

Changing flora of Devil's Hole, Ravenmeols – 2025 update

Philip H. Smith, January 2026

Summary

The 'Devil's Hole' consists of two large active dune blowouts that originated in the early 1940s at Ravenmeols Local Nature Reserve on the Sefton Coast, north Merseyside. Wind erosion produced two calcareous, seasonally-flooded, dune slacks (north and south) that are still growing. Their floristic development was studied between 2004 and 2025, with annual changes being monitored from 2012. By 2025, 200 vascular plants had been recorded, annual totals showing a tendency to level off after about 2015 and then start to decline, following a 'hump-back' model that describes a typical trend of species-richness during ecological succession. Forty-two regionally or nationally notable taxa were listed (21% of the total), while only 18 (9%) of the plants were non-native, this low figure being attributed to the distance of the site from gardens. Particular features of the slacks include large populations of the 'Red-listed' *Parnassia palustris* (Grass-of-Parnassus), *Dactylorhiza incarnata* subsp. *coccinea* (Early Marsh-orchid) and *Epipactis palustris* (Marsh Helleborine). Older parts of the two slacks were densely colonised by 15 taxa of *Salix* (willow), including over 100 bushes of the 'Nationally Rare' hybrid *Salix* × *friesiana*. Analyses of fixed-point quadrats recorded in the northern slack in 2014, 2019 and 2025 provided accordance with UK National Vegetation Classification (NVC) communities of calcareous dune slacks.

The site supported breeding Natterjack Toad (*Epidalea calamita*) in wet years and a rich diversity of insects, including the Red-listed Northern Dune Tiger Beetle (*Cicindela hybrida*) and a solitary bee Early Colletes (*Colletes cunicularius*).

Introduction

Devil's Hole (National Grid Reference SD278054) consists of two large active blowouts in the Ravenmeols Sandhills Local Nature Reserve on the Sefton Coast, north Merseyside. Formerly owned by Sefton Metropolitan Borough Council, the land was transferred to the ownership of the National Trust on 15th September 2017. Initiated in the early 1940s by World War II military activity, most likely a bomb explosion, the Devil's Hole is considered to be the largest feature of this type in Britain (Fig. 1) and has attracted international interest as a site for the study of the

effects of wind-flow on sand movement. It consists of two steep-sided troughs, the northern being by far the larger, together with a depositional lobe to the east which is inundating a block of conifers planted between 1905 and 1910 (Gresswell, 1953). Previously a bare sand basin (Figs. 2, 3), by the early-1990s the northern blowout reached the water-table, producing a secondary dune slack that floods in wet winters (Smith, 2017) (Figs. 4, 5).



Figure 1. Devil's Hole in 2010 (Bing 3D maps), showing an early stage in slack formation



Figure 2. Monochrome photograph of the Devil's Hole in about 1970 looking south



Figure 3. Aerial photograph of the Devil's Hole in 1984 before slack formation began



Figure 4. Devil's Hole northern basin flooded for the first time in 1995, after a wet winter

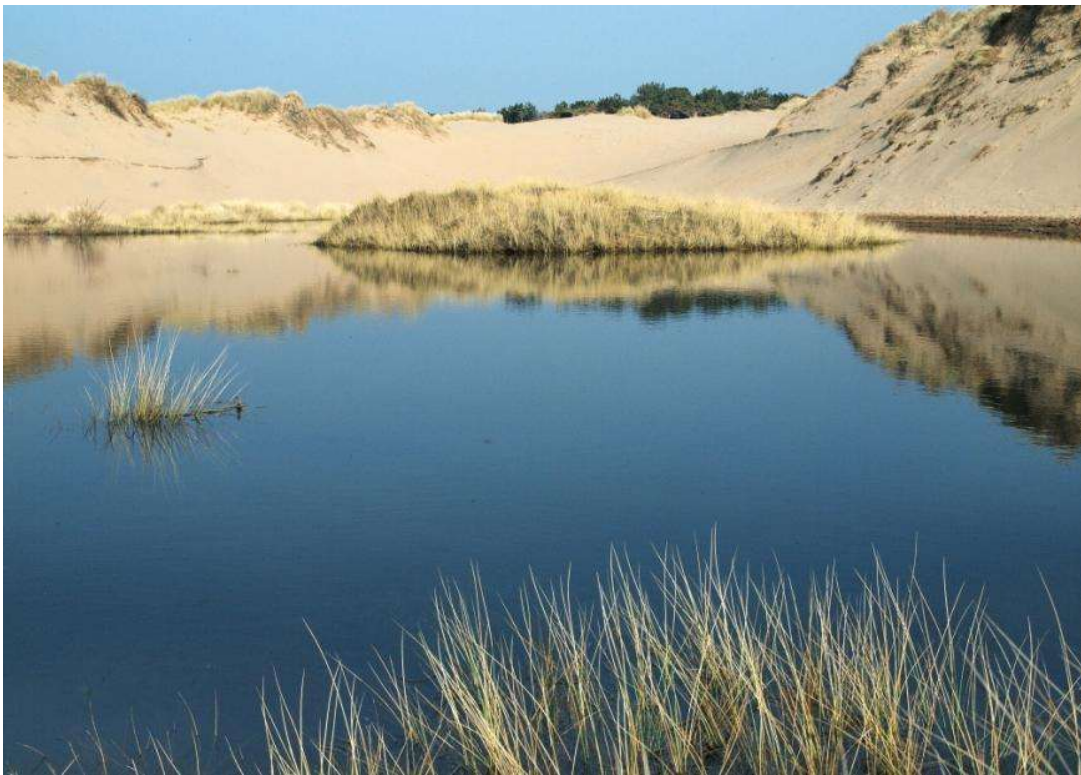


Figure 5. Extensive flooding of Devil's Hole northern basin in March 2013

The structure and early evolution of the blowouts, before colonisation by slack vegetation, were described by Neal & Roberts (2001). Later studies based on aerial photographs and field survey showed that, by 2012, the northern basin was about 320 m long, having grown in length at a linear rate since 1945 and had a maximum width of 90 m, while the southern blowout measured about 125×50 m. The entire site covered an area of over 3.13 ha, though its annual rate of growth had declined linearly since 1960, due in part to landward expansion being slowed by the conifer plantation (O’Keeffe, 2014).

