

THE CHELTENHAM PEREGRINES (2010 to 2016)

Dave Pearce

Introduction

Single Peregrines had been seen occasionally for several years on the tower of Christ Church in Cheltenham. In 2009 I thought that they might have tried to breed. After the time when any young would have hatched and church members were about to be taken up to hold an event on the roof, Martin Chapman (who was then responsible for the church fabric) and I went up to have a look. The birds had laid three eggs but these were distributed over the flat roof which has gutters to remove rain water on two sides. The eggs had rolled away from each other and one was in the gutter. The birds needed some help to breed successfully and so we proposed putting a nest box on the tower for the 2010 breeding season.



On January 23rd 2010, after I had obtained a Schedule 1 species licence, we put up a tray of gravel with some cover from the weather.

The 175 year old wooden spiral staircase ends up in a wooden cabin with a door opening onto the roof. Several holes were made in the sides of the cabin and door so that discreet observations could be made. In later years, a young bird sometimes looked into a hole as this photograph by Andrew Everitt shows.

A CCTV camera with Pan/Tilt/Zoom was set up during 2011 and provided a picture on a monitor in the church and at my home. In 2010 I had to stand in the cabin to wait for events to unfold in order to observe the birds and to take photographs - the birds unaware of my presence. With the CCTV view at home, if there was some activity perhaps the male plucking prey, I could be at the church and up the tower by the time the chicks were being fed. I could also Pan, Tilt and Zoom the camera from home to follow the action. The current view was recorded and could be copied to my computer later.

Pre-laying Activity

One or both birds were occasionally present in the first two months of each year and more frequently in March. In the last two weeks of March both the male and female, usually separately, entered the nest box initially standing in the gravel. If they both came into the box they bowed their heads down and made reassuring clucking calls to each other. A scrape was formed by sitting down and pushing their legs out backwards and wiggling the body to make a depression in the gravel. The female also pecked at the stones and drew them towards her.

Copulation was often heard but seldom seen as it took place on the pinnacles of the church. The latter were difficult to see from the cabin and impossible on the CCTV as the camera could not tilt upwards. Copulation was never observed on the tower floor.

Egg Laying

The first egg to be laid in the nest box was on April 27th 2010 which was a very late date for Peregrines. Over the next six years the first egg was laid about three weeks earlier which is a more usual date. For these last six years the date varied from March 31st to April 7th as shown in Table 1.



In 2010 and 2011, only approximate dates and times of egg laying could be made by checking progress by visiting the top of the tower. In 2012 to 2016 the CCTV was available and so times could often be determined to the minute (or even the second). There are several clips of the egg actually dropping from the adult female when she was facing away from the camera. When she was facing the camera it was from her actions (raising her tail, pushing and jerking) that the time the egg dropped could be estimated.

In 2010 three eggs were laid (as was the case in the unsuccessful previous year). In 2011 four eggs were laid but only three chicks hatched. In 2012, 2013, 2014 and 2015 all four eggs laid were hatched and all the chicks fledged. In 2016 four eggs were laid but only three hatched. The female only intermittently sat on the first egg since Peregrines do not incubate continuously until the clutch is almost complete. It was noticeable in 2012 and 2014 and particularly in 2016 that the last egg was whiter than the reddish colour of the others (as shown in the photograph).

After the egg had dropped the female remained absolutely still for some time. This was especially true for the first egg of the year when she remained motionless for an hour or more. The typical time between each egg was from 53 to 60 hours. In 2012 and 2014 there were accurate times for the first to the last of the four eggs and the total times were about seven days (3 hours less in 2013 and 11 hours more in 2014).

The CCTV view of the laying of the fourth egg in 2015 can be seen on the YouTube link;

https://www.youtube.com/watch?v=ITN55Tc23_8&list=PLTM1gWldEpiJuwQUfrdN3iNTIDmZNtjYX&index=4

The female starts calling soon after the egg has dropped and peers up at the male on one of the church pinnacles.

Viewing the clips from YouTube you may have to close the tab when it has finished (or you have viewed for long enough) as YouTube may load another random clip and not of a Peregrine.

During incubation, the female often dozed for a few minutes at a time. Occasionally the male came in and there would be some posturing with the male appearing quite cautious. Sometimes he would remain on the cabin top if the female flew away - presumably to guard the eggs, but more often he sat on the eggs. The incubating bird often shifted the eggs around to turn them and pulled in some of the gravel towards her/him to stop the eggs rolling away.

In 2013 I looked carefully to see which adult carried out most of the incubation of the eggs and for how long. A typical pattern was seen on the CCTV records for 20th and 21st of April. The female sat on the eggs from dusk, all through the night and was on the eggs at first light at 4.00 each morning. On each of the two days the male came in and took over in the early morning and the female returned mid-morning. The male came in again in the early afternoon and the female returned in the evening and was still present on the eggs when it was dark at 19.30. The male therefore incubated twice during the day with an average of just over 4 hours and the female's midday session was almost exactly three hours on both days. Sometimes the male was disinclined to go but the female was the boss and eventually he would get off the eggs.

