

Kent Rare Plant Register

Draft species accounts

S (first part: Sa-Sera)



Kent rare plant register

This section of the register covers:

In Part Sa-Sera:

Sabulina tenuifolia
Sagina nodosa
Salicornia disarticulata
Salicornia emerici
Salicornia fragilis
Salicornia obscura
Salix purpurea
Salix repens
Salsola kali
Salvia pratensis
Salvia verbenaca
Sambucus ebulus
Sanicula europaea
Sarcocornia perennis
Saxifraga granulata
Scandix pecten-veneris
Schoenoplectus tabernaemontani x triqueter
Scleranthus annuus
Serapias vomeracea

In Part Serr-Su:

Serratula tinctoria
Sibthorpia europaea
Silene conica
Silene flos-cuculi
Silene gallica
Silene noctiflora
Silene nutans
Sium latifolium
Solidago virgaurea
Sonchus palustris
Sparganium natans
Spartina maritima
Spergula arvensis
Spiranthes spiralis
Stachys arvensis
Suaeda vera
Succisa pratensis

It is issued in draft, pending further development. Records, photographs and information regarding the occurrences of these plants in Kent will be welcome.

The register accounts give priority to data from 2010 onwards, but some historic data are also included (however, in the data tables, generally no specific sites without post-1970 records) so as to indicate trends and where the plant may yet be discovered or rediscovered. Distribution maps for records from 2010 onwards show vice counties 15 and 16 separated by a black line. See the Kent webpage of the BSBI website at <https://bsbi.org/kent> for the full Kent rare plant register list, the introduction to the register and a list of 'probably extinct' Kent plants.

Abbreviations used in the text:

Recorders' initials:

ACH Andrew Henderson
 AGS Trudy Side
 AS Mrs A. Smith
 AW Tony Witts
 BCE B.C. Eversham
 BL Brian Laney
 BW Brian Woodhams
 CAS Clive Stace
 CO Colin Osborne
 DAB David Broughton
 DC Danny Chesterman
 DCa David Carey
 DG Doug Grant
 DJ David Johnson
 DM Daphne Mills
 DS David Steere
 DTH David Holyoak
 EGP Eric Philp
 FR Francis Rose
 GH Georgina Hopkins
 GJ Geoff Joyce
 GK Geoffrey Kitchener
 HS Heather Silk
 JA Jan Armishaw

JD J. Dancy
 JF John Feltwell
 JoA Joy Andrews
 JP Joyce Pitt
 JRP John Palmer
 KCS Ken Side
 MG Mark Gurney
 MGT Mark Telfer
 NB Nick Bertrand
 OL Owen Leyshon
 PJW P.J. Wilson
 RM Richard Moyse
 RMB Rodney Burton
 RoF Lady Rosemary FitzGerald
 SB Sue Buckingham
 SC Steve Coates
 SP Sue Poyser
 TI Tim Inskipp

Other abbreviations:

KBRG Kent Botanical Recording Group

***Sabulina tenuifolia* (L.) Rchb. (= *Minuartia hybrida* (Vill.) Schischk.) (Fine-leaved sandwort)**

Draft account

vc 16; apparently gone from vc 15

Rarity / scarcity status

Fine-leaved Sandwort is a fairly local plant, scattered in England and Wales, largely from Hampshire through to West Norfolk. It is considered to be **Endangered**, both in England and in Great Britain as a whole. In England, the extent of its occurrence, or geographical spread, was taken to have declined by 65% in comparing records for 1930-69 and 1987-99. Also – although this did not form part of the justification for its risk assessment – it was calculated that the likelihood of finding the species had declined during this period, by 48%. In Kent, it has always been **rare** and it is currently found in only one area.



