

Analysis of Thames Basin Heaths 2016 People Counter Data

Summary of unpublished report by Footprint Ecology for Natural England

Visitor access data is collected using automated counters placed at access points. These counters can be used to examine daily, weekly and monthly patterns at specific locations, and to study trends across several years. This report examines the data collected during 2016 for 21 counters.

During 2017 another 13 counters were added to the network and 5 unreliable or missing counters were replaced.

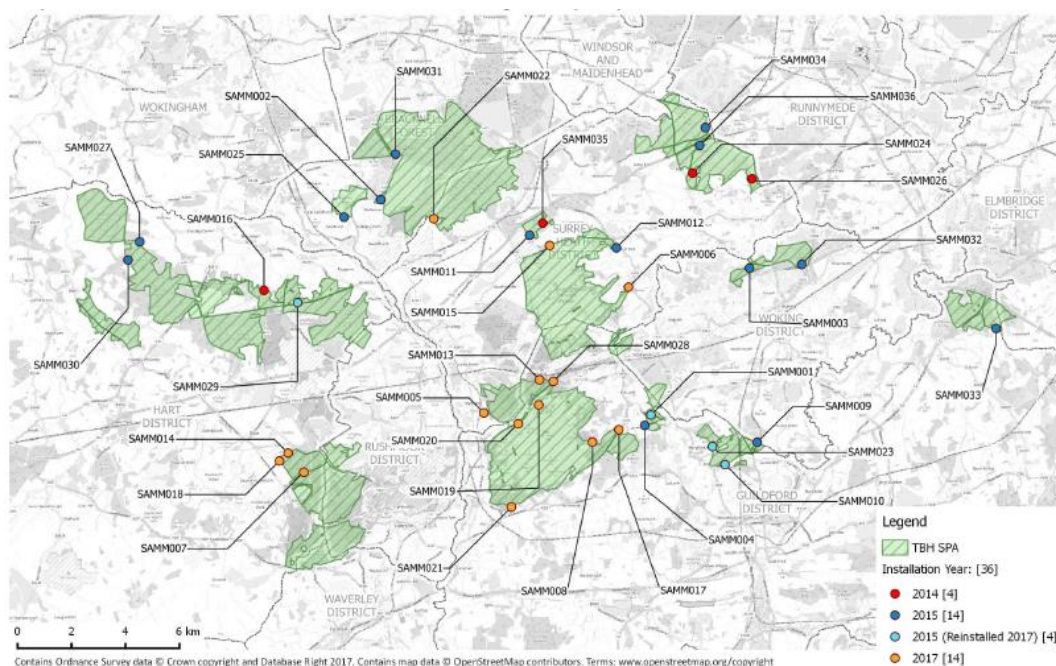


Figure 1 - Distribution of counters across the Thames Basin Heaths

SSSI name	Approx. area (ha)	Number of counters
Ash to Brookwood Heaths	1570	10
Bourley & Long Valley	820	3
Bramshill	670	2
Broadmoor to Bagshot Woods & Heaths	1690	3
Castle Bottom to Yateley and Hawley Commons	920	2
Chobham Common	650	4
Colony Bog & Bagshot Heath	1130	5
Eelmoor Marsh	70	0
Hazeley Heath	180	0
Horsell Common	180	2
Ockham & Wisley Commons	220	1
Sandhurst to Owlsmoor Bogs & Heaths	90	1
Whitmoor Common	170	3
Total		36

Figure 2 - Distribution of counters across SSSIs

In the full report, Footprint Ecology describe issues relating to the data collected, including early setup issues, equipment damaged by water, unreliable data caused by insects in the Schmidt Passive Infrared counters and vandalism. Vandalism was the main issue.

Four counter types have been used, from three different companies. The full report lists the pros and cons of the different equipment.

Sensor type	Number of sensors (all years)	% of sensors vandalised (all years)	% of sensors with data issues (all years)	Number of sensors (only sensors recording data in 2016)	Average of % of errors in each unit for 2016 data
PIR	11	50.4	54.5	11	21.3
Pressure pad	5	20	80	5	7.6
RadioBeam	20	10	5	6	5.8
Total	36	25	30.5	22	13.6

Figure 3 - Summary of the quality of data and vandalism recorded from the different types of counter

After data cleaning, the 2016 dataset consisted of 20 counters which collected 14,456 data rows, i.e. hours of data. For a single counter, SAMM001 which had only recorded data for January, all data was discarded. The number of data rows for individual counters in this cleaned data set ranged from 2,640 (SAMM027, equivalent to c. 110 days) to 8,640 (SAMM036, equivalent to c. 360 days), although most counters collected a reasonable amount of data, with a mean value of 7,179 hours per counter (equivalent to c. 299 days).

