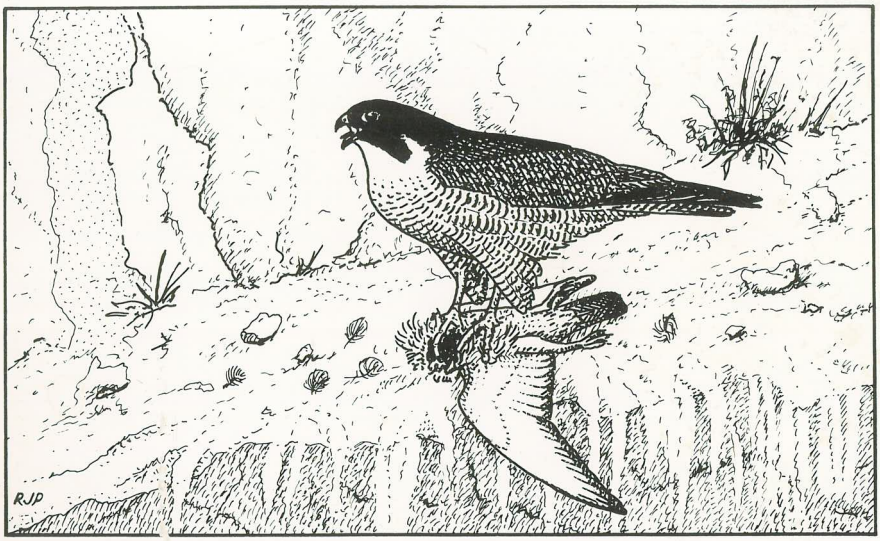
BRISTOL ORNITHOLOGY

THE JOURNAL OF THE BRISTOL ORNITHOLOGICAL CLUB



NUMBER 22, 1993

Peregrines in the Avon Gorge

Feral Pigeons in the City of Bristol

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Preface

Bristol is surrounded by some extremely beautiful countryside, and not surprisingly many Club members prefer to watch birds away from the noise and bustle of the city. However, increasing numbers of people are finding that urban birdwatching can be equally rewarding, not just in town parks but in the most built-up areas themselves. Feral Pigeons are one of the most numerous species in our cities, but have been very much neglected by the average birder, although attracting much attention from city planners, pest control officers and the general public, though for very different reasons. In 1992, John Tully organised a survey of this species in the City of Bristol, and we publish here the results collected by his teams of assistants.

The choice of subject was not entirely arbitrary, of course, as the pigeons are the favoured prey of the Peregrine, and Bristolians are very fortunate to have a pair of this fine falcon now re-established on the cliffs of the Avon Gorge. From 1991 onwards the nest-site has been guarded throughout the breeding season by a team of watchers, who not only protected the pair, but also collected much useful data on the birds' behaviour. The information to date has been summarised in this issue of *Bristol Ornithology*, once again by John Tully.

Although both papers have been compiled by one person, John would be the first to acknowledge that the effort put in by literally hundreds of Club members has provided the data for analysis here, as well as helping ensure that the Peregrines, and the pigeons, are treated fairly and without prejudice.

Ken Hall & Robin Prytherch, *Bristol Ornithology* Editorial Committee

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Observations from the Avon Gorge Peregrine Watches, 1991 and 1992

John Tully

After an absence of many years, Peregrines *Falco peregrinus* returned to breed in the Avon Gorge close to Bristol in 1990. In that year the nest was attacked by vandals, so in 1991 and again in 1992 the Bristol Ornithological Club organised a vigil over the pair throughout the breeding season. More than 100 birders took part in these watches, and noted all relevant observations in a logbook kept on-site. This paper extracts some of the information gathered from almost 2000 hours of watching in a wide variety of weather conditions.

Historical Note

The Birds of Somerset (Palmer & Ballance, 1968) records Peregrines as breeding in the Avon Gorge in the seven years 1928–34, nesting on the Leigh Woods side (in what was then Somerset) only in 1933. It also quotes breeding on the Leigh Woods side as having occurred in 1956, but there is some doubt about this breeding record (see below). A general decline in records was noted from 1957 onwards.

The Bristol Bird Reports provide additional breeding season information to the above. In 1938 both a male and female were seen singly in the Avon Gorge and near Avonmouth on various dates. A pair was noted on 16th February 1943 and a single bird on 9th July 1944. Single birds were seen in the gorge from January to early April 1945 but there were no further records that year until a pair was noted on 4th September. Single birds were noted on 6th May 1946, 25th May and 15th June 1947. Paul Chadwick noted a bird using a plucking post opposite the tennis courts in the Gorge on 15th, 22nd and 29th February 1948 with Feral Pigeon *Columba livia* as prey on the first two dates and Black-headed Gull *Larus ridibundus* on the last, but there were no subsequent breeding season records in that year.

No further breeding season records are mentioned until 1956 when a pair was noted at the 'old eyrie' in early April but the female was found shot dead on the Leigh Woods side on 9th April that year which puts the Palmer & Ballance record of breeding, mentioned above, in some doubt.

An interesting slant on the fall and rise of the Peregrine in the Gorge is provided by an analysis of pigeon ring recoveries there. In September 1991, a group of 'Tippler' Pigeon keepers searched the Leigh Woods cliff and its base for rings using metal detectors. They found nearly 100 rings, some of which were embedded in Peregrine pellets. When the 88

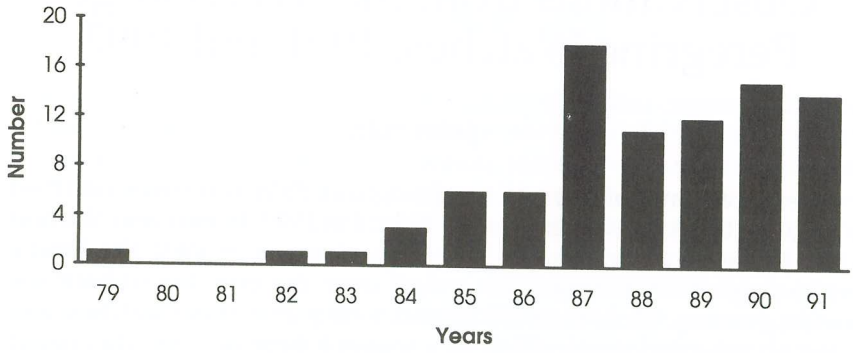


Fig. 1 Pigeon rings recovered in September 1991

rings which were datable were analysed, the results confirmed some of the above dates as well as giving an extra insight into the start of recent Peregrine activities.

Two rings from 1929 and one from 1930 were discovered from the early period. The next period of activity was covered by a ring from 1945 and another from 1950. Figure 1 shows the next collection of rings which runs from 1979 to 1991. The first large group in 1987 probably indicates that a serious breeding attempt took place in that year or 1988 and then subsequently.

The first of the more recent Bristol records in the *Avon Bird Report* was in 1984 when a Peregrine was seen feeding on a Feral Pigeon in Castle Street on six dates in May. This was followed by a bird feeding on a pigeon on a roof in Cotham in May 1986. The Avon Gorge is specifically mentioned from 1987 onwards. The 1990 Report records the first recent definite breeding in the Gorge, when the pair had four young, two of which were killed by vandals. Luckily the other two fledged successfully. In 1991 and 1992, watches were organised on a regular basis, and in both years young were successfully fledged (three and two respectively). In 1991 the female died of natural causes just after the young fledged, but a new adult female had filled the vacancy by the end of the year.

