



**Four-spotted Tyta luctuosa:  
East of England Survey 2005-2008**

**S. Hearle**

**2009**

**Butterfly Conservation Report No. S09-43**



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**Hearle, S., 2009. Four-spotted Tyta luctuosa: East of England Survey 2005-2008. Butterfly Conservation, Wareham. (Butterfly Conservation Report No. S09-43).**

## **Contents**

1. Summary.....	1
2. Introduction .....	2
3. Methods .....	2
4. Results .....	3
a) Great Chesterford Group.....	4
b) Great Wilbraham Group.....	14
c) Other sites.....	18
5. Discussion and conclusions.....	21
6. Recommendations.....	23
7. Acknowledgements.....	23
8. Bibliography.....	24
9. Appendix 1: Summary of Chalk Carpet records.....	25
10. Appendix 2: Site photographs.....	27

**Hearle, S., 2009. Four-spotted *Tyta luctuosa*: East of England Survey 2005-2008. Butterfly Conservation, Wareham. (Butterfly Conservation Report No. S09-43).**

## **1. Summary**

The Four-spotted *Tyta luctuosa* is a distinctive day-flying moth that occurs very locally on calcareous sites in southern England. It is a Priority Species in the UK Biodiversity Action Plan. This report summarises surveys for the moth in the East of England region undertaken between 2005 and 2008. The moth was discovered at four sites in Cambridgeshire, eight sites in Essex and one site each in Bedfordshire and Hertfordshire. The moth was abundant at several sites in close proximity at Great Chesterford suggesting the Four-spotted occurs as a metapopulation across this landscape. Successful nocturnal searches for larvae were undertaken in July 2007 at one site in Cambridgeshire.

The Cambridgeshire/Essex border around Great Chesterford was confirmed as a stronghold for the Four-spotted moth in the UK. Several new sites were found for the moth during this survey and was been shown to persist along railway corridors in the East of England Region where open ground is maintained by regular disturbance.

The species appears to respond quickly to developments where suitable conditions for the moth are created such as road schemes, building sites or new reservoirs although these can be short lived. Agri-environment schemes with 6 metre cultivated field margins offer significant potential for this moth.

Recommendations for survey of other promising sites are made, especially in Bedfordshire and along railway corridors leading to Peterborough.

## **2. Introduction**

This report provides a summary of survey work for Four-spotted moth at various sites in the East of England between 2005 and 2008. The project received funding from Natural England through the Countdown 2010, Esmée Fairbairn Foundation as well as assistance from numerous volunteer surveyors.

The Four-spotted moth has been the focus of Butterfly Conservation effort in the East of England Region. It is a Priority Species in the UK Biodiversity Action Plan and is associated with light calcareous soils in warm open conditions with areas of bare ground. Colonies are often found on field margins and on the south-facing banks of railways, roads, ditches and other disturbed sites with thin soils and sparse vegetation. The adult often flies during the day and is sometimes seen on flower heads especially Ox-eye Daisy *Leucanthemum vulgare*, Red Clover *Trifolium pratense* and Charlock *Sinapis arvensis* or flying through sparse vegetation. It can also be caught after dark at light traps. The larvae feed on Field Bindweed *Convolvulus arvensis*. This species is double-brooded although the first brood in May and June is most numerous in the East of England. Eggs are laid in July and August and the species overwinters as a pupa in a cocoon beneath the ground.

The results are listed as sites but it is clear that this is a moth that uses several locations across a wide landscape area and will move to new areas of disturbed soil.

## **3. Methods**

All sites were visited during the day between 9am and 4pm in dry, sunny weather in the flight season for the moth. The surveyors especially targeted flower rich areas with abundant Ox-eye Daisy, Red Clover, Black Medick, *Medicago lupulina* and Charlock in areas where Field Bindweed, the caterpillar foodplant was growing.

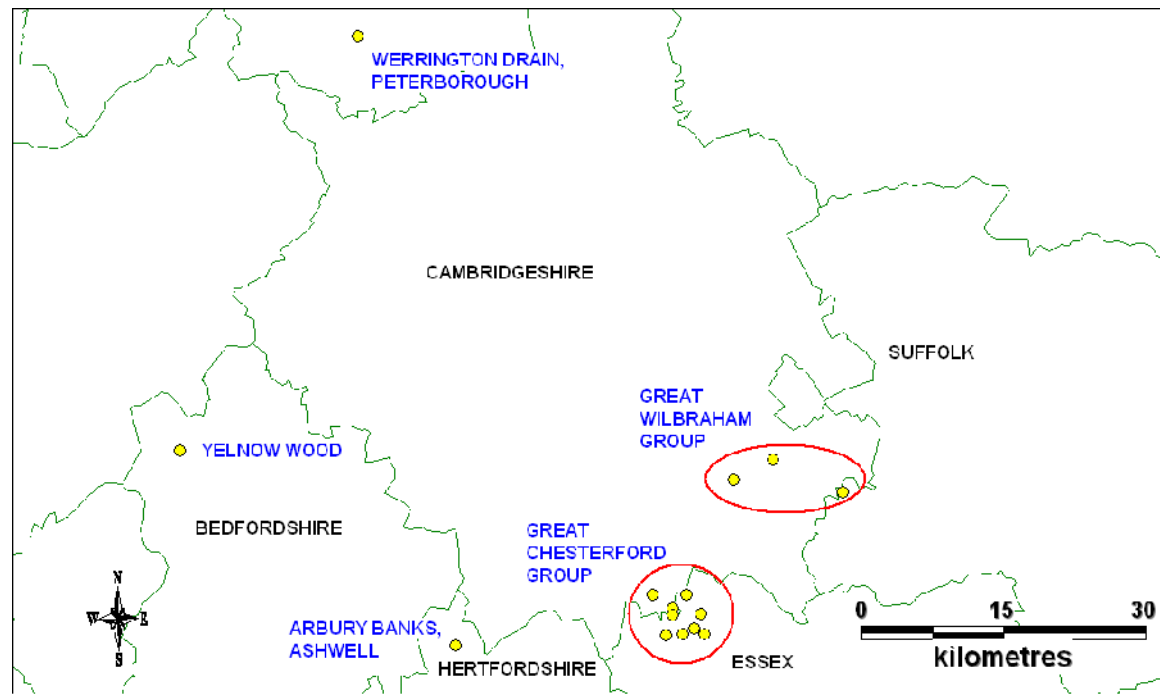
Surveyors were able to benefit from the weekly transect walked by Paul Waring in Peterborough, Cambridgeshire specifically for Four-spotted moth to provide a guide to emergence and numbers on the wing. This transect has been walked every year since 2000.

Not all sites were visited each year and the date of the last record does not indicate that the moth was not present in subsequent years or previous years. Many sites were only visited on one occasion and for only a few hours. In many cases survey work was limited to sites with public access or landowner permission. Survey effort across the region was very varied with most effort in Great Chesterford and Great Wilbraham areas (both in Cambridgeshire) and least effort in Bedfordshire. A complete list of records including those from light traps is maintained by the county moth recorders.

#### 4. Results

Figure 1 illustrates the distribution of the Four-spotted moth in Eastern England and includes sites with positive records between 2005 and 2008.

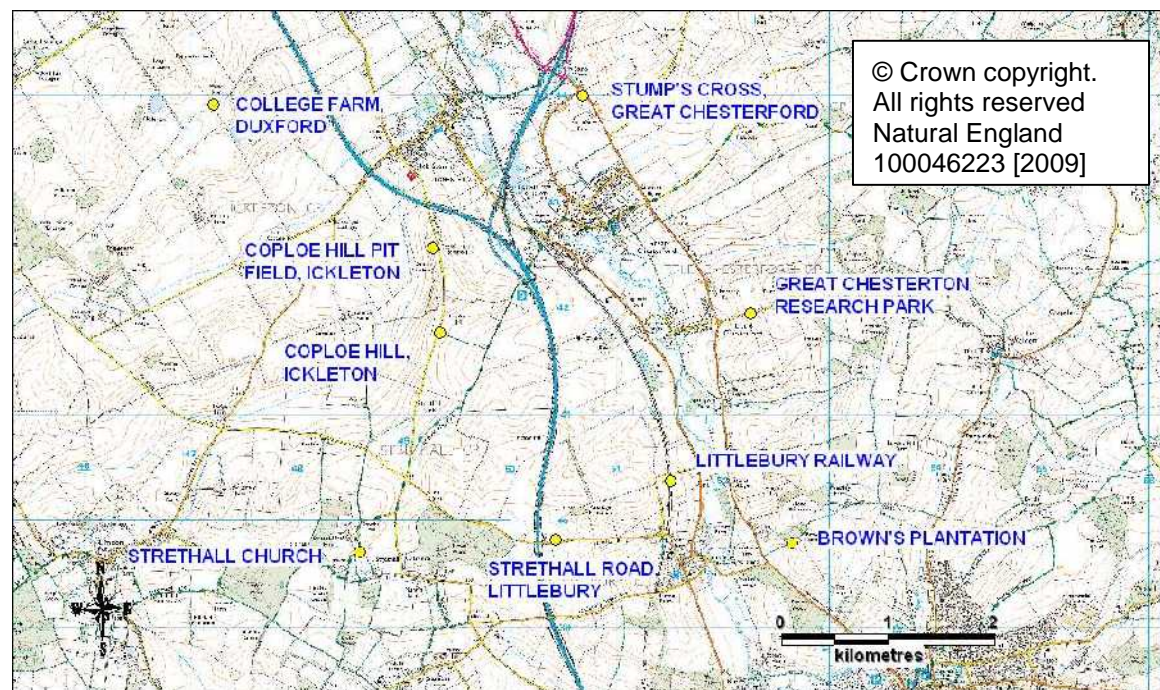
**Figure 1: Map showing location of known Four-spotted moth sites (positive records 2005-08) in the East of England Region**



### a) Great Chesterford Group

Figure 2 shows the location of sites in the Great Chesterford area, which appears to represent the core of the Four-spotted moth's UK distribution. Data for each site are tabulated below, including location, conservation status, agri-environment scheme status, ownership, access, adult records, habitats and proximity to nearest site. Maps are provided which indicate the approximate extent of Four-spotted moth habitat on each site. The history of management for each site is provided as well conservation recommendations and survey notes.

