Berkshire
Buckinghamshire
Oxfordshire

Striking the Balance –
Assessing the level of grazing at Greenham Common; 2016 to 2019

BBOWT Ecology Team Feb 2020

Executive Summary

This report summarises the findings of the grazing monitoring at Greenham Common which has taken place between 2016 and 2019 inclusive. The results are set into context using the agreed sward height, flower cover, and cattle number limits. Management and monitoring recommendations are made.

Across the growing season in most years, a similar pattern in the sward height and the cover of flowers can be seen: that is, the sward becomes much taller and the cover of flowers much greater within the exclosure (in the absence of grazing) than outside the exclosure (where grazing is taking place).

2019 sward height data (in June) inside the exclosure is slightly more similar to that outside the exclosure, than over the previous years. In 2016 the difference is c.7cm and in 2019 it is c.3.5cm. This implies an improvement, namely a reduction, in grazing pressure. This may be as a result in the reduction in livestock numbers recorded over the summer months in 2018 & 19. However, given the small data set (4 values) this trend should be treated with caution.

There is no obvious trend of improvement in the cover of flowers in June, across the years.

There is a steady increase in the proportion of heather samples assessed as being 'over-grazed'. This may relate to the numbers of livestock present on site over the winter, which has consistently exceeded the limit of zero.

The proportion of samples failing grazing limits remains steadily high across the years, at over 70% of samples. The current threshold is set at 25%, over which the entire Common is assessed as 'overgrazed'. This may relate to the high numbers of cattle on site over the winter and early into the growing season, which prevent the development of the sward in spring.

While the number of cattle present over the summer for 2018 and 2019 has been within the prescribed limits, it is worth noting that the grazing pressure is not even across the Common. Some compartments receive on average, a much higher grazing pressure than is recommended for heathland grazing.

Given that the recommended and agreed grazing limits have not yet been fully implemented for any given year, it is recommended that the limits are adhered to and the monitoring continued for a number of years. At which point it will be possible to review the stocking density and the subsequent impact on sward and flowers; and generate evidenced recommendations.

It is also recommended that the limits on the cover of flowers should be reviewed after a further two years of surveying.

1. Introduction

Greenham Common is an important site for its contribution to local and national biodiversity, and as a cultural landscape, supporting the exercise of traditional commoners rights, especially grazing rights. It is well understood that grazing by livestock is an essential tool in the conservation management of lowland heath and grassland, such as at Greenham Common. Grazing changes the dynamics of a heathland by altering the structure and species composition. From an ecological point of view this can be both beneficial and detrimental depending on the level and timing of grazing.

To date there has been much discussion as to whether the right balance has been struck between the needs of the graziers and the conservation value of the Common. In 2016, following a request from the Greenham and Crookham Commons Commission to attempt to clarify this issue, a monitoring strategy was developed by the Berkshire, Buckinghamshire and Oxfordshire Wildlife Trust (BBOWT) to assess the ecological impacts of the current level of grazing.

In 2016 the Conservation Management Committee (a committee of the Commission) agreed the conservation objectives outlined in a newly revised management plan for the Common. The objectives in this plan were used as the targets for assessing the level of grazing, from a conservation point of view.

This report outlines the key findings based on the results from the grazing impact monitoring, carried out annually between 2016 and 2019 inclusive. Other data, in particular the number of cattle, is also assessed. Finally management and monitoring recommendations are made.

Details of the methodology used for the grazing impact monitoring have not been provided in this document as they are available in the previous grazing report (May 2019).

2. Survey Results and Conclusions

2.1 Short term – Effects on grassland areas

The sward height and cover of flowers was recorded throughout the growing season, inside and outside a series of enclosures (which prevented livestock grazing, but allowed rabbit grazing). The difference in results between these two areas together with set limits (based on the approved management plan objectives) was then used to assess the impact of livestock grazing.

<u>Annual variation</u>

As might be expected, in most years there is a marked difference between the sward height inside the enclosure (where there is no livestock grazing) and outside the enclosure (where livestock grazing is occurring). This difference is also repeated in the cover of flowers.

