



AEWC Ltd

Animal Ecology & Wildlife Consultants

Lesser Horseshoe Roost Monitoring

Northern Quarter

Cinderford

Daniel Whitby
2019

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1 Introduction

- 1.1 AEWCLtd. was commissioned by the Forest of Dean Council to conduct monthly monitoring surveys of all buildings present at the Northern Quarter site from January 2019 to through to December 2019.
- 1.2 These surveys are a continuation of monthly surveys conducted at the site by AEWCLtd. from July 2013 and by other consultancies prior to this.
- 1.3 This report provides the results of the surveys conducted to date at the site by AEWCLtd since January 2019 to December 2019. The results of this monitoring are intended to be used to inform for any proposed development of the site and to be used with licence applications for this site.

2 Method

- 2.1 There are 5 existing historical structures that are surveyed each month by licenced ecologists, the bath house, canteen building, office building, woodland shed and artificial roost. The same survey methodology has been used as was used by AEWCLtd surveys since July 2013 to ensuring consistency of data gathered where possible and suitable.
- 2.2 Surveys are conducted once each month with all buildings surveyed on the same day to ensure accuracy of surveys and no bats are moving between buildings being re-counted.
- 2.3 Each month internal surveys are conducted on the bath house, canteen building, office building and woodland shed, the Artificial roost is only surveyed internally during colder months from October to April due to the high levels of disturbance this would cause to the main maternity roost colony during summer months and inaccuracy of using this survey method with high numbers of active bats present.
- 2.4 During summer months from April to October emergence surveys were conducted using night vision cameras and IR illuminators to enable the visual identification of bats emerging from the building in low light and dark conditions which are otherwise impossible to count the bats present.
- 2.5 Following on from years of data collected at the Bath House and Office building, where repeated low counts were identified using these buildings, these two buildings were counted during daytime internal surveys, and the artificial roost was counted by emergence survey. If numbers were identified to increase in the office or bath house and an internal survey could not get an accurate count then these would also have emergence surveys conducted.
- 2.6 Since June 2017 the two new replacement roosts, Nelson and Birch Wood have also been surveyed monthly to count the number of bats present, check and monitor the building and identify any new notable evidence of use by bats.

3 Results

- 3.1 During 2017 there were a number of changes at the artificial roost in both repairing heaters, and roost modification creating additional access point for the larger colony and to provide an alternate access to reduce risk to the colony from the single access available. The counts during this time were variable, some months recording the highest recorded, by a notable number, and other months lower than the previous year.
- 3.2 Trapping surveys at the roost sites in 2013 did identify that there were unusually high proportions of male bats present using the roost sites, and how the males may move between this and other sites is unknown, however these surveys conducted in 2017 cannot identify the sex of bats present to identify if this has continued into recent years, or of the proportion of the sexes changes throughout the year.
- 3.3 The 2019 survey data provides additional data following these changes to identify if activity and use has remaining consistent and identify any changes in use by bats at the site.

Monthly observations

14th January 2019

With continued colder weather more bats had now left the site with lower numbers found in all areas.

No bats were identified in Nelson roost and only a single LHB in the basement at Birchwood.

No bats were identified in the Office, in the store room and canteen. The Bath House was not surveyed on this occasion.

The artificial roost had 66 bats present, mostly in the large ground floor room with 44, and a number just behind the hot box.

20th February 2019

Although recently warmer, it had mostly been colder since the last survey, especially in late January more bats had now left the site with lower numbers found on the site.

No bats were identified in Nelson roost and only a single LHB in the basement at Birchwood.

No bats were identified in the Office or woodland shed. The Bath House had two bats present, one in the main cupboard and one in the electrics room. Two bats were in the canteen. This can be typical of some bats using transitory roosts to opportunistically forage on any suitable nights.

19th March 2019

With the onset of spring warmer weather the numbers have started to increase with double the numbers present the previous month.

No bats were identified in Nelson roost and only a single pipistrelle in the southern bat box at Birchwood.

There was a single LHB in the woodland shed, the first for over a year. There were 5 bats in the office, the Bath House had four bats present, three in the main cupboard and one in the rear of the bath house.

The main artificial roost had increased to 71, with most bats in the main larger ground floor room.

18th April 2019

No bats were identified in Nelson roost and only a single LHB at Birchwood in a wall box on the ground floor far room.

