Report on bat surveys conducted at Claremont Landscape Garden, Esher in July 2004

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Introduction

In summer 2004 the Surrey Bat Group was invited by the National Trust to carry out surveys at Claremont Landscape Garden, Esher (TQ130633), in order to assess the impact of annual open-air concerts held in the Garden on bat activity. Following a preliminary survey of the site to decide on suitable positions for monitoring bat activity, it was decided to conduct surveys using bat detectors on three evenings, before, during and after the concerts.

Methods

Concerts, each followed by a firework display, were held in the Garden on the evenings of 22, 23 and 24 July 2004. Bat surveys were conducted on 19, 23 and 26 July 2004, between 21.00 and 22.30 to encompass the expected early evening peak in bat activity at that time of year. On the first evening, one or two surveyors were positioned at each of seven points around the concert site, as well as the route from it to the public car parking area for the concerts (see Figure 1). Heterodyne bat detectors were used to record the number of bat passes at these points during each 10-minute period throughout the survey. Surveyors also made notes of the bat species recorded; species identities were checked using supplementary recordings made on minidiscs via the frequency division function of Batbox Duet detectors, and analysed using Cool Edit software. As the greatest numbers of bat passes were recorded at points 2, 4, 6 and 7, repeat surveys were performed at these points on the other two dates.

To check that bat passes were not missed by surveyors on the night of the concert owing to the loudness of the music, the number of passes heard by the surveyor directly in front of the stage was compared with the number recorded on the minidisc.

Results

The comparative level of bat activity on each survey date is given in Figures 2 and 3. These show that numbers of bat passes at all survey points were much lower on the night of the concert than on the other two nights. Moreover,

