for each year. Both years included equal numbers of territories checked by professional fieldworkers and RSG fieldworkers and here their data have been combined. Over both years, there was about a 50% chance of detecting a Peregrine, if the territory was occupied, on a single visit. There was little difference between months, although the wet June of 2002 was associated with the lowest detection probability, even though a proportion of sites had been found occupied on previous visits. The detection probability in the even wetter May 2003 was not so affected, probably because visits were often abandoned under the worse conditions and were not recorded.

The sample sizes were insufficient for a detailed analysis but the data provides some weak evidence that weather may influence Peregrine detectability.

4.4 Possible reasons for discrepancies between the surveyors' results

There were discrepancies between results obtained by the two fieldworkers at 10 territories. For six of these, the visit schedules of the two observers were markedly different (Table 4). This suggests that differing visit schedules may have an impact on Peregrine detectability due perhaps to variation in weather and Peregrine activity through the season. Despite the greater efficiency of the SRSG fieldworker (see above), there were still territories that the professional fieldworker found to be occupied when the SRSG fieldworker did not. Thus, in some cases, chance effects may also determine whether a Peregrine is observed, especially if the birds are singletons, or part of a non-breeding pair, that range more widely and return to the potential nest sites within a territory less frequently than breeding birds.

Table 4. Discrepancies in results between the two fieldworkers

Territory code	Peregrines located		
	Prof fw	SRSG fw	Differences in schedule that could explain discrepancy
BHR1	0	1	Located by SRSG fw on June visit – no June visit by Prof fw
BHR28	0	2	Four visits by SRSG fw (the third and fourth covered different parts of the territory) and extensive additional searching (the birds were found on a previously unrecorded cliff) – only one visit by Prof fw
BHR90	2	0	Located in April by Prof fw - no April visit by SRSG fw
BHR98	0	1	Located by SRSG fw on June visit, no June visits by Prof fw
BHR111	0	1	No substantial difference
BHR132	0	1	Located by SRSG fw on June visit – no June visit by Prof fw
BHR155	1	0	No visit by SRSG fw between 2 April and 13 June, although he noted possible occupancy from evidence of droppings
BHR176	0	2	No substantial difference, but the Prof fw could not make a second visit
BHR184	0	1	No substantial difference
BHR185	1	0	No substantial difference

The location of additional birds by the SRSG fieldworker appeared to be facilitated by making additional or later visits. Comments on the recording forms also suggested that the SRSG fieldworker might have spent longer on average at territories (c. two hours) than the professional fieldworker (c. one hour), which could have contributed to increasing the probability of detecting Peregrines. Thus although experience almost certainly played a part, differences in effort at each territory may have also increased the chances that the SRSG fieldworker recorded Peregrines.

5. DISCUSSION

The occupation of Peregrine territories is clear cut when birds are seen at or near a nest site that is being actively used. In territories where occupation is by non-breeding pairs or singletons, birds may not be regularly present near known nesting sites and occupancy can be more difficult to ascertain. This study aimed to explore whether there might be differences in the detection of occupancy by fieldworkers of different experience. This can only be considered an exploratory study because the sample size of each type of fieldworker was only one, and the experienced SRSG fieldworker faced partially different conditions to those faced by SRSG surveyors during the national survey. In this study, the SRSG fieldworker was not familiar with the majority of sites: normally they would be familiar with some sites, although others may not be visited except during decennial surveys. Where fieldworkers are familiar with a site, they may build up cumulative knowledge that probably influences success and their effort expended in a territory. The SRSG fieldworker in this study was encouraged to gather information from SRSG fieldworkers familiar with the territories, but this would not have been the same as having gained personal experience of the territories over several years. The conditions facing the professional fieldworker were probably the same as those experienced by those participating in the national survey in 2002. She was given information on the known nesting sites in each territory and would have identified likely locations from maps that needed to be checked.

Given these caveats, the validation exercise does suggest that Peregrine surveys may differ between different fieldworkers at territories that are unlikely to be occupied by breeding birds. Although the overall difference between occupancy rates by the two observers was modest, discrepancies were found at 10 out of 18 occupied territories, whereby Peregrines were found by only one of the fieldworkers. In 2002, there were fewer differences apparent between professional and SRSG fieldworkers, suggesting that the differences found in 2003 may be due to the individuals concerned or the effort expended.