Nine LHB were present in the office, with 8 being in the drying room. The canteen didn't have any LHB present, when commonly 1-2 are present this time of the year.

The Bath house had a single LHB in the main cupboard, however a GHB was also present in the toilet block. The first for a long time.

The artificial roost had 148 bats present, mostly in the ground floor large room where 96 were found present.

15th May 2019

Bats were present in both the Nelson and Birchwood roosts. Nelson had a single LHB in torpor in a box on the first room ground floor. Birchwood had two bats, one active in the loft area, and one in torpor in a box on the far room. Three pips were also using the southern bat box.

The office had only a single LHB present in the rear roof, unsurprising given the colder recent weather. The Bath house had three LHB, all present in the main central cupboard.

The artificial roost had an emergence survey conducted which had a count of 246 emerge, and one single bat left in the roost at the end of the survey. This is pretty standard, with May still being a slightly volatile month for numbers present. 2018 had only 231, whereas 2017 had 343 individuals.

18th June 2019

Bats were again present in both the Nelson and Birchwood roosts in the same numbers, Nelson had a single LHB in torpor in a box on the first room ground floor. Birchwood had two bats, one active in the loft area, and one in torpor in a box on the far room. Two pips were also using the southern bat box.

The office had its typical summer increase in numbers of bats present with warm dry weather with 34 LHB bats present. The Bath house had only five LHB present, one in the toilet block, one in east hallway, one in rear of bath house and two in east cupboard, which were spread out and not in the main cupboard roosting area. Notably there was a GHB present in the toilet block room. The canteen had only a single natterers present in the ceiling.

The artificial roost had an emergence survey conducted which had a count of 395, fairly typical for this time of year with numbers still slightly variable.

14th July 2019

Bats were again present in both the Nelson and Birchwood roosts, however only a single individual LHB in each building, both in the loft areas.

The office still had its typical higher summer population present with 58 LHB and a single BLEB, with almost all bats, 53, in the rear roof space. The bath house had only 12 LHB present, with the GHB again found present, this time in the eastern hallway. Notably the canteen also had a GHB present in the store room, the first time we have recorded two GHB on the site together, and the natterers in the ceiling.

The artificial roost had an emergence survey conducted which including the internal count had a total of 537, the highest July count on record, however this included pups and may be due to an earlier breeding year.

The Pup count conducted found a total of 125 pups/juveniles present.

17th August 2019

Bats were found present in the Birchwood roost, with three in the loft area, but no bats in Nelson.

The office still had a number of bats present, with 44 individuals along both roof areas. The bath house notably had only a single bat present, the GHB, located inside the main cupboard used as the main LHB roost area. No LHB were found inside the bath house. The canteen again had the single natterers present.

The artificial roost had an emergence survey conducted which had a count of 536. By this date all juveniles were active and flying.

16th September 2019

Bats were found present in the Birchwood roost, with the highest count recorded to date with a total of 9 individuals, five in the loft and four in the ground floor areas. No bats were found in Nelson.

The office had 43 bats present, similar to the previous month, and the canteen again had the single natterers present. The bath house which had no LHB the previous month and a single GHB, had only the single GHB again, and one single LHB.

The artificial roost had an emergence survey conducted which had a count of 376, fairly typical for this time of year with numbers still slightly variable.

13th October 2019

Bats were found present in both the Nelson and Birchwood roosts, with 4 bats in Birchwood and three bats in Nelson, the highest count of bats present in Nelson to date.

The office had only 14 bats present, mostly in the drying room with 12 present. One bat was in the roof and one up a chimney. No bats were identified in the woodshed, canteen or bath house of any species.

The artificial roost was counted internally as bats were in torpor. A total of 299 bats were found present, with most bats 189, found in the main ground floor room. October counts vary notably with the changing weather at this time of the year. In 2013 this was 99 individuals, in 2014 it was 337 whereas the 2017 count was 97. The current count is similar to the 2018 count of 315.

13th November

Bats numbers had notably dropped this month, as expected and typical with the lower temperatures. No bats were found in the canteen, bath house, woodland shed, and only a single bat in the office building.

No bats were found in the Nelson building, and two were present in the Birchwood roosts, one just on the stairs to the basement, and one in the basement. Meaning there were more LHB found in the new artificial roosts than the existing NU buildings.