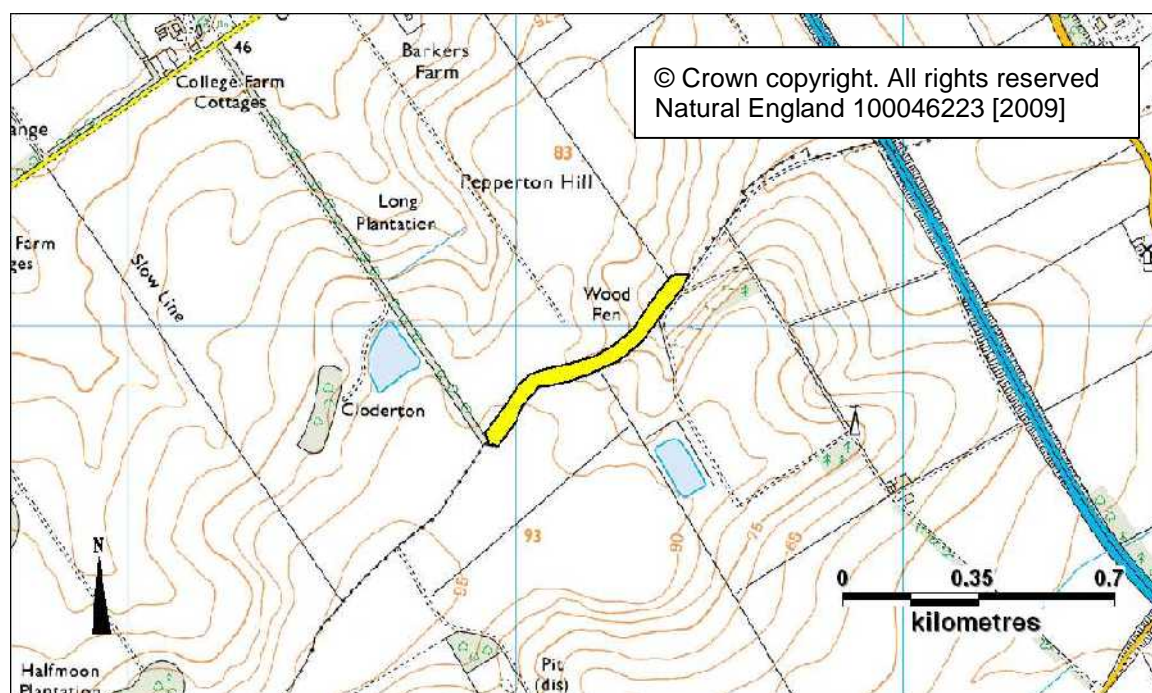
**Figure 2: Map showing the location of the Great Chesterford Group of Four-spotted sites**





## 1. College Farm, Duxford (Cambridgeshire)

<b>District</b>	South Cambridgeshire	<b>Grid Reference</b>	TL 470438
<b>Conservation Status</b>	None	<b>Ownership</b>	Russell Smith Farms
<b>Funding Scheme</b>	See below	<b>Access</b>	Private
<b>Date of last record</b>	2007	<b>Adult Count</b>	2
<b>Habitats Present</b>	Arable farmland and reservoir banks	<b>Nearest site</b>	Part of Great Chesterford Group



### Site Management History

This is a large 2000 acre arable farm growing a variety of cereals and vegetables. It is a LEAF (Linking Environment and Farming) demonstration farm. The farm participates in Countryside Stewardship (CSS), Entry Level (ELS) and Organic Entry Level (OELS) Environmental Stewardship schemes. There are grass margins, cultivated margins, over-wintered stubbles, beetle banks, pollen and nectar and wild bird cover mixes on the farm.

### Conservation/Management Requirements

Encourage uptake of cultivated field margins and management of flower-rich areas such as reservoir banks. Monitor effectiveness of different schemes.

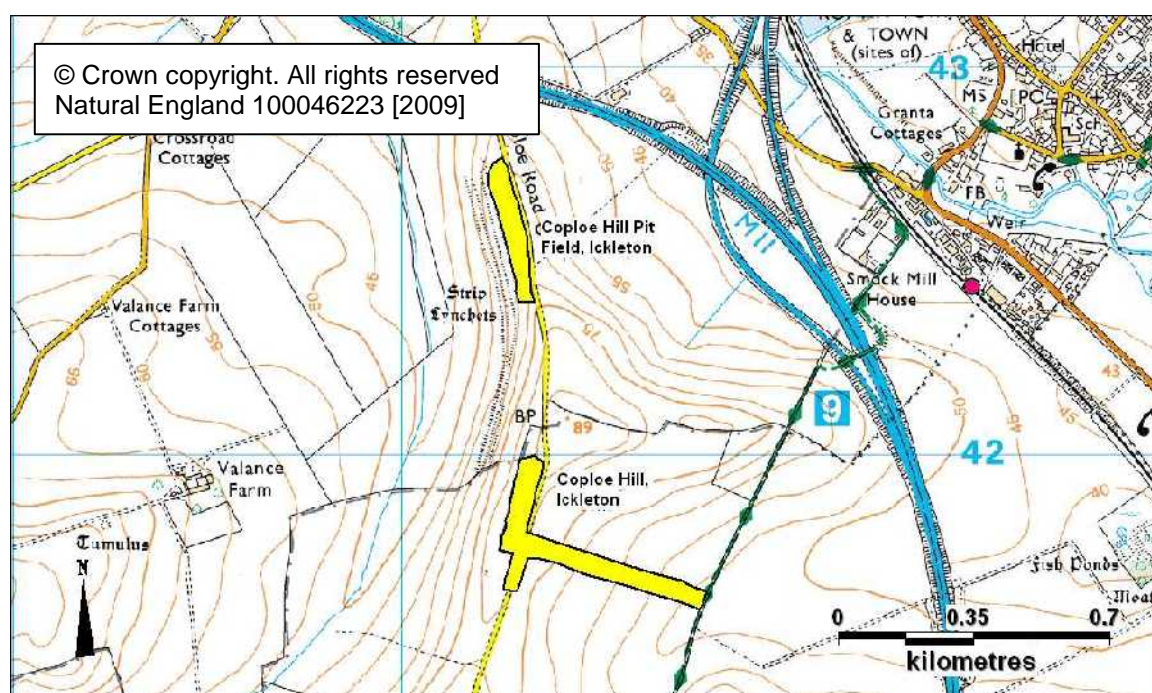
### Survey Notes

Only a relatively small area of the farm was surveyed on one day only. It is highly likely that further survey especially along the M11 corridor and targeting the various field margin schemes would provide valuable additional data. Large parts of the farm are on heavy clay soils and provide no suitable habitat.



## 2. Coploe Hill Pit Field, Ickleton (Cambridgeshire)

<b>District</b>	South Cambridgeshire	<b>Grid Reference</b>	TL 493424
<b>Conservation Status</b>	None	<b>Ownership</b>	R. Duke
<b>Funding Scheme</b>	Set aside	<b>Access</b>	Roadside verge
<b>Date of last record</b>	2007	<b>Adult Count</b>	1
<b>Habitats Present</b>	Arable farmland and roadside verges	<b>Nearest site</b>	Part of Great Chesterford Group



### **Site Management History**

This site was in set-aside during 2006 and 2007 but has since been put back into arable cultivation. The roadside verges and field margins still support Field Bindweed and nectar sources.

### **Conservation/Management Requirements**

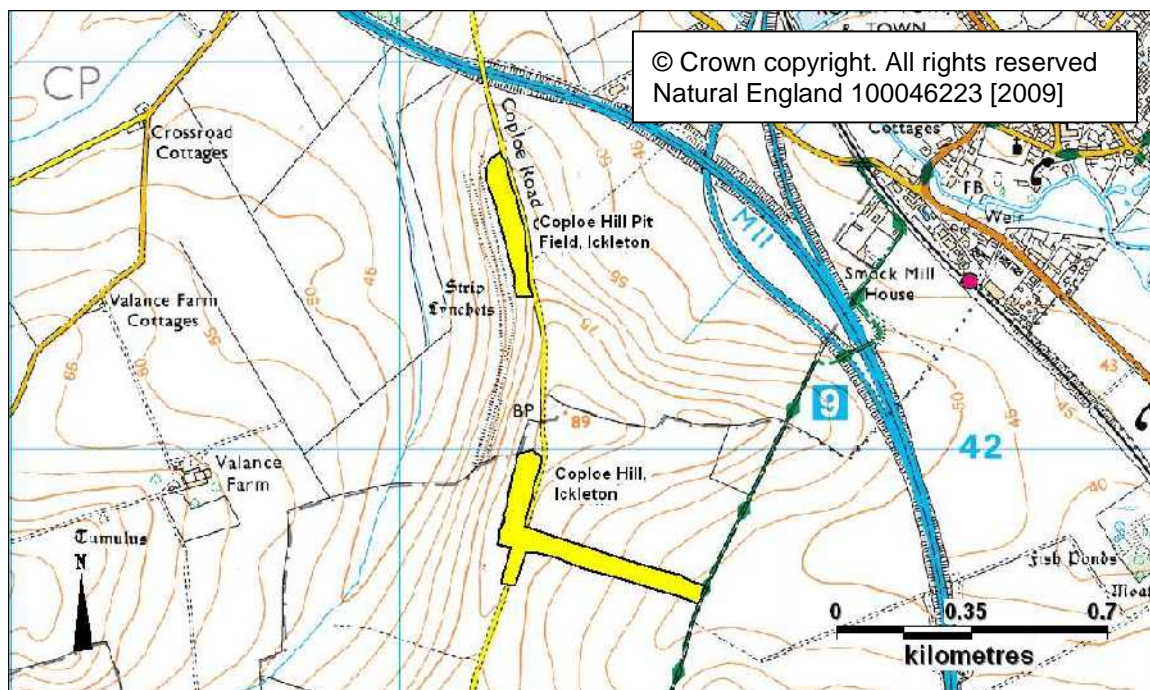
Encourage uptake of ELS cultivated field margin options.

