



HERTFORDSHIRE & MIDDLESEX BRANCH

PURPLE EMPEROR PROJECT PROGRESS REPORT FOR 2003



**LIZ GOODYEAR
&
ANDREW MIDDLETON**

APRIL 2004

Report supported by

**The Hertfordshire
Natural History
Society**



**The Corporation of
London**



Front cover
Purple Emperor watching at Broxbourne Wood Nature Reserve ~ July 2003
Photo: Nick Sampford

Index

1. **Abstract**
2. **Introduction**
 - 2.1. Contributors
3. **Historical Hertfordshire records**
 - 3.1. Purple Emperor *A.iris* species account by Colin Plant (Plant 1987)
 - 3.2. Additional historical notes concerning *A.iris* in Hertfordshire & Middlesex (pre-1950)
 - 3.3. Further notes on later sightings of *A.iris* in Hertfordshire & Middlesex (post 1950)
 - 3.4. Extracts from the Hertfordshire & Middlesex Branch of Butterfly Conservation's Annual Butterfly & Moth Reports for 2001 & 2002 (Murray & Wood)
4. **Surveying and results for 1998-2003**
5. **Annual charts for 2003**
6. **Individual accounts of locations in Hertfordshire & Middlesex found to have *A.iris*, 2003**
 - Hertfordshire
 - 6.1. Site A
 - 6.2. Site B Tring Park
 - 6.3. Site C
 - 6.4. Site D
 - 6.5. Site E Broxbourne Wood Nature Reserve
 - 6.6. Site F
 - 6.7. Site G Broad Riding Wood / Broxbourne Common
 - 6.8. Site H
 - 6.9. Site I
 - 6.10. Site J Wormley Woods complex
 - 6.11. Site K Box Wood / Ermine Street area
 - 6.12. Site L Broxbourne Woods complex central area
 - Middlesex
 - 6.13. Site Z Ruislip Woods National Nature Reserve
 - 6.14. Site Y Forty Hall
7. **Potential areas for *A.iris***
 - 7.1. Wormley, Bencroft, Danemead, Hoddesdonpark and Box Woods (TL30)
 - 7.2. North Hertfordshire (Hitch Wood, Knebworth, Astonbury Wood and St. John's Woods)
 - 7.3. The Welwyn area (TL21)
 - 7.4. The Northaw and Cuffley area
 - 7.5. North-east Hertfordshire
 - 7.6. TL31
8. **Notes on the habits of *A.iris* as observed in Hertfordshire**
 - 8.1. Male territorial activity
 - 8.2. All other activity including grounding and female activity
9. **Notes on climatic conditions and *A.iris* in Hertfordshire**
 - 9.1. Notes on weather and *A.iris* in Hertfordshire in 2003
 - 9.2. An early flight season in 2003
10. **Maintaining and increasing habitat**
 - 10.1. Recent efforts for positive habitat management
 - 10.2. Breeding larvae
 - 10.3. Overview of progress in addressing the Regional and County *A.iris* Species Action Plans
11. **References**
 - Appendix I** Extract from *Illustrations of British Entomology Vol. I* by J. F. Stephens (1828)
 - Appendix II** Extract from *A Manual of British Butterflies, Vol. I* by H. T. Stainton (1857)
 - Appendix III** Abbreviations used within text
 - Appendix IV** Scientific names of taxa referred to in text
- 9.2a Colour images

1 ~ Abstract

Monitoring and survey results for the 2003 Purple Emperor *A.iris* flight period are reported for Hertfordshire and Middlesex. Historical notes additional to the 1999-2002 report (Goodyear & Middleton, 2003) are presented. We report on efforts towards conserving *A.iris* habitats in Hertfordshire and the Hertfordshire *A.iris* Species Action Plan.

A.iris was recorded again in all surveyed woodland complexes where it was found between 1999-2002. In addition, its presence was confirmed in the Wormley Woods complex in Hertfordshire and a male was seen at Forty Hall, Enfield, Middlesex.

The recording methodology under development indicated that the 2003 flight season in Hertfordshire was both the earliest and strongest on record. The colony at Site C appeared to make further recovery, as the felled willows regrow. Sap run feeding was recorded for the first time.

Three new territorial areas were found by observing, where possible, over canopies at high points from outside of various woods. This approach is described in full, as is our interpretation of various aspects of male territorial activity as observed in Hertfordshire, in particular the relationship between primary and secondary territorial areas.

1st edition ~ April 2004

Liz Goodyear,
7, Chestnut Avenue,
Ware,
Hertfordshire,
SG12 7JE.

Telephone: 01920 487066

Andrew Middleton,
46, Bursland Road,
Enfield,
Middlesex,
EN3 7EX.

Telephone: 020 8245 0847

2 ~ Introduction ~ Liz Goodyear (LG) and Andrew Middleton (AM), April 2004

This is our second report and covers progress in the year 2003 and is intended as an annual update on our major work 'The Hertfordshire Purple Emperor ~ June 2003' (throughout this report, it is referred to as the 1999-2002 report: *ref.* Goodyear & Middleton, 2003). The present report covers the flight period during the summer of 2003, and any progress we have made with the Purple Emperor project, researching historic records and visiting woods to determine their suitability for sustaining a colony of *A.iris*. For the first time we are also including information on the Middlesex sightings in the full body of the report.

Highlights of the year include locating a territorial area for the Wormley Woods complex and hearing that a Purple Emperor had been seen at a sap run on an oak tree along Ermine Street on the north-eastern edge of the Broxbourne Woods complex. We also received a report of a male Purple Emperor being seen by a stream at Forty Hall in Enfield. We have been asked to give a presentation in April 2004 at the Forestry Commission's Alice Holt Forest Centre on the Hampshire/Surrey border as part of a Purple Emperor Workshop being arranged by Butterfly Conservation. It is very satisfying to know that so many people have now been able to see at least one Purple Emperor in Hertfordshire, not least on Butterfly Conservation led visits to Broxbourne Wood NR, and that so much pleasure and enjoyment has been generated.

One of our major projects has been to write a Species Action Plan (SAP) for Hertfordshire as part of the Hertfordshire Biodiversity Action Plan review. Butterfly Conservation Hertfordshire & Middlesex Branch is the lead partner and as species co-ordinators for *A.iris*, we are the lead contacts. Part of the SAP requires the signing-up of key partners such as the Forestry Commission and English Nature, and as such working with us in ensuring that the needs of the butterfly continue to be addressed.

Our biggest hurdle is the simple fact that despite the Purple Emperor having a Butterfly Conservation designation of High Priority in our region (Upper Thames) and being the rarest resident butterfly currently found in Hertfordshire and Middlesex, it is not a UK BAP Priority Species. As a result the project does not have access to the types of additional funding that can be allocated by such bodies as the Forestry Commission to these species. This relatively low level of support for the woodland species we do have or could encourage can be frustrating, and although we do appreciate that the Purple Emperor is not suffering from the acute and serious declines that some of our other native butterflies are, it is a very important butterfly in our region and a wonderful flagship species to help promote all woodland butterflies in Hertfordshire and Middlesex.

Once again we would like to thank everyone for helping us with this project and hope that you will enjoy reading this report as much as we understand most people did enjoy our *magnum opus*.

2.1 ~ Contributors

We would like again to thank the many people who have helped in so many ways with this project, such as: watching for *A.iris*; writing sightings reports; giving information that has helped with the study; for allowing access to private woodland; and for considering positive habitat management. We hope that all contributors' names have been included – thank you to everyone!

We would especially like to thank all woodland owners, managers and neighbours who are helping with the project, and:

Nigel Agar	Hertfordshire & Middlesex Branch of Butterfly Conservation
Lynda Alderson (Rothamsted Research)	Hertfordshire Natural History Society
Liz Anderson (Hertfordshire Biological Records Centre)	Martin Honey
Diane & Richard Andrews	Malcolm Hull
Helen Bantock	Trevor James
Allen Beechey & Kathryn Graves	Paul Jarczewski (Countryside Management Service)
Pat Bonham (Butterfly Conservation, Norfolk Branch)	Brian Jessop
Les Borg	Jenny Jones (Hertfordshire Biological Records Centre)
Nigel Bourn (Head of Species Conservation, Butterfly Conservation)	Ken King
Nick Bowles	Philip MacMurdie
Robert Callf	Ron MacMurdie
Rob Clements	John Murray
Daphne Coates	Iris Newbery
Neil Chamberlain (The Woodland Trust)	Matthew Oates
David Chandler	Steve Pash
Tony Clancy	Colin Plant
June Crew	Barry Prater (Butterfly Conservation, East Midlands Branch)
Jonathan Crozier	Royal Forestry Society
Fred Currie (Wildlife & Conservation Advisor, Forestry Commission)	Nick & Angela Sampford
Jeremy Dagley (Forest Ecologist, Epping Forest, Corporation of London)	Brian Sawford
Brian Dawton	Martin Shepherd
Dennis Dell	Christine Shepperson
Joan & Marcus Dixon (Herts Woodland Forum)	Lissa Smith
The Forestry Commission, East England Conservancy	Kevin & Sandra Standbridge
Keith French	Nigel Taylor
Emily Funnell (London & S.E. England Regional Officer, Butterfly Conservation)	John Tomkins
Jeremy Gaskell	Dave Waterhouse
Ched George	Ian Woiwod
Sharon Hearle (Anglia Regional Officer, Butterfly Conservation)	Andrew Wood
	Philip Woodward
	Gordon Wyatt (English Nature, Essex, Hertfordshire & London team)

See also 11 ~ references

3 ~ Historical Hertfordshire records

3.1 ~ Purple Emperor *A.iris* species account for the London area by Colin Plant, reproduced with his kind permission from the 'The Butterflies of the London Area'

by Colin Plant 1987

Purple Emperor

Apatura iris (Linnaeus)

The Purple Emperor is our largest resident butterfly, and one of most striking appearance. It inhabits only the "best" woodlands, where mature oaks and ashes are available in proximity with willows, on which it lays its eggs. It is a butterfly of hot days in July and August, mostly on the wing during the morning, and far less commonly seen after midday. Both sexes are normally to be found at the very tops of tall oak or ash trees, where they can be watched from woodland rides flying well beyond the reach of the average entomologist! The males will frequently engage in an aerial combat with each other, leaping from high perches and chasing round in circling flight. In this manner they also pursue females, and mating takes place in the tree tops. From here the females descend to lay their eggs on the leaves of willow bushes *Salix caprea*, though *Salix cinerea* is apparently used in the Weald. Male Purple Emperors are most often seen on hot summer mornings when they periodically descend to the ground to feed on the liquids of decaying organic matter such as animal droppings or carrion. In the London area, dog faeces seem particularly popular. The extremely distinctive "horned" larva goes into hibernation during October, in its third instar, and awakens to feed again in March. Pupation occurs in June and the adults emerge after about a fortnight.

Because of its particular life style, the Purple Emperor may well be under-recorded in the London area, though it seems unlikely that the general pattern of distribution shown on the map here will be significantly altered during the next few years. Certainly the butterfly has drastically declined from Kent, and has not been seen in the county as a whole since a female was spotted in 1967 (outside the London area)¹. It is now presumed extinct in that county. Foster's 1937 Hertfordshire list gives a record for Oxhey Wood², with "*six specimens flying over tree tops during two days in 1878, 1879 or 1880*", whilst more recently there is a record from Northaw Great Wood in 1965. Newman (1869) had earlier noted a record of the butterfly made by Stephens at Caen Wood (=Ken Wood) Middlesex, in the 1850s. In the same vice-county area, one was also seen at Enfield in 1909, and another, a male, at Northwood in July 1966 (de Worms 1969). Essex provides us with the earliest record for the area: Harris (1766) writes "*On 26th of May, in the year 1758, Mr Drury, an ingenious Aurelian, in searching for caterpillars beat four off the willow, near Brentwood, in Essex*". It is of some interest that Drury gave one of these larvae to Harris who reared it successfully, thus discovering the previously unknown life history. Two adults were apparently also seen in this locality in 1882. Elsewhere in Essex, Doubleday (1836) recorded a single confirmed record in Epping Forest, adding that it also occurred in Ongar Great Wood, and it was reported at Woodford in the 1899 list by Buckell and Prout. A further example was seen in Epping Forest in about 1890, but there have been no further reports from this locality until one was seen in the car park of the "Volunteer" public house during 1983. Sadly, there are no records since for Epping Forest.

It seems therefore, that the Surrey sector is the last stronghold of this magnificent butterfly in our area. There was one seen in Prince's Coverts, Oxshott during August 1943, and two were captured at Ashted Woods during 1945. A small number have been reported at Bookham Common in most years from the early forties to the present. Today, it remains restricted to that small corner of Surrey in our area, where it appears to be under no immediate threat.

Colin Plant

The Butterflies of the London Area 1987

London Natural History Society

¹ Presently known from Kent outside the present London Natural History Society recording area (Rob Clements, personal communication; Butterfly Conservation, Kent Branch website www.kentbutterflies.org).

² Colin has acknowledged that this is an incorrect location and should refer to Oxbury Woods, near Meesden (see 3.2, 1999-2002 report).

3.2 ~ Additional historical notes concerning *A.iris* in Hertfordshire & Middlesex (pre-1950)

Introduction

Throughout 2003, we continued our research into the historic records of Hertfordshire and regularly followed up potential leads of possible sightings. However, we have also looked more closely at the records that came from Middlesex and these have been included in the main body of this report (3.3). In February 2004, we again visited the London Natural History Museum to look at the old entomological journals. Since many of the entomological authors of the 1800s had access to all these old journals, it seems unlikely that we will find anything new but it can be very interesting to read the original source of a record.

Illustrations of British Entomology; Vol. IV [1834]

Appendix to Vol. I by J. F. Stephens

Page 50. APATURA Iris. *Curtis*, v. viii pl 388. – Two magnificent figures of this splendid insect. Abundant at Monks' Wood and Hertford in July 1833.

This is the original source of the first known record for Hertfordshire and is mentioned only in the Appendix to Volume I in Volume IV. Stephens' original entry for *Apatura iris* is in Volume I, and a full transcript can be read in Appendix I of this report.

An Illustrated Natural History of British Butterflies; 71-77 [1874]

Purple Emperor by E. Newman

Middlesex. Caen Wood, near Hampstead - *J. F. Stephens*.

[The complete text from this section is reproduced in Appendix I of the 1999-2002 report.]

We have tried to find the original source of this record. Colin Plant in the *Butterflies of the London Area* (Plant, 1987) dates it as being in the 1850s, which would have been after Stephens completed his *Illustrations of British Entomology* and it should also be noted that Stephens died in 1852 (Gibbs, 1903). We have spoken to Colin and his thoughts are that he may well have found the information on an annotated copy of an original journal or book that he had access to when researching his book.

We have also investigated the possibility that Caen Wood was incorrectly assumed to mean Ken Wood, as the Ordnance Survey maps used the name Ken Wood a little later, in 1873-1876. There is a Caen Wood in the Ashted Woods complex in Surrey (TQ173594) but here the 1871 map only shows a farm by the name of Caen Farm and the wood seems to be a more modern addition to the complex.

The Entomologist Vol. 42; 282 [November 1909]

CAPTURES AND FIELD REPORTS.

APATURA IRIS AND VANESSA ANTIOPA IN ESSEX. – A female specimen of *Apatura iris* was seen in this neighbourhood this summer by a young collector, Mr. Webster. It had settled on the ground but a short distance from him. As there is a good deal of oaks and some willow in the vicinity, it is quite possible that this was a wild individual. Mr. P. I. Lathy informs me that he saw a specimen of *Vanessa antiopa* at Broxbourne. Another individual of this species was observed within the precincts of the Royal Small Arms Factory at Enfield. – GEORGE TALBOT; 11, Palace Gardens, Enfield.

[Palace Gardens is in Enfield town (TQ327962) and close to the New River and the Town Park]

3.3 ~ Further notes on later sightings of *A.iris* in Hertfordshire & Middlesex (post 1950)

The woodland complex surrounding Ruislip Common or Ruislip Woods National Nature Reserve

In the 1999-2002 report we gave brief details of the exciting news that *A.iris* had been seen in the woods surrounding Ruislip Common since 1999. Ched George of the Ruislip & District Natural History Society has given permission for us to include the Society's data in our flight tables (6.13). Ched also referred us to details of an historic sighting given in the Society's Journals, so during a visit to the London Natural History Museum we looked at these old papers and to our amazement found details of two sightings.

Journal of the Ruislip & District Natural History Society: No. 2 [1953]

An introduction to the Butterflies and Moths with special reference to the Ruislip District by W. E. Minnion

This is the first reference to butterflies in the Journals and there is no mention of Purple Emperor in this article, although Mr. Minnion says "*Perhaps the most noteworthy are the Silver Washed Fritillary (Argynnis Paphia) which is very well established in the woods, especially in Copse Wood, and the White Admiral (Limenitis Camilla). Both have become much more plentiful of recent years, the spread of the White Admiral from the New Forest and a few large woods in the S. E. England during the last 30 years having been quite phenomenal.*"

Journal of the Ruislip & District Natural History Society: No. 5 [1956]

The Lepidoptera of Ruislip [for the year 1955] by W. E. Minnion

.....One quite extraordinary report, received from two separate sources, was that a Purple Emperor Butterfly APATURA IRIS Linn. had been seen at the end of June in Ruislip High Street. This handsome insect should not be mistaken by people with any knowledge of natural history but the event was so unusual that any further verification would be appreciated. The Purple Emperor is a woodland insect which normally flies at tree-top height descending only to feed or for the female to lay eggs in Sallow bushes. Our woods seem a likely enough habitat for the butterfly, but Ruislip High Street certainly does not! There seems, however, no reason to doubt this record, but for the time being we feel it would be wiser not to add the species to our list.

Journal of the Ruislip & District Natural History Society: No. 8 [1959]

The Lepidoptera of Ruislip [for the year 1958] by W. E. Minnion

.....For the moth hunter 1958 was a year of disappointment. The cool wet summer was a pretty effective damper on our activities, and our regular Friday evening sessions at Battle of Britain house were particularly badly hit by weather so that progress in this field was limited. Nevertheless the year was not without its events. Our member Mr. G. Peche was with a party from the Middlesex Touring Club who had the very good fortune to see, and watch for some time, a Purple Emperor Butterfly APATURA IRIS LINN. This insect was immediately recognised by several members of the party.

[No exact location given.]

Astonbury Wood (TL22)

In the 1999-2002 report (3.3; 7.2), we mentioned that we had tried to contact Jonathan Crozier who had seen Purple Emperors in 1978 at Astonbury Wood. Just as we went to print, Brian Sawford suggested we contact John Tomkins who had also helped us with information about Roger Ferry.

John was able to give us an address for Jonathan and at his suggestion we also contacted Daphne Coates who was the warden at the Astonbury Field Centre at the time of the sightings. Both were able to give some more information and in the autumn of 2003 LG visited the HBRC and looked at the Astonbury Wood file and found copies of the Astonbury Wood Annual Reports. LG was able to find the original entry under the Hymenoptera Report, which Jonathan wrote. Jonathan has since contacted us and is looking up his old notes for us between trips abroad!

Astonbury Wood Annual Report for 1978

THE HYMENOPTERA OF ASTONBURY WOOD 1978 ~ J. Crozier

APATURA IRIS

On August 13th, a male purple emperor butterfly was sat on the path at the entry to the wood. The following Sunday (August 20th) a pair of the butterflies was seen in flight in the trees above the main paths

J. N. Tomkins [John Tomkins] comments in the introduction to his report on **The Macrolepidoptera of Astonbury Wood (Part 3 –1978)**:

One aspect of Astonbury Reserve is becoming increasingly obvious to those interested in entomology. There is an inadequate amount of rich ground cover with abundant blossom. The ideal areas for insects are large clearings or wide rides, which allow light to penetrate for most of the day. This produces a vital microclimate area, sheltered from wind, which insects find so acceptable.....

....The traditional coppice cycle was historically an excellent insect management system and its cessation may well have contributed to the local decline of many species (e.g. Fritillaries, 3 species of which disappeared from Newton Woods¹ between 1935 and 1940).

There is little doubt that widening of some portions of the main rides, or the creation of new, slightly larger clearings would significantly improve the insect population of the wood.

¹ Knebworth

Oaklands area of St. Albans, 1950s

[tetrad centred on TL160060]

Brian Sawford includes in his text in the *Butterflies of Hertfordshire* (Sawford 1987):

“Other sporadic, but not entirely authenticated, sightings were made over the next thirty years, mainly in south and central Hertfordshire. These were from [included] the Oaklands area of St Albans in the 1950s...”

We have spoken to Brian and Trevor James on several occasions with regard to this entry and unfortunately they are both unsure of the source of this comment. Unfortunately Brian’s index cards do not include any notes which might give any additional clues as to where, when or by whom one may have been seen. It should also be noted that the modern maps show very little suitable habitat in this particular tetrad, but it may have been the case of a wandering male (8.2.2).

3.4 ~ Extracts from the Hertfordshire & Middlesex Branch of Butterfly Conservation's Annual Butterfly & Moth Reports for 2001 & 2002

Hertfordshire & Middlesex Butterfly & Moth Report for 2001*

John B. Murray & Andrew Wood

Purple Emperor

First seen:	July 3rd (Elizabeth Goodyear)
Last seen:	August 17th (possible sighting by Brian Jessop in Tring Park)
Peak date:	?July 15th
Maximum Number Seen:	2 on several occasions (Elizabeth Goodyear & Andrew Middleton)
Mean Index of Abundance:	?
Change in abundance since 2000 ?	
Recorded in:	4 tetrads (1.1% of those covered)
Range change since 1999:	91% expansion

Continuing good news for this species, now possibly our only surviving species given high priority status in the Regional Action Plan (Butterfly Conservation 2000). Andrew Middleton and Liz Goodyear have continued to scour unexplored woodlands and have found it at one new large woodland complex, and at three other previously known locations where it was seen in 1999 and/or 2000. They recorded individuals between 3rd July (the earliest record for Hertfordshire or Middlesex) and 13th August, with multiple sightings between 5th and 24th July, and clashing males from 13th to 17th July. Unfortunately, all four of these locations are on private land, and in every case the owners have asked for locations not to be revealed publicly. It is a classic problem that will doubtless have to be faced time and time again by the Rare Species group: how to monitor, protect and conserve rare species whilst maintaining good relations with landowners, some of whom place wildlife conservation well down their list of priorities, and how to defend such sites against development when the records are not available to the interested parties. However, it is clear that this wide-ranging species is present in woods extending right across southern Hertfordshire, and Liz Goodyear, who will be co-ordinator for this species on the Conservation Subcommittee, has given some tips on when and where to look. She suggests watching sallows for female activity associated with egg laying between mid day and two o'clock in the afternoon, and watching for male territorial activity around tall oaks at the top of high ground in forested areas from one o'clock onwards. The main activity is throughout the month of July, with a maximum for a week or two around the 15th. To emphasise this last point, Rachel and Lissa Smith saw a Purple Emperor on 15th July on a path in Broxbourne Woods at 12h 25m. They returned on 20th July and found it again, and were able to get some photographs. Brian Jessop describes its possible continuing presence at Tring Park in the early afternoon of 17th August: "...a large butterfly flew from one section of woodland towards me very fast. As it came towards me I could see white markings on a brown background. It flew quite close to my face and then disappeared into the other section of woods. I am 99% sure it was a Purple Emperor, but it happened so quickly I decided not to record it". If you wish to search for this species or help in its conservation, please contact Liz Goodyear (contact details on back cover). As Liz writes: "Appropriate and timely decisions regarding sallows in woods could tilt the balance in favour of Purple Emperor for many years to come, and several woodland managers are considering the problem in full. Of all our endangered species of butterfly, it seems that Purple Emperor could be relatively simple to manage for on a less than annual [basis, given the right decisions at the right time]".