Figs 1 and 2, show that sward height and cover of flowers, inside and outside the exclosures start and end the year at very similar levels; but that during the growing season the areas inside the enclosure develop more flowers and the sward grows taller than outside where grazing is present.

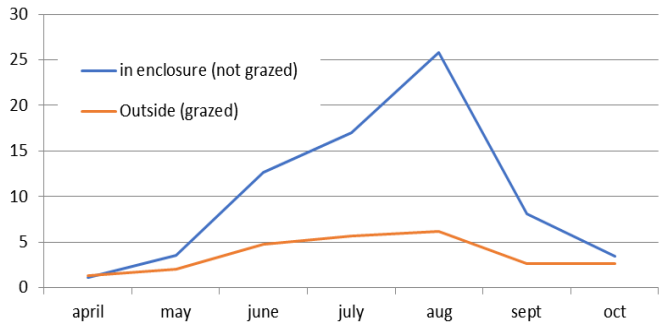

Fig 1: Sward height (cm), 2016

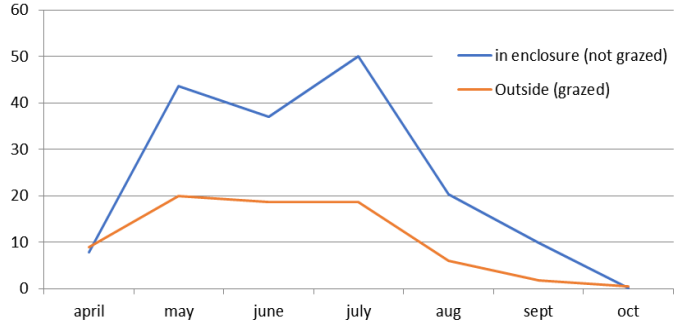

Fig 2: Cover of flowers (%), 2016

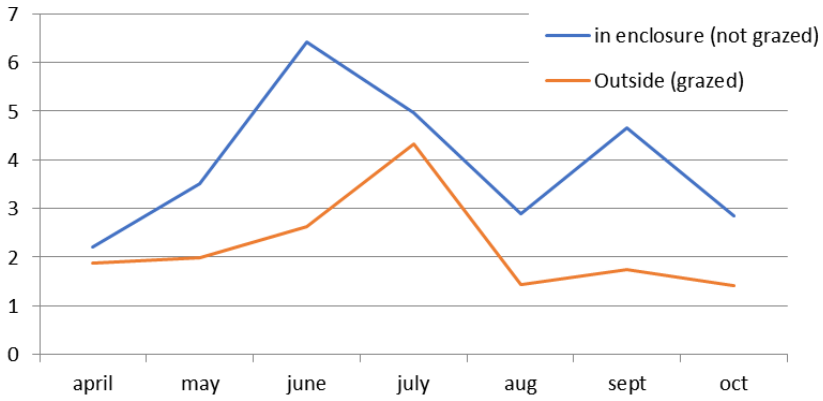

Fig 3: Sward height (cm), 2019

While this monthly growth trend was consistent across most years, in 2019 the annual growth pattern was more chaotic than in the preceding 3 years. Additionally across the growing season the sward height within the enclosure remained consistently taller than outside, but more marginally than in previous years. (See Fig 3). The unusual pattern may have been due to seasonal weather variation (see weather data – Appendix 1), 2019 was exceptionally warm.

<u>Trend across years</u>

Using June as an 'indicator' month it is possible to assess trends in sward height and cover of flowers, over the 4 years of surveying. June has been selected as the indicator month because there is consistent annual data available and it is also the peak time for flowering and grass productivity. In the months following June, perennials start to return their energy stores to their root systems ready for the following growing season. This is linked to the reduction in daylight hours.

Fig 4 shows that across the Common as a whole the average sward height in June has declined, regardless of whether or not it has been grazed. This decline is appears to be greater in the un-grazed enclosure. The cause for this is not known, but it may be because the sward here is more responsive to weather variations (such as increasingly dry summers), than where it is already short as a result of grazing.