Whenever I looked in 2016 this timing was generally followed. However, two days before the first chick was due to hatch, the male came on to the eggs at 14.27 BST but the female did not come back! I was worried that she might have had an accident which had resulted in a broken wing or even died! Would the male be able to cope on his own? There was no change late in the evening, but I had a last look at 21.22 BST. Without an infra-red lamp I could not see much at all. But then I glimpsed the white cheeks of the sitting male and then suddenly more white cheeks of a Peregrine coming into the box. The sitting male must have got off the eggs as I could now see the four white blobs of the eggs and the new bird sat on them – she had returned! The male had incubated for 7 hours which was more than twice as long as I had seen before. It was interesting that the next day the male was only on the eggs for a total of 45 mins and he came off for a few minutes during this period and looked up at the pinnacles for his mate. This was the shortest stint he had ever done and clearly he was not prepared to do another long stint.

Here is the male and female exchanging incubation duties. The male gets off the four eggs;

<https://www.youtube.com/watch?v=Xx16wfv28NE> and the female starts her stint a minute later;

<https://www.youtube.com/watch?v=SlkqxJf4iM>

The incubating bird was always alert even when her eyes were closed. Building works below were often very loud but new or odd noises alerted the bird. Familiar sounds did not bother her however loud they were. When the bell tolled, although it would always make me jump, she did not even open her eyes or look up. But a new or odd noise from builders below would immediately cause her to be alert.

Hatching

About 37 days after the first egg was laid the first chick was hatched. This was usually fairly obvious as the female would be sitting in a different way with her wings hanging loose and perhaps standing. It was often difficult to determine the time of hatching as the action could be obscured by the female. In addition, a hole in the egg could be seen several hours before the chick finally struggled free of the shell and so it was difficult to define a time of hatching. From the first to the fourth chick took four days and six hours in 2014 as shown in Table 1.

A newly hatched chick was not immediately fed by the female, even if she was feeding other chicks. It would appear that the chick had to dry out first and be able to raise its head and beg before it received a tiny morsel.



Feeding

The male usually provided the plucked prey to the female and she fed it to the chicks, tearing off small bits which she transferred carefully from her bill to the bill of the chick whilst making loud clucking noises.

In the first year in 2010, the female spent a lot of the time standing up, with the young by her legs, shielding them from the sun with partly raised wings. There was barely enough room for all three young to keep in the shade. Not only were the eggs a month later than expected, the sun had been very strong and bright in the mornings for many weeks. I had assumed the tower was aligned east-west and with the box along the south wall it would face north. In fact the alignment is 45 degrees from this, so that the box actually faced north-east and thus got more morning sun than I had anticipated. For subsequent years an extra sidepiece was made and the roof was extended to provide additional protection.



The chicks put on weight at a rapid rate and changes could be seen almost daily. The last born was always much smaller than the others and even at ringing could be only half the weight of the heaviest. It seemed to have a torrid time at first fighting for its life, sometimes on its back with its legs waving in the air and generally being ignored.

Here is a clip from the first day in the life of a last hatched chick. It is the chick on the right on its back!

<http://www.youtube.com/watch?v=VPU0o1vGuKc> It does struggle up eventually but ends up facing the wrong way!



<http://www.youtube.com/watch?v=8ops9NYxvd0>

The female is looking after them very well as usual and the male brings in food on demand. All four chicks are fed in this clip from 2015;

<https://www.youtube.com/watch?v=YvMoXd9E0F0&index=6&list=PLTM1gWIdEpiJuwQUfrdN3iNTIDmZNtjYX>

The following link shows a clip of the male bringing in a prey item when the chicks are a bit older. The CCTV recording jumps a bit at first but recovers;

<https://www.youtube.com/watch?v=8tjVAKlaLo&feature=youtu.be>

After twenty minutes of vigorous feeding the pace is reduced and soon after the following clip ends the chicks did not accept any more food despite several attempts by the male adult;

Here we have a short video with better resolution of the chicks sleeping and a short part of a feeding session at:

<https://www.youtube.com/watch?v=COIqZDlzj64&spfreload=10>

and

<https://www.youtube.com/watch?v=3ZjFSJBbsKc&spfreload=10>

As the days went by I noted that the last born was often nearest the female when she came in with food but initially this was usually taken by a taller chick behind the smaller bird. However, the latter got plenty of food when the larger chicks became full.

Sometimes I wonder that the chicks survive at all. Here is a clip where the chicks are becoming too big for the male to brood easily even though they are only one week old. The male is smaller than the female and has shorter legs and can be rather clumsy as shown in the following link where he puts all his weight on the throat of one of the chicks as he moves out and the incoming female is rather concerned!