Eynsford Baptist Church. Photo by Liam Rooney, 13 May 2012

Account

The first printed reference to the occurrence of *Minuartia hybrida* (as *Alsine tenuifolia*) in Kent is in the third edition of John Ray's *Synopsis Methodica Stirpium Britannicarum* (1724, edited by Dillenius), as 'In a Close on the left Hand going down a Hill a Mile from *Deptford* [sic] towards Southfleet; Mr. *Newton*'. Deptford is evidently in error for Dartford, and the hill may have been Fleet Downs. James Newton knew John Ray, but his information was presumably not available for Ray to have included in earlier editions. Hanbury and Marshall (1899) refer to manuscript notes by Newton c.1680 in a copy of Parkinson's *Theatrum Botanicum*, giving a version of this record and referring to Darford [sic]. Puzzlingly, the historical summary in Hanbury and Marshall (1899), which was written by the remarkably erudite B. Daydon Jackson, does not refer to the annotated Parkinson as a source, but rather to an annotated copy

of the second edition of Ray's *Synopsis* (1696), in Jackson's possession.

The sandwort was still in the Southfleet area, as a specimen collected by Pocock in 1825 is held at **CGE**. But on the whole, the records for Kent, both historic and recent, are few, scattered and do not seem to represent stations of long persistence. This sort of pattern seems more applicable to a series of introductions than to continued native presence, although Hanbury and Marshall (1899) considered it to be a rare native of dry sandy or chalky ground. They gave records from near Hayes; rocks at Ephraim Mount, Tunbridge Wells; from Cranbrook; and the Isle of Thanet. It is not known whether there is any continuity between the last of these (collected by Alexander Irvine, who died in 1873; but also reported by Canon Aubrey Moore, who died in 1890) and a 1963 find by Miss B. Nash near Acol, Thanet. Her discovery was on a high north-facing wall at Cleve Court, TR3166, where it survived long enough to be recorded for Philp (1982).

The status of *Sabulina tenuifolia* as a current Kent species rests on populations found at Eynsford by Rodney Burton. In 1994, he discovered a substantial population on the mediaeval flint walls of Eynsford Castle. Factors which may have favoured its appearance and a great increase in *Saxifraga tridactylites* (Rue-leaved Saxifrage) were disturbance caused by maintenance work and also the cessation of herbicide spraying. In May 2012 there were some 130 plants, of which at least 110, mostly tiny, were on the north west side of the hall

ruin, from TQ 54164 65839 to TQ 54164 65837. Other locations included 2.5m above the bottom step up from the solar undercroft (TQ 54165 65871) and three metres above ground in an opening of the curtain wall at TQ 54150c65797. There were no plants on the north west side of the curtain wall. In April 2013, there were about 320 plants, spread over many parts of the castle; it was still present in 2016 and in February 2018 seedlings were suddenly frequent on the south side of the gatehouse, although two months later most of these seedlings had been smothered by rapid growth of *Anisantha sterilis* (Barren Brome). Only one plant was seen in 2019, but there was a good showing on the castle in 2020.

In April 2007, Rodney Burton found a further site, 90m to the south east, on the flint and brick boundary wall south west of Eynsford Baptist Church. The sandwort appeared to have arrived within the preceding three years, and was already densely massed along about four metres of the wall. On 9 May 2012, he recorded c.400 plants on the top and the south west wall face along five metres centred on TQ 54235 65737; and on 25 May, a further c. 650 plants along the north east side from TQ 54233 65741 to TQ 54241 65735. Populations fluctuate from year to year: in July 2013 only 90 plants were seen on the wall, and no *Saxifraga tridactylites*; but in July 2016 it extended along the front wall. In June 2019 it was still plentiful along the north east side of the wall and in 2020 it germinated well there, except for smaller seedlings, which were smothered by *Saxifraga tridactylites*.

Eynsford Castle. Photo by Liam Rooney,
13 May 2012



The natural habitat of *Sabulina tenuifolia* is supposed to be dry, weathered calcareous rocky slopes¹, but the data on previous Kent sites are insufficient to identify habitat corresponding to this, and the historic record for rocks at Mount Ephraim suggests wider tolerance, as the



Ardingly sandstone outcrops are acid in nature. The mortar of walls provides an artificial proxy for its natural habitat. This habitat preference is shared with species such as *Galium parisiense* (Wall Bedstraw) and *Saxifraga tridactylites*, although only the latter appears to have a degree of association. *Sabulina tenuifolia* is an annual, and population fluctuations presumably indicate unfavourable conditions for germination or growth. The longer term risks for the species are likely to be any need to repair or re-point its walling, or any wish to do away with wall vegetation generally.

