

# Surveys of Pyramidal and Other Orchids on Roadside Verges around Hinksey Hill Interchange, Oxford, 2012 – 2020

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## Summary

Michael Bloom, a member of the Abingdon Naturalists Society, presents a thorough and detailed report on the orchid displays around the Hinksey Hill Interchange which have given pleasure to bus passengers travelling to and from Oxford and to passing motorists, as well as being of conservation importance.

## Introduction

Hinksey Hill Interchange is the large roundabout at the junction of the Oxford Ring Road (A423), the A34 and Hinksey Hill. The surveys were prompted by observations (from buses between Abingdon and Oxford) of the abundance notably of Pyramidal Orchid *Anacamptis pyramidalis* on the grass verges on and around the roundabout. In fact, orchids were first reported on the Hinksey Hill roundabout itself in 2000, this then being the only site for them on the Oxford Ring Road (Jackson-Houlston 2000). The mowing regime of these verges, which affected the flowering and seed setting of the orchids, was also observed and, in particular, the early mowing of part of the area in 2012, which led to no flowers there that year. This stimulated the first survey of the whole area to ascertain how many orchids were there in the different zones. These surveys became an annual feature and were carried out every year since then until COVID-19 prevented a full 2020 survey. The Ashmolean Natural History Society of Oxford (ANHSO) has had a Verge Survey Group since the 1980s, and one of its members (Caroline Jackson-Houlston) assisted in some of the surveys.

## Scope

Surveys took place between late June and mid-July each year depending on peak flowering times commencing in 2012 and covered the verges shown in figure 1.



**Figure 1. Map of Areas Surveyed (The area colours match the colours of the bars in Figure 2 below)**

The areas are:

- The small triangle dividing the carriageways at the foot of Hinksey Hill (HHTV).
- The extensive verge on the north east side above Redbridge Hollow. This is divided into an elongated eastern section (RHVE), narrowing to the east, and a smaller western section (RHVW) next to the A34 southbound exit slip road. These two sections are separated by a short footpath.
- The two areas north and south of the roundabout between the slip roads and the cutting in which the A34 runs (SCNV and SCSV respectively). Each area consists of two zones on either side of the A34, data for which has been combined in each case.

Orchids were also seen on the roundabout itself, but with two notable exceptions in 2013 and 2020, it was normally considered too dangerous to attempt to access this area.

From 2017, the verge on the east side of the A4144 Abingdon Road opposite Redbridge Park and Ride (ARV, not shown on the map) was also examined.

The following orchids were included in the survey:

- Pyramidal Orchid *Anacamptis pyramidalis*
- Common Spotted-orchid *Dactylorhiza fuchsii*
- Bee Orchid *Ophrys apifera*

Apart from Pyramidal Orchids the other species were found occasionally at best, although there was an occasional abundance of Common Spotted-orchids in a small area. Each year a count was made of each species in each area and inserted into the map at the appropriate place. A survey report, including other observations, was then produced to accompany the map, and both documents were sent to Oxfordshire County Council (OCC), Thames Valley Environmental Records Centre (TVERC) and Abingdon Naturalists Society (ANS). This article comprises a chronological distillation of the surveys and reports from 2012 to 2020 inclusive, and describes the

changes observed over that period and notable events, including weather conditions and OCC activities, that affected the orchids year by year. For detailed historical weather data, visit the following website:  
<https://www.metoffice.gov.uk/pub/data/weather/uk/climate/stationdata/oxforddata.txt>

## Management by OCC

### Mowing

Area	2012	2013	2014	2015	2016	2017	2018	2019	2020
HHTV	X				X		P		
RHVE	P	X		P		P			X
RHVW				X			X		X

**Table 1. Early Mowing in Areas HHTV, RHVE and RHVW. X = whole area mown before orchid flowering season, P = area partly mown before orchid flowering season**