During the 1970s, two small ‘proto-dunes’ began to form around *Ammophila arenaria* (Marram) in what was then a sandy northern basin. These developed into sizeable features, a third one forming to the east in 2008. The two older ones have stabilised to form rounded fixed-dunes. The vegetated area in the floor of the blowouts increased by about 10% per annum since the early 2000s and had an area of 1.05 ha by 2012 (O’Keeffe, 2014). Further sand-blow and slack enlargement have continued. Studies of wind-flow dynamics measured about 4 tonnes of sand moving in the northern blowout during a few days of moderate winds in October 2015 (Delgado-Fernandez *et al.*, 2018) (Fig. 6).



Figure 6. Wind sculpturing during a gale, Devil’s Hole northern basin

Floristics to 2024

Following the breaching of the winter water-table, vegetation began to colonise the larger northern basin in 2003, while plants first appeared in the southern slack in 2008. Smith & Lockwood (2012) recorded only 16 vascular plants in 2004. Twenty years later, 114 taxa were present in the northern slack, while 57 were identified in the southern basin, the cumulative total since recording began being 186 vascular plants (Smith, 2024a). The proportion of non-native taxa was particularly low at 9.1%, this being attributed to the site's distance from gardens (about 600 m). By 2024, as many as 40 regionally or nationally notable species had been recorded in the two slacks (21.5% of the total). The species count increased annually up to about 2015, when numbers levelled off and then began to fall. Lower totals throughout for the southern slack were probably mainly due to its much smaller size (Fig. 1).

Deep flooding in years such as 2013 and 2021 seemed to kill off some plants, including the England Red-list 'Vulnerable' *Parnassia palustris*, which declined to only 1125 individuals in 2013, compared with an estimated 10,000+ the previous summer (Smith & Lockwood, 2012).

In August 2014, nineteen 2 x 2 m quadrats were recorded in five representative slack vegetation types using NVC methodology (Rodwell, 2000). The same quadrats were recorded again in August 2019. Keys and descriptions in Rodwell (2000) showed that the plant communities in 2014 and 2019 were referable to SD13: *Sagina nodosa*-*Bryum pseudotriquetrum* dune-slack and SD14: *Salix repens*-*Campyllum stellatum* dune-slack. Both are relatively rare vegetation types associated with young calcareous dune slacks.

The 2025 survey

As before, visits were made at not less than two-week intervals from spring to autumn to record vascular plants in the two slacks. The year total for the larger northern basin was 119, six more than the previous year, while the southern slack held 67 taxa, an increase of ten on 2024. The combined year total for both sites was 124 taxa (Appendix 1). Since 2015, the data show an overall decline in species-richness for both slacks, especially the southern one, following a 'hump-back' model that describes a trend of species-richness during ecological succession (Isermann, 2011) (Fig. 7). In 2025, 30 regionally or nationally notable plants were recorded in the northern basin (25% of the year total), while 16 (24%) were found in the southern slack. Three new taxa were added to the site species list: *Populus alba* (White Poplar), *Prunus* sp.

(cherry) and *Trifolium micranthum* (Slender Trefoil), all being listed as ‘rare’ in the northern basin. This brings the cumulative total of higher plants identified in the Devil’s Hole slacks since recording began in 2004 to 200 taxa. Forty-two (21%) of the cumulative total are notable, 18 of them Red-listed (Appendix 1). The proportion of non-native taxa remained low at 9% of the cumulative total.

As usual, *Parnassia palustris* was a feature of the vegetation during the late summer with several thousand plants in flower, concentrated on the drier fringes of the slacks. There was also a fine display of the ‘near threatened’ *Epipactis palustris* in June/July. The ‘nationally scarce’ *Pyrola rotundifolia* subsp. *maritima* (Round-leaved Wintergreen) was mostly associated with patches of *Salix repens* (Creeping Willow). Worryingly, *Phragmites australis* (Common Reed), found for the first time at the eastern end of the northern slack in 2021, continued to spread rapidly. This species is known to become invasive over time (Smith, 2020). The National Trust mowed the reed stand in late summer for a second time in the hope of reducing its vigour.

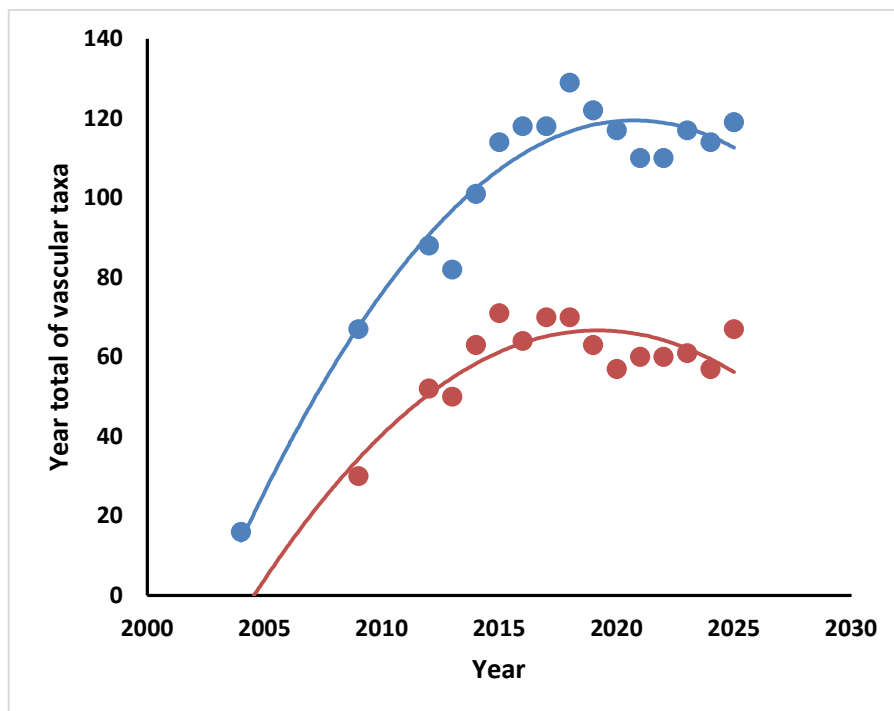


Figure 7. Number of vascular taxa in northern (blue) and southern (red) slacks, 2004-2025; fitted lines polynomial (northern $r = 0.99$, $p \leq 0.00001$; southern $r = 0.824$, $p = 0.00016$)

Willows continued their general dominance of the slack vegetation with 12 taxa identified, the same as in 2024. The largest bushes, mainly of *Salix caprea* (Goat Willow), *S. cinerea* (Grey Willow) and *Salix* × *fragilis* (Hybrid Crack-willow), are now over 3 m tall (Fig. 8). An ongoing survey of the nationally rare hybrid *Salix* × *friesiana* (*S. repens* × *S. viminalis* Osier) recorded, measured and labelled 121 bushes, seven more than the previous year. Overall, the number of bushes of this hybrid recorded annually since 2012 has begun to fall (Fig. 9), probably due to competition from other willow taxa and less bare ground in which to seed. The growth trends for mean area and mean height of bushes since 2012 are shown in Figs. 10 and 11. *S.* × *friesiana* is known from only thirteen post-2000 hectads (10 x 10 km national grid squares) in Britain & Ireland (BSBI Maps project) but is relatively frequent on the Sefton Coast with over 400 bushes recorded up to 2014 (Smith, 2015) and more since. The Devil's Hole also supports five specimens of the even rarer *Salix* × *doniana* (Don's Willow). Only about 43 bushes of this hybrid are known in Britain, 38 being in the Sefton dunes (Smith, 2024b.).