It is unlikely to be confused with anything other than the much more common *Arenaria serpyllifolia* (Thyme-leaved Sandwort) or *Arenaria leptoclados* (Slender Sandwort). The latter two, however, have ovate (rather than linear) leaves; and *Sabulina tenuifolia* is more upright in habit.

Eynsford Baptist Church. Photo by Liam Rooney, 13 May 2012

¹ J.O. Mountford (1994). *Minuartia hybrida* (Villars) Schischkin. In (eds.) Stewart, A., Pearman, D.A. & Preston, C.D., *Scarce plants in Britain*, JNCC.

Sagina nodosa (L.) Fenzl (Knotted Pearlwort)

Draft account

vc 15

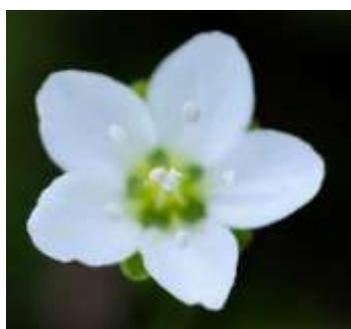
Rarity / scarcity status

Sagina nodosa is widespread in the British Isles, other than in southern parts, and grows on damp, rather open sandy and peaty soil, often with some calcareous influence. Losses of open calcareous habitat may have contributed to its southern decline, and it is considered to be **Vulnerable** to the risk of extinction in England. This risk assessment is based on a reduction both in the overall geographical extent of its occurrence and in the area of occupancy within that range. A comparison over the periods 1930-1969 and 1987-1999 showed that its overall range had reduced by 39% and its area of occupancy had declined so that there was a calculated 36% reduction in the likelihood of recording the species. In Kent, although now rediscovered near Sandwich, to add to its Dungeness/Romney presence, it remains **very scarce** indeed, as it has long been.

Sandwich, golf course. Photo by Liam Rooney, 20 July 2011

Account

The first trustworthy records for Knotted Pearlwort are likely to be those by G.E. Smith in his *Catalogue of rare or remarkable phaenogamous plants, collected in South Kent* (1829), where he refers to it growing 'Upon the Warren at New Romney; about Lydd: upon the sand-hills, Sandwich. Upon a sand bank east of the Ivy Cottage, at Sandgate'. However, 'Knotted spurry' had been claimed as 'in the brooks near Margate' by Dr. R.E. Hunter, who listed it in *A short description of the Isle of Thanet; chiefly intended as a Directory for the company resorting to Margate and Broadstairs* (1796), but this 'popular' work is known to have many botanical errors. This site might have been possible for *Sagina nodosa*: the Brooks was a mere, some 300 yards across where facing the sea, and it occupied the low ground of Margate south of The Bay, as far inland as what is now Tivoli Park. It silted up and became marshy ground with a sand bar seawards, and if there was damp sandy ground with calcareous influence from the Margate chalk, then perhaps there was suitable terrain. Matthew Cowell (*A Floral Guide for East Kent etc.*, 1839) gave the species as common in Thanet, from Hunter's manuscripts, which as a broad statement seems unlikely given the absence of other appropriate habitat, but George Pittock listed it in his *Flora of Thanet* (1903) as well.



Sandwich, golf course. Photo by Liam Rooney, 20 July 2011

Hanbury and Marshall (1899) wrote that it was a native of 'Sandy or gravelly ground, preferring spots liable to be overflowed in winter; very local'. The sites of which they knew included the shingle between Great and Little Stonar, Ham Brooks, between Deal and Sandwich, and a saltmarsh near Romney. Francis Rose described it as of 'Dune slacks and shingle hollows, liable to be wet in winter; now very rare'. He found it in a dune slack ½ mile south of Shellness, Sandwich in 1946, where it was rare and he was unable to re-find it since. However, it was reported by Mrs Brickenden as abundant near Downs Farm, Sandwich in 1962. He also knew it in dune slacks at Greatstone from 1947 to 1950, where it was locally abundant; and E. Scott reported it in damp shingle lows, where quarried, at Dungeness in 1953 (it has been known near the Dungeness gravel excavations at least back

to 1937). These two areas, Sandwich and Dungeness, have been the focus of records since. Philp (1982) recorded it only in two tetrads in the Deal-Sandwich area; it could not be re-found at Dungeness. Philp (2010) recorded it at both areas, but in one tetrad each.