The chicks all had subtle differences in character, for example, some were bolder than others in exploring the floor of the tower. One was always more determined than the others to jump off the gravel tray and the others would follow during the subsequent days. It was interesting that after two weeks the female was seen to grab hold of the neck of a small chick trying to leave the box and she hauled it back from the edge and quite a fight ensued (see photo). In most years all the chicks were out and about by the time they were three weeks old and increasingly the female was usually standing guard from a position low on a nearby pinnacle rather than being in or near the nest box.

Colour Ringing



Rob Husbands aims to put colour rings on the youngsters about three weeks after the first hatching. The timing was not crucial as the site was well enclosed and the young could not escape (nor appeared to want to). The parents fly round several times while calling but eventually calm down. The young are put back into the box where they usually go to sleep, seemingly not particularly bothered by the process, and the adults are usually back to their normal positions within an hour or so.

A Day in the Life of One Month Old Peregrine Chicks

In 2012 the BBC Springwatch set up two cameras and an infra-red lamp. Unfortunately the most important camera failed but a bonus for me was that the infra-red lamp allowed excellent views on the CCTV at night – as good as the view during the day.

It is interesting to review a typical 24 hour period in the life of the Peregrine chicks. The four chicks were hatched between May 15th and 18th and the date chosen was June 12th when the chicks were about one month old. The infra-red light gave good views of night time activity.

Generally the female remains on the pinnacles keeping an eye on her chicks. The male appears to do all the hunting for prey. On this day, except for the first feed in the morning the male took the prey directly into the nest box in the morning period but on two out of the four occasions he was immediately moved aside by the female who then fed the chicks. In the afternoon, on all three occasions, the male fed the chicks on the tower floor.

During the night the male Peregrine came into the nest box once but no food was fed to the chicks and for several hours he sat on the nest box roof. The first time the chicks were fed was at 4.00 and again at 5.43, 6.36 and at 8.14. There was a gap until 12.37 until they were fed again and the chicks were soon full up and disinterested. A few scraps were also fed to two chicks at 13.12. The last feed was at 15.48 and continued until the chicks were full although scraps were fed by the male to one chick at 18.34. In total the chicks were fed about seven times - most frequently early in the morning. The total time spent feeding the chicks in the 24 hour period was 90 minutes and on three occasions the chicks were full up with food still available.

This was an interesting but typical 24hours for a family of one month old chicks. There is more detailed information “**A Day in the Life of One Month Old Peregrine Chicks**” in the Appendix of this article with clips from the CCTV.

In this photograph, it appears as though the birds are looking at me. They are looking at the male which has landed on the cabin with food just above my head.



The Chicks become Juveniles

During the following weeks the young were often lying together, touching bills and preening each other:
<https://www.youtube.com/watch?v=sS-uG5SqaCA&list=PLTM1gWldEpiJuwQUfrdN3iNTIDmZNtjYX&index=12>

Preening became increasingly important when they were on their own and was interspersed with short sleeps. Irrespective of the actual date of hatching it became clear that the males were smaller than the female young.

Aircraft and the flying parents were watched intently and nearby wasps and flies caused much movement of the head for the eyes to focus on them. The young often sat on stone pillars I had arranged on the tower floor and looked up begging for food from their parents sitting on the pinnacles.

The following clip shows all four chicks being fed in the nest box although they appear rather disinterested;

<https://www.youtube.com/watch?v=qdVzo0Fi18c&index=9&list=PLTM1gWIdEpiJuwQUfrdN3iNTIDmZNtjYX>



and here, three chicks are being fed on the nest box roof on June 20;

<https://www.youtube.com/watch?v=l0FbJSgQs84&list=PLTM1gWIdEpiJuwQUfrdN3iNTIDmZNtjYX&index=10>

Here two juveniles are trying to eat the same piece of prey;

<https://www.youtube.com/watch?v=mKZehGb59OM&index=11&list=PLTM1gWIdEpiJuwQUfrdN3iNTIDmZNtjYX>

Even after 6 weeks I noted that all four were still sleeping together in the box and there was not much room for them all. Eventually they preferred to stand on the ledges around the outside of the church tower, like their parents, staring into the distance or down at the traffic and people below. Presumably they remained there during the night as the box was increasingly often empty.

First Flights

As the youngsters became older they flapped and stretched their wings particularly if the wind was strong and often stood on the nest box where the wind was stronger.

After six weeks they were ready to attempt to fly and this always occurred on a very windy day. The young carried out vigorous wing flapping and stood right on the edge for ages, every now and again almost being blown off. In 2010 I watched a youngster looking down for more than half an hour then suddenly with a stronger gust of wind and it was gone. I walked the area for some hours expecting to find the bird on the ground.



It was interesting to see the adult female appeared to be also looking for it, doing circles at low level downwind of the church. I did not find it but when I came back from a few days away from Cheltenham it was on the tower! A new flying youngster needed several attempts to land successfully back on the tower and for the first few days could be often seen on lower roofs after failed attempts.