Duration of the Watches

The watches began at a time when it was thought that the clutch had been started and finished when the last young left the nest. The watch commenced on Monday, 8th April and finished on Sunday, 23rd June in 1991. In 1992, a start was made on Monday, 6th April and the watch ended on Saturday, 20th June. The watch was stood down in 1992 from 13th–26th April inclusive as the nest on the Downs side of the Gorge

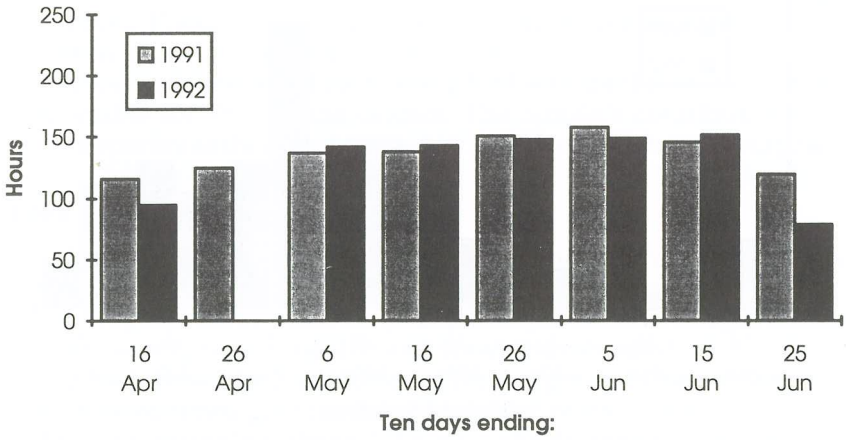


Fig. 2 Duration of watches in 10-day intervals

was thought to be safe from interference. The nest in 1991 on the Leigh Woods side was much more vulnerable (but luckily more observable from the watch point).

Observation was maintained for 1091 hours in 1991 and 908 hours in 1992. In practice, it is likely that these are under-estimates due to some observers not fully completing the log.

Figure 2 gives the distribution of the watch hours in ten-day periods.

Number of Prey Items per Day

The log records the arrival of prey items that were observed, but as any member of the watch knows it was impossible to see all activity. It was also possible to see the birds suddenly with prey when it wasn't clear whether the prey had been caught just before or had been extracted from caches of food on the cliff faces. Only items that were definitely brought in as fresh prey are used in the following analyses. In many cases a food pass was observed from the male to female on the former's arrival in the vicinity of the nest site.

In 1991, 115 items of fresh prey were recorded and 90 in 1992. The decrease in the second year is probably due to three factors:

(1) The total period of the watch was less in 1992.
(2) Two young were reared in 1992 compared to three in 1991.
(3) The nest on the Downs side gave reduced visibility.

Figure 3 gives the number of prey for ten-day periods for the two years. In 1991 the significant period was the early period after hatching when there was a significant increase in number of items. The 1992 figures increased earlier and stayed reasonably high over the period when the young were in the nest. The young in 1992 probably hatched three to five days earlier than 1991.

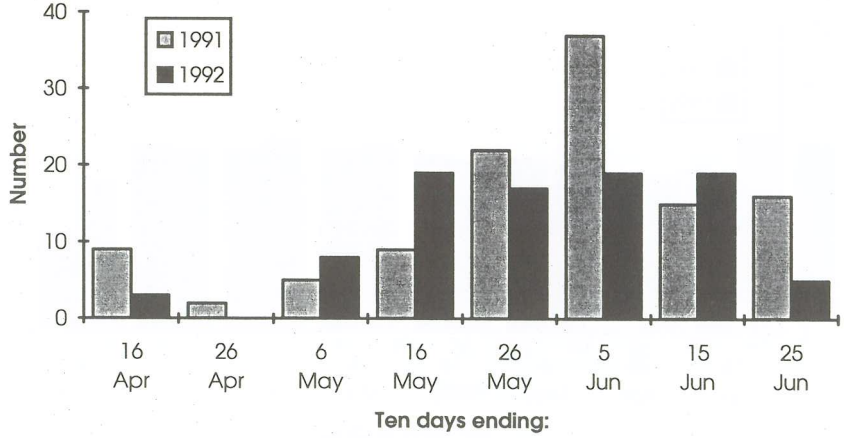


Fig. 3 Number of prey items in 10-day intervals

An additional comparison is that in 1991 one item of prey arrived for every 9.5 hours of the watch whereas in 1992 the rate was slower at one item every 10.1 hours.

Prey Items by Time of Day

Figure 4 shows the comparison of the prey items using two-hour intervals during the day.

In 1991 a much higher proportion of prey was caught in the morning with peak activity between 12.00 and 14.00 and an even greater peak between 16.00 and 18.00. In 1992 there was relatively little activity at the beginning of the day, not peaking until the afternoon period from 14.00 to 16.00. The high rate was sustained up to 20.00. The contrast may be due to the position of the nests: the 1991 nest was in direct sunlight in the morning whereas the 1992 nest did not have direct sun until mid-

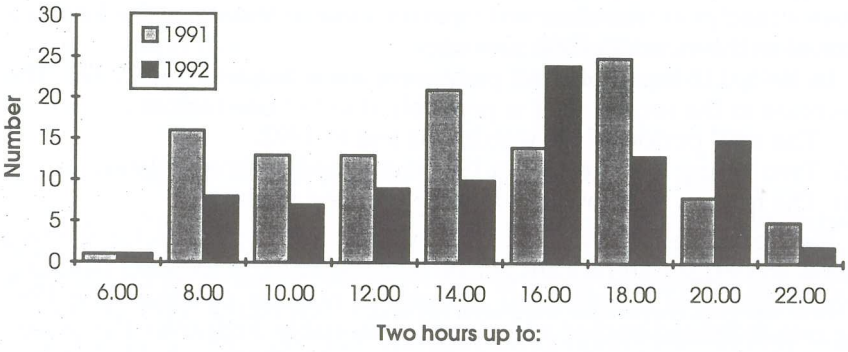


Fig. 4 Prey items by time of day

afternoon. Possibly the young were more active in direct sun and therefore more demanding of their parents.

In most cases the sex of the hunting bird was identified, with the male responsible for 78% of the catches. The female's contributions were more apparent at the end of the fledging period, which is not surprising.

Prey Species

It was very difficult to identify prey brought in as very often the body was incomplete. It was, however, possible to recognise the species of some prey and the others were placed into one of three categories: large (pigeon-sized), pigeon family, and small (thrush-sized).

Figure 5 shows the distribution of the categories in the two years. The first three columns give remarkably similar proportions.

Mallard weighing about 1 kg was the heaviest prey taken and Starling or Song Thrush at 80 g was the lightest. Feral Pigeon and similar domestic varieties average out at approximately 250g per bird.

Using information on mean weights in the BTO's *Enjoying Ornithology* (Hickling, 1983), it is possible to estimate the total weights of the prey which was seen to be brought in. In 1991, 24 kg of fresh food arrived and in 1992, 20 kg was brought in. This is a remarkable feat if you interpret the 1991 figure as bringing in the weight of 24 bags of sugar! *BWP* (Cramp & Simmons, 1980), states the food requirements of captive birds as 141 g/day for females and 113 g/day for males. Free-flying birds probably require more food than the mean of 127 g of the above figures. If we use a mean of 150 g per bird or juvenile, the 24 kg of 1991 gives food for 160 bird days. Calculating the theoretical requirements for 77 days for each adult and 40 days for each of the three juveniles, 274 days of food were needed. This suggests that 58% of the required

Fig. 5 Prey species

food was observed when it arrived. In 1992, the shorter period of observation gave 62 days for the adults and 40 days for each of the two juveniles, that is 204 days of food were needed. The 20 kg brought in provides 133 days giving 65% of the required food observed on its way in. Perhaps these figures should give encouragement to the watch in the sense that we were all better observers after a year's practice.

Duration of Hunting Flights

In 1992 the log was detailed enough to determine the absence from the gorge of the bird, usually the male, during 42 hunting flights which were successful. These varied from two minutes to two hours. Figure 6 gives the details. The longer flights may be an over-estimate because sometimes it was impossible to see the bird if it slipped back in to a sheltered perch.

Half the hunting flights were 30 minutes or less, and the average length was 40 minutes. There is at least one flight documented (Ayres, pers. comm.) where the Peregrine was seen to be harried by Carrion Crows *Corvus corone* and to drop the prey and abandon it.

The log clearly shows that during a large portion of the day the male spent his time perched on the cliff on the Leigh Woods side. This was convenient to the watchers as they were usually able to show the general public a bird in the telescope.

