

Report

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**NEW FOREST CICADA (*Cicadetta montana* Scopoli)
(Hemiptera: Cicadidae): Progress Report 2008**

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1.1. Summary

This report summarises work on the New Forest Cicada during 2008.

At Gibbet Wood no cicada turrets, singing males or current year's egg nests were recorded.

Temperature records are presented from miniature temperature loggers installed at two different depths below the ground in Gibbet Wood, one was also buried in an area of relatively recent clear-fell habitat in Island Thorns Inclosure.

Habitat management through bracken spraying was completed by the Forestry Commission in July.

No cicada song was heard in the New Forest during 2008. Coverage at Gibbet, Denny and Matley Woods, King's Garn Gutter, Raven's Nest Inclosure, Island Thorns and Furzy Lawn Inclosures was good, so we may conclude that cicadas were either absent or present in exceedingly low numbers.

Suggestions for future research, and monitoring are presented.

1.2 Monitoring Cicadas at Gibbet Wood in 2008

1.2.1. Turrets

One visit was made to the glades to search for the presence of pre-emergence turrets on 7th May. Despite a thorough search of the whole area no earthworks resembling turrets could be found.

1.2.2. Singing Males

Four visits were made to listen for the presence of singing males. The visit dates were 8th, 9th June and 1st and 4th July. All visits were made between 10:00 and 16:00hrs, and only when the temperature was greater than 18°C and the wind was only slight. No cicada song was heard during any of the visits.

1.2.3. Egg Nests

A search was made for egg nests during the visit on 4th July but no nests of the current year were found.

1.3. Other Monitoring at Gibbet Wood in 2008

1.3.1 Temperature Logging

Cicada activities such as turret building, emergence, flight, and oviposition are temperature related. Grant & Ward (1992) found that *C. montana* sang more readily at temperatures >19.9 °C. In many parts of western Europe *C. montana* occurs on hot south-facing slopes and these are often areas that are much colder in winter than the UK. It seems likely therefore that the decline in UK populations could be related to lack of suitable habitat with warmer temperatures in spring and summer.

Miniature temperature loggers (Tinytalk II) were placed in the soil at two depths (5 and 15 mm) in Glades 1 and 4 at Gibbet Wood in the same positions in previous years. One logger was placed at 5 mm depth at Island Thorns in an open area after clear felling. The full records of temperatures (°C) were from 23/2/08 to 5/10/08 at 3-hourly intervals (1800 records). The logger at Island Thorns Clear Fell needed repair, and was placed out later - on 21st March.

All available data from the temperatures loggers (1977-2008) have been stored in an ACCESS database (cictemps.mdb).

1.3.2 Results

The results for 2008 for the two glades at Gibbet Wood and for the curtailed time at Island Thorns (clear-fell) are shown in Figure 1. The summer was generally rather cool, apart from May when temperatures rose above 20°C in Glade 1 at 5 mm at Gibbet Wood (May 6-9, 11-15 and 21). Thereafter there were only two short periods with these warmer temperatures (June 8-11 and July 27-28). The logger at Island Thorns at 5 mm had comparable results although the site was relatively cooler in spring and warmer in the summer. The logger in Glade 4 at Gibbet Wood at 5 mm the maximum temperature recorded was only 17 °C.

When logger records for two soil depths at Gibbet Wood were compared, this again showed, as in previous years, that the ground was much cooler at 15 mm as compared to 5 mm, and that diurnal fluctuations were markedly reduced in amplitude. This was especially clear for the temperature records from the loggers in Glade 4.

Temperature records at Gibbet Wood began in 1997 after clearance of the glades, and these long runs of data are now useful in showing the changes over the years. Figure 2 compares the temperature in 2008 at 5 mm in Glades 1 and 4 with the mean temperatures from 1997-2001 and 2002-2006. Throughout this time the larger and less shaded Glade 1 has been warmer than the small Glade 4. Seasonal comparisons show that in spring (until early May) temperatures in 2008 fluctuated but were not consistently different to the mean figures for earlier years. This is thought to be because shading is much less critical in the early part of the year, whereas in summer the increase in vegetation growth progressively cools the ground. This summer affect was shown in 2008 for both Glades 1 and 4, particularly in the latter.