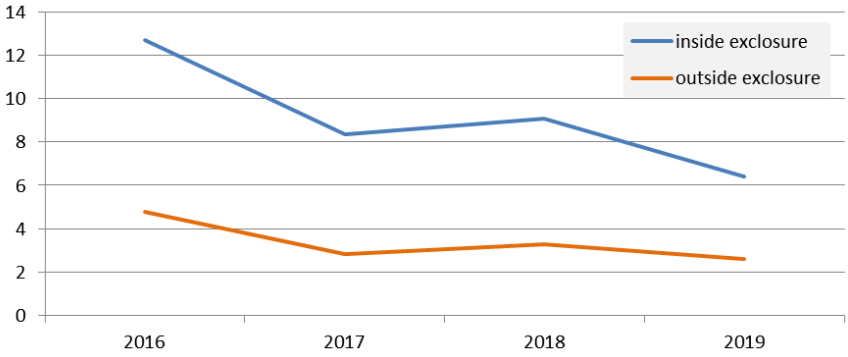

Fig 4: Mean sward height in June

It can also be seen that there is a very slight movement towards in the sward height in areas grazed and those un-grazed becoming more similar. (i.e. the blue and orange lines get closer). This is best demonstrated between 2016 and 2019. In 2016 the difference is c.7cm and in 2019 it is c.3.5cm. This may indicate that grazing pressure has slightly reduced (see stocking density). However this data set is very small, consisting as it does of only 4 data points and there is no evidence of the sward height increasing in the grazed areas; so this conclusion while gently promising, must at this stage remain tentative.

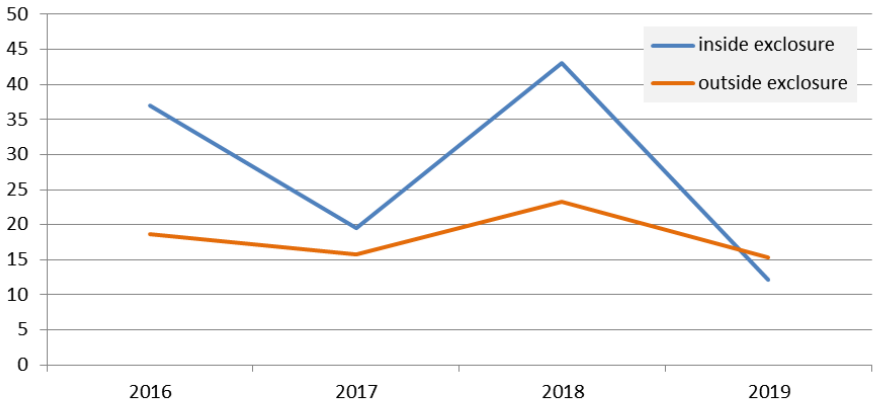

Fig 5: Mean cover of flowers in June

There is no apparent similar trend in cover of flowers in June when contrasting areas grazed and not grazed (See Fig 5). Data from 2016 and 2018 demonstrates that in un-grazed areas, the cover of flowers was substantially greater than in grazed areas – approximately twice as much. However, in 2017 and 2019 this difference is less pronounced and maybe due to seasonal variation.

What is interesting to note is that the apparent similarity of flower cover between inside and outside the exclosure in 2019 is not uniform across all three exclosures. The photo (right) shows the 'eastern exclosure', where the abundance of flowers inside the exclosure remains visually striking in contrast to the low cover outside. Also, one of the exclosures includes an area of gorse and bramble which is spreading and may be affecting (suppressing) the average sward height values. This enclosure was pre-existing one on the Common, re-purposed for this project; a new exclosure may be preferable (subject to agreement of the Commission)

Grazing pressure limits

The proportion of samples failing to meet grazing pressure limits and thus being classified as 'over grazed' can be seen in Fig 6.

The first thing to highlight is that the proportion of samples failing limits remains consistently high at over 70% of samples. (The current threshold is set at 25%, over which the entire Common is assessed as 'overgrazed'). It can also be seen that while the proportion of samples failing the sward height criteria has declined between 2017 and 2019, there is no clear trend of improvement for the cover of flowers.