Dungeness, habitat (path to Hanson Hide). Photo by Owen Leyshon, October 2011

Our 2010-20 records amount to four tetrads (six monads), but are still in the same two general areas, plus Romney Warren. At Dungeness it has been noted as growing on sand and shingle, generally on disturbed ground, as by paths, tracks, roadsides and a car park. At Sandwich, it has also been seen at pathsides, its substrate being peat and sand. Its soils are infertile, probably slightly saline, and it is possible that there is some calcareous influence at both locations, from shell fragments. We do not have information regarding associated species for these records, although the accompanying photograph shows the presence at Sandwich of *Achillea millefolium* (Yarrow) and *Euphrasia*

sp. (Eyebright). *Sagina nodosa* is generally regarded as a pioneer species of the early stages of dune slack development; it may be that its pathside appearances at Sandwich (which seem to have tailed off after 2011) are a consequence of disturbance of a seed-bank from past, more open dune conditions.² We have no varietal information in Kent, although it looks as though var. *nodosa* is our plant (var. *moniliformis* would have procumbent stems and the ability to propagate vegetatively from bulbiferous 'knots' dropping from the stems). *Sagina nodosa* is readily recognised by its relatively large flowers, the five petals being twice the length of their sepals, and its leaves clustered in 'knots' up the stem.



Sandwich, golf course. Photo by Lliam Rooney, 20 July 2011

Site	Grid reference	Site status	Last record date	Recorder	Comments
Dungeness	TR01U (includes TR0618 and TR0619)		(1) 1 August 2019 (2) 17 June 2016 (3) 27 July 2014 (4) 5 August 2012 (5) 25 July 2012 (6) 24 July 2012 (7) 7 September 2011 (8) 20 August 2011 (9) 28 August 2010 (10) 25 July 2009 (11) 28 July 2000	(1) AW (2) DS (3) JP (4) BW (5) SB (6) CO (7) DJ (8) SB (9) MG (10) JP (11) EGP	(1) TR0618. (2) TR0619. (3) Frequent in thin disturbed grass, RSPB reserve car park area. (4) TR0618. (5) Abundant on shingle by track at TR 0652 1847. (6) Around track from Dungeness Road to railway c. TR 063197 (7) TR 0694 1960, c.50 plants at side of path to the Hanson Hide. (8) 20 - 30 plants on sand and shingle roadside TR06229 19697. (9) TR0618. (10) TR 065 185, on bare sand in ARC Pits area. (11) TR01U.
Dungeness (Water Works)	TR0620		(1) 17 July 2016 (2) 8 August 2012	(1) DS (2) SB, TI	
Dungeness (N of Denge Beach)	TR0719		(1) 28 August 2010 (2) 28 June 2010	(1) MG (2) TI	

² Cf. Plassmann, K. *et al.* (2009). Can soil banks contribute to the restoration of dune slacks under conservation management? *Applied Vegetation Science* **12**: 199-210.

Dungeness	TR0816		(1) 23 July 2011 (2) 30 August 2008	(1) DM (2) DM	
Romney Warren	TR0825, TR0826		(1) 5 June 2010 (2) 7 July 2002	(1) JS (2) BW	(1) TR 0876 2614. (2) c. TR 086 252, Littlestone golf course.
Pegwell Bay	TR3416		22 June 1998	JS	TR 341 632.
Sandwich Bay	TR35P (includes TR3559)		(1) 23 May 2011 (2) 24 June 2010 (3) 28 July 2007 (3) After 1990, before 2006	(1) SB (2) SB (3) DG, EGP (3) Philp (2010)	(1) Many plants on sand and peat, scattered along 30 metres of pathside from TR 35174 59205 to TR 37135 59260. (2) TR 35160 59222, One plant, peat and sand pathside on Prince's Golf Course, old practice range. (3) & (4) TR35P.
Sandwich Bay	TR35Q, TQ35S		After 1970, before 1981	Philp (1982)	