However Glade 1 was mainly warmer in 2002-6 as compared to 1997-2001.

Another way of showing how cooling might be affecting a cicada habitat is to count the number of days in spring and summer with temperatures >19.9 °C (Fig. 3). A reduction in numbers of warm days is obvious for all sites. Glade 1 at Gibbet Wood had some 50-65 warm days for the first 10 years, but this has declined sharply in the last two years, to only 16 days in 2008. At Island Thorns the cleared area was initially very warm with 92 days in 2002, but this fell more steeply than at Gibbet Wood (Glade 1) to 20 days in 2008. The smaller Glade 4 at Gibbet Wood has always been colder and there were no days with temperatures >19.9 °C in 2008 (no records for 207 as logger was disturbed).

1.3.3 Conclusion

Habitats for *C. montana* are usually open ground with bushes on warm south-facing slopes. However these are dynamic successional habitats with progressive shading due to the growth of both field layer (bracken/heather in the New Forest) and of taller shrubs and trees. Thus all the study sites have become cooler. Glade 1 at Gibbet Wood retained reasonable warmth over nine years of temperature logger records since 1997, probably due to its larger size and to management to reduce bracken re-growth by cutting/Asulox treatment. However this Glade was much cooler in 2007 and 2008. From April-July only 16 warm days with temperatures >19.9 °C were recorded in 2008. The unmanaged Island Thorns clear-felled area was initially very warm but demonstrated a faster decline in warmth than Gibbet Wood from 92 days in 2002 to 20 days in 2008. Glade 4 at Gibbet Wood is a small size with more shading and was only really warm in the first year after clearance.

The results show that the times scales over which temperatures cool in this successional habitat might mean that *C. montana* could oviposit on a favourable site, but when the adults emerge after 6-7 years underground the habitat may have become unsuitable. Dispersal to new areas might then be imperative. Sites such as Glade 1 at Gibbet Hill remained suitable for longer allowing for the build-up of annual populations, and it is important to understand why this might occur. In 'natural' conditions this is thought to relate to dry nutrient poor areas in full sun where vegetation is slow to colonize and grow dense and tall, while elsewhere the changes might be slowed by management measures to control vegetation growth and shading and attempts to 'reverse' successional change.

Variation in temperature is obviously highly multi-factorial. Although general trends can be related to habitat in our data, we cannot exclude that part of the variation due to inter-year differences in weather because our loggers are situated in a changing environment. As this should be better studied, an initial exploration was made into additional information from a standard Meteorological Office recording site in Hampshire (Hurn). The mean maximum temperatures for each month were compared for the last 15 years. These showed that 2008 was indeed a poor summer. August was the coldest for 15 years, while April and July were 10th coldest and June the 9th coldest. However May was the second warmest month. Rainfall (mm) was greater than average in all months except June: July was particularly wet (2nd highest out of the 15 years).

1.3.4 Other Insects Recorded

A number of insects were recorded in the glades at Gibbet Wood, whilst surveying for cicadas. A list of those species recorded appears below, 306 insect species have been recorded here between 1994 and 2006. All data has been entered into an ACCESS database (*cicada3*). All records have also been submitted to the relevant county and national recorders.

- 7th May** Lepidoptera: Butterflies
Celastrina argiolus
Diptera: Beeflies
Bombylius major
Hymenoptera: Aculeata
Andrena haemorrhoa, Andrena subopaca
- 8th June** Odonata, Dragonflies
Cordulegaster boltonii
Orthoptera and allies:
Nemobius sylvestris (N), Tetrix undulata
Diptera: Hoverflies
Episyrphus balteatus, Myathropa florea, Microdon analis (N)
Diptera: Beeflies
Bombylius major
Hymenoptera: Aculeates
B. pascuorum, B. pratorum, Apis mellifera
Coleoptera: Longhorn Beetles
Rhagium bifasciatum, Leptura rubra
- 9th June** Orthoptera and allies
Nemobius sylvestris (N), Chorthippus brunneus, Chorthippus parallelus
Diptera: Hoverflies
Epistrophe eligans, Eristalis pertinax, Eristalis tenax, Melanostoma scalare, Microdon analis (N)
- 1st July** Lepidoptera, Butterflies
Maniola jurtina
Orthoptera and Allies
Chorthippus parallelus, Chorthippus brunneus, Pholidoptera griseoptera
Diptera: Hoverflies
Melanostoma scalare, Eristalis pertinax, Eristalis arbustorum
Hymenoptera, Apidae
Bombus pascuorum, Apis mellifera