Although there was evidence of some Rabbit (*Oryctolagus cuniculus*) grazing and browsing, it was insufficient to prevent the growth of dense willow scrub in the older slack areas, this being dominated by *S. repens* (Fig. 12). Rapid successional changes since 2007 are illustrated by the contrast between Fig. 13 and Fig. 14. As in previous years, any seedlings or young bushes of the invasive *Hippophae rhamnoides* (Sea Buckthorn) and *Betula* (birch spp.) were removed when seen.



Figure 8. Large bushes of *Salix* × *fragilis* in Devil's Hole northern basin, September 2025

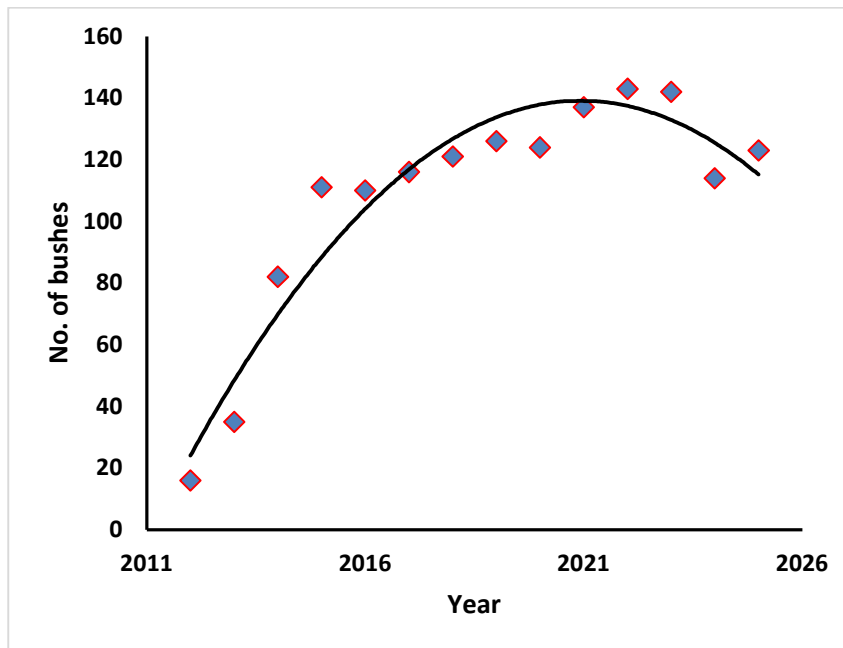


Figure 9. Annual number of *Salix* $\times$ *friesiana* bushes found in the Devil's Hole, 2012-25; fitted line polynomial

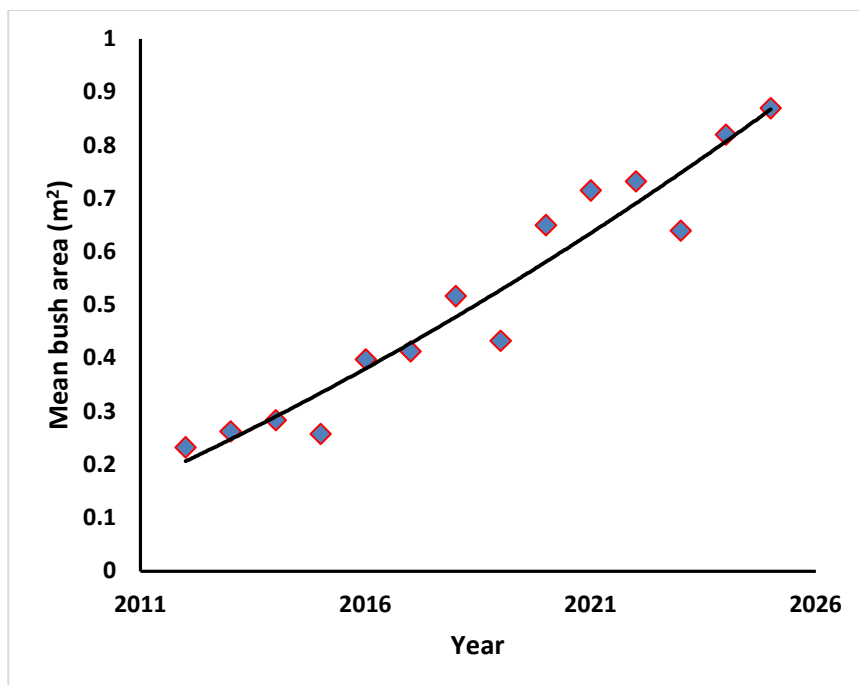


Figure 10. Mean area (m²) of *Salix* $\times$ *friesiana* bushes in the Devil's Hole, 2012-25; fitted line polynomial