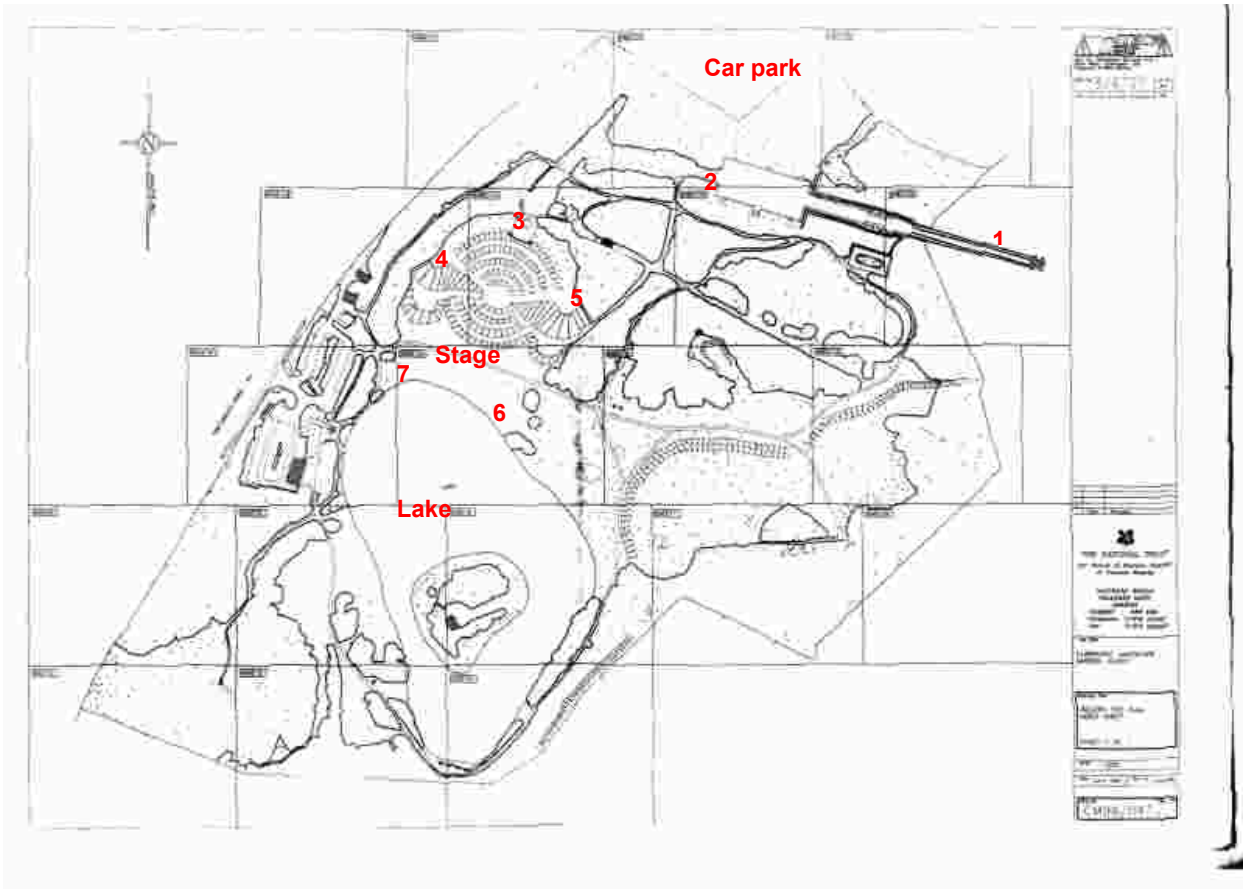


Figure 1. Map of Claremont Garden with survey points marked.

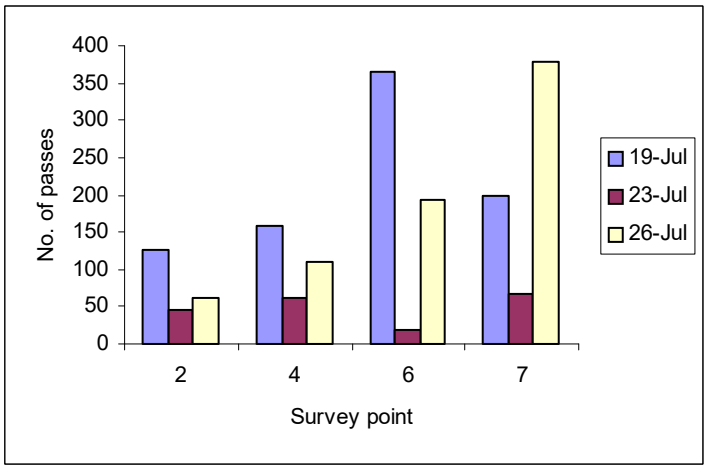
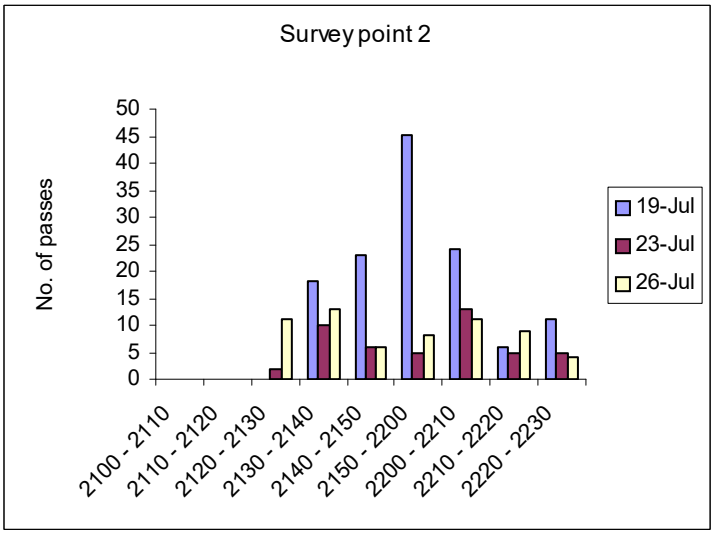
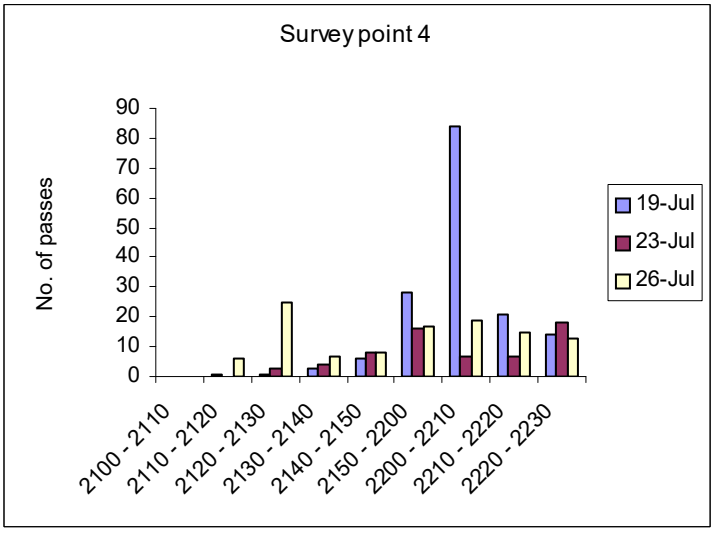