1.4. Other Possible Cicada Sites

1.4.1. Denny and Matley Woods

Four visits were made to Denny and Matley Woods on 6th and 31st May and the 7th and 30th June to search for pre-emergence turrets, and to search for the presence of singing males. Visits were made between 10:00 and 16:00hrs, when the temperature was above 18°C and the wind only slight. No cicada song was heard during any of the visits.

1.4.2 King's Garn Gutter

This area was visited on two occasions, to search for singing males and egg nests. The visits were made on 9th June and 1st July. No evidence of cicadas was recorded during any of the visits.

1.4.3 Furzy Lawn Inclosure

Following the discovery of a possible turret and hearing possible song in 2000 this area has been visited with more frequency. Two visits were made on 10th June and 1st July. No turrets or structures resembling turrets were found and no instances of song recorded.

1.4.4 Island Thorns Inclosure

This area had been identified as having suitable looking habitat during survey in 2001. One visit was made to search for singing adults on 11th June. No evidence of cicadas was recorded.

1.4.5 Raven's Nest Inclosure (SU256147)

Two visits were made to this area on 8th June and 4th July to listen for cicada song. The proximity of this clear-fell/replant area to Gibbet Wood suggested it should be worth visiting. Suitable habitat exists throughout much of the area, but no cicada song was heard.

1.5 Reports of Cicadas

There were three reports of cicadas received during the year.

The first related to a specimen circling a skylight in a house in Bursledon, Southampton on the evening of 8th June. It was described in an E-mail as ‘...sounding like a cicada but not looking like the ones...’ the reporter had seen in France. The reporter had opened the window to allow the insect to escape before reporting the find. This is thought to have been the Tabanid fly *Tabanus sudeticus*, the weather conditions had not been suitable for cicada activity (temperature only reaching a maximum 17°C with a strong cooling wind) and the site is some considerable distance from known cicada sites within the New Forest.

The second record came from ‘a keen amateur naturalist’ who is familiar with cicadas in Europe and Africa. He reported hearing what he thought was cicada song ‘...on the edge of the New Forest near Ringwood Campsite.’

Despite a request for further information relating to this record including date, time and weather conditions no information was received.

The third record was of a dead cicada found at the military base at Aldermaston, Hampshire. This specimen has been donated to the collections of Hampshire County Museums and Archives Service at Winchester. The specimen is of an unknown species of cicada and is thought to have arrived within the packaging material of an unspecified ‘parts’ delivery.

1.6. Photographic Monitoring

Fixed point photography was continued in the glades at Gibbet Wood with the photographs being taken on 8th October. Plate 1 illustrates the current condition of four glades. Plate 2 illustrates the location in clear-fell of the temperature logger in Island Thorns Inclosure, and the site of replanted clear-fell where a logger has previously been placed.

1.7. Habitat Management Works

Proposals were made to spray the bracken regrowth in all the glades during July 2007 but prolonged periods of heavy rainfall prevented this taking place. This work was undertaken in July 2008.

It is hoped that the increased light levels available in the glades will be of benefit to the ground flora and invertebrate populations already present, in addition to continuing to provide ideal conditions for the cicada.

1.8. Discussion

1.8.1. Monitoring and Research

The monitoring of any signs of cicadas should continue at Gibbet Wood. This includes searching for pre-emergence turrets, egg nests and listening for singing males.

Equal attention should also be paid to areas highlighted from previous surveys as time permits. These priority sites are Denny and Matley Woods, Pig Bush and Honey Hill, Ferny Crofts, and Raven's Nest, Island Thorns and Furzy Lawn Inclosures and Bramshaw Wood.