*Hertfordshire and Middlesex Branch Newsletter Issue 31 September 2002 Corrections to the Annual Report, by John Murray

Despite the increased proof-reading this year, serious errors in the 2001 Report have been pointed out to me.

In the species account for Purple Emperor, the early and late extremes 3rd July to 13th August, multiple sightings 5th to 24th July and clashing males 13th to 17th July ALL refer to the decade 1992-2001, not 2001 alone as stated.

Liz Goodyear alone is listed at being Rare Species co-ordinator, and is alone credited with giving tips on when to observe this species, whereas Andrew Middleton is joint co-ordinator with Liz, and wrote much of the advice with her.

A full account of the Purple Emperor will appear in a later newsletter.

Hertfordshire & Middlesex Butterfly & Moth Report for 2002

John B. Murray & Andrew Wood

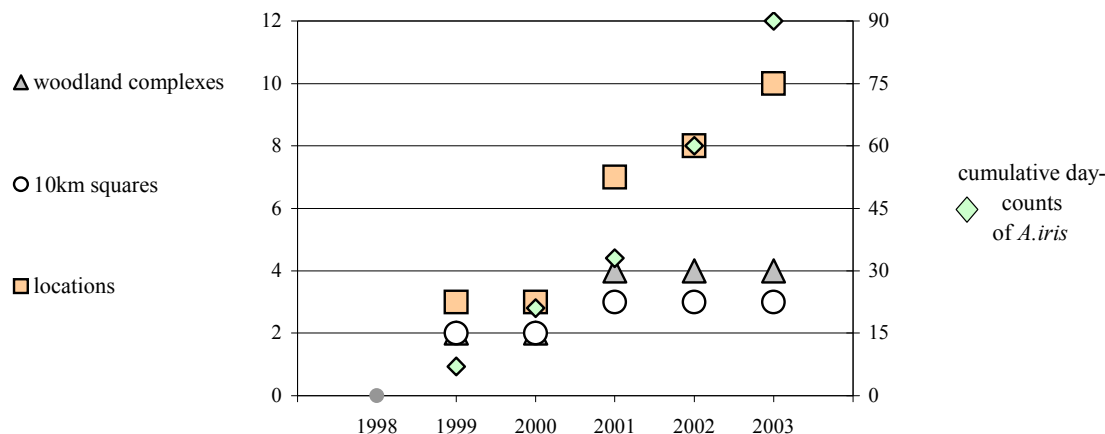
Purple Emperor

<i>First seen:</i>	7th July
<i>Last seen:</i>	17th August
<i>Peak date:</i>	around 16th July
<i>Maximum Number Seen:</i>	at least 4 at Tring Park on July 20th (Brian Jessop)
<i>Mean Index of Abundance:</i>	1
<i>Change in abundance since 2001:</i>	
<i>Recorded in:</i>	7 tetrads (2% of those covered)
<i>Range change since 1999:</i>	74% expansion

The status of Purple Emperor is again most encouraging, with more sightings in Hertfordshire, and for the first time, news that the species has also strayed over the border into Middlesex. Andrew Middleton and Liz Goodyear, the species co-ordinators, have been liaising with the various woodland managers and owners to promote positive management for the species, which is now to be accorded the status of a Hertfordshire Biodiversity Action plan (BAP) species, as well as undertaking intensive observation: *"In Hertfordshire the species was seen in three 10 km squares, and at 8 locations. It was re-recorded at all probable breeding locations found since 1999, and sightings came from 2 new locations, one in an area where there are historical records"*. The decision to make public the Broxbourne Wood sightings on the website meant that at times several people were rewarded with superb views of this rare insect, and it has generated more records, raised awareness and interest amongst observers and the site manager, whilst at the same time taking the pressure off private sites which owners want kept secret. *"The species was recorded at 4 additional locations (three previously known) on private ground, one of which was a new site. We hope that confidentiality of these other sites will be respected in the hope of encouraging positive management. Activity was encouraging especially at the site where tallows were cut down in 2000. Brian Jessop, Philip Woodward and Alan Beechey were all privileged to see Purple Emperor at Tring Park this year. Both males and females were observed. On a very worrying note and a reminder that collectors do still exist, Brian noticed damage around one of the tallows on one of his visits, which looked like the work of a collector looking for eggs, but large scale negative management, or lack of positive management, are likely to be more important factors"* (Andrew Middleton & Liz Goodyear).

4 ~ Surveying and results for 1999-2003

Chart 4.1 ~ Recorded numbers and distribution of *A.iris* in Hertfordshire 1998-2003



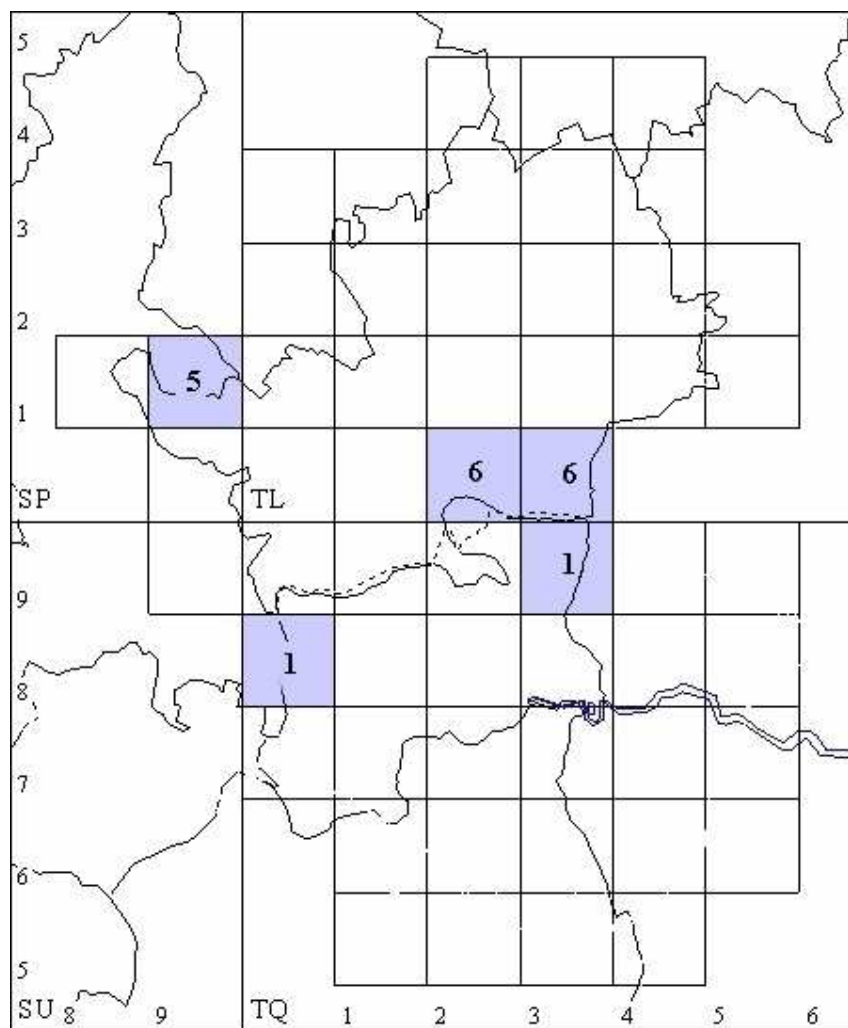
Note ~ one complex and location with a colony of *A.iris* recorded in 2001-2 was not monitored in 2003, so is not included in the 2003 figures. We have allowed ourselves to record Wormley Woods as an additional complex to Broxbourne Woods because it is itself such a large area covering several named woods, and also as a reward for the years it has taken to confirm the presence of *A.iris* here.

Chart 4.1 shows a continued increase in records of *A.iris* in 2003. It appears that favourable weather conditions resulted in an early and strong flight period, which may account in part for the increase in the overall cumulative day-count for 2003. We would like to thank all those who contributed records to the project in 2003, for both Hertfordshire and Middlesex. We divided our time in 2003 between monitoring known sites, investigating potential sites, and field trip duties. All three avenues were fairly successful, although finding *A.iris* at promising new sites always seems to take many hours of field-work, often over several years. To find a colony in a fourth 10km square of Hertfordshire should be a definite target for anyone interested in the future of the project.

***A.iris* in Middlesex in 2003**

We received records for *A.iris* at two locations in Middlesex in 2003, Ruislip Woods NNR (6.13) and Forty Hall, Enfield (6.14). Both areas have some historical records for *A.iris* (3.2 & 3.3). As *A.iris* joint species co-ordinators for Butterfly Conservation, Hertfordshire and Middlesex Branch, we have decided to include this data in the overall flight charts and analysis for 2003 *i.e.* this report (though for continuity, excluding Chart 4.1).

Image 4.1 ~ Recorded distribution of *A.iris* in Hertfordshire and Middlesex in 1999-2003



Note ~ the number in each 10km square is the peak cumulative day-count for all locations in that square for 1999-2003, although in effect all peak counts were made in 2003.

5 ~ Overview of the *A.iris* 2003 flight season in Hertfordshire and Middlesex

Chart 5.1 ~ *A.iris* numbers and sightings in 2003

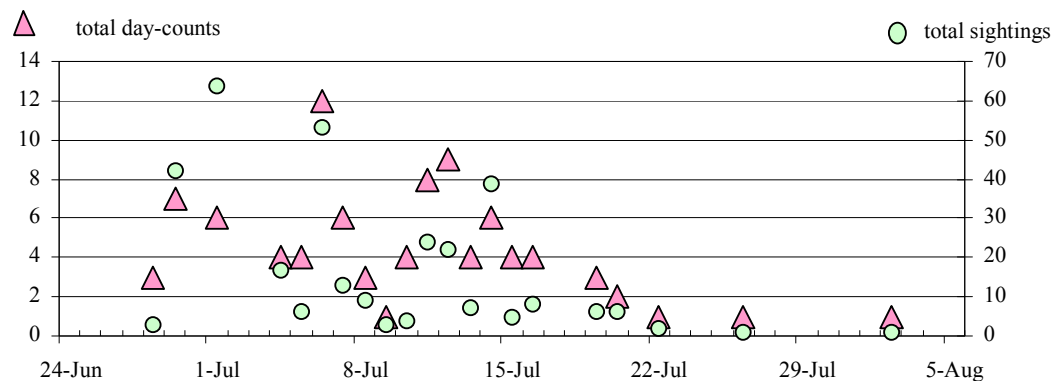
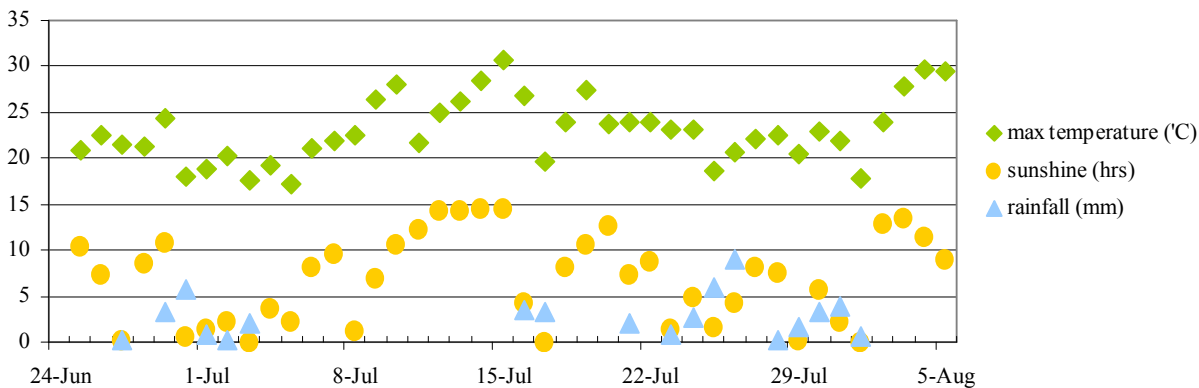


Chart 5.2 ~ Weather data for July 2003 ~ Rothamsted Research



As previously stated, the 2003 flight season was relatively early, by as much as eight days; please see 9 for comparisons, more detailed weather information and further discussion. *A.iris* was recorded in Hertfordshire in the last days of June for the first time, starting with three seen at Tring Park on 28th June 2003 by Brian Jessop. Although July was relatively settled with slightly lower than average rainfall (-6%, cf. 25yr av.), levels of sunshine (+10 %) and temperature (+6 %) were not exceptionally high for recent decades (9).

Two weeks of heightened activity through the first half of July began to decline by the middle of the month, at a time when recorded activity was peaking in 1999-2002. Observations across Hertfordshire satisfy us that the bulk of territorial activity in the county had already been completed in a normal fashion by mid-July when the temperatures began rising towards 30°C. Please see 8 & 9 for further detailed discussion on weather, flight period and territorial activity.

Observed female activity has tended to lag behind male activity, however it seems probable that the generally settled weather through the second half of July, with temperatures generally between 20-25°C, would have allowed females to lay at least an average number of eggs during this period. Despite the extremely hot and dry weather that followed through the late summer and autumn, the sallows in south Hertfordshire, at least, appeared to fare well, with very little sign of leaf wilt, loss or disease, or sallow death. In comparison, the honeysuckle in many woods appeared to be in a very sorry state, with few green leaves remaining amongst the dead foliage, and one wonders how the larvae of the White Admiral will cope.

Hopefully the fine weather in July, combined with an early and apparently strong flight period, will have helped the colonies in Hertfordshire and Middlesex to strengthen, and perhaps generate some dispersal. Any such dispersal may provide an opportunity for gene flow between colonies, and perhaps the colonisation of developing habitat may result.

6 ~ Individual accounts of locations found to have *A.iris*, 2003

6.1 ~ Site A

‘A point of heightened territorial activity may exist nearby which has not yet been found.’ (1999-2002 report)

This proved to be the case, with the centre of activity found to be c.100m away from the previous viewing location, which could now be referred to as a ‘warm-up’ and/or secondary territorial area (8.1). A ‘best’ view over the hilltop canopy, from c.200m outside of the wood, revealed the prominent top branches of an oak to be the focus of the territory. Although clashes and occasional flights could be seen from this distance, it was too far to see perching males or any territorial flights between perches. Being situated high above an area of rather continuous canopy, territorial activity here would be difficult to see from below on the woodland floor, and any aerial clashes would be out of view altogether.

The records seem to indicate a continued healthy population of *A.iris* here, and as was the case elsewhere in Hertfordshire, the flight period came early. The habitat remains much as described in the 1999-2002 report and some conservation work in the form of thinning around a few stronger sallows was carried out in February 2004.

Chart 6.1.1 ~ *A.iris* activity recorded at Site A in 2003

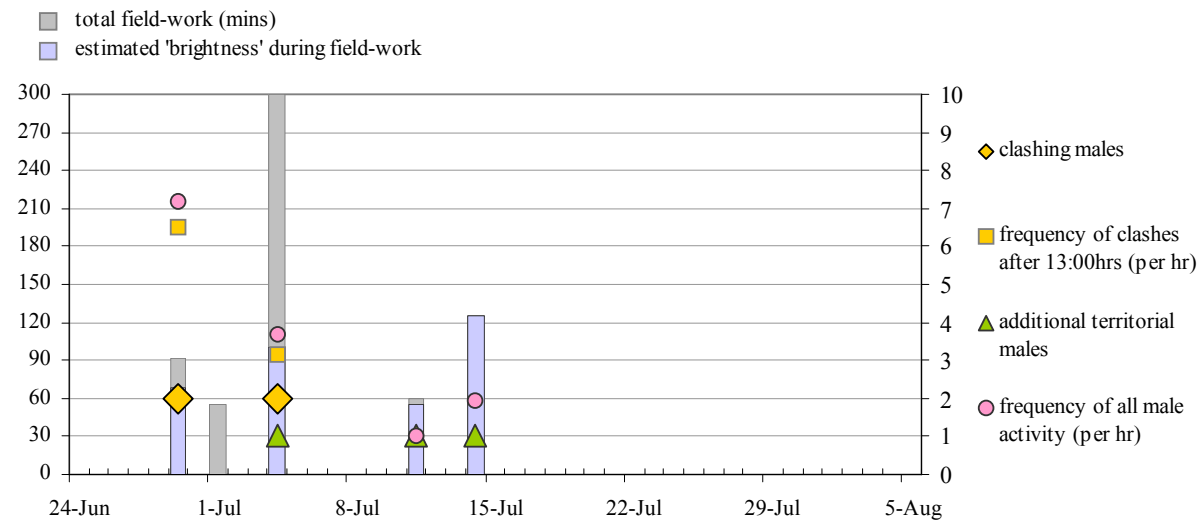


Table 6.1.1 ~ Notes on selected observations at Site A

Date	Notes taken on the day	Description
29-Jun 03	~ 16.48-18.20hrs, sunny but not 100% bright. 16:56hrs, 2 clashing males. 17:28-18:07hrs, 9 clashes of two males, high into sky and/or far over canopy, mean of one clash every c.5mins. Victorious male returning to key territorial spot. Vanquished male dropping some distance away to canopy in the area of the secondary territory.	Males seen ~ 2
04-Jul 03	~ 13:30-16:30hrs, cloudy, bright, just a few minutes sunshine, 11 clashes of two males, also one single flight. Mean of one clash every 16 mins.	Males seen ~ 3

Tring Park continued to produce records in 2003 and provided Hertfordshire with its earliest ever date on record for emergence, 28th June, although a possible sighting on the 21st by Lissa Smith may have eclipsed this.

Brian Jessop excitedly rang LG on the 29th to say that whilst walking his transect the previous day he had several Purple Emperor sightings at the territorial area. However, on the 21st June, Lissa had visited Tring Park with her family and had reported that she had seen a White Admiral. However, White Admiral has not been recorded at Tring Park, at least not in recent years, although Brian Jessop has seen it in nearby woods in the past. Tring Park has virtually no honeysuckle so although Brian was very pleased to hear of the sighting, Lissa began to have doubts as to whether she had mis-identified this butterfly and that it had been a Purple Emperor. Unknown to Lissa, the Butterfly Conservation's 'first sightings of the year' webpage reported one being seen in Surrey on the same day. We shall not know for certain, but we feel that there is a good chance that it was a Purple Emperor that flew over Lissa's head and down the escarpment. Tring is a warm site and we know from our own experience that many of the grassland species will emerge several days if not a week earlier here than at some of the cooler, damper sites in the central and eastern areas of Hertfordshire.

On the 15th July we made our first ever visit to Tring Park during the flight period when for once the sun was shining. Until now we always had the luck of driving over to Tring on days when butterflies have no intention of flying! Not only was the day sunny, it was also extremely hot, a day when watching from the shade was essential. Unfortunately, Brian was not able to join us, but we promised to visit him at work on our way home. Brian had given us instructions on where to find the territorial area, and we were fairly certain we had found the correct trees and we sat down in the shade and started watching and waiting. After awhile AM left the territorial area to investigate the woods and see whether he could get a glimpse of *A.iris* through the canopy. LG continued to watch the territory and then suddenly caught a glimpse of an orange butterfly on the brambles, similar in a way to that seen a few days earlier at an Essex wood (7.5). Rushing to the bramble bank, the butterfly immediately disappeared out of sight and LG phoned AM to get him to come back and look. Nothing was seen and AM went back in search of *A.iris*, only to get another phone call to say the butterfly was back and it was without doubt a Silver-washed Fritillary. A rather exciting find, which Philip Woodward was also able to enjoy a few days later on one of his visits to the Park.

Eventually, just after 2 pm, we did get a glimpse of *A.iris*; it might have been a male but this can not be confirmed as it quickly flew up to the trees and just as quickly as it arrived it was gone in a north-easterly direction over the scrub and along the escarpment. Obviously the territory drew a blank for this butterfly and there was no reason for it to hang around. We left the site at 3 pm and stopped in Hemel Hempstead to visit Brian, and showed him our digital images of the Silver-washed Fritillary.

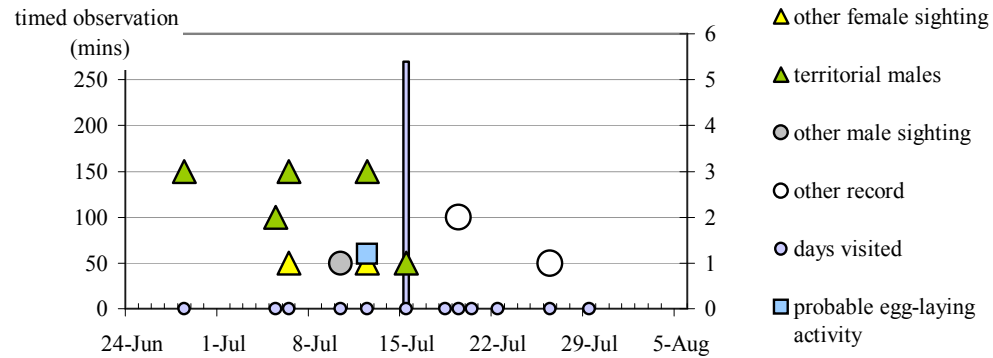
Brian, Allan Beechey and Kathryn Graves, and Philip Woodward all saw *A.iris* at Tring in 2003, but there were no grounded males. Philip kept a note of the visits he made including those days when he did not see *A.iris*, which was equally important – a reminder to anyone visiting a site that we do like to know if people do not get a sighting as this adds to our flight chart data. Also of interest is the length of time that a site is visited, which we have not been able to include in this table apart from our visit, which incidentally shows just how long we had to wait for a glimpse of *A.iris*. The last record at Tring came from Brian on the 26th July, which was also the last Hertfordshire record in 2003.

We understand that *A.iris* was not seen in the immediate area 'over the border' in Buckinghamshire in 2003, however we heard, via Nick Bowles, from Julia Carey (Bucks. County Council) of a report from Whiteleaf Hill (SP823039) on Sunday 13th July 2003 of a female Purple Emperor which was in "crisp" condition and seen by I. Kelloway and F. Gomme.

We would like to thank the following for giving details of their sightings at Tring Park in 2003:

Allen Beechey and Kathryn Graves
Dennis Dell
Brian Jessop
Lissa Smith and family
Philip Woodward

Chart 6.2.1 ~ *A.iris* activity recorded at Tring Park in 2003



6.3 ~ Site C

Site C came up trumps this year, and despite nearly losing the colony only a few years previously, it would now appear to be well on the way to recovery as the woodland edge willows regrow.

