

## MONITORING A PURPOSE BUILT ‘STAG BEETLE CONTAINER’ IN HIGH WOODS COUNTRY PARK

*George Davidson, Maria Fremlin and Sonya Lindsell*

High Woods Country Park (HWCP) is a 150 ha (370 acres) park North of Colchester consisting of ancient woodland, Sweet Chestnut coppice woodland, grassland and scrub. It is a public park located in an ever-increasing urban setting but it still manages to retain its countryside feel and at the same time conserve its biodiversity.

One of the species sighted in the park is the European Stag Beetle *Lucanus cervus* L., which is a protected species under Schedule 5 of the Wildlife and Countryside Act 1981 (sale only) and a species listed as a priority species for conservation. In 1998 under the direction of Jerry Bowdrey, then the curator of the Colchester Natural History Museum, the first Stag Beetle pyramid in the country was built at the edge of a copse of trees in the park. This artificial Stag Beetle nursery was built with thick logs according to Tochtermann (1998) in the hope of boosting their habitat. After that pyramids became a very popular artificial habitat in the country and several more were installed in HWCP, but for various reasons became difficult to monitor.

In 2005 a wood chip path in a London park was dug up in order to replace it with a low maintenance surface, and hundreds of Stag Beetle larvae were found (Fremlin, 2005).

Based on the idea that they favoured wood chips, Maria Fremlin set up an experiment with fresh wood chips in her garden and surprisingly they were promptly colonised; the chips decomposed into a dark soft mould in two years. Inspired by this, George Davidson decided to do the same in HWCP.

For the location he choose the Big Garden. This garden was set up in the park back in 2007 as part of the Big Garden Project, now run as the 'Together We Grow Community Interest Company' managed by Wayne Setford.

The project essentially consists of a large allotment plot run by volunteers where all sorts of vegetables and fruit are grown. Within this space are six 1.2 m × 1.2 m × 0.8 m compost bins made out of old wooden pallets.

In May 2012 George built a seventh bin and filled it with hard wood chips and ten seasoned logs: 9 willow (*Salix* spp.) and 1 hazel (*Corilus avellana*), all resourced in HWCP.



*Photo 1 (see legend at end of article) - all photos are by Maria Fremlin*

From then on this 'Stag Beetle container' was monitored for Stag Beetles in the hope that we had tempted them in and at the same time be able to follow their development in the field, right from the beginning.

## Monitoring results

From 2013 until 2015 we monitored this container in the spring by carefully digging out the layers and placing them on wheelbarrows or a tarpaulin; then putting everything back.

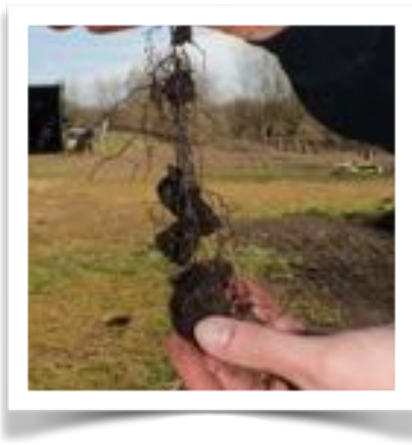


Photo 2



Photo 3

Fungi moved in promptly as expected, they are the front-runners of wood decomposition. We found white mycellia and rhizomorphs on both the chips and the logs, probably of **Honey Fungus** (*Armillaria* spp.) a widespread species.



Back garden ants (*Lasius niger*) were nesting there together with worms. Both favour decomposing organic matter. With their combined action the level of the chips was lowering as they were turning slowly into a nice brown mould.

Since we had no success in finding signs of Stag Beetle activity, we stopped monitoring this habitat.

Photo 4

Afterwards, on two occasions people who had been renovating their gardens and in the process unearthed rotten wood containing Stag Beetle larva brought them into the park visitor centre. Stag Beetles' breeding sites are very cryptic, hence these people did not realise what they had done until it was too late; unfortunately this happens all the year round in Stag Beetle hotspots (Fremlin, 2013). However, they had the good sense to realise they should be re-homed if possible. One lot were brought in in 2016 and the other in 2018. Those in 2016 came with a small piece of rotting log containing about four large larvae. Those in 2018 came with four or five logs containing about six to eight large larvae. All the larvae were probably at the third instar stage already and if they relocated successfully they would pupate and emerge either the following spring or the next depending on the weather conditions (Fremlin, 2016). On both occasions the rotten logs containing the larvae were relocated to the 'Stag Beetle habitat container' in the Big Garden.