1.9. References

GRANT, J.A. & WARD, L.K. 1992. English Nature Species recovery programme - New Forest cicada (*Cicadetta montana* Scopoli) (Hemiptera: Cicadidae). pp 52 + 6 figures. English Nature/NERC Contract (T09056k1)

2.0. Acknowledgements

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The New Forest Cicada Steering Group wishes to acknowledge the financial support of Natural England.

2.1. Figures

1. Temperatures (°C) 2008 at Gibbet Wood in Glade 1 and 4 at two depths and at Island Thorns in the clear-felled area.
2. Maximum daily temperatures (°C) at Gibbet Wood in Glades 1 and 4 at 5 mm in 2008 compared to the means for 1997-2001 and 2002-2006
3. Numbers of days April-July 1997-2008 with maximum temperature >19.9 °C at Gibbet Wood and in the cleared area at Island Thorns (Belgian cicada site in 2001 shown for reference: loggers at 5 mm: * some missing data values interpolated)

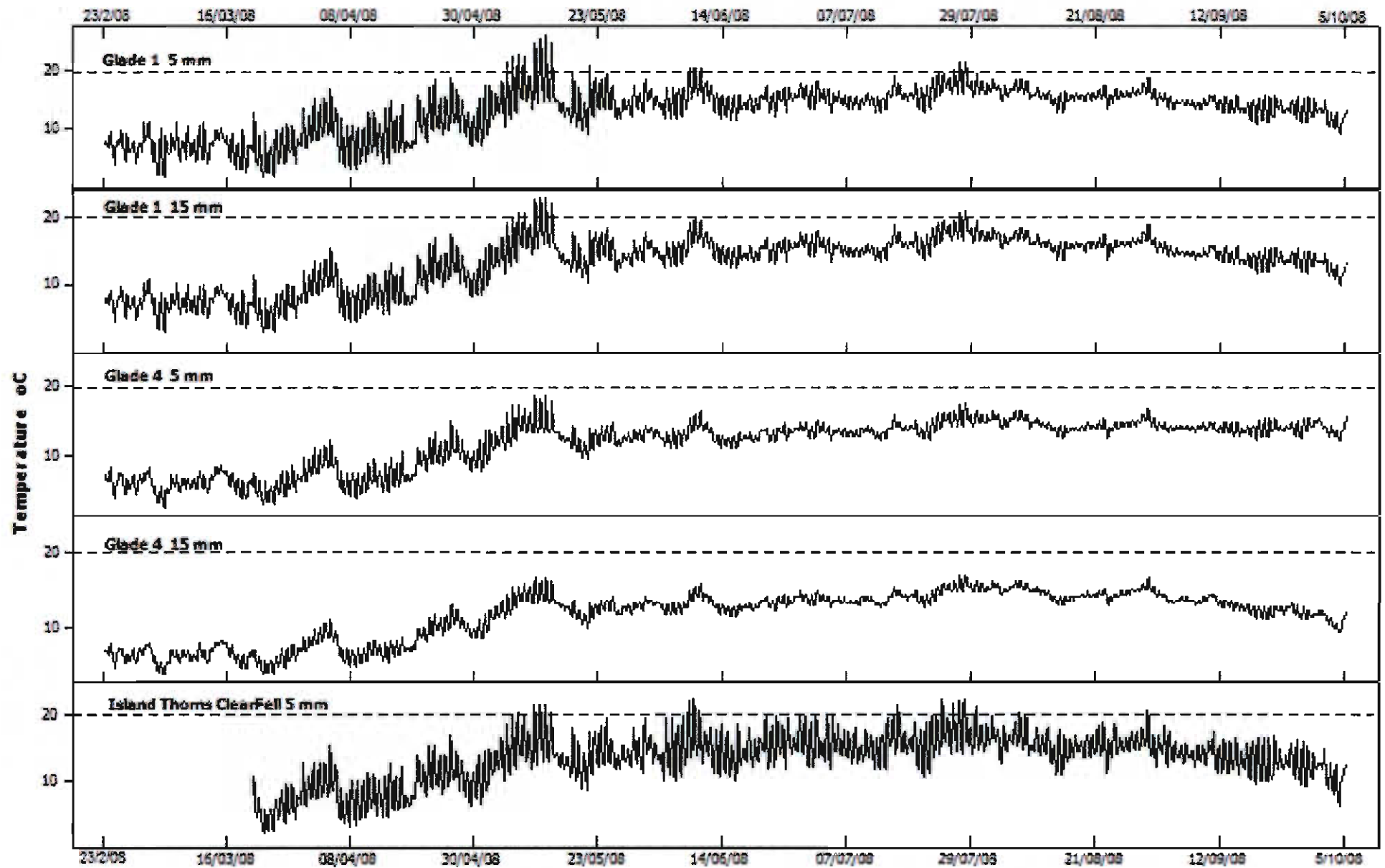


Fig.1 Temperatures (°C) in 2008 at Gibbet Wood in Glades 1 and 4 at two depths, and at Island Thorns in the clear-felled area

Fig. 2 Maximum daily temperatures (oC) at Gibbet Wood in Glades 1 and 4 at 5 mm in 2008 compared to the means for 1997-2001 and 2002-2006

