

## Heath Fritillary in the Blean Woodlands: 2020 Status Report

Butterfly Conservation Report No. S20-11

Steve Wheatley



Heath Fritillary pairing up at a new site in Kent in 2020 (Steve Wheatley/Butterfly Conservation)



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## Summary

- This was the third extremely good year in a row for Heath Fritillary in the Blean Woods complex.
- Combined peak counts in 2020 were the highest of any year on record. 2019 and 2020 have produced the widest distributions on record.
- Heath Fritillary populations are known to follow a natural fluctuation cycle (2011 was the previous best year on record; 2016 was the poorest year on record).
- The highest counts were at the RSPB Blean Woods reserve. This is confirmed to be the largest colony in the UK. West Blean, Clowes Wood and Ellenden Wood also had their highest counts in years.
- The high numbers and strong population are a result of the extensive woodland management being undertaken. Their progeny will benefit from the ongoing management.
- The peak took place around 25<sup>th</sup> June, five days earlier than 2019.
- Heath Fritillary was found to be resident and breeding at a new site in 2020 - Blean Wood. This is now the most westerly colony in the Blean woodland complex.
- Cow-wheat has been found to be colonising the Woodland Trust's newly planted Victory Wood between Ellenden Wood and Blean Wood and it has been assessed to be sufficiently abundant to support Heath Fritillary.
- A single Heath Fritillary was photographed recorded in South Blean Woods (around 3km from the nearest known colony), but subsequent searches did not find any others.
- Of the 6 UKBMS transects that cover the Heath Fritillary in Kent, only the two RSPB transects were walked this season.
- Cow-wheat survey coverage was greater in 2020 than any previous year (assessed and recorded in 353 100m squares). The location of Heath Fritillary colonies in 2020 continues to show a strong correlation to the presence of Cow-wheat, although there are still several colonies which appear to be surviving solely on Ribwort Plantain. It would be useful and valuable to develop a survey and monitoring system for Ribwort Plantain.
- 26 colonies were identified in 2020, meeting the colony target (25) set out in the UKBAP for the Heath Fritillary in Kent.
- The survey coverage, resulting data and this report are only possible thanks to the exceptional contribution of conservation volunteers. We are extremely grateful to all of them.
- Management recommendations have been produced for the individual sites within the Blean woodland complex. See Section 6.
- The Heath Fritillary is restricted to just four locations in the UK, the Heath Fritillary remains a highly-threatened butterfly. It is listed in Section 41 the NERC Act in as being a species of principal importance.

# 1. Introduction

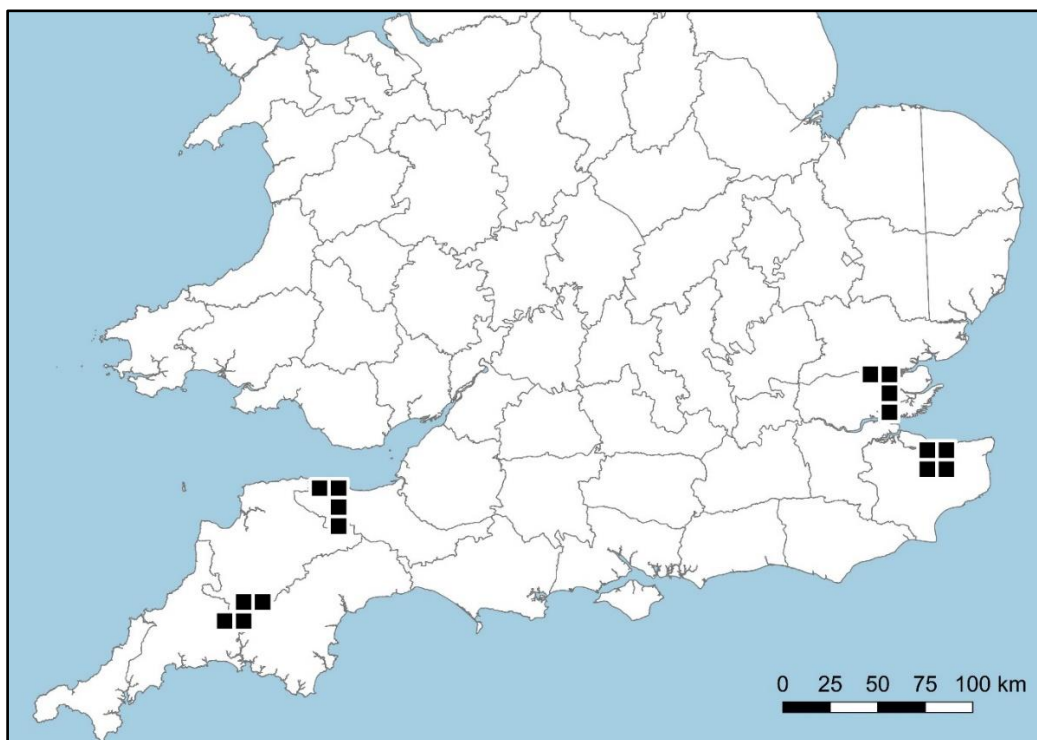
## 1.1. Scope of the Report

This report focuses on the distribution, abundance and connectivity of colonies of the Heath Fritillary in the Blean complex in Kent in 2020. The report presents the 2020 survey results in relation to targets set under the former UK Biodiversity Action Plan (UK BAP). The report includes recommendations for future management to help conserve and enhance the Heath Fritillary population.

## 1.2. Status of the Heath Fritillary in the UK

Heath Fritillary (*Melitaea athalia*) is one of England's most restricted and most threatened butterflies. It is designated as a Section 41 Species of Principal Importance under the Natural Environment and Rural Communities (NERC) Act 2006. The butterfly is listed as one of the top priority butterflies in Butterfly Conservation's UK Conservation Strategy 2018 and Regional Conservation Strategy for South East England 2016-2025.

There are four discrete Heath Fritillary populations in the UK; the Blean (Kent), Exmoor (Somerset), the Tamar and Lydford Valleys (Cornwall and Devon) and a complex of woodlands in South Essex. In 2017 the total combined occupied area of the UK Heath Fritillary population was less than 1 km<sup>2</sup> (Bourn et al 2019) highlighting the highly restricted range of this species.

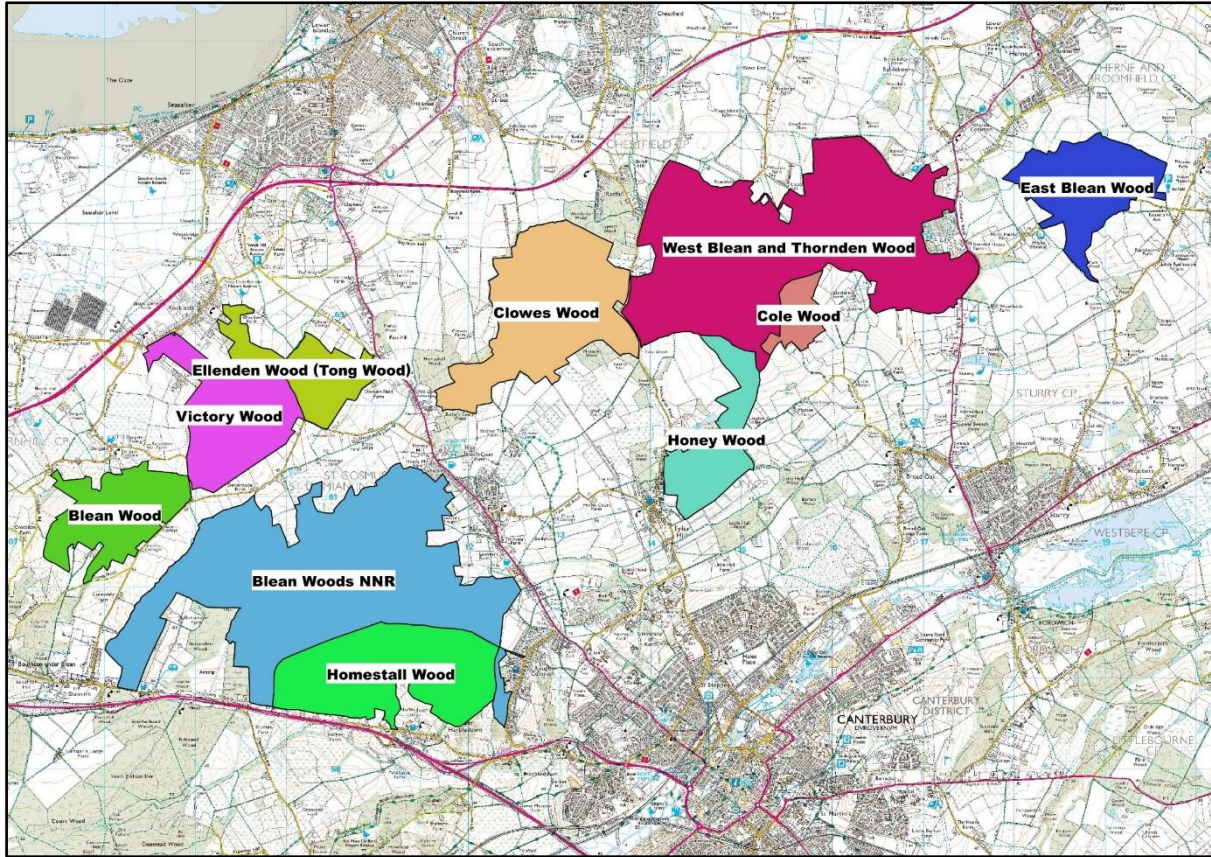


Heath Fritillary UK distribution since 2000 at 10km scale  
(data from the Butterflies for the New Millennium database)



### 1.3. Heath Fritillary in East Kent

The Kent population is the largest of the four UK populations. In Kent it is restricted to The Blean woodland complex, north of Canterbury. The woodlands surveyed in 2020 total 1,979 hectares (ha). The survey area was increased this year to include the 116ha privately owned Blean Wood (see Section 6.7) and the Woodland Trust's new 141ha Victory Wood (see Section 6.8).



### 1.4. UK BAP Targets for the Heath Fritillary in Kent

**Target 1:** Maintain a minimum of 25 interconnected colonies in Kent

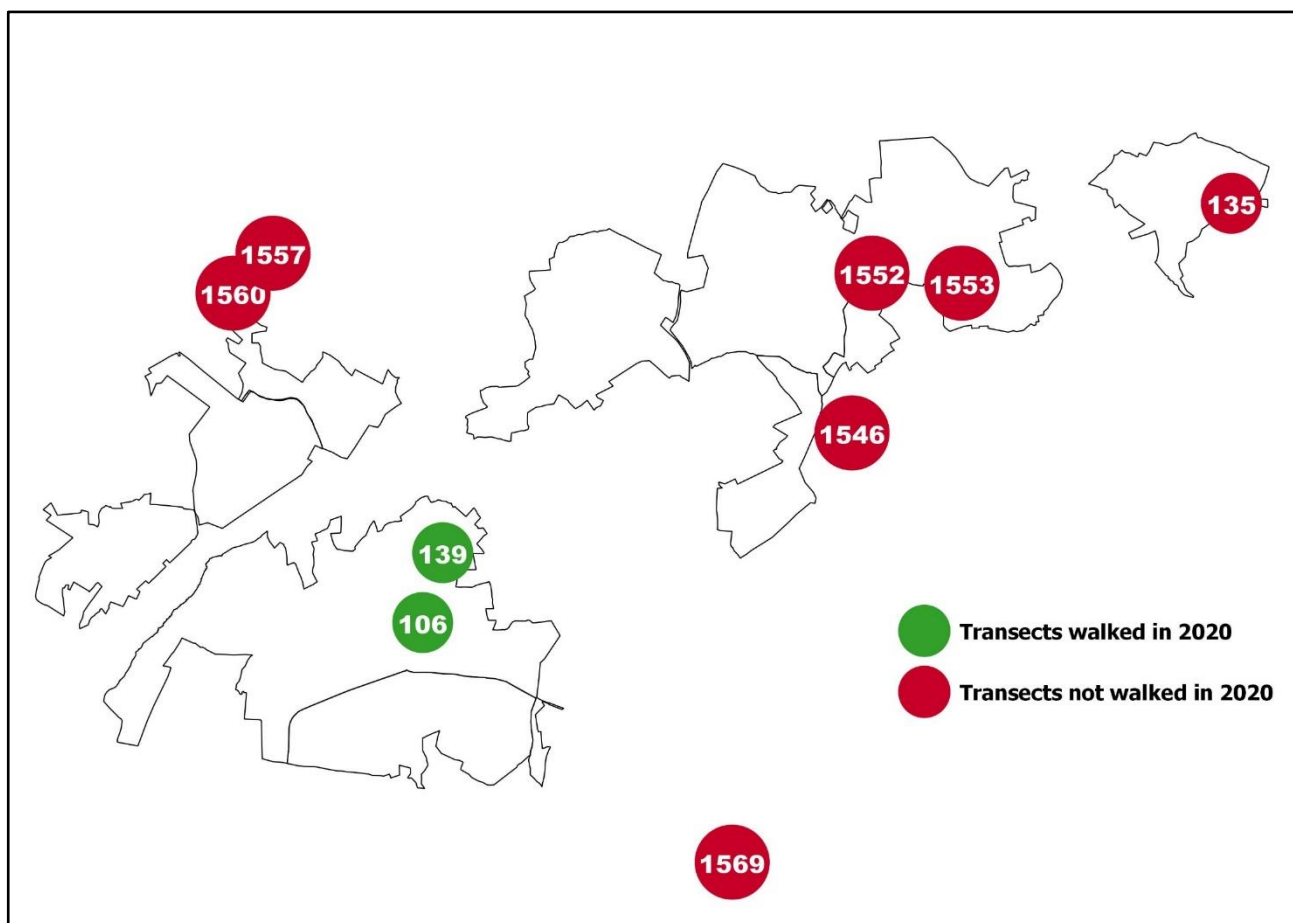
**Target 2:** Increase area of suitable interconnected habitat (active coppice & open areas) in Kent to 1980 levels by 2010 and then maintain (30 hectares per year).

## 2. Monitoring Methods

Formal annual monitoring within The Blean has taken place since 1982 by a variety of volunteers, conservation organisations and Butterfly Conservation staff. Transect and Timed Count monitoring data is collated centrally by Butterfly Conservation and used in the calculation of local, regional and national status trends.

### 2.1. Blean Transects

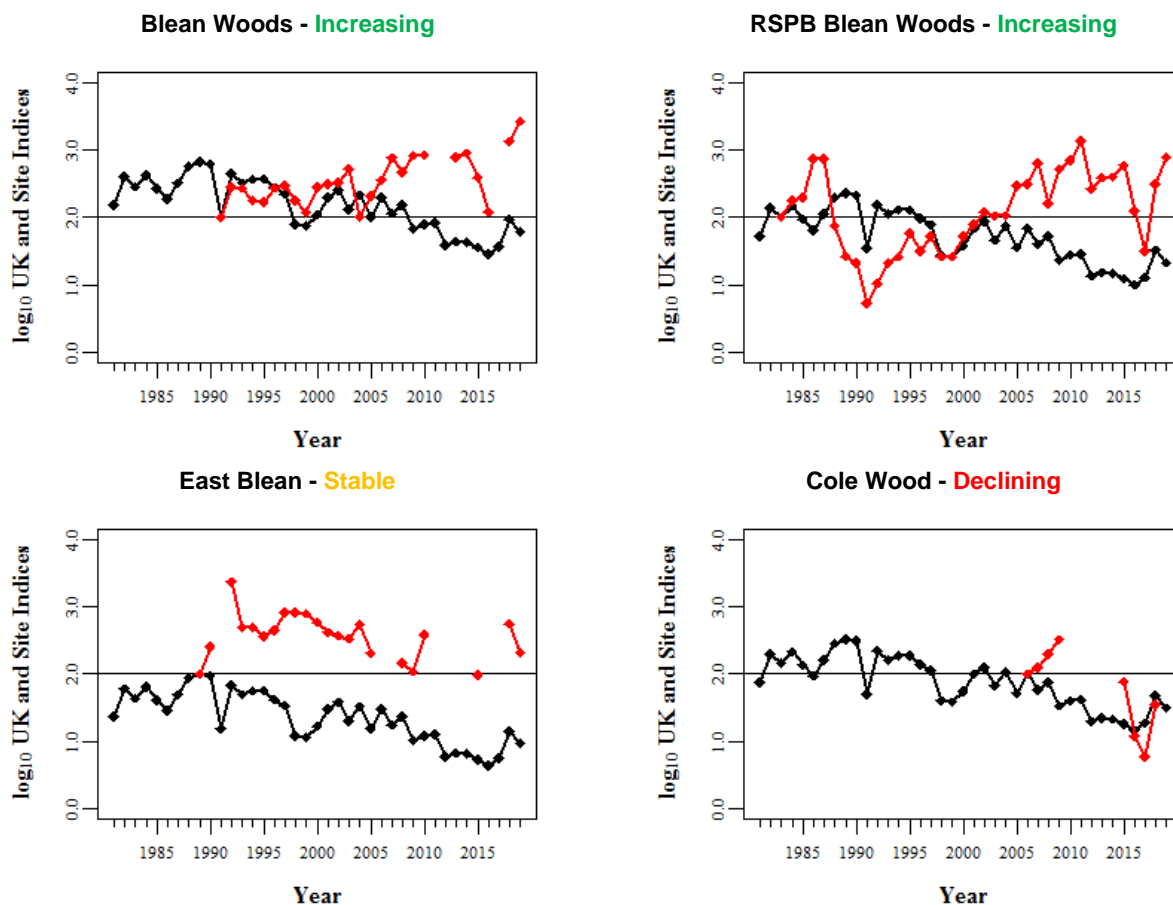
There are six formal transects that cover the Heath Fritillary flight area in the Blean woodland complex and at least another seven in other Heath Fritillary UK landscapes. The UK Butterfly Monitoring Scheme (UKBMS) generates extremely valuable standardised data produced to the high professional standards set out in the Code of Practice for Statistics (UK Statistics Authority 2017).