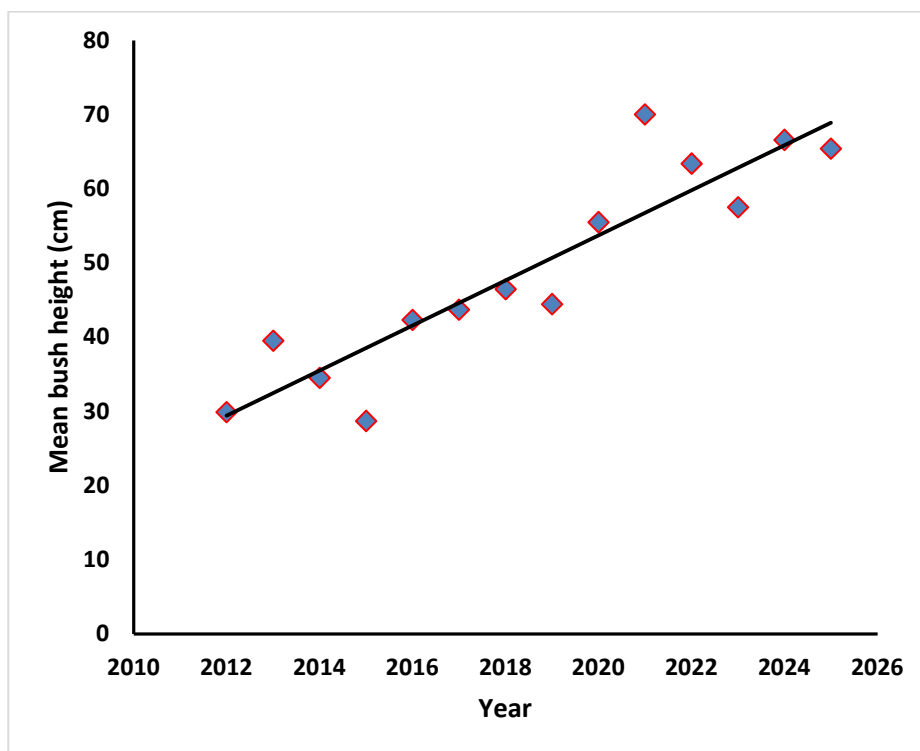


Figure 11. Mean height (cm) of *Salix* × *friesiana* bushes in the Devil's Hole, 2012-25; fitted line polynomial



Figure 12. Devil's Hole northern basin in June 2025, showing abundance of *Salix repens*



Figure 13. Devil's Hole northern basin in September 2007 showing an early stage in vegetation development



Figure 14. Devil's Hole northern basin in early May 2025, 18 years on from Figure 13, showing shallow flooding and successional change

Using NVC methodology, 2 x 2 m quadrats were recorded in representative slack vegetation at the same locations as in 2014 and 2019, the positions being identified using a GPS device. Forty-nine vascular plants were recorded in the 2014 quadrats, while 40 were found in 2019 and 20 in 2025, suggesting a decline in species-richness over time (Table 1). There was an increase in the proportion of notable taxa in the quadrats from 2014 to 2025 (Table 1). Reference to descriptions and keys in Rodwell (2000) showed that most of the earliest samples were referable to SD13: *Sagina nodosa*-*Bryum pseudotriquetrum* dune-slack, while those taken from a deeper, older hollow had affinities with SD14: *Salix repens*-*Campylium stellatum* dune-slack. A similar pattern prevailed in 2015 but, ten years later, most quadrat samples appeared closer to SD15: *Salix repens*-*Calliergon cuspidatum* (now *Calliergonella cuspidata*) dune-slack, with dense *Salix repens* and, often, a surface mat of the moss *C. cuspidata* (Pointed Spear-moss). Both SD13 and SD14 are scarce vegetation types associated with young to moderate-aged slacks that are shallowly flooded in winter by calcareous groundwater, while being dry in summer. SD15 is characteristic of older slacks subject to prolonged flooding by circumneutral groundwaters (Rodwell, 2000). Mean Ellenberg F (moisture) values for the ten most abundant vascular taxa in the three sets of quadrats (Table 1) suggest a drying habitat trend for three species, while no particular trend was apparent for seven taxa.

Table 1. Mean percentage cover, Ellenberg F-value and wetness trend for the ten most abundant vascular plants in Devil's Hole quadrats

Mean % cover

Taxon	2014	2019	2025	Ellenberg F value	Trend
<i>Agrostis stolonifera</i>	7.7	9.5	6.0	6	none
<i>Carex viridula</i>	10.8	7.9	5.5	7	drying
<i>Eleocharis palustris</i>	11.2	2.1	8.2	10	none
<i>Hydrocotyle vulgaris</i>	5.2	4.0	12.8	8	none
<i>Juncus articulatus</i>	3.9	2.0	5.0	9	none
<i>Mentha aquatica</i>	6.6	2.0	4.8	8	none
<i>Parnassia palustris</i>	5.3	2.8	0	8	drying
<i>Ranunculus flammula</i>	1.6	1.1	2.8	9	none
<i>Salix repens</i>	19.4	29.8	35.6	7	drying
<i>Samolus valerandi</i>	2.3	1.0	1.3	8	none
Total taxa	44	38	20		

% notable	29	37	50		
-----------	----	----	----	--	--

Other observations in 2025

As usual, fortnightly measurements of the water-table continued throughout the year. The autumn and winter of 2004/05 were drier than the previous one, resulting in the maximum water level achieved being about 40 cm lower. Over the eleven years of observations, there was an upward trend in water-table height, caused largely by three particularly wet years in 2019/20, 2020/21 and 2023/24 (Fig. 15). Conditions for Natterjack Toad breeding were unfavourable in 2025, with shallow surface water and drought conditions in spring leading to rapid drying up of the slacks in early summer. Over 1000 Natterjack tadpoles were noted in early May but these soon desiccated (Fig. 16). A first site record of Great Crested Newt (*Triturus cristatus*) was made in June (Fig. 17). Because of the spring/summer drought, Four-spotted Chaser (*Libellula quadrimaculata*) was the only dragonfly likely to have bred this year. I found a full-grown nymph of this species in May (Fig. 18). The nationally rare Northern Dune Tiger Beetle had a better year, with a high count of 62 reported by P. Kinsella in May (Fig. 19). The Red-listed solitary bee, Early Colletes, was abundant again in spring on the two older proto-dunes and in the northwest corner of the northern blowout (Fig. 20). A pair of Four-banded Beegrabbers (*Conops quadrfasciatus*) was photographed in August (Fig. 21). As usual, the Six-spot Burnet (*Zygaena filipendulae*) was numerous in August. Amongst the butterflies, Common Blue (*Polyommatus icarus*) was frequent, together with the occasional Gatekeeper (*Pyronia tithonus*), Wall (*Lasiommata megera*) and Grayling (*Hipparchia semele*). Orthoptera were represented by numerous Field Grasshoppers (*Chorthippus brunneus*) with a few Common Green Grasshoppers (*Omocestus viridulus*) and Slender Groundhoppers (*Tetrix subulata*), the latter being scarce in the north of England. Sandy tracks attracted Dune Robberfly (*Philonicus albiceps*), Fan-bristled Robberfly (*Dysmachus trigonus*) and Coastal Silver-stiletto (*Acrosathe annulata*). Recreational use of the site was often considerable, including children sliding down the slopes of the blowout and school cross-country runs (Fig. 22). Although potentially damaging to wildlife, this probably helped to maintain the dynamism of the feature, whose slopes are gradually being colonised by Marram. As usual, dogs were allowed or encouraged by owners to enter water in the slacks, despite signs erected by the National Trust in 2021 explaining the presence of breeding Natterjack Toads and requesting cooperation.