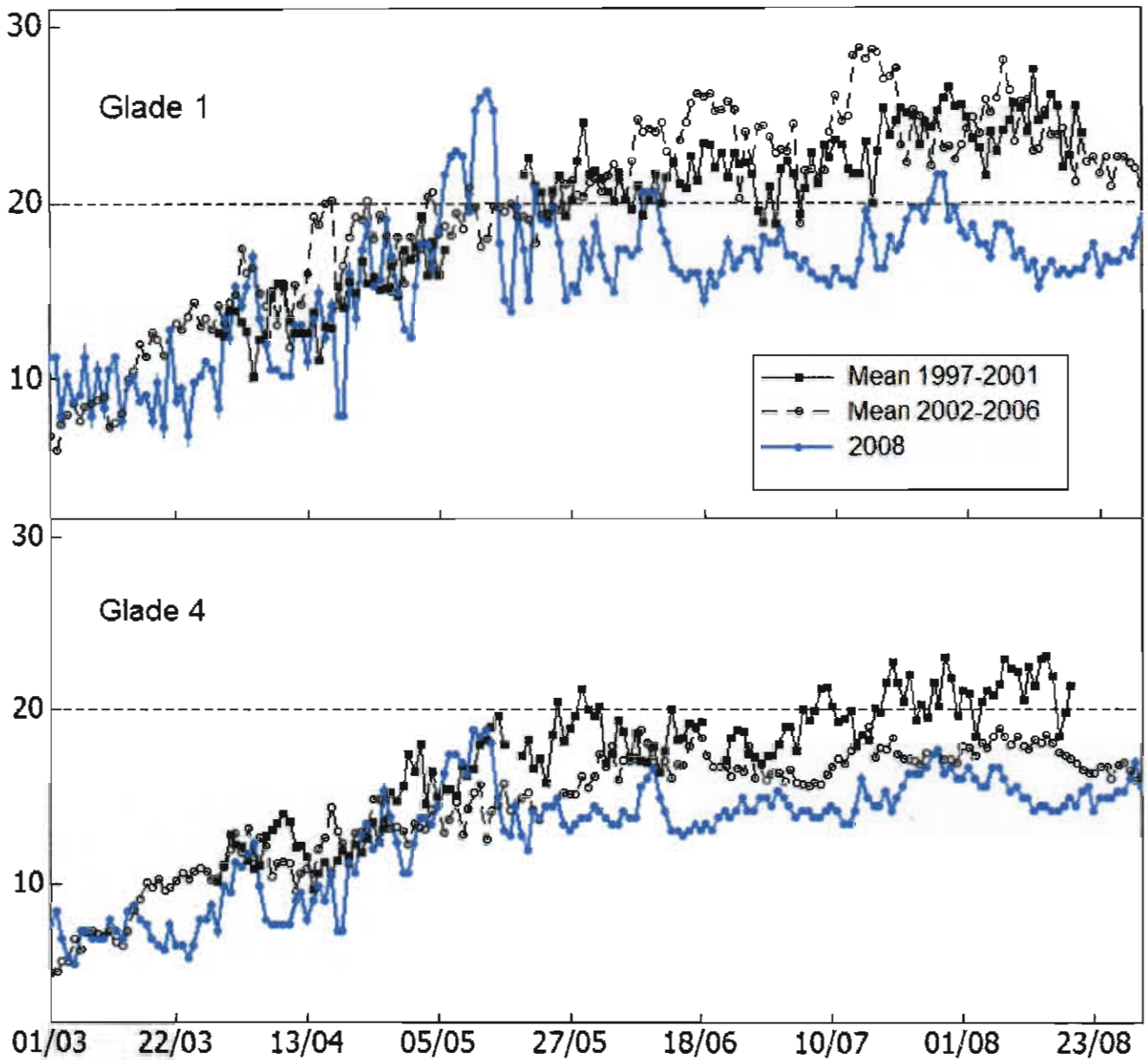