One of the projects for 2020 was a Biological Survey for HWCP (Lindsell, 2020), a good motivation to re-survey this purpose built 'Stag Beetle habitat container' and we did it in February - extremely well timed considering what happened next.

The level of the mould was considerably reduced, down to bottom third of the container, the logs were rotting very well and plants had colonised the top.



*Photo 5*

Interestingly we found in the mould and the rotting logs a total of 56 larvae: five in the second instar; and 51 in the third [and last] instar, 23 females and 28 males. Plus, one teneral adult male, but these were of the Rose Chafer *Cetonia aurata* L. not Stag Beetles



*Photos 6 & 7*

In this area this species has a two-year life cycle; that is, larvae from eggs laid during late spring-early summer will overwinter once and then pupate the following summer, the adults will overwinter and reproduce the following season.

This implies that the teneral adult was from an egg laid in 2018 and the larvae from eggs laid in 2019. Therefore, this was an excellent result, because until 2019 when Peter Beard found the first foraging Rose Chafer in HWCP, there were no Rose Chafer records north of Colchester.

So this has provided evidence not only that they are successfully breeding in the park, but also supports the idea that they are expanding their range in Colchester, which is a remarkable isolated hotspot in North East Essex (Fremlin, 2018).

We also found two predacious wireworms, probably Click Beetle larvae (Elateridae), but no ants or Stag Beetle larvae. As we did not clear the container right down to the soil level and dig into the soil below, we cannot rule out that the 2018 relocated Stag Beetle larvae had not moved into the soil to pupate, so there could have been some overwintering teneral imagos.

Exit holes could have been checked for in May/June but due to Covid 19 restrictions life wasn't running as normal so this could not be arranged. Also we could not check if the Rose Chafers were breeding in the other compost bins or elsewhere in the park.

## **Conclusion**

It is impossible to know what happened to the Stag Beetle larvae relocated in 2018 because we did not search below soil level and we were not able to check for emergence holes. However, the container has become a perfect habitat for the Rose Chafers.

Rose Chafer larvae are excellent composters so it will be important to keep the 'habitat container' topped up with wood chips and logs so it can continue to provide the right conditions to tempt a variety of beetles, whether that be Stag Beetles (hopefully in the future) or Rose Chafers.

Thus, this experiment was not a total success or total failure, but has gone to show how valuable compost heaps and rotting wood piles are to wildlife and we should all endeavour to have at least one of each in our gardens if we can.

## **Photo legends**

Photo 1 - Compost bin filled with seasoned wood and wood chips, April 2013.

Photo 2 - George Davidson monitoring in April 2013. Note the dark colour of the chips.

Photo 3 - Sonya Lindsell monitoring in April 2015. Note the lower level of the mould.

Photo 4 - Rhizomorphs attached to the mould, April 2015.

Photo 5 - Top of the compost bin, February 2020.

Photo 6 - Rose Chafer *Cetonia aurata* larva, third instar, inside its chamber.

Photo 7 - Rose Chafer *Cetonia aurata* larvae. Third instar: 28 females on the right, 23 males on the left; 5 second instar in the middle with the teneral adult male beetle.

## References

Fremlin, M. (2005) Stag beetle larvae found in woodchip beds, [http://maria.fremlin.de/stagbeetles/london\\_v](http://maria.fremlin.de/stagbeetles/london_v) beetle takes at least 3 years in the UK, <http://maria.fremlin.de/stagbeetles/lifecycle.html>

Fremlin, M. (2013) Results of the “Stag Beetle 'larval incidents' in private gardens” survey. *Essex Naturalist (New Series)* **30**: 94-106.

Fremlin, M. (2018) The Rose Chafer *Cetonia aurata* L. (Coleoptera: Scarabaeidae: Cetoniinae) in Essex: distribution and some aspects of its ecology. *Essex Naturalist (New Series)* **35**: 167-178.

Lindsell, S. (2020) Biological Survey Project High Woods Country Park 2020. *Cervus, Newsletter No 91*, Spring/Summer 2020: 36-37.

Tochtermann, E. (1987) Modell zur Artenerhaltung der Lucanidae. *Allgemeine Forst Zeitschrift* **8**: 183-184.

## Errata

The first reference above is incorrect, what it ought to be is two references:

Fremlin, M. (2005) Stag beetle larvae found in woodchip beds, [http://maria.fremlin.de/stagbeetles/london\\_veluwe.html](http://maria.fremlin.de/stagbeetles/london_veluwe.html)

Fremlin, M. (2016) The life cycle of a stag beetle takes at least 3 years in the UK, <http://maria.fremlin.de/stagbeetles/lifecycle.html>