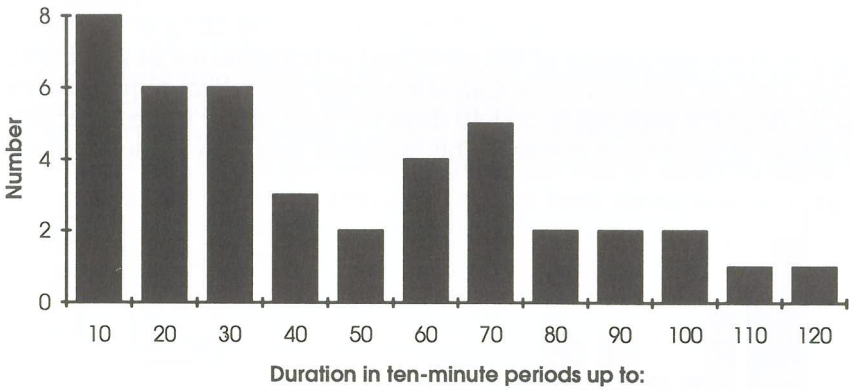


Fig. 6 Duration of hunting flights

Perching Positions on the Leigh Woods Cliff

The birds used the Leigh Woods side extensively even when they nested on the Clifton side. The records of 550 perching positions were made in the 1992 log, 329 male records and 221 female.

Figure 7 shows the positions on the main cliff site with the left hand columns recording the male and the right the female. The male spent

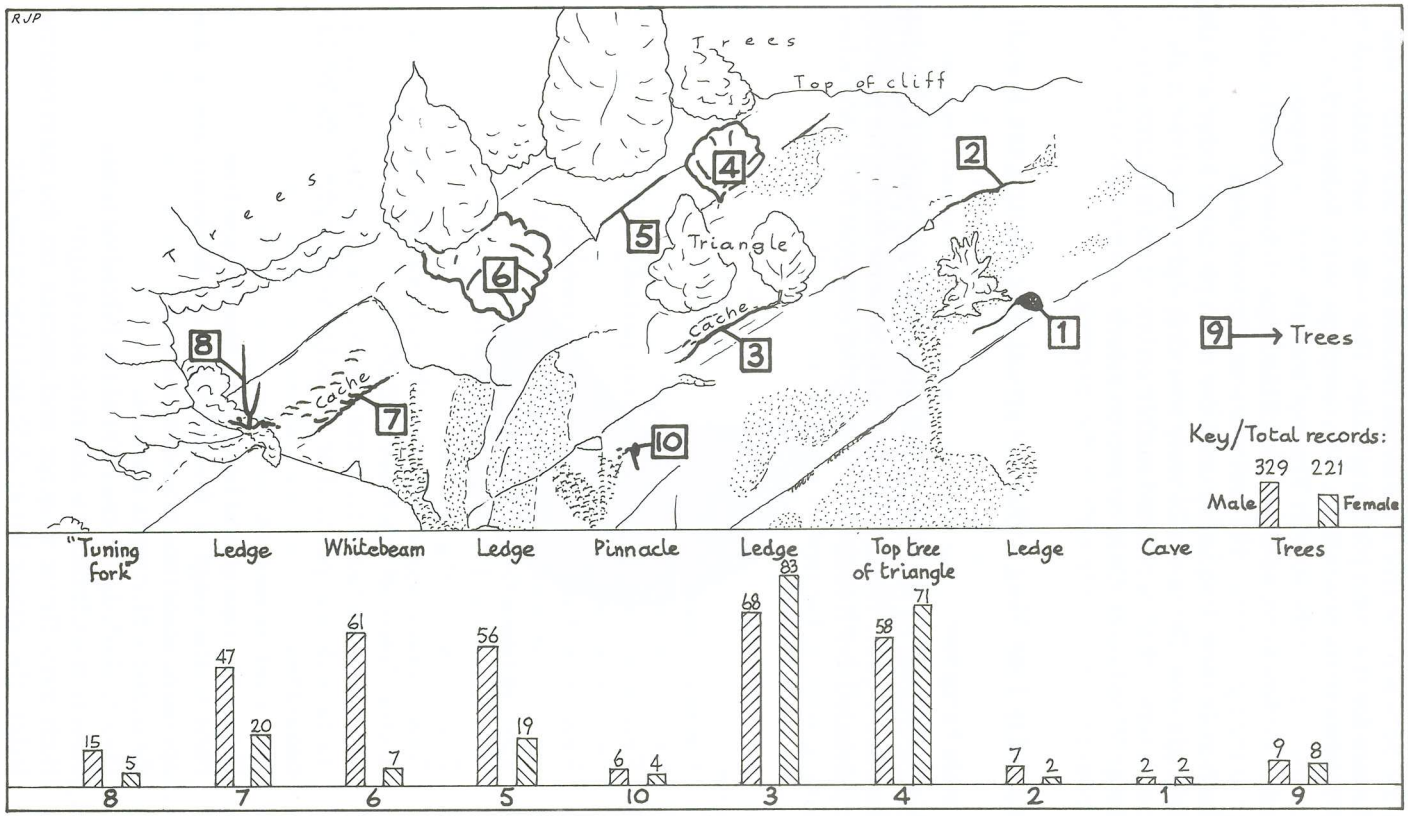


Fig. 7 Perching positions of Peregrines on the main cliff

his time between the five sites in the middle of the cliff with a slight preference for the main plucking ledge. This was closely followed by the Whitebeam tree late in the season compared to the ledge on the right of this tree early in the season. The top 'triangle' tree was popular (and probably under-recorded due to the difficulties of observation) and the ledge to the right of the 1991 nest site was also well used.

The female most frequently used the main plucking ledge and the top triangle tree. Using the 26 early morning sightings of the male, it can be assumed that he roosted mainly on one of his favourite sites on the Leigh Woods cliff. Only on two occasions was he seen to fly to the cliff from the Clifton side early in the morning.

Wednesday 13th May, 1992: A Typical Day During the Watch

The male Peregrine

The log enables us to chart the progress of the day particularly well for the male. I quote Wednesday 13th May because the log for that day is very detailed, but it seemed to be a typical day from the period when the young were in the nest as small juveniles, although two items of prey were above average.

Below we relate the male's day from 05.15 to 21.00 — from sunrise to sunset.

05.15 Position unknown
07.25 Flew across to nest from far side.
07.35 Flew from nest to far side with partially plucked prey and returned to nest without prey.
08.05 Flew to top triangle tree and began preening.
09.45 Left the tree and flew across to the Clifton side.
10.27 Blasting heard from the quarry.
10.37 Flew to cave and then on to the top triangle tree.
10.55 Flew to the 'tuning fork' site.
12.20 Flew round gorge and over to the current nest site, the female having flown off upstream at 12.05.
12.55 More blasting heard from the quarry. The male flew off over to the far side and perched on the ledge to the right of the Whitebeam tree.
13.48 Flew over to the nest.
14.01 Flew round gorge and back to the top triangle tree.
14.44 Flew to the ledge to the right of the Whitebeam tree. It disappeared sometime after this as at:
15.57 Returned with prey to the nest.
15.58 Flew to the ledge to the right of the Whitebeam tree.
16.15 Flew to the Clifton side and now out of sight.
16.50 Both birds flying in gorge and landing on the main feeding ledge. The female left at 16.55 and flew to this side.

18.05 The male left the plucking ledge.
19.10 Returned with fresh prey thought to be a chequered blue pigeon. It flew upstream and perched in trees about 400m upstream from normal quarry on the far side.
19.45 Both birds flying in the gorge. The female went into the nest and the male to the top tree in the triangle.
20.20 Flew to ledge by cave, took out cached food and began feeding.
20.25 Flew over with prey and called female off nest. He paused briefly on the far side before coming over to the nest.
20.35 Came off nest and over the gorge to perch on the top triangle tree.
21.00 Still in the top triangle tree.

If these events are analysed for the day, the resulting summary of activity of the male is given by the pie chart of Figure 8.

The vast majority of the male's day was spent resting in the gorge and only a small proportion of time was spent out of the gorge hunting for the two items of prey brought in during the day.