The main artificial roost was counted internally as bats were in torpor. A total of 181 bats were found present, with most bats 132 in the loft space, mostly in the warmer areas where 78 were in the hot box and 47 just behind the hot box (at least three bats were observed with rings on). The large basement had 48 bats present. It may be bats were still roosting in the warmer areas to try and forage opportunistically on any suitable nights.

13th December

Bats numbers had notably dropped this month, as expected for December and the main start of the hibernation period and more prolonged low temperatures. No lesser horseshoe bats were found in the canteen, bath house, woodland shed, and office building, with a single Brown long eared bat present in the rear area of the office roof.

No bats were found in the Nelson building, and one single LHB was present in the Birchwood roost in the basement, at the same location as the previous month, meaning there were more LHB found in the new artificial roosts than the existing NU buildings.

The main artificial roost was counted internally as bats were in torpor. A total of 84 bats were found present, which is consistent with the time of the year. Just over half the bats were in the ground floor with 19 still using the hot box, and 16 in the rear roof area which is still warmer.

Table 1 – 2019 internal counts existing buildings

Building	Area	January 14th	February 20th	March 19th	April 18th	May 15th	June 18th	July 14th	August 17th	September 16th	October 13th	November 13th	December 13th
Artificial roost	small room+stairs	2	1	4	0	NA	NA	NA	NA	NA	13	1	3
	large ground	44	36	58	96	NA	NA	NA	NA	NA	189	48	42
	upstairs	20	0	9	52	NA	NA	NA	NA	NA	97	132	39
Shed opposite	Artificial roost	0	0	1	0	0	0	0	0	0	0	0	0
Office	main roof	0	0	0	0	0	17	3+1BLEB	23	10	0	0	0
	second roof	0	0	1	1	1	7	53	11	23	2	0	1BLEB
	storage room	0	0	4	8	0	10	2	0	10	12	1	0
Canteen		0	2	2	0	0	1M.n	1M.n+1G HB	1M.n	1M.n	0	0	0
Bath house		NA	2	4	1+GHB	3	4+1GHB	12+1GHB	1GHB	1+1GHB	0	0	0
Total LHB		66	41	83	157	NA	NA	NA	NA	NA	313	182	84

BLEB-Brown Long-eared bats, M.n – Natterers bat, GHB – Greater Horseshoe bat,

Table 2 – Total bats found in Birchwood and Nelson 2019

Building	Area	January 14th	February 20th	March 19th	April 18th	May 15th	June 18th	July 14th	August 17th	September 16th	October 13th	November 13th	December 13th
Birch Wood	Loft	0	0	0	0	1	1	1	3	5	2	0	0
	Ground Floor	0	0	0	1	1	1	0	0	4	2	1	0
	Basement	1	1	0	0	0	0	0	0	0	0	1	1
	Small room	0	0	0	0	0	0	0	0	0	0	0	0
	South Box	0	0	1	0	3 pip	2pips	3pips	3pips	5pips	1pip	0	1pip
	East Box	0	0	0	0	0	0	0	0	0	1pip	0	0
Nelson	Loft	0	0	0	0	0	0	1	0	0	2	0	0
	Ground Floor	0	0	0	0	1	1	0	0	0	1	0	0
	Bat Boxes	0	0	0	0	0	0	0	0	0	0	0	0

- 3.4 During 2019 the emergence surveys were conducted from May to September as there were a high active number of active bats present during this time and an internal count was not accurate.
- 3.5 During 2019 emergence surveys were not conducted of the Bath House or office, the surveys during the previous years had consistently identified low numbers of bats present within the bath house and as such the internal counts were considered accurate, and more accurate to count the bats during the daytime than emergence surveys when not all emergence points were visible.
- 3.6 The total peak counts of Lesser Horseshoe bats using each building and the total for the site is shown in table 3. Generally, the number of bats present using the Northern United buildings is low, especially during the hibernation period where there are only the very odd individuals present. The bottom of table three shows the percentages of the number of bats identified each month using the two main buildings on the Northern United site, the Office and the Bath House, and the two new artificial roosts, Nelson and Birchwood.