There were three instances when a bird became grounded and could not take off again. In the "wild", on a cliff or in a quarry, it would continue to be fed by the adults on the ground but in an urban environment this is not possible. The youngster had to be caught, carried through the church, up the steps to the top of the tower and let out through

the door with minimum disturbance to the bird or the other young on the tower. Each rescue was different for several reasons but all were successful. In 2014 the congregation were waiting to go in for Sunday Service and the bird in my arms hissed a lot as we passed by and many took a step backwards! On another occasion a bird was carried on a mop passed from garden to garden.

In 2015 the first juvenile flew on a windy day but appeared to be stuck halfway down a face of the church in the evening. Early the following morning I hurried to the church worried that the bird might have become stranded on the ground. In fact it was on top of a pinnacle so it must have managed to fly up. It was being mobbed by Lesser Black-backed Gulls while the adults watched in a surprisingly relaxed manner. The juvenile then flew down to the floor of the tower and ate some prey vigorously while the other juveniles present were disinterested. Later that day all four juveniles were happily sleeping together.



Twenty five youngsters have been fledged over seven years at Christ Church which is an average of 3.6 per year which is much higher than would be expected in the 'wild' on cliffs or in quarries.

Continuing Dependence on the Parents

The young played together occasionally. One would take a feather or discarded leg and jump around with it and the others would follow. If one found a more substantial piece of prey it defended it by opening its wings over it (mantling). They also made short flights from the tower with quick and shallow wing beats and begged at the adults for food.

There was unexpected behaviour by an adult early in July and also in September when the nest box was entered and several scrapes in the gravel were made. Perhaps they were sad to see their young about to leave home.

When the male brought in prey, often to the top of the cabin, he plucked it and the juveniles usually remained on the tower floor but begged (whining) continuously. Plucking the prey is arduous work and took about 20 to 30 minutes. When the feathers had been removed, the juveniles often flew to the prey and grabbed it. Back on the tower floor they mantled the prey to prevent the adult taking it back - which occasionally happened. If there were no

juveniles on the church the male stopped plucking and looked around for the juveniles to appear.

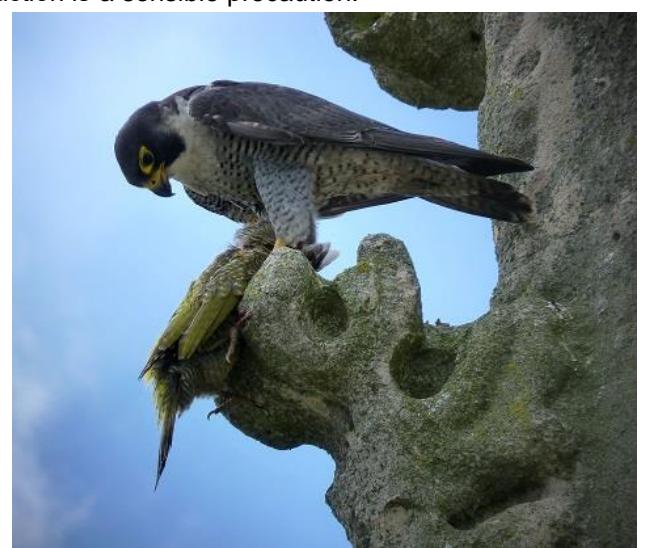
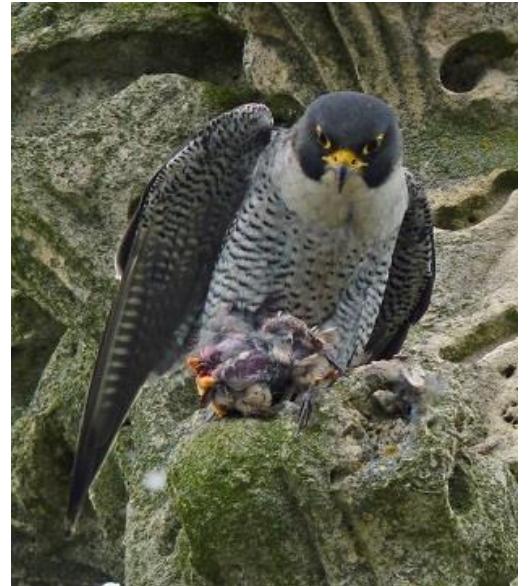
During August the adult male increasingly declined to pluck the prey but dropped the bird on to the tower floor. The juveniles at first did not know how to deal with this and left it then returned and eventually attacked the head as a means of getting some meat without the chore of plucking the feathers.

When the young bird is full up but there is still prey left, the juvenile will try and hide the remains for later. There are not many places to hide it but the juvenile would try behind the nest box or in the gutter. He or she was often worried about it for a few minutes and returned several times to move it and appeared reluctant to leave it.

On several occasions a juvenile became motionless for many minutes while stretching the neck upwards. An uncomfortable posture which I assume was due to waiting for food to go down.