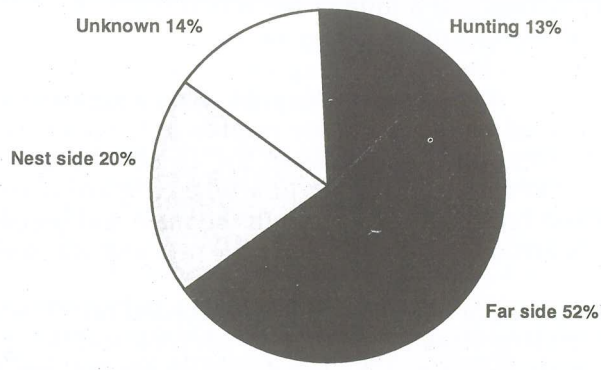


Fig. 8 Chart summarising main activities of the male Peregrine

The female Peregrine

The nest was not visible from the view point but as the young were small, it is reasonable to assume the female was on the nest or in the nest hole until she appeared at 12.05 when she flew off upstream. She was not seen to return due to the poor view. She was seen to fly off the nest again at 14.39 for a short three-minute flight after which she returned to the nest. Shortly after, at 14.47 she did a return trip to the far side. Another four-minute flight was made at 15.52.

Both birds were flying at 16.50 then she fed on the main feeding ledge on the far side before returning to the nest at 16.55. Both birds were

flying again at 19.45 but the female returned to the nest after two minutes. Her final activity was a flight to the top triangle tree at 20.25 where she stayed for ten minutes before returning to the nest.

The above observations give the impression that the female spent the vast majority of the day at the nest, only leaving for short intervals. These flights seemed to be for exercise or for eating food from the caches on the far side. However, it is possible that the flight at 12.05 could have been a hunting flight as there was no record of the return to the nest. It is interesting that she appeared to stay on the nest up to 12.05, this being the period of the day when the nest cavity was in shade.

Reaction to Other Birds of Prey

The Avon Gorge was visited over the watch period by several other birds of prey. In some instances the resident Peregrines reacted by chasing off the intruders.

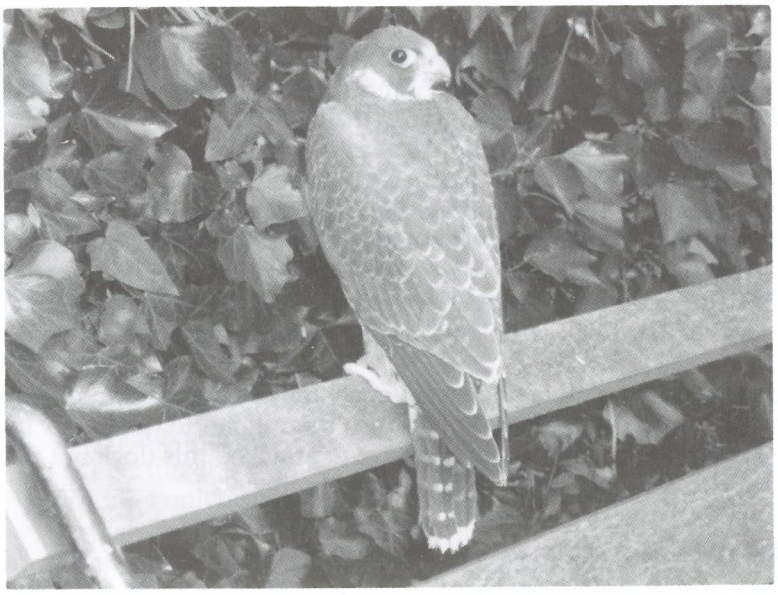
In 1991, Sparrowhawks *Accipiter nisus* appeared almost daily at the beginning of the watch but became less conspicuous as the breeding season progressed. The best occurrence was of three pairs displaying simultaneously within half a mile of the watch point. Sparrowhawks were chased off by the male Peregrine on three dates when they presumably flew too close to the Peregrines' nest area, the three dates being 12th and 17th April and 9th May. In 1992, a similar pattern of observation occurred with a few more records in the later part of the watch and a maximum of four birds in the air simultaneously. The Peregrine reacted to the species on 9th June when a Sparrowhawk with food was attacked unsuccessfully by both the male and female. Also, on 12th June a Sparrowhawk flew close to the nest and was seen off by the female.

In 1991, Kestrels *Falco tinnunculus* were recorded on 13 dates with only one bird straying close to the nest on 6th June and being chased away by the female Peregrine who left the chicks on the nest. In 1992, Kestrels were recorded on 26 dates. Only on 6th June was there interaction when the female Peregrine chased off a single bird.

In 1991, Buzzards *Buteo buteo* appeared on 17 dates with one going close to the nest on 23rd May which brought the female off the nest. In 1992, Buzzards were recorded on 18 dates and they were attacked by the Peregrines on six occasions. On 16th and 17th May a bird was seen off by the female, on 18th May the male chased off two birds, while on 26th May both male and female chased a bird. The male and female reacted on 27th and 29th May respectively to a single bird, and the male chased off a bird on 17th June.

Hobbies *Falco subbuteo* flew through the gorge on 16th April and 15th & 18th May 1991.

Incidentally, Foxes *Vulpes vulpes* were not tolerated and were seen to be attacked on one occasion in both 1991 and 1992.



Juvenile Peregrine — one of the two fledged in 1992 (Photo: Peter Wadley)

The Pair's Reaction to Other Peregrines

In 1991 additional Peregrines appeared on four dates. On the 8th and 18th April the resident male flew up strongly and saw the intruder off. However on 6th and 12th June the overflying bird was watched but the resident birds did not leave the nest area. Perhaps at this date the visitors were no threat to an established nesting area.

In 1992 additional Peregrines appeared in three dates in May. The male saw off an intruding male on 4th May, and a male showed up on 6th May but was not attacked. A juvenile Peregrine was chased off by the male on 17th May.

Communications with the Local Tippler Pigeon Groups

It was clear from the start of the Watch that a number of pigeons kept by Tippler Pigeon keepers were being taken by the Peregrines and also by other birds of prey. These pigeons are bred to fly for as long a time as possible, usually in slow flight above their lofts. They are extremely vulnerable to attack at the end of their long flights.

In 1991, the organising committee of the Watch felt that a liaison group with the Secretaries of the various Tippler groups would be helpful to establish the extent of the threat and to have a line of communication open between the two bodies.

A number of incidents occurred in 1991 and were discussed by the joint group. In some cases misunderstandings were resolved and in

Population and Distribution of Winter Feeding Flocks of Feral Pigeons in the City of Bristol

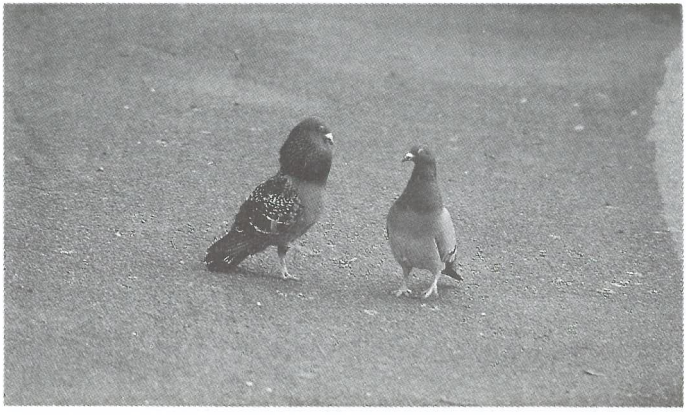
John Tully

Background

In 1991 a pair of Peregrines *Falco peregrinus* successfully nested in the Avon Gorge, having been wardened by members of the Bristol Ornithological Club and other wildlife organisations in Bristol (see this issue, pp. 3–15).

As the main food of the Peregrine is Feral/Rock Pigeon *Columba livia*, the organising group of the Watch agree to meet with the secretaries of the local pigeon clubs in order to assess their opinion of the threat to their birds over the Peregrines' breeding period of April to July. 'Tippler' Pigeons, which are trained to fly for as long a period as possible over a restricted circuit, were felt to be particularly vulnerable to the attentions of the Peregrines because of this specialised habit; in addition Tippler Pigeons are usually of a pale colouration and hence more conspicuous to predators.