Since the areas being surveyed are close to major road intersections, OCC are obliged to mow them to ensure that drivers have good visibility of traffic affecting their movements. Having said that, most parts of the areas surveyed (such as RHVE and RHVW) are not between roads and, moreover, the council normally carries out only one mowing of each area per year, and this could be expected to be carried out at a time of maximum vegetation height, normally in late summer. It should therefore be possible to devise a mowing regime which allows plants such as orchids to flower and disperse their seeds. As can be seen from the table above, mowing over the nine years of the survey has been haphazard, with no regular pattern as to which areas are mown at which season. This does not indicate any clear priorities on the part of OCC as to which areas need to be cleared for visibility purposes. No early mowing was observed in the other areas surveyed and on the roundabout itself, and mowing after surveys were carried out each year was not recorded.

At the time of the first survey in 2012, OCC employed an Ecologist Planner, Camilla Burrow, and I contacted her to ask if the mowing regime could be made more orchid-friendly. She was very helpful and, while explaining that mowing was carried out by the Highways Department, offered to facilitate the designation of part of the area as a Roadside Verge Nature Reserve (RVNR). Camilla Burrow left OCC later in 2012 and was replaced by Tamsin Atley who continued the good work. The triangle HHTV was designated a RVNR in that year and the large verge combining RHVE and RHVW was proposed as one also, but this sadly never materialised due to the 2014 roadworks (see next section). Unfortunately, other parts of the area could not be so designated as they were owned by the Highways Agency. OCC sadly had no budget for marker posts so the RVNR had to remain unmarked. Despite this designation, HHTV was mown early in 2012 as mentioned in the Introduction. In later years, all three areas were mown with no regular pattern, and it is unfortunate that orchid flowering was disrupted in this manner, especially with the designation of HHTV as a RVNR, which seems to have been ignored in 2016 and 2018.

## **Translocation of Turves to Outside the Survey Area in Connection with 2014 Roadworks**

In 2014 roadworks were planned in the area and part of the RHVE verge was required for the parking of contractors' vehicles. Prompted at least in part by the raised awareness of the species-rich nature of the land, OCC came up with a scheme to relocate some turves containing orchids and other species to another site so that they would not be damaged. It produced an impressive document entitled 'Hinksey Hill Interchange Grassland Translocation Method Statement' which described the lifting of turf from areas at risk, the donor sites, and transplanting them to a receptor site some distance away. The donor sites were in the narrow, eastern part of RHVE where the contractors were due to park their vehicles, and also a length of verge to the east of the roundabout and south of the A423 that was not included in my survey as very few orchids were ever seen there. The receptor site was on a steep bank between the cycleway and the A423 just west of Kennington Roundabout. OCC writes in its document (with minor editing by myself):

*A Receptor Site south of Kennington Interchange, on the A423, 650m to the east of Hinksey Hill Interchange, has been identified during various site visits between 2012 and 2014. The Receptor Site is approximately 125m<sup>2</sup> in size, and has been selected to match the Donor Sites as much as possible in terms of soil pH, drainage, topsoil depth, and aspect. The Receptor Site was required to be close to the Donor Sites to minimise transportation, and to be within the ownership of Oxfordshire County Council to allow for future maintenance.*

*A verge to the south of Kennington Interchange has been selected as the Receptor Site. It is on a south-facing slope of an embankment between the westbound carriageway of the A423 and a footpath/cycleway that runs parallel to the by-pass. The Receptor site is currently covered with low bramble scrub, ruderal plants and scattered saplings.*

*All scrub will be removed from the Receptor Site. Scrub will be cut to ground level. The topsoil at the Receptor Site will be removed using an excavator to expose the subsoil. This topsoil is no longer required and will be removed from the site. Topsoil removal should be conducted when ground conditions are not too wet and care must be taken to avoid unwanted compaction or damage to the subsoil.*

*The exposed subsoil will be inspected by the ecologist to determine its condition and characteristics and to inform a decision on the depth of turves to be taken from the Donor Sites (i.e. if there is a need for additional subsoil to be taken with the turves from the Donor Sites).*

Later it adds:

*Following the translocation, the Receptor Site will be managed for a period of five years. This management will include maintenance and monitoring tasks and will be the responsibility of Oxfordshire County Council.*

*The objective of the aftercare management will be to ensure successful establishment and maintain the extent of the species-rich grassland within the Receptor Site with no deterioration in biodiversity value. The biodiversity value will be measured by the presence of 12 key species typical of semi-improved species-rich grassland that are all present at the Donor Sites prior to translocation. These are:*

Agrimony	<i>Agrimonia eupatoria</i>
Bird's-foot-trefoil	<i>Lotus corniculatus</i>
Black Medick	<i>Medicago lupulina</i>
Common Knapweed	<i>Centaurea nigra</i>
Oxeye Daisy	<i>Leucanthemum vulgare</i>
Pyramidal Orchid	<i>Anacamptis pyramidalis</i>
Red Clover	<i>Trifolium pratense</i>
Ribwort Plantain	<i>Plantago lanceolata</i>
Rough Hawkbit	<i>Leontodon hispidus</i>
Selfheal	<i>Prunella vulgaris</i>
Perforate St John's-wort	<i>Hypericum perforatum</i>
Yarrow	<i>Achillea millefolium</i>

*In order to ensure the objective of management is met, the natural transition of grassland to scrub (succession) will need to be managed. The primary method of controlling succession is through regular mowing. There may also be, at first, vigorous growth of ruderal species that are capitalising on the release of nutrients from the soil following disturbance during the translocation. These species will also be controlled by mowing and the removal of cuttings after mowing will help maintain low levels of nutrients in the soil which benefits the key species. In order to allow the key species to flower and set seed, mowing will be carried out once a year in August or September.*

*In order to allow key species to flourish, undesirable invasive weed species must be controlled. Although mowing may keep bramble in check, other invasive species may require control measures, such as herbicide. The following species are native invasive or weed species that require control if within the Receptor Site:*

Spear Thistle	<i>Cirsium vulgare</i>
Creeping Thistle	<i>Cirsium arvense</i>
Ragwort	<i>Senecio jacobaea</i>
Broad-leaved Dock	<i>Rumex obtusifolius</i>
Curled Dock	<i>Rumex crispus</i>
Common Nettle	<i>Urtica dioica</i>
Bramble	<i>Rubus fruticosus</i>

*The 12 key species mentioned above, currently present at the Donor Sites, will be the key species for measuring the biodiversity value at the Receptor Site during establishment.*

I have received no evidence that any management of the receptor site in subsequent years was carried out, or that any associated documents were produced. I monitored the site myself and in 2015, after a year, there were very few orchids in the receptor site. These could indeed have been there from before the translocation; it was not possible to discern the exact positions of the planted turves as their edges had become obscured by growth of surrounding vegetation. The grass was coarse and vigorous and seemed unsuitable for more than the sporadic orchid presence found. However, the pyramidal orchids in the donor sites returned in later years, as did those in other disturbed areas of the verge from which no turf had been taken. It is quite possible therefore that the depth of the donor turf was not sufficient to reach the orchid's tuberous roots, but the results also indicate the resilience of the plants to disturbance and their ability to come back where the habitat is suitable. Orchids were noted as being very susceptible to disturbance due to the symbiotic fungal mycorrhiza that they require for growth and development (Jackson-Houlston 2000), and it is possible that

the fungal mycelium was not transferred, or not in sufficient quantities, from the donor to the receptor sites for the orchids to re-establish themselves. At least the OCC project showed that they were thinking along the right lines in 2014. In view of the poor display at the receptor site, and the fact that this was not one of the areas being regularly surveyed, management of it by OCC was not followed up later by me.

## **Scrub and Coarse Vegetation Encroachment**

Growth of both scrub and coarse vegetation increased markedly over the years of the surveys, particularly on the triangle HHTV and the A34 verges SCNV and SCSV. The eastern side of SCNV was particularly affected. Species included Hawthorn *Crataegus* probably *monogyna* dominant on SCNV, and Bramble *Rubus fruticosus* agg. and Ragwort *Senecio jacobaea* dominant on HHTV. On SCNV, Pyramidal Orchids continued to flourish quite well under the bushes, but on HHTV numbers diminished as the vegetation encroached and very few were seen amongst the coarser plants. Most of those that were present had small or very small spikes.