Transect number	Transect Name	Year Established	Walked by
106	Blean Woods (RSPB) - Church Woods	1982	Michael Walter
135	East Blean Woods	1987	Kent Wildlife Trust
139	Blean Woods	1991	Lesley Brown
1546	Cole Wood	2006	Kent Wildlife Trust
1552	West Blean Wood West	2010	Kent Wildlife Trust
1553	West Blean Wood East	2011	Peggy Goodhew

## 2.2. Transect Trend Analysis (to 2019)

Abundance trends from the Centre for Ecology and Hydrology are available for four of the six transects. The two West Blean transects have not yet been established for long enough to derive statistically robust trend data.



Note – these trends are based upon data up to 2019. They do not include 2020 data. Both East Blean Woods and Cole Wood had excellent results in 2020.



### 2.3. Combined Heath Fritillary Monitoring in the Blean

The 2020 Heath Fritillary surveys that inform this report were undertaken as follows:

Site	Monitoring	Recorders
Blean Woods NNR	Two UKBMS Transects & Timed Counts	Volunteers Michael Walter, Lesley Brown, Stuart Harris. Steve Wheatley (BC)
East Blean Wood	Timed Counts	Steve Wheatley (BC) Alfie Gay (volunteer)
West Blean & Thornden (including Cole Wood)	Timed Counts & ad hoc recording	Volunteers Mike Enfield, Alfie Gay. Steve Wheatley (BC)
Clowes Wood	Timed Counts & ad hoc recording	Steve Wheatley (BC) Volunteers Stuart Harris & Claire Inglis
Homestall Wood	Timed Counts	Steve Wheatley (BC) Michael Walter
Ellenden Wood	Annual Timed Counts	Steve Wheatley (BC) Michael Walter (volunteer)
Blean Wood	Time Count	Steve Wheatley (BC)
Victory Wood	Cow-wheat survey only	Claire Inglis (WT) Steve Wheatley (BC)
South Blean	Ad hoc search	Alfie Gay

Within the constraints of time and resources we aimed to cover....

- locations where the butterfly has been recorded in the last three years
- areas where management has been undertaken in the last three years
- areas where Cow-wheat has been found to be frequent or greater in the last two years

### 2.4. Analysis of Data

Timed Count data has been used to calculate estimates of total colony size at the peak flight period ('estimated peak population')<sup>1</sup>. The methodology is detailed on the UKBMS website and in previous Heath Fritillary annual reports. Where sufficient data is available, the data is converted into colony size (see the Table below) and used in annual comparisons. Where data is incomplete, colony judgements need to be made by experienced recorders, based upon the available data and observations.

Estimated Peak Population	Size Category
>250 adults	Large
100-250 adults	Medium
10-100 adults	Small
<10	Very small

Heath Fritillary peak population and estimated size category

The flight areas are mapped. The extent of flight areas or occupied habitat in which adults were seen has been used to define geographical colony coverage. The determination of an individual colony is based on the separation of observed flight areas by either a distance of 300m or by the existence of a

<sup>1</sup> Timed count data is used to calculate an encounter rate (No seen/Hr), relative adult number ( $y = \text{encounter rate} \times \text{area} \times \text{adjustment to peak}$ ) and estimated population size,  $x$  (where  $y = 0.499x - 2.396$ , after Warren 1985). The size categories are used in Wigglesworth *et al.* 2004. For the current monitoring programme correcting to peak is deemed necessary where the survey date falls outside of 25% of the peak, as indicated by a smoothed plot of local transect data.

barrier of unsuitable habitat, restricting the free interchange of individuals (based on Barnett and Warren 1995).

## 2.5. Cow-wheat Distribution and Abundance

In addition to monitoring Heath Fritillary, abundance surveys for Common Cow-wheat (*Melampyrum pratense*) at the 100m scale have been undertaken since 2018.

Cow-wheat is the primary foodplant of the Heath Fritillary, although Ribwort Plantain (*Plantago lanceolata*) is also noted as being used in The Blean woodland complex. It would be ideal to survey and monitor the Plantain but this is not currently done as standard.

The abundance of Cow-wheat was visually assessed at the 100mx100m scale and scored according to the scale as defined in Warren (1985).

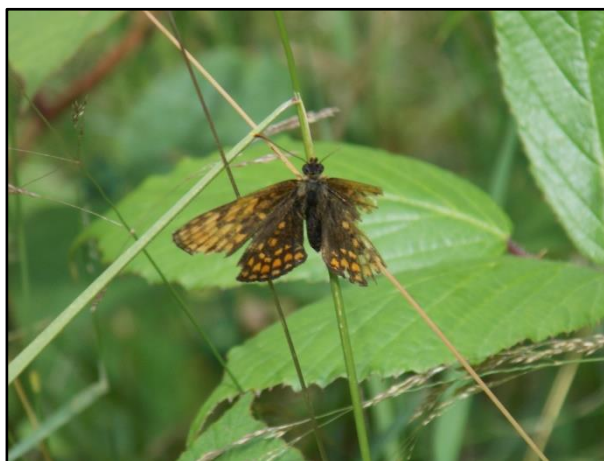
Cow-wheat Abundance Assessment	Abundance Score
Absent	0
Rare - a few plants only	1
Scarce - a few patches present	2
Frequent - patches always in view (alternatively, more than a few patches but less than 10% cover)	3
Common - ground cover more than 10%	4
Abundant - ground cover more than 40%	5

Due to the large area of woodland and potentially wide and dynamically changing distribution, Cow-wheat is generally only surveyed using an 'encounter' approach – recorded where it is encountered or where the butterfly is recorded. Absence of Cow-wheat data does not necessarily indicate an absence of Cow-wheat on site.

### 3. 2020 Results

#### 3.1. Flight Season Dates

2020		2019
15 May <sup>2</sup>	First UK record	18 May
16 May	First record in Kent	22 May
25 June	Estimated Peak	30 June
20 August	2 <sup>nd</sup> brood sighting in Kent	



left: Heath Fritillaries 16 May 2020 (Mike Enfield)

above: Heath Fritillary 13 July 2020 (Stuart Harris)

#### 3.2. UKBMS Transect Summary

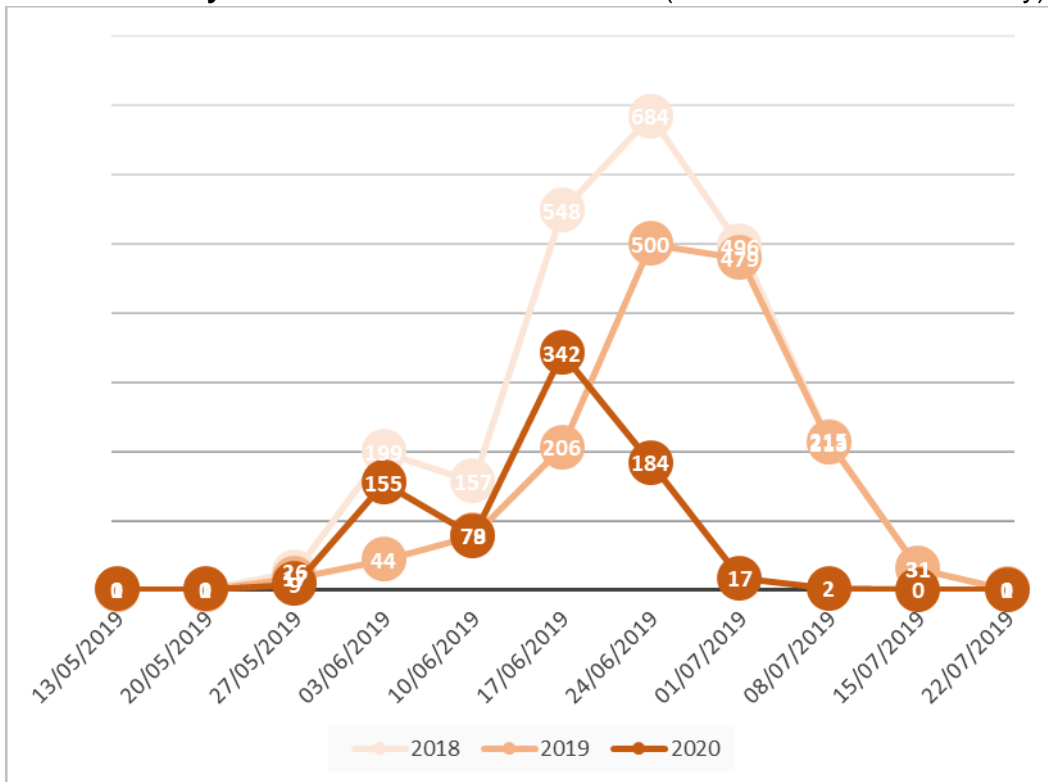
The first adult Heath Fritillaries recorded on transect were recorded during transect week 7 (commencing 13/05/2020).

Transect number	Transect Name	Peak week	Peak count	Total Recorded
106	Blean Woods (RSPB) - Church Woods	10	99	213
135	East Blean Woods	not walked		
139	Blean Woods (Natural England)	12	292	577
1546	Cole Wood	not walked		
1552	West Blean Wood West			
1553	West Blean Wood East			
<b>Total</b>		391		790
2019 Blean Woods transects Total		529		1570

<sup>2</sup> Essex

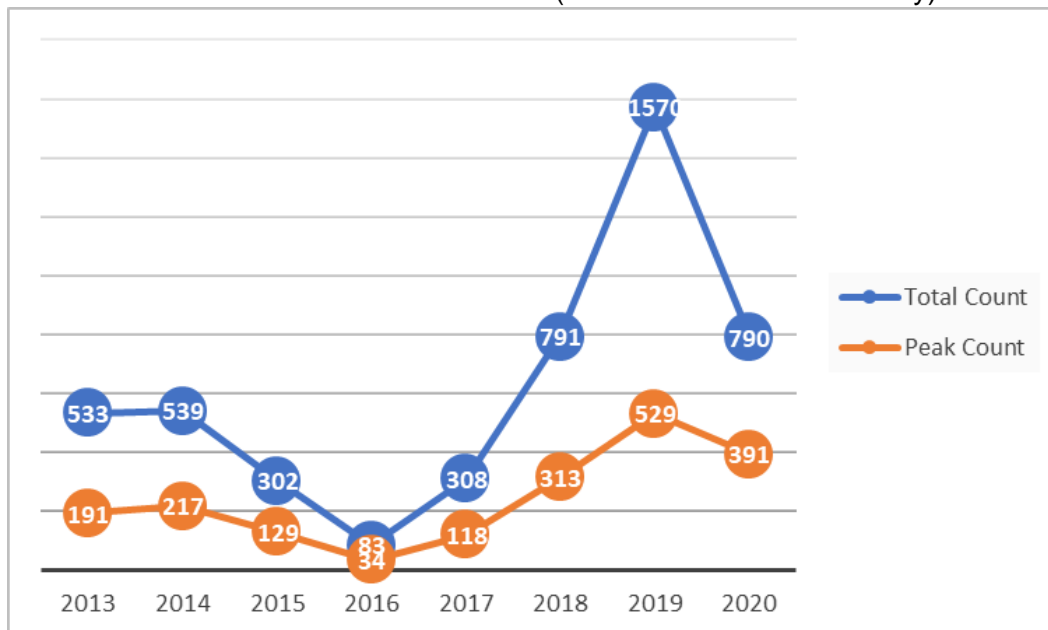
The highest weekly total of all transects was 342 in transect week 12 (commencing 17/06/2019). This peak is 1 week earlier than 2019.

**Heath Fritillary Abundance on Transects 2020 (Blean Woods transects only)**



The 2020 flight season peak on transect was likely around 18<sup>th</sup> June. The peak off-transect was estimated to be 25<sup>th</sup> June.

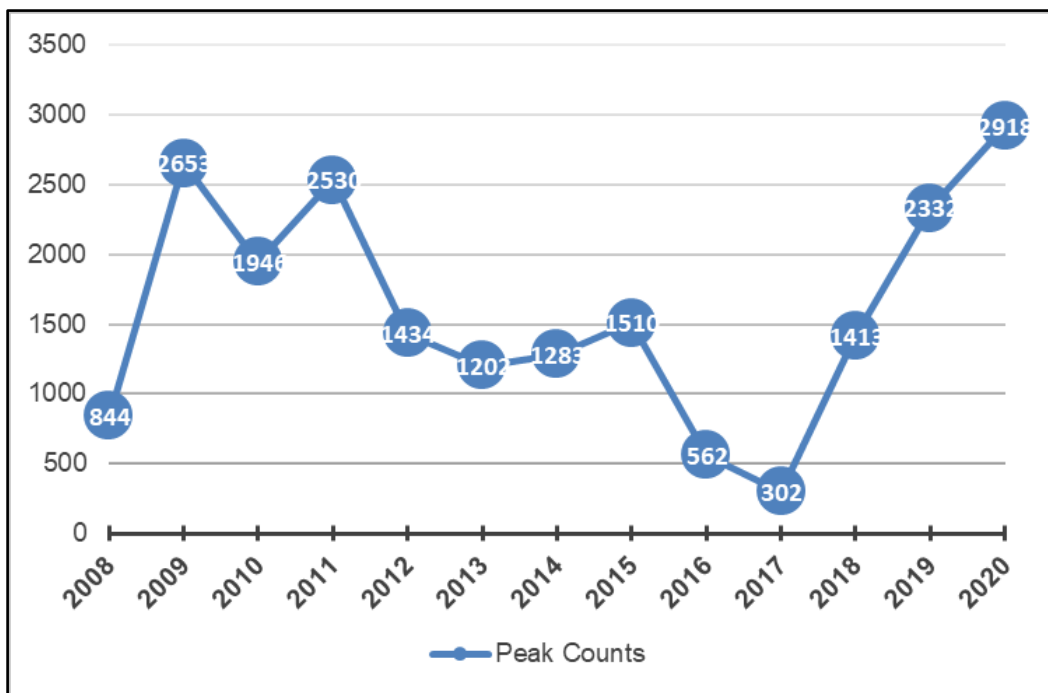
**Transect Results 2013 to 2020 (Blean Woods transects only)**



Heath Fritillary counts on the RSPB transect this year were clearly lower than in 2019, but totals counted off-transect on targeted Timed Counts were higher than in 2020 (see the next section).

### 3.3. Colony Counts and Total Counts

Targeted Timed Counts are employed to survey and monitor the Heath Fritillary distribution and abundance off-transect. The identification classification of distinct colonies is based upon the separation of observed flight areas by either a distance of 300m or by the existence of a barrier of unsuitable habitat, restricting the free interchange of individuals (based on Barnett and Warren 1995). For each identified colony the peak daily count or Timed Count can be used to determine the overall highest count for that area. 2020 had the highest counts on record.



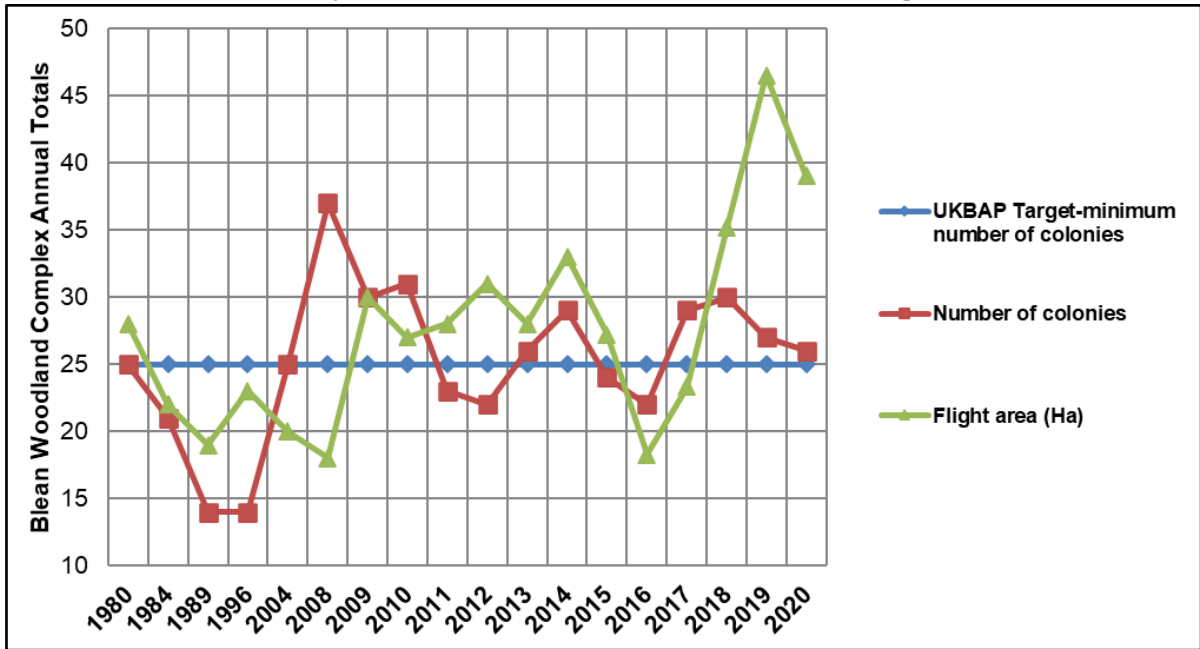
### 3.4. Colony Assessment & Mapping

Flight areas have been mapped using on site observations and the data collected in 2020 in order to identify and classify distinct colonies.