### **Survey Notes**

12 Four-spotted were recorded here in 2006. The moth has been found here for several years in succession. Further exploration of field margins and the rights of way network in this area could find more locations for this moth.

### 3. Coploe Hill, Ickleton (Essex)

<b>District</b>	Uttlesford	<b>Grid Reference</b>	TL 495417
<b>Conservation Status</b>	None	<b>Ownership</b>	R Duke
<b>Funding Scheme</b>	Not known	<b>Access</b>	Bridleway and roadside verge
<b>Date of last record</b>	2006	<b>Adult Count</b>	8
<b>Habitats Present</b>	Arable field margins	<b>Nearest site</b>	Part of Great Chesterford Group



#### **Site Management History**

This site is a half kilometre long bridleway field margin and is essentially an extension of the Coploe Hill Pit Field Ickleton site.

#### **Conservation/Management Requirements**

The bridleway is cultivated each year but not cropped and this appears to produce good habitat for the moth. Encourage uptake of ELS cultivated field margins in this area.

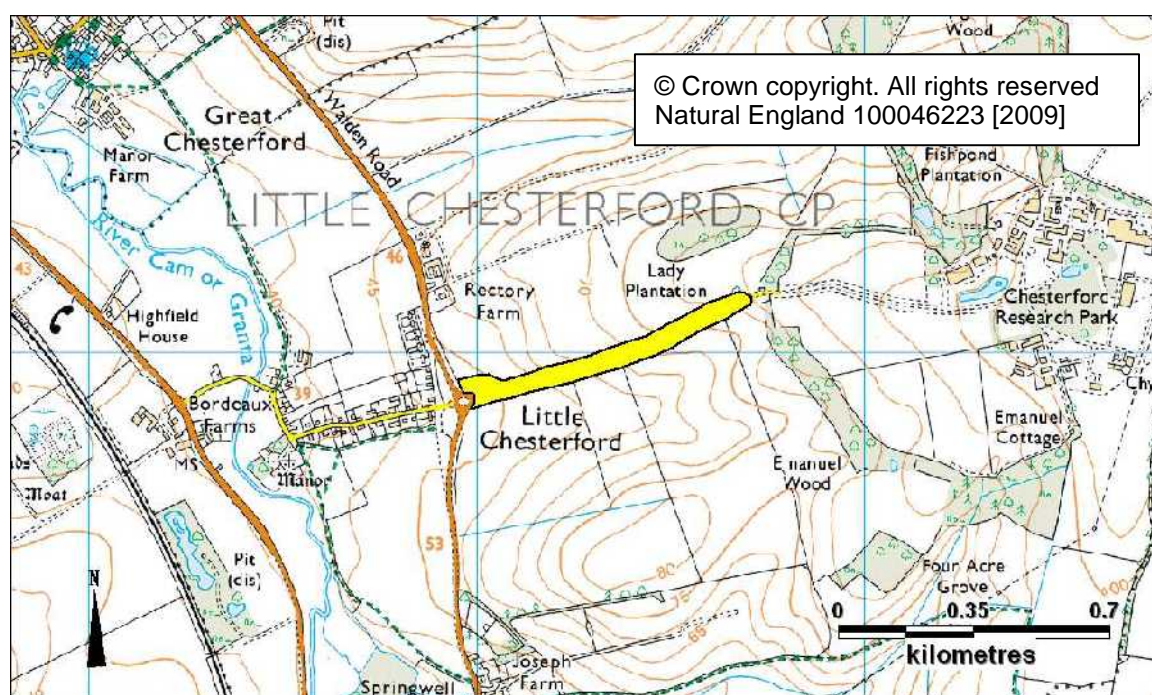
#### **Survey Notes**

The bridleway extends towards the M11 and Strethall for a further 3 km and it is quite likely that further individuals could be found along the entire length.



#### 4. Great Chesterford Research Park (Essex)

<b>District</b>	Uttlesford	<b>Grid Reference</b>	TL 524423
<b>Conservation Status</b>	None	<b>Ownership/management</b>	Research Park
<b>Funding Scheme</b>	Entry Level Stewardship	<b>Access</b>	Public Footpath and private
<b>Date of last record</b>	2008	<b>Adult Count</b>	2
<b>Habitats Present</b>	Arable field margins and road bank	<b>Nearest site</b>	Part of Great Chesterford Group



##### **Site Management History**

This site is an extensive area of laboratories and offices in open parkland. A new road was constructed in 2005 and the steep bank re-worked. The lower bank is mown during the summer. Some trees and shrubs have been planted. The top of the bank and arable margin is now a Public Footpath. Only the road bank and Public Footpath was surveyed.

##### **Conservation/Management Requirements**

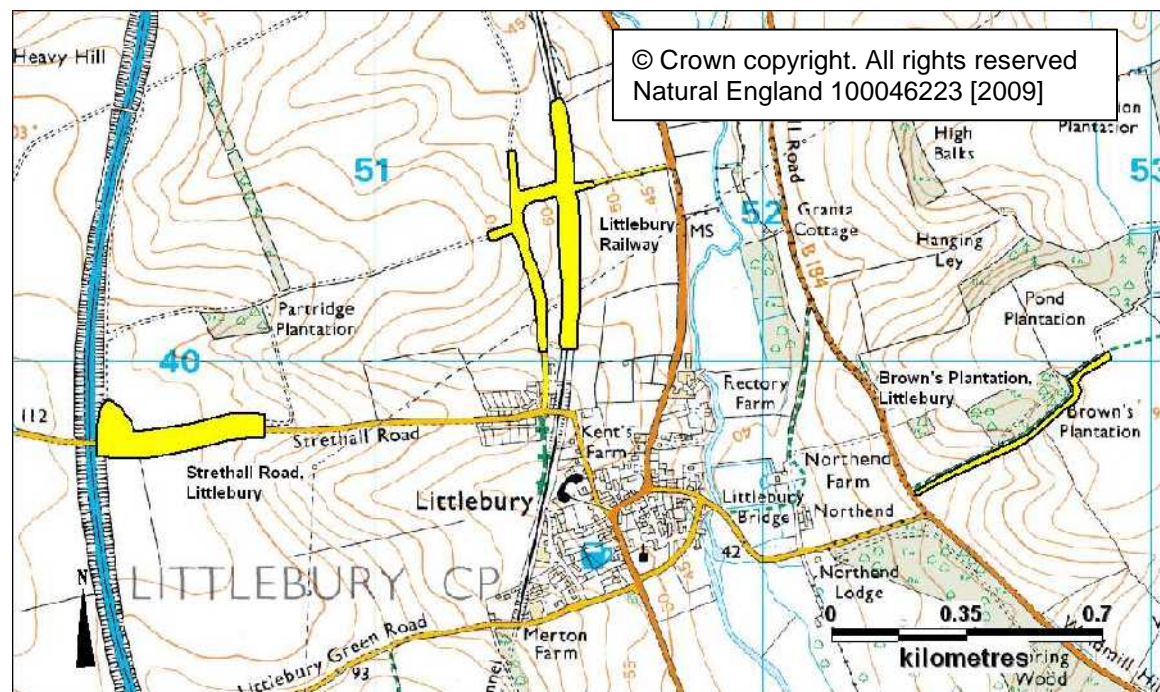
Remove some of the planted trees and shrubs and re-locate elsewhere on the site. The upper bank would benefit from mowing and scarification in patches to expose bare soil. A cultivated field margin along the arable field will help encourage Field Bindweed and wildflowers. The Public Footpath would also benefit from periodic soil disturbance and limited mowing in June and July.

##### **Survey Notes**

This area has a long history of records for Four-spotted moth. Over 40 were recorded in 2007. Surrounding field margins and linking Public Footpaths also appear to support suitable habitat.

## 5. Brown's Plantation, Littlebury (Essex)

<b>District</b>	Uttlesford	<b>Grid Reference</b>	TL 526396
<b>Conservation Status</b>	None	<b>Ownership</b>	Audley End Estate
<b>Funding Scheme</b>	Not known	<b>Access</b>	Along public footpath only
<b>Date of last record</b>	2005	<b>Adult Count</b>	2
<b>Habitats Present</b>	Arable field margins	<b>Nearest site</b>	Part of Great Chesterford Group



### Site Management History

This site is a Public Footpath with an east-west orientation, initially between two arable field and then along the south side of a woodland.

### Conservation/Management Requirements

Encourage uptake of ELS cultivated field margins and Rights of Way management that encourages continuity of Field Bindweed and wildflowers.

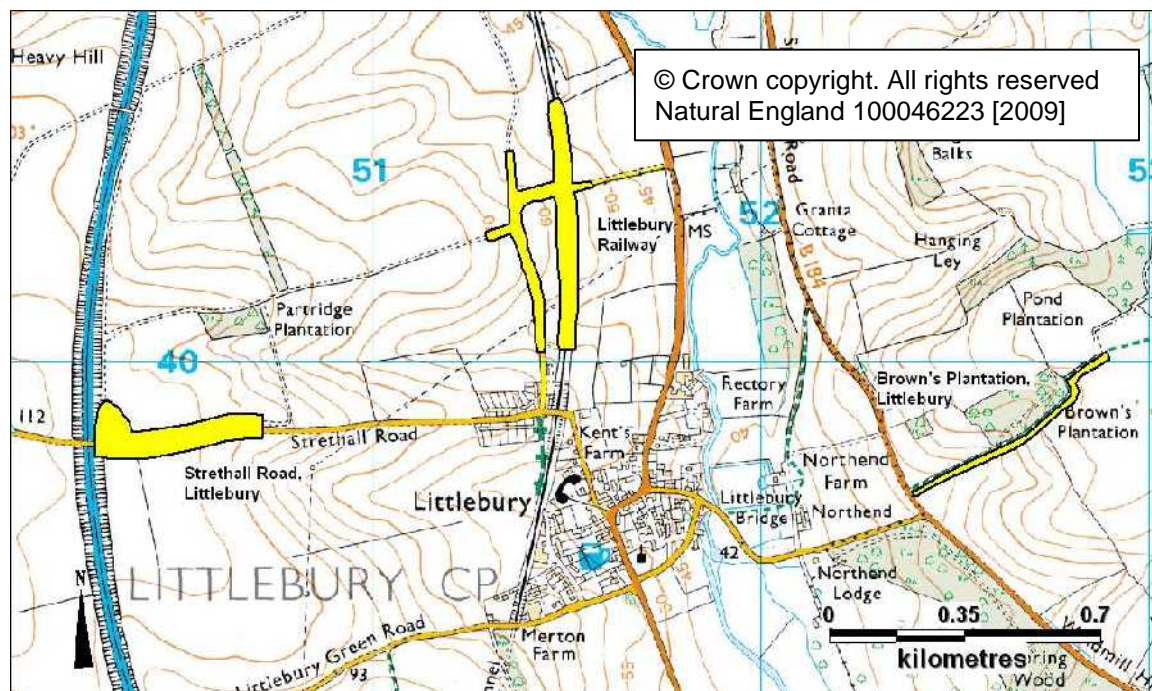
### Survey Notes

The Public Footpath extends for several km from Brown's Plantation and it is possible that further survey would find more colonies.