Early in our discussions, we all agreed that if the Peregrines were to take the local Feral Pigeons instead, most people would be happy. We made vague statements like 'there are thousands for the Peregrines to eat'. In fact we had no idea of how many there were or how they were distributed and hence the reason for organising a special survey of pigeon distribution within the City of Bristol.



Pair of Feral Pigeons displaying (Photo: John Tully)

Method

The survey was carried out from 1st November 1991 to 29th February 1992 within the boundaries of the City of Bristol. All areas of the city were visited on foot and the flocks of Feral Pigeons were counted and their position mapped using an OS reference. A minimum of ten birds was considered to constitute a flock for the purpose of this survey. The birds were counted in the areas where they gathered in order to feed. Although some of these areas coincided with their roosting sites no attempt was made to find all the roosts in the city.

All major flocks were counted at least twice and many far more frequently. My own counts were supplemented by figures from other members of the Bristol Ornithological Club, acknowledged at the end of the paper.

My main route from home in Westbury-on-Trym into the city centre along Whiteladies Road provided a sample series of flocks whose numbers stayed the same order of magnitude over the four months. Thus either the flocks were exchanging equal numbers or each one always comprised the same individual members. As five flocks were involved, the latter is more likely. Feeding flocks are known to be highly sedentary (Cramp, 1985) and the ringing results of Murton *et al.* (1972) found that in urban Manchester 86% of recoveries were within 90 m of ringing site and almost all within 1 km.

The large flocks in the city centre and Avonmouth Docks were more complicated to enumerate and the method used is explained below. All other flocks were concentrated and discrete, and therefore easy to count, particularly if they were resting on building ledges in single file.

Notes were made on the colouration of the birds of a sample of flocks and also any obvious injuries of individual birds.

Results

Size of flocks

Table 1 illustrates how the number of birds in each flock stayed at the same order of magnitude over the period of the survey. It gives the counts of the five Whiteladies Road flocks for four sample dates of the survey.

These five sites are situated along a main road and a walk of only 1200 m covers all the flocks.

Further counts at these and other sites confirmed that the size of all the feeding flocks stayed generally at the same order of magnitude.

Table 1 Pigeon flocks in Whiteladies Road

	Victoria Rooms	Oakfield Rd	Alma Rd	Clifton Down Stn	Apsley Rd
Nov 6	73	28	65	70	24
Nov 13	47	27	80	117	27
Nov 20	53	17	80	114	22
Dec 4	72	18	105	89	26

Position of flocks

Flocks gather mainly where food is provided and where safe perching places are available for resting in the sun, as well as surveying the area for arrival of further food (Cramp, 1985).

The feeding areas preferred are those which provide flat areas free of obstructions, such as town squares and parks. However, fairly small feeding areas are tolerated if near safe perching places, such as railway bridges (see also Simms, 1975).

It was noted that Feral Pigeons use the highest available perches as their definition of safe. Where the geometry of the buildings permit, this is usually in excess of 5 m and in the case of some high-rise buildings very much higher. Where possible the perches are changed throughout the day to gain the maximum effect of the sun (note that all the observations were made in the winter period). There was one exceptional case of the Buttery Cafe on the city docks where the only perches available were 2–2.5 m high on the cafe roof. Presumably the risk is worth taking as there is a surfeit of food provided by the open-air diners.

Feral Pigeons taking advantage of rooftop vantage point (Photo: John Tully)

In the inner city area, the roofs are preferred for perching if the feeding area is visible but often the geometry of the building obscures the sight-line. In this case, the highest ledge is used or in some cases a convenient tree in the street.

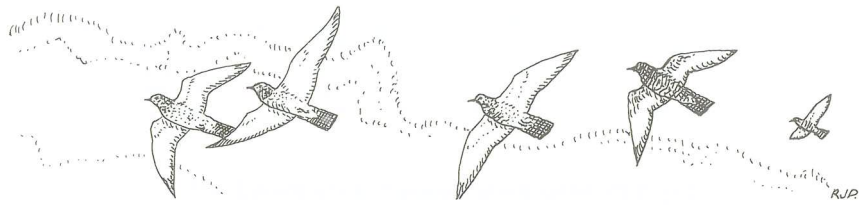
In my experience from this winter fieldwork, the majority of flocks can be described as 'regular', i.e. flocks which I would expect to find in a given location on any visit made during the four month period. The size of the flock on each date varied but was of a similar order of magnitude. There are however a minority of flocks which are intermittent and are not predictable. They are usually small flocks which do not appear to have a regular source of food.

For instance, a flock of up to 60 birds gathered at the Downs water tower to take advantage of large, irregular food source provided by a series of coach parties. In the summer period when coaches were more frequent it became a more regular flock, but was intermittent in the winter. However, once a mobile refreshment bar opened in the winter the flock became a regular one.

The accompanying map (Figure 1) details the distribution of regular flocks throughout the City of Bristol. For discrete flocks, the figure used is the maximum count. Even this count in some locations is an underestimate. In some instances I counted the resting flock and then put down food, subsequently counting the feeding numbers which always then increased. It was not always convenient or practicable to use this method.

For flocks in the city centre and Avonmouth Docks, where particularly high numbers were found, the system for determining flock numbers was still the maximum flock size in the regular flocks with irregular flocks being ignored. Even so, exact counts of the large regular flocks were difficult and were probably under-estimated. Some birds commuted between feeding positions in these densely populated areas but it was my feeling that all these factors balanced out and that the totals for the city centre and docks are accurate to within 10%. The exact details of each flock are listed in the Appendix.

Figure 2 gives the total figures for each 1 km square, the result of adding up the regular flock numbers for the square. Also included is the outline of the built-up area of the city according to Kelly's map of 1885.