AM visited the site on the afternoon of the 29th June and despite increasing cloud cover, saw one *A. iris*, although he was unable to determine which sex it was. LG/AM returned on the 1st July and although the weather was still generally poor, during a 1 ½ hour window of sunshine managed to get video footage of some superb male territorial activity. Seven visits were made in total to the site, in varying weather conditions, with the last on the 27th July when no activity was observed.

Highlights included seeing what appeared to be warm-up activity on a hornbeam 50m north of the clearing, which was a site first, and with easterlies on the 14th July AM moved c.75m west of the clearing and observed clashes along the woodland edge as opposed to around the 'master tree'. However, no female behaviour indicative of site-selection for egg-laying was observed this year, although AM did have a possible pre-pairing flight on 14th July.

Another positive point to note is that we hope that some positive woodland management will take place shortly, with willow management a priority.

Chart 6.3.1 ~ *A.iris* activity recorded at Site C in 2003

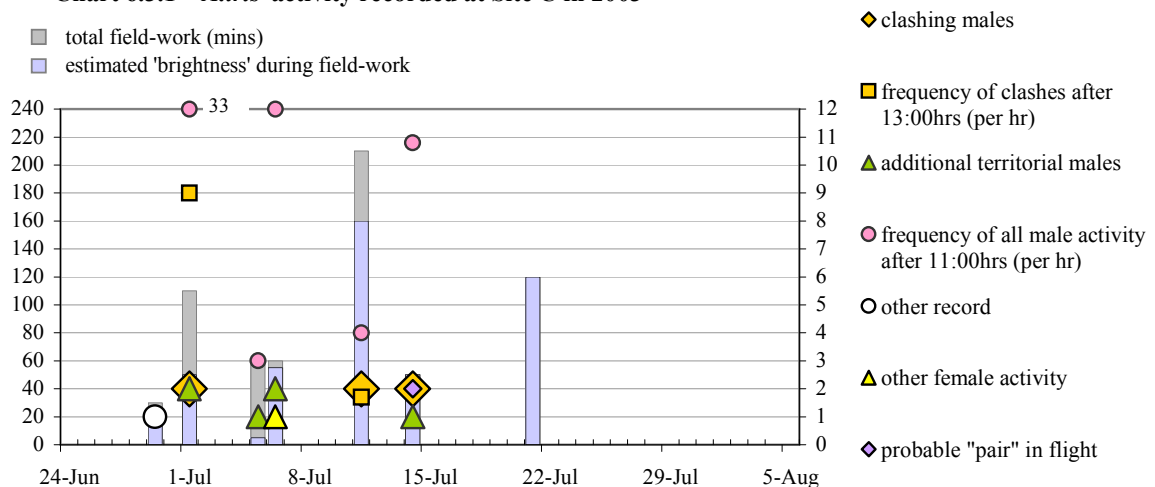


Table 6.3.1 ~ Notes on selected observations at Site C

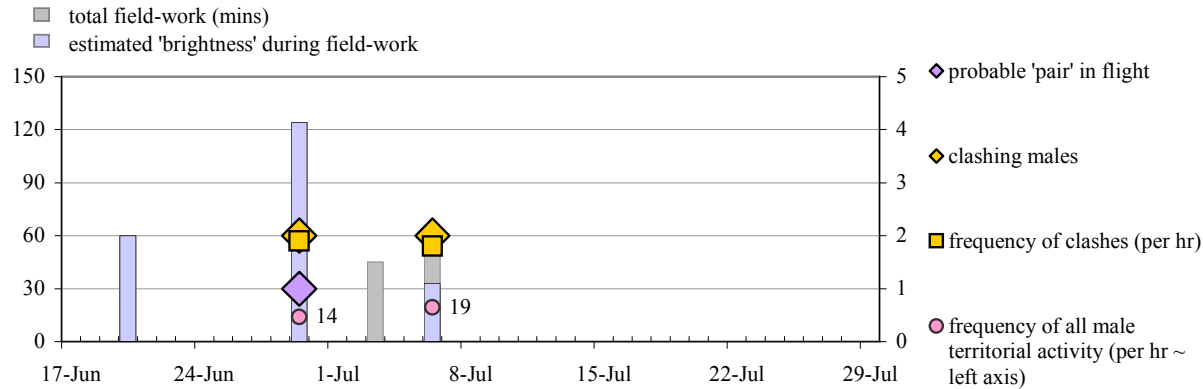
Date	Notes taken on the day	Description
29-Jun 03	~ 15:05-15:35hrs, light breeze, 50% sunshine. 15:13 one flew right to left around lower half of 'master tree', then back, then left over sallows. Possibly a female - sex uncertain dropping to canopy some distance away.	One of undetermined sex
01-Jul 03	~ 12:10-14:00hrs, previously cloud and drizzle to 12:00hrs. 12:13hrs, brighter. 12:15hrs, first flight around a prominent hornbeam just beyond the north edge of the clearing. A probable male was seen to fly around the tree on several occasions on what appeared to be a warm-up flight despite weather conditions being still quite poor. Note: this tree has not been seen to be used before. 13:20-13:32hrs, video footage shows continuous activity to and from the 'master tree', around 'master tree', also many clashes and spirals far into sky of two males. One, probably male, flying around willows went off and clashed. Thought to have been certainly three and possibly four males. 13:38-14:00hrs, video continues but despite improved conditions, the activity weakens. We had only about 1 ½ hour window of fine weather before conditions deteriorated. Activity during this period intense and very exciting and rewarding.	Males seen ~ at least 3
11-Jul 03	~ 11:00-16:50hrs, hot, sunny with light breeze. 12:28hrs, 1m patrolling willow canopy west side of clearing, 12:40hrs, appeared from left side willows, returned, then left to right over willows and behind 'master tree', 12:53hrs, 1 over willows left side sex unknown, flew along edge, then south over willows, then north again. 13:05hrs, left to right over north willows. 13:08hrs, left from hornbeam. 13:26hrs, 1left willow, settled then flew to 'master tree', clashed with 2nd male and spiralled high in sky. 13:30hrs, 1 (probable male) left from 'master tree', 2nd probable male from 'master tree', 13:32hrs, 1 male around 'master tree', 2m spinning around between 'master tree' and hornbeam appeared to rise up from ash area. 13:40hrs, left site. 16:20hrs, returned to site, still sunny. 16:33hrs male right hand side oak and away. 16:35hrs returned and perched male, then changed perch and out of view; using right hand side of 'master tree' still and low down. 16:50hrs, left site.	Males seen ~ 2
14-Jul 03	~ 15:14-16:04hrs, hot and sunny with slight north-easterly breeze. 15:14hrs, on arrival possible pre-pairing flight left to right across clearing. 15:40-15:49hrs, moved to watch western field edge, flight from ash east then back to perch on ash, 1flight around adjacent hornbeam plus 2nd male in flight, flight to perch on ash. 15:51hrs, 1 flight to hornbeam. 15:52hrs, 1 flight to hornbeam. 15:55hrs, 2 clashing between ash and hornbeam then out over field, possible 3rd in view nearby. 15:57hrs, 1 flight behind oak. 16:02hrs, 1 flight in background. 16:04hrs, left site.	Males seen ~ 3 Possible behaviour indicative of pre-pairing activity

6.4 ~ Site D

Territorial activity was recorded at Site D for the third consecutive year, with the canopy ‘bowl’ again being the focal point for the males. On the two visits when timing and conditions were favourable for monitoring, activity was at least as strong as in 2002. Chosen perches were similar to those used in 2002, and of particular interest was the sight of a newly arrived female drawing a male from its high perch, leaving the territory vacant for 24 minutes until observations ended.

The habitat status at Site D remains as in the 1999-2002 report. Forestry work was carried out in a wide area of adjacent woodland in 2003, but we are pleased to report that many of the numerous mature sallows found throughout the area have been retained.

Chart 6.4.1 ~ *A.iris* activity recorded at Site D in 2003



Date	Notes taken on the day	Description
29-Jun 03	~ 12:00-14:04hrs, 100% sun, 18°C. 12:00-12:48hrs, nine flights. 12:51hrs, 2 clashed high up into sky. Clashes 12:56, 13:06 and 13:11hrs. Also nine territorial flights until 13:40hrs. 13:40hrs, a female flew into the territorial area fairly high in the canopy and immediately drew the attention of the territorial male, which left its perch. Both flew quickly down into adjacent scrub and were lost to view. 13:40-14:04hrs, no territorial activity or presence.	Males seen ~ 2 or 3 Females seen ~ 1

For ourselves, and we hope for everyone else who saw *A.iris* on the Reserve in July 2003, it really was an enjoyable time in so many ways.

In terms of the butterfly itself, activity was noted as strong and early. And for observers, sightings were regular, often frequent, and activity was varied in terms of male or female, groundings, possible egg-laying, perching, sap run feeding, and not least male patrol flights.

A joint field-trip with Countryside Management Service and Butterfly Conservation on 12th July was fortunate to coincide with a rather early peak in activity and was attended by c.40 people through the day. A field-trip with Butterfly Conservation, Norfolk Branch on 20th July also yielded some sightings, but by then activity had rather fallen away.

Lest we take the situation for granted, it was only on 15th July 2001 that Lissa Smith made the first reported sighting on the reserve. The habitat is still very much as described in the 1999-2002 report.

We would like to thank all those who reported their observations to the branch (2.1), and hope this information will continue to flow in 2004. Notes including time, duration and description of sighting, general weather conditions, and overall time spent looking in fruitless search, generate valuable data gratefully received. Particular thanks to Nick and Angela Sampford for note-taking over many days in 2003, and for pointing other observers in the right direction. Nick's patience was duly rewarded with a fine set of images of a grounded male along the main ride early in the season (9.2a).

Chart 6.5.1 ~ summary of all *A.iris* activity recorded at Broxbourne Wood NR in 2003

We have tried to make estimates of 'safe minima' seen for each day, although there is every chance that more individuals were seen on any one day. As was the case across Hertfordshire, the noted flight season on the Reserve started early and peaked early, and appeared to be relatively strong (5; 9.2). Notes on duration of observation for some dates were not available, and no doubt the site was being scrutinised anyway by keen lepidopterists beyond the times recorded.

Chart 6.5.2 ~ male *A.iris* activity recorded at Broxbourne Wood NR in 2003

For those who have watched from the bench for many hours, the sight of a male patrolling the 20ft canopy has become an expected event. The activity may not take the same form as of a male occupying a prominent perch about tall oaks at a high point, but certainly appears to be vigorous territorial activity over a broad front of habitat. The males skim the tops of the facing belt of willows and mixed growth, or cross the ride and sometimes pass through the older conifers. Once two males met and were seen to clash off up into the sky and out of view. At the peak, one can expect a few flights every hour, with activity continuing throughout the afternoon. The males sometimes give fine views as they perch on the canopy of willows, oaks and other growth. The main ride is fairly wide and sunny, and in places damp, and grounded males were again seen on several occasions in 2003, especially in the first half of the flight season. A further exciting discovery, by Sandra & Kevin Standbridge on 12th July, was of a male visiting a small sap run on an oak, also visited by hornets and other insects.

Chart 6.5.3 ~ female *A.iris* activity recorded at Broxbourne Wood NR in 2003

Regular observers at the Reserve will be aware of the problem of distinguishing between the sexes when given fleeting views along the main ride as an individual disappears into the trees. Even with good views of a static individual, it is worthwhile taking one's time before deciding upon gender, perhaps by moving closer, or to one side with care, to get a better impression of size and to catch sight of any purple if present.

It may be that one or two of the presumed females in 2002 were in fact males. However, we believe that the majority of these were correctly identified to sex, and that two sightings of grounded *A.iris* in 2003 were definitely female. On 11th July, a fresh female was observed basking on the trunk of a pine, at a height of 1m for approximately 5 minutes, at around 15:15hrs.

Sightings of females lurking around the willows came on an almost daily basis, with apparent egg-laying activity observed within large willows, but not yet any eggs seen.

Chart 6.5.1 ~ summary of all *A.iris* activity recorded at Broxbourne Wood NR in 2003

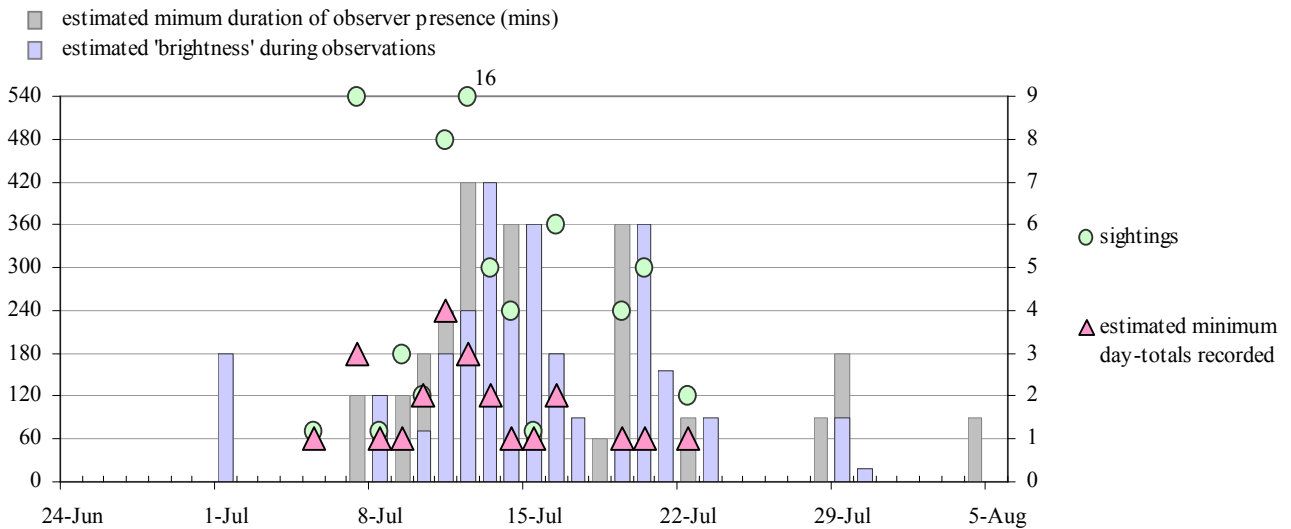


Chart 6.5.2 ~ male *A.iris* activity recorded at Broxbourne Wood NR in 2003

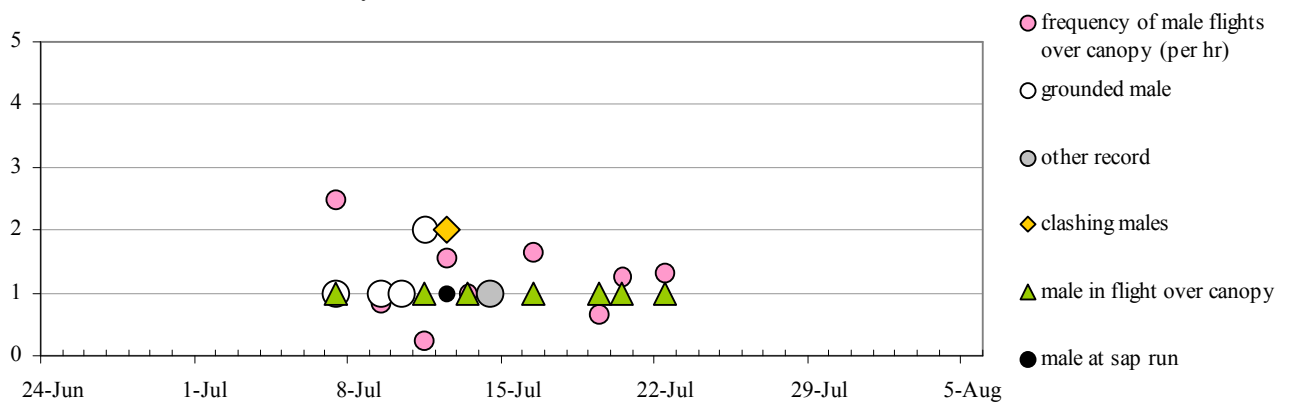
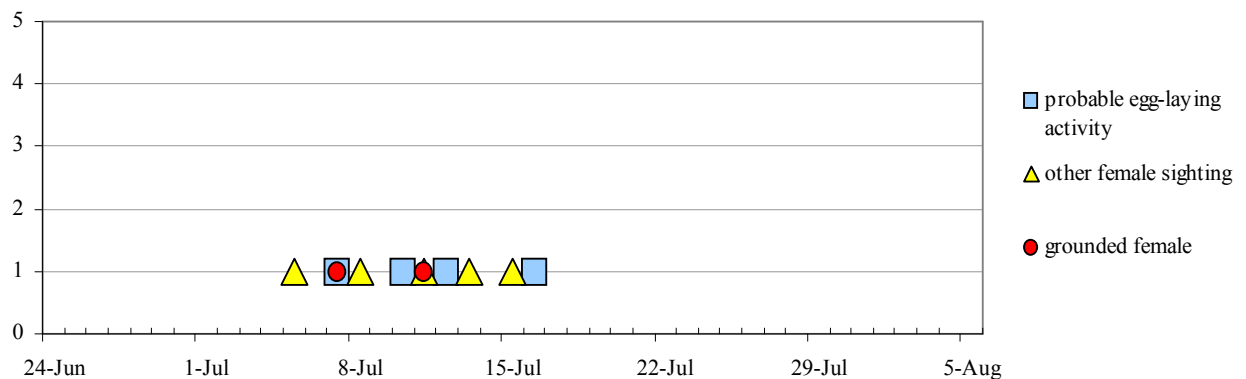


Chart 6.5.3 ~ female *A.iris* activity recorded at Broxbourne Wood NR in 2003



6.5.1 ~ Notes on selected observations at Site E Broxbourne Wood Nature Reserve

Mon 7th July 2003

11:00-13:00hrs, 19°C, 100% sunshine. Two females, one or more males.

11:00hrs, main ride, male in low flight - Lissa Smith.

11:10hrs, main ride, male flew north to south.

11:15hrs, main ride, male clashed with white admiral over willows.

11:20hrs, main ride, male flight over willows.

11:23hrs, main ride, male flew quickly north to south.

11:47hrs, main ride, male in flight.

12:21-12:26hrs, north outer ride, a female in low flight, also creeping along the dry path, also in low marginal vegetation, eventually flew just above ground and into wood.

12:43hrs, main ride, male flew from damp patch on ground at low point.

Lissa Smith, LG/AM

‘12:30-48hrs, main ride, a female flew in, resting on willows, probably egg-laying.’

Nick Sampford (NS)

Wed 9th July 2003

09:30-11:30hrs, 19°C, 60% sunshine. One grounded male from 10:25-11:09hrs.

‘We arrived at Broxbourne Wood NR around 9.30am and walked down the ride from the west car-park where we met Dave the teacher [Dave Waterhouse] at the bench. There were many commoner butterflies about and we soon saw an odd white admiral fly past. There was some fresh dog’s muck and horse muck on the ride. At about 10.20am Angela noticed a butterfly around the tall willow, and when it finally showed to all of us we agreed it was a Purple Emperor. It flew over the willows and was lost to view. We waited for a few minutes and then Angela decided to walk down the ride. At about 10.25am, just before the damp area, she noticed a large dark butterfly on the path and called Dave and I went over to see it. Angela shouted ‘*It’s a male Emperor I think*’. When we got there we were given amazing views of a male Emperor feeding on the ground. I took about 10 photos of it head-on, then it flew up the track towards the bench and settled again on the ground 10ft in front of me, allowing me to take more photos. Again it decided to fly, this time high over our heads and along the track directly behind the bench. Angela followed it and found it again on the ground. Then at 10.40am, it flew up the track back towards and high over the bench, and was lost to view. Angela walked down the ride to where it was first found, to see if it had returned and by an amazing bit of luck it had. It showed there for 2 minutes, then flew slowly up the track, stopping every now and then as if posing for photos. I was having problems with low shutter speeds and missed a few great shots. It continued to about 30 yards past the bench then decided to turn tail and fly back down the track, where it stopped on some old dog’s muck at 10.47am. It stayed in the same position until 11.02am, when it flew slowly off down the track, stopping for a few seconds every 5 yards or so. Dave and I followed it through the damp patch and along the ride, where it disappeared into the wood at 11.09am and wasn’t seen again. What a brilliant sighting. I knew sitting and waiting at the bench would pay off in the end. Using the exact times recorded by the camera, the butterfly was in view for 49 minutes. I took 267 photos in total, but many were slightly out of focus due to low light/shutter speed but I’ve attached what I feel represent the best shots.’

Nick Sampford

[Nick also mentioned that when they first approached the butterfly, and whilst Angela and Dave were delighting in its purple sheen, Nick could see no such colour from his slightly different angle. Some of these images are reproduced in this report in Section 9.2a, and Nick’s image of a male is to be used for the cover of the Butterfly Conservation Hertfordshire & Middlesex Branch Annual Report for 2003.]

Thurs 10th July 2003

Minimum 3hrs, 18°C, 100% sunshine. One female, one grounded male.

‘Brilliant view of an egg-laying female Purple Emperor in Broxbourne Wood NR this afternoon. On willow by the path just down from the west car park. Between 14:00 and 15:00hrs, watched for about ten minutes.’

Nigel Agar

‘I thought you would like to have another record of the sighting of Purple Emperor at Broxbourne Wood NR today, at 12:05hrs for about half an hour, along the main ride from the west car park. On the muddy strip for about 15 mins, then flying and settling on horse droppings for the rest of the time. Several White Admirals also seen.’

Iris Newbery (Butterfly Conservation, Cambridgeshire & Essex Branch)

Fri 11th July 2003

18°C, 100% sunshine, various sightings throughout the day.

'At about 12:20hrs, Les Borg returned to the car park for his lunch and was told that a purple emperor had been perched on his car feeding on squashed insects. I thought they could only suck. Maybe it was sucking up juices. An interesting observation?'

June Crew and the Cheshunt Natural History Society Field Trip

'Sightings for Broxbourne woods: Purple emperor - several sightings during the day from - the first at 12.08 1 male on ground near the lowest point on the ride. Approx 1.30: 1 female on tree. Further sightings of flying emperors up to 3.30pm. A couple in the car park reported a male settling on car bonnets, possibly to feed from fly squash. One of the cars was mine.'

Les Borg

[Les has since said that he feels it is probable they were taking salts from the dirt on his car, as he never cleans it!]

4 sightings of Purple Emperors from West car park [1 male sighting in willows at 2.30 and 2 females at 1.15 and 2.00]. 1 fresh female gave superb views with open wings on pine trunk below bench at 3.15.

Tony Clancy

'Male Purple Emperor towards bottom of main track from West Car Park at 12.08pm. Female seen at 1.10pm on tree, ten yards up from bottom of track. Also purple hairstreak, four commas, eight + white admirals, gatekeeper, small skipper, red admirals, ringlets, large white, small white, brown hawk and southern hawk dragonflies and probable broad bodied chaser.'

Nigel Taylor

Sat 12th July 2003

18°C, hazy sunshine.

Joint Field Trip, Butterfly Conservation, Hertfordshire and Middlesex Branch and Countryside Management Service.