SITE	TOTAL COLONIES	HIGHEST COUNTS	COLONIES			OCCUPIED AREA (HA)
			LARGE	MEDIUM	SMALL/ V. SMALL	
Blean NNR and Stock Wood	9	1,776	4	5	0	16.7
Clowes Wood	4	240	0	2	2	5.6
East Blean	1	244	1	0	0	3.8
West Blean, Thornden & Cole Woods	6	595	1	1	4	5.7
Ellenden Wood	2	30	0	1	1	2.6
Homestall Wood	3	19	0	0	3	1.4
Blean Wood	1	14	0	0	1	2.8
<b>TOTAL</b>	<b>26</b>	<b>2918</b>	<b>6</b>	<b>9</b>	<b>11</b>	<b>38.6</b>

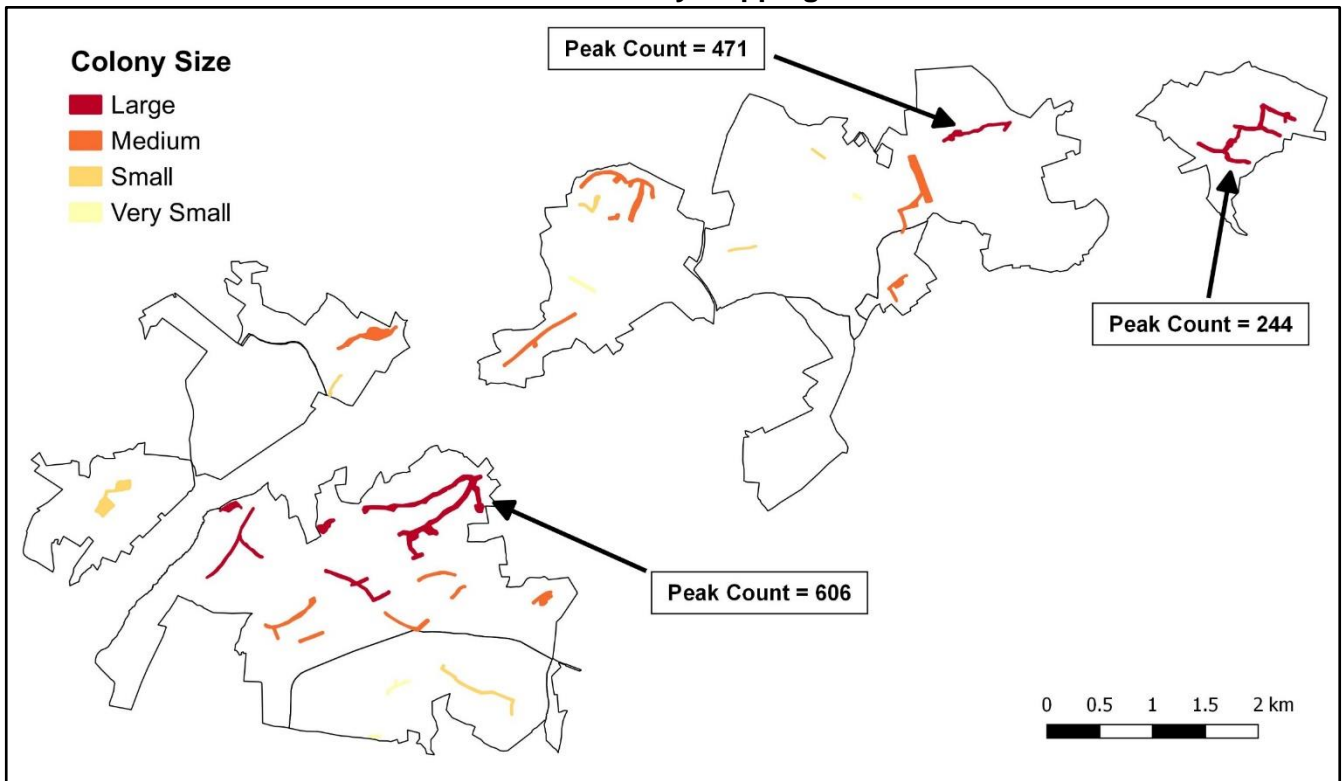


### Colony Assessment in Relation to UK BAP Targets

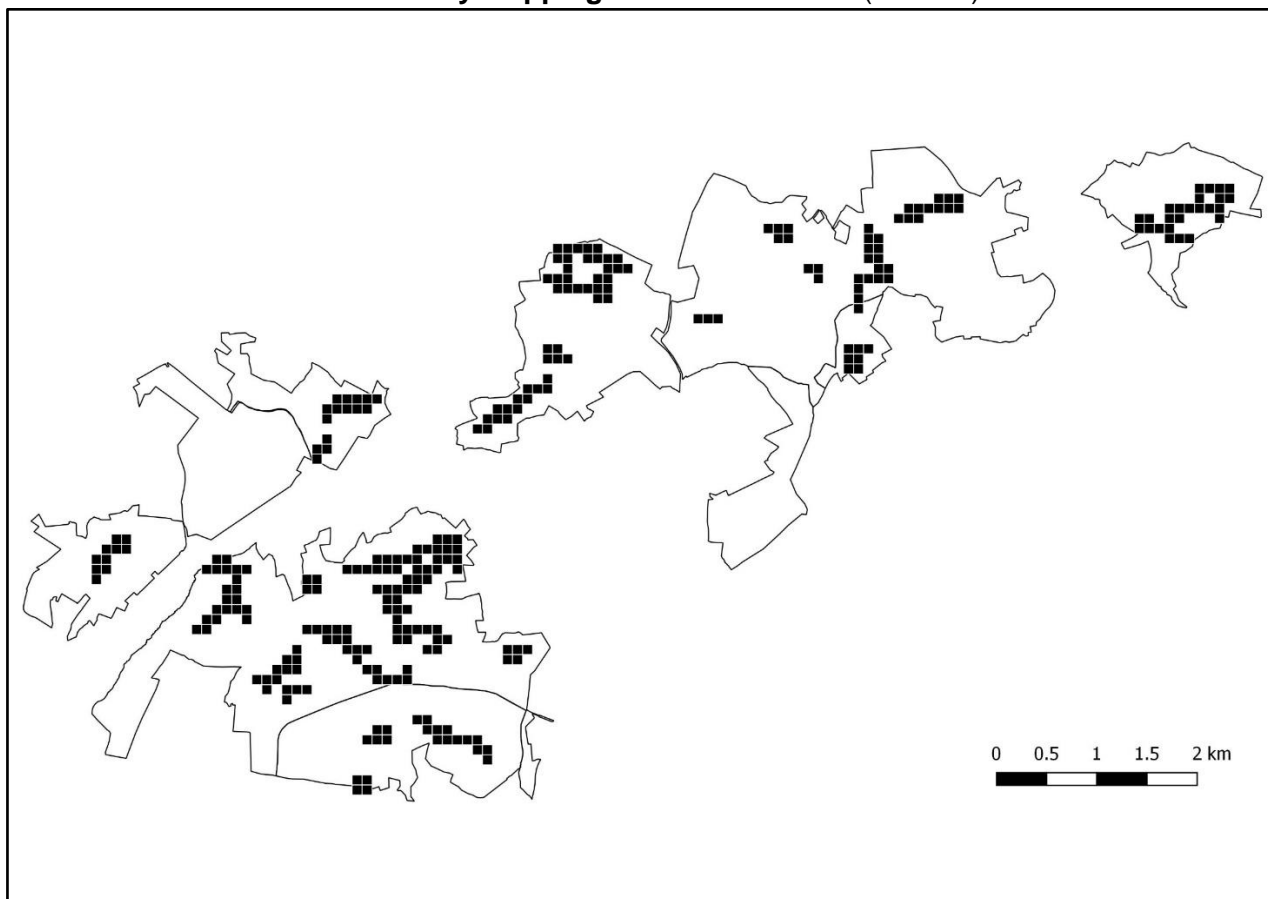


The number of discrete colonies identified in 2020 (26) exceeds Target 1 (25) set out in the UKBAP.

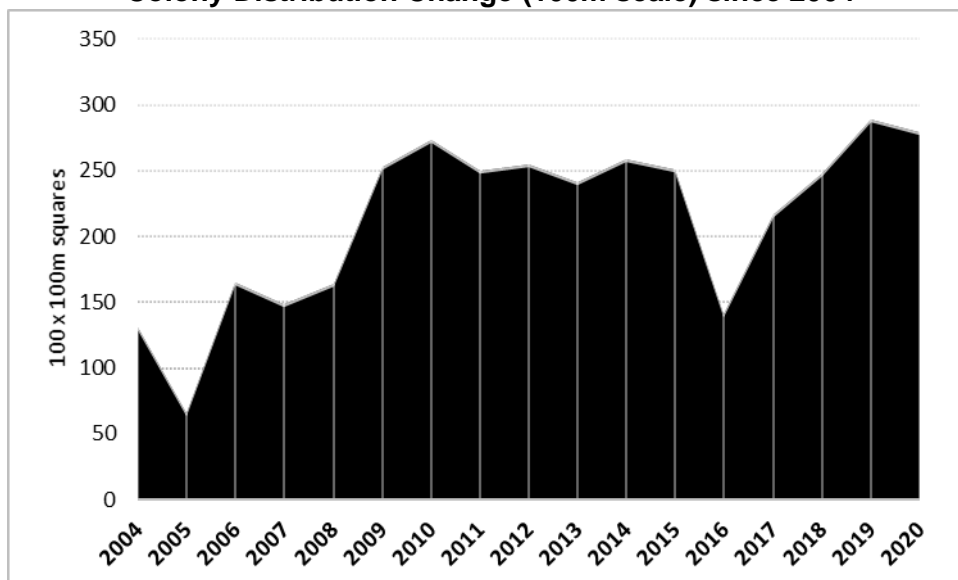
### 2020 Colony Mapping



2020 Colony Mapping at the 100m scale (n = 279)



Colony Distribution Change (100m scale) since 2004

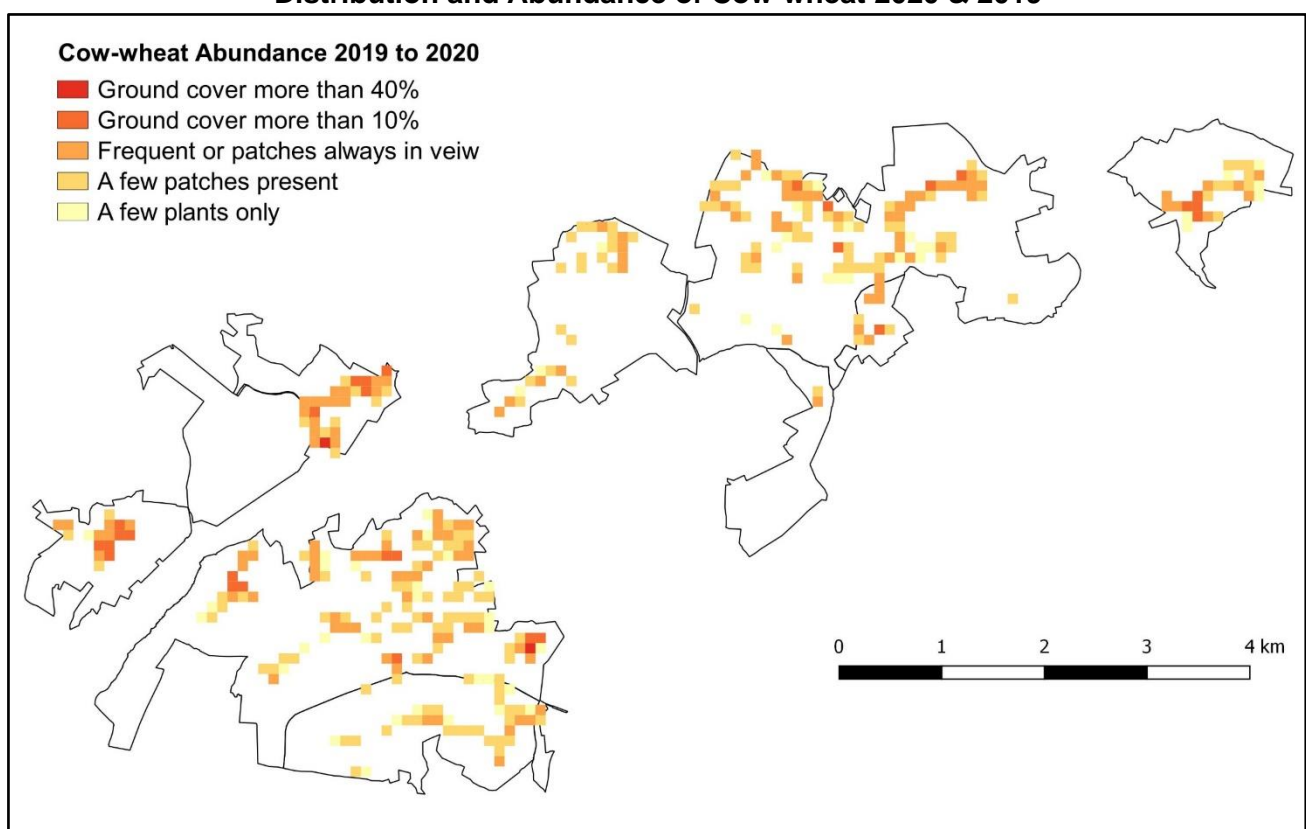


### 3.5. Cow-wheat Distribution and Abundance

Cow-wheat abundance was assessed at 351 100x100m squares in 2020. This is more squares than any previous year. Of these 351 squares, 113 were squares that have not previously been assessed or were squares that were previously assessed but where no Cow-wheat was previously found.

Score	Cow-wheat Abundance Assessment	Frequency
0	Absent	not recorded
1	Rare - a few plants only	46
2	Scarce - a few patches present	144
3	Frequent – more than a few patches but no more than 10%	131
4	Common - ground cover more than 10%	28
5	Abundant - ground cover more than 40%	2
<b>Total</b>		<b>351</b>

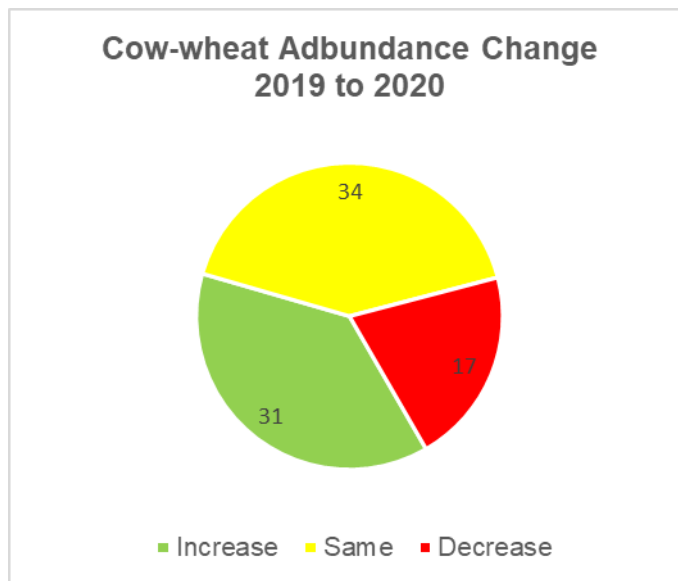
**Distribution and Abundance of Cow-wheat 2020 & 2019**



Note - this survey was not exhaustive; absence of data does not confirm absence of Cow-wheat.

### 3.6. Cow-wheat Abundance Change 2019 to 2020

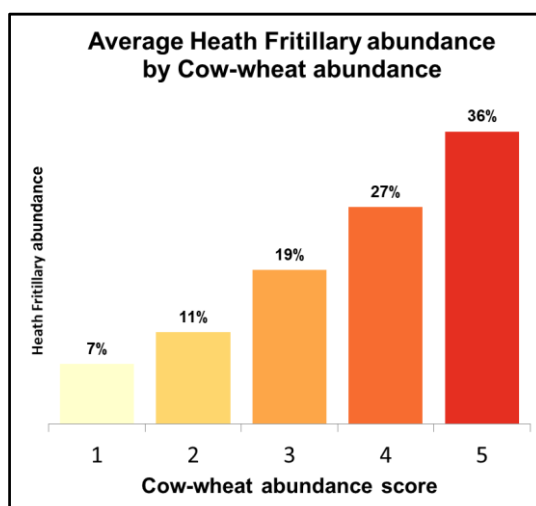
Cow-wheat abundance in 82 squares has been assessed in both 2019 and 2020. Almost twice as many areas showed an increase in abundance rather than a decrease.



Almost all sites exhibited a representative change with a mixture of abundance increases, decreases and stable areas. However, of the 15 squares surveyed in both 2019 and 2020 at West Blean and Thornden Woods no increases in Cow-wheat abundance was found.