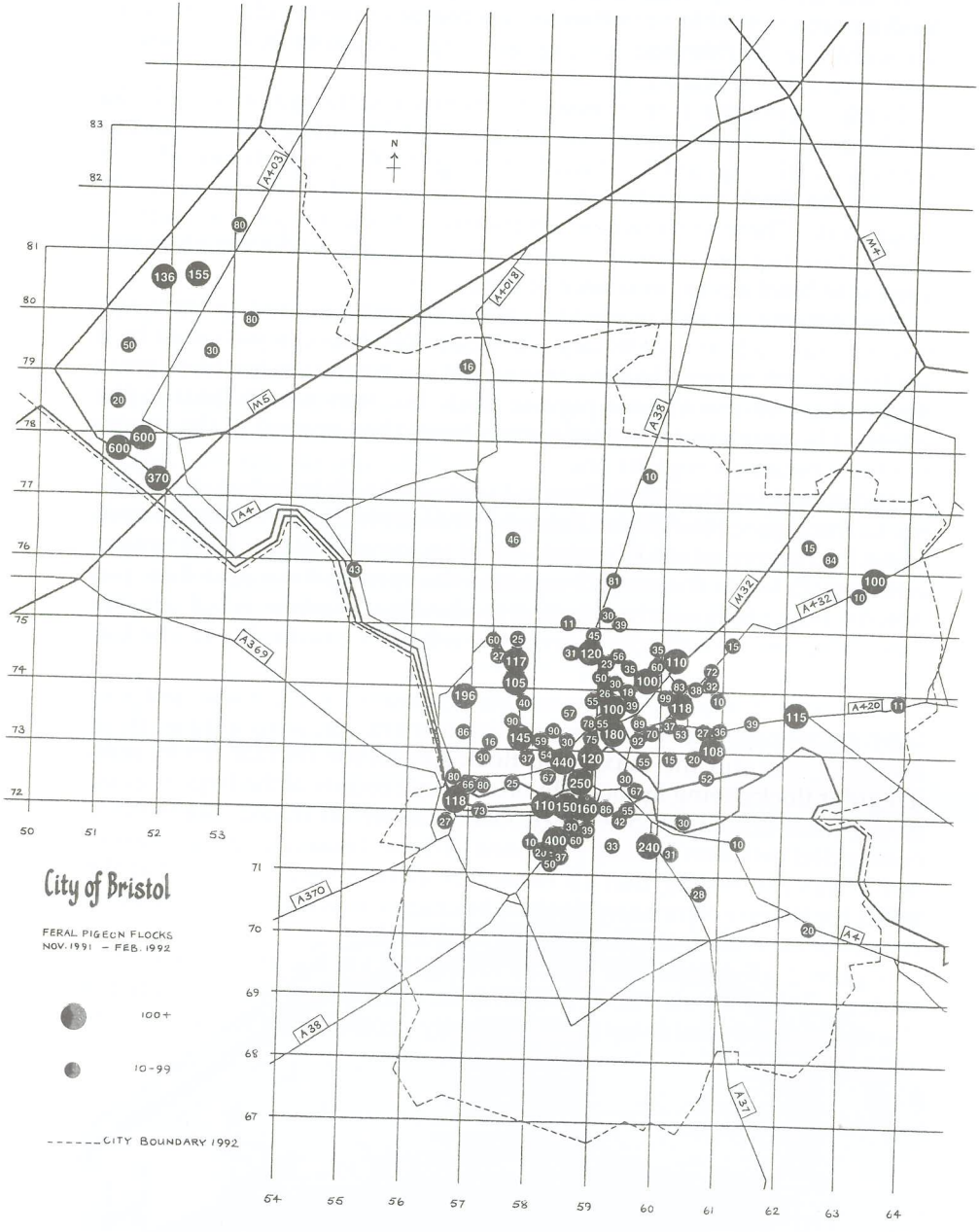


Fig. 1 Distribution of pigeon flocks in Bristol

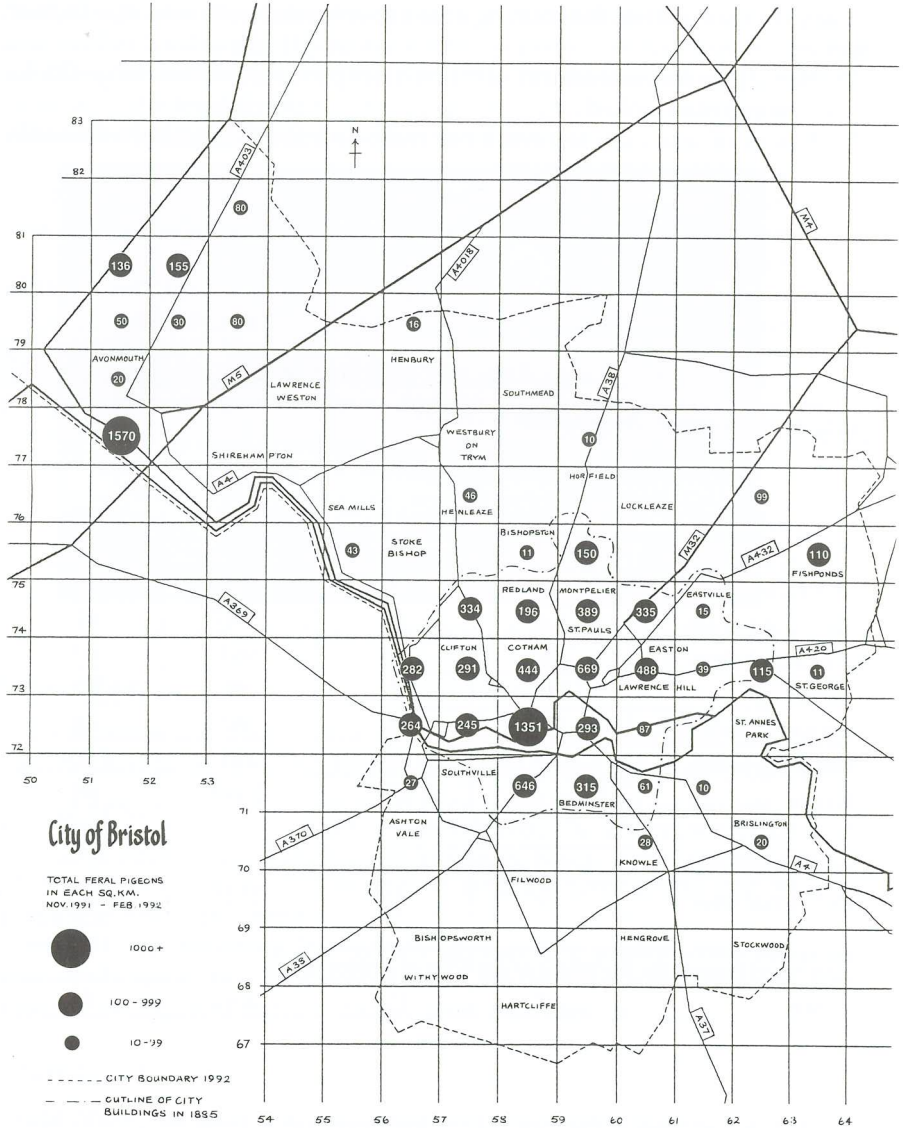


Fig. 2 Numbers of pigeons in each 10 km square

Classification of feeding flocks

I have attempted to classify the areas used by feeding flocks, although the groupings can only be my subjective view of the site (see Table 2).

My opinion is that the total figures are an under-estimate due to four factors.

(1) Not all flocks were found, although it is probable that no large flocks were overlooked.
(2) Flocks of less than ten were not included. Small numbers do roam about the outer suburbs.
(3) Some flocks were very difficult to count particularly where they were based on derelict buildings, complex industrial sites and railway bridges.
(4) Even during the November to February period, a number of birds were on nests and were not seen in the feeding flocks.

Table 2 Areas used by feeding flocks

City area (excluding Avonmouth)				
	Code	No. of sites	No. of pigeons	Mean value
City parks	CP	12	1308	109
City squares	CS	13	1371	105
Outdoor cafes	OC	3	245	82
Shopping areas	SA	36	2247	62
Industrial sites	IS	16	961	60
Hospitals	HS	2	99	50
Railway bridges	RB	8	387	48
Housing areas	HA	18	822	46
Totals		108	7440	69
Avonmouth area				
Industrial sites	IS	10	2121	212
Combined figures for the whole of the City of Bristol area				
Totals	All	118	9561	81

Taking the above factors into consideration a total of 11,000 birds would be my best estimate of the numbers of Feral Pigeons feeding within the city boundary, during the winter period of 1991–92.

Flock size and feeding sites

The average flock size seems to be proportional to the availability of food. Table 2 indicates that the best areas for the pigeons is in the Avonmouth Dock and adjacent industrial areas. This is unsurprising as the spillage from the animal feed mills provides large amounts of grain and similar foodstuffs. If you are a town pigeon, city squares and parks are the areas with the most food and the residential housing districts those with the least amount. Shopping areas and industrial sites in town fall somewhere in between as sources of food.

Flock of Feral Pigeons in Clifton (Photo: John Tully)

Colouration

To estimate the distribution of colour forms, a sample of city flocks was checked carefully. The distribution was found to be fairly constant, with about 75% being of the light blue chequered form similar to the wild Rock Dove, 1%–2% mainly white birds, 1%–2% brown birds and 20%–25% dark forms ranging up to nearly black birds. Simms (1975) estimated proportions in London of 10% for both white and brown forms and 5% dark forms.

In 1991, the breeding Peregrines appeared to prefer white birds as prey, indicating the vulnerability of the mostly pale-coloured loft pigeons as opposed to their darker feral relatives.

Injured birds

The most obvious injuries noted were foot deformities, with most flocks containing at least some birds with such injuries. However, they were not in constant proportions, being less than 10% in some flocks and more than 50% in others. The immediate environment seemed to be the deciding factor — the flocks in residential Clifton having low

numbers of injured birds whereas the flock in the fruit and vegetable market in central Bristol was particularly prone to damage, mainly caused by discarded nylon packaging.

One bird in the City Centre flock was almost blind and is particularly cossetted by the taxi driver feeders. A few birds had only one leg. Only one dead bird was seen.