***Salicornia disarticulata* Moss (*S. pusilla* Woods) (One-flowered Glasswort)**

Draft account; post-2000 records for vc16 needed.

vc 15; probably still in vc16 although not seen recently

Rarity / scarcity status

Salicornia disarticulata is a succulent, salt-tolerant annual of saltmarshes in southern parts of the British Isles, with its main distribution in south Wales, Hampshire and East Anglia down to north Kent. It is a nationally **scarce** species and one whose conservation risk status is regarded as of 'Least Concern'. However, this assessment of risk is based on the level of decline in records for the period 1930-99, which did not reach a level of least 30% (qualifying for Vulnerable status); but if 1987+ data were considered against all records, including those before 1930, a decline of 33% would have been shown. In Kent, there is some evidence of decline (35%) between the periods 1971-80 and 1991-2005, but not since, except as regards an absence of post-2000 records for the Hoo peninsula. Whilst local, it is neither rare nor scarce in the county.

Account

The first record of this species in Kent appears to be a pressed specimen in **CGE**, collected by E.S. Marshall at New Romney on 17 September 1891 (det. P. Sell). Marshall was evidently taking an interest in *Salicornia* spp. at New Romney in 1891 as there is a long account by him in Hanbury and Marshall (1899) regarding a plant on the muddy flats near Great Stone which he named as *S. appressa*. However, there is no mention there of any one-flowered glasswort, in spite of the 1891 gathering. On the other hand, Marshall (1915³), in writing up a prostrate form of *S. disarticulata* from Devon, which he named as var. *humifusa*, referred to his 1891 '*S. appressa*' plant as probably the same as a prostrate form of *S. disarticulata* seen by Dr C. Moss in both Brittany and England.

Subsequently, Francis Rose assessed *S. pusilla/disarticulata* as locally frequent in the Thames, Medway and Stour Estuaries and noted records from Frindsbury, 1945 (the BSBI database credits A.J. Willmott as the first finder for vc16, West Kent here); Grain, 1948; Funton Creek, 1962; Conyer Creek; Faversham Creek (Nagden); Elmley, 1950-54; Harty, 1945-63; Shellness, Sheppey, 1949-63; Whitstable, 1926 (by G.C. Druce); Castle Coot, 1960-62; and Shellness at the mouth of the River Stour, 1954.

Oare. Photo by Liam Rooney, 22 September 2010



Records in Philp (1982), covering the 1971-80 county survey, showed no sign of the earlier New Romney and Shellness (Stour) presence, but gave 23 tetrads for upper saltmarshes in the Swale and Medway estuaries and just edging round Grain to the Thames estuary. Whilst the 1991-2005 survey (Philp, 2010) gave only 15 tetrads in the same area of distribution, it is possible that the ostensible decline relates to the practicalities of

³ Marshall, E.S. (1915). A new *Salicornia* variety and hybrid. *Journal of Botany* **53**: 362-363.

recording: the window of recording is effectively late September to mid-November and some of the saltmarshes are remote and difficult to access. Those considerations may also apply to 2010-19 recording, which has produced 14 tetrads (22 monads). However, 2010-20 recording has been successful in confirming continued presence at the mouth of the River Stour and, although no longer at New Romney, the species has been found in two sites at Dungeness. As One-flowered Glasswort is not uncommon in Kent, the distributional data maintained in this register will be at 1km square (monad) level, as shown in the 2010-19 distribution map. This entails recording at a finer scale than the tetrads given in Philp (2010), from which the accompanying

1991-2005 map is taken (with kind permission of the late Eric Philp and the Kent Field Club).



Salicornia disarticulata (One-flowered Glasswort) 2010-20

Salicornia disarticulata (One-flowered Glasswort) 1991-2005



The limits to its presence are of course the availability of suitable saltmarsh. At Dungeness, the habitat is relatively unusual for Kent in that it is landward of the sea wall or shingle banks, which are penetrated by saltwater seepage. Elsewhere in the county, the norm appears to be saltmarshes which are subject to direct tidal influence and which lie seaward of any coastal or estuarial defences. Typically, *Salicornia disarticulata* is to be found on the higher and drier parts of saltmarshes, just around or slightly above the level of normal tides; often growing on open flat areas, sometimes surrounding small shallow pools. Such areas are without heavy cover of *Atriplex portulacoides* (Sea-purslane), and associated species are *Puccinellia maritima* (Common Saltmarsh-grass) and *Salicornia ramosissima* (Purple Glasswort).