## 6. Littlebury Railway and surrounding farmland (Essex)

<b>District</b>	Uttlesford	<b>Grid Reference</b>	TL 515405
<b>Conservation Status</b>	None	<b>Ownership</b>	Audley End Estate/ Network Rail
<b>Funding Scheme</b>	Not known	<b>Access</b>	Road edge
<b>Date of last record</b>	2008	<b>Adult Count</b>	2
<b>Habitats Present</b>	Arable margins, chalk grassland and roadside verges	<b>Nearest site</b>	Part of Great Chesterford Group



### Site Management History

The main feature of this site is a deep railway cutting and sunken lane surrounded by arable fields.

### Conservation/Management Requirements

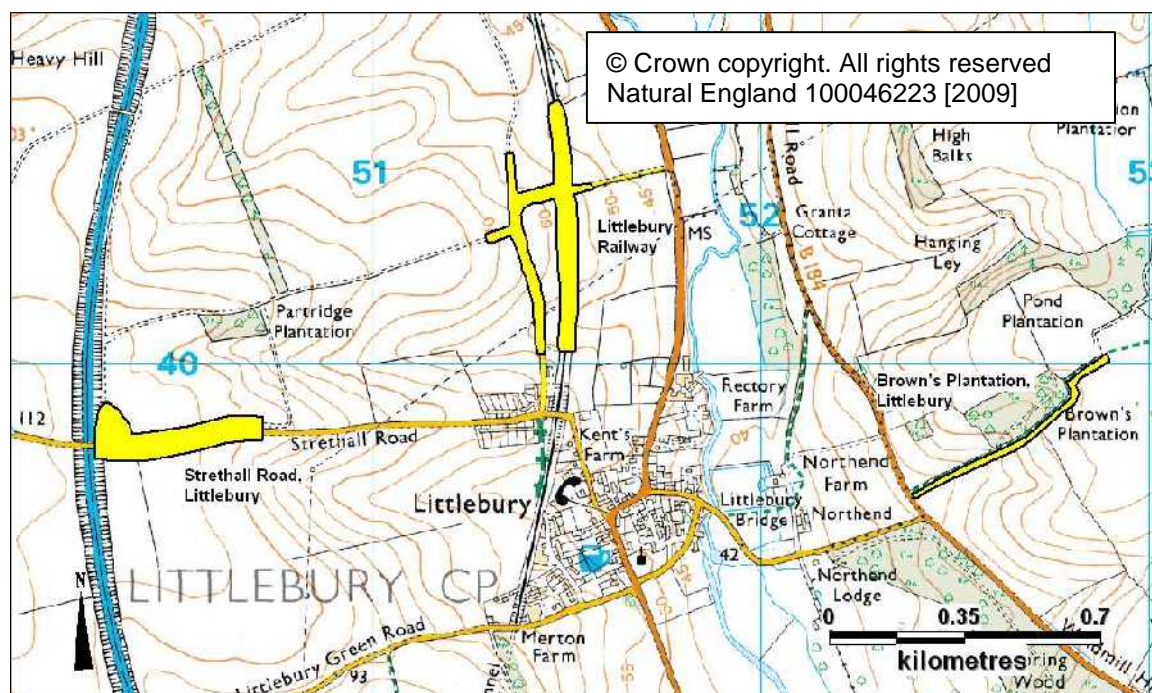
The railway banks should be kept clear of scrub and occasionally scarified to create bare ground. Encourage uptake of ELS cultivated arable margins. Scarify road verges to create bare ground.

### Survey Notes

A well known site with volunteer surveyors and where Colin Plant recorded over 100 in 2005. It is quite possible that the railway corridor north and south of this site could provide further suitable habitat for the moth.

## 7. Strethall Road, Littlebury (Essex)

<b>District</b>	Uttlesford	<b>Grid Reference</b>	TL 504398
<b>Conservation Status</b>	Protected roadside verge	<b>Ownership/management</b>	Local Authority Highways
<b>Funding scheme</b>	Not known	<b>Access</b>	Roadside
<b>Date of last record</b>	2005	<b>Adult Count</b>	2
<b>Habitats Present</b>	Chalk grassland	<b>Nearest site</b>	Part of Great Chesterford Group



### Site Management History

This site is a protected roadside verge for its chalk grassland flora.

### Conservation/Management Requirements

The verge appears to be unmanaged. Annual mowing with removal of cuttings and occasional scarification would help reduce rank grassland and increase diversity.

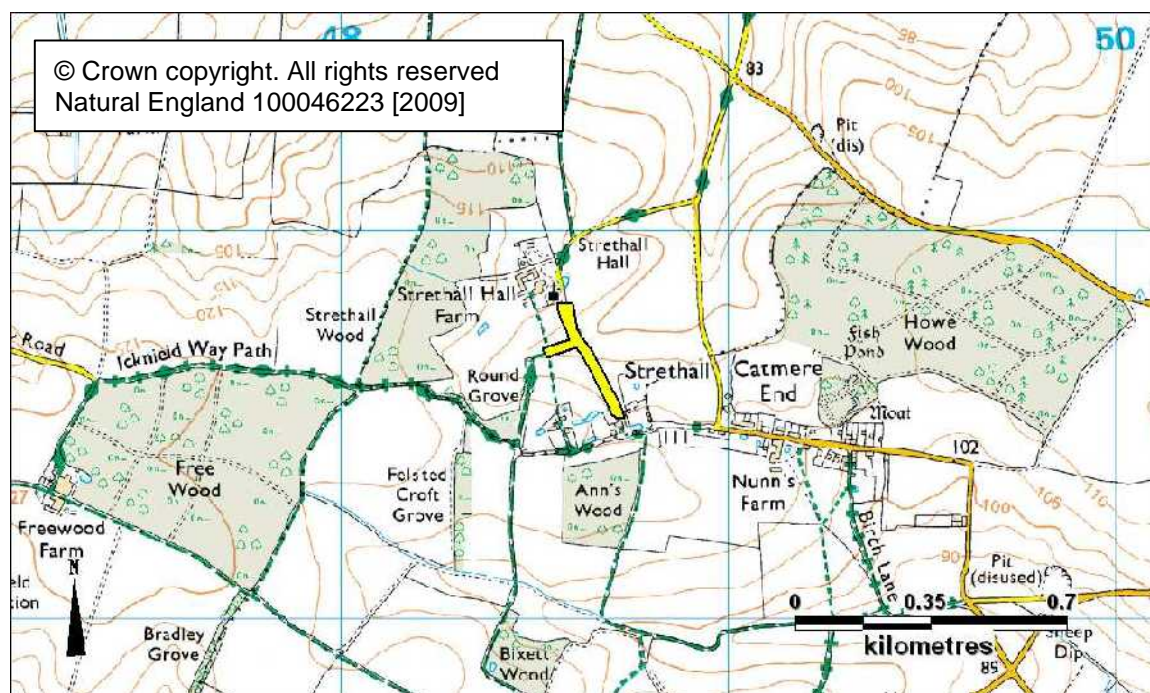
### Survey Notes

The moth has been recorded along this verge over several years but almost certainly depends on the wider arable landscape and field margins to provide suitable breeding habitat.



## 8. Strethall Church (Essex)

<b>District</b>	Uttlesford	<b>Grid Reference</b>	TL 486399
<b>Conservation Status</b>	None	<b>Ownership</b>	Not known
<b>Funding scheme</b>	Not known	<b>Access</b>	Public Footpaths
<b>Date of last record</b>	2006	<b>Adult Count</b>	1
<b>Habitats Present</b>	Arable farmland	<b>Nearest site</b>	Part of Great Chesterford Group



### Site Management History

This site is an area of arable/footpath verges in the vicinity of Strethall Church where Field Bindweed is abundant along track and verge edges.

### Conservation/Management Requirements

Encourage uptake of cultivated field margins and avoid mowing footpath verges in June and July.