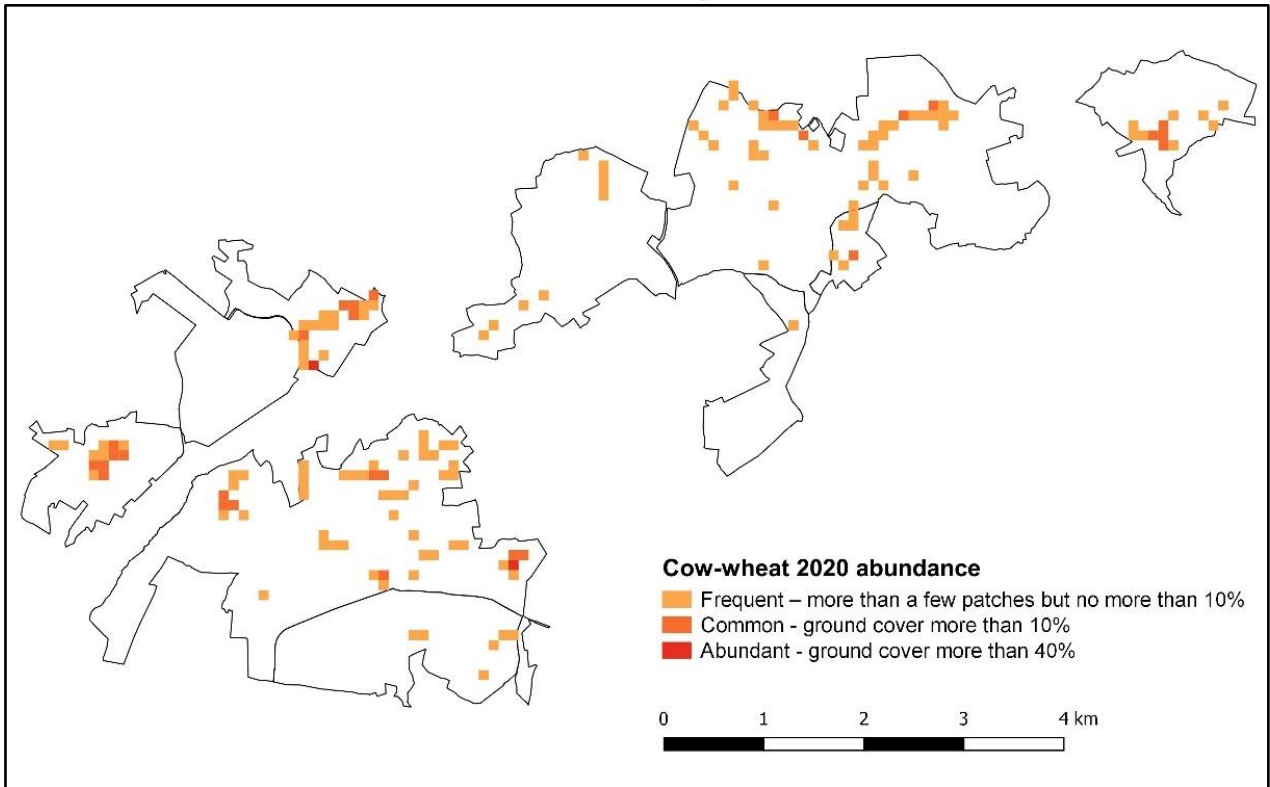
### 3.7. Heath Fritillary Abundance Relative to Cow-wheat Abundance

Comparing Heath Fritillary abundance to Cow-wheat Abundance over the most recent two seasons (2020 and 2019) produces the following graph (based upon 7,298 Heath Fritillaries recorded in 514 100m squares).



Over the 2019 and 2020 seasons 82% of all Heath Fritillaries were recorded in the 46% of squares where Cow-wheat is assessed to be Frequent or more abundant.

### Locations Recorded Where Cow-wheat is Frequent or More Abundant, 2019 & 2020





## 4. Observations and Discussion

### 4.1. Woodland Management

Woodland management across the complex is extensive and ongoing. There is clearly a good level of targeted management being undertaken for the Heath Fritillary and this is the fundamental reason for the Heath Fritillary having been conserved in this landscape and that this Kent population is the largest population in the UK. The efforts of the different organisations and individuals is hugely appreciated by Butterfly Conservation.

### 4.2. Abundance of the Heath Fritillary

Several sites or sub-sites this year recorded their highest counts in recent years - **RSPB Blean Woods**, northern **West Blean (WB2)**, **Cole Wood**, **Ellenden Wood**, **Clowes Wood**. In the case of Cole Wood and Ellenden Wood this appears to be a direct response to recent targeted management. In the case of RSPB Blean Woods, West Blean and Clowes Wood the good counts appear to be a result of broader environmental or ecological factors which allow the butterfly to then capitalise on the long-term effort of good woodland management through ride widening, mowing, ride-side coppicing, thinning and clearfelling.

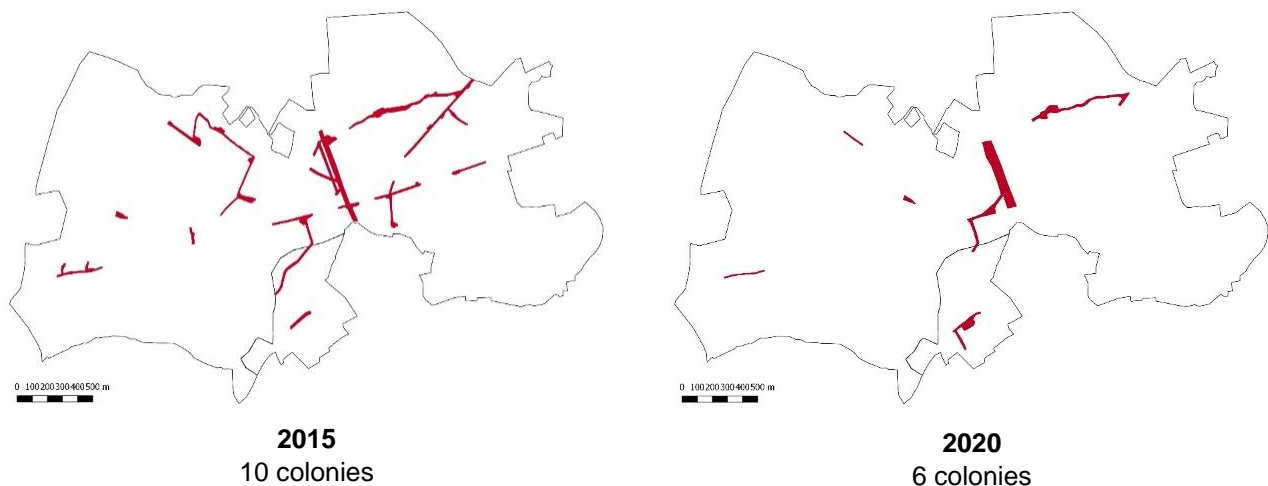
### 4.3. Distribution of the Heath Fritillary

Data shows Heath Fritillary distribution in Kent has increased, with 2019 and 2020 showing the broadest distribution, at least since this detail of recording began in 2004. The potential for further colonisation is high given the scale of good, targeted management and the availability of foodplant. The natural spread of Cow-wheat into the Woodland Trust's Victory Wood presents another opportunity for the butterfly to increase its distribution.

At a site level there is a mixed and fascinating picture in terms of distribution; at **East Blean Wood** ongoing management has continued to building upon previous good work to extend and enhance the availability of habitat, such that the butterfly is now distributed throughout an extensive ride and coppice network, essentially forming a single, large, interconnected colony.



At **West Blean and Thornden Woods** the distribution of extant Heath Fritillary colonies has declined significantly since 2015.

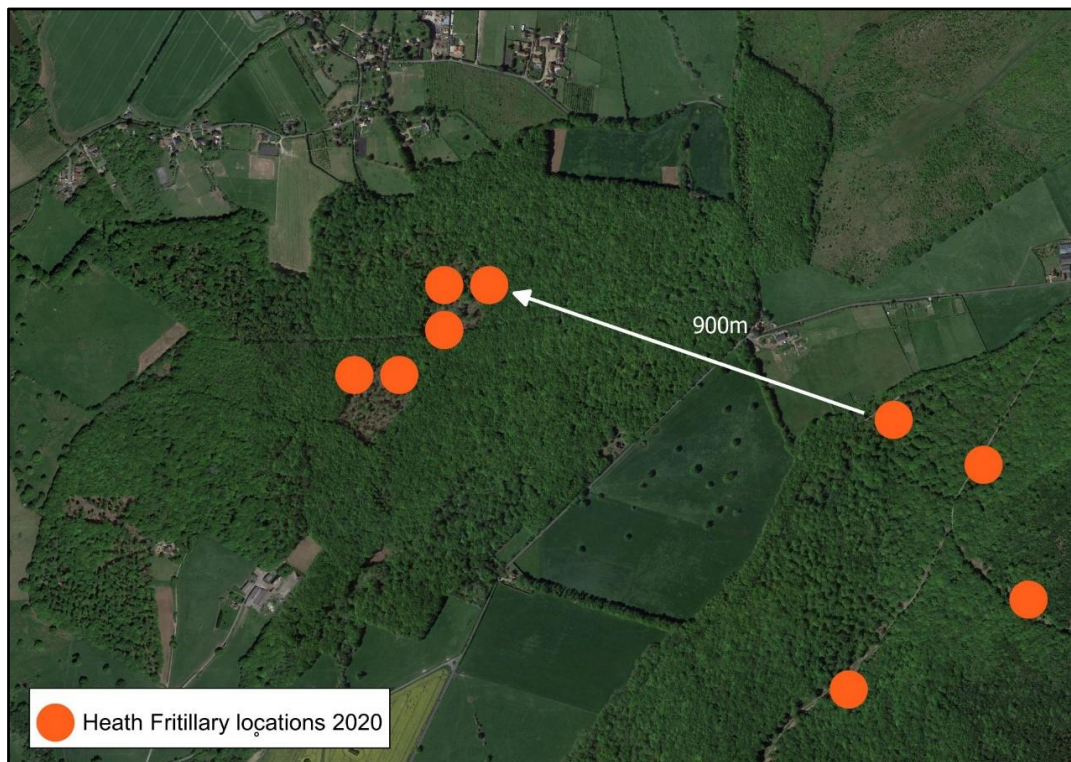


Kent Wildlife Trust is currently developing plans for a major change to their management approach at West Blean and Thornden Woods. This would include the introduction of pigs and bison to the wood. The hope is that future management approach will promote foodplant spread and will improve the situation for the Heath Fritillary. The concern is that the new management approach will hamper the Heath Fritillary population when it is already at a relatively low ebb in the wood. Butterfly Conservation is in discussion with Kent Wildlife Trust about specific and targeted monitoring of the impacts of the Trust's proposed project.

#### 4.4. Dispersal & Colonisation

The re-colonisation of Homestall Wood in the last two or three years is a very positive sign and is highly likely to be a result of the positive woodland management that has been undertaken here in recent years, both at Homestall Wood by Sylva Woodland Management and at Blean Wood nature reserve by the RSPB.

A fascinating development in 2020 was the discovery of a small colony at the privately-owned Blean Wood. Until 2017 there was no suitable open space within this wood. It is likely the source of this colonisation was the RSPB site to the south east. At least one gravid female (probably several more) would have had to cover at least 900m of unfavourable and unsuitable habitat (including arable fields, a B road and high forest) to find these new woodland clearings.



The nearest RSPB Blean Wood colony to the new habitat in Blean Wood

Warren (1987b) mentions dispersal/migration has been recorded over distances up to 1,200m although 300m seemed to be far more frequent. He states colonisation of new habitat occurs mostly in the first summer after management, and occasionally in years 2 and 3 after which butterfly numbers build up. This matches our current observations at Blean Wood.

There is a variety of drivers that can encourage and also limit dispersal; declining habitat condition and high butterfly numbers can both be inter-related drivers for dispersal (e.g. Stevens et al 2009; Nowicki & Vrabec 2011). The north-western edge of the RSPB site was coppiced in winters 2015/16 & 16/17 and numbers of Heath Fritillary have subsequently increased (colony BW7; peak count of 127 in 2020). This large population now coincides with declining habitat suitability as the coppice regrows and shade increases. It is therefore likely that high population density combined with decreasing habitat suitability is encouraging dispersal from this coupe. Butterflies heading northwest (towards more sunlight) have a chance of eventually finding the abundance of Cow-wheat in the clearings in Blean Wood.

It is also possible that individuals could also very occasionally be making the opposite journey (from Blean Wood to the RSPB site). This is far less likely however because population density in the new wood is low and the availability of suitable habitat is high. A mark-recapture study would be fascinating could provide valuable data on population dynamics and migration. The future of an a strong, interconnect metapopulation here will depend upon the management regimes in both woods.

Equally interesting is the sighting of a Heath Fritillary in South Blean in 2020, photographed by Derek Chambers on 14<sup>th</sup> June. Subsequent searches in that area failed to find any more adult butterflies, suggesting that this was a lone vagrant - the nearest known colony being 2.8km away and on the other side of the A2. This closest colony north of the A2 is thought to be small, but as with the Blean Wood example, the decline in habitat suitability here (4-year old coppice) might have helped to encourage dispersal. Another possibility is that there is a nearer as-yet unrecorded colony. A watching brief should be maintained at South Blean.





Homestall Wood (the nearest known colony) to the sighting location in South Blean Wood

It is very likely that dispersal has been encouraged and facilitated by recent high numbers, especially at **RSPB Blean Woods** which seems to be close to all these other sites, at least three of which have been successfully colonised in the last 5-6 years. The RSPB management is therefore not only contributing positively to site conservation but promotes a robust and dynamic metapopulation operating across the wider landscape.

This observed mobility is a positive sign for the longer-term survival of the Heath Fritillary, as long as suitable habitat and suitable climatic conditions are present. However, this dispersal and colonisation ability does rely upon high population density and the potential of successfully finding new areas. Jeremy Thomas (2010) comments on the Heath Fritillary's poor dispersal abilities, with adults struggling to reach fresh clearings unless they arise within 200-300m. This does not seem to be what we are currently observing in The Blean complex, with almost all clearings, whether suitable or not being visited by the butterfly and this may be due to the extensive good woodland management and the exceptionally high numbers of butterflies in the last three years.

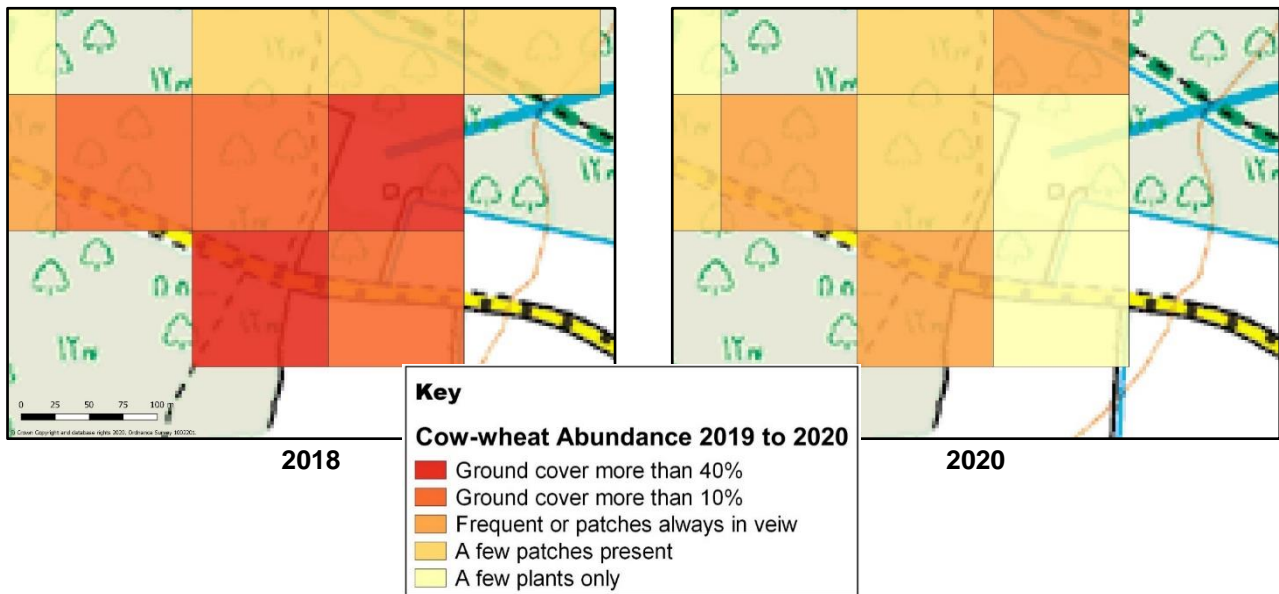
Dispersal ability is not a fixed species-specific trait, but is highly sensitive to selective pressures over generations (see Bonelli et al 2013). Short-to-medium distance dispersal traits in this Heath Fritillary metapopulation are currently being rewarded (gravid females ultimately finding new suitable habitat) thanks to the ongoing and extensive good woodland management. Conversely, dispersal depression can occur when dispersal mortality increases (due to failure to find new habitat). This underlines the importance of maintaining a continuity of well-connected networks of suitable habitat.

#### 4.5. Foodplants

Michael Walter reported "Cow-wheat was far more abundant than usual in many areas this year, but conversely has all but disappeared from some rides." (pers comm.). The data certainly supports this observation, with Cow-wheat increasing in 37% of the squares assessed over 2019 and 2020, and declining in 21% of squares. Overall Cow-wheat was more abundant across the entire complex in 2020 than in the previous two years of recording. This bodes well for progeny of the 2020 butterflies as it

ensures a good supply of foodplant for the early caterpillars and a good source of seed to produce flower spikes in 2021.

The following example from **East Blean Woods** shows how Cow-wheat abundance has declined over three years (2018 to 2020) in an area near the car park, with one hectare in particular going from more than 40% Cow-wheat ground cover to just a few plants. This is a natural process but highlights the ephemeral nature of this plant.



Although Cow-wheat abundance has declined in this part of the wood, overall Cow-wheat distribution and abundance in **East Blean Woods** has increased. This is thanks to ongoing positive woodland management in other parts of the wood.

Cow-wheat remains the primary foodplant for this butterfly in Kent, but Ribwort Plantain also used in some areas (e.g. Clowes Wood and West Blean Wood) and appears to be the sole foodplant for some sub-colonies (e.g. at Thornden Wood West). The management of those woods must conserve and enhance a strong ribwort plantain abundance and distribution, whilst also seeking to increase Cow-wheat abundance and distribution.

The spread of Cow-wheat into **Victory Wood** provides a unique and valuable opportunity for study. Currently occupying four 100m squares, this distribution and abundance should continue to be measured and monitored. There is a variety of studies on Cow-wheat dispersal, including Gibson (1993) and Heinken (2004), Gammans et al (2005).