1. Variation across months of the year

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Annual Mean	Ratio of Min/Max	SD
SAMM002	-	1.8	1.8	1.9	2	2.1	2.1	2.2	1.7	1.8	1.7	1.9	1.9	0.77	0.2
SAMM003	1.1	1.5	1.4	1.3	-	-	1.7	1.7	1.5	1.4	1	1.2	1.4	0.59	0.2
SAMM004	0.3	0.4	0.3	0.4	0.5	0.4	0.2	0.2	0.4	0.5	0.9	0.8	0.4	0.22	0.2
SAMM009	-	0.2	0.2	0.2	0.3	0.4	0.4	0.4	0.2	0.8	0.5	0.3	0.4	0.25	0.2
SAMM010	-	0.1	0.1	0.4	0.9	1.2	1.5	1.8	1.5	0.5	0.2	0.8	0.8	0.06	0.6
SAMM011	-	5.9	5.6	5.8	8.4	-	5.7	5.4	5.3	5.4	4.1	5.1	5.5	0.49	1.1
SAMM012	0.1	0.2	0	0	0.2	0.1	0.6	1.5	1.5	1.5	1.2	1.7	0.7	0.00	0.7
SAMM016	6.5	1.5	1.6	5.5	2.6	7.4	23.2	9.3	2.8	2.8	6.2	8	5.5	0.06	5.9
SAMM023	1.2	1	1.2	1.1	3	4.5	2.3	2.3	1.9	1.4	0	1.4	1.8	0.00	1.2
SAMM024	-	0.1	0.1	0.2	0.3	0.3	0.3	0.2	0.2	0.2	0.1	0.1	0.2	0.33	0.1
SAMM025	-	0	0	0.1	0.3	0.4	0.6	0.9	0.7	0.2	0	0	0.3	0.00	0.3
SAMM026	0.2	0.3	0.4	0.6	0.6	0.6	0.6	0.5	0.4	-	-	0.3	0.5	0.33	0.2
SAMM027	0.9	0.3	0.3	0.3	0.1	-	-	-	-	-	-	-	0.3	0.20	0.1
SAMM030	1.7	2.4	1.9	1.7	2.6	2	2.1	2.1	2.3	2	1.6	1.9	2	0.62	0.3
SAMM031	1.3	1.6	1.1	1.3	1.3	1.3	1.3	1.5	1.1	1.2	1	1.1	1.3	0.63	0.2
SAMM032	13.7	-	-	21.6	18.3	15.8	16	20.3	19.8	17.4	14.5	18.5	17.2	0.63	2.6
SAMM033	-	-	-	-	-	0.1	1.1	0.5	0.1	-	0.3	0.2	0.5	0.09	0.4
SAMM034	0.3	-	-	1.3	0.8	1.7	1	0.9	0.9	1	0.7	0.7	0.9	0.18	0.4
SAMM035	8.9	8.4	5.3	5.2	4.8	4.2	4.7	4.8	4.6	5	5.4	5.5	5.6	0.47	1.5
SAMM036	1.3	1.1	1.9	1.8	2	1.1	1.4	1.7	1.6	1.8	1.4	2.2	1.6	0.50	0.4
Total	2.7	1.5	1.4	1.7	2.6	2.6	2.7	3.1	2.6	2.6	2.4	2.7			
Mean	2.8	1.6	1.4	2.7	2.7	2.6	3.5	3.1	2.6	2.6	2.3	2.7			

Figure 4 - Average number of passes per hour in each month for the individual counters, with cells coloured red to green for low to high values

2. Variation across hours of the day

	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
SAMM002	3	6	7	7	7	10	8	7	9	8	9	7	4	4	2
SAMM003	0	1	2	5	13	16	12	10	8	8	8	6	5	4	2
SAMM004	1	3	6	7	8	8	9	15	12	7	6	7	5	2	0
SAMM009	1	2	3	7	8	10	8	11	17	11	10	6	4	2	1
SAMM010	3	3	8	7	6	6	6	6	7	8	9	9	9	8	4
SAMM011	1	4	8	10	11	10	8	8	9	10	8	6	4	2	1
SAMM012	0	1	3	8	9	9	9	7	8	8	10	9	8	7	2
SAMM016	1	2	3	4	5	9	15	10	8	7	6	5	4	2	2
SAMM023	1	2	5	7	10	10	10	7	7	9	11	5	4	4	9
SAMM024	0	3	4	8	11	13	9	7	7	9	7	7	5	3	3
SAMM025	2	4	5	8	8	6	6	4	5	6	9	9	12	10	4
SAMM026	0	1	2	4	9	9	8	10	9	11	13	10	6	5	2
SAMM027	1	3	6	7	10	8	9	9	10	10	8	6	3	2	1
SAMM027	1	3	6	7	10	8	9	9	10	10	8	6	3	2	1
SAMM030	0	1	3	7	10	14	15	13	7	7	7	6	4	2	2
SAMM031	1	2	3	6	9	12	13	9	7	6	8	6	7	5	4
SAMM032	0	1	3	6	9	10	10	9	9	10	10	8	5	4	3
SAMM033	0	0	1	1	2	4	9	11	15	21	3	0	5	7	0
SAMM034	0	1	2	3	6	6	8	11	23	12	6	5	4	4	3
SAMM035	0	1	4	9	10	12	10	10	8	8	9	7	5	3	2
SAMM036	0	0	1	2	6	10	13	12	13	13	11	8	4	2	2