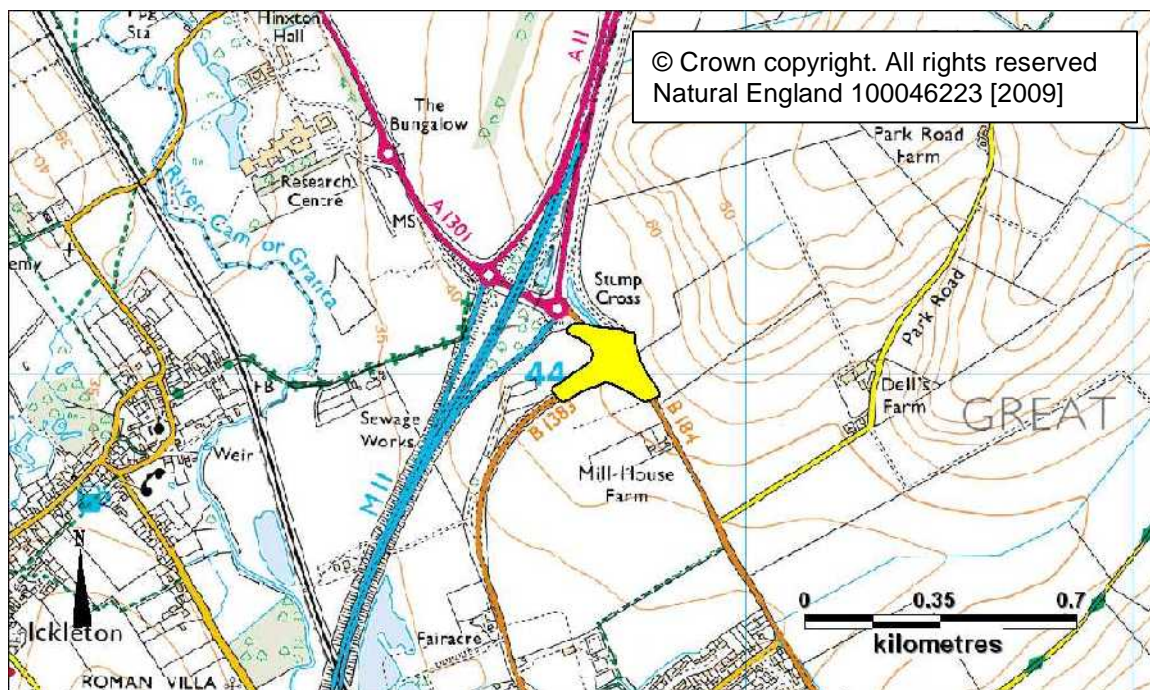
### Survey Notes

It is possible that further survey in the wider landscape here would locate additional colonies of this moth.



## 9. Stumps Cross, Great Chesterford (Essex)

<b>District</b>	Uttlesford	<b>Grid Reference</b>	TL 505440
<b>Conservation Status</b>	None	<b>Ownership</b>	Local Authority Highways
<b>Funding scheme</b>	Not known	<b>Access</b>	Roadside verge
<b>Date of last record</b>	2006	<b>Adult Count</b>	3
<b>Habitats Present</b>	Arable farmland and recent highway works	<b>Nearest site</b>	Part of Great Chesterford Group



### Site Management History

This site is an area of recent highway works to create a new roundabout and side roads. Verges have been planted with wild flower mixes which included abundant Ox-eye Daisy a favourite nectar source for the Four-spotted moth.

### Conservation/Management Requirements

Further disturbance or scarification will be needed to maintain the abundance of wild flowers and bare ground found here necessary to support the moth. Field Bindweed was not found along the verges here and the moth is probably dependent on the surrounding arable farmland verges.

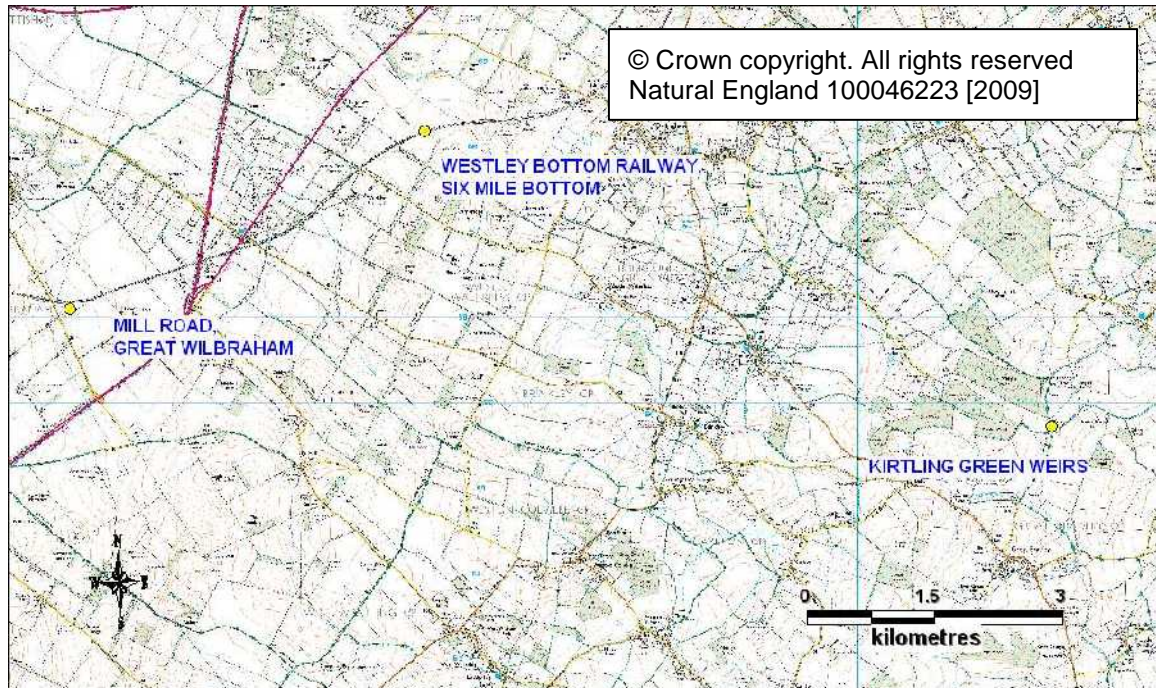
### Survey Notes

Great care needed when surveying this area due to heavy traffic.

**b) Great Wilbraham Group**

Figure 3 shows the location of sites in the Great Wilbraham area.

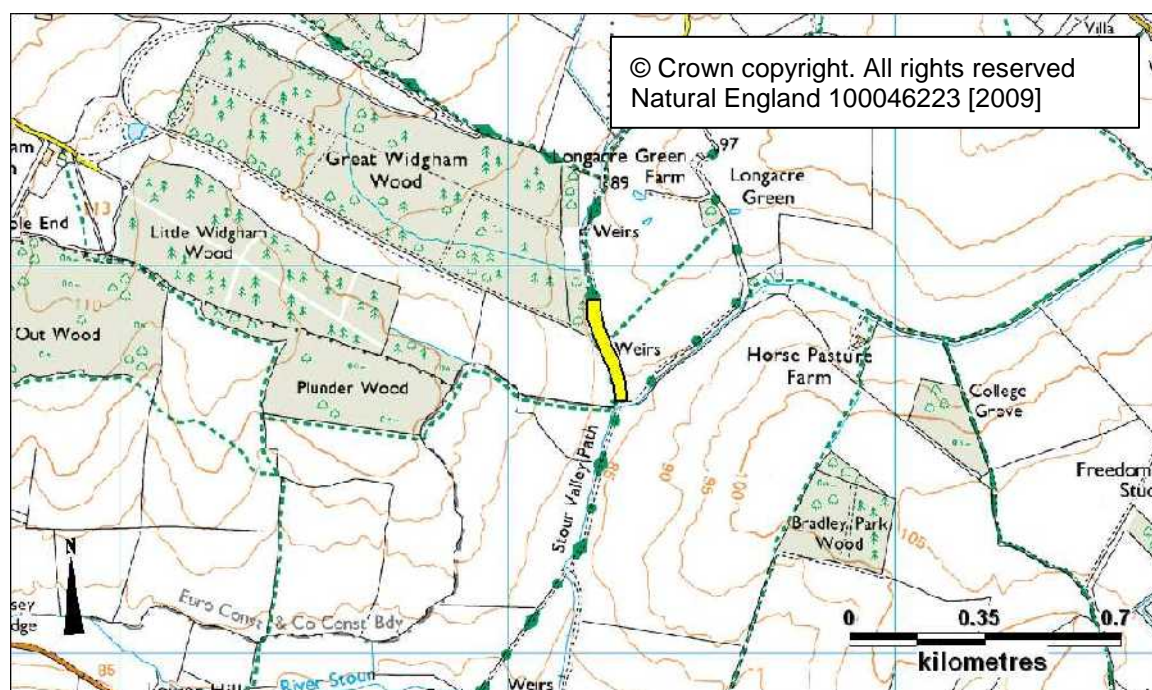
**Figure 3: Map showing the location of the Great Wilbraham Group of Four-spotted sites**





## 1. Kirtling Green Weirs (Cambridgeshire)

<b>District</b>	East Cambridgeshire	<b>Grid Reference</b>	TL 673547
<b>Conservation Status</b>	None	<b>Ownership</b>	Ron Hall/Environment Agency
<b>Funding Schemes</b>	Not known	<b>Access</b>	Public Footpath
<b>Date of last record</b>	2006	<b>Adult Count</b>	1
<b>Habitats Present</b>	Arable farmland and ditch bank with neutral grassland	<b>Nearest site</b>	Part of Great Wilbraham Group (Westley Bottom site 8 km)



### Site Management History

This site is a 5 km long channel with a series of weirs built about 30 years ago between arable fields. The rounded banks were allowed to vegetate naturally and there is abundant Field Bindweed but this now grows in increasingly tall rank grassland.