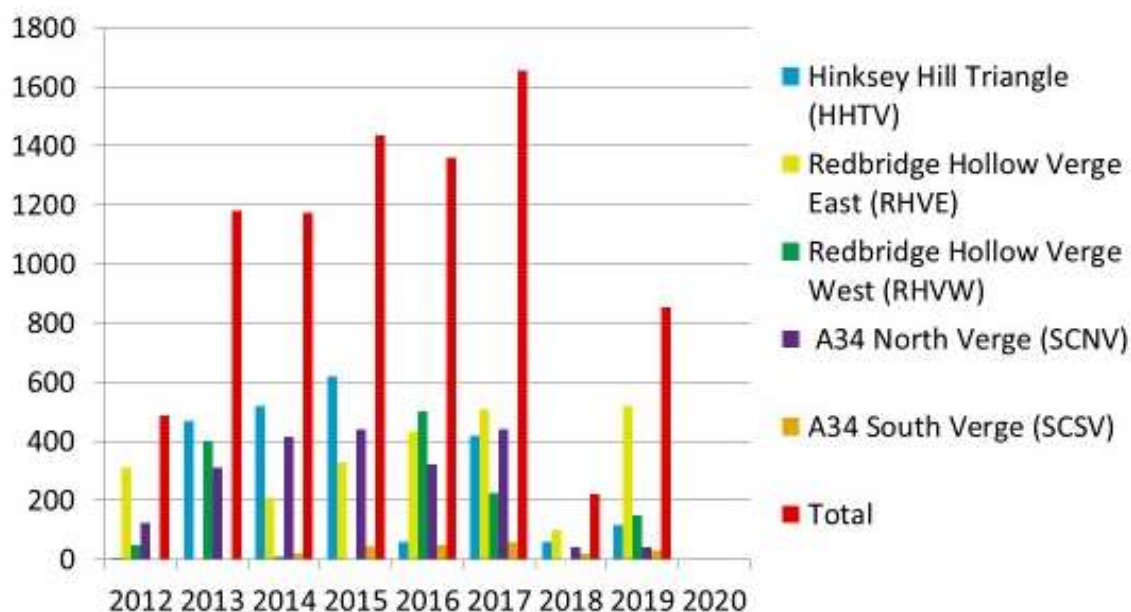
## **Future Management**

At the time of writing OCC has a new Ecologist, Sarah Postlethwaite, and it may be hoped that liaison with her and with the Highways Department will lead to a favourable mowing regime in future years. OCC was approached in earlier years regarding scrub and coarse vegetation clearance but no responses were received – presumably on SCNV at least, it is not necessary to improve visibility, and it may well not have a budget for this non-essential work, however environmentally friendly it may be. Also, any management of the translocation receptor sites that may have been carried out by OCC post-2014 could be followed up in retrospect with the new Ecologist, which would show that interest in the area remains.

## **Pyramidal Orchid Surveys, 2012 - 2020**

It has been noted for some years that there is a good Pyramidal Orchid display in the area under discussion (they were noted in 2000 as mentioned in the Introduction (Jackson-Houlston 2000)). They first came to my attention in 2011, when I noted that, while there was a good Pyramidal Orchid display on these verges, mowing by OCC was often carried out soon after flowering, preventing the orchids from setting seeds. Orchid seeds are very small and wind-dispersed so this would have affected colonisation of this and new areas. In some years, mowing took place before flowering so that an anticipated display did not materialise. As stated above, the first survey in 2012 was stimulated by the early mowing of HHTV (and partial early mowing of RHVE) that year, but a reasonable count in other areas (Figure 2) encouraged a further survey in 2013, when RHVE was again mown early. The leader of the ANHSO Roadside Verge Survey Group, Caroline Jackson-Houlston, assisted with the survey that year, even rising very early one morning in order to cross to the roundabout itself when traffic was very light, and recorded 175 Pyramidal Orchid spikes there. HHTV had recovered by then and figures in other areas led to a greatly increased overall total (Figure 2).