Figure 5 - Hourly percentage of passes recorded for the different counters, with cells coloured red to green for low to high values. Percentage based on all recorded passes during the 24 hrs, but only values between 07:00 & 21:00 shown

3. Variation across days of the week

	Mon	Tues	Weds	Thurs	Fri	Sat	Sun	% of passes on weekends	% passes on Sundays
SAMM002	180.0	185.7	174.2	176.6	176	191.8	226.1	32	17
SAMM003	117.8	92.9	105.9	107.2	109.2	181.0	228.8	43	24
SAMM004	36.0	34.9	66.6	39.0	37.0	40.1	36.9	27	13
SAMM009	30.2	25.3	46.1	25.4	32.5	39.4	46.1	35	19
SAMM010	72.6	74.0	69.1	70.2	74.9	87.9	112.0	36	20
SAMM011	473.6	426.3	439.4	432.5	441.8	651.6	850.0	40	23
SAMM012	61.8	64.9	64.2	71.1	65.7	71.4	94.1	34	19
SAMM016	399.4	710.3	500.3	553.0	661.4	531.5	435.5	26	11
SAMM023	161.9	279.0	136.6	151.0	135.6	155.9	220.8	30	18
SAMM024	14.0	11.8	16.5	14.1	16.1	24.5	27.0	42	22
SAMM025	27.5	35.1	29.5	25.2	26.2	30.1	42.0	33	19
SAMM026	43.1	42.7	38.7	36.6	33.0	54.5	69.6	39	22
SAMM027	32.8	31.5	31.5	37.8	26.7	45.6	66.7	41	24
SAMM030	177.0	137.8	146.4	156.0	175.2	248.7	354.3	43	25
SAMM031	73.4	69.2	115.8	93.2	84.1	175.2	250	49	29
SAMM032	1558.9	1428.3	1441.2	1656.7	1484.7	1957	2295.9	36	19
SAMM033	12.3	19.4	55.5	47.6	8.6	26.2	161.1	57	49
SAMM034	98.2	88.4	96.2	107.6	68.1	64.3	93.5	26	15
SAMM035	487.7	546.1	485.2	502.9	442.9	515.3	827.6	35	22
SAMM036	120.8	95.3	80.5	101.8	94.1	194.2	409.3	55	37

Figure 6 - The average number of passes for each day of the week. The percentage of all passes which occur of weekends and Sundays is also shown

4. Conclusions and discussion

The results provide a fascinating overview of the access at the counter locations, and over time it will be possible to look for changes across years. As such the counter network forms an important component in the long-term monitoring of access on the Thames Basin Heaths.

The counter data relate to very specific locations, i.e. single gateways or tracks. Looking across the locations, the counter with highest level of daily passes (by some margin) was one at Horsell Common, around 50m down the track from the main car-park. This is a popular car-park and a busy part of the SPA. Other busy locations, in terms of daily passes, included Lightwater Country Park.

Across all locations, results indicate the use is greatest around midday, but that certain locations exhibit twin peak patterns with greater use late morning and again in late afternoon.

Use was also typically greater at weekends, but this is location specific and a few counters recorded higher values on weekdays.

Variation across the year was interesting for its relevance to the sensitive period from 1st March to 15th September, during which the three SPA bird species are nesting. While it would be expected that use is

much greater in the sensitive period, there was often a lull in use in February-April. This factor, combined with reasonably high access in December-January (likely influenced by Christmas/ New Year's holidays), resulted in an overall similar level of access between the sensitive period and non-sensitive period.

It is important to highlight that results give values for the number of passes recorded and that can be approximation for, but is not directly equivalent to, numbers of people. Counters ideally require calibration, e.g. direct observation, to record how the passes recorded equate to the number of people and how different access is recorded.

The overall reliability of the data is believed to good, and while approximately 9% of data was discarded this was not considered unusual given the issues that can be encountered. The issues were often more apparent in winter, due to the general effects of winter weather. The winter values need to be considered in light of this effect.

Vandalism is an issue, and this may be hard to avoid, and can occur at any time and wipe out all data which has been collected since the previous data download. Measures to minimise impacts on the data, such as regular checks and rapid replacement are recommended.

Networks of counters can provide very useful and detailed data but require considerable input to maintain, check and ensure the information is reliable and useable. The usefulness of the data comes from a consistent, well-maintained network running for a number of years, providing a long-term perspective of change and fluctuations. The data summarised here are the initial results and more data are required to conclude monthly patterns and allow change over time to be picked up. The data collected to date provides a reasonable sample of data at a daily and weekly level, but comparing monthly totals becomes more challenging, and the number of counters where this is possible is limited. The counter network needs to be carefully maintained, regularly checked and allowed to run for longer in order to allow more accurate and detailed comparisons between locations and over time.