Figure 2. Total number of bat passes during the survey period at each survey point





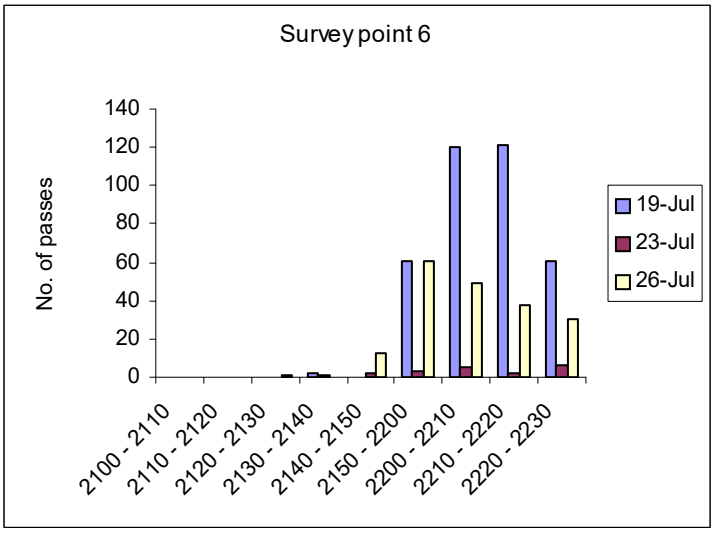


Figure 3. Number of bat passes during each 10-minute period at each survey point (continued on next page).

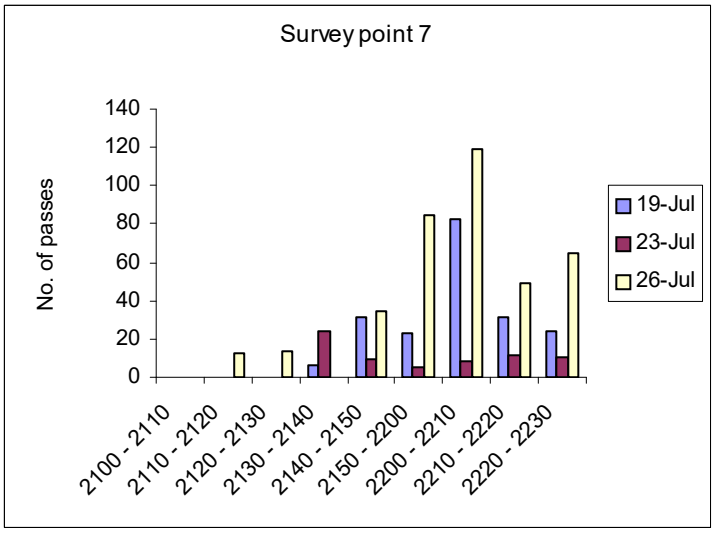


Figure 3 (cont.)

activity levels at points 2, 4 and 6 on the survey night after the concerts remained below pre-concert levels. More bat passes were recorded on the night after than on the night before the concerts at point 7, but this was counterbalanced by a marked drop at the other lakeside survey point (point 6) after the concerts. This suggests that the bats - mainly Daubenton's bats at these points - had moved feeding site (possibly a result of the floodlighting of the island and western side of the lake?). Figure 4 demonstrates that the reduced number of bat passes detected on the concert night was not simply a result of surveyors not hearing the sound from the bat detectors, as a similar number of passes were recorded on minidisc.

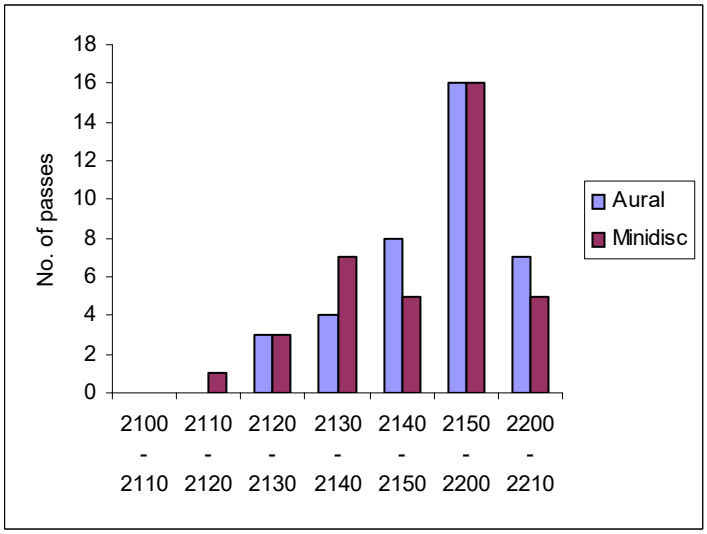


Figure 4. Comparison of numbers of bat passes heard on a bat detector and recorded onto minidisc at survey point 4 on 23 July.