Butterfly Conservation, Hertfordshire & Middlesex Branch Newsletter No 35, September 2003

Broxbourne Wood Field Trip Report – Saturday 12th July 2003 by Nick Sampford

On Saturday 12th July a large group was in Broxbourne Woods looking for a Purple Emperor. At one point there were at least 40 people and nearly everybody was rewarded with excellent sightings. I arrived at 10.15 and walked straight to the bench. There were lots of people about and at:

10.56, Angela [Sampford] picked up a high flying male which gave brief views around the top of a willow.

11.05, a male, [probably] the same butterfly, circled the willow by the bench and flew off high down the track.

11.36, a male again flew from willow to oak by bench, and then back, and drifted down the track to the damp patch. It was seen again at bottom of track by a group walking back to the bench.

12.00, a male flew quickly around the willows and back, and over the heads of the observers and was lost to view.

12.10, report of a female down the track by the damp area.

12.40, I saw a very distant butterfly about a foot off the ground 150 yards up the track. I called it as a possible emperor. The group got on to it and it flew slowly down the track towards us settling 20 feet in front of the group and allowing excellent ground views for 4/5 minutes. It was a stunning male and Liz [Goodyear] managed to get the rest of the group back from the pond area in time to see it, before it flew off towards us and circled the group, then drifted off slowly at head height down the track behind the bench. This was a different male to the one I photographed on Wednesday 9th, due to there being no nick out of the wing.

12.48-12.52, a male flew along the top of the willows, then decided to sit on an oak tree for just over 4 minutes, allowing Andy [Middleton] to set his scope on it and again the group got stunning views.

1.15, a male flew over willows then went across the path towards the oak and was lost to view.

1.41-1.48, a male was seen again over the tops of the willows. It stayed in view for a minute before it went into the centre of the tree. Here it was joined by a female. We lost the male in the tree, but the female came out and slowly flew along the willows and appeared to egg-lay or at least inspect for egg-laying. She sat in full view in 2 places for a minute or so, before slowly drifting off over the willows.

c.2.25 [a minute or two before the 2.26 sighting] Andy picked up 2 clashing males spiralling and chasing upwards quickly from the willows, seen from the viewpoint, but they were quickly lost to view over the adjacent canopy.

2.26, a male along the willows briefly.

2.39, a male again in same area.

2.41, a male flying between oak and willows.

2.57, a male over the willows.

In total there were 15 views of Purple Emperor which is my best count ever and I think everybody who went there went home happy. We also had numerous sightings (40+) of White Admiral and Purple Hairstreak were there in constant view all day. In total we had 17 species.....

Nick Sampford

17:00hrs, Sandra and Kevin Standbridge spotted a male Purple Emperor on a sap run issuing from a small branch 20ft up an oak tree not far from the west car-park. The male was seen at the run for perhaps 10 minutes, before flying off onto a nearby oak, then away. When looked at subsequently, the run was also being visited by several hornets and other insects.

Andrew Middleton with Robert Callf and Malcolm Hull

Wed 16th July 2003

10:00-13:00hrs, 22°C, 75% sunshine. Minimum one male and one female.

'Had 5 sightings of emperors. 12.04, male above willows briefly. 12.05, male joined by female, clashed briefly, female seemed to chase male off and then laid 2 eggs in willow opposite the bench. On both occasions I saw the abdomen point towards the willow, although I never actually saw an egg. The sites were roughly 6 ft apart. She then flew off strongly down the ride. 12.07, male over the willows. 12.09, male over the willows. 12.11, male over willows then up and down the ride, as if it was looking for the female. It clouded over at about 12.20, then rained, and we had no more sightings.'

Nick Sampford

Sun 20th July 2003

11:00-15:00hrs, 21°C, 65% sunshine, minimum one male seen, six sightings.

Joint Field Trip with Butterfly Conservation, Norfolk Branch.

Butterfly Conservation, Hertfordshire & Middlesex Branch Newsletter No 35, September 2003

Broxbourne Wood NNR Field Trip Report Sunday, 20th July by David Chandler

Following overnight thundery rain, Sunday dawned a sunny day, with blue skies & white puffy clouds, ideal weather for the joint field trip to Broxbourne Wood NNR that had been arranged as a field trip with guest appearance from BC's Norfolk Branch.

Norfolk branch, who were on a whirlwind three-site day tour of East Anglia, joined the party shortly after lunch with the aim of seeing some of our summer woodland butterflies and the hope of a glimpse of the Victorian's elusive "noble fly", the "*Apatura Iris*", otherwise known as The Purple Emperor.

There had been encouraging reports from Liz Goodyear and Andrew Middleton (the walk leaders, BC & Herts. NHS), who have both studied the Purple Emperor in detail in the wood for many years, that "*iris*" had been seen regularly at this location of late. However there was also a concern that as "*iris*" had emerged earlier than usual this year and that the site visit was perhaps towards the end of the butterfly's flight period rather than at its peak.

Local members of Butterfly Conservation, some Wildlife Trust & RSPB members and even one or two passing members of the public, curious at our strange woodland antics, all made their way down from Broxbourne's western car-park, the couple of hundred yards or so down the main ride, to the small clearing where the wood opens up. This is the point, near the Emperor's favourite oaks and pine trees, beside the seat, where there are good views of the willow trees (the butterfly's food plant).

Travelling down from the car park there were Ringlets, Speckled Woods, Meadow Browns, Gatekeepers, Peacocks, Common and Holly Blues on view plus a Comma flying along the bridle path. Just before the small clearing Small Whites, Green Veined Whites, Large & Small Skippers and another Comma were seen.

Arriving at the seat, where a small ride crosses the main ride, we waited about an hour and saw two White Admiral before the first of two sightings of an Emperor, two brief flurries of excitement around 11.30am & 11.35am. Then the sun went behind some clouds and butterfly activity stopped. Shortly afterwards we did see a Red Admiral, high in the canopy, which sometimes can fool uninformed Emperor watchers, but the RA has much less pointed wings.

During the dull period we saw another Comma, a possible White-letter Hairstreak, which is more chocolate-coloured than the Purple Hairstreak, and then two genuine Purple Hairstreak, made their appearance in the oak canopy above.

David Watson had brought a telescope and very fine views were obtained of the Purple Hairstreak as the small silvery butterfly walked in small circles around the oak leaf sipping honeydew and slowly opened and closed its wings as the sun and cloudy shade alternately warmed and cooled it. The Purple Hairstreak stayed around on his leaf for a good twenty minutes so giving all who saw it in such close detail (orange antenna tips!), a magnificent view.

Norfolk branch then joined the group. After a quick second look at the sedentary Purple Hairstreak, the sunshine came back and we saw a White Admiral. We all paused and it alighted on ferns near the willow tree by the path for a few minutes and most were able to get a good close view.

Then, around 1.30 pm, back up the hill from the main ride's crossroads there was a fleeting moment of excitement as Andrew spotted an Emperor swiftly fly across the ride and go amongst the fir trees. Only one or two members were quick enough to respond and catch a glimpse. Back down the ride, "*Iris*" made two further appearances around 2 pm and I'd guess about half the party of around 25 people got a brief sighting. And that was about it for the day.

Unfortunately no Emperors descended to the ground today, but speaking personally, I had two sightings out of the five; these were my first *ever* sighting of this species in 40 years of looking at butterflies; so it was still a "red letter" day for me.

It was now 2.45pm and a few clouds were beginning to gather and it became overcast. We headed back towards the cars but there was still time to see some dragonfly patrolling the main ride.

David Chandler

'We were joined by 12 members of the Norfolk Branch today (although I believe one lady was an Essex member). Unfortunately, the Purple Emperor did not co-operate and there were only about 6 fleeting glimpses and then unfortunately not everyone present was lucky enough to see them. However, White Admiral were still showing well and thanks to Dave Watson, several present were able to observe a very sedentary Purple Hairstreak through his "scope", feeding on honey-dew'

LG

Tue 22nd July 2003

11:00-12:30hrs, 20°C, 100% sunshine. Minimum one male seen.

'Ian Woiwod and companions had watched for an hour to 12 o'clock, when we arrived. At 12.10, a brief sighting of one over willows, then by bench, a male flew over ride, around, then landed on willow opposite bench. It sat there for 3 minutes or so, then flew off high through the pine wood. At 12:20, another brief sighting of one over willows. Watched until 12.30.'

AM/LG

Tue 29th July 2003

10:30-13:30hrs, 30°C, 100% sunshine.

'No sightings of Purple Emperor.'

Nick Sampford

6.6 ~ Site F

Site F was not surveyed in 2003, however we plan to visit the area again in July 2004. Habitat management here is positive for *A.iris*.

6.7 ~ Site G Broad Riding Wood / Broxbourne Common

(TL343075)

We did not manage to visit this part of the Broxbourne Woods complex during the 2003 flight season. However, there is willow-rich habitat in adjacent areas, and it seems a good place to search for territorial activity. Various bodies involved with managing the woods in this area have been informed of the presence of *A.iris* and are being encouraged to manage positively for the species.

6.8 ~ Site H

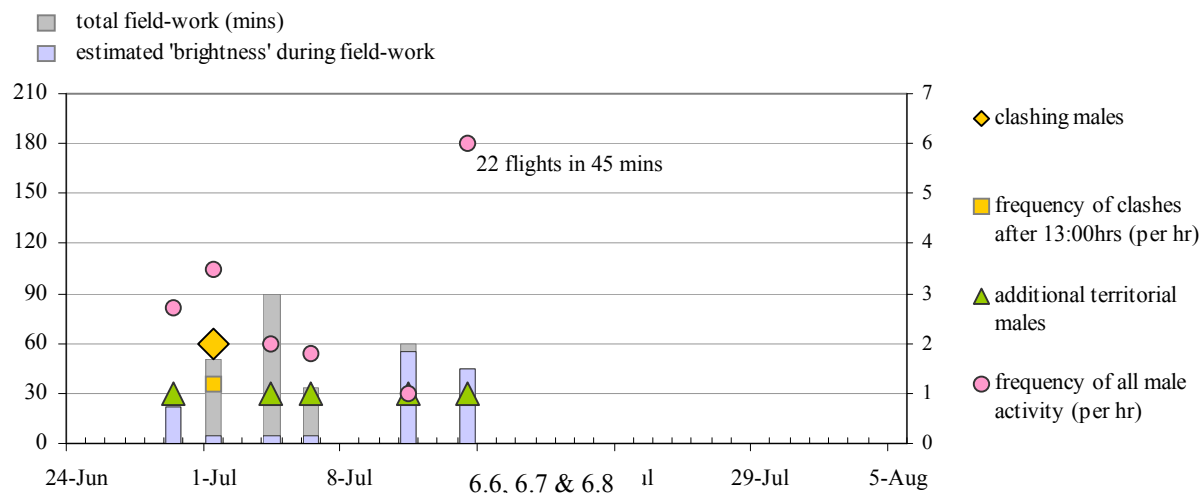
Territorial activity was observed for the second consecutive year amongst several well-spaced oaks spread over c.75m. Activity here seems to be less intense than elsewhere, and choice of particular trees and perching positions seems to differ between surveys.

The habitat through adjacent woodland remains generally as described in the 1999-2002 report .

6.8.1 ~ Notes on selected observations at Site H

Date	Notes taken on the day	Description
14-Jul 04	~ 14:15-15:00hrs, 23°C, 100% sunshine. One male perching on, and flying between, two oaks. 14:20hrs, 1 flight to perch west. 14:22hrs, 1 flight after purple hairstreak. 14:22-14:26hrs, six flights and perches. 14:31-14:34hrs, 3 flights to perching west side of gap. 14:35-14:42hrs, 6 flights to perching east side of gap. 14:45hrs, chase purple hairstreak to perch east side, then flight. 14:48hrs, 1 flight left to right further away in background. 14:54hrs, flight behind oak further away. 14:55hrs, flight right to left behind oak, appeared to fly way through oaks. 15:00hrs, end of observations.	Males seen ~ one

Chart 6.8.1 ~ *A.iris* activity recorded at Site H in 2003



6.9 ~ Site I

Woodland description ~ This is a private wood with no public access. The wood lies adjacent to the north side of Broxbourne Wood Nature Reserve and is designated a Site of Special Scientific Interest. The topography of the area is such that, over 1km of woodland, the land rises from a low of 70m in the south-east of the Reserve to over 100m at the north edge of the wood.

Nature of observations ~ All sightings were made with binoculars from the roadside 400m south of Brickendon Green. In any case, this is the best location to view territorial flights and clashes over the canopy. Parking is available at Brickendon Green, and the canopy was viewed at a distance of 200m from the wide verge off the lane. The lane is fairly narrow and busy, so observers must be careful to stand on the verge well away from passing traffic; viewing is at one's own risk.

The territory ~ Considering the presence of willow-rich habitat and *A.iris* in the Reserve, we have rarely driven past this wood in recent years without commenting that it would be a classic location for male territorial activity. It is well worth concentrating on the large ash visible in the canopy, as many of the flights and clashes were first seen around this area. Viewing distance is approximately 200m.

6.9.1 ~ Notes on selected observations at Site I

Date	Notes taken on the day	Description
06-Jul 03	~ 16:40-17:50hrs, 18°C, hazy sunshine. AM met Brian Dawton in the Broxbourne Wood NR, and suggested they investigate the canopy at Site I from the roadside verge near Brickendon. Observers: AM and Brian Dawton. 17:00hrs, 2 males clash low over canopy, then one flight through canopy. 17:32hrs, 2 males chasing low over canopy left to right. 17:37hrs, 1 flight. 17:42hrs, 2 males clash. 17:43hrs, 1 flight right to left. 17:50hrs, end of observations.	Males seen ~ 2
07-Jul 03	~ 13:07-14:00hrs, 19°C, hazy sunshine. Observers: LG, AM, Dave Waterhouse, NS & Simon Rasch. 13:20hrs, 2 males clashing flight very high into the sky. 13:21hrs, 2 males clashing flight very high into the sky, also a third male nearby over canopy. 13:23hrs, 2 males clash. Subsequently brighter and no activity observed until finish at 14:00hrs.	Males seen ~ 3

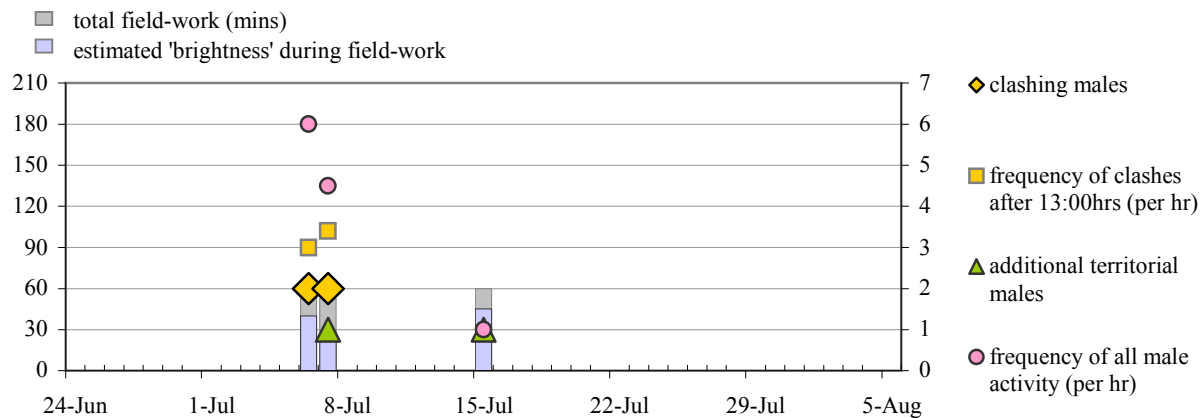
Tue 15th July 2003

1hr observation time, fairly sunny, 24°C. Number seen: 1 male. 13:32hrs, 1 flight

'I was fortunate to see presumed male for a few seconds round the 'master' ash tree on the Brickendon corner of the wood. Notes are a bit sparse: 15th July ~ 13.32 - one on Corner of the wood - ash master tree. I recall the flying time being long enough for me to tell two other watchers that I'd found one but not long enough for them to get on to it. Probably only *ca.* 5 seconds. Duration of watching time at least one hour. I don't have a note of the weather but recall that it was bright but hazy: if the Met Office records confirm that as probable you could probably state it as fact. Difficult to put in percentage terms as it can still be bright even with no blue sky and I don't recall for sure if there were patches of blue (but think not). Certainly there was enough sunlight for the wing pattern on the PE to be very clear and for an oddly marked leaf, punctured with holes, to make a striking resemblance to a settled insect. Hope that helps. (I'll try to be a little more scientific in future).'

Jeremy Gaskell

Chart 6.9.1 ~ *A.iris* activity recorded at Site I in 2003



6.10 ~ Site J The Wormley Woods Complex

(centred on TL320058)

'For anyone willing to try, A.iris is almost certainly waiting to be 'found' in this large wood.' (1999-2002 report)

Woodland description ~ The Wormley Woods complex (c175 ha including Bencroft Wood) forms part of the larger Broxbourne Woods National Nature Reserve (NNR; SSSI), and is owned and managed by the Woodland Trust with conservation and biodiversity as major considerations. See the 1999-2002 report, section 7.1, for more details. Recently, a further sallow-rich panel in the south of the complex has been thinned of its conifers, and we are pleased to report that numerous sallows have been retained in the stand along with a fair abundance of climbing honeysuckle.

Introduction ~ From early in our studies, we were convinced that *A.iris* would be found in the Wormley Woods complex. We knew that two had been seen in 1996 (Murray & Souter, 1997) and that woodland visits had identified the southern half of the complex as having a sallow density that was the highest we had found in Hertfordshire.

We had been watching Wormley since the summer of 2001 but, like the Broxbourne Woods complex, searching for *A.iris* here is like looking for the proverbial needle in a haystack. We identified several high points as well as where the greatest densities of sallow were and then made visits to the complex to systematically watch all these areas during the flight period.

Nature of sightings ~ This season our first two visits were not successful partially thwarted by the weather. It should be pointed out that despite the general belief that July was hot and sunny, there were actually several days in early July when the weather was quite poor and a lot of time was lost. However, we proved how essential it is to be out in this weather waiting for the rain to stop or the sun to shine. You never know what you could miss!

The morning of the 8th July dawned dull and gloomy and the decision was made that we should visit Wormley Woods just in case there was any improvement in conditions. We parked on the south side and started walking around the sallow rich southern area from around 11:00hrs. There was a slight improvement in conditions and we watched the Ringlet and other grassland butterflies slowly start their day's flight, which they would have normally begun several hours earlier. White Admiral were quite numerous and they were still flying around the brambles and had not yet risen into the tops of the trees, behaviour normally associated with this period of the day. We watched the sallows around the southern entrance to Derry's Wood but no *A.iris* were seen despite some serious watching, so we decided to walk up the rise on the east side towards the area near the Coal Post and pond; an area we had felt for some time had territorial potential. To view this area from beneath the tree canopy was almost impossible so we tried to find a vantage point that enabled us to look across and over the canopy in the same way that had been so successful at Sites A (6.1) and I (6.9).

With some difficulty a viewpoint was found and at 14:20hrs, AM started watching the canopy through his binoculars, whilst LG wasted time trying to reply to a text message! **Almost immediately AM called out to say he had seen two males clash!** We had found a territorial area in the Wormley Woods complex. We watched the woodland canopy for about 90 minutes; for the first hour the weather was still quite cloudy but we had several sightings. However, what appeared strange to us at the time, was that as the weather improved and we began to anticipate more activity, the activity actually stopped.

The territory ~ appears to be an area of prominent trees at one of the highest woodland points. We took a GPS reading at our vantage spot and we tried to determine where the exact territory was under the woodland canopy and our belief is that it is a short distance north of the pond. However, there is no focal point obvious from below and certainly as yet we have not found any breaks in the canopy where good observations could be easily made. We stood under the canopy and looked up for some time on the 8th, but by the time we returned to the wood the activity had already subsided and we saw nothing that could be confirmed at a definite sighting. As with the Broxbourne Woods complex, the area is so large, with several obvious high points and such a high density of sallow, there are almost certain to be more territories, but they may remain impossible to find from the forest floor.

The 1996 sightings (Murray & Souter, 1997) had been seen in this area, and we now feel it was likely to have been of two males in a warm-up area or secondary territorial area (small glade) near the 'coal post' c.100m from the territorial activity seen in 2003 over the canopy. These gaps look like they should have potential for being a territorial area, but in 2002 we had watched them for some time and saw nothing, although it should be noted that they are not quite at the highest point, which could make a significant difference to their potential. See 8.1 for discussion regarding warm-up or secondary territorial areas.

On the 13th July we received this email from Brian Dawton who had been encouraged by AM to visit Wormley Woods

'Just to say I have spent some time in Wormley Woods and as you suggest sallow is scarce [north section] and concentrated in the southern part where I saw 1 Purple Emperor male on main north-south bridleway towards edge of wood. Also checked Thunderfield Grove where sallow appears none existent but white admiral is present'

At our request Brian sent us some more information

'The purple emperor was a male grounded in full sun at about 11.30 am on what appeared to be a dry stone bridleway to the south of Derry's Wood where the track runs south I believe into Hammond Street. Just before the wood opens out to farmland to the west, there is a glade and the wood is recent growth with good structure. I observed it for about 30 seconds before it flew over the canopy.'

Brian Dawton

And finally Martin Shepherd sent this message on 15th July

'Derry's Wood (south of Wormley Wood): Purple emperor found at 12.28 at south end of Derry's Wood at the edge of a clearing with oak and sallow. The butterfly - I think it was a male but no close views - was on sallow and flew south. It then reappeared at 12.45 and landed on oak, and flew north and out of sight at 12.50. Also white admiral, two purple hairstreaks, and several ringlets and red admirals.'

Martin Shepherd

It took us nearly three years but it was worth the wait! Congratulations to Brian and Martin.