# Pyramidal Orchids



**Figure 2. Pyramidal Orchid Totals by Area and Overall Totals, 2012-2020**

The disruption by roadworks in 2014 has been described above, but positive features that year were an absence of early mowing and several very large spikes of Pyramidal Orchids, particularly on the triangle HHTV. The longest of these was 10cm. in length – should it be called a cylindrical rather than a Pyramidal Orchid? (Figure 3) Also, a pale form of Pyramidal Orchid was recorded in RHVE (Figure 4).



**Figure 3. 10 cm. spike (2<sup>nd</sup> from R.), HHTV, 2014**



**Figure 4. Pale Spike, RHVE, 2014**

In 2015 the number of Pyramidal Orchid spikes continued to increase and become denser, especially in HHTV (Figures 5 and 6). Although there were many smaller spikes, this area recorded its highest ever annual total of 620, ample justification for the RVNR designation. Area SCNV recorded some very large spikes in 2015 (Figure 7). Area RHVW was unfortunately mown early in 2015, as was part of RHVE, and recorded no orchids. However, after four years of surveying it was noted that the orchids seemed to recover well from mowing in due course. Early mowing has to be undesirable though, as it probably affects the long-term survival of the species in respect of seed dispersal and replenishment of the tuberous roots, as well as preventing the floral display that many people must admire as they pass.



**Figure 5. General View of HHTV, 2015**



**Figure 6. Dense Spikes, HHTV, 2015**



**Figure 7. Large Spikes, SCNV, 2015**

In 2016, area RHVW was not mown early and recorded around 500 spikes, indicating a good recovery. RHVE also recorded a high number (432) giving the highest combined total for the two parts of this zone (932). However, the triangle HHTV was mown early despite having been designated a RVNR, and this severely reduced the count in this area from over 600 in 2015 to 59 in 2016. Another interesting feature



was the discovery of two pure white specimens of Pyramidal Orchid in the western section of SCNV, although scrub had increased here (Figures 8 and 9). The high number in RHVE included a rare pink spike (Figure 10). Colour variation has in fact been noted over the years, including various shades of pink as well as pure white, but these forms have not been consistently found year on year.



**Figure 8. General View of SCNV, 2016**



**Figure 9. Encroaching Scrub, SCNV, 2016**



**Figure 10. Pink Spike, RHVE, 2016**

2017 saw a maintaining of high numbers in RHVE (over 500), despite a small part of it being mown early at the east end which always supported fewer orchids. However, RHVW reduced to less than half the 2016 figure (225). Despite increasing scrub (mainly hawthorn) encroachment, SCNV also did well recording over 400 spikes. They seemed to be happy growing between and even under the bushes, although many of the spikes were very small. HHTV recovered from the low numbers of 2016, recording 441. SCSV has not been mentioned to date; this was fairly consistent although low in numbers, recording 30-50 year by year, and had its maximum of 60 spikes in 2017. For the first time the ARV verge was also inspected. From the traffic lights at the junction with the Old Abingdon Road to the A423 roundabout about 200+ Pyramidal Orchids were found plus, notably, a bee orchid and a couple of common spotted orchids. The Pyramidal Orchids were to be found in clumps and sporadic areas. Interestingly there were a considerable number of specimens in deep shade under pine trees, particularly towards the southern end of the verge, where the soil must have been very dry, an interesting and unusual habitat for a plant normally found in areas open to full sun (Figures 11 and 12).