## 5. General Recommendations

### 5.1. Habitat Requirements

The Heath Fritillary survives and is thriving in most of The Blean woodlands thanks to ongoing woodland management which is ensuring a succession of new areas with abundant foodplant. Wide rides, coppicing, felling and heavy thinning can produce these conditions, but many areas soon become unsuitable for breeding (within 2-4 years after management). The continuity of woodland management is essential. It is therefore advised that multiple small areas (e.g. 0.5 to 1 acre) are created each year, then working in adjacent or nearby plots within 3 years. Creating a shifting mosaic of successional habitat in this way on a 10-20 year rotation will ensure a continuity of management whilst keeping the other ground flora sparse.

Michael Walter noted this year that rides that are kept permanently open often suffered, with no cow-wheat and few fritillaries, but several rides that are managed on a longer rotation and had the scrub cut last year did well, with populations springing up abruptly (pers comm.).

### 5.2. Management for Cow-wheat

Management should continue to create areas where Cow-wheat is at least Frequent (always in view and/or more than just a few patches). It is fundamental that management for Cow-wheat and the Heath Fritillary should target areas where mature oak is present and ensure those oaks are retained (since Cow-wheat has a complex, partially parasitic relationship with oak and other plants and fungi). A long-term strategy of increasing the distribution oak standards should also be pursued. Transplanting Cow-wheat is not thought to be a viable option (Walter 2005), so the aim must be to maximise through woodland management the distribution and abundance of Cow-wheat from the existing resource.

Successful conservation will continue to rely upon the continual supply of new areas through good woodland management, creating a mosaic of areas at different stages in the management cycle. Cow-wheat seems to be rarely or only briefly present in the open, un-shaded areas of coppice coupes but it might be found in the shade of oak standards. Coppice coupes should therefore be small and management should aim to retain the oaks.



Ride-side Cow-wheat in partial shade on a sunny ride (photo by Stuart Harris)

### **5.3. Management for Ribwort Plantain**

Presence of Ribwort Plantain is considered to be an indicator of compacted ground but is not tolerant of regular trampling. It spreads by seed and requires bare areas and sunshine. It therefore tends to occur on ride/path edges. Management should aim to generate areas of sunny ride/path edge with sparse vegetation.

The plantain flowers May to September. The flower heads are borne on tall stalks and so are vulnerable to mowing. Mowing should be infrequent (not every year) and take place in the Autumn (October onwards) – a regime of mowing alternate ride edges on rotation every other year should be positive for plantain if bramble growth is not excessive. Providing bare patches or creating a sparse sward and reducing the shade in these areas can help to encourage seeding.

### **5.4. Survey and Monitoring**

Annual recording via UKBMS transect, Timed Counts and by ad-hoc sightings remain crucial to monitor and understand the state of the Heath Fritillary population and provide valuable feedback to site managers. It is important to try to ensure the established UKBMS Transects are walked every year (if not for all species throughout the entire season, then at least for Heath Fritillary – late May to late July) and that the data is submitted to the UK Butterfly Monitoring Scheme promptly and accurately. The target should be for every transect to be completed and submitted every year to ensure continuity and the best quality trend data. Butterfly Conservation can help existing transect walkers to ensure that this valuable survey is done.

Distribution and abundance of foodplants is a crucial factor. Whilst the total area to survey is vast, the assessment of Cow-wheat abundance according to the abundance classification in Warren (1985) is very straightforward and easy and can be undertaken by volunteers and/or alongside other survey activities. Foodplant searches and surveys should certainly be undertaken where woodland management has recently taken place. Otherwise these surveys could be undertaken on a 2/3 year basis.

Development of a survey and monitoring programme for Ribwort Plantain would be very useful.

## **6. Site Summaries**

The summaries for individual sites are provided on the following pages.



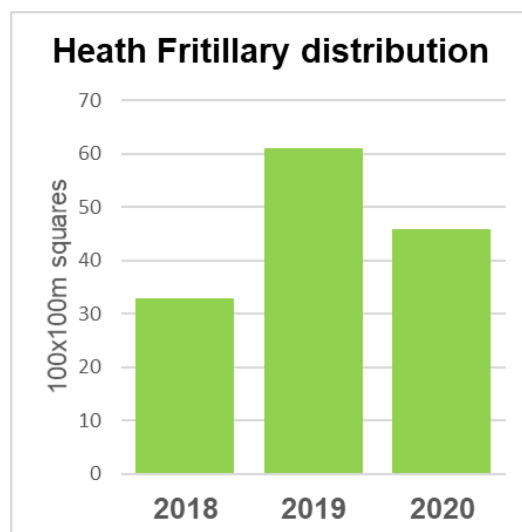
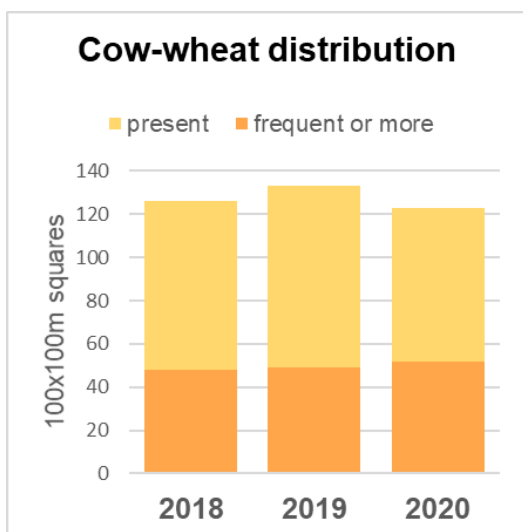
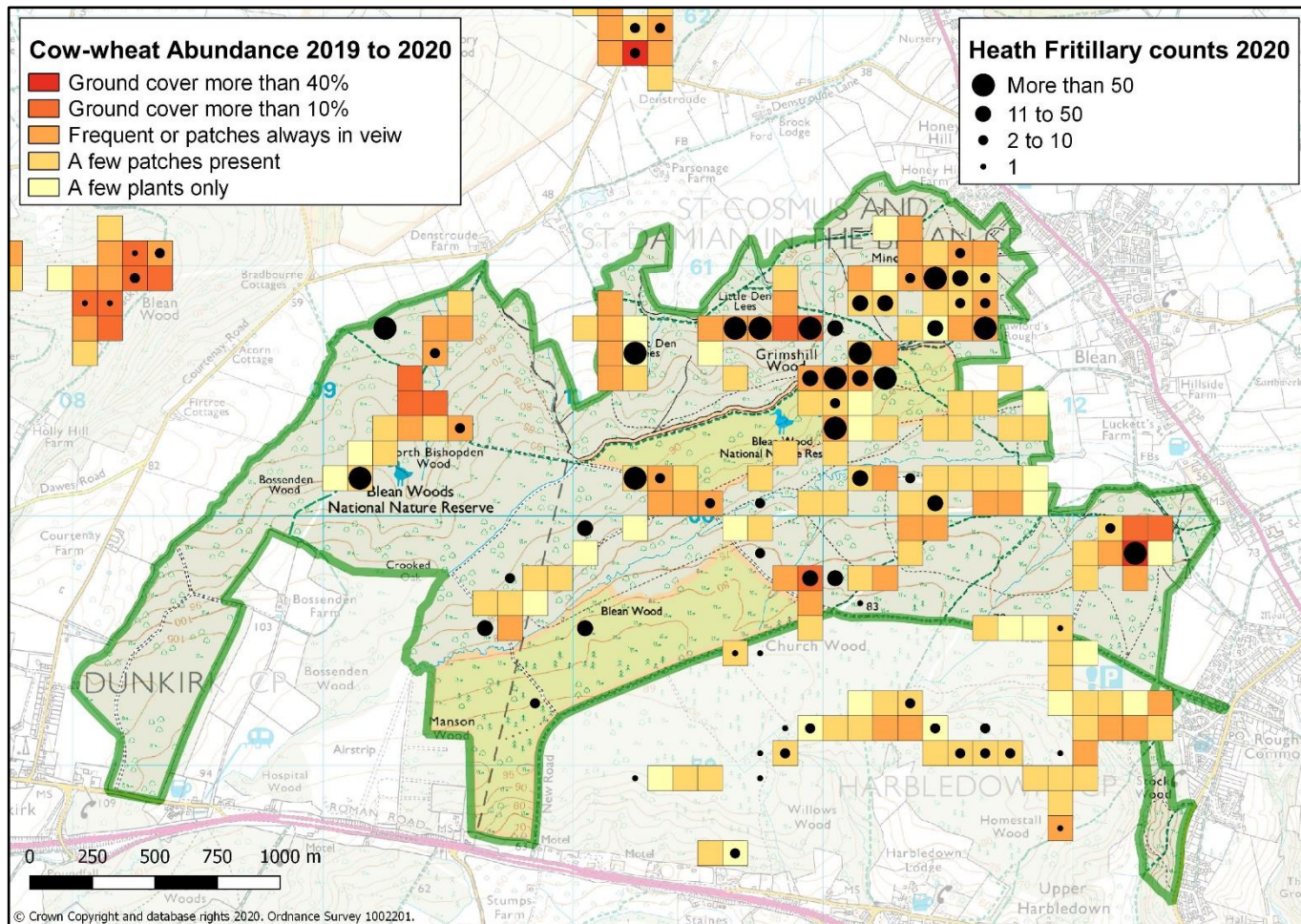
### 6.1. RSPB Blean Woods (including Stock Wood) (509ha)

Ownership: RSPB, Natural England, The Woodland Trust, Kent CC, Canterbury City Council and Swale Borough Council

Site manager: Sam Richardson (Warden, RSPB)

Butterfly & foodplant monitoring by: Michael Walter, Lesley Brown, & Stuart Harris (volunteers), Steve Wheatley (Butterfly Conservation)

Transect Trends (2 transects): **Increasing**



RSPB Blean Woods Summary:

As a result of the ongoing excellent woodland management by the RSPB team it has been another extremely good year for the Heath Fritillary at RSPB Blean Woods.

Both distribution and abundance were very high for the third year in a row. Although recorded distribution was lower than 2019, peak counts in 2020 were the highest yet recorded.

Distribution of Cow-wheat remains high. The already good abundance of Cow-wheat has also increased year on year. It was noted by Michael Walter that rides that are kept permanently open often suffer, with no cow-wheat and few fritillaries, but several rides that are managed on a longer rotation do well.

The success of the Heath Fritillary at the RSPB reserve is almost undoubtedly responsible for the colonisation of Ellenden Wood to the north and Blean Wood to the west. RSPB Blean Woods home to the largest and arguably the most successful and most important Heath Fritillary colony in the UK.

### **Key Suggestions:**

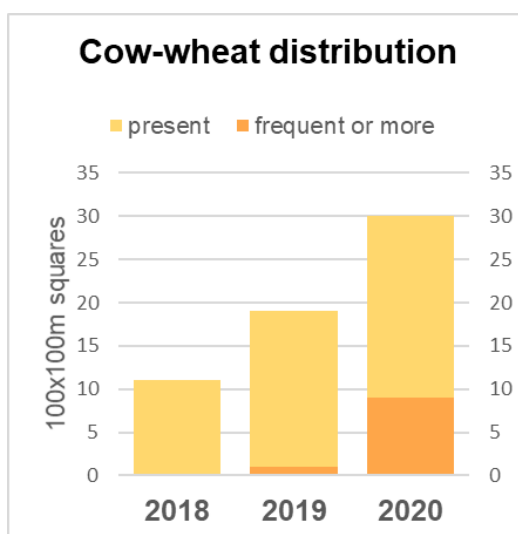
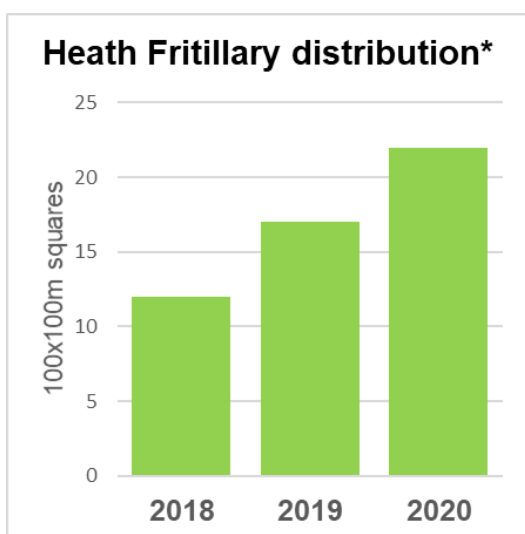
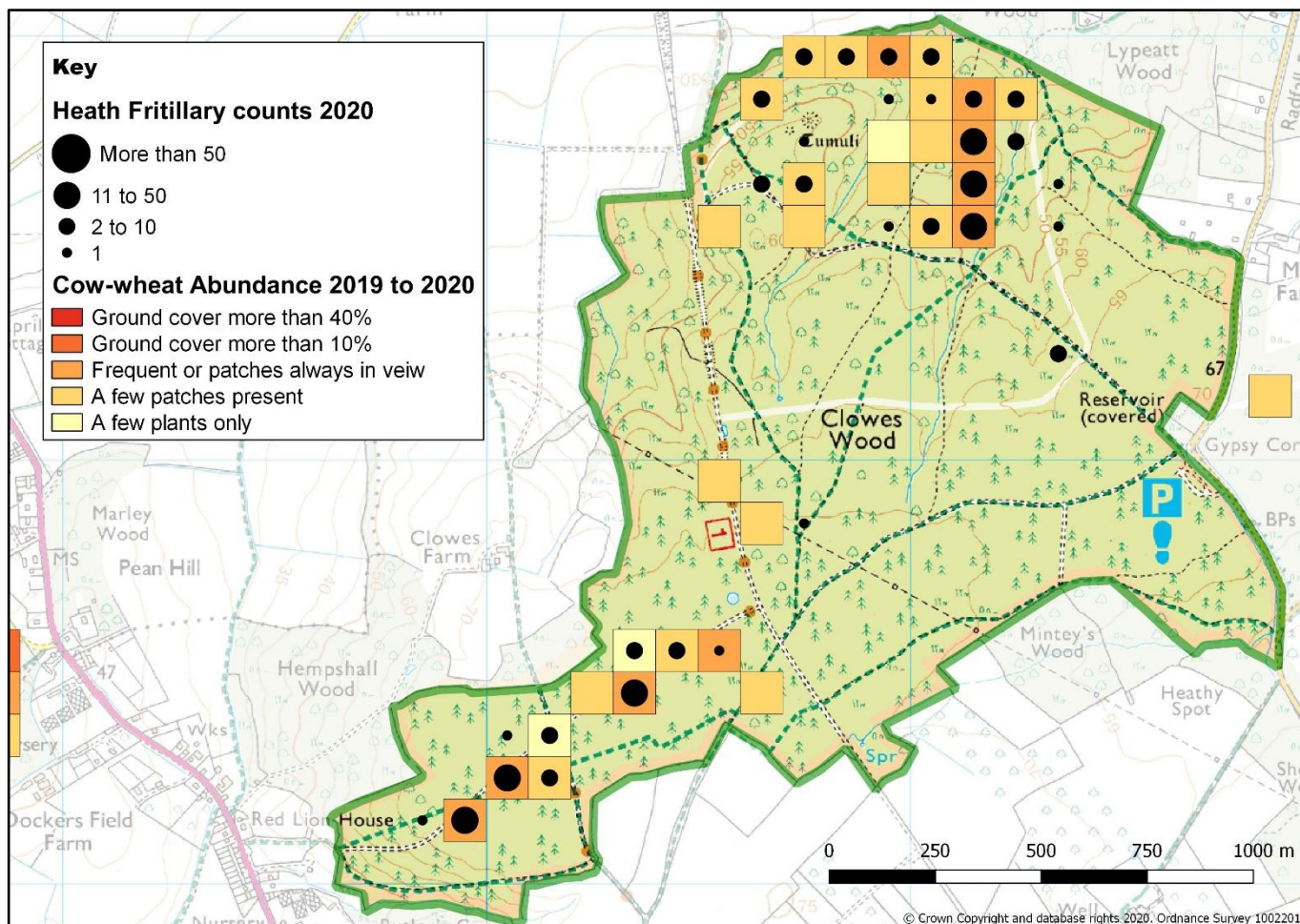
- Continue to deliver the diversity of woodland management to maintain the mosaic of interconnected Heath Fritillary habitat areas.
- Aim to increase the abundance of Cow-wheat in areas where it is only occasional. Reduce the density of the woodland canopy whilst retaining some shade for the Cow-wheat to flourish.
- Focus work on/near areas where Cow-wheat is present or has previously been present. Proximity to oak is almost certainly crucial.
- Aim to retain oaks and ensure a good distribution and abundance of oak across site. Consider restocking oak where it is less frequent or absent.
- Continue to encourage habitat connectivity throughout the woodland. Aim to link up colonies by extending those areas or enhancing rides. Also continue to maintain good connectivity with Homestall/Church Wood to the south.
- Scalping, coppicing or thinning the south side of rides along rides can reduce shade on the ride itself and help to create sunny areas that the Heath Fritillary can move along. Avoid exposing existing Cow-wheat patches to full sun.
- Continue monitoring of both Heath Fritillary and Cow-wheat to assess the response of the Heath Fritillary to recent and future management works.
- Consider publishing and promoting the experience and results at Blean Woods to help inform and help Heath Fritillary conservation efforts in other woods both in Kent and Essex.