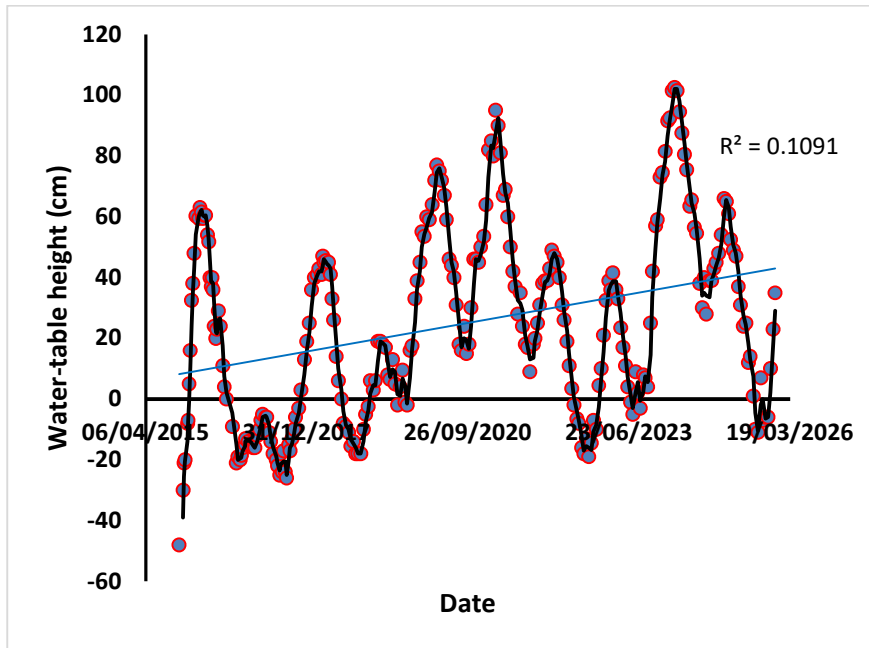


Figure 15. Fortnightly measurements of the Devil's Hole north water-table from October 2015 to December 2025 (blue regression line: $r = 0.33$; $p \leq 0.00001$). Zero on the y-axis indicates ground level



Figure 16. Dried up Natterjack Toad tadpoles, Devil's Hole May 2025



Figure 17. Immature Great Crested Newt, Devil's Hole June 2025



Figure 18. Nymph of Four-spotted Chaser, Devil's Hole May 2025



Figure 19. Pair of Northern Dune Tiger Beetles, Devil's Hole May 2025

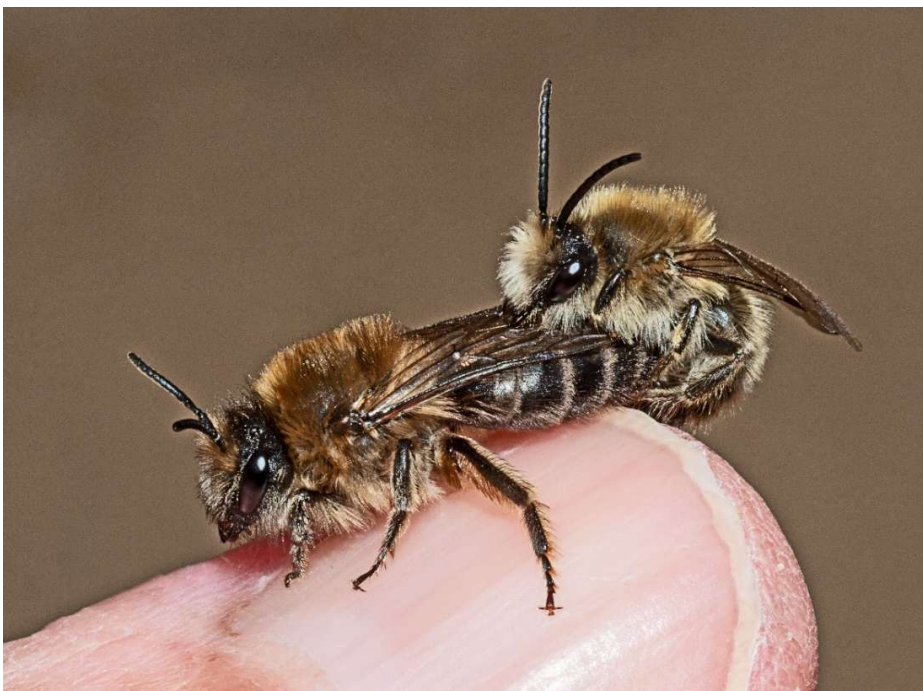


Figure 20. Pair of Early Colletes bees, Devil's Hole March 2025

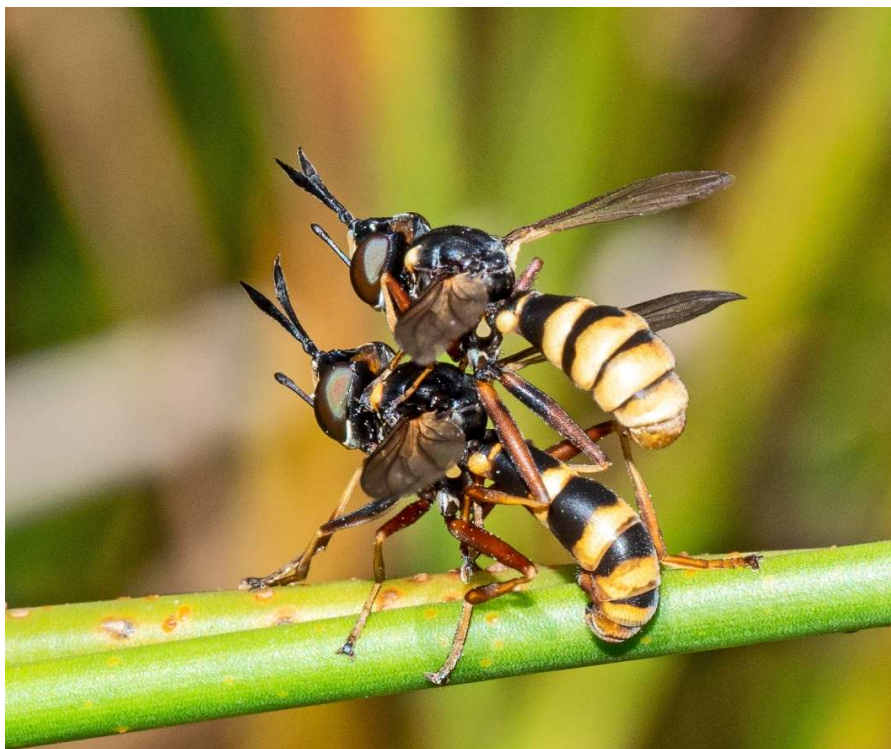


Figure 21. Pair of Four-banded Beegrabbers, Devil's Hole August 2025



Figure 22. School cross-country run, Devil's Hole October 2025

Acknowledgements

Pete Kinsella kindly provided some insect records. I am especially grateful to Mike Wilcox for proof-reading and making helpful suggestions on a draft manuscript.