A typical scene with several juveniles present on the church – on the pinnacles or stone work is as follows. The birds are tucking into prey (with a few squabbles). After a while they become rather full and have increasing periods of recovery while they digest some of it before they can carry on eating. When they can eat no more they close their eyes and often begin apparently whining for more – sometimes looking up at their parents. I believe the sight of the adults stimulates this response even if they are full up. It may also be to discourage the adult from flying down and eating the prey. The adult may deliver prey to a juvenile which then looks up at the adult and whines for ten minutes before eventually starting eating. When prey is left, even with the juvenile present, the adult may swoop down and eat the remains so maybe the juvenile's action is a sensible precaution.

During September the adult male would increasingly fly in with prey (see photo above by Terry Clarke) and then fly away with it and the juveniles would be in hot pursuit attempting to take the prey from the male's talons. Presumably, all part of teaching the young to learn to catch food for themselves. A juvenile Green Woodpecker was brought in (see photo) but the adult flew off with it followed by a youngster. Two people have commented to me that they have watched a Peregrine over the County Cricket ground dropping prey for the juvenile to catch and that this was more entertaining than the match. However, it must be many months before they become adept at stooping successfully on flying birds.



Dispersal of Young

The young were usually present around the church throughout July and August but increasingly one or two became absent. One year, the last born came back to the tower and was given food by the adults right through to the last week in November. In another year the last bird to keep returning was also the last born. Although the adults often ignored the begging juveniles, I never saw either of the adults try and drive a juvenile away from the church.



More prey is brought in
(photo by Andrew Bluett)

In October after the young had gone there was an interesting interaction between the adults in October. The female was eating prey on top of the cabin in which I sometimes stand. She had been eating for 20 minutes or so then stopped and looked around. The male came in and ate a few bits and pieces. Note the difference in size between the male and female. He then grabbed the prey from the female and a bit of a tussle ensued. He flew away with the prey. Fortunately the female did not seem particularly bothered.

<https://youtu.be/55am8-BiPyo>

When the adults, especially the male, are not at the church I have often wondered where they are. I have looked at many tall buildings but have not been able to find the Peregrines except occasionally on the Eagle Star building or on St. Gregory's Church near the centre of town. Occasionally when I am in town I hear one or more calling to each other or an adult bringing in food.

Identified Prey Items

For the first five years, after the juveniles had departed, Ed Drewitt inspected the prey remains on the tower. Ed is an expert at recognising feather and skeleton remains and in 2008 wrote an important paper in British Birds in which he summarised the diet of urban Peregrines and reviewed their night time hunting behaviour. Even then, well over 115 species had been reported from several urban sites. At Christ Church, Ed could only inspect the remains from the last few weeks as most of it had been present for up to 6 months and was too compacted. He also identified species from photos I took of remains found at other times (I am certainly not very competent at recognising the species from a chewed skeleton).



Amongst the pigeon remains have been several Woodcock, waders and water birds which suggests that the Peregrines were sometimes feeding at night, or at least at dusk, on the birds migrating overhead. The most unexpected find was a juvenile Great Grey Shrike, probably migrating southwards above Cheltenham at night in the first week in October. Other interesting species was a Kingfisher in 2015 and 2016 and a Sandwich Tern in the spring of 2016.

Table 2 contains a list of species which have been identified at Christ Church - the total number of species so far being 33. As well as those already referred to, these include Little Grebe, Teal, Snipe, Knot, Lapwing, Woodcock and Whimbrel. Also brought to the tower each year has been several Great Spotted and Green Woodpeckers and many Starlings and even Swifts.

In 2016 a Sandwich Tern had been caught probably in the spring. It was stuffed behind the nest box along with a mass of other remains. The juveniles, when they are full up but have not eaten all the prey, wish to hide it. There are very few places to hide the prey on the tower floor and the most obvious place is behind the nest box

Subsequent Sighting of the Young

From 2010 to 2016 twenty five young Peregrines have been fledged successfully from Christ Church. One might think that there would be many sightings of these orange colour ringed juveniles. In fact this is not the case as only a few young are likely to survive the first winter. Early in 2013 an orange coloured ringed individual with a letter J and therefore a Christ Church juvenile from 2012 was seen by Dave Grubb on Worcester Cathedral. Around the same time Dave also spotted an orange ringed juvenile in Kidderminster perched on top of a chimney. In March 2013 a first winter female with an orange leg ring was photographed by Sam Hobson flying over Bristol city centre.



together and again no eggs were laid so we must await 2017.

In 2015, a male (JP) from Christ Church hatched in 2012, was present with a female on a chimney at Weavers Wharf Kidderminster but this was believed to be a failed breeding attempt. The male (JP) was not specifically identified in 2016 although Peregrines were occasionally present.

In 2015, a female (JN) from Christ Church hatched in 2012, was present with a male on Walsall Town Hall and fledged four young and a female (CZ) from Christ Church hatched in 2010, was present with a male at Stafford and fledged three young.