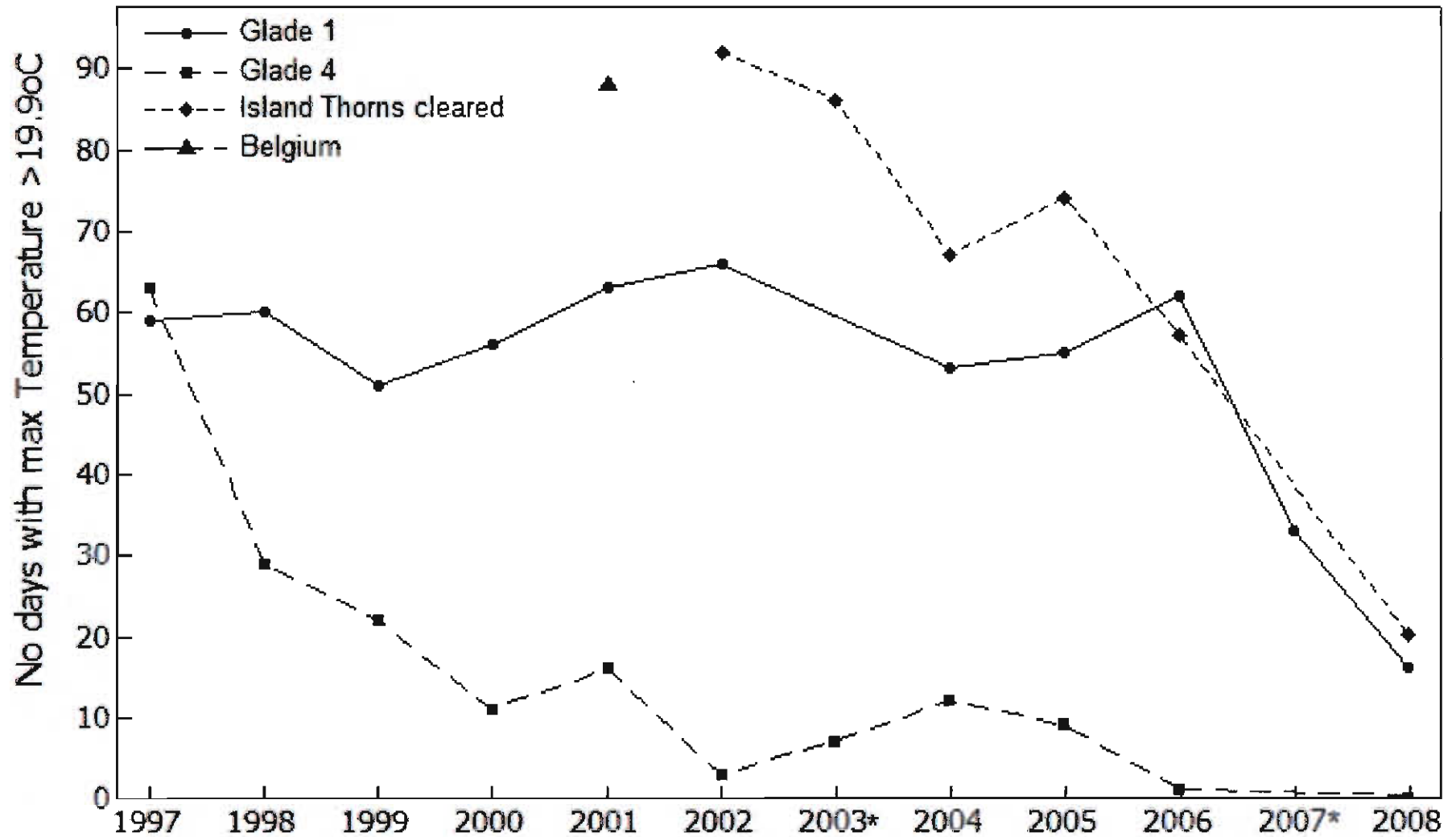