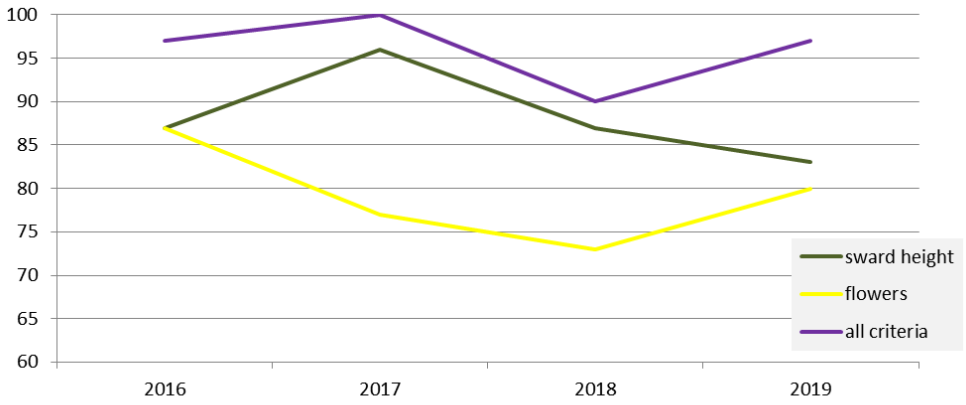

Fig 6: percentage of samples failing criteria in June

2.2 Medium term – effects on heather areas

At the end of the growing season, heather was assessed for: sward height; the presence of stem damage or breaks; and growth forms indicating high levels of grazing. None of the exclosures are in heather dominated areas, so all samples were taken within grazed areas.

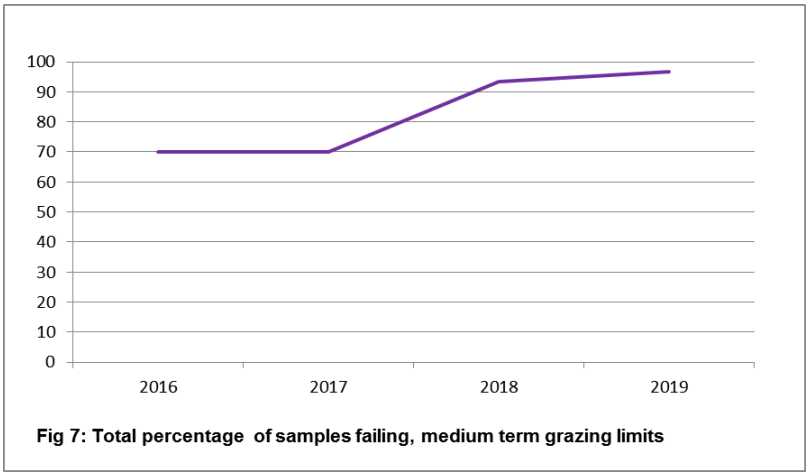

Fig 7: Total percentage of samples failing, medium term grazing limits

Fig 7 shows that over all there is a steady increase in the proportion of heather samples assessed as being 'over grazed'. Across all four years it is the heather growth form and to a lesser extent the sward height which has driven this result.

It is worth noting that as a slow growing woody species, the heather samples will reflect the grazing pressure received a year or so previous to one the in which the survey has taken place.

It is possible that this trend reflects the high number of cattle still on the site over winter (see stocking density), as this is the time of year that livestock focus on eating heather as there is very little alternative forage available.

2.3 Effects of grazing levels on other species

The level of grazing is likely to impact on a range of flora and fauna species at Greenham Common. Skylark has selected from those identified as priorities in the approved management plan, as there is current data this species.

Skylark

Skylark (*Alauda arvensis*) is a UK Red listed species due to the severe long term breeding population decline experienced across the UK (> 50 % between 1969-2007). The population at Greenham Common has been monitored since 2009 by an independent consultant. The results show a significant decline in skylark territories[1] (see Fig 8). The report concludes that while skylark was once a common species on site it has been steadily declining for several years, possibly due to a lack of suitable nesting habitat. Skylark breed in grassland, nesting on the ground in a grass tuft, preferentially where the vegetation is 15 – 40cm tall[2]. Surrounding small scale vegetation structure is also essential to provide the fledged chicks with shelter from predators. Results from the sward monitoring show that in the grazed areas the sward height in spring (May) is between 2-3cm.