Chart 6.10.1 ~ *A.iris* activity recorded in the Wormley Woods complex in 2003

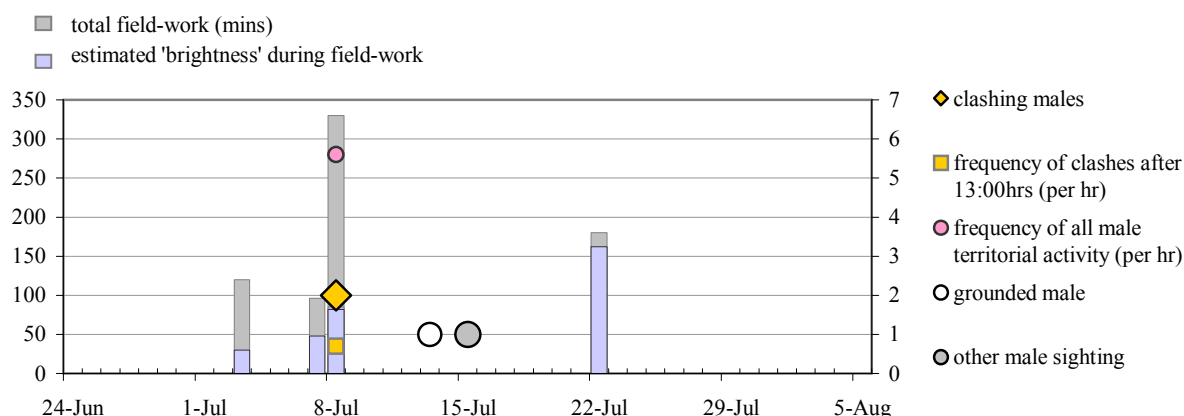


Table 6.10.1 ~ Notes on selected observations at Site J

Date	Notes taken on the day	Description
5-Jul 03	<p>~ 17°C, rather cloudy during observations, some sunny spells before and after.</p> <p>14:23hrs, two clash and fly very high over central area just north of pond - line of two or three oaks seemed to be the central area, perhaps 75 to 100m into wood and 100-150m from coal post.</p> <p>14:29hrs, one very large male flew around the oaks.</p> <p>14:33hrs, again very large (massive) flew around the oak, then very cloudy, thick cloud.</p> <p>14:56hrs, slightly brighter one swooped around oaks.</p> <p>15:02hrs, massive butterfly, moved around, perched north end of oaks.</p> <p>15:04hrs, flight to right side.</p> <p>15:06hrs, flew into gap between line of oaks.</p> <p>15:21hrs, possible brief sighting, then much brighter until 15:45hrs.</p> <p>Watched from 14:20-15:45hrs.</p> <p>At 15:50hrs moved into wood and watching under oaks, 'possibles' in canopy and around trees seen from below.</p> <p>16:09hrs, possible, then shortly after, one possible lower and met another - possibly white admiral.</p> <p>Walked back to car.</p>	Males seen ~ 2

6.11 ~ Site K Ermine Street / Box Wood area

(TL348095)

'Numerous sallows are visible in the wood and along Ermine Street. A high point by Elbow Lane Farm makes this an area of some potential.' (1999-2002 report)

Woodland description ~ Box Wood is a private wood, which lies just north of Hoddesdon Park Wood and to the west of Ermine Street. Although the wood has no public access, Ermine Street is a public right of way.

Aerial images of Box Wood show a wood with good age diversity and the probability of good sallow numbers. Its proximity to an area of the Broxbourne Woods complex where there are historic records of *A.iris* and the fact that the radio mast was built at one of the highest points in the area (the radio mast is clearly visible for many miles including near to where LG lives in Ware!) made this an area already identified by LG/AM as having potential.

In the late afternoon of 7th July LG/AM walked up to the radio mast. Unfortunately time was short for LG but the weather was good. Around the mast are several large prominent trees which look ideal for a territorial area and after watching these for several minutes we started to walk back to the car which had

been parked at the Goose Green car-park. LG turned round to continue watching and suddenly saw two butterflies clashing and flying low to the west. AM was just able to get onto them with his binoculars but the sighting was so brief neither of us could be certain that these were *A. iris*. The sighting was unusually low and although at the time no Red Admiral had been seen, one was seen shortly afterwards.

However, a few days later on the 13th July, the following news was received from Kevin and Sandra Standbridge. AM had met the Standbridges the previous day in the Broxbourne Wood Nature Reserve and they had told him that they had seen a Purple Emperor a few years ago towards the middle of the complex (6.12).

Sun 13th July 2003

‘Today we walked around Balls Wood and saw 3 White Admirals and large numbers of Ringlets, Meadow Browns, Gatekeepers and Skippers large and small. We then walked towards Goose Green on Ermine Road, halfway between Elbow Lane Farm and Goose Green, we spotted a White Letter Hairstreak on the right hand side. Then about a hundred yards on the left, we spotted various butterflies feeding on sap about 25 feet up on an Oak tree. 3 Red Admirals, 3 Commas, 1 Speckled Wood and a PURPLE EMPEROR (unable to id sex). It stayed on sap for at least 45 mins from 11.30 am. We left to get scope to take photos however on our return an hour later it had gone. The other butterflies were still there, it could therefore be a regular sap site.’

Kevin and Sandra Standbridge

On the 16th July, LG walked slowly south along Ermine Street. A storm was brewing and she knew there was only a small window to make this visit. LG found the oak that the Standbridges had marked, and although the sap run was not so well attended, after ten minutes a very tatty *A.iris* was seen at the sap run. The Standbridges later commented that “*Our PE was a large individual but it was in good condition, wings were not tatty at all. However we did not see inside as it did not fly at all when we were there. We tried to take a photo but came out as a silhouette*”.

LG had the same problem, as the butterfly was mostly in silhouette and only visible when looking towards the sun; all attempts at taking a photograph failed.

These sightings and that of a male on a sap run at the Broxbourne Wood Nature Reserve (6.5) were highlights of the 2003 season. We had always wondered what the male or female may do after mating and the condition of the Ermine Street specimen answered some of our questions.

Table 6.11.1 ~ Notes on selected observations at Site K

Date	Notes taken on the day	Description
16- Jul 03	~ very humid with storm on horizon.	Sex unknown
	10:30hrs, arrived Balls Wood, walked towards Box Wood along Ermine Street.	
	10:50hrs, found tree, 2 red admirals.	
	11:00hrs, a tatty PE arrived, viewing into sun.	
	11:15hrs, still present, very tatty, 11.25hrs flew out again - so tatty, hardly any wings left.	
	11:35hrs, still present.	
	11:45hrs, returned in direction of Balls Wood, uncertain whether PE still in tree, possibly male but not certain.	
	12:00hrs, returned and took GPS reading of tree.	
	12:10hrs, walked slowly to radio mast, very humid, storm approaching.	
	12:35hrs, back at car.	

6.12 ~ Site L Broxbourne Woods Complex; central woodland area

The woods covered in this large area include the privately owned Cowheath, Brambles and Highfield Woods. Although there are public rights of way through these woods, access is restricted. Over the years *A.iris* has been reported from these woods (1999-2002 report) although up to now not attributed to this particular area. However, we have decided to classify these woods as an additional site this year in view of the news detailed below.

Woodland description ~ A very mixed woodland habitat, comprising large areas of conifer plantation, but also areas of hornbeam coppice and mature mixed deciduous woodland. Sallow density varies from extremely high to poor, but overall the area provides excellent *A.iris* habitat. During the late summer of 2003, some areas of conifer plantation were subject to thinning but the majority of sallows were retained. The area is being managed positively for *A.iris* and the species is considered within the owners' woodland plan.

Description of sightings ~ Richard Andrews was encouraged to go to Broxbourne on the 16th July, after his wife Diane had attended one of the field-trips (6.6). Unfortunately, Richard took the wrong turning and found himself walking through the central private area of woodland and completely lost!

Wed 16th July

11.30-11.45 – 12.15

'I was walking along a path approaching a broken culvert where the path drops 5 or 6ft with a small wet patch of mud at the bottom. The weather was hot, dry and still with sunny periods. As I approached a butterfly flew up. I stopped and it returned to the same spot on the mud. I was about 10ft away and as I focused my binoculars it flew off again, only to return, pitch and remain for the next almost 25 mins.

I had never seen a Purple Emperor and at first saw just a large brown butterfly until it moved slightly and the light caught it, a definite male, and I was over the moon. I watched for more than 5 mins before I decided to time it, then watched for the next 15mins or so. In the wet mud also was a Peacock, on a bramble bush nearby (6ft) 4 White Admirals, 3 Peacocks, 7 Commas and a Painted Lady, and numerous browns. Close by on either side were young sallows about 12-14ft high and on one side *cattail reeds*

All told a wonderful day.'

R[Richard] J Andrews

We were also told of another sighting by Kevin and Sandra Standbridge (6.11)

'Andrew [AM] also requested that my wife give you details of a Purple Emperor she spotted approx. 5 years ago. If you walk into the woods from Goose Green car park, walk passed the pond and turn right up the bridlepath until the top, turn left and it was a short distance along, flying around trees and it was a male Purple Emperor before 12.00 on a sunny day.

Additional information received ~ 'Yesterday's PE (6.11) was seen whilst we headed towards Hertford Heath from Goose Green car park and Sandra's previous sighting was in the other direction crossing the road into the woods towards pond and turning right after the pond up the bridleway, where the workmen are at present and turning left at the end.'

Kevin and Sandra Standbridge

[Probably somewhere near TL342081, along a public right of way in the southern area of Brambles Wood]

6.13 ~ Site Z Ruislip Woods National Nature Reserve

(centred on TQ072895)

'John Matthews created great excitement by recording a male of this species [Purple Emperor] in Copse Wood on 5/7/99' (George, 2001)

Although briefly discussed in our first report along with a list of sightings (1999-2002), this was truly exciting news and the Ruislip story began in the same year that our studies also commenced. We would like to thank Ched George and the Ruislip & District Natural History Society for allowing us to publish details of their observations. AM/LG have not visited the site during the flight period but made a visit in the autumn of 2003 to get a 'feel for the site'. What was very interesting was how this site differed from nearly all the known *A.iris* sites in Hertfordshire and the visit was a very educational experience for understanding the different types of woodland and landscapes that this butterfly can inhabit.

Extract from www.english-nature.org.uk:

Introduction

Ruislip Woods National Nature Reserve (NNR) consists of five principal areas – Poor’s Field, Mad Bess, Bayhurst, Park Wood and Copse Wood - making a total of 295.7 ha. As a unit it represents 10% of London’s Semi-Natural Ancient Woodland (SNAW). Park Wood, at 100.2 ha, is the largest unbroken wood in London. Ruislip Woods were declared as an SSSI in 1950 and became London’s first NNR in May 1997.

Significant habitats and species

The majority of the site is wooded, with extensive areas of hornbeam coppice overstood with either common or sessile oak. The remaining woods are secondary, consisting of oak/birch, birch/aspens, beech and sweet chestnut. Most of the woodlands contain historical earthbanks, some with laced or stubbed trees indicating external boundaries, former divisions within the wood and cover for game shooting.

Situated between Park Wood and Copse Wood is Poor’s Field, an area of 16.2 ha, which is a Registered Common. Sub-soil ranging from Reading Beds to Reading Sand, combined with a long history of grazing, has given rise to a wide range of flowering plants.

There are numerous header streams, mostly running in their original meanders, and areas of wetland surrounding small bodies of water amounting to approximately 6 ha.

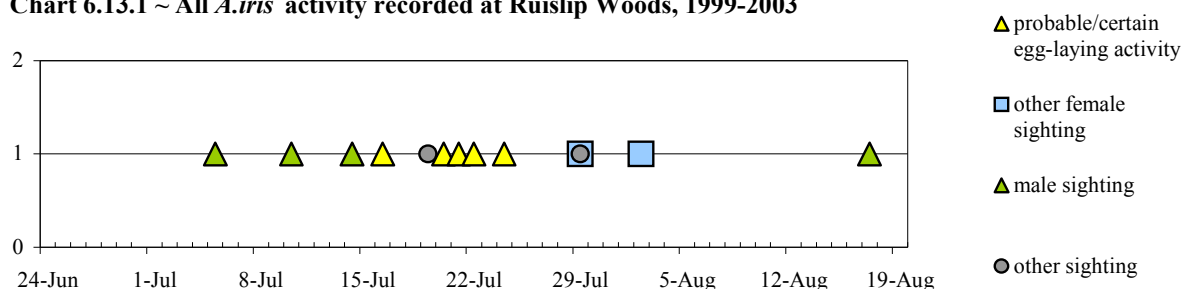
English Nature www.english-nature.org.uk

Sallows ~ There are numerous sallows around the lake and on the Common area (Poor’s Field), although many of the willow in this area are *S. cineria*. The wooded areas form a bowl around the lake and rise up to several high points in various directions. There also appears to be an abundance of *S. fragilis*, and perhaps other willow species, in the damper areas of the NNR adjacent to the woodlands, probably more so than at any of the other known locations for *A. iris* in Hertfordshire or Middlesex. It would be interesting to know if these willow trees are being used at all by the colony of *A. iris* here at Ruislip.

Woodland Management ~ The woods are under positive management and form a mosaic of different structures and forms varying from high canopy, to recent coppice, a truly mixed scheme of management, which has without doubt been of benefit to *A. iris*, and there are several areas where willow density is high but equally there are several areas where there is none. Of concern is that a lot of scrub has been removed from the Common to help the new grazing regime, and in doing so a lot of willow has also been removed. We appreciate that there is a difficult balance to be maintained in restoring the Common landscape but at the same time managing sympathetically for *A. iris*, which is presently the rarest butterfly known to be resident in Middlesex.

Nature of observations ~ Since 1999, when the first modern day sighting was made, *A. iris* has been seen every year but never in large numbers. The best year was 2002 when *A. iris* was recorded on four occasions (Chart 6.13.1). This chart clearly shows that the majority of male sightings have been at the beginning of the flight period, followed then by the females and predominantly showing behaviour indicative of egg-laying.

Chart 6.13.1 ~ All *A. iris* activity recorded at Ruislip Woods, 1999-2003



A territorial area? ~ As yet no territorial area has been found, although there are several points around the complex that could have potential, but as with our own sites in Hertfordshire, identifying high points on a map is easier than finding territories. In view of the size of the complex it may be that there is more than one territorial area.

Table 6.13.1 ~ Sightings of *A.iris* in the Ruislip Woods National Nature Reserve, 2003

Date	Number	Recorder
10th July	1	Steve Pash
2nd August	1	Steve Pash & Ched George

6.14 ~ Site Y Forty Hall Country Park, Enfield, Middlesex

(centred on TQ335990)

On the 20th July 2003, whilst walking his dog near Turkey Brook at Forty Hall, Ron MacMurdie saw a Purple Emperor. The news came via his son Phil. This is the first record from TQ39 since our project began but see 3.2 in the 1999-2002 report for previous records from this area.

‘1 male **Purple Emperor** at **Forty Hall Enfield** - sighting on **Sunday 20th July** [2003], by my father. I quizzed him about it and he was quite categorical about the sighting, and said that he had only ever seen one once before. It was sitting in a clearing at Forty Hall near a small brook.’

More information was received on 12th September, 2003:

‘It was the first Purple Emperor he had seen in the area ever, he had seen one during the war but that was in Hampshire. He was so surprised at what he saw that he had to get his pocket book out at first to confirm what he had seen, and even then I gave him some prints from the internet as he still couldn’t believe it. It was seen just before lunchtime at approx 1 pm in a clearing near the river at Forty Hall, sitting on the ground sunning itself. Unfortunately the all too brief sighting was ended when it took to the air into the trees.

He walks his dog around Forty Hall and the fields at least three or more times every week of the year, come rain or shine, as he only lives two minutes walk around the corner.

Suffice to say he is “keeping his eyes open” for another next year.

It’s interesting as there are a number of willow trees in the area. Not sure what would be classified as a “suitable breeding tree”, but who knows. There are also some significant oaks in the area.’

Phil MacMurdie

Forty Hall itself is predominantly an area of open grassland surrounding the old house. However, the brooks are tree-lined and mature woodland can be found nearby in Whitewebbs Country Park. Although AM is moderately familiar with the area, LG/AM visited the **Forty Hall** area once more in February 2004 and walked a fairly comprehensive route, which included walking beside Turkey Brook (which the Cuffley Brook joins having risen in the west side of Wormley Wood), along the New River (old course), through Whitewebbs Country Park and Wood and back across the golf course to Forty Hall. Unfortunately, we found very little willow, although beside the brooks we did see numerous willow species. Whereas in the Theobalds area (7.4) there appears to be an abundance of *S.fragilis*, there may be less of this species to be found at Forty Hall and perhaps more *S.alba*. (White Willow).

A rather disappointing visit, which makes us wonder if this male butterfly might have wandered from its normal habitat (8.2.2). Proximity to the Wormley Woods complex (6.10) should be considered or alternatively, that there is a colony in a willow-rich area nearby which we have not found. We have also visited areas near the Cuffley Brook in Cuffley and found a respectable number of willows present there (7.4). However, it should also be considered that *A.iris* might be present on willow species, at very low density across a large area spanning Whitewebbs, Forty Hall, Theobalds and Cuffley areas, as suggested by Martin Catt (see 3.3, 1999-2002 report). It would be nice if a colony could be found on willow species somewhere along a wooded valley situation. This site certainly warrants continued investigation, as it must be remembered *A.iris* is hard to see at the best of sites in Hertfordshire.

7 ~ Potential areas for *A.iris*

See also sections 3 & 7 in the 1999-2002 report.

7.1 ~ Wormley, Bencroft, Danemead, Hoddesdonpark and Box Woods (TL30)

7.2 ~ North Hertfordshire (Hitch Wood, Knebworth, Astonbury Wood and St. John's Woods)

7.3 ~ The Welwyn area (TL11 and TL21)

7.4 ~ Northaw and Cuffley area

7.5 ~ North-east Hertfordshire

7.6 ~ TL31

Introduction ~ an update on our progress

Throughout 2003 we continued to visit areas of Hertfordshire and subsequently Middlesex looking at sallow density, woodland structure and the potential for maintaining a colony of *A. iris*.

7.1 ~ Wormley, Bencroft, Danemead, Hoddesdonpark and Box Woods (TL30) ~ In the 1999-2002 report we said "*the possibility of seeing A.iris seems likely*" in the Wormley Woods complex (6.10) and that certainly is the case. We were sure *A.iris* could be found here; it just took several years. *A.iris* was also seen in the Box Wood area (6.11) at a sap run alongside the wood on Ermine Street although because of its worn state, the sex could not be confirmed.

7.2 ~ North Hertfordshire ~ We did not have the time to visit the **Hitch Wood area** (TL12) in 2003 during the flight period. Ian Woiwod has offered to target this area in 2004 as he travels through the area every day on his way to work, and we have suggested starting with an assessment of the sallow density in the spring.

We visited the **Knebworth area** (TL22) in the winter of 2003, and returned to the area on the 9th July, on what was a very hot and humid day - we watched the Knebworth (Newton Wood) and Norton Green (Watery Grove) areas and in particular the clearing where a cable line has been put through. We also watched the Watery Grove canopy, and other canopies to the south from 11:00hrs through to after 15:00hrs. We did not have any luck nor did we see any White Admirals or fritillaries, although we noted that there was a lot of good quality blackthorn. This area still needs to be monitored in the summer as it certainly has potential.

Ken King who walks the Knebworth transect (Murray & Wood, 2002) has told us about an unusual "butterfly" sighting he had in 1999.

'The sighting was on 11 July 1999 (not 2001 as per last e-mailed guess). The butterfly had left the small square copse to the NW of Burleigh Farm. There is actually a field divide from this copse going NE to meet up with Newton Wood. This hedge is of tall (15 ft) saplings etc. Butterfly was quite large and flying strongly (no swooping or glide) consistently about 10 ft up. My visual impression was "orange brown with white bars across" - you know the sort of visual snapshot that you can retain.

Later on, flying along a ride in the centre of Graffridge Wood to the west of the B656, there was another slightly larger, again golden brownish but flying with less pronounced wing beats and the occasional short glide.

Subsequent contact with John Murray disclosed that there had been other sightings of Oak Eggar on or about that date in the area. In dismissing the one, I 'forgot' the other as well. If it was counted at all it would have been as a Meadow Brown I guess.'

Ken was happy for us to report his 'sighting' but added 'please include some reservations. I am a scientist by training and like to quantify my facts!!!'

Like Ken we do have our reservations regarding this as being a possible sighting of *A.iris* as his description refers to the colouring as 'golden brown' which would not be right for a male or female *A.iris*. However, we would like to hear of any unusual sightings of butterflies in this area.

LG visited **Astonbury Wood** (TL22) (3.2) on a Moth Evening in December 2003 with Colin Plant and the Herts Moth Group and in the dusk was able to pick out one massive old sallow on the wood edge and several more sallows in the wood. Twenty-five years ago, the wood would have been considerably younger

and at an age when sallows could have been thriving and to our knowledge although no *A.iris* have been seen since 1978, the proximity to other historic localities still makes this site very interesting.

7.3 ~ The Welwyn area (TL21) ~ We visited the woods around **Mardley Heath** on the 13th November. Most of the sallows are in the area around the main car park and adjacent woods, otherwise the sallow density is poor. However, this area should not be dismissed for *A.iris* and anyone visiting in July should look out for this species.

Despite our belief that **Bramfield Park Wood** has incredible potential, we still have not had any luck here. AM visited the woods on 18th July, a bit late in the flight period but the weather was hot and sunny, especially after 14:00 hrs and again nothing was seen. We shall continue to visit though.

7.4 ~ The Northaw/Cuffley area ~ Despite our best intentions this area did not get visited during the flight period – again this is an area that needs monitoring during the flight period.

In the winter of 2003, we walked through from Cuffley, passing Soper's Viaduct and towards Theobalds Park parallel with the M25, which as the crow flies is only a short distance to Whitewebbs Wood and Country Park, as well as Forty Hall where Ron MacMurdie had his *A.iris* sighting on 20th July (6.11). Not all the woods contained sallow, but where they did it was in satisfactory numbers. In particular, in a wood which contained a new plantation near the viaduct where several mature sallows had been retained, there was a lot of young sallow growth amongst the recently planted trees. Crack Willow is also abundant alongside Cuffley Brook.

AM has also visited the **Theobalds Park** area and again the area has an abundance of Crack Willow, and although we have no direct evidence of *A.iris* using *S.fragilis* in our area, it is reported as being used on occasion.

7.5 North-east Hertfordshire ~ Having made a visit in March 2003, we returned to this area of Hertfordshire and Essex on 10th July, when we were given permission to look at the private wood we had visited in March and where we had been amazed by the sallow density. As with many other days in July, we visited on a very hot day. We first watched the sallows, and were amazed at the number of butterflies taking salts from the dirt track that went through the wood. We then left the wood and went to a small copse to view the highest point in the area, getting excited at one point only to realise after a few minutes that it was a Red Admiral scouting the tops of the oaks. No *A.iris* were seen and despite reports of White Admiral being present, none were seen either. However, we were thrilled to see a male Silver Washed Fritillary patrolling a small clearing very dominantly and clashing regularly with a very strong Comma population. We can only repeat that this area, like many others in Hertfordshire, may reward continued investigation.

7.6 TL31 ~ This is a new area for investigation with no historic records, which we visited in February 2003. Our first visit took in an area west of High Cross, north to Sacombe Green and returning past Sacombe Park and through Home Wood/Low Wood to Marshall's Lane. Some of the woods were relatively young and sallow was found in **Rowney Wood** and in **Home Wood/Low Wood** where it was evident the wood had been replanted around 30/40 years ago in a very standardised manner and sallows had been able to grow up within the plantation. Unfortunately, the age of the wood means that the sallows will be out-competed and will soon start to decline. Despite the absence of any historic sightings, this area is well worth visiting next July.