**Figure 11. General View of ARV, 2017**



**Figure 12. Orchids Under Pine Trees, ARV, 2017**

In 2018 there was a long, hot, dry spell leading up to the flowering season, and this, combined with my absence abroad leading to a late survey, understandably resulted in very low numbers being recorded throughout the area. Also, all of RHVW and part of HHTV were mown early once again, and the remainder of HHTV, on the south side, was now covered with impenetrable scrub and only 30 Pyramidal Orchids were seen in amongst the brambles, ragwort etc. Another factor was that, after a warm wet spring, the grass and other vegetation was unusually tall (up to 150 cm.) and rampant this year, making it difficult to see the orchid spikes. It may also have been that the hot dry weather and competition from other vegetation caused many spikes to remain undeveloped, as it is difficult to imagine that the plants would not have attempted to flower as normal. In ARV, only one small patch of Pyramidal Orchid spikes was found, directly opposite the Park and Ride, otherwise, like the rest of the surveyed area, this verge was very poor in 2018.

2019 saw a marked recovery with no early mowing; RHVE recorded its highest ever total of 520 Pyramidal Orchid spikes, including one white one (Figure 13). RHVW was however down at only 150. SCNV was also very low at only 41, and HHTV had only partially recovered at 115. A marked increase in the low-growing bramble and ragwort encroachment on the south side was noted here (Figure 14) and this reduced the area available for orchids. An increase in scrub was also noted in SCNV, probably accounting for the low numbers. The hot, dry summer weather now being experienced may be partly responsible, since scrub bushes have deeper roots and are thus able to make better use of such water as there is than smaller herbaceous plants. The area ARV recovered markedly from 2018 and did extremely well in 2019. Along the full length of the verge as defined in 2017 there were 900-1000 Pyramidal Orchid spikes in all, mainly in two large patches with many more scattered throughout the area. Notably there were once again a considerable number under the pine and other trees towards the southern end of the zone. There was no early mowing in 2019.



**Figure 13. White Pyramidal Orchid, RHVE, 2019**



**Figure 14. Encroaching Ragwort and Scrub, HHTV looking south, 2019**

In 2020 no survey was carried out due to the COVID-19 pandemic. However, Caroline Jackson-Houlston and Sally Gillard communicated some observations. The whole of RHVE and RHVW had been mown just before the flowering season and no orchids were seen here at all. C J-H managed to get on to the roundabout itself; part of it had already been mown, and there was a lot of shrub growth in the central area. However, she counted at least 34 rather scrawny flowering spikes of Pyramidal Orchid in the southern section of the verge. No orchids were seen in HHTV and it is now almost entirely covered with brambles, ragwort and other coarse vegetation. The best area in 2020 was ARV where several good clumps with large spikes were seen.

### **Other Orchids**

A smattering of Common Spotted-orchids was recorded in amongst the Pyramidal Orchids between 2013 and 2020 every year except 2018. (They may well have been over when the survey was eventually carried out.) They were on RHVE, SCNV

eastern side where they seemed to do well under the hawthorn scrub, and HHTV (Figure 15). In 2020, 12 spikes were seen on the roundabout itself. The maximum total for any one year was in 2014 when 19 were recorded, including 15 on SCNV. Total numbers fluctuated between eight and 19 over the period. In 2014 a white spike was seen on HHTV (Figure 16).



**Figure 15. Common Spotted Orchid, SCNV, 2019**



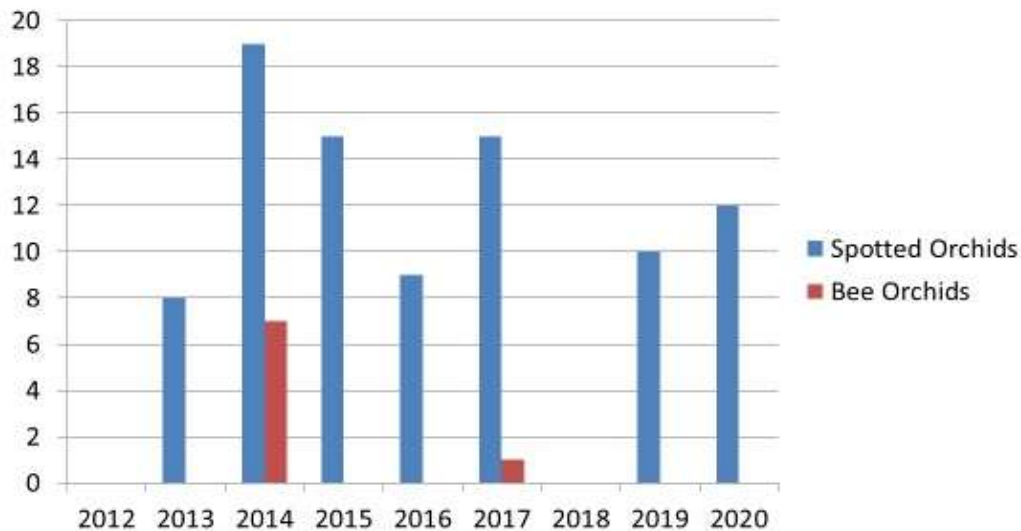
**Figure 16. White Spotted orchid, HHTV, 2014**