## 6.2. Clowes Wood (233ha)

Managed by Forestry England (FE)

Kate Harris (Beat Forester), Neal Armour-Chelu (Ecologist), Steve Peters (Wildlife Ranger)

Heath Fritillary monitoring by: Butterfly Conservation and volunteers



\* based upon sightings of two or more butterflies



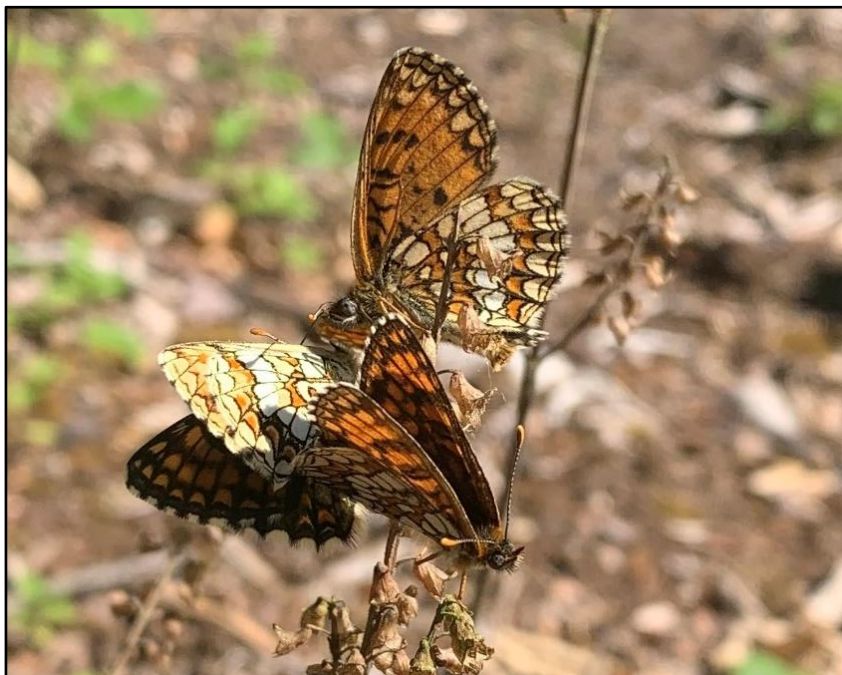
### Clowes Wood Summary:

The abundance of Cow-wheat and numbers of Heath Fritillaries in 2020 was the highest for many years. The previous windblow and resulting clearance has produced areas with abundant Cow-wheat. Exactly 100 Heath Fritillaries were counted in one of these areas. These strips are also helping the butterflies to disperse further through the northern part of the site. Maintenance of these open spaces (potentially mowing a non-linear pattern) will enable these areas to continue to improve for the Heath Fritillary and other wildlife. This could also provide a very positive story about producing biodiversity benefits from unexpected (“catastrophic”) events.

Cow-wheat has also responded positively to management along the track in the south-western part of the site. Just over 100 Heath Fritillaries were counted here this year. Ongoing path-side scalloping here has produced a wide sunny area, with the Cow-wheat well distributed and suitably abundant. This ride is the most floristically rich part of the site, producing plenty of nectar sources. There is also Ribwort Plantain on the edges of the metallated track, which the Heath Fritillary will also be using. Ongoing mowing of the ride-edges (on rotation with arisings removed or scraped back) will be essential to maintain their floral diversity.

### Key Suggestions:

- Continue the good work of enhancing the vegetation structure in the two core Heath Fritillary areas.
- Increase Cow-wheat distribution and abundance by undertaking sensitive work around existing oaks. Avoid exposing existing good Cow-wheat patches to full sun but create sunny areas/glades nearby. Identify and map oaks to identify areas for potential Cow-wheat enhancement.
- Aim to retain all oaks and plant oak where it is less frequent or absent.
- Improve connectivity between the two colonies by extending existing habitat and creating new ride edge habitat along the metallated north-south path.
- Mow path-sides from October onwards and alternately on rotation every other year. Aim to remove the cuttings from the ride edges to encourage floristic diversity and prevent a build-up of nutrients and plant material which would encourage bramble.
- Aim to establish a UKBMS transect at Clowes Wood (full season transect or single-species transect) and recruit a volunteer to undertake this.



Heath Fritillaries at Clowes Wood, June 2020 (Steve Wheatley/Butterfly Conservation)



### 6.3. West Blean and Thornden Woods (including Cole Wood) (635ha)

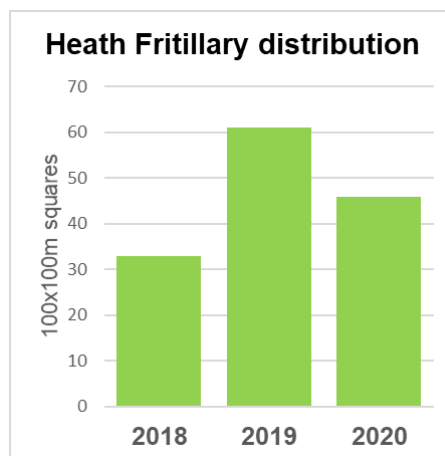
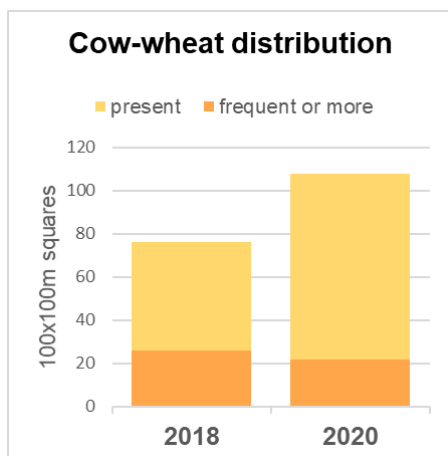
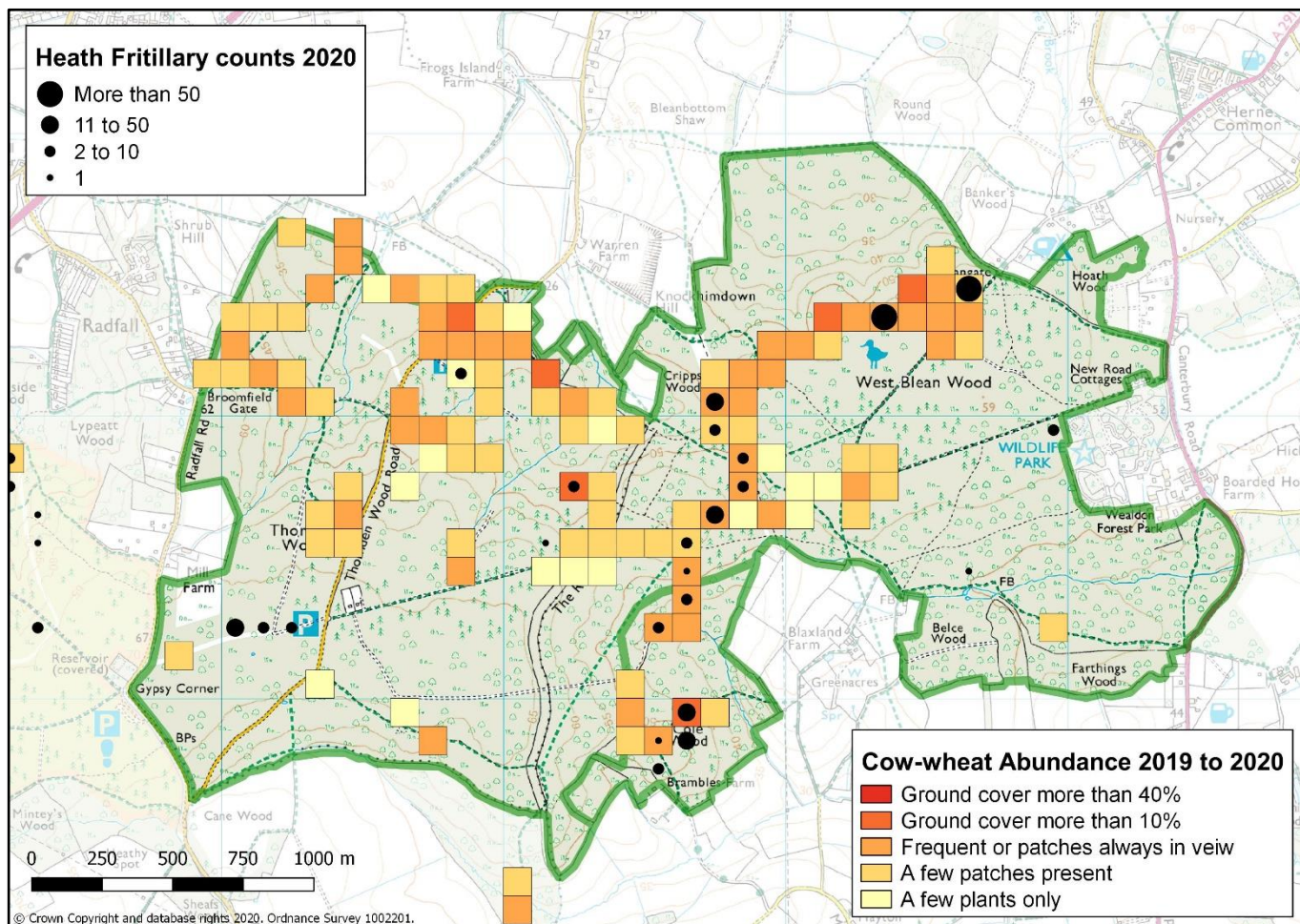
Ownership and Management: Kent Wildlife Trust (KWT); Cole Wood is owned by South East Water (SEW) and managed by KWT on behalf of SEW. The map also includes a few outlying woodland areas.

Site managers: Matt Hayes, Will Douglas

Heath Fritillary monitoring by Butterfly Conservation staff and volunteers

West Blean Wood West and West Blean Wood East Transects **not walked** in 2020.

Cole Wood Transect Trend: Declining (note: this trend calculation does not include the exceptionally good 2020 data)



## Summary for West Blean, Thornden and Cole Woods

This is a very large and mixed site where previous management has created some good, extensive networks for the Heath Fritillary, with Cow-wheat being at least 'Frequent' in many areas. The northwest ride in West Blean Wood (WB2) and Cole Wood produced their highest counts on record this year (471 and 50 respectively). Across the rest of the site abundance and distribution was low relative to previous years. Overall distribution of records was also lower than in 2019. That said, this is a very large site and full survey coverage was difficult to achieve in 2020.

The data suggests the abundance is generally declining. However, distribution of the foodplant (Cow-wheat) is still good and, due to increased effort by volunteers, more Cow-wheat was found and recorded in 2020 than in the previous two years.

Historical maps suggest there are plenty more areas where Cow-wheat will flourish if woodland management takes place. It will likely be most productive to open up new clearings whilst letting some existing clearings or coupes shade over, although a wide sunny ride network should be maintained for habitat connectivity.

Due to the Covid situation the transect was not walked in 2020. We hope that this can be resumed in 2021 as it provides invaluable standardised data which is complemented by the other surveys. Keen volunteers could be recruited to walk the transect, in order to minimise the impact on staff time.

The proposed 'Wilder Blean' project could have some very significant impacts on the species and habitats here. The site's butterflies and foodplants should be extensively surveyed in 2021 to establish clear and thorough baseline data against which any changes can be measured. The 'Wilder Blean' project can then be informed by the baseline data and ongoing surveys. Butterfly Conservation is happy to work with Kent Wildlife Trust to plan and prioritise surveys for the priority butterflies and moths and their foodplants.

## Key Suggestions for West Blean, Thornden and Cole Woods:

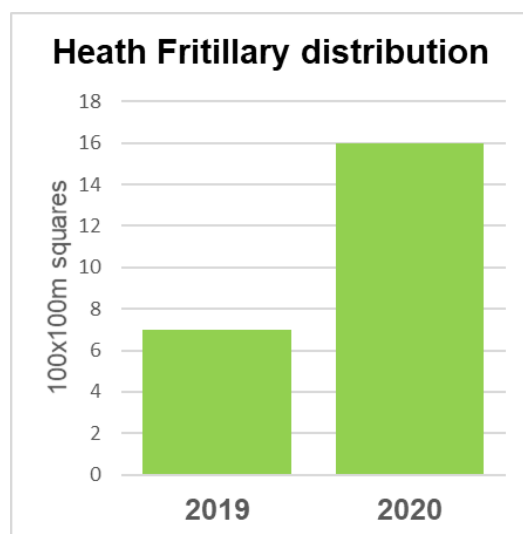
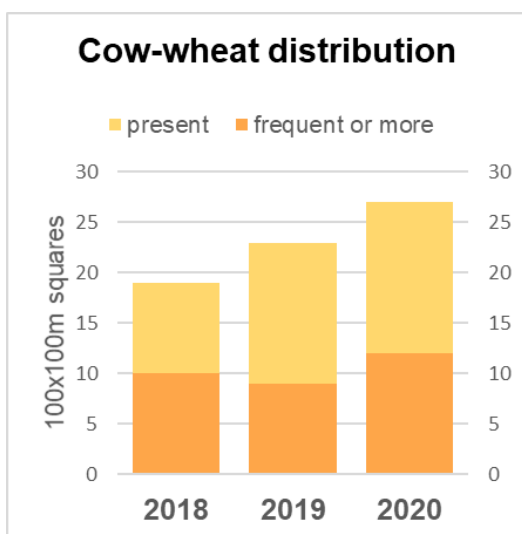
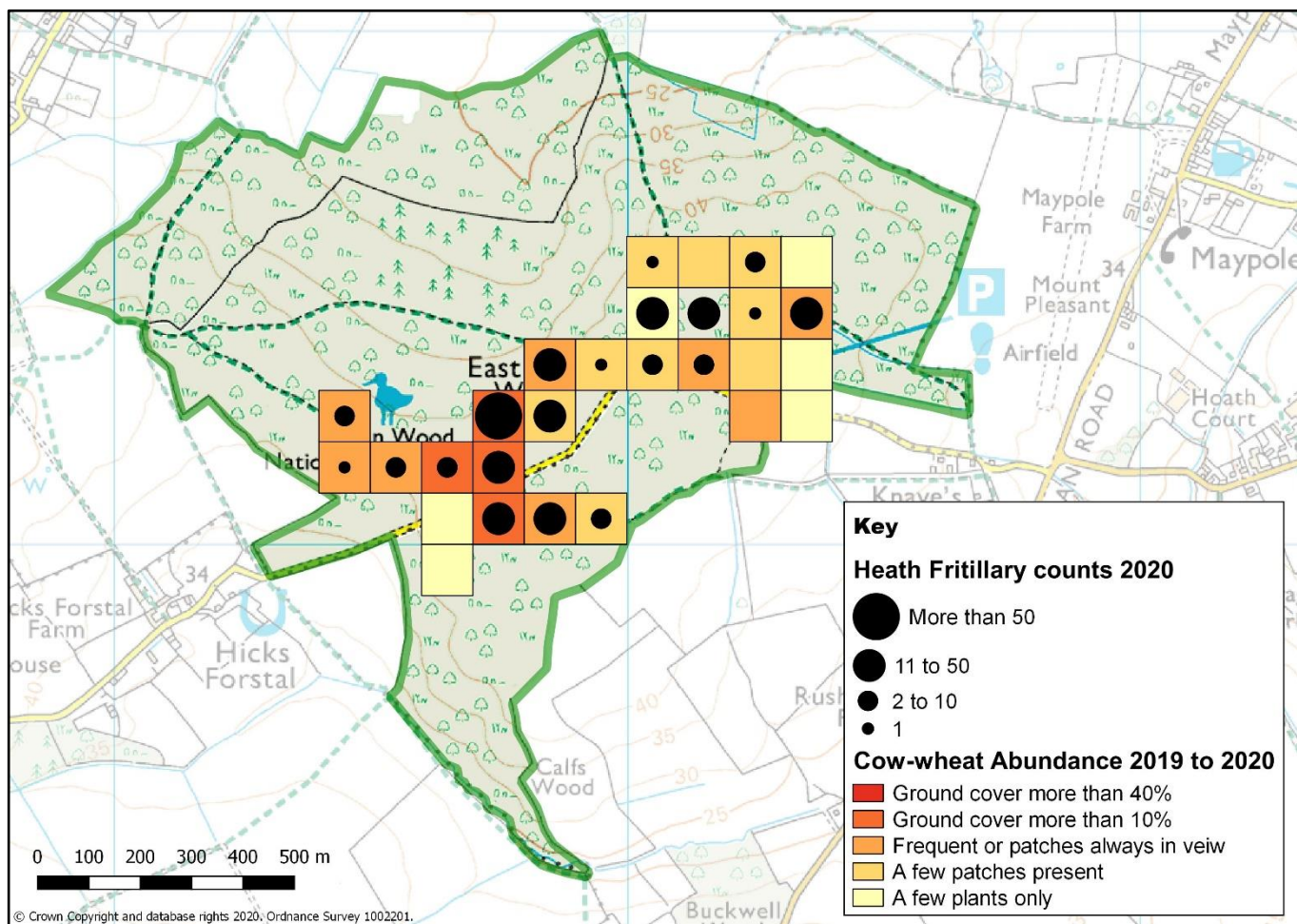
- Continue to develop networks of sunny rides. On a rolling programme scallop, coppice or thin the southern edges of rides to increase warmth and light on the rides themselves.
- Continue to remove conifers and promote native species. Retain oaks and restock with oak in areas where it is absent or infrequent.
- Thin the surrounding woodland to provide opportunities for Cow-wheat to flourish. Martin Warren's 1980's maps highlight additional areas where Cow-wheat would likely respond well to management.
- Continue the programme of verge mowing and cutting to maintain a wide distribution and good abundance of Ribwort Plantain (don't mow before the end of September as the caterpillars will still be active and plantain will be flowering). Seek to extend network of Plantain-rich verges by cutting back edges and extending the mowing regime.
- Continue traditional woodland management to increase and improve connectivity between habitat patches and provide potential for expansion of existing colonies. Target areas near or adjacent to Cow-wheat or Plantain.
- Encourage a diversity of growth structure under the wayleaves to provide a mosaic of habitat areas for the butterfly and foodplants. Discourage the cutting of entire lengths in any one season and only cut between October and February. Encourage a 'little-and-often' approach.
- Resume the three UKBMS transects (continuity is essential to provide the best value information). Undertake Timed Counts as deemed appropriate. Also encourage ad-hoc recording and submission of all Heath Fritillary sightings (using 6 figure grid references) or using iRecord.