The following species were detected during the surveys:

Common pipistrelle (*Pipistrellus pipistrellus*)
Soprano pipistrelle (*P. pygmaeus*)
Daubenton's bat (*Myotis daubentonii*)
Noctule (*Nyctalus noctula*)
Serotine (*Eptesicus serotinus*)
Leisler's bat (*Nyctalus leisleri*)

(Note: it is impossible to separate all species accurately using aural bat detectors; it is likely that other species, in particular other *Myotis* species and brown long-eared bats, were present but not identified.)

Discussion and recommendations

Population sizes of all British bats are thought to have fallen dramatically during the last century, with numbers of even the relatively common pipistrelles estimated to have decreased by 70% between 1978 and 1993 (Stebbings 1995). For this reason, all British bat species are afforded protection under the Wildlife and Countryside Act 1981 through inclusion on schedule 5, and additionally under the Conservation (Natural Habitats &c.) Regulations 1994 (which were issued under the European Communities Act 1972), through inclusion on annex IV. These make it illegal to kill, injure, capture or disturb bats; or to obstruct access to, damage or destroy bat roosts. The UK is also a party to the Agreement on the Conservation of Bats in Europe, set up under the Bonn Convention; article 3 of the agreement requires protection of all bats and their habitats, including the identification and protection from damage or disturbance of important feeding areas.

Any disturbance of bats while foraging should therefore be avoided as far as possible. Although this was a limited survey, it was clear that feeding activity of bats was affected by the concerts. Reduction in foraging activity was particularly marked by the lake, but also in front of the stage and even well outside the amphitheatre where the sound from the concert was less loud. We

would therefore speculate that at least part of this disturbance was due to the lighting of the concert area, the lake, and the route from the temporary car park to the auditorium. If the concerts are to be repeated we would recommend:

a) replacing the strings of lights placed high in the trees with low-level, downward-angled lights: this should be sufficient to allow people to find their way to and from the amphitheatre safely;

b) avoiding having bright, flashing lights shining from the stage onto the auditorium [which, as part of the audience, I found quite annoying in any case! - LW];

c) avoiding floodlighting the lake: Daubenton's bats, in particular, are specialist feeders over water, therefore illumination of water bodies can reduce their potential feeding habitat severely.

Finally, we would suggest giving serious consideration to whether post-concert firework displays are justified in view of their obvious impact not only on bats but on other wildlife (large numbers of roosting wildfowl flew up from the lake as the display started).

It should be noted that this study was organised at short notice and was therefore restricted in both duration and area covered. It is hoped that further surveys can be carried out to establish more accurate baseline data on the use of Claremont Garden by bats, and whether bat activity in other parts of the Garden is affected by the summer concerts.

The occurrence of Leisler's bats, two of which were heard flying over the amphitheatre on the first survey night, but which were not detected during subsequent surveys, was of particular interest as this is one of the rarest mainland British bat species (see Table 1). The Surrey Bat Group would be

Table 1. Estimated British mainland bat populations (Altringham 2003).

Species	Population size
Pipistrelle (common + soprano)	2 million
Brown long-eared bat	200,000
Daubenton's bat	150,000
Natterer's bat	100,000
Noctule	50,000
Whiskered bat	40,000
Brandt's bat	30,000
Lesser horseshoe bat*	17,000
Serotine	15,000
Leisler's bat	10,000
Barbastelle*	?5000
Greater horseshoe bat*	4000
Bechstein's bat*	1500
Grey long-eared bat	1000
Nathusius' pipistrelle	?

* Species listed in EU Habitats Directive Annex II.

particularly interested in conducting further work to find out whether this species is roosting or foraging within the Garden.

Note

The opinions expressed in this report are those of the authors, and not necessarily those of other members of the Surrey Bat Group.

Acknowledgements

We would like to thank the staff of Claremont Garden for inviting us to conduct these surveys, and for providing access and assistance. Many thanks to all the Surrey Bat Group members who helped out with the surveys at short notice.

References

Altringham J (2003). *British bats*. London: HarperCollins.

Stebbings RE (1995). Why should bats be protected? A challenge for conservation. *Biological Journal of the Linnean Society* **56A**: 103-118.