There are likely to be four main factors that have affected these results: experience, time spent in a territory, numbers of visits made to a territory, and chance.

First, the experienced SRSG fieldworker was more effective at finding Peregrines, presumably because of a combination of greater expertise and of knowledge of the sites gained from other SRSG fieldworkers. It should be noted that the sample size of each observer type was only one, thus there will be an element of variability within experienced and professional fieldworkers that has not have been measured in this study. If anything, the observers in this study are likely to be more different in Peregrine knowledge than the average, because the SRSG observer that took part is one of the most experienced Peregrine fieldworkers in the UK. Thus the differences due to expertise should be pronounced.

Second, the experienced SRSG fieldworker was more effective at finding Peregrines, probably because of a greater search effort, in terms of time spent at territories during a visit but also in terms of area covered within each territory. Although not explicitly recorded, the notes made by the observers on their field sheets indicated that the SRSG fieldworker was likely to spend at least two hours searching a territory or watching from a vantage point, whereas the professional fieldworker appeared to make observations for around an hour before moving on.

Third, the probability of recording a Peregrine appeared to be similar whether the visits were made in April, May or June, at around 50-60% detectability (if Peregrines were present, Table 3 & Fig 1). Thus the numbers of visits made has a large impact on the probability of detecting birds: two visits are substantially better than one. The total number of birds recorded by the SRS fieldworker was larger partly because of the greater number of visits made to some territories.

Fourth, given the nature of these types of territories as being rather marginal, in the sense that they are occupied by non-breeding pairs or singletons, the resident birds may range widely and chance factors on a particular day may determine whether they are detected. This could explain some of the instances where only one of the fieldworkers detected birds despite no major differences in the fieldworkers' visit schedules to a territory.

In the 2002 Peregrine Survey, 12.7% of territories were estimated to be occupied by single birds. This study suggests that the probability of detecting non-breeding birds (singletons or pairs) could be reduced by *c.* 40% if only single visits are made. This may be the worst-case scenario, given that the territories included in this study were often very remote, sometime relatively inaccessible, were in areas where multiple alternative and potentially suitable nesting crags were available and that the SRS fieldworker had no prior experience of most of the territories. In other parts of the UK, the area needed to be searched around a known nest site may be much more restricted and easier to cover. However, in future surveys, the emphasis should remain on the requirement for at least two visits to be made early in the season, in April and early May because, as the season progresses, it becomes increasingly possible that some of the birds apparently missed early on may have actually moved between territories through the season – thereby introducing an element of potential double counting.

Some of the issues raised here could be further investigated using data from the 2002 Peregrine Survey to establish whether these patterns are evident elsewhere in the UK – in particular, the effects of the number and timing of visits. These data suggest that a proportion of territories that are recorded as unoccupied are in fact occupied and that population estimates are therefore conservative, although probably only to a small extent. An assessment of the maximum effect that this would have on the national population estimates for Peregrines should be made by assessing how many territories recorded as unoccupied were visited just once.

We conclude that although there are some differences in the occupancy rates recorded between professional fieldworkers and more experienced voluntary fieldworkers at marginal Peregrine territories, these are not substantial and could be kept to a minimum if the fieldworkers follow standard fieldwork protocols and have similar visit schedules. In particular future survey methods should provide recommendations on the minimum time to be spent watching an apparently unoccupied territory – this study suggests that one hour may be too short and that at least two hours may be required. An additional study to determine the length of time needed for watches at inaccessible nest sites would be useful. Future survey methods should advise fieldworkers to avoid poor weather conditions and the recording forms need to include weather recording to help interpretation of the results. An important source of error could be reduced if fieldworkers made at least two visits to a territory and, if possible three, as the probability of detecting occupancy is strongly related to the number of visits made.

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Appendix 1. Number of adult Peregrines reported at each territory in 2002 and 2003. In 2002, territories numbered BHR1 to BHR112 were visited by professional fieldworkers and territories BHR119 to BHR185 by SRSG fieldworkers.

