

Moon Carrot Survey 2024

(Version PD 20/08/24)

Background

Moon Carrots (*Seseli libanotis*) are white flowered umbellifers that are quite widely distributed across continental Europe, but are only found in a handful of sites in Britain. Since at least 1845 they have been recorded on Seaford Head, where they currently grow close to Hope Gap. The vast majority are on the north facing slope to the west of the Gap (shown in Figure 1). Almost all of the others have been recorded up the hill to the east of the Gap, near the coast path in the areas shown in Figure 3.

Most Moon Carrots are biennial and die after two growing seasons (normally two years), so the number of plants can vary considerably between years. The numbers will be influenced by the success of seed-production and dispersion two years previously, and the quality of subsequent growing conditions. All these factors can be highly variable, especially given the current weather perturbations and the exposed nature of the Hope Gap site.

In order to monitor changes in both the numbers and location of the plants, members of the Seaford Natural History Society started a series of annual surveys in 2013. These continued until 2019, but stopped due to Covid proximity restrictions in 2020. They restarted in 2021.

The surveys take place during the peak flowering season for the Moon Carrots – typically the middle of August. In 2021, 2022 and 2023 the surveys were on August 18th, 15th and 14th. These dates are informed by preliminary visits to check whether there are stable numbers in several test areas.

Flowers were appearing early in 2024 and the count took place on August 5th after preliminary visits had established that numbers were stable.

Survey methods and results

Two different approaches are used in the surveying.

1. Plants on the main slope are counted in strips whenever possible, and the strip totals are combined to give estimates for three larger blocks, shown in Figure 1.
2. The smaller numbers in Hope Bottom, and on the cliff tops to the east, are recorded individually.

Surveying on the main slope

Seven people from the Natural History Society surveyed the main slope in 2024. We covered an area that was approximately 140m long: from the fence that goes to the Hope Gap steps, up to a point 10m beyond a “cliff edge” sign.

In previous years we have counted the number of flowering plants in the Main East and Centre Blocks of the main slope in a series of N-S strips. These were approximately 2-3m

wide and went from the coast path up to the cliff edge. For safety reasons, plants within 10m of the edge were counted at a distance. However, due to increasing scrub in the Central area, we were only able to use this method for Main East and the approach in Main Centre was more ad hoc. The approximate layout of the 2024 count across the slope is sketched in Figure 2, where it can be seen that the far eastern end of Main East was counted in two small blocks rather than strips.