Ringed birds

There was no regular attempt to count the number of ringed birds in the flocks. However it was possible to make rough estimates when birds were on the ground feeding and in all cases the number of ringed birds was 5% or less.

Discussion

The results of regular counts of sample flocks show that feeding flocks are sedentary and faithful to given areas over the winter months.

These areas confirm the typical preferred habitats as shown in Simms (1979), namely city parks and squares, industrial areas, shopping centres and housing areas with buildings over two storeys high. Outdoor cafes and mobile food sources are modern developments that should be added to Simms' list.

The area of the City of Bristol used by these feeding flocks is the same as the built-up area of Bristol as shown on Kelly's map of 1885, the only exception being the Avonmouth Dock area which has thriving flocks which take advantage of the spillage from the animal feed mills. The relatively modern outer suburbs of the city are not used as feeding areas to any great extent, although a few outer town high-rise flats show signs of embryo flocks. This concentration on the older area of the city is probably due to the 'nook and cranny' architecture of the older buildings and the deterioration of the older roofs (Gompertz, 1957).

Many flocks are regarded as pests. Buildings in the City Centre area are protected by netting but in some instances pigeon just rest on top of the netting. Damage and fouling of buildings is a major problem to the city and remedial action is expensive. The recently incurred cost of cleaning and proofing the frontage of a building in Bristol was over £20,000 (BOU, 1990).

Several new buildings are likely to be candidates for future proofing as architects do not seem to 'design out' perches on the drawing board. Two major examples are the new Galleries Shopping Centre where exterior girder work over two entrances is likely to be welcomed by Feral Pigeons and Starlings *Sturnus vulgaris* as resting and/or roosting sites. The other is the headquarters of Lloyds Bank in the city docks — here the tops of the numerous pillars will be very suitable as roosting

and nesting sites in an area with a high number of pigeons. This latter building will be difficult to proof.

The animal feed mills in Avonmouth Docks also have a major problem with large flocks of pigeons feeding on spillage during loading and unloading operations. One reported £3,000 a year on control measures and further capital expenditure of £25,000 during the last financial year to adapt doorways to keep pigeons out of the buildings.

Working against the activities of various bodies wishing to eliminate or decrease flocks are two groups of citizens of the city. The first are those who regularly provide corn and bread to feed flocks in specific areas. In the case of a man I met in Queen Square, his annual cost of providing 4 kg of corn per day is considerable and reflects the pleasure he gets from feeding the birds. The second group are the casual feeders who provide bread, etc. at outdoor cafes or from their sandwiches. This second group provide a greater proportion in the good weather of the spring and summer.

If we take a figure of 8,000 pigeons in the inner city, each requiring the equivalent of 30 g of corn during the day, the total weight of food consumed by the pigeons alone (and neglecting the gulls and other species) has to be 240 kg of corn or its equivalent per day.

Direct feeding by humans is an important source of food (Photo: John Tully)

Reference to Figure 1 with regard to the positions of the Feral Pigeon flocks around the city relative to the Tippler Pigeon keepers of south Bristol shows that there were no Feral Pigeon flocks in the direct line of flight from the Avon Gorge to south Bristol. The nearest flocks were in the docks at the entrance to the Cumberland Basin but their flying areas were 'around the corner' to the direct line, the 'corner' being the massive rocks above the Hotwells.

After a meeting of some members of the Peregrine Watch and representatives of the South Bristol Tippler flyers it was jointly decided to put down corn on a regular basis across the river from the Cumberland Basin to build up a flock in the direct line of flight from the Avon Gorge to South Bristol. Corn was placed daily at two places, 100 metres apart, on the footpath/cyclepath on the south side of the entrance to the New Cut (ST566722). The regular walkers and cyclists disturbed the feeding flocks which flew between the two sites and the top of the nearest bonded warehouse (30 metres high). The regular flights enabled the Peregrines to see the birds and to have sufficient air space to hunt.

Feeding started on 23rd March 1992 and the regular flock grew to 50 birds by 9th April rising to 70 by 6th May, 80 on 16th May and 100 by 29th May. From this date, a regular flock of 80–100 birds were flying the area in the afternoons. There are so far no direct observations of any hunting attempts by the Peregrines on these birds, but the numbers of hunting visits to South Bristol in 1992 were lower than in 1991.

Acknowledgements

I am grateful for the help and encouragement of C.F.B. Coombs of ADAS and also for his comments on this manuscript. R. Bevan, Bristol City Pest Control, N. Land, Avonmouth Port Health Authority and D. Boulton, Bristol Zoo, all gave information generously. Thanks also to the following who gave information on specific flocks: N. Ayers, R.L. Bland, G. Blowfield, J. Lay, A. Lord, K. Lucas, A. Scott and D. Stainer.

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Appendix

Details of regular feeding flocks: 1/11/91 to 29/2/92

Regular feeding flocks are recorded for all flocks of over ten birds. In each case the maximum number at the site is given.

	OS ref	Code	Flock
ST5177			
Avonmouth Docks, Spillers Mill	513778	IS	600
Avonmouth Docks, Dalgety's Mill	519773	IS	370
Avonmouth Docks, Ford's Mill	514779	IS	600
ST5178			
Avonmouth Docks, O Shed	512785	IS	20
ST5179			
Avonmouth Docks, Eastern Arm	514794	IS	50
ST5180			
Avonmouth Docks, North Shed	519806	IS	136
ST5279			
Rhone Poulenc Chemical Works	527793	IS	30
ST5280			
Industrial Estate, opp Burcott Rd	524807	IS	155
ST5379			
Incinerator Plant	533799	IS	80
ST5381			
Chittening Trading Estate	530814	IS	80
ST5575			
Sea Mills Railway Bridge	550759	RB	43
ST5671			
Strachan and Henshaw	566718	IS	27
ST5672			
West Bond Warehouse	568722	IS	118
East Bond Warehouse	569721	IS	66
Hotwells Almshouses	568725	HA	80
ST5673			
Christ Church Green, Clifton	569733	CP	86
Bristol Zoo	569739	CP	196
ST5679			
Henbury, Machin Rd High Rise Flats	568792	HA	16
ST5772			
Baltic Wharf / PBA Yard	572721	IS	73
Brandon Hill Park	579729	CP	37
Regent St, Clifton	572729	SA	30
Hotwells, Holy Trinity Flats	572725	HA	80
Brandon Hill House	577727	HA	25

	OS ref	Code	Flock
ST5773			
Whiteladies Rd / Oakfield Rd	578738	HA	40
Victoria Rooms	577734	CS	90
Old Roman Catholic Cathedral/Triangle	578732	SA	145
Victoria Square	573731	CS	16
ST5774			
Clifton Down Station	577742	SA	117
Whiteladies Rd / Alma Rd	577740	SA	105
Whiteladies Rd / Apsley Rd	574746	SA	27
Downs Water Tower	573748	OC	60
Lower Redland Rd / Elm Lane	577748	HA	25
ST5776			
Henleaze Rd / Cavendish Rd	576764	SA	46
ST5871			
East St / Mill Lane	586716	SA	60
East St / Albany	584715	SA	37
Dean St Car Park / Dame Emily Park	583716	CP	400
North St / Hebron	582714	SA	20
North St / Fairfield	580715	SA	10
Robinson Bagmaker Factory	584714	IS	50
East St Wills Building	587717	SA	30
East St, ASDA front / St Phillips St	588718	SA	39
ST5872			
Old Bristol Gaol	585721	IS	150
Bathurst Basin / Western Coal Depot	587721	IS	160
The Centre / Narrow Quay	585728	CS	440
College Green	583727	CS	67
Queens Square	587725	CS	250
Brunel Buttery	582722	OC	110
St Nicholas Church	589729	SA	120
Mecca Leisure Centre	584719	SA	54
ST5873			
University Tower	581732	SA	59
King David Hotel	585732	SA	30
Kings Square	589738	CS	55
St James Church / Haymarket	589735	CS	78
Kings Down Parade / Montague Place	586737	CS	57
Park Row	583731	SA	90
Corn St / Broad St	589730	OC	75
ST5874			
Redland Rd Railway Bridge	586746	RB	31
Cheltenham Rd Railway Bridge	588746	RB	120
Gloucester Rd / Claremont Rd	589749	SA	45