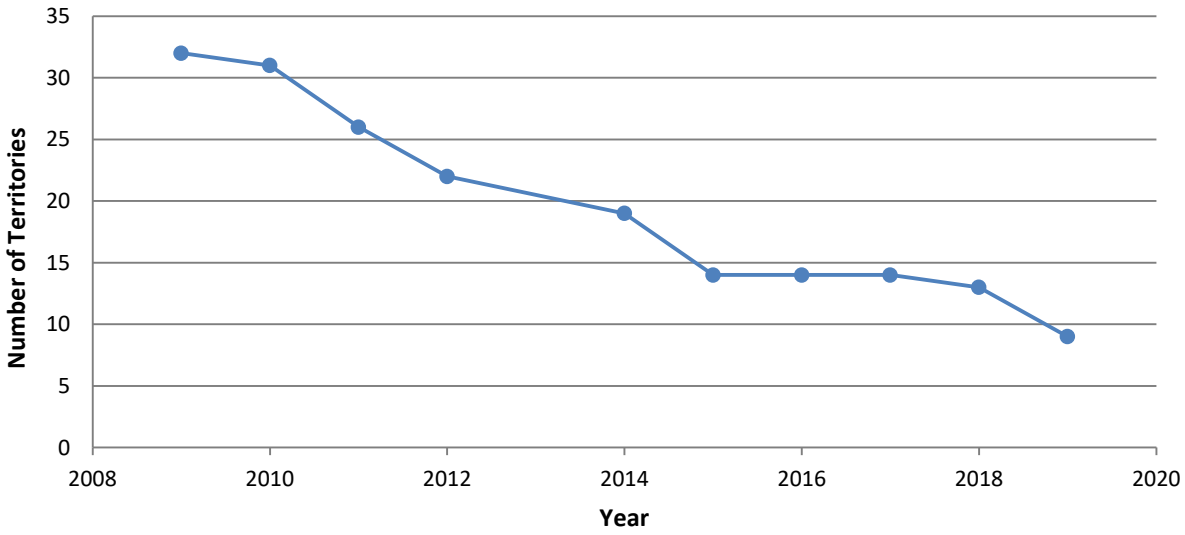

Fig 8: Skylark territories across Greenham Common

[1] Greenham Common ground nesting bird report 2019. A E D Hickman. December 2019
[2] A management guide to birds of lowland farmland. 2005. Winspear R and Davies G. RSPB.

2.4 Stocking density

The number of cattle (and ponies) present on the Common has been recorded monthly since October 2013, thus providing a good data set which reflects the grazing pressure.
Ponies have been excluded from this analysis because from 2015 onwards they have never numbered greater than 4, and as such cannot be significantly contributing to the grazing pressure. Prior to 2015 pony numbers were between 8 and 10.

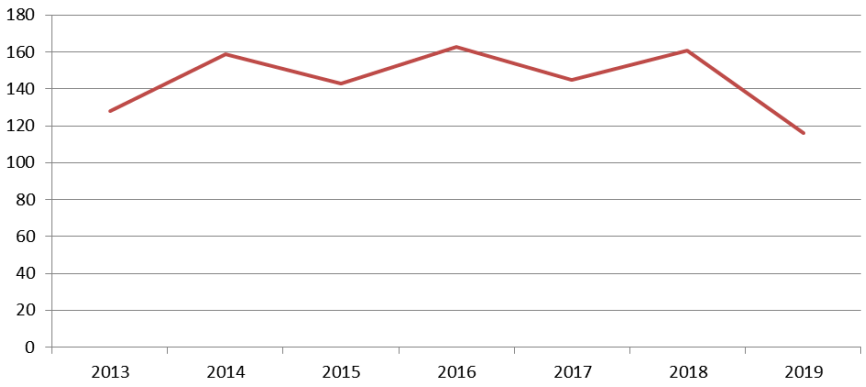

Fig 9: Maximum number of cattle, at any one time, per year

Fig 9 shows that the maximum number of cattle present on the Common in any single month has remained consistently high; with a drop in 2019 to just less than the set maximum (in late summer/autumn) of 120. (See Table 1 for limits)

It is possible to interrogate the data in more detail to see whether in any given month the number of cattle have exceeded or met prescribed limits.