Figure 1 The Main Slope and the three reporting areas – picture from August 2022

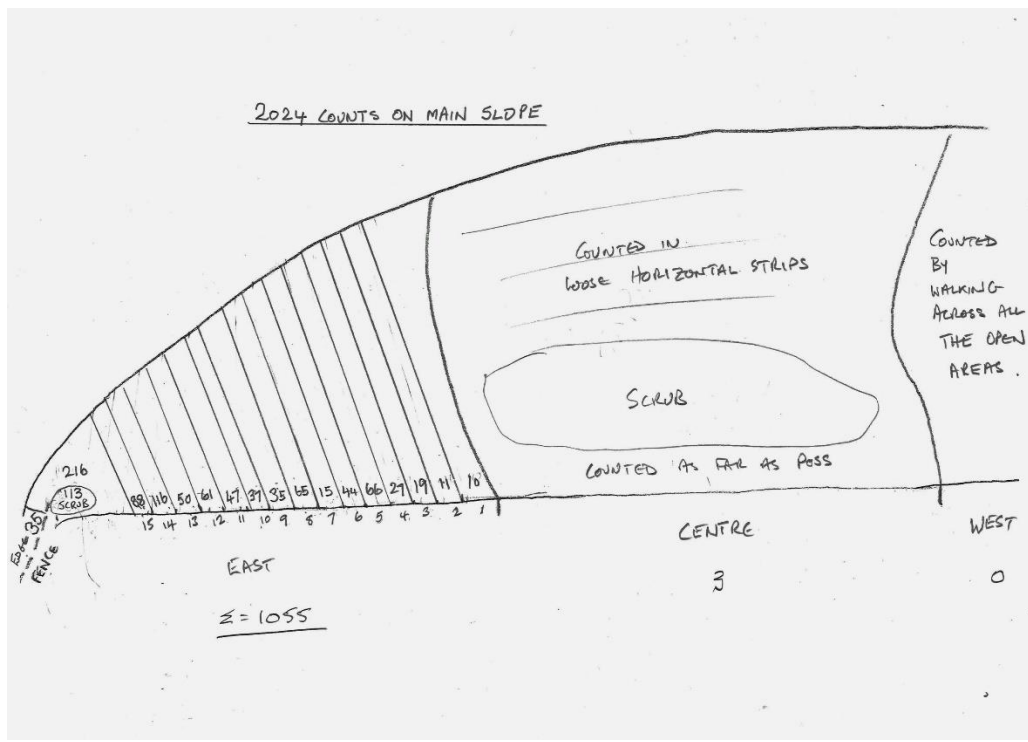


The increasing density of scrub meant it was also impossible to strip count the Main West block (west of easting 50870) and, as in 2023 and 2022, this part of the main slope was also done on an ad hoc basis – with several surveyors covering any ground not obscured by scrub.

The three blocks used since 2019 to present the main slope results are as follows.

- Main East is the section of mostly much shorter grass to the east of the obvious N-S track up the cliff. Its western end is at easting 50902.
- Main Centre is an area of mostly Tor Grass, with some substantial patches of bramble. It starts at the track where Main East finishes and ends at a path that goes up from the main valley track, starting at easting 50870. This path used to go directly up the hillside (as in Figure 1 – taken in 2022), but it now veers to the east. We have tried to keep to the original boundary by following the traces of the old path which are now barely visible on the ground. Figure A.2 in Appendix 1 shows both the current path and the boundary used in the survey, approximating to the older path.
- Main West starts at the western boundary of Main Centre and continues west for about 60m, finishing approximately 10m beyond the first “cliff edge” sign (at 50808 east). Although a few plants were seen this area in 2013, by 2016 much of it was impenetrable due to scrub encroachment, and was not surveyed from 2016-2018. Following scrub clearance, limited surveying re-started in 2019.

Figure 2 Strips and other areas used in the 2024 Main Slope counts



The 2022 report gives more details of how these three areas correspond to the narrower transects used in the pre-2019 reporting. Because some of these earlier transects crossed the current boundaries, there could be some imprecision in assigning their counts to the three blocks currently used to present the results in Table 1. Moreover, the methodology for surveying the main slope, designed from the outset to be simple and easy to repeat, also runs the risk of introducing imprecision into the counts: not least by the miscounting of multiple flower heads. So, we need to be very cautious about drawing conclusions from small differences in the absolute numbers – and regard them more as orders of magnitude.

Section	Number of plants										
	2013	2014	2015	2016	2017	2018	2019	2021	2022	2023	2024
Main East	338	274	1113	835	1091	2330	3536	5353	3216	3952	1055
Main Centre	470	261	1011	412	355	543	348	1691	416	227	3
Main West	94	59	48	22	6	1	0	23	8	33	0
Total	902	594	2172	1269	1452	2874	3884	7067	3640	4212	1058
% in East	37	46	51	66	75	81	91	75.7	88.4	93.8	99.7
% in Centre	52	44	47	32	24	19	9	23.9	11.4	5.4	0.3
% in West	10	10	2	2	0	0	0	0.3	0.2	0.8	0

Results from the main slope (Table 1):

- Combined figures for all three parts of the main slope.
Since the start of the surveys, the total number of plants recorded on the main slope has varied from 600 to 7000, but trying to identify any recent trend is complicated by the lack of data for 2020 and the sudden increase in numbers in 2021. The peak in 2021 might have led us to expect high numbers in 2023, but there is an argument that growing conditions in 2021 were exceptional, and we should only expect similar numbers if these conditions were repeated. With the exception of 2021, we have seen some recent stability, with the 2019, 2022 and 2023 counts all in the range 3600-4200). But the count in 2024 (1058) was less than a third of these figures and closer to the numbers recorded in 2013, 2016 and 2017.
- Totals for the Main East and Central blocks:
Without wanting to over-interpret the figures, the percentage of the main slope total in the Central block has been falling since the surveys started: from around 40-50% in 2013-5, to 20-30% in 2016-2021 (9% in 2019), and down to 11% in 2022, 5% in 2023 and 0.3% in 2024. This may be due to the increasing density of Tor Grass in the central area and some increase in the size of the scrub patches.
- Counts for the Western block
In the first 3 years of the survey (2013-2015) the Western block counts were 98, 59 and 48. Although there have been subsequent sightings of 20-30 plants, these have all been at the eastern end of the Western block and the problem of locating the boundary track could mean that some of these should have been assigned to the Centre. In any event, the Western block counts for 2021, 2022 and 2023 suggest that Moon Carrots are nearly lost from this area. And we saw no plants here in 2024.