Fig. 3. Numbers of days April-July 1997-2008 with maximum temperature >19.9 oC at Gibbet Wood and in the cleared area at Island Thorns (Belgian cicada site in 2001 shown for reference: loggers at 5 mm *some missing data values interpolated)



2.2. Plates

Plate 1

2.2.1 Glade 1 - *Molinia caerulea* growing well, but shading by bracken and shrubs increasing. Hopefully bracken spraying will reduce this cover for 2009.

2.2.2 Glade 2 - Good growth of *Molinia caerulea* which has been grazed during the winter months, clearfelling has opened this glade dramatically.

2.2.3 Glade 3 - Oak covering part of the glade has now been cleared but bracken encroachment (obscured by shading in the photograph) has increased.

2.2.4 Glade 4 - Now heavily shaded by shrubs on all sides, bracken growth now dominates the ground flora, it is hoped that spraying in 2008 will reduce the bracken cover for 2009.

Plate 2

2.2.5 Island Thorns Inclosure, showing location of temperature logger, the previously open area of clearfell is rapidly being covered now with replanted conifer.

2.2.6 Island Thorns Inclosure, showing continued strong growth of replanted area, where a temperature logger has previously been placed.



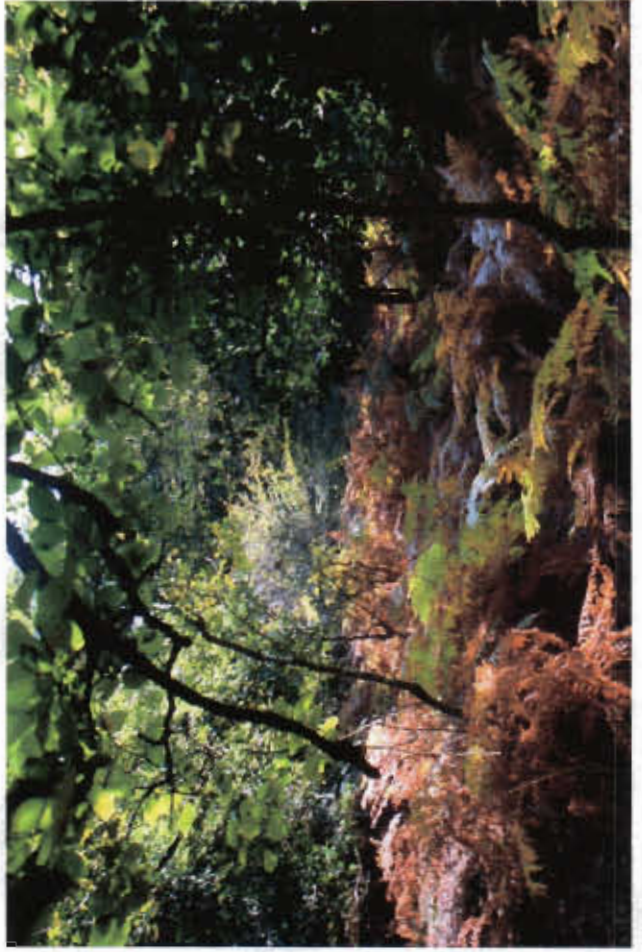
2.2.1



2.2.2



2.2.3



2.2.4

Plate 2

2.2.5. Island Thorns Inclosure, showing location of one temperature logger and site where a second temperature logger was previously placed.



Clearfell area



Replant area (no logger in 2008)