Table 2 - Total Lesser horseshoe only counts for each building 2019 (inc pups)

	January	February	March	April	May	June	July	August	September	October	November	December
Artificial roost	66	37	71	148	246	395	537	536	376	299	181	84
Shed opposite	0	0	1	0	0	0	0	0	0	0	0	0
Office	0	0	5	9	1	34	58	34	43	14	1	0
Canteen	0	2	2	0	0	0	0	0	0	0	0	0
Bath House		2	4	1	3	4	12	0	1	0	0	0
Nelson	0	0	0	0	1	1	1	0	0	3	0	0
Birch Wood	1	1	0	1	2	2	1	3	9	4	2	1
Peak Total	67	42	83	159	253	436	609	573	429	320	184	85

% LHB in Bath House	0.0%	4.8%	4.8%	0.6%	1.2%	0.9%	2.0%	0.0%	0.2%	0.0%	0.0%	0.0%
% LHB in Office	0.0%	0.0%	6.0%	5.7%	0.4%	7.8%	9.5%	5.9%	10.0%	4.4%	0.5%	0.0%

% LHB in Nelson	0.00%	0.00%	0.00%	0.00%	0.40%	0.23%	0.16%	0.00%	0.00%	0.94%	0.00%	0.00%
% LHB in Birch Wood	1.49%	2.38%	0.00%	0.63%	0.79%	0.46%	0.16%	0.52%	2.10%	1.25%	1.09%	1.18%

4 Constraints/Limitations

- 4.1 The bat numbers on the site fluctuate notably, not only throughout the seasons but can change notably from one month to the next, and, it is believed from one day to the next. Each survey only acts as a snapshot in time and gives an indication of the numbers of bats using the site, however, numbers present may fluctuate daily with bats moving to, or between, other sites.

5 Discussion

- 5.1 The counts in summer of 2019 are again high with a peak of 609 individuals, again in July. This is similar to the 2018 peak count of 625. This is standard where it was around when many bats were giving birth, many small pups may have been carried out to nursery roosts and so can be very variable. Notably although the July count is lower than 2018, the August count is much higher with around 100 more bats present, a 20% increase.
- 5.2 The winter counts were higher this year, and considered more proportionally standard compared to the previous year or two. The lowest count of 42 in February 2019 compared to 14 and 13 individuals in 2018 and 2017 respectively. The start of hibernation 2019/20 also appears higher with 81 bats, compared to 20 in December 18.
- 5.3 As has been found in previous years the peak count was in July, when pups were present, however the population appears to drop of quickly after this with notably lower August and/or September counts. This clearly shows that simple monthly counts to identify breeding do not work.
- 6.1 The number of bats using all the Northern United buildings has remained notably low over the 2019 season, all with the exception of July, with 11.5% of the colony present at the time using the two buildings. The average percentage of bats using the Office building and Bath house throughout the year is 5.4%
- 6.2 The use of the bath house has remained very low, with more than 10 bats being identified present on only one occasions, with a peak of 12 individual in July. The average occupancy is 2.25 bats representing 1.2% of the colony, around half of the use found the previous year. The bath house has continued to be used by other species with GHB found present on five occasions. The Bechstein's bat was not identified during 2019.
- 6.3 The office is used by a higher number of bats, and has a recorded a peak of 58, representing 9.5% of the colony in July 2019. Proportionally the number of bats using the building isn't high with an average of 16.6 representing an average of 4.2% of the colony.
- 6.4 The canteen and office building have regularly been identified as being used by other species, with a natterers bat and Brown long eared identified present.

- 6.5 Surveys of the Birch Wood and Nelson new artificial roosts were conducted monthly throughout the year. These roosts are still very new and considered stabilising with modifications being made to improve conditions and monitoring ongoing.
- 6.6 The surveys have identified that the Birch wood site is being used regularly, with bats identified present on 11 of the 12 monthly surveys, and a peak of 9 individuals in September 2019. Additionally the numbers of droppings indicate higher levels of use, where it appears that these buildings are being used as night roosts by more individuals. Currently the heaters in the building are not functioning and repairing these is likely to increase the proportion of use.
- 6.7 The Nelson roost has been extremely damp and notably less suitable, modifications have improved this and remained very damp and less suitable. Bats were recorded present on 4 months, with a peak of 3 individuals, however level of use remains low.
- 6.8 The surveys have shown that the population at Northern United is doing well, this appears to be still growing with the vast majority of the population still using the heated original artificial roost. The number of bats using the NU buildings, notably the Bath House has been decreasing from the levels of historic use and while the new artificial roosts are being used, the uptake and level of use remains low.