References

- Delgado-Fernandez, I., Smyth, T.A.G., Jackson, D.W.T., Smith, A.B. & Davidson-Arnott, R.G.D. 2018. Event-scale dynamics of a parabolic dune and its relevance to mesoscale evolution. *Journal of Geophysical Research: Earth Surface* 123: 3084-3100.
- Gresswell, R.K. 1953. *Sandy shores in south Lancashire*. Liverpool University Press, Liverpool.
- Isermann, M. 2011. Patterns in species diversity during succession of coastal dunes. *Journal of Coastal Research* 27: 661-671.
- Neal, A. & Roberts, C.L. 2001. Internal structure of a trough blow-out determined from migrated ground-penetrating radar profiles. *Sedimentology* 48: 791-810.
- O’Keeffe, N. 2014. *Factors controlling geomorphological change in a coastal blowout: a case study of the Devil’s Hole, Formby (1945 to present)*. B.Sc. dissertation, Edge Hill University, Ormskirk.
- Rodwell, J.S. ed. 2000. *British plant communities Volume 5. Maritime communities and vegetation of open habitats*. Cambridge University Press, Cambridge.
- Smith, P.H. 2015. The occurrence of *Salix* × *friesiana* on the Sefton Coast sand-dunes, north Merseyside (v.c.59: South Lancashire). *BSBI News* 129: 41-46.
- Smith, P.H. 2017. The natural history of a sand-dune blowout. *British Wildlife* 28: 329-334.
- Smith, P.H. 2020. Increasing status of non-native vascular plants in the Sefton Coast sand-dune system, north Merseyside, UK. *British & Irish Botany* 3: 232-262.
- Smith, P.H. 2024a. *Changing flora of Devil’s Hole, Ravenmeols – 2024 update*. Unpublished report.
- Smith P.H. 2024b. Revisiting *Salix* × *doniana* (Don’s Willow) on the Sefton Coast sand-dunes, Merseyside (v.c.59 South Lancashire). *BSBI News* 155: 13-16.
- Smith, P.H. & Lockwood, P.A. 2012. *Vascular Flora of Devil’s Hole, Ravenmeols, 2012 update*. Unpublished report.

Appendix 1. Devil's Hole vascular plants recorded annually from 2017 to 2025 (2004-2016 excluded)

Nomenclature follows C.A. Stace's *New Flora* fourth edition (2019) and later amendments

KEY: * = non-native taxon (neophyte or introduced native); frequency: d = dominant; a = abundant; f = frequent; o = occasional; r = rare; l = locally; v = very. Stat. = conservation status; NR = Nationally Rare; NS = Nationally Scarce; VU = GB Vulnerable; NT = Near Threatened (*italics* = threat status in England Red List); S41 = listed as a species of principal importance under Section 41 of NERC Act 2006; SCI = Species of Conservation Importance in North West England; JS = record by Joshua Styles; No frequency shown = plant recorded before 2017.

Northern basin

Year

Taxon	English name	17	18	19	20	21	22	23	24	25	Stat
<i>Agrostis capillaris</i>	Common Bent	r			r						
<i>Agrostis stolonifera</i>	Creeping Bent	la	la	la	la	la	la	la	la	la	
<i>Aira praecox</i>	Early Hair-grass			vla		lo		lo	r	vlf	
<i>Ammophila arenaria</i>	Marram	la	la	la	la	la	la	la	la	la	
<i>Anacamptis pyramidalis</i>	Pyramidal Orchid	r	o	lo	lo	lo	lo	lo	lf	lo	SCI
<i>Anthoxanthum odoratum</i>	Sweet Vernal-grass					lo					
<i>Arenaria serpyllifolia</i>	Thyme-leaved Sandwort	r	lo	lo	lo	lo		lo	lo		
<i>Asparagus officinalis</i> *	Garden Asparagus	r	r	r	r	r	r	r	r	r	
<i>Bellis perennis</i>	Daisy						r				
<i>Betula pendula</i>	Silver Birch	r	r	o	o		r	r	vlo	r	
<i>Betula pubescens</i>	Downy Birch	r	r	r	r			r	r		
<i>Blackstonia perfoliata</i>	Yellow-wort	o	o	o	o	o	o	o	o	o	
<i>Blysmus compressus</i>	Flat-sedge	vlo	vlo	r	r	r	r	r		vlf	VU VU SCI S41
<i>Bromus hordeaceus</i>	Soft Brome										
<i>Campanula rotundifolia</i>	Harebell	vlf	vlf	vlf	vlf	lf	lf	lo	lo	vlf	NT
<i>Cardamine hirsuta</i>	Hairy Bitter-cress	o	o	o	o		vlf	r	lo		
<i>Cardamine pratensis</i>	Cuckooflower	lf	o	lo	r	r	lo	lo	lo	o	
<i>Carex arenaria</i>	Sand Sedge	la	la	la	la	la	la	la	la	la	
<i>Carex flacca</i>	Glaucous Sedge	la	la	la	la	la	la	la	la	la	
<i>Carex hirta</i>	Hairy Sedge	o	r	lo		r	lo	lo	lo	lo	