Territory code (number of alternative nest sites to be checked)	Professional fieldworker 2003	SRSG worker 2003	2002 survey - all visits	2002 survey – from first 2 visits
BHR1	0	1	1	1
BHR28 (2 alt)	0	2*	0	0
BHR29 (2 alt)	0	0	1	1
BHR33	0	0	0	0
BHR35 (1 alt)	1*	1*	1	1
BHR40	0	0	0	0
BHR42	2	2	1	1
BHR43	0	0	0	0
BHR57	0	0	0	0
BHR90 (1 alt)	2	0	0	0
BHR98 (1 alt)	0	1*	2	2
BHR99 (1 alt)	1	2	2	2
BHR107 (1 alt)	1	1	1	1
BHR111	0	1	1	1
BHR112	0	0	0	0
BHR119	0	0	0	0
BHR120	0	0	1	1
BHR121 (1 alt)	1*	1*	0	0
BHR122	0	0	0	0
BHR127	0	0	0	0
BHR129	2	2	1	0
BHR132	0	1	1	1
BHR134 (1 alt)	0	0	1	1
BHR155	1	0	1	1
BHR156 (1 alt)	1	1	1	1
BHR163	1	1	1	1
BHR175	0	0	0	0
BHR176	0	2	1	1
BHR184	0	1	1	1
BHR185	1	0	0	0
total birds	14	20	19	18
total occupied territories	11	15	17	16
territories with 2 birds	3	5	2	2

* Birds were found at alternative nest sites within the territory

Appendix 2. Visit dates by fieldworkers in 2003. Dates that are underlined are those on which Peregrines were recorded, dates in parentheses indicate incomplete visits due to bad weather conditions

Territory	Professional fieldworker		Scottish Raptor Study Group fieldworker			
	Visit 1	Visit 2	Visit 1	Visit 2	Visit 3	Visit 4
BHR1	12/04/2003	20/05/2003	30/04/2003	<u>05/06/2003</u>		
BHR28	08/04/2003		24/04/2003	26/04/2003	09/06/2003	<u>12/06/2003</u>
BHR29	09/04/2003	09/05/2003	24/04/2003	11/06/2003		
BHR33	20/05/2003		25/04/2003	(10/06/2003)		
BHR35	<u>30/04/2003</u>		<u>24/04/2003</u>			
BHR40	09/04/2003	09/05/2003	24/04/2003	12/06/2003		
BHR42	<u>21/05/2003</u>		<u>23/04/2003</u>			
BHR43	(25/05/2003)		26/04/2003	09/06/2003		
BHR57	19/05/2003		22/04/2003			
BHR90	<u>03/04/2003</u>		03/05/2003	01/06/2003		
BHR98	06/04/2003	08/05/2003	02/06/2003			
BHR99	<u>07/06/2003</u>		02/06/2003			
BHR107	24/04/2003	<u>15/05/2003</u>	29/04/2003	<u>07/06/2003</u>		
BHR111	23/04/2003	15/05/2003	<u>30/04/2003</u>			
BHR112	25/04/2003		27/04/2003			
BHR119	24/04/2003	15/05/2003	27/04/2003	08/06/2003		
BHR120	24/04/2003		28/04/2003	06/06/2003		
BHR121	<u>03/04/2003</u>		<u>03/05/2003</u>			
BHR122	04/04/2003	05/05/2003	04/05/2003	01/06/2003		
BHR127	11/04/2003		04/05/2003			
BHR129	<u>15/04/2003</u>		<u>05/05/2003</u>			
BHR132	02/05/2003	06/05/2003	07/05/2003	<u>03/06/2003</u>		
BHR134	06/05/2003	14/05/2003	07/05/2003	03/06/2003	14/06/2003	
BHR155	<u>07/05/2003</u>		21/04/2003	13/06/2003		
BHR156	<u>07/05/2003</u>		<u>21/04/2003</u>			
BHR163	<u>13/05/2003</u>		<u>21/04/2003</u>			
BHR175	29/04/2003	30/04/2003	23/04/2003	12/06/2003		
BHR176	30/04/2003		<u>23/04/2003</u>			
BHR184	29/04/2003	30/04/2003	<u>23/04/2003</u>			
BHR185	29/04/2003	<u>30/04/2003</u>	22/04/2003	13/06/2003		