	OS ref	Code	Flock
ST5875			
Cranbrook Rd / Trinity Church	585751	HA	11
ST5971			
York Rd / St Lukes Rd	594719	HA	42
Victoria Park	593715	CP	33
Wells Rd / St Johns Lane	598715	SA	240
ST5972			
Redcliffe Wharf	590725	IS	55
Temple Meads Stn, Approach & Platforms	596724	IS	67
Temple Way, derelict mill	595727	IS	30
Hannah More School	598729	IS	55
Redcliffe Bridge Flats	590721	SA	86
ST5973			
Broadmead	592733	SA	180
Debenhams Roundabout	591735	CS	55
Brunswick Square	592736	CS	100
St Pauls Park	595738	CP	39
Grosvenor Road	595739	HA	18
Jamaica St / Stokes Croft	591739	SA	26
River St	596735	HA	89
St Matthias Park	596733	CS	92
Lamb St / Haviland House	598734	HA	70
ST5974			
Arley Chapel	591745	HA	23
St Agnes Park	598742	CP	100
City Rd / Drummond Rd	593740	HA	30
Lower Cheltenham Place	595744	CS	35
Minto Rd	599747	IS	35
Picton St	592742	SA	50
Station Rd, Montpelier	592745	HA	56
Ashley Rd / Sussex Place	599743	SA	60
ST5975			
Gloucester Rd / Berkley Rd	591753	SA	30
Gloucester Rd / Bristol Prison	592758	SA	81
St Andrews Park	593751	CP	39
ST5977			
Filton Rd / Doone Rd	597775	SA	10
ST6070			
Wells Rd / Broad Walk	607708	SA	28
ST6071			
Bristol Fruit and Vegetable Market	604719	IS	30
Totterdown Church	602714	SA	31

	OS ref	Code	Flock
ST6072			
Feeder Rd Railway Bridge	608726	RB	52
Barrow Rd / Lincoln Rd	606729	HA	20
Kingsland Rd Bridge	601729	IS	15
ST6073			
Stapleton Rd / Wills Dr	603738	SA	118
St Phillips Library	601735	SA	37
Bates Close / Perry St	602738	HA	99
Lawrence Hill Old Railway Bridge	607734	RB	27
Easton Rd Railway Bridge	609738	RB	10
Barton Hill Church	609730	SA	108
Morton St	609733	CS	36
Barton Hill Roundabout	604734	CP	53
ST6074			
Mina Rd Park	602745	CP	110
Pennywell Rd / Highett Drive	603741	HA	83
Stapleton Rd / Lansdown Rd	605740	SA	38
St Marks Rd Railway Bridge	608743	RB	72
Bannerman Rd Railway Bridge	608742	RB	32
ST6171			
Arnos Court Stables	612716	IS	10
ST6173			
Church Rd / Victoria Place	615735	SA	39
ST6174			
Fishponds Rd / East Park	610748	HA	15
ST6270			
Brislington Trading Estate	625702	IS	20
ST6273			
St Georges Park	621737	CP	115
ST6276			
Glenside Hospital	624764	HS	15
Manor Park Hospital	627762	HS	84
ST6373			
St Michaels Church, Kingsway	639738	SA	11
ST6375			
Fishponds Rd / Manor Rd	634759	CP	100
Fishponds Library	631757	SA	10

Club Activities, 1992

Although the Club's 25th anniversary fell in 1991, it was also to provide one of the highlights of 1992. With the actual date being so close to the year's end, it was not surprising that the commemorative dinner should be held after the season of Christmas parties had passed — in January 1992.

Tony Soper, who had in earlier years spent so much time at the BBC Natural History Unit in Bristol that he could easily have been an honorary member of BOC, was the speaker and the event went with a swing. Doing a quick flip to the other end of the year, December saw Robin Prytherch — former Chairman, leader of Club holidays, weekends and field trips, designer of our Pied-billed Grebe logo, joint Editor of *Bristol Ornithology*, illustrator and contributor to just about everything the Club has ever published, and a fount of birding knowledge — officially made an Honorary Life Member by unanimous agreement of the Annual General Meeting. Robin was a member of the very first Committee, as well as being a prime mover in BOC's foundation, and has served on every Committee since. As current Chairman Gordon Youdale said at the AGM, no-one deserves Life Membership more.

After the previous year's initial move into the business of bird protection, organisation of the Avon Gorge Peregrine watch was taken over by Alix Lord, whose husband Mike drummed up some amazing sponsorship from industry in the city — no less than £450 was given.

To take some of the sting out of criticism by pigeon fanciers, who saw our prized raptors as a threat to their prize birds, a feeding station was set up between the Clifton Suspension Bridge and the Cumberland Basin to attract Feral Pigeons to the area, and act as a 'buffer zone', providing on-the-wing food for any Peregrine which might feel tempted to home in on the homing birds of South Bristol fanciers.

Success of the watch could be measured by the fact that, by the time it was over, two young female Peregrines had flown, many Bristolians had learned something about this most splendid of falcons, and BOC membership had benefited from the publicity.

Such matters apart, 1992 was year of steady progress rather than anything else. A total of 21 field meetings and coach outings to the Exe Estuary, Exmoor and Radipole met with varying success — and weather conditions. Consider these comments in the General Committee minutes: Midford, 'weather bad' in February; Inglestone Common, 'thick drizzle', Gare Hill, 'poured with rain', both in June. Also in the same month was 'very windy' Chepstow Park Wood, even though 30 members attended. Haldon Forest in September saw weather so poor that members decamped to nearby Topsham, on the Exe Estuary instead. But at Westhay, at the end of June, it was 'very hot'.

Day trips ranged widely, from a joint meeting with the Wiltshire Ornithological Society at Haxton Down in March, to Dinas in June — a meeting which managed to lose five members (temporarily) but all found the birds on the leader's 'probable' list. Weekend birding trips to Lancashire, the New Forest and North Norfolk drew plenty of takers — and provided a lot of birds.

Indoor meetings deviated somewhat from those advertised in the annual programme. In September David Gibbons, BTO National Organiser for the *New Atlas of Breeding Birds*, found himself double-booked and had to go to Amsterdam on the 'firm's' business. Instead he sent colleague Steve Carter to talk about other BTO survey work. Then, two months later, British Airways steward Charlie Moores, who had been doing a sponsored 'Speedbird' count around the world, pulled out of the November meeting. Fortunately Dr John Sparks, whose series 'Realm of the Russian Bear' has just begun in BBC2's top Sunday evening slot, came to the rescue with a splendid talk and video presentation about the making of the series.

And then there was a specially arranged and exceedingly well attended extra meeting in April. Javier Hidalgo, in whose bodega near Jerez members had supped the golden nectar during the previous year's Spanish holiday, came to speak about the Coto Doñana and the threats to this most important of European wetlands.

Members were able to write of their experiences 'Further Afield', more often than not in exotic locations, for a *Bird News* series organised by Committee member Roger Staples. And, as the year drew to a close, a growing number of readers were receiving copies of our monthly newsletter. Membership was higher than at any time since December 1982, with the total drawing steadily closer to the 500 mark as the year ticked away.

Indoor Meetings

16.1.92	Birding in North-west India – Steve Whitehouse
20.2.92	Members' Evening
19.3.92	In the Shadow of the Moon Mountains – David Cotteridge
2.4.92	The Birds of the Coto Doñana – Javier Hidalgo
17.9.92	Keeping Track of British Birds – Steve Carter
15.10.92	Birds of Jamaica – George Stebling-Allen
19.11.92	The Realm of the Russian Bear – John Sparks
17.12.92	Annual General Meeting

John Barber *Honorary Secretary*

Published by the Bristol Ornithological Club, 1993 (c/o The Anchorage, The Chalks, Chew Magna, Bristol BS18 8SN). Printed by the Longdunn Press, Bristol.