<i>Carex nigra</i>	Common Sedge						vlf		vlf	vla	
<i>Carex viridula</i>	Small-fruited Yellow-sedge	lf	o	lf	lf	lf	lf	lf	lf	lf	SCI
<i>Carlina vulgaris</i>	Carlina Thistle	lo	lo	lo	lo	lo	lo	lo	lf	lf	SCI
<i>Centaurea nigra</i>	Common Knapweed										
<i>Centaureum intermedium</i>	Intermediate Centaury	r	r	r	lo	lo	r	r	r	lo	EN
<i>Centaureum erythraea</i>	Common Centaury	lf	lf	lf	o	lf	o	lf	lf	lo	
<i>Centaureum littorale</i>	Seaside Centaury	vlo	r	r	r	lo	lo	r	r	r	NS SCI
<i>Centaureum pulchellum</i>	Lesser Centaury										SCI
<i>Cerastium diffusum</i>	Sea Mouse-ear	lo	lf	vlf	o	lo	lo	vlf	lf	lo	
<i>Cerastium semidecandrum</i>	Little Mouse-ear	lo	lo				lo	r	lo	r	
<i>Cerastium fontanum</i>	Common Mouse-ear	o	o	o	o	o	r	r	o	o	
<i>Chamaenerion angustifolium</i>	Rosebay Willowherb	lf	lf	lo	lo	lo	lo	lo	lo	lo	
<i>Cirsium</i> × <i>celakovskianum</i>	Hybrid Thistle										
<i>Cirsium arvense</i>	Creeping Thistle	lf	lf	o	o	o	o	o	o	o	
<i>Cirsium vulgare</i>	Spear Thistle	r									
<i>Crepis capillaris</i>	Smooth Hawk's-beard	r	o	r	o	o	o	o	o	o	
<i>Cynoglossum officinale</i>	Hound's-tongue	r	r								NT SCI
<i>Dactylorhiza</i> × <i>grandis</i>	Hybrid Marsh-orchid	r	r	r							
<i>Dactylorhiza fuchsii</i>	Common Spotted-orchid	r									
<i>Dactylorhiza incarnata</i> subsp. <i>coccinea</i>	Early Marsh-orchid	lf	lf	lf	lf	lo	lo	lo	lo	lf	NT SCI
<i>Dactylorhiza incarnata</i> subsp. <i>incarnata</i>	Early Marsh-orchid			r			r	r			SCI
<i>Dactylorhiza praetermissa</i>	Southern Marsh-orchid	o	o	o	o	o	o	o	o	o	
<i>Dactylorhiza purpurella</i>	Northern Marsh-orchid		r	r			r	r			SCI
<i>Daucus carota</i>	Wild Carrot	r	r			r		r	r	r	
<i>Eleocharis palustris</i>	Common Spike-rush	la	la	la	la	la	la	la	la	la	
<i>Eleocharis quinqueflora</i>	Few-flowered Spike-rush		vlf	vla	la	la	la	la	la	la	SCI
<i>Elymus juncea</i>	Sand Couch		r								
<i>Elymus repens</i>	Common Couch			JS							

[illegible]

[illegible]

[illegible]

<i>Rumex crispus</i>	Curled Dock	vlo	r	lo	lo	lo	lo	lf	o	o	
<i>Rumex obtusifolius</i>	Broad-leaved Dock		r	r	r		r		r		
<i>Sagina apetala</i>	Annual Pearlwort										
<i>Sagina maritima</i>	Sea Pearlwort	vlo		vlo	r	r				r	
<i>Sagina nodosa</i>	Knotted Pearlwort	lo	lf	lf	o	o	o	o	lo	lo	VU
<i>Sagina procumbens</i>	Procumbent Pearlwort										
<i>Salix</i> × <i>doniana</i>	Don's Willow	r	r	r	r	r	r	r	r	r	NR
<i>Salix</i> × <i>forbyana</i>	Fine Osier	o	o	o	r	o	o	o	o	o	
<i>Salix</i> × <i>friesiana</i>	Hybrid Willow	o	o	o	o	o	o	o	o	o	NR
<i>Salix</i> × <i>fragilis</i> *	Hybrid Crack-willow	o	o	o	o	o	o	o	o	o	
<i>Salix</i> × <i>fragilis</i> nothovar. <i>basfordiana</i> *	Hybrid Crack-willow							r			
<i>Salix</i> × <i>reichardtii</i>	Hybrid Willow			r	r	r	r	r	r	r	
<i>Salix</i> × <i>smithiana</i>	Broad-leaved Osier	r?	r?	r?	r				r	r	
<i>Salix alba</i>	White Willow	r	r	r	r	r	r	r	o	o	
<i>Salix caprea</i>	Goat Willow	o	o	o	o	o	o	o	o	o	
<i>Salix cinerea</i> subsp. <i>cinerea</i>	Grey Willow				r		r				
<i>Salix cinerea</i> subsp. <i>oleifolia</i>	Grey Willow	f	f	f	f	f	f	f	f	f	
<i>Salix pentandra</i>	Bay Willow	r	r	r	r						
<i>Salix purpurea</i>	Purple Willow	r	r	r	r	r	r	r	r	r	
<i>Salix repens</i>	Creeping Willow	a	a	a	a	a	a	a	a	a	NT
<i>Salix viminalis</i>	Osier	r	r	r	o	r	r	r	r	r	
<i>Samolus valerandi</i>	Brookweed	lf	lo	lo	r	o	o	o	o	lf	SCI
<i>Saxifraga tridactylites</i>	Rue-leaved Saxifrage	vlf	lf	vlo	lf	la	la	la	la	la	
<i>Schoenoplectus tabernaemontani</i>	Grey Club-rush		r		r	vlf	vlf	vlf	vlf	vlf	SCI
<i>Scorzoneroidea autumnalis</i>	Autumn Hawkbit	r		lo				r			
<i>Sedum acre</i>	Biting Stonecrop	lf	lf	lf	lf	lf	lf	lf	lf		
<i>Jacobaea vulgaris</i>	Common Ragwort	o	o	o	o	o	o	o	o	o	
<i>Schedonorus arundinaceus</i>	Tall Fescue										
<i>Senecio squalidus</i> *	Oxford Ragwort		r	(JS)							
<i>Senecio vulgaris</i> subsp. <i>denticulatus</i>	Groundsel	o	o						r		NS