Table 1: Cattle limits

0 cattle Jan, feb, March, april
< 50 cattle may
< 100 cattle june
< 120 cattle july, aug, sept, oct, nov, dec

Table 2: Number of cattle per month present on the Common
(empty cells = no data, red cells = limits exceeded)

Year	apr	may	jun	jul	aug	sep	oct	nov	dec	jan	feb	mar
2013							118	128		116	117	122
2014	138		114	109	151	159	152	131	117	116	120	128
2015	130	143	140	114	109	135	127	106	136	120	121	116
2016	128	163	114	91	131	126	134	126	8	29	29	55
2017	99	98	92	108	100	100	145	137		69	9	
2018	9	86	161	102	113	105	112	110	85	27	37	40
2019	64	116	73	98	96	99	76	78	74			

Table 2 shows that overall there has been a reduction in the number of cattle on site, and that during the majority of summer months in 2017, 2018 and 2019, the numbers have met the limits (ie the cells are white). However is clear that the number of cattle remains too high over the winter and especially in the early spring months, January to April.

When looking at the stocking density (number of cattle per hectare), the average density is 0.21 cows ha^{-1} yr^{-1}. This is not far off the recommended density for reptiles of 0.2 livestock units per ha; a cow being roughly equivalent to a livestock unit. However, as would be expected, the cattle favour some areas more than others. For example the monthly counts hardly ever pick up any cattle in the woodland areas. This means in practice the total number of cattle (or grazing density) across the Common as a whole does not reflect the grazing pressure experienced by favoured compartments.

The most favoured and thus most heavily grazed compartments are those marked in red Table 3. Out of these compartments, 9, 10, 11 and 15 consistently have the highest stocking density. It can be seen that for these areas between 2013 and 2019 there is no obvious trend reduction in cattle density.

Table 3: Mean cattle per hectare for most favoured compartments
(red = density greater than the recommended 0.2LUha^{-1} yr^{-1})

Compartment	2013	2014	2015	2016	2017	2018	2019	max mean across years
1b	1.4	1.0	1.1	0.1	0.0	0.6	0.3	**1.4**
9	1.1	0.7	0.7	0.6	0.3	0.1	0.4	**1.1**
10	1.3	1.4	1.2	1.1	0.2	0.7	0.9	**1.4**
11	0.7	0.8	0.4	0.7	1.2	1.1	0.6	**1.2**
12	0.8	0.6	0.4	0.5	0.3	0.2	0.2	**0.8**
14	0.1	0.1	0.3	0.2	0.6	0.5	0.1	**0.6**
15	0.5	1.1	0.7	0.8	1.0	1.8	0.7	**1.8**
18	0.0	0.7	0.4	0.3	0.1	0.0	0.5	**0.7**
16w	0.0	0.1	0.4	0.3	0.1	0.1	0.1	**0.4**
max mean across compartments	**1.4**	**1.4**	**1.2**	**1.1**	**1.2**	**1.8**	**0.9**	

3. Recommendations

Management recommendations

The cattle numbers shown in Table 2 indicate that while the summer stocking density has more or less met the prescribed limits, the winter limits have not been adhered to. This means that the sward growth in the early months of the year has been constrained; and thus has likely resulted in the monitoring indicating the sward is 'overgrazed'. Given that the cattle limits have not yet been met, it is not possible to further comment on the stocking density. It is therefore recommended that the stocking density and importantly the timings throughout the year, recommended in the previous report are complied with. Once this has occurred for a number of consecutive years it will be possible to review whether or not these can be relaxed or tightened up, in light of the impact on the sward.