### Conservation/Management Requirements

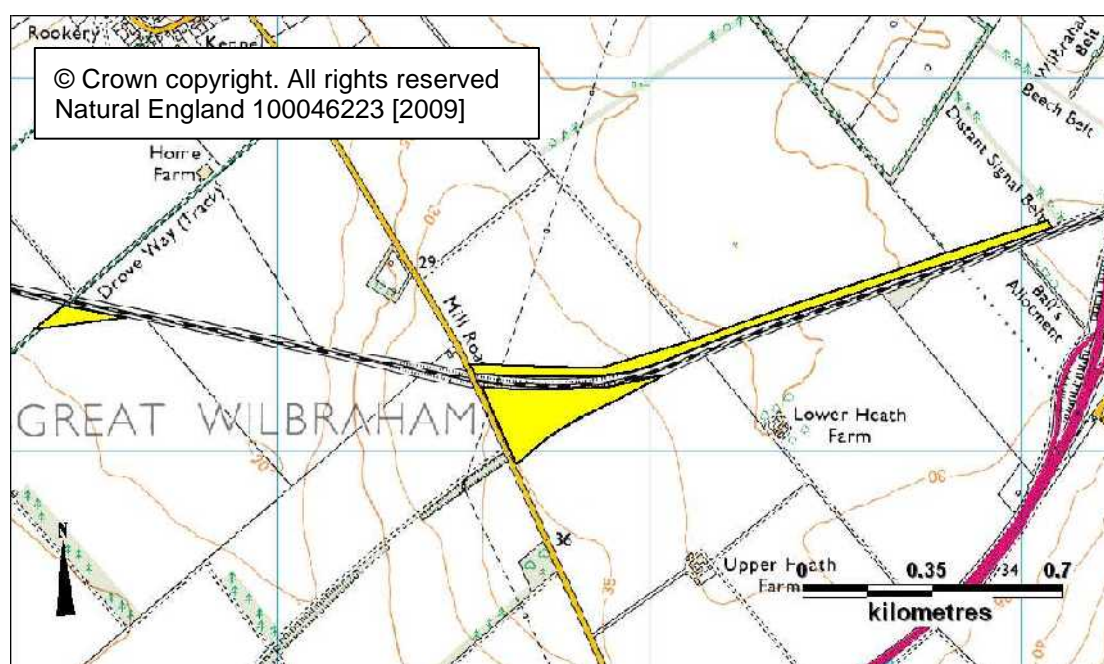
The banks are mown once a year in the autumn and the cuttings left on site. Removal of these cuttings and scarification to create bare ground and encourage Field Bindweed would improve the habitat. The Environment Agency has plans to build a major new pipeline alongside the existing channel in 2010 which will provide an excellent opportunity to create some additional habitat for the moth.

### Survey Notes

Despite repeated survey visits in suitable weather the moth was not recorded in 2007 and 2008.

## 2. Mill Road, Great Wilbraham (Cambridgeshire)

<b>District</b>	South Cambridgeshire	<b>Grid Reference</b>	TL 556562
<b>Conservation Status</b>	None	<b>Ownership</b>	Great Wilbraham Estate/Network Rail
<b>Funding Schemes</b>	Entry Level Stewardship	<b>Access</b>	Private
<b>Date of last record</b>	2007	<b>Adult Count</b>	5
<b>Habitats Present</b>	Railway cutting, set-aside field, arable margins and rifle range	<b>Nearest site</b>	Part of Great Wilbraham Group (Westley Bottom site km)



## Site Management History

This site is a set aside field corner (now in its 8<sup>th</sup> year) next to a deep railway cutting in an open arable landscape. A nearby rifle range and wide flower rich roadside verges provide additional habitat.

### Conservation/Management Requirements

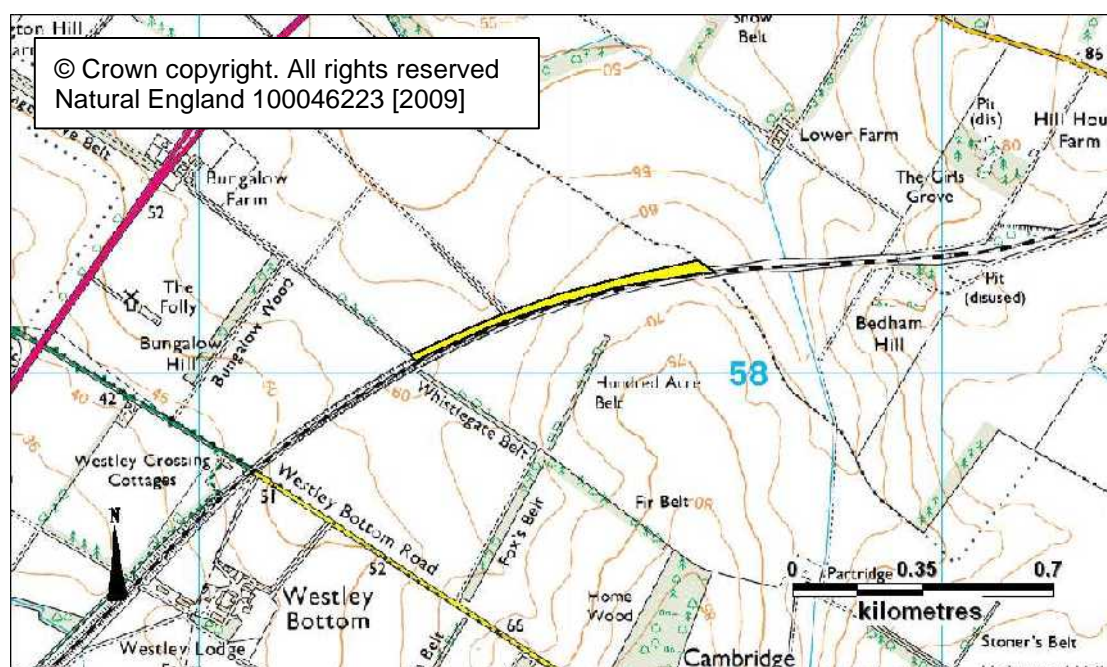
The farm is in ELS but further use of cultivated field margins as opposed to grass margins would provide useful habitat. This particular field is in set aside but will not be cultivated due to its proximity to the rifle range. The field would benefit from some rotovation strips to break up area of rank grassland and encourage Ox-eye Daisy and Field Bindweed. The railway cutting will need to be cleared of scrub in the future to prevent loss of habitat and to maintain a large area of Field Bindweed.

## Survey Notes

The moth was recorded along a 9.5 km length of field margin next to the railway corridor here. It is likely that further survey in the wider landscape would locate additional colonies of the moth. Four larvae were found along the railway boundary fence on 5 July 2007. This site is private and permission from the landowner is required.

### 3. Westley Bottom Railway, Six Mile Bottom (Cambridgeshire)

<b>District</b>	South Cambridgeshire	<b>Grid Reference</b>	TL 598582
<b>Conservation Status</b>	None	<b>Ownership</b>	Six Mile Bottom Estates/Network Rail
<b>Schemes</b>	Entry Level Stewardship	<b>Access</b>	Private
<b>Date of last record</b>	2006	<b>Adult Count</b>	3
<b>Habitats Present</b>	Railway banks, field margins and set aside	<b>Nearest site</b>	Part of Great Wilbraham Group between Kirtling Green Weirs (8 km) and Mill Road Great Wilbraham (3 km)



#### **Site Management History**

This site is a large arable farm estate on light calcareous soils with an active railway line through the middle. Wide field margins are left for shooting purposes.

#### **Conservation/Management Requirements**

Scrub clearance along the railway corridor will be needed in the future to maintain habitat. Significant scrub clearance along the Newmarket stretch of this railway line in 2008 may provide good habitat for the moth in the future. ELS to encourage cultivated field margins and flower rich verges would provide good habitat for the moth.

#### **Survey Notes**

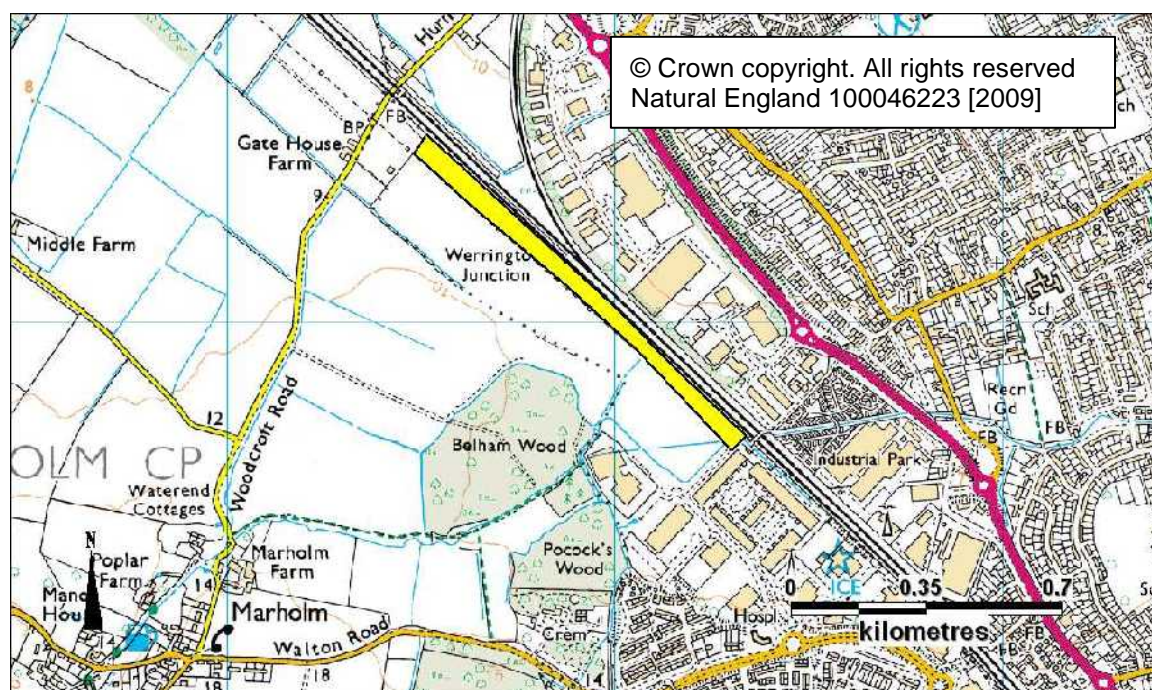
The moth was recorded along a 3 km length of the railway corridor. It is likely that further survey in the wider landscape would locate additional colonies of the moth. This site is private and permission from the landowner is required.



### c) Other sites

#### 1. Werrington Drain, Peterborough (Cambridgeshire)

<b>District</b>	Peterborough	<b>Grid Reference</b>	TF153037
<b>Conservation Status</b>	None	<b>Owner/Manager</b>	Environment Agency/Network Rail
<b>Funding Schemes</b>	Survey funded by LBAP grant	<b>Access</b>	Private
<b>Date of last record</b>	2008	<b>Adult Count</b>	5
<b>Habitats Present</b>	Drainage channel and railway verge	<b>Nearest site</b>	Not known



#### **Site Management History**

A wide drainage channel that runs parallel to railway line. The channel is managed by the Environment Agency with advice from Dr Paul Waring.