### 6.4. East Blean Wood (129 ha)

Ownership and Management: Kent Wildlife Trust (KWT)

Site management: Matt Hayes, Will Douglas

Heath Fritillary monitoring by: Butterfly Conservation staff and volunteers



### **East Blean Summary:**

Where the Heath Fritillary was previously found in distinct colonies within the wood, the population has now spread to all areas where Cow-wheat is available and developed into a strong, well distributed and interconnected population. This is a direct result of the positive and ongoing woodland management by the Kent Wildlife Trust team.

The foodplant (Cow-wheat) is also increasing in distribution and abundance as a result of the work, including starting to appear in parts of Calfs Wood where work has taken place in recent years.

Continuing this good management is likely to continue to produce ongoing positive results. The opening up of the rides on the western side of the site has potential to significantly increase the distribution of the foodplant and available flight area for the butterfly.

Due to the Covid situation the transect was not walked in 2020. We hope that this can be resumed in 2021 as it provides invaluable standardised data which is complemented by the other surveys. Keen volunteers could be recruited to walk the transect, in order to minimise the demand on staff time.

### **Key Suggestions:**

- Continue the positive ongoing programme of woodland management, creating diverse woodland structure with interconnected sunny areas.
- Consider widening some more paths to enhance these sunny corridors for colonisation and connectivity.
- Thinning the ride edge or understory will provide a cooler micro-climate for Cow-wheat, adjacent to the sunny areas for the butterflies. Rides with oaks are likely to produce more Cow-wheat.
- Continue the butterfly monitoring programme and resume the UKBMS transect.
- Survey the Cow-wheat at least every other year to generate valuable management feedback.
- Encourage recording and submission of all Heath Fritillary sightings via iRecord or the iRecord Butterflies app or via other methods.

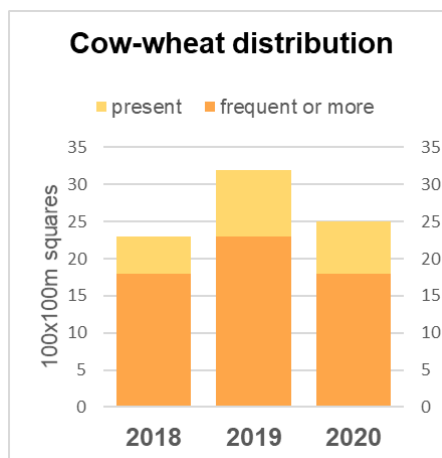
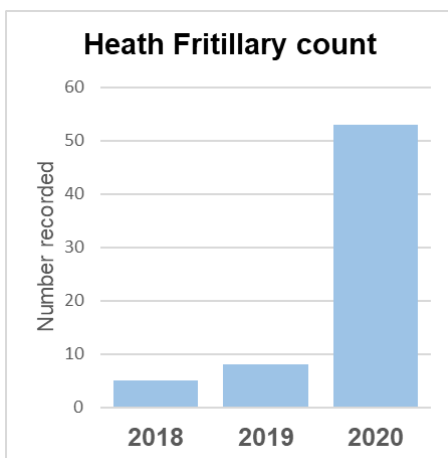
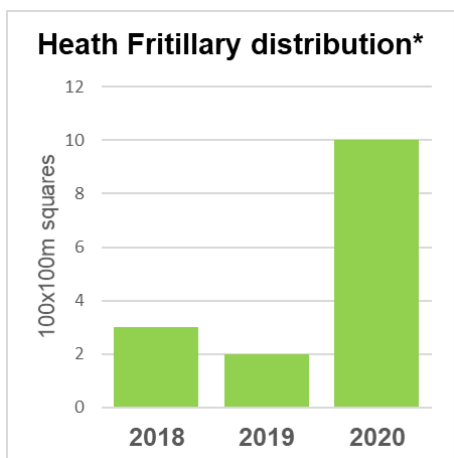
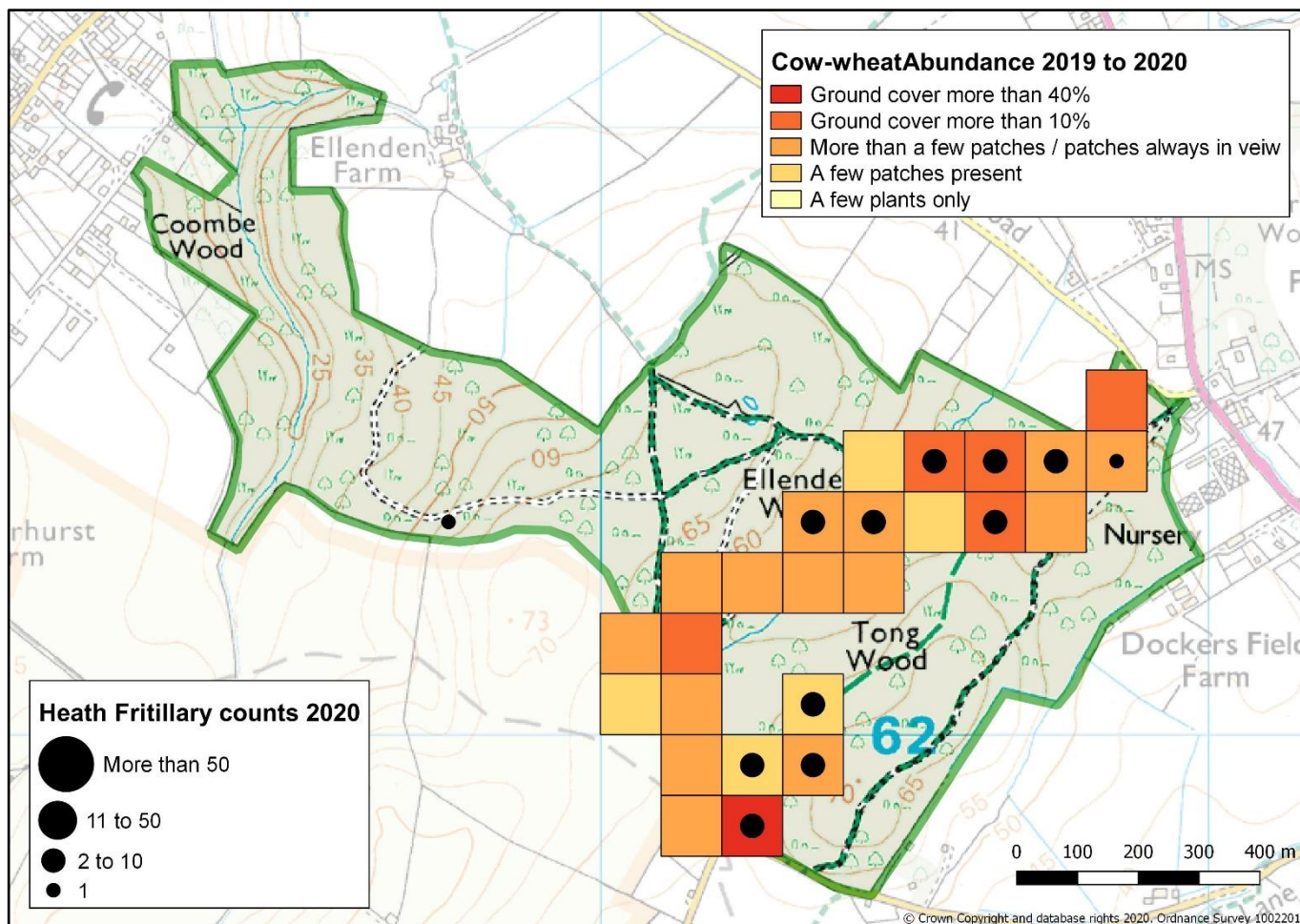


## 6.5. Ellenden Wood (Tong Wood) (88ha)

Ownership and Management: Private ownership, Managed by Tilhill Forestry

Site management contacts: Hugh Davies & John Allen

Heath Fritillary monitoring by: Butterfly Conservation



\* distribution chart is based upon sightings of two or more butterflies to discount wandering individuals

## **Ellenden Wood Summary**

This woodland has long had potential to support a thriving Heath Fritillary colony. Cow-wheat is abundant in this wood but the lack of open sunny areas was limiting the opportunities for the butterfly. The recent woodland work to open up the ride network and get sunlight into the wood is now paying off, and the butterfly is responding superbly.

Cow-wheat flourishes in managed areas but abundance declines after a few years, so a continuity of management in adjacent areas is essential. The new ride network should be mown on rotation, with other woodland management (coppicing, thinning) taking place adjacent to the rides or adjacent to previously managed areas.

Crucially, Cow-wheat is also spreading from Ellenden Wood into the adjacent Victory Wood. Any future Heath Fritillary colonisation of Victory Wood will likely be as a direct result of the good management of Ellenden Wood.

Ellenden Wood is certainly one of the most interesting woods in The Blean complex. The impacts of ongoing management can continue to be surveyed and monitored over the coming seasons and will undoubtedly produce fascinating results and data that will be valuable both at this site and across the wider landscape.

### **Recommendations:**

- Continue to develop the network of wide, sunny rides and interconnected sunny glades.
- Mow the rides on rotation (i.e. not all of the ride and not all rides in any one year). Mow from October when the caterpillars have dropped down close to the ground, and before March when they become active again.
- Restore hornbeam and hazel coppicing to produce a series of small, recently cut coupes every year.
- Continue the programme of thinning whilst retaining a good distribution of oak. This will ensure a continuity of Cow-wheat.
- Continue annual monitoring of the Heath Fritillary and the Cow-wheat to gather valuable feedback on the effectiveness of woodland management.

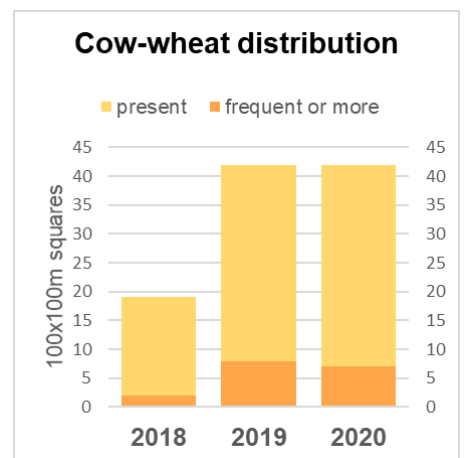
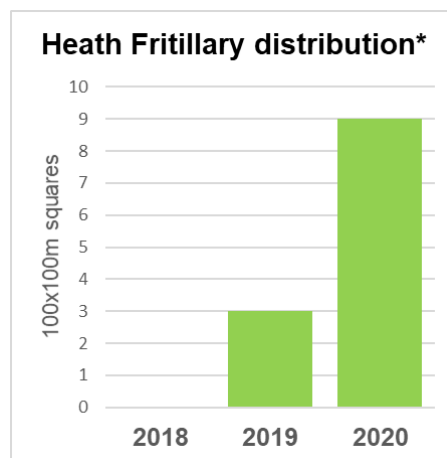
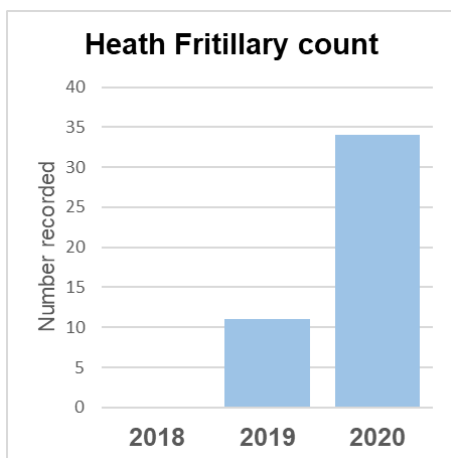
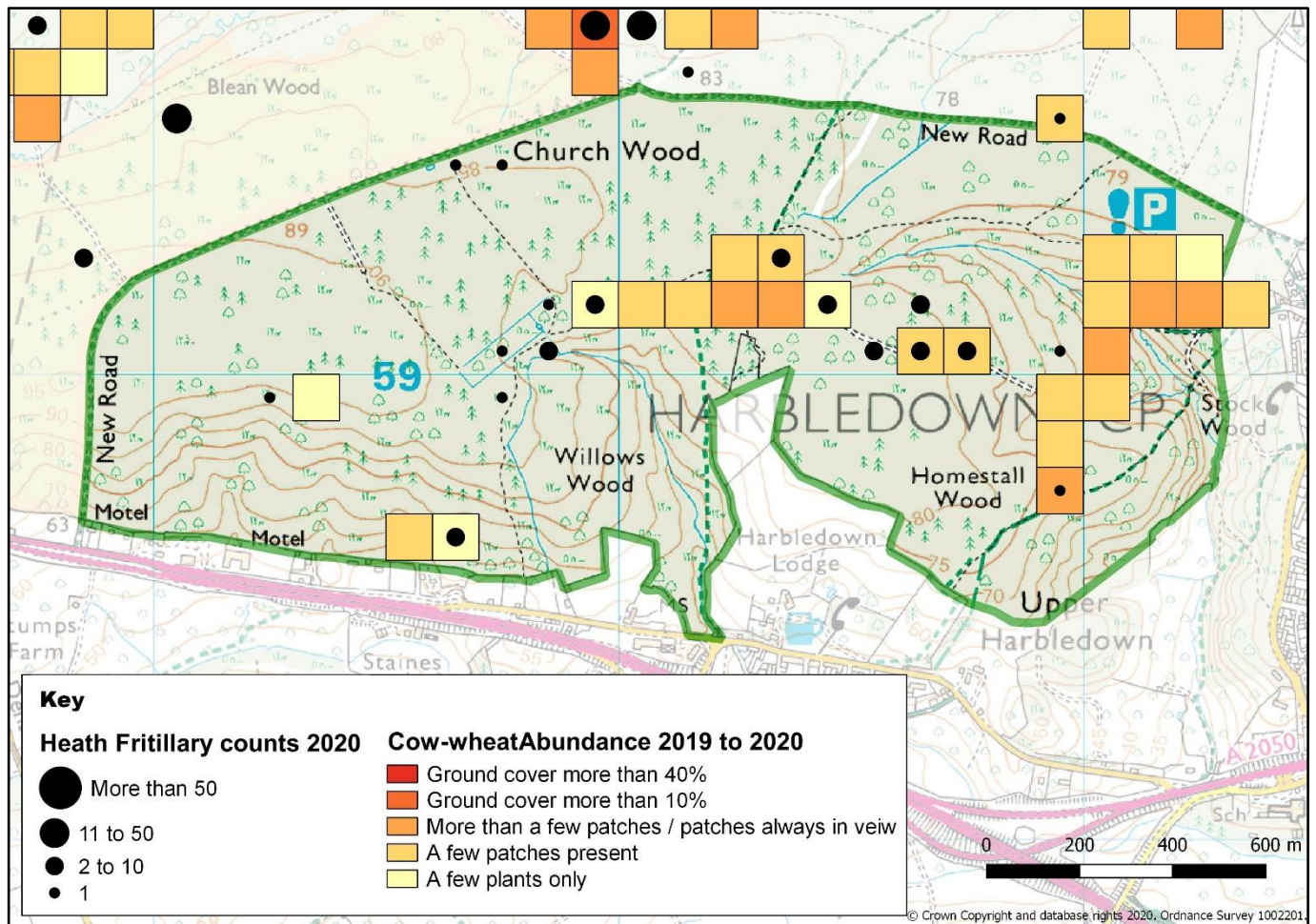


## 6.6. Homestall Wood (Church Wood) (204ha)

Ownership and Management: Private ownership, Managed by Sylva Woodland Management.

Site managers: Rick Vallis & Tim Saunders

Heath Fritillary monitoring by: Butterfly Conservation



\* distribution chart is based upon sightings of two or more butterflies to discount wandering individuals

## **Homestall Wood Summary**

It appears that a good Heath Fritillary colony is now established in the wood. This follows several years of very positive management that is producing the foodplant (Cow-wheat) and the enhancement of a good network of sunny rides, clearings and coupes. The central, sunny ride is the current core of this colony and this can ideally continue to be enhanced and extended. There are also signs that the butterfly is looking to spread both east and west from here and could certainly colonise recently managed areas in the east of the wood, especially if ride enhancements and coppicing continue.

Further woodland management between the central ride and the RSPB site is likely to produce positive benefits for the butterfly.

There is also an interesting small colony present on the southern edge of the wood where recent woodland work has produced Cow-wheat. Ongoing woodland work here might generate more habitat and strengthen the small colony here.

### **Recommendations:**

- Continue to enhance and extend the central east-west ride and undertake woodland work in areas that connect to this.
- Mow sections of the rides each year (but not all in any one year). Mow between late September and February when the caterpillars will be low down in the leaf litter.
- Undertake more woodland management between the central ride and the boundary with the RSPB reserve to improve opportunities for the butterfly to move between the two sites.
- Thin the understory around oaks to encourage Cow-wheat.
- Aim to retain a good density of oak standards and plant oak where it is absent.

