STAG BEETLE SIGHTINGS ON FALSE-ACACIA STUMPS

Maria Fremlin

In Nature in North-East Essex 2010 I wrote about a female stag beetle, *Lucanus cervus*, attracted to a stump of a freshly cut false-acacia *Robinia pseudoacacia,* in a Maldon Road drive, TL986243, on June 26, 2009 (Fremlin, 2010). This was a fleeting observation because the female promptly disappeared into a crack; nevertheless it raised several questions and the only way to answer them was to keep an eye on this stump (Figure 1). Now, I have the pleasure of reporting here on the results of 2 years intensive monitoring of this stump and a couple of smaller false-acacia stumps in the adjacent front garden which were cut about the same time (Fremlin, 2010).

Figure 1: March 28, 2012, large false-acacia stump on a front garden drive, diameter approx. 66cm excluding the bark. In the foreground are heartwood remains full of larval channels.
Photo: Maria Fremlin

METHODS

In order to monitor these stumps during the flight season I included Maldon Road in the area that I have been monitoring since 2005 daily in the evening from 21.30 hrs (BST), starting from early May. My route in 2010 -2011 covered the streets and an alleyway in the vicinity of our house, 25 Ireton Road, TL986245, an area roughly 165 m x 210 m. When possible, I capture, measure, weigh, mark and release all the stag beetles encountered during the season; I puncture their elytra with a needle following Mendéz (2008). This allows me to follow their movements, etc.

RESULTS

The total numbers of *L. cervus* sightings by the large stump during 2010 and 2011 were respectively 25 and 18; they are included in Table 1 together with the summarised overall results. They represented 9 percent of the total sightings in the monitored area: a significant activity.

In 2010 the first sightings were of 5 flying males on June 9, 6 days after emergence, which was rather late that year, but in the end it turned out to be a very good year for stag beetles; a total of 295 sightings. Soon after that, 12 June, I discovered a dead female in a crack at the base of the stump. This female was very old; she had white eyes and worn front tibia; perhaps a corpse from the previous year?

Table 1: Results of *L. cervus* monitoring during 2011-12: captured beetles, sightings in the monitored area and by the large false-acacia stump.

Season	May 16 – September 5, 2010			May 5 – June 23 & July 2 - August 10, 2011		
	No. of marked beetles	Sightings in the monitored area	Sightings by the stump	No. of marked beetles	Sightings in the monitored area	Sightings by the stump
Male	58	146	13	35	87	10
Female	53	107	11	45	85	8
Unknown		42	1		22	
Total	111	295	25	80	194	18

The males' sightings, 13, include two recaptures one of which was dead, all observed until July 7. The first live females' sightings were from July 2 and a couple of them even tried to dig into the concrete area by the base of the stump. The last female died on August 9; a total of 11 sightings which include 3 recaptures.

Lastly, I glimpsed a lesser stag beetle *Dorcus parallelipipedus* through a crack in the bark, August 15, and managed to prise it out. It was a male, recaptured 6 days later in the same spot.

In 2011 there was an unusually warm April and this brought out the stag beetles rather early. My first sightings of the season were by this stump: 2 flying males, on May 7 (see photo p85). But Neil Warren, the resident of this property, had seen one male close by under a bush in the front garden, 3 days earlier.

Two days later, May 9, there was great activity by the stump around a female which attracted 5 males. I saw them flying, fighting and one successful mating. One of the males was a recapture from the previous day, 16m away. These were my last live male sightings there. After that I collected 2 males that had been killed by predators, one of which was a recapture, from May 9.

Three female sightings overlapped with the males until June 20, one had also been killed by a predator. The rest of the females came afterwards and 1 more was killed by a predator.

The last female died on August 5. Soon after I stopped monitoring because the season had come to an end; there were fewer sightings than in the previous year, 194, but was still a fairly good one.

This year I saw another male lesser stag beetle there in July.

Apart from these two species of stag beetles and the wildlife one would expect there, I also found a spider attacking a moth caterpillar, a frog and even a couple of newts in August 2010. There is a pond in the back garden of this property, about 30 m away.

There were no stag beetle sightings by the two smaller false-acacia stumps on the next door front garden during the two seasons.

At the time of writing, March 2012, the heartwood of all the stumps has decomposed. In the large stump all that remains of it are loose bits of wood riddled with larval channels characteristic of *L. cervus*, shown by the stump on Figure 1. Inside this stump there is now a lot of brown wood mould that travels deep into the root system. In it I found body fragments of several adult stag beetles, 3 males and a small right elytron with a number 10 puncture, possibly of an early female. Interestingly there were a few faecal pellets from *L. cervus* and plenty from rose chafer *Cetonia aurata* larvae; however there were no larvae at all.

The heartwood of the smaller stumps has also decomposed, but I could find no wood with larval channels. Their deep hollows are now filled with wood mould with many faecal pellets from *C. aurata*.

DISCUSSION AND CONCLUSION

There is clear proof that stag beetles *L. cervus* have promptly colonised the large false-acacia stump. The finding of a very old female corpse early in 2010 indicates that in 2009, soon after it had been cut, at least 2 females had been attracted to it.

Monitoring a stump in such an isolated habitat allowed very interesting observations of the stag beetles' behaviour throughout the season; in particular at the beginning of the season there was a confirmation of what I had already observed around other freshly colonised sites: strong male competition over scarce females and matings (Fremlin & Fremlin, 2010). It has been reported that "matings occur in a frenzy of activity at the end of the flight season" (Harvey *et al*, 2011), however I have never observed it in this area. Later in the season, the males lose interest while the females are busy doing their egg-laying rounds and their sightings by the stump confirmed this.

It was rewarding to monitor this stump until the end of the season; this way I was able to observe the females' physical decline. As they reach the end of their lives their front leg tibia become blunt, they lose weight and near the end become very flaccid. Some came up to die above the ground by the stump.

Interestingly, lesser stag beetles *D. parallelipipedus* have also been attracted to the large stump; both stag beetles are saproxylic species - dependent on dead or decaying wood during their immature stage - and often share their habitat. However lesser stag beetles are not often sighted because they behave very differently from their bigger cousins (Fremlin & Hendriks, 2011). Even more interesting was that, judging from the faecal pellets, rose chafers *C. aurata* were also attracted to it. These three species are locally abundant.

The fact that the stag beetles seem to have ignored the other 2 stumps but not so the rose chafers, was rather unexpected. The latter are more generalist feeders; indeed in this area I often find their larvae in compost heaps, etc. (Fremlin, 2008) but only occasionally sharing the wood with *L. cervus* larvae. This species on the continent is considered saproxylic, but not so in the UK. For example, it has been omitted from the list of saproxylic invertebrates in Essex (Hammond *et al.*, 2011).

In the NNEE 2010 I asked a question: "If this stump were successfully colonised would the stag beetles be able to emerge?". This May I am going to watch it carefully for any signs of that. As the minimal duration of their larval stage is two years (Rink & Sinsch, 2008, and pers. observ.) the results of those two females' visits in 2009 might be turning up. I shall keep you posted.

Acknowledgements

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Further news, just before going to press.

Yes, they were able to emerge! Two male stag beetles were successfully trapped inside the stump hollow; they emerged on May 21 and 23, 2012, thus proving that their life cycle may last as little as three years.