A question I am often asked is whether the adult male and female are the same individuals each year. Comparing photographs each year they certainly appear to be the same birds. Both (especially the female) have the same favourite perches and the same habits each year. The only other Peregrine I have seen near the church in the spring had an orange colour ring and was probably raised at the church in a previous year. It was chased by the resident pair. I note that for the last eight years the Exeter peregrines are believed to have been the same male and female. Apparently, a female in the USA nested 16+ times, with 6 mates, laid 60 eggs and fledged 43 young, but most die long before they reach old age with an average age at death of around 6 years.

The following table summarises known attempted breeding of birds fledged at Christ Church.

Bird	Sex	Year	Town	Comment
CR	Male	2010	Tewkesbury Abbey	With DX (Avon Gorge) on September 25th 2014. DX roosted at night on St Michael's Church at Bishops Cleeve near Cheltenham at the end of December to end of May 2015 although she was seen with CR at Tewkesbury Abbey on March 17. DX was seen back at Bishops Cleeve on May 15th and CR at Tewkesbury Abbey was with a new female without a ring at the end of April 2015. Both CR and the new female were present and interacting to the end of 2016 but no eggs were laid. See http://www.abbeyperegrines.blogspot.co.uk
JP	Male	2012	Kidderminster, at Weavers Wharf	Failed breeding attempt on tall chimney; possibly even before the egg stage but both birds still present.
JN	Female	2012	Walsall Town Hall	After 5 unsuccessful years the female which had been present died in 2014. JN is believed to be the new female which had moved in and four chicks were raised in 2015. In 2016 three young were raised.
CZ	Female	2010	Stafford	Four chicks in the first year 2014 at this site. In 2015 a photo showed CZ and 3 chicks fledged (probably CZ was also the female in 2014). In 2016 four young were raised but 2 were killed flying into the window of a new building!

Occupation of the Church in the Winter Period

During the winter period one or both of the adults may be present but are unlikely to be on the pinnacles. They are often below the level of the tower floor on the ornamental stonework. The north-east face which is out of the sun and wind is mostly used as are the other faces but one has to look carefully to be sure a bird has not been missed. Although the female has been noted on these lower perches from July onwards especially when no juveniles are present, it is most likely from September to March. The female is more likely than the male to be present as she "owns" the site.

Table 1 Dates of Egg Laying, Hatching and Fledging

Activity		2010	2011	2012	2013	2014	2015	2016
Egg Laying	1	April 27	April 4	April 6 @ 19.32	April 7 @ 6.33	April 4 @ 5.50	Mar 31 @ 16.22	April 1 @ 14.34
	2		April 5	April 9 @ ~1.30	April 9 @ 11.14	April 6 @ 14.45	April 3 overnight	April 3 to 4
	3	May 4	April 7	April 11 @ ~7.05	April 11 @ 16.20	May 8/9 overnight	April 5 @ 7.27	April 7 overnight
	4	—	April 11	April 13 @ 16.18	April 13 @ ~21.00	April 11 @ 16.55	April 7 @ 17.39	April 8 @ 18.00
Hatching	1	June 7		May 15 in early hours	May 14 late evening	May 11 @ 7.14	May 9 morning	May 9 morning
	2		May 11	May 16 in early hours	May 15 @ 4.00	May 11 @ evening	May 9 evening	May 10
	3	June 14	~May 17	May 16 @ ~9.00	May 16 early hours	May 13 @ 10.21	May 10 morning	May 13 evening
	4			May 18 morning	May 17 @ ~9.00	May 15 @ 12.41	May 11 morning	
Orange colour ring on left leg with black letters	1	CZ female	CN male*	JN female	NJ female	Y9 female	73 female	2.S female
	2	CR male	CV male	JS female	NN female	ZD female	74 female	3.S female
	3	CX female	No ring male	JP male	NA female	ZB male*	75 female	4.S male
	4			JL male	J6 male	ZA male	76 female	
First flight		July 15	June 22	June 29	~June 30	June 22	June 22	June 23

All times in GMT because the CCTV does not allow for BST

Times for hatching are approximate as a hole in the egg can be seen several hours before the chick finally struggles free of the shell

* known to have died after fledging



An adult with chick



A juvenile tucks in



A juvenile begs for food from an adult on the cabin roof above my head

Table 2 Identified Prey Species

Year	Specific Prey Items (one item unless stated otherwise)
2010	Teal (female) Lapwing Woodcock (2) Snipe Black-headed Gull Wood Pigeon Feral Pigeon (48 at least) Great Spotted Woodpecker (5 (3 juveniles)) Jackdaw Skylark Starling(3) Song Thrush (fresh) Redwing (3) Dunnock House Sparrow Chaffinch Greenfinch (male) Goldfinch (juvenile)
2011	Knot Wood Pigeon (juvenile) Green Woodpecker (2 juveniles) Great Spotted Woodpecker (5) Magpie Blackbird (2 (1 juvenile)) Starling (6) House Sparrow
2012	Little Grebe possible Golden Plover Woodcock (brought into the tower at dusk at 16.37 GMT) Swift (photo of prey brought in) Green Woodpecker Great Spotted Woodpecker (3) Magpie Starling (4+) Song Thrush Redwing (2) Dunnock House Sparrow (2) Meadow Pipit Linnet
2013	Green Woodpecker Starling (8) Blackbird Song Thrush Song Thrush or Redwing
2014	Whimbrel Collared Dove Green Woodpecker Great Spotted Woodpecker Starling (2 juv) Blackbird Song Thrush (fresh)
2015	Teal (male) Kingfisher Great Spotted Woodpecker Starling Redwing
2016	Golden Plover (taken on autumn migration) Woodcock (feathers) Sandwich Tern (taken on spring migration) Kingfisher Green Woodpecker (juvenile) Great Spotted Woodpecker Jay Starlings (4+) Song Thrush House Sparrow Goldfinch