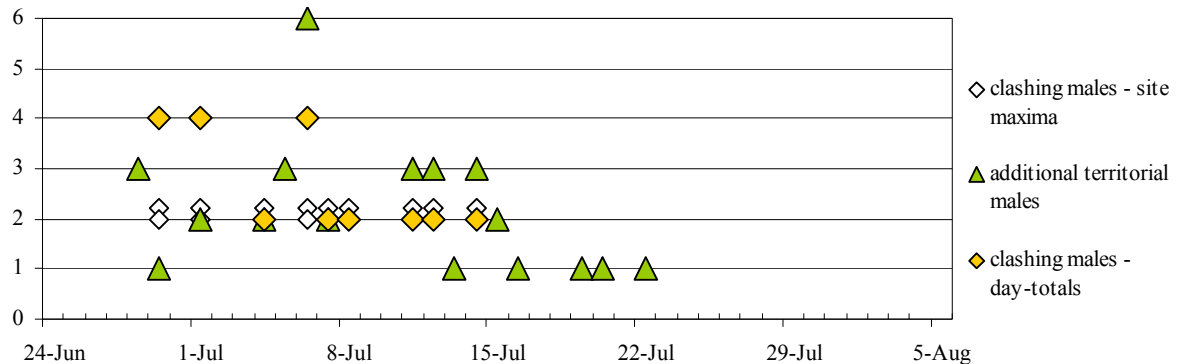
Our second visit targeted an area between Barwick Ford and **Plashes Wood** (a SSSI adjacent to the new A10 bypass). Plashes Wood did not have an abundance of *salix* but it did contain an area where there were several very mature sallows, which unusually had no competition from anything else.

Overview

We can only comment that there are many areas in Hertfordshire, and some also in Middlesex which look like they could have potential. Two individuals working on their own simply cannot visit them all during the flight period. However, it would be nice to confirm the presence of *A.iris* in a 10km square in central Hertfordshire away from the known colonies. Anyone knowing of an area where the sallow density is good should consider visiting when *A.iris* is known to be flying and just patiently watch the highest points in the area or around prominent trees - patience is essential though.

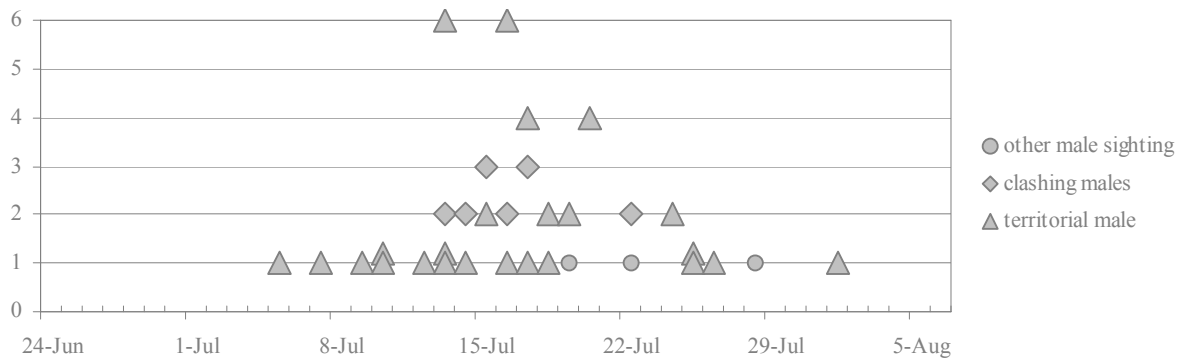
8.1 ~ Male territorial activity

Chart 8.1.1 ~ *A.iris* male activity 2003



1999-2002 report, Chart 8.1.1 ~ *A.iris* male activity 1999-2002

(each point refers to one day in one year)



Please see the 1999-2002 report for notes on male territorial activity that are not repeated here. During the course of our studies in the summer of 2003, we discovered some interesting aspects of male territorial activity that were new to us and these are discussed below, together with some associated advances we feel we have made in detecting male territorial activity. This section is rather long, as we have tried to support our comments throughout with various examples and discussion of our own.

Timing ~ Compared with the 1999-2002 record of male territorial activity, which appeared fairly constant in timing from year to year and rather short-lived, clashing activity was noted two weeks earlier in 2003, and observations of multiple males spanned 18 days (12 days for 1999-2002) and clashing males 16 days (10 days for 1999-2002). Male activity again peaked a few days before overall activity, which includes female sightings (see '9.2 ~ An early flight period in 2003'). Although several visits were paid to known territorial areas prior to the first sightings at Tring, it seems probable that a few males may have emerged undetected a few days earlier. Male territorial activity in Hertfordshire in 2003 was the strongest and most sustained on record. However, this may be due in part to an improvement in monitoring techniques, and activity may have been slowed (effectively prolonged) by a few days' poor weather early in July (5).

'Not here for our entertainment'

At Site D (6.4) on the 29th June 2003, we were watching as territorial activity increased towards 13:00hrs. There were nine flights from 12:00-12:48hrs, then four clashes of two males from 12:56-13:11hrs, followed by a further nine flights to 13:40hrs. Then, at 13:40hrs, a female flew into the territorial area fairly high in the canopy, arriving from the direction of the main body of the wood and immediately drew the attention of the territorial male which left its perch. Both flew quickly down into adjacent scrub and were lost to view. This was the first time we had actually seen this happen so we were quite pleased, however we were disappointed that there was no further territorial activity to be seen from 13:40-14:04hrs, before we left. On mentioning this to Nick Sampford, he replied quite aptly, that '*They aren't here for our entertainment*'.

Our observations over the last five years in Hertfordshire lead us to believe that given good weather, males on territory may generally find a female quite quickly, and this seems to be especially so during the peak period of activity. Although we only have the one definite observation of this exact event, it may be that males are quicker at spotting females than we are from ground level. In this instance the male appeared to respond to the sight of the female, as observed when either another male is encountered, or brief chase is given after a bird or dragonfly that may fly through the territory. However, we have not yet begun to investigate any research into the part that pheromones may also play in this process.

So, the formation of territories and territorial activity appears to be a useful way of hastening the process of finding a mate, when a species such as *A.iris* may emerge at low density across a large area (as described by Willmott, including observations of pairing activity: 1987; 1990; 1994). However, there are other aspects of observed behaviour which seem plain enough to us, and which may not be so odd, but which are worth reporting. On several occasions since 1999, we have watched sustained male activity in rather dull weather, and waited expectantly for even more excitement as the sun came out. Quite often though, we have been disappointed, and 30 minutes or so later nothing is to be seen. Much the same thing can happen after activity gets underway around 13:00hrs on a perfectly sunny day. Males appear high in the territory and begin to make some flights, perhaps there are a few clashes, perhaps a female is seen, but an hour later and the observers lot may become hard work. A series of continuous observations at single locations from 12:00-18:00hrs would be needed to confirm this. However, our interpretation is that males do find females at territorial areas, and when they do, sometimes there is little to be seen afterwards.

Indeed, at times the male may well have a similar opinion of male territorial areas. Our feeling is that after the main flush of territorial activity has passed, an unmated male may not stay forever at a territory where there is little to be seen, in a forlorn wait for a female. Then one may have to watch for an hour, or all afternoon, for a male to pass overhead in its search, skirting the territorial area, before wandering off who knows where. The following are some examples of observations of behaviour under certain specific circumstances:

Brightening weather ~ Wormley Woods (6.10) ~ 14:23hrs, cloudy, two clash high over canopy...14:29hrs, one very large male flew around the oaks...14:33hrs, again very large flew around the oaks...then very cloudy, thick cloud...14:56hrs, slightly brighter, one swooped around oaks...15:02hrs, massive butterfly, moved around, perched north end of oaks...15:04hrs, flight to right side...15:06hrs, flew into gap between line of oaks...15:21hrs, possible brief sighting, then much brighter until 15:45hrs, but no activity seen. See also Table 6.3.1 regarding observations at Site C on 1st July 2003.

Male moving on after lone territorial activity ~ Site H (6.8) ~ 14th July 2003, 14:20-14:54hrs, 31 flights of a male between perches on two adjacent oaks, later moving slowly further away...14:55hrs, appeared to fly away through oaks...15:00hrs, end of observations.

Skirting the territory late in the season ~ Tring Park (6.2) ~ 15th July 2003, 13:00-15:00hrs...just after 14:00hrs, we did get a glimpse of *A.iris*, it might have been a male but this can not be confirmed as it quickly flew up to the [territory] trees and just as quickly as it arrived it was gone in a north-easterly direction over the scrub and along the escarpment. Obviously the territory drew a blank for this butterfly and there was no reason for it to hang around.

Please see 6.3 in the 1999-2002 report, for an example of a flush of activity after a week or so of poor weather, followed by a quick decline over the next few days.

Primary and secondary territories, warm-up and spill-over areas

In the 1999-2002 report we speculate that at some sites, where male activity was regularly seen, there may well be heightened territorial activity somewhere nearby which we had not yet found. For example, at Site D, we initially found what proved to be a secondary territorial area in the form of a wide ride which males would occasionally patrol, but where a constant male presence had not been recorded (6.4). The primary focal point was subsequently found c.250 away on the edge of the wood.

In 2003, we developed a new approach to surveying for territorial activity which proved to be quite successful, and which, for us, went some way to explaining the links between primary and secondary territories, and what appear to us, and may be best described, as warm-up and/or spill-over areas. The whole process seems to have a certain pattern, but the expression of this pattern appears to depend very much on the topography and structure of each site.

Detecting territories over closed canopy from outside of a wood ~ Luckily, many Hertfordshire woods are on hilly ground and often end at the top of a slope. Such a location, in a wood with abundant sallows, has proven, for us, to be a likely place where male territorial activity may develop, being at a high point where the territory is contained, or its location is dictated, by the woodland edge. But some potential territorial areas tend towards high and closed canopies, near impossible to survey from the woodland floor. In any case, some are private woodlands with no access.

So, we began looking over the canopy of potential areas from the best vantage points we could find outside of each wood, and our efforts were rewarded with three new territories (6.1, 6.9 & 6.10) and some of the most exciting displays of territorial activity we have yet seen. Our viewing spots were 100-200m from the edge of each wood, and the focal points all appeared to be c.50m into each wood, so a good pair of binoculars is essential. Whereas from inside a wood one may expect to view favoured territorial perches, from our distant stations we have of course seen none of these. However, no-one in the shade of these woods could ever see the full extent and vivacity of the astonishing clashes between males as they spin high into the sky and far over the wood, the victor finally turning directly back to the territory on high, the vanquished descending to some lesser area.

At Site A in 2003, several times a beaten male has been seen to descend from a clash emanating from the newly found primary territory to a lower area some 100m away, in this case the very area we had believed may be a **secondary territory** (6.1). Similar distances have been noted at Site I (6.9), and beaten males at Site D appear to then patrol lower areas nearby where they may be seen far less often from an open ride as they skirt the tree-tops, c.250m away from the primary focal point (6.4). At Site C, a male was seen to patrol and perch on an oak c.100m away from the focal point (6.3, 1999-2002 report), actually at a slightly higher although less commanding position. However, clashes at Site C are often lost to view quite quickly, and the typical flights of beaten males have not yet been traced. From all this, it seems quite clear to us that at least some of the secondary territorial areas we have found are clearly **spill-over areas** used by vanquished males. But what might one see, if one could place oneself high over the canopy like an Emperor? A great deal more no doubt than can be seen from the ground floor.

Warm-up areas ~ At certain well-monitored sites (especially 6.1, 6.3), males can be seen in the vicinity of the territory through the late morning. At Site C, males have been seen in occasional flight low over the canopy within 100m of the territory during observations from 11:00-13:00hrs, and in 2003 low level warm-up flights were noted by a hornbeam c.25m from the focal point (6.3). At Site A, males are often seen perched or in occasional lower flight in the secondary territorial area during observations from 11:00-13:00hrs, but generally appear less often around the tree-tops here after 13:00hrs when territorial activity tends to begin (6.1). Having observed the site over five summers, it is almost certainly the case that this secondary territorial area, with its small sunny glades and close proximity to the primary territory, is used as both a warm-up area, from where some (or all) males may ascend to the primary territory, and as a secondary territorial area used by vanquished males. This may also be the case at Wormley Woods (6.10), where a sighting of two males in 1996 was made (probably) in a glade c.100m from the territorial activity seen above the canopy in 2003. This pattern may (or may not) be repeated at other sites in Hertfordshire where observations have been less intensive or views are restricted.

Territorial activity prior to 13:00hrs ~ Although territorial activity generally begins around 13:00hrs (as described by Willmott, 1987; 1990; 1994), high level patrol flights and perches were noted in the primary focal point at Site D from 12:00hrs on 29th June (6.4), as follows: 12:00-12:48hrs, nine flights; 12:51hrs, 2 clashed high up into the sky; further clashes at 12:56, 13:06 and 13:11hrs.

Territorial activity on a broad front ~ An interesting aspect to emerge from the project (particularly through continued observations made by Nick and Angela Sampford, and others), and confirmed in 2003, is that males appear to patrol the willow-rich canopy at Broxbourne Wood NR (6.5) on a broad front through the afternoon, with no obvious focal point in the way of a prominent tree or group of trees at a high point yet found on the reserve. The ride from the West car-park is lined with sallows, and the canopy can be observed quite easily from the vicinity of the bench. The general frequency of male flights here in 2003 was 1.35 per hr or 1 flight every 44 minutes (n days=8); not unlike the frequency of activity recorded at primary territories after the peak, and at secondary areas. Males quite often perch on the canopy at no particular spot, and on one occasion two males were seen to clash off high into the sky. It may be that males choosing to patrol the willow-rich canopy, rather than some distant territory, can intercept newly emerged females close to the larval foodplant. This habitat also attracts egg-laying females, and at least one

inquisitive male has been seen to be rebuffed by a female around the willows, but perhaps this is not always so. The ride is not a particular high point relative to its surroundings, at 90-100m above sea level, and is lower than the territorial area some 500m to the north (6.9) at c.105m.

Overview ~ We can only repeat that interpreting observed territorial activity in Hertfordshire may not be an exact science, but it is rather interesting. The Hertfordshire colonies are probably of lower density than those in the central southern English counties, therefore the territorial activity may be weaker and relatively short-lived. However certain patterns of behaviour are emerging, and hopefully this rather long section of the report will make some sense and be of interest.

Table 8.1.1 ~ Focal point elements and territorial activity

	Site	A	B	C	D	E	F	H	I	J
High point		✓	✓	✓	✓		✓	✓	✓	✓
Woodland edge (or near)		✓		✓	✓		✓	✓	✓	✓
'Master tree'			✓	✓						
Group of trees		✓			✓		✓	✓	✓	✓
Focal point over closed high canopy		✓							✓	✓
Canopy gap element		?*			✓			✓	?	?
Secondary activity or temporary focal		✓		✓	✓		?			
Territorial activity on a broad front						✓				

Notes ~ * The secondary territory at Site A has a canopy gap element. The sites with focal points over closed high canopy may have some degree of canopy gap. Site F may relate to secondary territorial activity.

Correction to Table 8.1.1, 1999-2002 report ~ in some reports a few figures were printed incorrectly one column to the right of their intended positions. The present table 8.1.1 above presents the information correctly.

8.2 ~ All other activity including grounding and female activity

Introduction ~ Please see the 1999-2002 report for notes on activity that are not repeated here. Although we have continued to focus our monitoring on male territorial activity, 'other activity' remains an important subject. As the study has continued, experience has been gained by ourselves and others, and so records have increased each year. By the end of 2002, we were able to form a detailed picture of the kinds of 'other activity' and associated timings to expect. There were many interesting observations to report from 2003, and the charts continue to show some clear patterns of behaviour.

8.2.1 ~ Grounding activity

Male Grounding ~ Grounded males were observed in 2003 at Broxbourne Wood NR (6.5), Wormley Woods complex (6.9), Broxbourne Woods Complex central woodland area (6.11) and at Forty Hall (6.12), but none were reported from Tring Park. The majority were reported from the Broxbourne Wood NR on the main ride, by several observers. Nick Sampford was very successful in getting an album of photos on the 9th July of a grounded male presumed to be taking salts (9.2a). Nick, with Angela Sampford and Dave Waterhouse, watched the butterfly for just under 50 minutes. It moved up and down the ride, alighting for short periods and then flying off, finally staying in one place for 15 minutes before it eventually flew off into the wood, not to be seen again. What is clear from Nick's photos is that from some angles, this male showed no iridescent purple and to some might have been thought to be a female. We now wonder whether some of the previously recorded grounded females have been incorrectly identified as such, since grounding is considered to be unusual for females (see 8.2.1, 1999-2002 report). However, we do feel that in the majority of cases, groundings have been attributed correctly to sex.

In 2003, *A.iris* was reported grounded on both dry and damp ground, and on excrement (horse and dog), and on occasions alternating between these. For analysis, we have assumed that a male on dry ground would be taking salts, and on damp ground or excrement, to be taking salts and/or moisture. In 2003, there was no record of any second phase of groundings later in the afternoon.

Female Grounding ~ There was only one report of a grounded female in 2003, at the Broxbourne Woods NR (6.5). On 7th July, AM, LG and Lissa Smith, whilst walking around the outer path of the Reserve, disturbed a female from the dry track, which although it alighted again, subsequently flew off low into the woods. The ground was in the full mid-day sun, and appeared to be dry. See *Male Grounding* (above) for further discussion on the possibility that some butterflies previously identified as females may have been males.

Table 8.2.1.1 ~ Grounding, Wandering and Sap Run Activity, 1999-2002 & 2003

Site	A	B	C	D	E	F	G	H	I	J	K	L	Y	Z
Grounded male ~ presumed to be taking salts and/or moisture	*	*			✓	*				✓		✓	✓	
Grounded male ~ presumed to be taking salts		*			*									
Grounded female					✓		*							
Wandering <i>A.iris</i> (8.2.2)		*											?	H
Sap run feeding (8.2.3)					✓						✓			

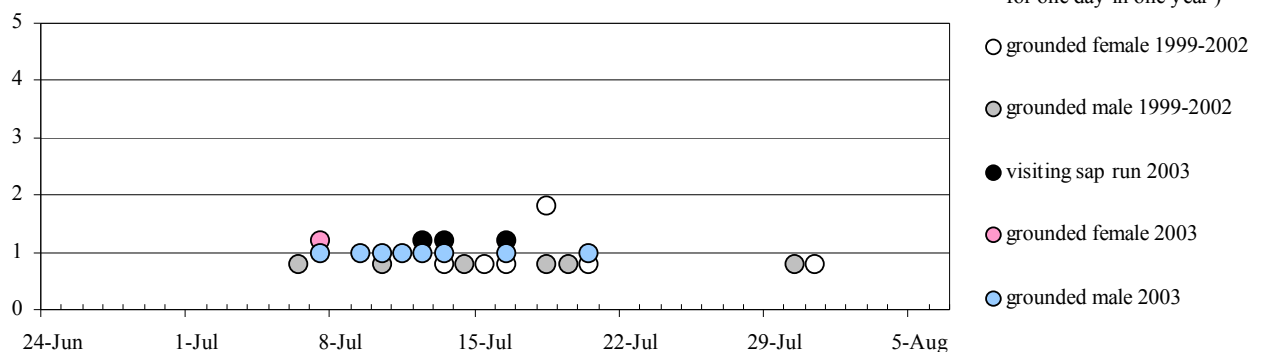
✓ 2003
 * 1999-2002
 H Historical (3.3)

Correction to Table 8.2.1.1, 1999-2002 report: all recorded activity should read Site E not Site F. Grounded female, presumed taking moisture, should read Site G not Site H.

8.2.2 ~ Wandering *A.iris* ~ As discussed in the 1999-2002 report, we feel that this description is still relevant. The only possible contender for this category would be the grounded male seen at Forty Hall on 20th July (6.13), but this can only be disproved were a colony confirmed to be present here through further monitoring.

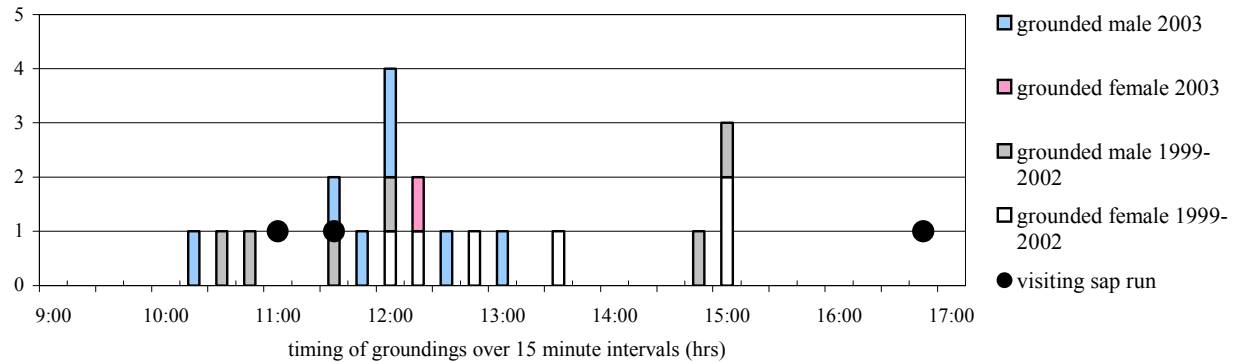
Although, only our own theory, LG whilst in conversation with Pat Bonham, BC Norfolk Branch Butterfly Recorder, learnt of a similar situation with the Swallowtail butterfly in Norfolk. The Swallowtail is known to have a small second brood, usually seen in August. Pat commented that the only records he has received of Swallowtail away from recognised habitat has occurred during the second brood. It is also possible that the male emerges and finds no females in the vicinity and subsequently goes in search of one, only to turn up in a strange place, just like *A.iris* may do towards the end of its flight period. See 10.2 for discussion concerning the effect that releases may have on the conservation of *A.iris* when it is known that the butterfly can be found out of habitat.

Chart 8.2.1.1 ~ *A.iris* - grounded and visiting sap run, 2003 and 1999-2002



Note ~ Not included in this chart is the report, by unknown observers to Les Borg, of a male on car bonnets, including his own, in the West car-park of Broxbourne Wood NR on 11th July 2003 (6.5).

Chart 8.2.1.2 ~ *A.iris* - time of groundings or at sap run, 2003 and 1999-2002



Note ~ timings have been based on the time first seen if observed grounded for more than 15 minutes.

8.2.3 ~ Sap run feeding

Chart 8.2.1.2

In 2003, we were thrilled to receive the first reports and be able to observe individuals ourselves feeding at sap runs. Kevin & Sandra Standbridge alerted AM to a male *A.iris* feeding at a small sap run issuing from a side-branch of an oak tree alongside the main ride at Broxbourne Wood NR on 12th July (6.5). On the following day the Standbridges saw *A.iris* feeding at a sap run on an oak along Ermine Street (6.10). By the time LG visited the tree 72 hours later, the butterfly, if the same individual, was the tattiest *A.iris* that had been observed since our study began. We had always wanted confirmation of what *A.iris* might do after mating or egg-laying, and this suggests that some may spend their last days visiting sap runs or feeding on honeydew, well out of sight of any observer.

Red Admiral and Speckled Wood were also visiting these particular sap runs, as were many other insects including hornets, which helped make the sap runs quite visible. It is well worth looking out for this activity, and if a sap run is found, give it some time and perhaps *A.iris* will pay a visit.

Neither Kevin, Sandra or LG could determine what sex the individual, or individuals, seen along Ermine Street had been, as on both occasions the butterfly could only be observed by looking towards the sun where it was somewhat silhouetted. (Chart 8.2.1.2).