In summary these remain:

Stocking timing

Ideally it is recommended that:

- **1st January to 1st May - all stock are excluded from site.**
- **1st May to 1st June - up to 50 cattle and 10 ponies.**
- **1st June to 1st July - up to 100 head of cattle (and up to 10 ponies present).**
- **1st July to 1st January - up to 120 cattle (and up to 10 ponies). Stock should be removed sooner than 1st Jan if supplementary feeding is required (i.e. when natural forage is exhausted).**

If this is not logistically feasible, it is recommended that:

- **1st January until 1st June - all stock are excluded from site.**
- **1st June to 1st January up to 120 cattle (and up to 10 ponies). Stock should be removed sooner than 1st Jan if supplementary feeding is required.**

Monitoring recommendations

Given the apparent annual variation in the cover of flowers, possibly driven by the weather, it is recommended that the current limit of 30% cover should be reviewed after two more years of monitoring. The limit may need to be reduced, or set as a proportion of outside the exclosure, in a similar way to that already done with the sward height. The average cover of flowers both within and outside the exclosure over a 6 year time period will be used to inform the decision.

Appendix 1 – Annual summary weather data

The following weather summaries have been taken from the Met Office reports – 'State of the UK Climate Reports, 2014 – 2018'[3]. 2019 data is only available as preliminary information and no data can be readily located for 2013.

2014

- Warmest year on record for the UK, England, Wales and Scotland in a series from 1910, and for Central England in a series from 1659.
- Lowest heating degree day index* and second highest growing degree day index[+] for the UK in series from 1960.
- Fourth wettest year on record for the UK in a series from 1910.
- Marginally sunnier than average for England and Wales, but duller for Scotland.

2015

- 16th warmest year for the UK in a series from 1910, and 25th warmest for Central England in a series from 1659.
- Heating degree days in 2015 were slightly below average but not exceptionally so. Growing degree days were near average.
- Seventh wettest year on record for the UK in a series from 1910
- Sunnier than the 1981-2010 average for the UK overall.

2016

- 2016 was the 13th warmest year for the UK in a series from 1910, and 22nd warmest for Central England in a series from 1659.
- Growing degree days were slightly above average.
- Rainfall was slightly below average for the UK overall with 95% of the 1981-2010 average precipitation.
- Sunnier than the 1981-2010 average for the UK overall with 104% of average sunshine hours.

2017

- Fifth warmest year for the UK in a series from 1910, and eighth warmest for Central England in a series from 1659.
- Heating degree days in 2017 were fifth lowest and growing degree days equal- fifth highest in series from 1960.
- Rainfall for the UK overall was 97% of the 1981–2010 average and 102% of the 1961–1990 average.
- Sunshine for the UK overall was exactly 100% of the 1981–2010 average and 103% of the 1961–1990 average.

2018

- Seventh warmest year for the UK in a series from 1884, and fourth warmest year for Central England in a series from 1659.
- Heating degree days in 2018 were below average and growing degree days were third highest in series from 1960.
- Rainfall for the UK overall was 92% of the 1981–2010 average and 96% of the 1961–1990 average. June 2018 was the driest June for England since 1925.
- Year 2018 sunshine for the UK overall was 114% of the 1981–2010 average and the third sunniest year in a series from 1929.

2019[4]

- 2019 was warmer than average. Temperatures exceeded 30 °C somewhere in the UK on 10 days during the summer. Also noteworthy were the record-breaking warm spells in February and July as noted above, and record-breaking warmth for both the Easter and late-August bank holiday weekends.
- It was also a sunnier than average year.
- It was a rather wet year, with above average rainfall in March and then most months from June onwards. There were a series of heavy-rainfall events in February, March, April and June, and numerous incidences of flooding from the end of July onwards.

* the number of days on which an average household heating system comes on

[+] the number of days on which conditions are conducive to plant growth (a constructed model; not based on an actual species)

[3] https://www.metoffice.gov.uk/research/climate/maps-and-data/summaries/index

[4] https://www.metoffice.gov.uk/binaries/content/assets/metofficegovuk/pdf/weather/learn-about/uk-past-events/summaries/uk_monthly_climate_summary_annual_2019.pdf