Also in 2014, seven spikes of Bee Orchid were seen on HHTV (Figure 17), but sadly they did not recur in subsequent years. One spike of this species was seen on ARV in 2017; it also was not seen again. See the totals chart for these two species, Figure 18.



**Figure 17. Bee Orchid, HHTV, 2014**

## Spotted and Bee Orchids (Totals)



NOTE: The 2017 Bee Orchid was by Abingdon Road opposite Redbridge Park & Ride (ARV)  
The 2020 Spotted Orchids were on the roundabout itself

**Figure 18. Spotted and Bee Orchid Totals, 2012-2020**

### Conclusions

1. Until 2017 there was a general trend towards increasing numbers of Pyramidal Orchids year by year, but since then numbers have declined especially on RHVE, RHVW, HHTV and SCNV. This has been mainly due to mowing on RHVE and RHVW, and encroaching hawthorn and bramble scrub and coarse vegetation such as ragwort on HHTV and SCNV. Other adverse factors since 2017 have been periods of hot weather and the health-related restrictions in 2020. See the totals chart, Figure 2.
2. Pyramidal Orchids seem to recover well after mowing. This leaves the tubers intact in the ground and the plants may benefit from a rest year. However, mowing does affect both the attractive flowering and also seed dispersal to the same and other sites. It also weakens the plants as the removal of the leaves decreases photosynthesis and thereby adversely affects the size of the tubers for the following year.
3. High density of plants and the presence of nearby tall coarse vegetation and scrub reduce the size of the spikes. The largest spikes were always found in open grassland.
4. Disturbance of the ground, such as happened during the 2014 road works, may have helped to provide bare ground for seed germination. Pyramidal Orchids are known as colonisers of bare ground. This may explain some of the increase in numbers on the affected sites in subsequent years.
5. The designation of HHTV as a RVNR may have helped to preserve the orchids, although it did not prevent early mowing of the site in 2016 and 2018. The encroaching coarse vegetation makes the future quality of the site as a nature

reserve questionable, and it would be very helpful if scrub clearance could be carried out here to encourage the orchids and other grassland plants. Other areas that would benefit from clearance are SCNV and the roundabout itself. It would indeed be beneficial if the whole site could be designated a RVNR, especially the orchid-rich areas of RHVE, RHVW and SCNV. This may also lead to a more favourable mowing regime. Negotiations have been initiated with OCC to these ends, and it can only be hoped that they will be successful (see “Future Management” under “Management by OCC” above).

The botanical conservation organisation ‘Plantlife’ has produced a publication 'Managing Grassland Road Verges' (Bromley et. al. 2019) which mentions Pyramidal Orchids a few times, particularly in connection with the colonisation of bare ground, and also suggests a number of mowing and other management regimes. It may well be of interest to readers and anyone liaising with local government and other organisations regarding this subject.

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[https://www.plantlife.org.uk/application/files/3315/7063/5411/Managing\\_grassland\\_road\\_verges\\_Singles.pdf](https://www.plantlife.org.uk/application/files/3315/7063/5411/Managing_grassland_road_verges_Singles.pdf)

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