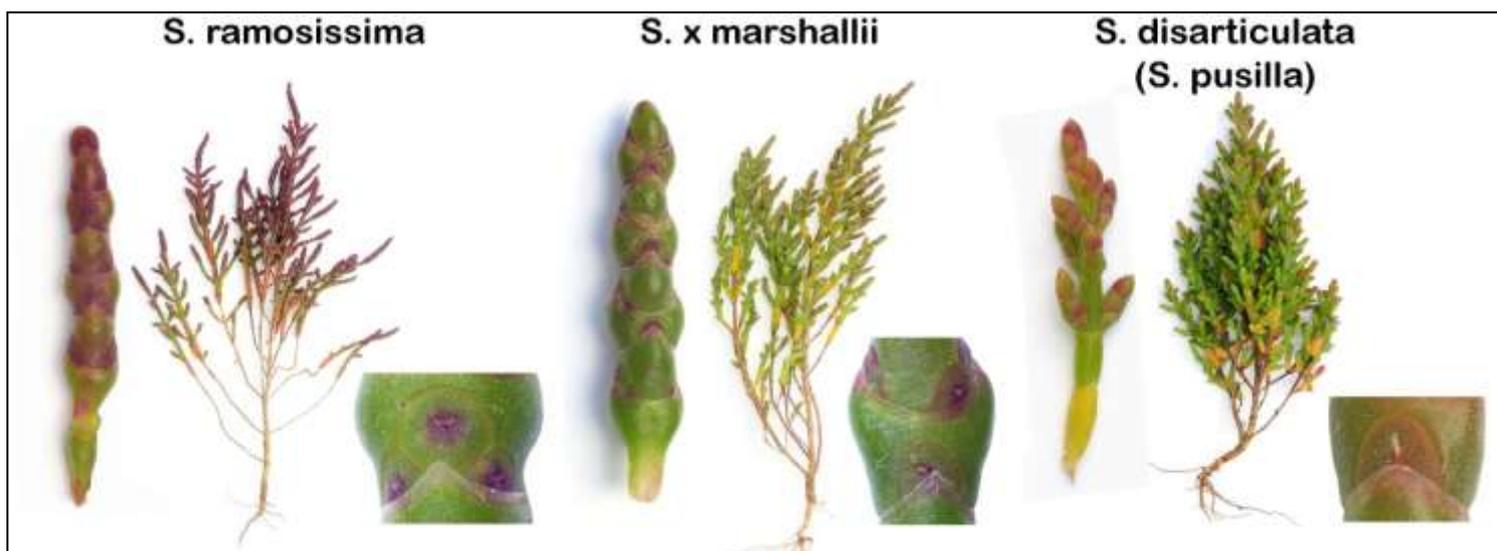
Oare, habitat. Photo by Liam Rooney, 16 October 2018

One-flowered Glasswort is, unsurprisingly, readily recognizable by its single flowers (cymes). Other British glassworts have their flowers, when fully developed, in groups of three. Occasionally, Kent



plants have been found with flowers in a mixture of ones, twos and threes. Where this mix can be seen not to

a consequence of an early stage of development in which flowers in groups of three have not fully emerged with expansion of the spike or branch segment, then it can be concluded that this is *Salicornia x marshallii*, a hybrid between one- and three- flowered species (*S. disarticulata* x *ramosissima*). This is mentioned as known in East Kent by Dalby (1975)⁴ and it was reported at Bedlams Bottoms, Iwade, TQ86Z, by Geoff Smith, although not included in Philp (1982). The first recent record was by Liam Rooney, near Oare, in 2010, after which, with the benefit of annual *Salicornia* expeditions by the Kent Botanical Recording Group, Kent botanists have become accustomed to its recognition and it has been seen in 12 monads in the period 2010-20. It is named after the *Flora of Kent* co-author, E.S. Marshall, who first described the hybrid, from Devon, as a cross between *S. disarticulata* and *Salicornia smithiana* (since treated as subsumed into *S. ramosissima*). Hybrids may arise as first generation through wind pollination between the parents, or as a subsequent generation since hybrids are fertile, varying but generally closer to *S. disarticulata* in appearance.⁵ Both parents and hybrid are annuals.