8.2.4 ~ Other female activity

We have separated female activity into the following categories:

Grounded female (8.2.1)	Female showing behaviour indicative of egg-laying
Sap run feeding (8.2.3)	Other behaviour
Honey-dew feeding	Rejection of a male by a gravid female
Female in flight	Pairing activity (not yet observed)
Pre-pairing flight (with a male)	Egg-laying (not yet observed)

Table 8.2.4.1 ~ Characteristic female behaviour, 1999-2002 & 2003

Site	A	B	C	D	E	F	G	H	I	J	K	L	Y	Z
Flight from or to a possible honeydew / dropping-off site	*		*		*									
Pre-pairing flight (with a male)			✓	✓	*									
Female displaying probable egg-laying behaviour	*	*	*		✓									*
Female seen in the vicinity of willows	*	*	*		✓	*								✓
Other record of female in flight	*	✓	✓	*	✓					✓		* ¹		*
Other female behaviour					✓									

✓ 2003

* 1999-2002

¹ Previously attributed to being close to Site E

Corrections to Table 8.2.31, 1999-2002 report: pre-pairing flights have been observed at Site C not B; females have been observed flying between oak and willow at Sites C, E & F, not D.

General timing ~ With the possibility that the first male activity was missed at the main sites before the first reports on the 28th June 2003, the appearance of a female (6.4) on the second day of records may suggest that some males may have emerged a few days earlier. In the period 1999-2003, females had been seen up to the end of July, usually after the bulk of male sightings, whereas the penultimate female sighting in 2003 was on the 16th July, before recorded male activity had ceased. However, the 2003 flight period was considerably earlier than in previous years, and many 'Purple Emperor watchers' were already giving up by then, after an already long season. The sole August record was of a final female at Ruislip (6.12) on the 3rd, after a gap of over two weeks.

Honeydew feeding and dropping-off points ~ no observations were recorded in 2003, although females were seen to fly between oaks and willows at Site E.

Female in flight ~ There were fewer reports in 2003, partly due to better recognition of other female activity and those noted tend to be ones where details received were too brief to give any positive behavioural identity. It would certainly help if observers could describe activity in addition to times.

Pre-pairing flight with a male, rejection and mating ~ As discussed in 8.1, a female was observed to arrive in the territorial area at Site D and immediately depart with a male. This and one other pre-pairing flight were the only two observed this year, and timings were similar to those for 1999-2002.

Female showing behaviour indicative of egg-laying ~ On several occasions at Site E, females were observed behaving in a manner indicative of egg-laying, flying amongst the willows. Females were also observed near willows at Site Z; as with Site E, the willows at Ruislip are fairly easy to watch. On 16th July 2003 at Site E, Nick Sampford reported '*12.05 male joined by female & clashed briefly - female seemed to chase male off and then laid 2 eggs in willow opposite the bench; on both occasions I saw the abdomen point towards the willow though I never actually saw an egg, the eggs were roughly 6 feet apart; she then flew off strongly down the ride*'.

In 2003, no females were observed behaving in a manner indicative of egg-laying at Site C. In the two years preceding the felling of the willows, it was very reassuring to make those observations, even if very few males were observed. In 2003, however, the male territorial behaviour was almost back to the levels of activity observed in 2000 but strangely very few females were seen. It is possible that some of the willows that were cleared have now reached a height attractive to females and that the females are no longer reliant on the more visible bushes that we have watched in the past. We hope that females were active despite the lack of observations.

Other female behaviour ~ On the 11th July at Site E, two females were observed on trees, the activity of the first can not be confirmed but the second sighting at 15:15hrs was reported by Tony Clancy as being of '*a fresh female basking on the trunk of a conifer*'.

Chart 8.2.4.1 *A.iris* - all females, 2003 and 1999-2002

(each point has been based on the total number of females seen each date in each time period)

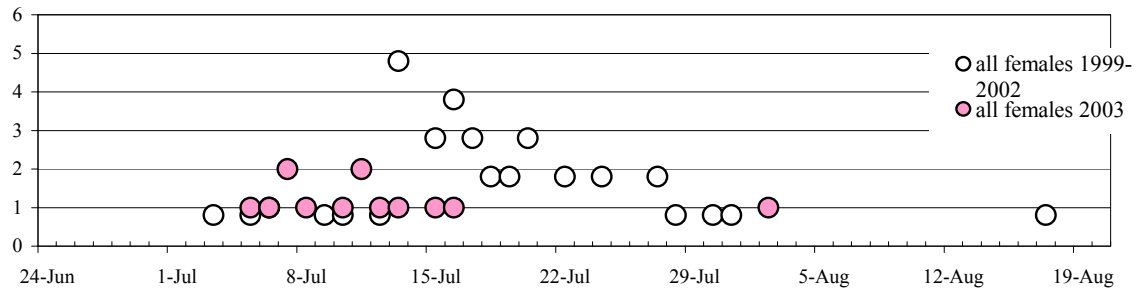
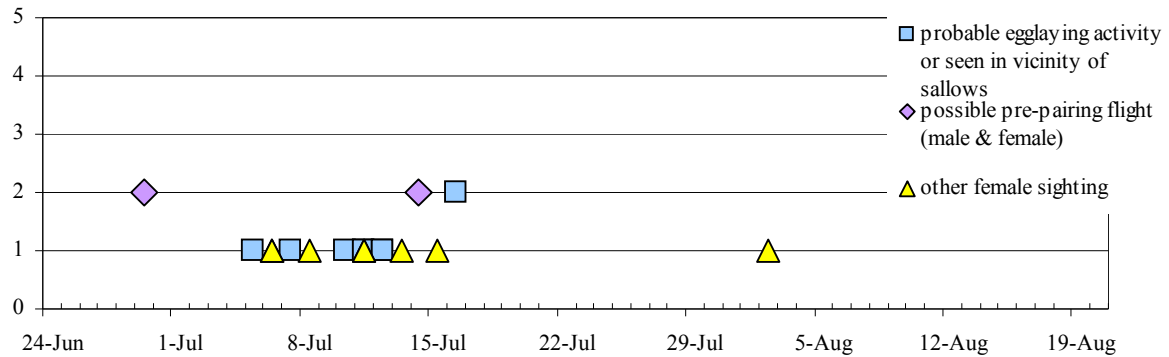


Chart 8.2.4.2 ~ *A.iris* - female activity and possible pre-pairing, 2003

(each point refers to one day in one year)



1999-2002 report, Chart 8.2.3.2 ~ *A.iris* - female activity and possible pre-pairing, 1999-2002

(each point refers to one day in one year)

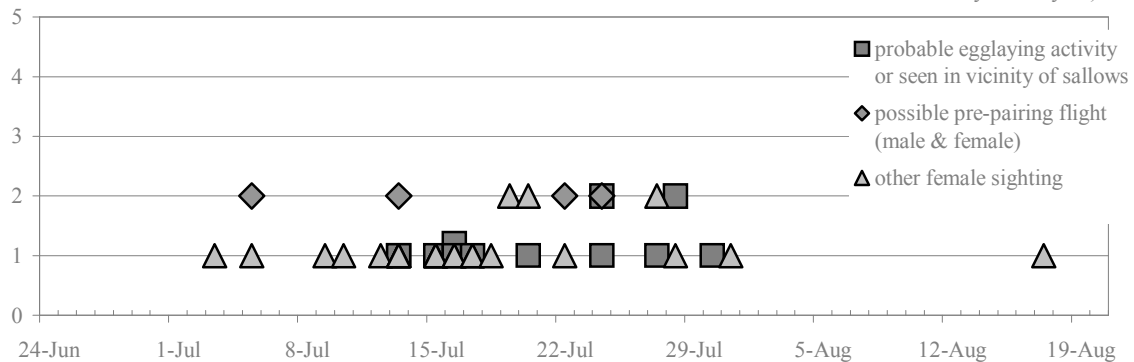
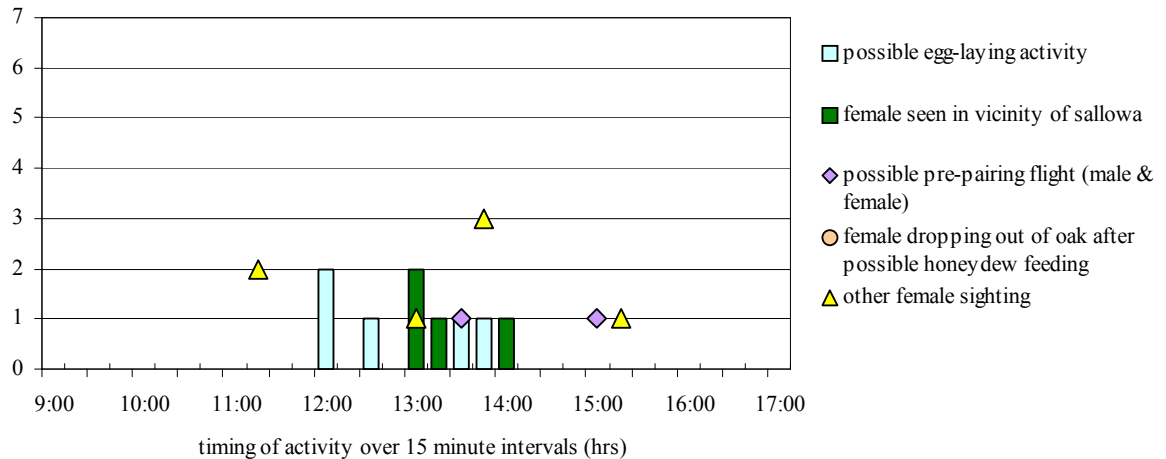
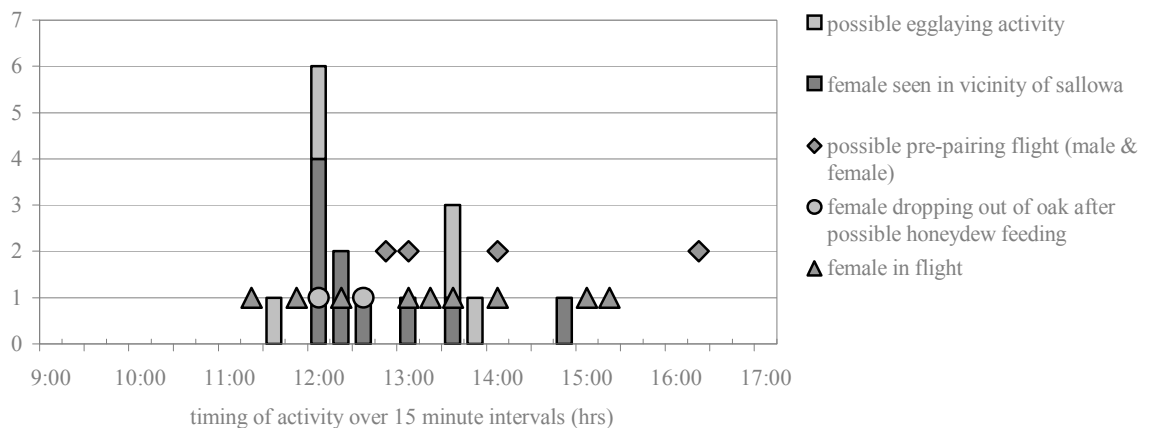


Chart 8.2.4.3 ~ *A.iris* - time of female behaviour, 2003



1999-2002 report, Chart 8.2.3.3 ~ *A.iris* - time of female behaviour, 1999-2002



Overview and weather conditions ~ With the earliest known flight period in Hertfordshire, the majority of female activities were brought forward by similar periods of time to that of male territorial activity. However, after the first confirmed female was seen on 29th June, no more were confirmed until the 5th July 2003, but it must be remembered that after the first two days of intense territorial activity on the 28th and 29th June, there followed a spell of poor weather which might have affected the emergence and/or activity of females. Certainly, on the 1st July, at Site C (6.3), watched during a window of relatively sunny weather sandwiched between two days of poor conditions, male activity was intense. We saw no females, although this does not mean none were present, we may just not have seen them. With relatively few females seen each year, we still have a lot to learn and understand, but there is no doubt that more females are being recognised and more details being noted, although apart from at Site E, sightings were very sparse in 2003.

9.1 ~ Notes on weather and *A.iris* in Hertfordshire in 2003

Chart 9.1.1 ~ The overall patterns of temperature, rainfall and sunshine for the year leading up to the 2003 flight season were typical for the study period, 1999-2003 (see the 1999-2002 report for full discussion).

Chart 9.1.2 ~ The longer term (cf. 20-30yr) trend of higher recent temperatures continued in 2003 at similar levels to the study period 1999-2002, the exception being that accumulated day degrees for the larval stage April to June were a further 6% higher than for 1999-2002. This increase was due mainly to higher temperatures in June 2003 ~ please refer to section 9.4 for further details and discussion.

Chart 9.1.3 ~ Weather conditions through July 2003 were generally close to average for both 1999-2002 and the previous 30 years, in particular accumulated day degrees and sunshine levels were typical. Although July 2003 was rather dry in comparison with recent years, rainfall during the month was very close to the 30 year average.

Chart 9.1.1 ~ Annual weather data for the study period, 1999-2003 (mean annual) ~ Rothamsted Research

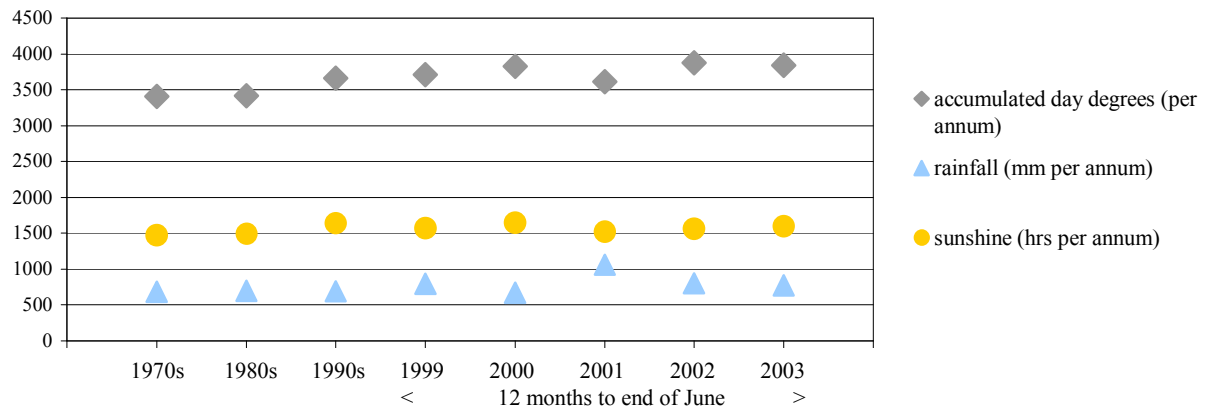


Chart 9.1.2 ~ Accumulated day-degrees by season (mean annual) ~ Rothamsted Research

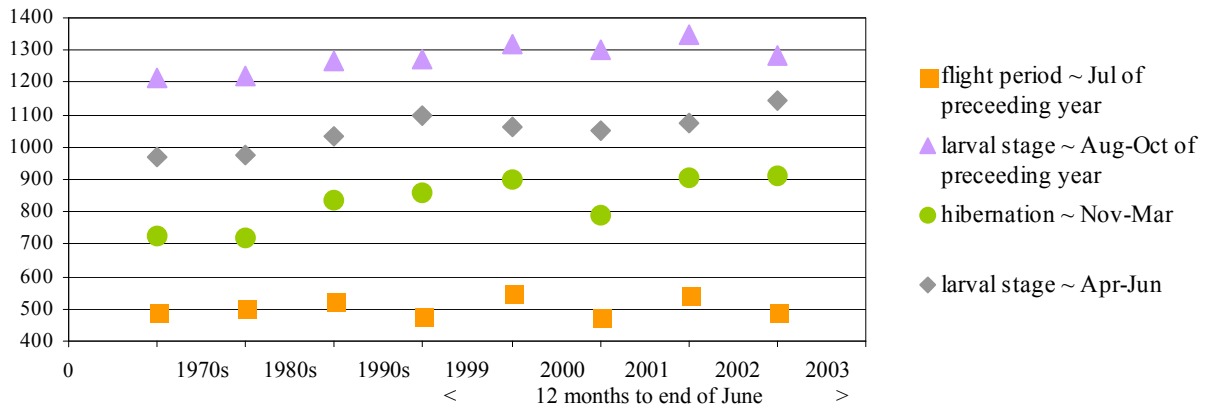
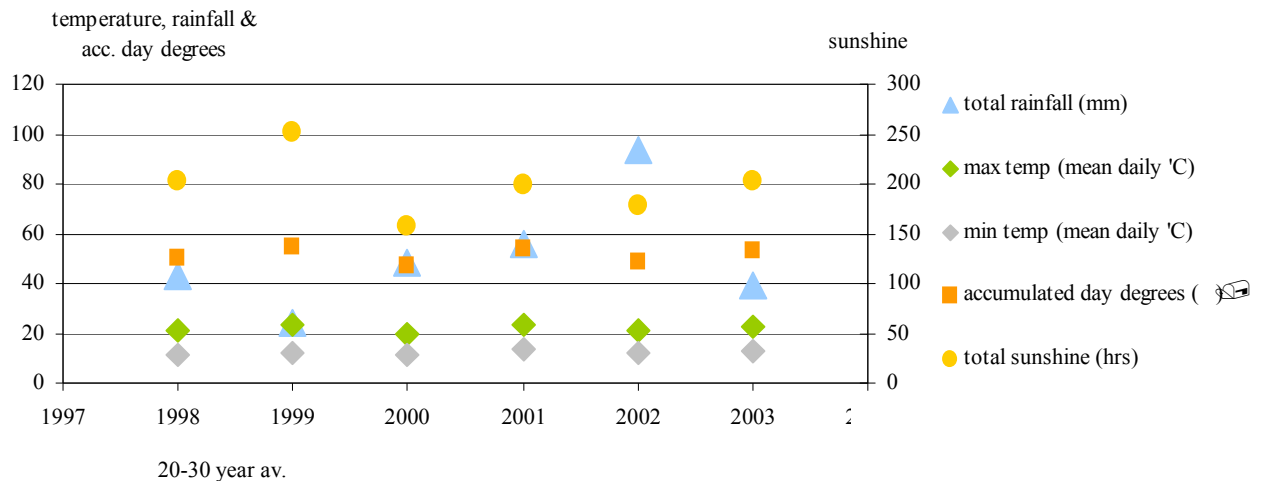


Chart 9.1.3 ~ July weather 1999-2003 ~ Rothamsted Research



9.2 ~ An early flight period in 2003

One of the most interesting aspects of the *A.iris* study in Hertfordshire in 2003 was the species' early flight period. Having collected data for the 1999-2002 flight periods, when weather conditions and recorded flight periods appeared quite stable and regular, Charts 9.2.1, 9.2.2 and 9.2.3 suggest a rather nice correlation between an increase in temperatures from early June into July, and an early flight period.

Chart 9.2.3 shows the effect of recent higher 'winter' temperatures, generally during larval hibernation, on accumulated day-degrees, with the average for 2000-2 diverging above the long term mean. However, once the spring and summer larval growth period begins, the recent average appears rather parallel to the long term average. Unfortunately, we do not of course have data for the flight period of *A.iris* in Hertfordshire over the last 30 years for comparison.

In 2003, temperatures from early June and into July rose significantly above the recent norm. The accumulated day-degrees for 2003 reached 3500 units approximately 7 days in advance of the average for 2000-2, due to the higher temperatures in June (Chart 9.2.3).

Likewise, the mean date for the 2003 flight period was brought forward *c.*8 days compared with 2000-2, and the earliest sighting in 2003 was of 3 at Tring Park on 28th June, a record date for Hertfordshire and 7 days earlier than the mean of 5th July for 1999-2002 (range 3rd to 8th July). Although some sites were monitored prior to 28th June, no *A.iris* were seen. However, it seems likely that one or two singles may have been missed prior to 28th June, as some of the first counts were already of multiples. It may be that Tring is, or appears to be, slightly earlier than the south-central Hertfordshire locations, possibly as a result of differences in climate and/or colony strength.

Overall then, this at least suggests that the relatively hot weather through June and early July accelerated the later stages of development and almost certainly pupation, resulting in a correspondingly early flight period.

In addition, recorded activity at all sites appeared to be stronger than for 1999-2002 (cf. 5 and 1999-2002 report). The 'shape' and 'length' of the flight period appeared similar to 1999-2002, just early. Cumulative day-counts increased by 50% over 2002, although this was due partly no doubt to an increase in observer effort. Although we are developing a recording methodology, year to year differences in site-specific coverage, habitat changes and changes in understanding of how each territory works, means that results have to be interpreted. However, our impression of a strong flight period in 2003 seems to be supported by comparisons between the site-specific annual charts for 2003 and 1999-2002 (cf. 1999-2003 report).

Discussion ~ It seems reasonable to conclude that the species certainly did benefit from higher temperatures in June 2003. Having watched blue tits and greenfinch return again and again to glean large numbers of well-grown White-letter Hairstreak larvae from the leaves of elm trees, one can imagine how the 'speeding up' of the later stages of development of *A.iris* could reduce the total loss prior to emergence, especially loss through predation.

Looking at the comparative accumulated day-degrees for April to June in Chart 9.1.2, it seems likely that *A.iris* may have benefited to some degree from the moderate increases recorded since the 1990s, however, June temperatures may be especially important.