Surveying the Satellite sites

Because of their smaller numbers, the Moon Carrots in the satellite sites east of Hope Gap (and a few in Hope Bottom) can be surveyed more precisely than those on the main slope. In these areas, individual plants and their locations (grid references) are recorded. Two people were involved in the 2024 satellite area counts – which took place on more than one day.

Surveying the cliff top satellites

The areas in which most of the “satellite” plants have been seen begin at the top of the slope going east from Hope Gap. They are shown in Figure 3 (taken from Chris Brewer's 2019 report). In his 2018 report he noted that Satellite 1 had been present since the start of the surveys and that a second area further east (Satellite 2) was first seen in 2017 and had expanded by 2018. By 2019, Satellite 2 had extended eastwards into Satellite 3 and many more plants were recorded. There were also 3 isolated plants north of the main coast path in satellite 4. In 2021 we found a similar distribution of plants on the cliff top sites, including 16

plants in Sat 4. In 2021 we also saw a single plant further east and inland at TV51192 97517. The counts for all these Satellites are in Table 2.

Figure 3 Plan of the 4 cliff top satellite areas in 2019



We do not know the numbers in 2020 because there was no survey, but two years later we could only find 3 plants in this entire area, despite revisiting the site on several occasions. All 3 were in Sat 3. Numbers were higher in 2023, but still far below the figures for 2019 and 2021.

	2013	2014	2015	2016	2017	2018	2019	2021	2022	2023	2024
Sat 1	4	8	8	9	6	13	30	77	0	26	19
Sat 2					25	64	164		0	8	3
Sat 3							145	129	3	10(a)	4
Sat 4							3			2(b)	5(b)
Total	4	8	8	9	31	77	342	206	3	46	26

Notes: (a) One of these 10 was much further east – beyond the second bench. (b) These were at the top of the slope, inland of the main path, to the west of area 4 on the plan.

In advance of the 2023 survey, we had hoped that the collapse in 2022 would not be repeated, and that the offspring of the 206 plants seen in 2021 would revive the numbers. In the event, we recorded only 46 in 2023. The numbers were lower in 2024 but the distribution was broadly similar – with the greatest numbers on the seaward side of the coast path, where the fencing ends at the top of the slope from Hope Bottom.

At present we are seeing no signs of a return to the higher numbers recorded in these cliff-top satellites in 2019 and 2021, which had suggested that a more substantial colony might be becoming established in the east.

Surveying the satellites in Hope Bottom and along the scrub edge looking down from the east on Hope Bottom.

In addition to the plants recorded in satellite areas 1-4, small numbers have been seen along the edge of the eastern scrub above Hope Bottom and in the flattish area facing the main slope where the paths converge in the centre of Hope Bottom.

Plants inland of the coast path (going east) near the top of the slope out of Hope Bottom

In 2024 five plants were recorded on the scrub edge, inland of the coast path, just before the path reaches the top of the slope out of Hope Bottom. These are included in the table of counts for satellite 4 although they are just beyond the western end of the area marked as 4 on the plan.

Also in 2024, a further 4 plants were seen further inland along the upper scrub edge that curves round to look down on Hope Bottom.

Plants in the floor of Hope Bottom

Since the start of the surveys, we have recorded a few plants in the central part of the floor of Hope Bottom. The 2021 survey was exceptional in finding 58 plants around the grass and scrub margins where several paths converge. Small numbers had previously been recorded in Hope Bottom: there are certainly sightings from 2018 and 2019, but we could not find specific details when compiling the 2021 report, and had to assume that they had also been included in the main slope totals. In 2022 we found no plants in any of these areas. Four plants were recorded in 2023: one at TV 50918 97387 and three at TV 50901 97401. Two were seen in this central area in 2024: both close to TV 50935 97386.

Summary and Conclusions

It is worth repeating that the survey method was designed to be relatively easy to implement, but not intended to give meaningful quantitative data, only at orders of magnitude. Factors likely to introduce imprecision into the counts – especially on the main slope – include: the layout of the strips/transects, the accuracy and consistency of recording grid references, and the experience of the surveyors (including the extent to which they can identify Moon Carrots and ensure they are counting plants not flower heads).

Although the timing of the surveys will also be important, the preliminary monitoring helps ensure that counts take place when numbers are stable.

Interpretation of the resulting counts has to be very circumspect, as there are many short-term factors that may influence the number of plants. These include:

- Weather influences on Moon Carrot seed dispersion, germination and plant development.