From Glassworts crib sheet prepared by Liam Rooney from Kentish specimens



Other characteristics of *S. disarticulata* are its yellow-green colour, becoming brownish- or pinkish-yellow (grey-green in an occasional prostrate form⁶); the fairly short terminal spike and side branches; also, the plant disarticulates (cf. *disarticulata*) when the fruit is ripe, so that the branches with their fertile segments become detached and settle on the ground or are moved by the tides elsewhere. The segments with their seeds may float in sea water for up to three months and are characteristically deposited on high points.⁷ It is perhaps the easiest *Salicornia* species to identify because of its single flowers; otherwise the boundaries between the species are often difficult to identify in view of their plasticity, the differentiation within a species of inbreeding populations and the general lack of discontinuities in the range of variation between the various taxa.

Oare. Photo by Liam Rooney, 22 September 2010

⁴ Dalby, D.H. (1975) *Salicornia* L. in (ed.) Stace, C.A., *Hybridization and the Flora of the British Isles*, BSBI/Academic Press, London.

⁵ *Salicornia* L., in Stace, C.A., Preston, C.D. & Pearman, D.A. (2015). *Hybrid Flora of the British Isles*, BSBI, Bristol.

⁶ D.H. Dalby (1994) *Salicornia pusilla* J. Woods. In (eds.) Stewart, A., Pearman, D.A. & Preston, C.D. *Scarce Plants in Britain*, JNCC, Peterborough.

⁷ Dalby, D.H. (1963) Seed dispersal in *Salicornia pusilla*. *Nature* **199**: 197–198.

Salicornia emerici Duval-Jouve (*Salicornia nitens* P.W. Ball & Tutin) (Shiny Glasswort)

Draft account: investigation needed for old Fairfield site

vc 15

Rarity / scarcity status

Salicornia emerici has a very sparse distribution in saltmarshes around the coasts of the England, Wales and Eire, being nationally **scarce**. It appears in the *Vascular Plant Red List for England* as data deficient, that is to say, it is believed to have very restricted populations and is possibly threatened, but sufficient information is not available on which to conduct a threat assessment. Until 2020, it had only been found once in recent years in Kent, but in that year two colonies were located. It is accordingly to be regarded as **rare** in the county.

Account

Shiny Glasswort does not feature in Hanbury and Marshall (1899), Philp (1982) or Philp (2010). The earliest records appear to be ones in the BSBI database for TR06 and TQ96 within the period 1950-69, but they lack any details by which they may be assessed. There is, however, an entry in Francis Rose's manuscript *Flora of Kent* as regards a find (as *Salicornia nitens*) in saline meadows by Fairfield Church, TQ 986 264, by Mrs. K.D. Rowlands in 1962, det. T.G. Tutin. Whilst this is an inland location on Romney Marsh, over 12km from the coast, historic marine transgressions have rendered this an anomalously saline site, with a range of salt-tolerant species present.



Oare. Photo by Lliam Rooney, 5 October 2011

After a gap of some decades, the species was seen again in Kent, this time in the uppermost saltmarsh, close to the sea defence embankment, east of the Oare Marshes KWT reserve, TR0164, where Faversham Creek opens onto the Swale. The find was made in the course of a KBRG meeting on 5 October 2011 and was determined by Eric Philp. It was a single plant, growing in an area which was not particularly open, amidst *Suaeda maritima* (Annual Sea-blite) and *Atriplex portulacoides* (Sea-purslane)



On 11 September 2020 a colony of at least 20 plants was found nearly 2km eastwards, at Castle Coote, TR 03422 67439, by Lliam Rooney and Caroline Ware, subsequently (23 October) viewed and confirmed by Fred Rumsey as well. The site is a shingle spit, largely shell-sand, projecting into the Swale channel with associated saltmarsh, and the plants were growing exclusively at the end of the saltmarsh against the shelly shingle.