## 6.7. Blean Wood (116ha)

Ownership: Multiple private ownership

Site Manager (north): Steve Castle

Heath Fritillary monitoring: Butterfly Conservation staff

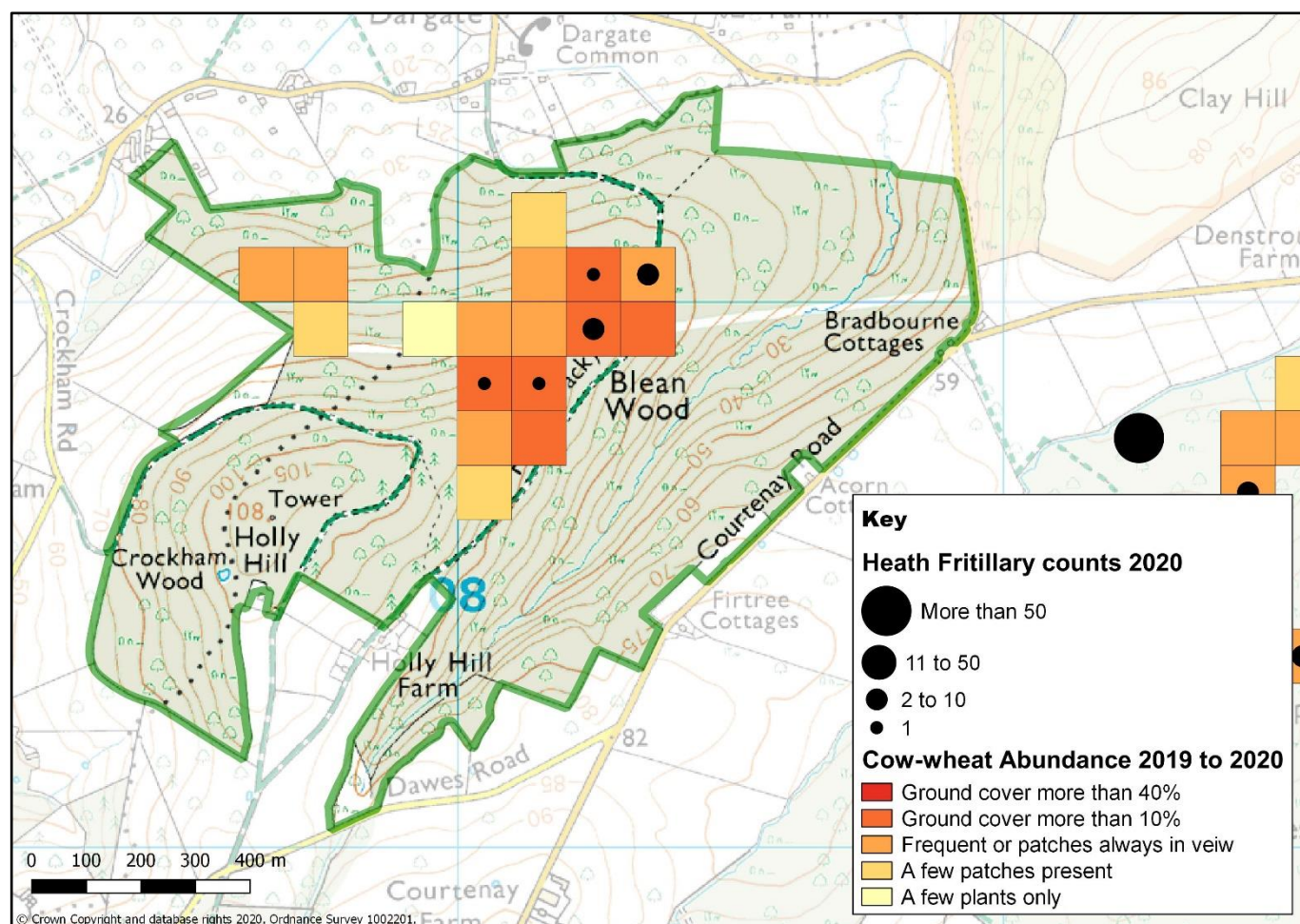
Heath Fritillary counted in 2020: **24**

Cow-wheat distribution: **17** 100x100m squares (Frequent or greater in **13** squares)

This woodland had a closed canopy for many years but recent management has created at least three open, sunny clearings. A survey this year revealed abundant Cow-wheat (Heath Fritillary foodplant) and a small but well distributed Heath Fritillary colony using two of the three clearings. The butterfly most likely colonised the site in the last couple of years. Further opening up of the canopy is likely to promote more foodplant and more habitat that the butterfly can utilise. This wood now represents the most westerly Heath Fritillary colony in Kent.

### Recommendations:

- Continue to create small clearings or coupes on an annual basis. Aim to produce 2 or 3 clearings every year of 1-2 acres each and ideally adjacent to existing open areas. Areas where oak is present will be more productive in terms of producing Cow-wheat.
- Develop a wide sunny ride network managed on a 3-zone system. This will benefit the butterflies and will also help to facilitate future management.
- If canopy thinning is being considered, aim to link this in with an open ride system or other existing open sunny areas.
- Continue to monitor the heath Fritillary and Cow-wheat each year. This will provide useful feedback on the management. Good news could potentially be shared with the local community.





## 6.8. Victory Wood (141ha)

Ownership: Woodland Trust

Site Managers: Clive Steward and Claire Inglis

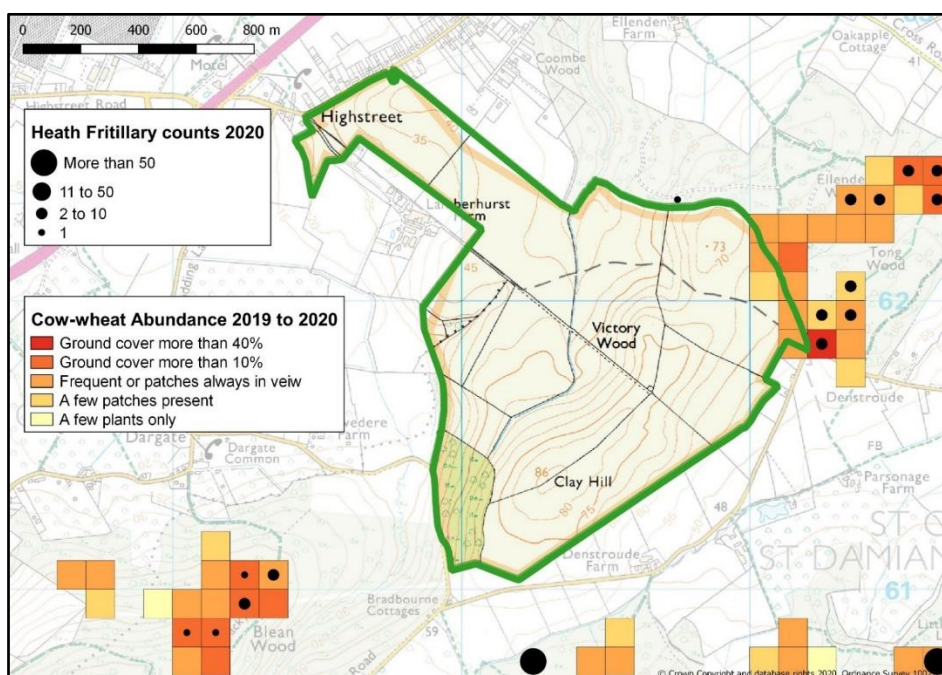
Heath Fritillary status: Ad hoc sightings

Cow-wheat distribution: 4 100x100m squares (Frequent or greater in 3 squares)

Victory Wood is one of the most exciting prospects in the Heath Fritillary landscape. It was formerly part of the Blean Woodland complex (pre-war) but was then cleared and farmed as arable until the early 2000's. It was planted up in 2005 to 2008 and this will re-link Ellenden Wood and Blean Wood. Victory Wood is currently a mixture of small trees, scrub and open ground. Single Heath Fritillaries are occasionally seen on the site, likely to be wandering from Ellenden Wood (adjacent) and from the RSPB Blean Woods reserve (1km south). In 2019 Cow-wheat (the Heath Fritillary caterpillar foodplant) was confirmed to be growing at Victory Wood close to the boundary with Ellenden Wood (Cow-wheat is exceptionally abundant in Ellenden Wood). In 2020 the Cow-wheat was surveyed at Victory Wood by Butterfly Conservation staff and was found to be sufficiently abundant to support Heath Fritillary (i.e. abundance is at least Frequent). Multiple Wood Ants nests were also seen; the ants are likely to be the main drivers spreading the Cow-wheat seed. The neighbouring Denstroude House also has Cow-wheat in the garden. Victory Wood has great potential to support a future Heath Fritillary population and, if so, will be an important element in the Blean meta-population.

### Recommendations:

- Continue to allow the woodland to develop, with a diverse structure providing a good range of different micro-habitats.
- Search for caterpillars on the Cow-wheat in April to identify if/when this butterfly becomes resident at Victory Wood.
- Ensure a good distribution of oak. Where young oaks fail, consider Beating Up.
- Survey the Cow-wheat abundance and distribution annually. This will provide an invaluable insight into its recolonisation & spread and highlight areas for targeted Heath Fritillary searches.
- Record Heath Fritillary sightings and encourage visitors to do the same. If the butterfly is confirmed to have colonised the site, begin to include this site in the annual Timed Count monitoring programme.
- Share good news with local communities and with members of Butterfly Conservation and the Woodland Trust.



### 6.9. Honey Wood (90ha)

Ownership and Management: Private ownership (part South East Water)

Site managers: unknown

Heath Fritillary monitoring: ad-hoc (last surveyed in 2019)

Heath Fritillary Distribution: none

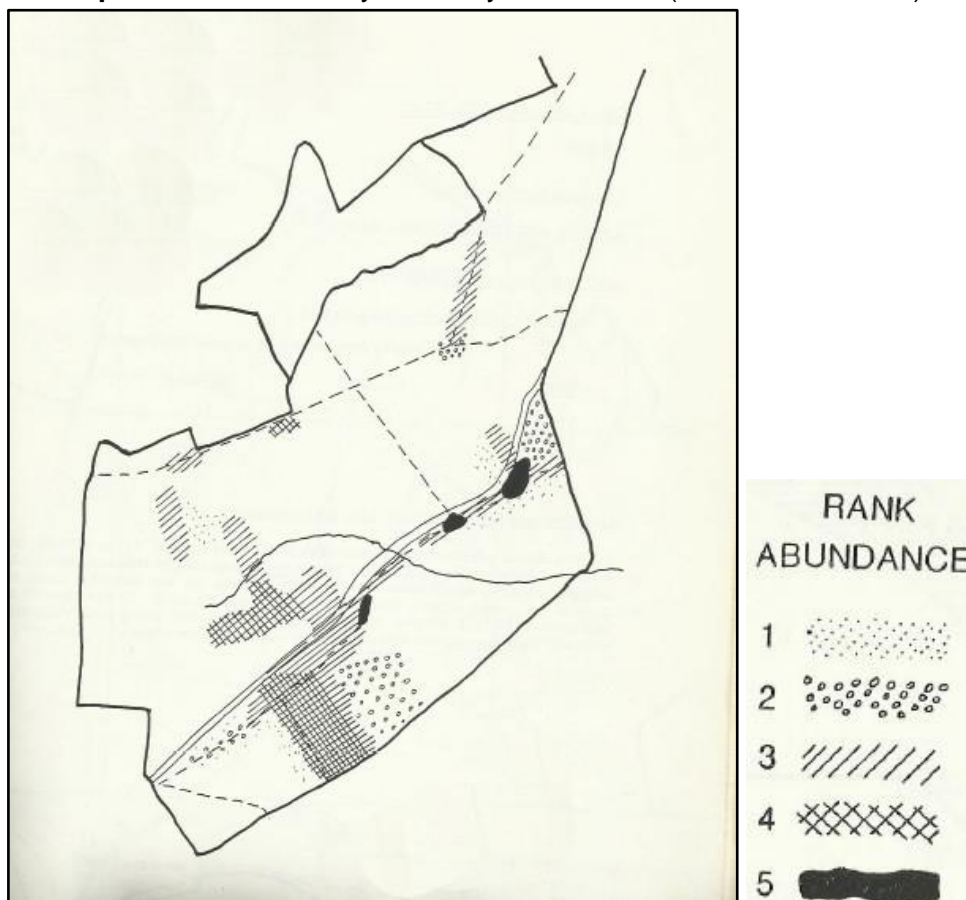
Foodplant distribution: 2 100x100m squares in the northern part of the wood

Honey Wood has excellent potential to support a Heath Fritillary colony but has been undermanaged since the early 1990's. Heath Fritillary was recorded here in the 1990's (last known record 1995). There was no Cow-wheat seen during a survey in 2019. In 1982 Martin Warren mapped substantial areas of abundant Cow-wheat (at least Frequent, see map below), indicating that the soils are at least suitable for Cow-wheat and that there is likely to remain good potential if management is undertaken.

#### Key Suggestions:

- Identify the owners/managers of Honey Wood.
- Encourage woodland management including the creation of sunny glades and rides.
- Following management, undertake butterfly and foodplant surveys.
- Retain oak standards and promote restocking with oak where oak density is low.

**Map:** Cow-wheat survey of Honey Wood 1982 (from Warren 1985)



## **7. Acknowledgements**

Butterfly Conservation would like to thank all the partner organisations and woodland managers working in The Blean for their ongoing contribution to the conservation of this most important Heath Fritillary population, especially the team at the RSPB (Sam Richardson Emma Higgs, Michael Walter), also Claire Inglis (Woodland Trust), Hugh Davies (Tilhill), Kate Harris (Forestry England), Rick Vallis and Tim Saunders (Silva Woodland Management Ltd), and Steve Castle.

Thank you to all the volunteers undertaking surveys and reporting sightings. Particular thanks this year are due to Michael Walter, Alfie Gay, Stuart Harris, Mike Enfield, Noah Wheatley & Derek Chambers for undertaking surveys and reporting key sightings.

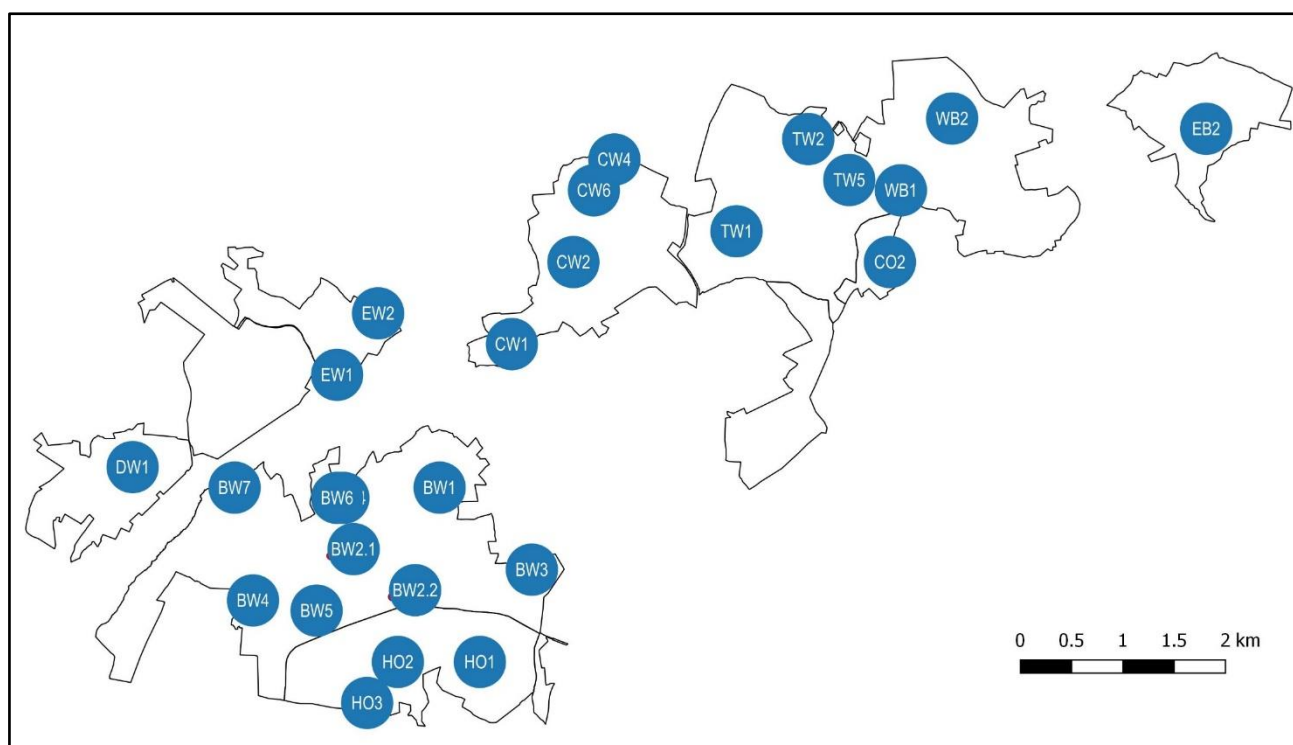
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## 9. Appendix



Notes: Colony codes are unique to this season and do not relate to codes assigned in previous seasons.

Site	Colony Code	Central Gridref	Peak number counted
Blean Woods	BW1	TR112607	606
Blean Woods	BW2.1	TR103601	153
Blean Woods	BW2.2	TR109597	41
Blean Woods	BW2.4	TR102606	44
Blean Woods	BW3	TR121599	120
Blean Woods	BW4	TR097596	65
Blean Woods	BW5	TR100595	43
Blean Woods	BW6	TR102606	577
Blean Woods	BW7	TR092607	127
Cole Wood	CO2	TR156629	53
Clowes Wood	CW1	TR119621	90
Clowes Wood	CW2	TR125629	1
Clowes Wood	CW4	TR129639	140
Clowes Wood	CW6	TR127636	9
Blean Wood	DW1	TR082609	14
East Blean	EB2	TR187642	28
Ellenden Wood	EW1	TR102618	14
Ellenden Wood	EW2	TR106624	16
Homestall Wood	HO1	TR116590	12
Homestall Wood	HO2	TR108590	5
Homestall Wood	HO3	TR105586	2
Thornden Woods	TW1	TR141632	15
Thornden Woods	TW2	TR148641	6
Thornden Woods	TW5	TR152637	3
West Blean	WB1	TR157636	94
West Blean	WB2	TR162643	471