Number	List of species identified other than numerous Feral Pigeons Total species = 33
28	Starling
16	Great Spotted Woodpecker
6	Green Woodpecker Redwing
5	Song Thrush House Sparrow
4	Woodcock Blackbird
3	
2	Teal Golden Plover Wood Pigeon Kingfisher Magpie Dunnock Goldfinch
1	Little Grebe Lapwing Whimbrel Knot Snipe Black-headed Gull Sandwich Tern Collared Dove Swift Great Grey Shrike Jay Jackdaw Skylark Meadow Pipit Chaffinch Greenfinch Linnet

Links

Photographs

There is a selection of photos on Flickr taken from the top of Christ Church for each of the years 2010 to 2016. To view them, open the link to Flickr:

<https://www.flickr.com/photos/55200709@N07/sets>

Click on first photo of the album you wish to look at, Peregrine2010 (or Peregrine2011 etc), then you can look through the collection by clicking on > which appears on the right side.

Videos from the CCTV

In all I have kept 400 clips of selected interesting behaviour over the seven years - mostly are only few minutes long. Many thanks are due to the North Cotswold Ornithological Society for funding the CCTV. This has enabled me to observe the birds almost continuously and to make the clips available to members. There is more information at the NCOS website at: <http://ncosbirds.org.uk> (to be updated in due course)

More clips from the CCTV can be found in “A Day in the Life of One Month Old Peregrine Chicks” in the appendix to this article.

Acknowledgments

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Dave Pearce

Appendix A Day in the Life of One Month Old Peregrine Chicks

It is interesting to review a typical 24 hour period in the life of the Peregrine chicks on Christ Church, Cheltenham. The four chicks were hatched between May 15th to 18th 2012 and the date chosen was June 12th when the chicks were about one month old. At this time they spend more than half their time in the nest box and the camera can be trained on them. As they progressively move about the tower floor it becomes a full time occupation to move the camera about and follow the action. They had been rung four days earlier and there were two males - JL (the smallest) and JP, and two females JS and JN. The females were noticeably larger than the males. We had a powerful infra-red light shining on the nest box. BBC Springwatch had set it up but their main camera had failed which was a pity but it still meant we had great views of activity at night on our CCTV. The camera switches over to the infra-red mode when it detects the day light is very low. On this day it switched on at 21 GMT and off at 4 GMT.

At 12.00 GMT, midnight, the chicks are huddled together mostly sleeping although one occasionally stretches and disturbs the others but they soon settle down. At 12.40 one of the chicks gets up and politely relieves itself outwards so as to not cover the others. The following link shows this behaviour;

<http://www.youtube.com/watch?v=zX4hYytLQFE>

At 1.00 the chicks are more restless with the chicks occasionally standing up and preening.

At 2.00 the chicks are restless and at 2.25 the adult male Peregrine lands on the nest box roof. He then flies down and walks into the nest box; <http://www.youtube.com/watch?v=5NG81vGNEpI> The chicks briefly beg and are then restless.

The adult male looks up and moves his head side to side to see better into the dark. He leaves at 03.10; http://www.youtube.com/watch?v=wyoF0_hwpeA The chicks huddle together and mostly sleep.

Soon after 4.00 the adult female arrives with a small prey item, presumably brought in and dropped by the male, and feeds it to the chicks; <http://www.youtube.com/watch?v=-epIPD65W48> The female leaves at 4.05 and the chicks move about, two leaving the box at 4.07 for a few minutes, and after they return all four huddle together and snooze.

At 5.43 the adult male comes into box with a small prey item. The adult female follows almost immediately and grabs the prey and the male flies off; <http://www.youtube.com/watch?v=8fiy8cCFwhI> The chicks beg for food and the female feeds them. There is no squabbling between the chicks but some manoeuvring of position to be closer to the female – she decides who gets fed. The female leaves at 5.47 with the chicks still begging and they flap their wings and move about. The two female chicks leave the box.

From 6.00 to 7.00 only two chicks are in box, then three and sometimes four. The adult male comes in at 6.36 with prey and feeds three of the chicks the fourth looking on; <http://www.youtube.com/watch?v=DN5fHpqG5nw> Eventually he feeds the fourth chick after it has waited patiently. The male leaves at 6.48 and all the chicks leave the box.