Chart 9.2.1

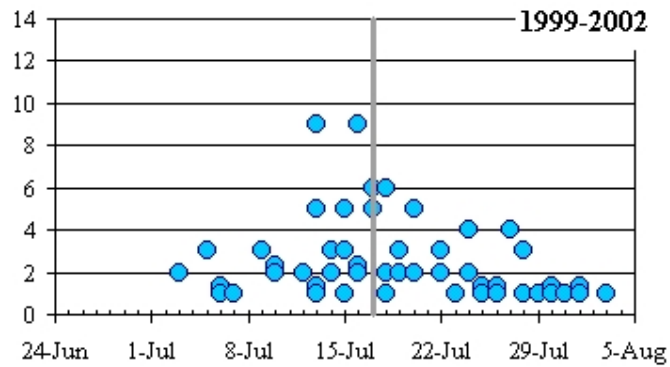
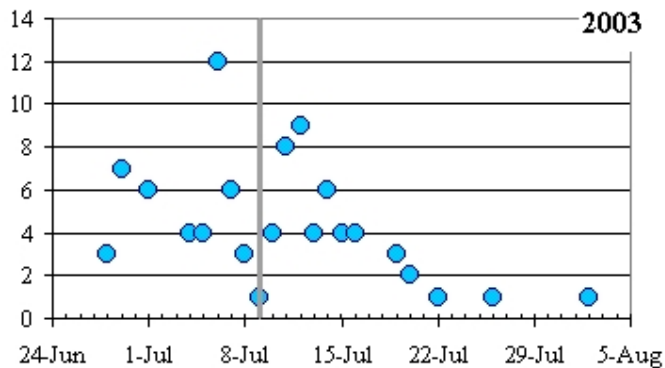


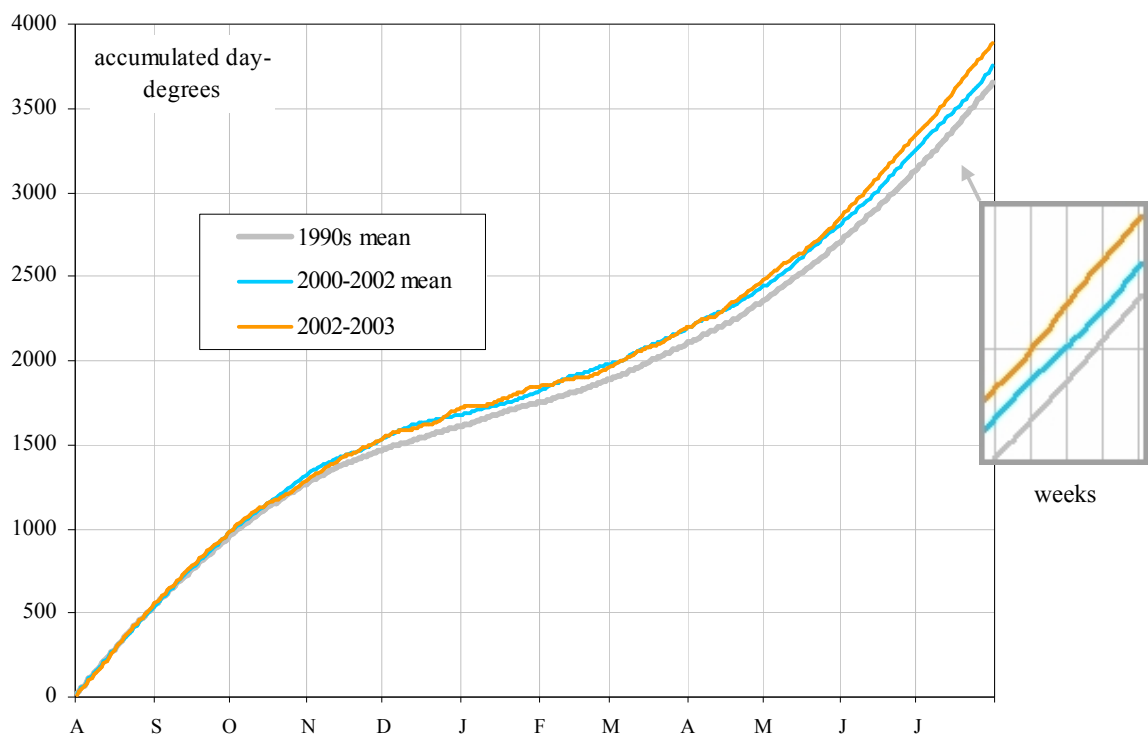
Chart 9.2.2



Note ~ Charts 9.2.1 & 2 illustrate the recorded flight periods respectively for 1999-2002 and 2003. Each point refers to a cumulative day-total of individuals seen (estimated) for one day in one year. 9.2.1 refers to Hertfordshire; 9.2.2 refers to Hertfordshire and Middlesex. The vertical grey lines indicate a simple mean for each dataset.

Chart 9.2.3 ~ Comparative accumulated day-degrees over 12 months of the lifecycle, August to July

The chart represents the mean for the 1990s, the mean for 3 years 2000-2, and the data for one year 2002-3.





9.2a ~ Colour images facing page

A male *A.iris* grounded along the main ride at Site E Broxbourne Wood NR during the morning of 9th July 2003 (6.5 & 8.2.1). All images are of the same butterfly; if you look carefully a small nick is visible at the tip of the left forewing.

All photos: Nick Sampford

*We would like to thank Nick for his permission to use the images ~
www.nicksampford.co.uk*

10 ~ Maintaining and increasing habitat

In addition to Section 10, 1999-2002 Report

10.1 ~ Recent efforts for positive habitat management

Site A ~ a few sturdy sallows have recently been given more room by thinning adjacent birch, and some willow stakes have been planted out to see if they take (6.1).

Site C ~ positive management for the *A.iris* colony at Site C is to be included in a forestry plan for this woodland.

Site L ~ we are pleased to report that during forestry thinning operations in the central area of Broxbourne Woods, many large sallows have been retained, undoubtedly to the benefit of the *A.iris* colony found through the complex.

No significant loss of habitat of habitat has been noted at any of the other Hertfordshire sites found to be supporting *A.iris* (6.12).

During talks and visits, directly with woodland owners and managers, and also through the Herts Woodland Forum, we have learnt a little about the management of more woodlands as **continuous cover**. Our own observations, somewhat confirmed through discussion with forestry experts, suggest that willow, being a light demanding species, may not regenerate effectively under this system of management, as it does in coppiced panels and clear-felled areas. Some effort may be needed to ensure that adequate willow-rich habitat is maintained over the long-term, alongside rides for example, in woodland managed as continuous cover.

10.2 ~ Breeding larvae

We have become acutely aware that members of the public are still able to purchase *A.iris* larvae by mail order in this country. Throughout our study we have continually heard the comment that the reason why the butterfly is being seen in Hertfordshire is because of releases. This we have never believed to be the case but the release of a captive bred specimen does nothing for conservation. We know from our own study that the wild butterfly will wander away from its presumed haunts and when seen out of location, the immediate cry is 'it's a release' but suppose this were not the case; how then can we get the relevant bodies to manage woodlands in the area positively. (See 8.2.2, and 8.2.2 1999-2002 report, for more discussion on the ability of *A.iris* to wander out of habitat.)

Furthermore, can it be a good idea to release an adult (resulting from a purchase) whose genetic background is so uncertain? Indeed, it would be hard to prove the provenance, wild or captive, of a larva offered for sale. In the past, no doubt a bred specimen would have ended up on a pin, indeed many of these modern purchased larvae may well suffer the same fate. But then there will always be that person who feels that the butterfly should be allowed to 'fly away', whatever the negative effect this may have on conservation efforts.

Notes on Legal protection

Wildlife and Countryside Act 1981

Statutory Instrument 1989 No. 906 25th May 1989 ~ Article 2 adds 22 butterfly species to Schedule 5, conferring protection in respect of the sale of those species. [including Purple Emperor *Apatura iris*]

Schedule 5 Purple Emperor *Apatura iris*: Section 9 (Part 5) “sale” only.

Part 5 (a) selling, offering for sale, possessing or transporting for the purpose of sale (live or dead animal, part or derivative).

Part 5 (b) advertising for buying or selling such things.

www.legislation.hmsso.gov.uk

Believed to relate to all stages of the life-cycle.

10.3 ~ Overview of progress in addressing the Regional, County and Species Action Plans

RAP: Butterfly Conservation ~ Regional Action Plan: Thames Region. Clarke & Bourn, 2000.

SAP: Butterfly Conservation ~ Species Action Plan: Purple Emperor Apatura Iris. Bourn & Warren, 2000.

BAP: Biodiversity Action Plan for Hertfordshire presently under review.

Biodiversity Action Plan for Hertfordshire: Species Action Plan for Purple Emperor

March 2004 update ~ The Hertfordshire Species Action Plan for Purple Emperor had been taken forward through 2003 to ‘final’ draft form, with the input of LG/AM. However, we have recently been told that the Biodiversity Action Plan Officer for Hertfordshire County Council has now left the position, leaving the project in limbo, although we have been told that there is funding for the continuation of the post. However, we are unsure as to the future of Hertfordshire County Council’s Purple Emperor Species Action Plan, but will nonetheless continue our self-resourced work as Butterfly Conservation, Hertfordshire and Middlesex Branch, Purple Emperor species co-ordinators as before.

Forestry Commission

In May 2003, we spent a day with Fred Currie, Wildlife & Conservation Advisor, Forestry Commission, to discuss woodland management, *A.iris* and general biodiversity, and the Woodland Improvement Grant Scheme. We were impressed by Fred’s knowledge and interest, and hope that he will indeed be able to encourage a more positive and effective approach to addressing biodiversity within the forestry grant system. We hope to be meeting Andrew Hoppit, of the East England Conservancy, in May 2004, to discuss these subjects further, hopefully to the benefit of *A.iris* and other woodland butterflies, and woodland biodiversity in general.

11 ~ References & other sources of information

References

- Bourn, N.A.D., & Warren, M.S., 2000, *Species Action Plan: Purple Emperor Apatura Iris*, Butterfly Conservation.
- Clarke, S.A., & Bourn, N.A.D., 2000, *Butterfly Conservation, Regional Action Plan: Thames Region*, Butterfly Conservation.
- Crozier, J., 1978, *The Hymenoptera of Astonbury Wood*, Astonbury Wood Annual Report for 1978.
- George, A.M., 2001, *Butterfly Report (1997 – 2001)*, Journal of the Ruislip & District Natural History Society No. 31 (2001).
- Gibbs, A.E., 1903, *Notes on Lepidoptera observed in Hertfordshire in the year 1903*, Trans. Herts. Nat. Hist. Soc. 12:109-116.
- Goodyear, L., & Middleton, A., 2002, *Purple Emperors are in Broxbourne Woods NNR – Honest!* Wood Warden News, Autumn & Winter 2002, Countryside Management Service (Eastern Area, Hertfordshire).
- Goodyear, L., & Middleton, A., 2003, *Species Focus: Purple Emperor*, Wildlife Matters, Spring 2003, Herts & Middlesex Wildlife Trust.

- Goodyear, L., & Middleton, A., 2003, *The Hertfordshire Purple Emperor*, Hertfordshire Natural History Society.
- Minnion, W. E., 1953, *An introduction to the Butterflies and Moths with special reference to the Ruislip District*, Journal of the Ruislip & District Natural History Society: No. 2.
- Minnion, W. E., 1956 *The Lepidoptera of Ruislip* [for the year 1955], Journal of the Ruislip & District Natural History Society: No. 5.
- Minnion, W. E., 1959 *The Lepidoptera of Ruislip* [for the year 1958], Journal of the Ruislip & District Natural History Society: No. 8.
- Murray, J.B., 2002, *Corrections to the Annual Report*, Butterfly Conservation Hertfordshire & Middlesex Branch Newsletter Issue 31
- Murray, J.B., 1997, *Hertfordshire & Middlesex Butterfly & Moth Report for 1996*, Butterfly Conservation Hertfordshire & Middlesex Branch.
- Murray, J.B., & Wood, A., 2002, *Hertfordshire & Middlesex Butterfly & Moth Report for 2001*, Butterfly Conservation Hertfordshire & Middlesex Branch.
- Murray, J.B., & Wood, A., 2003, *Hertfordshire & Middlesex Butterfly & Moth Report for 2002*, Butterfly Conservation Hertfordshire & Middlesex Branch.
- Newman, E., 1874, *An Illustrated Natural History of British Butterflies*, Allen, London.
- Plant, C.W., 1987, *The Butterflies of the London Area*, London Natural History Society.
- Sawford, B., 1987, *The Butterflies of Hertfordshire*, Castlemead Publications.
- Stainton, H.T., 1857, *A Manual of British Butterflies*, Vol. I. London.
- Stephens, J.F., 1828, *Illustrations of British Entomology*, Haustellata. Vol. I. London.
- Stephens, J.F., 1834, *Illustrations of British Entomology*, Haustellata. Vol. IV. London.
- Talbot, G., 1909, *Apatura iris and Vanessa antiopa in Essex*, The Entomologist 42:282.
- Tomkins, J.N., 1978, *The Macrolepidoptera of Astonbury Wood part 3*, Astonbury Wood Annual Report for 1978
- Willmott, K.J., 1987, *The Ecology and Conservation of the Purple Emperor Butterfly*, World Wildlife Fund.
- Willmott, K.J., 1990, *The Purple Emperor Butterfly*, Butterfly Conservation Booklet No.12.
- Willmott, K.J., 1994, *Locating and Conserving the Elusive Purple Emperor*, British Wildlife Vol. 5 No.5.

Website references

- Butterfly Conservation ~ www.butterfly-conservation.org
- Butterfly Conservation Hertfordshire and Middlesex Branch ~ www.hmbutterflyconservation.org.uk
- Butterfly Conservation Kent Branch ~ www.kentbutterflies.org
- Butterfly Conservation Upper Thames Branch ~ www.lepidoptera.dsl.pipex.com
- English Nature ~ www.english-nature.org.uk
- Her Majesty's Stationery Office. ~ www.legislation.hmso.gov.uk
- Nick Sampford Wildlife Photography ~ www.nicksampford.co.uk
- Multimap.com ~ <http://multimap.com/static/photoinfo.htm>
- Old-Maps.co.uk ~ www.old-maps.co.uk
- Ordnance Survey Get-A-Map ~ www.ordnancesurvey.co.uk

Other sources of information

- Hertfordshire Biological Records Centre
- London Natural History Museum

Appendix 1 ~ Illustrations of British Entomology Vol. I [1828]

Purple Emperor by J. F. Stephens

(see 3.2 for entry relating to Hertfordshire)

p. 49-51

Genus XIII. – *Apatura*, *Fabricius*.

Palpi longer than the head, contiguous, compressed, the points closely approximating and acute, forming a conical beak, chiefly clothed with hair, three-jointed, the basal joint short, rather stout, bent, the second slender, very long, slightly angulated interiorly, and a little bent at the base, terminal about as long as the basal, subcylindrical, obtuse; *antennae* rather long, with an elongate, obconic, thickened club, terminating in a lateral point: eyes naked: wings nearly as in *Cynthia*, with the basal areolet of the posterior open behind: anterior legs very short in both sexes, the rest furnished with bifid claws. Caterpillar fusiform, spiny, with two horns on the head. Chrysalis rather angular, compressed, gibbous, head-case beaked.

In form this genus much resembles the last described; the anterior wings being exactly similar in shape, and the posterior differing but a trifle: the chief distinctions are to be found in the structure of the club of the antennae and palpi, the former being much thickened and elongated, and the latter more slender, as well as slightly dissimilar in form; and in their natural state the tips are more closely applied to each other: the larva and pupa are, however, widely different, as are also the habits of the perfect insect.

Sp 1. Iris. *Alis nigris caeruleo-micantibus, aut fuscis, fascia communi utrinque alba interrupta, posticis supra unio-cellatis*. (Exp. alar. 2 unc. 6 lin. – 3 unc. 3 l.in.)

Pa. Iris. *Linne.* – *Lewin*, pl. 16. – Ap. Iris. *Steph. Catal.*

Males with the wings above black, changing according to the light to a splendid mazarine blue: the anterior with ten white spots, disposed in a triple series, the first towards the inner margin, composed of three spots, the central one being lunate; the second series reaches from beyond the middle of the costa to the anal angle, and is composed of five spots, of which the three towards the costa are united and form a crescent, pointing inwards; the other series is composed of two small spots, of which the posterior is minute: the posterior wings have a white angular band, placed in continuity with the first series of spots on the anterior wings; and an ocellus at the anal angle with a narrow tawny iris, and black pupil; parallel with the hinder margin is a pale tawny streak: beneath, the anterior wings; are variegated with brown, tawny, black and white, the latter colour corresponding with that of the upper surface, and the posterior margin is cinereous; between the disc and hinder margin is an oblique broad white band, attenuated towards the inner margin, and with a conical tooth in the centre of this external edge; this band is bordered on each side with reddish brown, shaded into cinereous at the base and hinder margin: near the anal angle is a small ocellus, corresponding in colour with the one on the upper surface: the body is black above, cinereous beneath; the legs are of the latter colour, and the antennae black. The female differs in being considerably larger, and in having the upper surface of the wings brown where the male is black, and is destitute of the brilliant blue reflection of the male: there are two additional minute white spots at the tip of the anterior wings.

The caterpillar is of a beautiful green, with reddish bristles at the tail, and greenish-yellow horns: it feeds on the willow: the chrysalis is of a delicate pale green.

This splendid insect justly claims the chief attention of the collectors of indigenous Lepidoptera, “the varying lustres of its purple plumes” giving it a proud pre-eminence above its fellows. Like several other butterflies, it has become unfrequent near the metropolis within these few years. About ten years ago I saw it in plenty at Coombe-wood, in July, and a number of specimens were then taken; since that period I have not seen the insect at large near London; it has, however, been taken occasionally at Darenth-wood. It was formerly not uncommon in Epping-forest, though it is evidently very local. I am informed by Mr. Dale that it occurs in Clapham-park-wood, Beds., Brinsop-copse, Herefords., Enborne-copse, Berks, near Warminster, Wilts, and Christchurch, Hants: - it is also found in several parts of Essex and Suffolk. An interesting notice of the habits is given in *Lepidoptera Britannica*, to which I must refer the reader on account of its length.

Appendix II ~ *A Manual of British Butterflies, Vol. I* [1857]

Purple Emperor by H. T. Stainton

p. 34-36

EXPLANATION OF THE ABBREVIATIONS USED.

LETTERS IN ITALICS,

placed between parentheses (), designate the name of the Author from whom the information in the preceding sentence is derived. The names in full explain themselves. The following are contractions:-

<i>Boisdv.</i>	Boisduval.
<i>Dup.</i>	Duponchel.
<i>Hub.</i>	Hubner.
<i>H. D.</i>	Henry Doubleday.
<i>Och.</i>	Ochsenheimer.
<i>Westw.</i>	Westwood.
<i>Gu.</i>	Guenée.

LOCALITIES.

[Non related localities have been removed from this article]

Brg.	Brighton.
Ep.	Epping.
Lc.	Leicester.
Ly.	Lyndhurst.
Pm.	Pembury, in Kent, near Tunbridge Wells.
St.	Stowmarket..
Tn.	Tenterden.

Having correspondents resident in most of the above localities, a list of the species occurring in each was prepared; and hence these localities are continually cited; but this does not by any means imply that the species do not occur in other localities.

When any of these abbreviations of localities are in *Italics*, it signifies that the insect *has occurred* there, but is not found there every year. ! Signifies that the species occurs there *commonly*; !!, that it is *abundant*. Either of these marks after an abbreviation in *Italics* implies that the insect has been common or abundant

Genus 7, APATURA

Antennae rather thick, with distinct moderately long club; *body robust*; hind-wings with *an ocellated spot*.

We have but one species, of which the smooth larva, very stout in the middle and much attenuated towards the tail, has often been compared to a green slug.

A. IRIS (Purple Emperor). 2" 6''' – 3" 3'''. *Blackish brown*; ♂ with, ♀ without, a *rich purplish blue gloss*; a *broad white band crossing the middle of the h.-w. and extending into the middle of the f.-w.* F.-W.-5 white spots in a curve from the costa to the anal angle, and 3 near the tip. *H.-w.-Anal angle* fulvous, and near it a *black spot in a fulvous ring*. VII.

Larva pale green, with oblique yellow lines and a yellow stripe on each side; head with two green tentacle-like horns (*Dup* [Duponchel].) On poplars and willows. VI b and m.

Woods in the South, on the tops of oaks. Brg. Ep. ! Lc. Ly. Pm. ! St. Tn. Monkswood, Hunts. Clapham Park Wood, Beds. Lincoln. Bourne; also new Ticehurst, Sussex.

The desire to possess *Apatura Iris* is one common to all collectors of butterflies; and when seen on the wing the desire to catch instantly seizes the collector. The recipe usually given is, to use a ring-net on the end of a pole thirty or forty feet long. No doubt one might, by constant practice, learn to handle such a net with great dexterity; but at best it is a cumbersome, awkward weapon; and a wiser plan is, to watch for opportunities of taking the Purple Emperor when he descends from his throne,

All monarchs have their moments of relaxation; and I have *heard of Iris* being ignominiously taken on the ground, feasting beneath a gooseberry-bush on fallen gooseberries. He evidently had a penchant for home-made gooseberry wine, perhaps esteeming it better than champagne. Muddy *places* are also known as another resort of his majesty; and a clever French entomologist, who, unfortunately for science, died young (M. Pierret), says, "Il se repose sur les matières excrémentielles;" and, however we may regret such coarse taste in so lordly an insect, yet, if the fact be so, we do well to profit by the knowledge of it to enrich our collections.

An entomologist once took shelter from a heavy shower under an oak-tree in Knowle Park, near Sevenoaks: the result was that he found two specimens of *Iris*, at rest, on the lower part of the trunk; and it might not be a bad speculation to profit by wet and dull days during the season, by looking in such places of repose.

Iris may probably, however, best be obtained by rearing it from the larva; and those who wish to obtain fine specimens should carefully search on the sallows in the localities which are known to be frequented by the perfect insect.

Appendix III ~ Abbreviations used within text

Andrew Middleton	AM	Liz Goodyear	LG
<i>Apatura iris</i>	<i>A.iris</i>	Minutes	mins
Biodiversity Action Plan	BAP	National Nature Reserve	NNR
Butterfly Conservation	BC	Number	n
Geographical Positioning System	GPS	Regional Action Plan	RAP
Hectare	ha	Site of Special Scientific Interest	SSSI
Hertfordshire Biological Records Centre	HBRC	Species Action Plan	SAP
Hours	hrs	United Kingdom	UK

Appendix IV ~ Scientific names of taxa referred to in text

Ash	<i>Fraxinus excelsior</i>	Large White	<i>Pieris brassicae</i>
Aspen	<i>Populus tremula</i>	Meadow Brown	<i>Maniola jurtina</i>
Beech	<i>Fagus sylvatica</i>	Oak	<i>Quercus spp.</i>
Birch sp	<i>Betula spp.</i>	Oak Eggar	<i>Lasiocampa quercus</i>
Blackthorn	<i>Prunus spinosa</i>	Painted Lady	<i>Cynthia cardui</i>
Blue Tit	<i>Parus caeruleus</i>	Peacock	<i>Inachis io</i>
Bramble	<i>Rubus spp.</i>	Purple Emperor	<i>Apatura iris</i>
Camberwell Beauty	<i>Nymphalis (Vanessa) antiopa</i>	Purple Hairstreak	<i>Quercusia quercus</i>
Comma	<i>Polygonia c-album</i>	Red Admiral	<i>Vanessa atalanta</i>
Common/Grey Sallow	<i>Salix cinerea</i>	Ringlet	<i>Aphantopus hyperantus</i>
Crack Willow	<i>Salix fragilis</i>	Silver-washed Fritillary	<i>Argynnis paphia</i>
Elm	<i>Ulmus spp.</i>	Small Skipper	<i>Thymelicus sylvestris</i>
Gatekeeper (Hedge Brown)	<i>Pyronia tithonus</i>	Speckled Wood	<i>Pararge aegeria</i>
Goat or Pussy Willow,	<i>Salix caprea</i>	Swallowtail	<i>Papilio machaon</i>
Great or Broad-leaved		Sweet Chestnut	<i>Castanea stiva</i>
Sallow		White Admiral	<i>Limenitis (Ladoga) camilla</i>
Greenfinch	<i>Carduelis chloris</i>	White Willow	<i>Salix alba</i>
Holly Blue	<i>Celastrina argiolus</i>	White-letter Hairstreak	<i>Satyrrium w-album</i>
Honeysuckle	<i>Lonicera spp.</i>		
Hornbeam	<i>Carpinus betulus</i>		

Notes