#### **Conservation/Management Requirements**

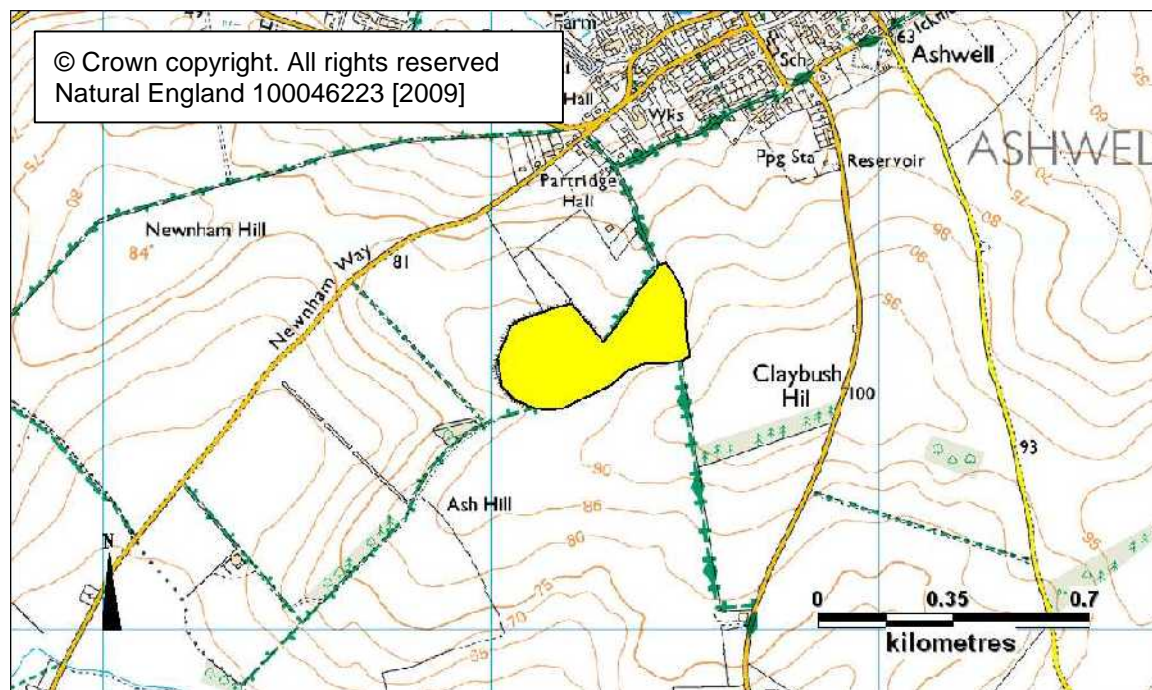
Periodic ditch clearance and bankside mowing in the autumn creates ideal conditions for Field Bindweed and wildflowers to flourish.

#### **Survey Notes**

Monitored by a weekly transect walk between April and September by Dr Paul Waring since 2000. Grizzled Skipper also present at this site.

## 2. Arbury Banks, Ashwell (Hertfordshire)

<b>District</b>	North Hertfordshire	<b>Grid Reference</b>	TL 260385
<b>Conservation Status</b>	Scheduled Ancient Monument	<b>Ownership</b>	Private
<b>Schemes</b>	Not known	<b>Access</b>	Public Footpaths
<b>Date of last record</b>	2005	<b>Adult Count</b>	3
<b>Habitats Present</b>	Neutral grassland and arable farmland	<b>Nearest site</b>	Duxford (20 km)



### Site Management History

This site is a bronze age hill fort managed by grazing cattle. The site is surrounded by arable farmland and field margins have abundant Field Bindweed

### Conservation/Management Requirements

Ashwell Parish Council are pursuing possible purchase of this site and an application for Higher Level Stewardship

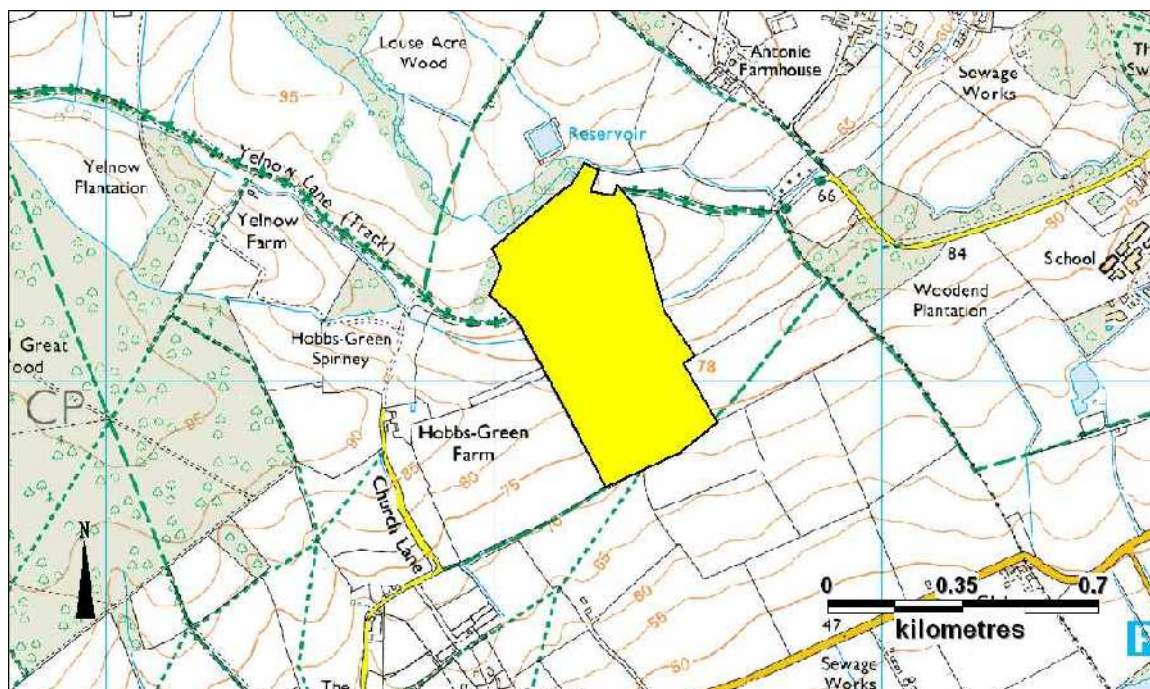
### Survey Notes

It is not known whether Four-spotted is restricted to this site but the light chalk soils and abundance of Field Bindweed along field margins in the surrounding arable farmland suggests that the moth probably occurs in the wider landscape and further survey is recommended. This is the only site with recent positive records in Hertfordshire.



### 3. Yelow Wood (Bedfordshire)

<b>District</b>	North Bedfordshire	<b>Grid Reference</b>	SP972591
<b>Conservation Status</b>	None	<b>Ownership</b>	Bedfordshire County Council
<b>Funding Schemes</b>	Not known	<b>Access</b>	Open access
<b>Date of last record</b>	2007	<b>Adult Count</b>	6
<b>Habitats Present</b>	New woodland rides and clearing	<b>Nearest known site</b>	Harringworth Northamptonshire (35 km)



#### **Site Management History**

This is a 16 ha area of new woodland planted on arable land. The first trees were planted in 1991. Wide rides and an area of natural re-colonisation at the northern end of the site next to Parson's Corner Spinney were included in the scheme.

#### **Conservation/Management Requirements**

The suitability of the site for Four-spotted moth will diminish as woodland develops and the sward becomes closed. A management regime that includes rotovation especially in the northern area of natural re-colonisation and the maintenance of wide open rides along the southern perimeter may help prolong habitat for the moth.

#### **Survey Notes**

The moth was recorded along the southern ride and the northern open area next to Parson's Corner Spinney at Yelow New Wood. There is abundant nectar but Field Bindweed is largely absent from the site although common along adjacent arable field margins (where the moth was also recorded). Further survey in the wider arable landscape is recommended where agri-environment schemes such as cultivated field margins would help in the longer term. It is also highly likely that the nearby railway line between Bedford and Wellingborough would provide suitable habitat for the moth.

## **5. Discussion and conclusions**

The numbers of Four-spotted moth recorded can be very unpredictable and there can be huge variations. Most records are in single figures but in 2005 Colin Plant recorded over 100 individuals and in 2007 the author recorded over 40. On both occasions visits the following day to the same location in similar weather only recorded 3 or 4 moths. It is not known why this phenomenon occurs and how important certain aspects of the landscape are in making this possible.

The Four-spotted moth is a good indicator of farmland biodiversity and other declining species such as Small Heath *Coenonympha pamphilus* and Common Blue *Polyommatus icarus* butterflies and Mother Shipton *Callistege mi* and Burnet Companion *Euclidia glyphica* moths are usually associated with good Four-spotted moth colonies.

Where there have been many positive sightings for the moth across a series of sites in close proximity (i.e. Great Chesterford), this suggests that the Four-spotted moth occurs as a metapopulation across this landscape.

The survey effort for this moth across the region has been uneven with most effort in the Great Chesterford and Great Wilbraham area. In Bedfordshire survey effort was restricted to Yelnow New Wood over a few days and hence considerable potential for further survey and perhaps additional records exists in Bedfordshire.

This survey confirmed the Great Chesterford area along the Cambridge/Essex border as a stronghold for Four-spotted moth in the UK covering an area of approximately 48 square kilometres. The next largest area was the nearby Great Wilbraham group covering approximately 10 square kilometres. Efforts were made to see if the moth could be found in areas of apparently suitable habitat between the Great Chesterford and Great Wilbraham group in the vicinity of Brinkley, Dullingham and Great Abington but these were all negative.