At 7.00 there are no chicks in the box but then after a lot of coming and going all chicks are in, huddled together and sleeping until 8.14 when the adult male comes in with prey; <http://www.youtube.com/watch?v=eE8ErYFvLz4> He starts to feed one chick, but immediately the female comes into the nest box and grabs the prey and feeds the chicks. He quickly departs. By 8.19 the chicks appear full and stop begging and one leaves box although food is available. Even the last born gets a few pieces. At 8.20 the female leaves and the chicks come and go but end up huddled together and sleeping.

From 9.00 to 12.00 the chicks remain in box but restless, sometimes begging. Two nibble each other's bills but eventually they all snooze together.

At 12.37 the adult male comes into the box with prey; http://www.youtube.com/watch?v=Z2yN_uMiuc8 At 12.50 the two female chicks are full and leave the box. The two male chicks are fed, and then leave and a female chick returns and is fed briefly. All the chicks are now full and have left the nest box and at 12.59 the adult male leaves taking some prey remains.

All chicks are out of the nest box and exploring the tower. At 13.04 the adult male flies in, picks prey from the box and flies out again. At 13.12, one chick, and then two, is fed by the male on the tower floor until he flies off at 13.15. By 13.45 and until 15.00 all the chicks are in the box mostly sleeping.

The chicks are restless and moving out of the box. At 15.48 the adult male is feeding fresh prey to all the chicks on the tower floor. Three chicks line up while the oldest female (judged from the covering of darker body feathers) watches and then walks away;

<https://www.youtube.com/watch?v=qLx5oX0jFbk&index=46&list=PLTM1gWIdEpiKcqOpSIOsk7G9GxE0vdWIg>

The youngest female then staggers away, full up from the feeding, and the oldest female takes her place. The three chicks appear to be full up and are more interested in watching the female flying overhead;

https://www.youtube.com/watch?v=Yhkl2CpFP_c&feature=youtu.be

At 16.19 only the two male chicks are left but at 16.21, even though they are being offered small pieces of prey, they refuse any more. At 16.21 the male flies away with the prey which he will probably eat out of sight of the camera, either on the tower floor or on a pinnacle.

At 17.00 the chicks are sleeping together on tower floor and in the nest box. An adult clearly arrives on the pinnacles because the chicks begin to beg but no food is brought to them;

http://www.youtube.com/watch?v=5gN3Q_I_xcY

The adult male collects some prey from a gully and flies over to two chicks on the tower floor at 18.34; <http://www.youtube.com/watch?v=x9yGnbqpuYg> The chicks are fed until 18.37. Afterwards, all four chicks are periodically sleeping in the box or exploring the tower floor.

At 19.00 the four chicks are in the box, restless but after 20.00 they eventually sleep.

For the rest of night the chicks are mostly asleep but also stand and stretch at times. The adult male is present on the roof of the nest box from 22.26 to 23.48 and the tail can be seen in the following clip;

<http://www.youtube.com/watch?v=2kLrFhLhkGI> As noted earlier he was also present from 2.25 to 3.10. I assume the female remains low down on a pinnacle where she is for most of the daylight hours.

Summary

Generally the female remains on the pinnacles keeping an eye on her chicks. The male appears to do all the hunting for prey. On this day, except for the first feed in the morning when the female comes in with prey, the male takes the prey directly into the nest box in the morning period. However, on two out of the four occasions he is immediately moved aside by the female who then feeds the chicks. In the afternoon on all three occasions the male feeds the chicks on the tower floor.

At 4.00 the female comes in with prey and feeds it to the chicks until 4.05.

At 5.43 the male is in with prey, the female follows immediately, grabs the prey and feeds the chicks until 5.47.

At 6.36 the male come in with prey and feeds the chicks until 6.48.

At 8.14 the male in with prey which the female immediately grabs and feeds the chicks until they are full at 8.19.

At 12.37 the male in with prey and feeds the chicks until they are full at 12.59.

At 13.04 the male picks up prey from the box, flies out again and at 13.12 is feeding two chicks until 13.15.

At 15.48 the adult male is feeding fresh prey to all the chicks on the tower floor until they are full up at 16.21.

At 18.34 the adult male collects some prey from a gully and feeds it to two chicks on the tower floor until 18.37.

In total the chicks were fed about seven times most frequently early in the morning. The total time spent feeding the chicks in the 24 hour period was about 90 minutes and on three occasions the chicks were full up with food still available

Feeding at night was not observed but June is not the time of year for night time migration of birds when it is expected that urban Peregrines take advantage of overflying birds at night. With hindsight it might have been useful to have looked carefully through the CCTV records during the two migration periods for any evidence of night time hunting while we had the benefit of the infra-red light. However, this would have been time consuming and most likely the prey would have been eaten on the pinnacles which are out of view of the camera.

This was an interesting but typical 24 hours for a Peregrine family with one month old chicks. The pattern of feeding and activity will of course depend on age – as they become older they beg for food more often and in a further two weeks' time become as large as their parents.

Dave Pearce