<i>Senecio vulgaris</i> subsp. <i>vulgaris</i>	Groundsel	r		r		r		r			
<i>Sisyrinchium californicum</i> *	Yellow-eyed-grass							vlo		r	
<i>Solanum dulcamara</i>	Bittersweet							r			
<i>Sonchus asper</i>	Prickly Sowthistle	o	r	r	r	r	r	r	r	r	
<i>Sonchus oleraceus</i>	Smooth Sowthistle		r	r	r	r	r	r	r	r	
<i>Symphotrichum</i> sp.*	Michaelmas-daisy			r							
<i>Taraxacum</i> agg.	Dandelion	o	o	o	o	o	o	o	o	o	
<i>Tragopogon pratensis</i>	Goat's-beard				r	lo			r		
<i>Trifolium dubium</i>	Lesser Trefoil	r		vlf							
<i>Trifolium micranthum</i>	Slender Trefoil									r	SCI
<i>Trifolium pratense</i>	Red Clover	o	la	la	lo	r	vla	la	la	la	
<i>Trifolium repens</i>	White Clover		vla	vlf	lf	la	la	lo	lo	lo	
<i>Triticum aestivum</i> *	Bread Wheat	r									
<i>Tussilago farfara</i>	Colt's-foot	vlo	vlo	vlo	r	r	r	lo	lo	lf	
<i>Typha latifolia</i>	Bulrush		r	lo	lo	lo	lo	lo	lo	lo	
<i>Valerianella locusta</i>	Common Corn-salad	lo	r		r						
<i>Veronica arvensis</i>	Wall Speedwell								vlo		
<i>Veronica scutellata</i>	Marsh Speedwell	r	lo	lo	r	lo	r				NT
<i>Vicia lathyroides</i>	Spring Vetch	lo	r	r				lo		r	SCI
<i>Vicia sativa</i>	Common Vetch	o	o	o	o	o		lo	vlf	r	
<i>Vicia sepium</i>	Bush Vetch										
<i>Viola canina</i>	Heath Dog-violet	lf	lf	lo	lo	lo	lo	lo	lo	lo	SCI NT VU
<i>Vulpia fasciculata</i>	Dune Fescue	lf	lf	lf	lf	la	la	la	la	la	NS
196 (2025) (18 alien)	Total	118	129	122	117	110	105	116	114	119	39

Southern basin (# = not in northern basin)

Taxon	English name	17	18	19	20	21	22	23	24	25	Stat.
<i>Agrostis stolonifera</i>	Creeping Bent	o	o	o	la	la	f	f	f	f	
<i>Ammophila arenaria</i>	Marram	o	o	o	o	o	lo	r	r	lo	
<i>Anacamptis pyramidalis</i>	Pyramidal Orchid		r			lo	lo		lo	lo	SCI

<i>Epilobium parviflorum</i>	Hoary Willowherb	r		lo			r			r	
<i>Epipactis dunensis</i>	Dune Helleborine			r							NR SCI
<i>Epipactis palustris</i>	Marsh Helleborine	o	lf	lf	lf	lf	lf	o	lo	lo	NT SCI
<i>Erigeron acris</i>	Blue Fleabane	r			o	lo		lo	o	lo	
<i>Erigeron canadensis</i> *	Canadian Fleabane									r	
<i>Erophila verna</i>	Common Whitlowgrass		lo								
<i>Euphrasia confusa</i>	Confused Eyebright	o	lf	o		r		o	lf		VU
<i>Euphrasia nemorosa</i>	Common Eyebright	lf	o		lf	lf	lf	lf	lf	lo	
<i>Euphrasia tetraquetra</i> #	Western Eyebright							r	r	r	NT NT SCI
<i>Festuca rubra</i>	Red Fescue	lf	lf	lf	lf	lf	lf	lf	lf	lf	
<i>Hieracium umbellatum</i>	Umbellate Hawkweed	r	r	r	r	o	r	o	r		
<i>Hippophae rhamnoides</i> *	Sea Buckthorn	o	r	r	r	r		r			
<i>Holcus lanatus</i>	Yorkshire-fog	lf	lf	lf	lf	lf	lf	o	o	o	
<i>Hydrocotyle vulgaris</i>	Marsh Pennywort	lf	lf	lf	lf	lf	la	la	la	la	NT
<i>Hypericum tetrapterum</i>	Square-stalked St John's-wort						r				
<i>Hypochaeris radicata</i>	Cat's-ear	o	o	o	o	o	o	o	o	o	
<i>Jacobaea vulgaris</i>	Common Ragwort	r	o	r		lo	r	o	o	o	
<i>Juncus articulatus</i>	Jointed Rush	f	f	f	f	f	lf	lf	lf	la	
<i>Juncus bufonius</i>	Toad Rush	r	lo		vlf	o	lf		lf		
<i>Lathyrus pratensis</i>	Meadow Vetchling	lo	lo	lo	o	lo	lo	lf	o	o	
<i>Leontodon saxatilis</i>	Lesser Hawkbit	o	r	o	o	o	o	o	o	o	
<i>Linum catharticum</i>	Fairy Flax	vlo		lf			vlf	vlf	vlf	vlf	
<i>Lotus corniculatus</i>	Common Bird's- foot-trefoil	lf	lf	lf	lf	lf	la	o	o	o	
<i>Luzula campestris</i>	Field Wood-rush									o	
<i>Mentha aquatica</i>	Water Mint	lf	o	o	o	lf	o	o	o	o	
<i>Myosotis laxa</i>	Tufted Forget-me- not	lf	lf	lo	o	o	o		o		
<i>Myosotis ramosissima</i>	Early Forget-me- not	r	r								SCI
<i>Oenothera × fallax</i> *	Intermediate Evening-primrose	r	o		r	r	r	r	o	o	
<i>Oenothera glazioviana</i> *	Large-flowered Evening-primrose	r	r								
<i>Ononis repens</i>	Common Restharrow	lf	lf	lf	lf	lf	lf	lf	lf	lf	
<i>Ophrys apifera</i>	Bee Orchid		o	o	o	o			o	r	
<i>Parnassia palustris</i>	Grass-of-Parnassus	lf	o	lf	lf	lf	la	o	lo	lo	VU SCI

[illegible]

<i>Sisyrinchium</i> sp.*	Blue-eyed-grass										
<i>Sonchus arvensis</i>	Perennial Sowthistle			r	r						
<i>Sonchus asper</i>	Prickly Sowthistle	r				r	r	r			
<i>Sonchus oleraceus</i>	Smooth Sowthistle		r				o				
<i>Taraxacum</i> agg.	Dandelion	o	o	r	r	r	r	lo	r	r	
<i>Tragopogon pratensis</i>	Goat's-beard								r		
<i>Tussilago farfara</i>	Colt's-foot										
<i>Veronica chamaedrys</i> #	Germander Speedwell	vlf	vlf	vlf	vlo		lo	r		vlf	
<i>Vicia lathyroides</i>	Spring Vetch		r				vlf	vlo			SCI
<i>Vicia sativa</i> subsp. <i>nigra</i>	Common Vetch	o	o	r	r					r	
<i>Viola canina</i>	Heath Dog-violet						o				SCI NT VU
<i>Vulpia fasciculata</i>	Dune Fescue		o	r	lo	lo				lo	NS SCI
112 (2025) (8 alien) (4 additional to N slack)	Total	70	70	63	57	60	60	60	57	67	27 not.