The discovery of new sites during this survey suggests that there are undetected populations of Four-spotted moth awaiting discovery. Much of this survey was limited to sites with public access along public footpaths or road verges. Relatively few visits were to the wider countryside but those that were undertaken such as the survey at College Farm Duxford and Six Mile Bottom Estate in Westley were very productive.

New developments including roads, pipelines and reservoirs offer the opportunity to create suitable habitat and offer the potential to be considered for mitigation for such developments. The Four-spotted moth was recorded along new reservoir banks at Duxford, balancing pond at Little Chesterford and a recent roundabout and road verges at Stumps Cross. These sites are unlikely to support the moth in the long term without management to create new areas of disturbance and bare soil and this should be taken into account if mitigation for development is being considered.

It is perhaps no coincidence that a major railway line is located within almost all the major landscapes for this moth in the East of England. Railway lines especially cuttings provide excellent warm, open conditions with areas of bare ground and sparse vegetation. Regular disturbance from rabbits, bank slippage and railway maintenance works help to maintain bare ground in the longer term.

The Four-spotted is a distinctive moth and easy to monitor during day time searches in the flight period. Volunteers can be shown how to recognise the moth and its habitat. Known sites are generally well visited by volunteers but there is considerable potential elsewhere in both the wider landscape and under-recorded areas of the region.

Entry Level Stewardship (ELS) is the first level of the Environmental Stewardship Scheme introduced by DEFRA in 2005. ELS has a high uptake amongst farmers, but each applicant is free to choose the options that suit them best in return for the payment, irrespective of the relative benefits they will bring to local biodiversity. There appears to be a low level of uptake of the best management options for Four-spotted moth such as uncropped cultivated field margins where the field margins are left unsown and with no chemical inputs. The majority of farmers appear to have gone for a permanent grass margin which eliminates potential for Field Bindweed and many other arable weeds and flowers.

Two sites in this survey were set aside farmland not used for food production and providing a habitat for wildlife. The decision by the European Union to reduce the amount of set aside farmland to zero in 2008 has led to the loss of one of these sites. It is not known how many other similar sites might have supported the moth across the region.

This survey has indicated that most sites with the moth show signs of soil disturbance in recent years as a result of arable farming or development. Low banks on light soils especially those facing south are especially important and can be covered in Field Bindweed. Larvae were recorded along a low bank next to railway boundary fence where rabbits had scraped out small areas of bare ground and Field Bindweed was spreading across bare ground. Arable margins in close proximity to flower rich grass verges appear to be favoured.

## **6. Recommendations**

### **a) Survey and monitoring**

Undertake further survey along the railway network in Bedfordshire, Cambridgeshire and Essex to identify further potential for Four-spotted moth and provide management advice to Network Rail.

Encourage volunteers to monitor known sites. A weekly transect walk in the Great Chesterford area is a key target and would compliment the transect undertaken annually by Paul Waring in Peterborough.

Continue monitoring at Kirtling Green Weirs despite 2 negative years it will be especially interesting to see if Four-spotted numbers build up after the new pipeline is built in 2010 and considerable bare ground is created.

Monitor how effective the prescriptions of current field margin options are in contributing to conservation of key species such as the Four-spotted. Further study needed to identify the best prescriptions and take-up by farmers for agri-environment schemes along field margins and promotion of cultivated field margins in the best areas.

Revisit negative sites and undertake further survey in the general area.

### **b) Site management**

Encourage farmers to choose options such as uncropped, cultivated field margins as part of their Environmental Stewardship schemes.

Investigate management of Rights of Way routes in the area which offer significant potential for Four-spotted moth. Avoid mowing in June and July where possible and encourage rotational rotoovation/scarification in the autumn as a management practice along verges.

Provide guidance for local planning departments to ensure that future developments including road schemes, pipelines, reservoirs or housing developments create and maintain suitable habitat for the moth where appropriate.

Review management of county highway verges and recommend changes to encourage floristic diversity in target areas for Four-spotted moth.

## **7. Acknowledgements**

Thanks to all the volunteers who helped with survey work and records including:

Dr Paul Waring, Brian Goodey, Vince Lea, Val Perrin, Louise Bacon, John Dawson, Jim Reid, Chris Tyler-Smith, Phil Jenner, Andrew Palmer, Colin Plant, Tom Fowling, Richard Fowling, Tony Moverely, Stephen Patmore. Jim Reid, John Chainey, Don Down, Tony Prichard, Ian Kimsey, Tim Sizer, Andy and Melissa Banthorpe.

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## 9. Appendix 1: Summary of Four-spotted records

### Four-spotted Records 2005-2008

Date	County	Site Name	Grid Ref	Number	Recorder
08.6.05	Essex	Stumps Cross	TL504439	1	Chris Tyler Smith
08.6.05	Cambs	Mill Rd Gt Wilbraham	TL555562	5	Sharon Hearle
08.6.05	Essex	Strethall Rd verge	TL504398	2	Sharon Hearle
09.6.05	Essex	Stumps Cross	TL504439	7	Chris Tyler Smith
11.6.05	Suffolk	Kirtling Weirs	TL673548	1	Sharon Hearle
18.6.05	Essex	Stumps Cross	TL506440	1	Chris Tyler Smith
18.6.05	Essex	Chesterford Park	TL524423	3	Chris Tyler Smith
23.6.05	Essex	Littlebury	TL508402	1	Chris Tyler Smith
23.6.05	Essex	Littlebury	TL508402	100	Colin Plant
27.6.05	Essex	Browns Plantation	TL526396	2	Phil Jenner
27.6.05	Essex	Browns Plantation	TL524397	2	Phil Jenner
27.6.05	Cambs	Coploe Hill	TL494420	3	Sharon Hearle
27.6.05	Essex	Coploe Hill bridleway	TL495416	2	Sharon Hearle
27.6.05	Essex	Strethall Field	TL486405	1	Sharon Hearle
02.7.05	Essex	Littlebury	TL510398	2	John Chainey
02.7.05	Essex	Littlebury	TL513404	2	John Chainey
02.7.05	Essex	Littlebury	TL513405	3	John Chainey
02.7.05	Essex	Littlebury	TL513406	2	John Chainey
2005	Hertfordshire	Arbury Banks, Ashwell	TL260385	3	Jim Reid
06.6.06	Cambs	Mill Rd Gt Wilbraham	TL556562	5	Sharon Hearle
07.6.06	Essex	Stumps Cross	TL505440	2	Sharon Hearle
07.6.06	Cambs	Mill Rd Gt Wilbraham	TL556562	3	Sharon Hearle
	Cambs				Andrew Palmer
08.6.06		Railway Gt Wilbraham	TL556562	8	&SH
	Cambs				Andrew Palmer
08.6.06		Railway Gt Wilbraham	TL567565	12	&SH
08.6.06	Cambs	Westley Bottom	TL598582	3	Sharon Hearle
	Cambs				Workshop Paul
14.6.06		Mill Rd Gt Wilbraham	TL556562	4	Waring
15.6.06	Cambs	Footpath Gt Wilbraham	TL538565	3	Sharon Hearle
17.6.06	Cambs	Gt Wilbraham Parish Pit	TL557557	1	Richard Fowling
					John Dawson &
18.6.06	Essex	Coploe Hill bridleway	TL495417	8	Don Down
					John Dawson &
18.6.06	Essex	Cople Hill road verge	TL494418	12	Don Down
					John Dawson &
18.6.06	Cambs	Ickleton strip lynchets	TL493424	4	Don Down
					John Dawson &
18.6.06	Cambs	Ickleton pit, Coploe	TL494427	4	Don Down
02.7.06	Essex	Strethall Church	TL486399	1	Anthony Moverley
					Workshop Paul
04.7.06	Cambs	Mill Rd Gt Wilbraham	TL556562	4 larvae	Waring

Date	County	Site Name	Grid Ref	Number	Recorder
04.7.06	Suffolk	Kirtling Weirs	TL673547	1 larva	Workshop Paul Waring
04.7.06	Suffolk	Kirtling Weirs	TL673547	1 larva	Workshop Paul Waring
19.5.07	Essex	Coploe Hill	TL494415	3	Stephen Patmore
20.5.07	Essex	Littlebury	TL508402	1	Richard Fowling
22.5.07	Cambs	Mill Rd Gt Wilbraham	TL556562	3	Sharon Hearle
22.5.07	Essex	Chesterford Park	TL524423	40	Sharon Hearle
22.5.07	Essex	Chesterford Pit	TL51428	1	Sharon Hearle
24.5.07	Essex	Chesterford Park	TL524423	6	Sharon Hearle
10.6.07	Cambs	Ickleton Pit, Coploe	TL492425	1	Chris Tyler Smith
10.6.07	Essex	Coploe Hill area	TL493420	1	Chris Tyler Smith
13.6.07	Bedfordshire	Yelnow Wood	SP972591	6	Workshop Paul Waring
17.6.07	Bedfordshire	Yelnow Wood	SP971593	10	Andy & Melissa Banthorpe
20.6.07	Cambs	College Farm Duxford	TL470438	2	Sharon Hearle
20.6.07	Cambs	Cople Hill	TL493424	1	Sharon Hearle
21.6.07	Cambs	Mill Rd Gt Wilbraham	TL556562	1	Sharon Hearle
05.6.08	Essex	Littlebury	TL515405	2	Sharon Hearle
05.6.08	Essex	Chesterford Park	TL524423	5	Sharon Hearle
29.6.08	Essex	Littlebury	TL515404	3	Tim Sizer



## **10. Appendix 2: Site photographs**



**Roadside verges at Coploe Hill, Ickleton, Essex**



**Roadside verge at Great Chesterford Research Park, Essex**



**Littlebury Railway, Essex and surrounding farmland**



**Mill Road, Great Wilbraham, Cambridgeshire.** Railway cutting and set-aside field with abundant Ox-eye Daisy





**Mill Road, Great Wilbraham, Cambridgeshire.** Larvae found along low bank next to railway boundary fence where Field Bindweed was sprawling along bare ground



**Westley Bottom Railway, Six-Mile Bottom, Cambridgeshire.** Four-spotted moth habitat along railway banks and adjacent field margin and track