- Factors that influence the growth of surrounding and encroaching vegetation, which could lead to the further development of coarse grasses, low scrub, and plants such as Yarrow that might overwhelm the Moon Carrots, or hide them so they are less likely to be recorded.
- Habitat management, both planned and unplanned – the latter being mainly the extent of rabbit grazing.
- Increasing visitor numbers in Hope Bottom and on the eastern end of the main slope.

The 2023 report tried, albeit very speculatively, to account for the recent variations in the numbers by referring to some of the above. This report is more circumspect and just presents the figures.

- The total sightings on the Main Slope were substantially (approximately 66% lower than in recent years) and closer to those of a decade ago.
- Only 3 plants were recorded in the Central Block of the slope – which is by far the lowest figure since the surveys started. The second lowest was 227 in 2023. But since the Central sightings have recently accounted for no more than 25% of the Main Slope total, the fall in the slope total cannot simply be due to reduced numbers in the Centre.
- Despite there having been some clearance in the Western Block of the Main slope, we found no plants here in 2024.
- Given the biennial cycle of the species, it was mildly encouraging that the near absence of plants in the satellite areas in 2022 was not repeated in 2024, though the counts were still much lower than the peaks in 2019 and 2021.

Appendix 1

Figure A.1 The Main Slope and the three reporting areas – picture from August 2022



Figure A.2 The Main Slope in August 2024

Taken from a slightly different position (further east) with a longer focal length lens than the 2022 picture. This explains the smaller coverage and the different orientation of the Centre-West boundary.

Note the expansion of both the scrub blocks in the central and western areas.

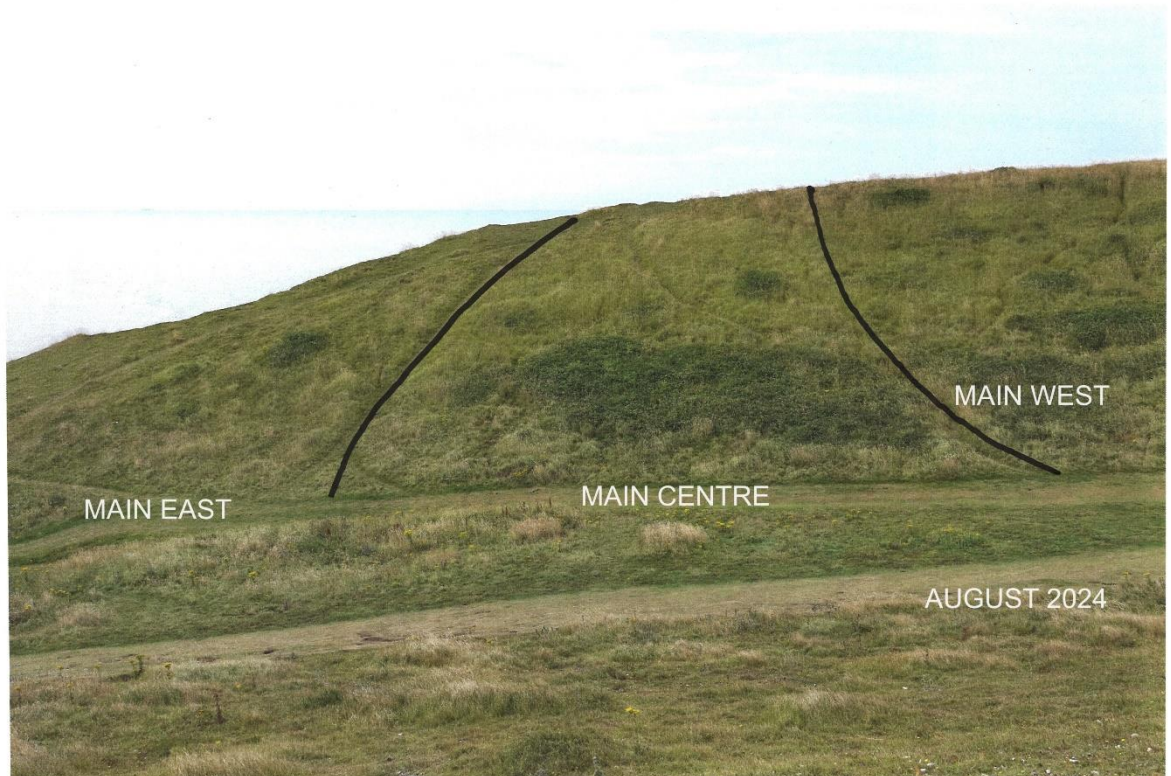


Figure A.3 Scrub areas near the seat at the eastern end of the Main East area of the slope (2024)