Castle Coote. Photo by Lliam Rooney, 23 October 2020

Then, on 25 October 2020, Lliam Rooney identified a further, small colony growing west of Faversham Creek, on the upper saltmarsh bordering the Swale north of Uplees Marshes, Oare at TR00228 65510. It was found near a saline pool in a mixed population of diminutive *Salicornia ramosissima* (Purple Glasswort) and *Salicornia europaea* (Common Glasswort). From a distance it resembled a more slender form of *S. ramosissima*, being of a similar colour, with extra long terminal spikes, but on closer inspection showed fertile segments and cymes in keeping with

the tetraploid *Salicornia procumbens* group. Later measurements showed lower fertile segments were within the range of *S. emerici* (see final illustration in this account).



Habitat, Uplees Marshes, Oare. Photo by Liam Rooney, 25 October 2020

The sum of these investigations therefore points to *S. emerici* probably having a persistent, but overlooked, presence on the saltmarsh bordering the Swale on either side of its confluence with Faversham Creek.

S. emerici is generally considered to be a plant of bare mud and salt pans on saltmarshes (Ball & Tutin).⁸ Little information about its British ecology seems to be available, although a 2015 Essex record mentions the habitat as being flat beach. (See below for extrapolations from French ecology.)

Identifying this species, as with *Salicornia* generally, is made difficult by a degree of overlap of characters between taxa. Its spikes have flowers (cymes) in groups of three, each more or less the same size, and the fertile segments are fairly straight-sided, rather than distinctly convex, so that the spike is cylindrical, not beaded: this places the species in an aggregate called *Salicornia procumbens*. This aggregate also includes *Salicornia fragilis* (Yellow Glasswort) and *Salicornia dolichostachya* (Long-spiked Glasswort). From these, *S. emerici* is distinguished by nearly always having fertile segments not more than 3mm long; being little-branched (whereas the other species are often much-branched); having a terminal spike normally not exceeding 40mm⁹ (the other species are often much larger); and by being treated in Britain as initially green, then becoming brownish purple/orange with a slight or diffuse red tinge (the other species generally become yellow or yellow-brown). The name Shiny Glasswort also points to its smooth, shining, somewhat translucent

⁸ Ball, P.W. & Tutin, T.G. (1959), Notes on annual species of *Salicornia* in Britain. *Watsonia* **4**: 193-205.

⁹ The Glassworts crib sheet extract at the end of this account reflects the potential for longer than this by giving up to 90mm, although not recognised in Stace's *New Flora of the British Isles* (4th edition, 2019). Terminal spikes on Kent material have been found well exceeding 40mm, and show affinity with Continental material which can measure to 90mm.

appearance; but in practice this may be obscured by tidal mud.

While distinguishing this species is not straightforward, neither is its nomenclature. Our British taxon was first described by Ball & Tutin in 1959, as *Salicornia nitens*¹⁰. This remained in standard usage through the first and second editions of Stace's *New Flora of the British Isles*, although the latter (1997) stated that 'The French **S. emerici** Duval-Jouve might be the same and the name has priority'. *S. emerici* indeed became standard through the third and fourth editions, although Sell & Murrell (2018)¹¹ hold onto *S. nitens*, stating that 'we do not think it is the same as this French species'. Yet another view¹² suggests that *S. nitens* might be a microspecies of *S. emerici*. Lahondère (2004)¹³ considered the names to be synonymous, and that *S. nitens* descriptions corresponded to specimens of *S. emerici* which had enjoyed insufficient lighting conditions (e.g. because at the northern end of their range) for the transformation of their initial green colour to the intense red that this species bears in the Mediterranean and western central France, perhaps to protect against higher ultraviolet levels. Whilst that intense red is supposedly not seen in Britain, it is evident (see accompanying illustration) that in Kent a definite reddening can occur and perhaps longer periods of hot weather are contributing to this.



Uplees Marshes, Oare. Photo by Lliam Rooney, 27 October 2020

Habitat, Castle Coote. Photo by Lliam Rooney, 23 October 2020



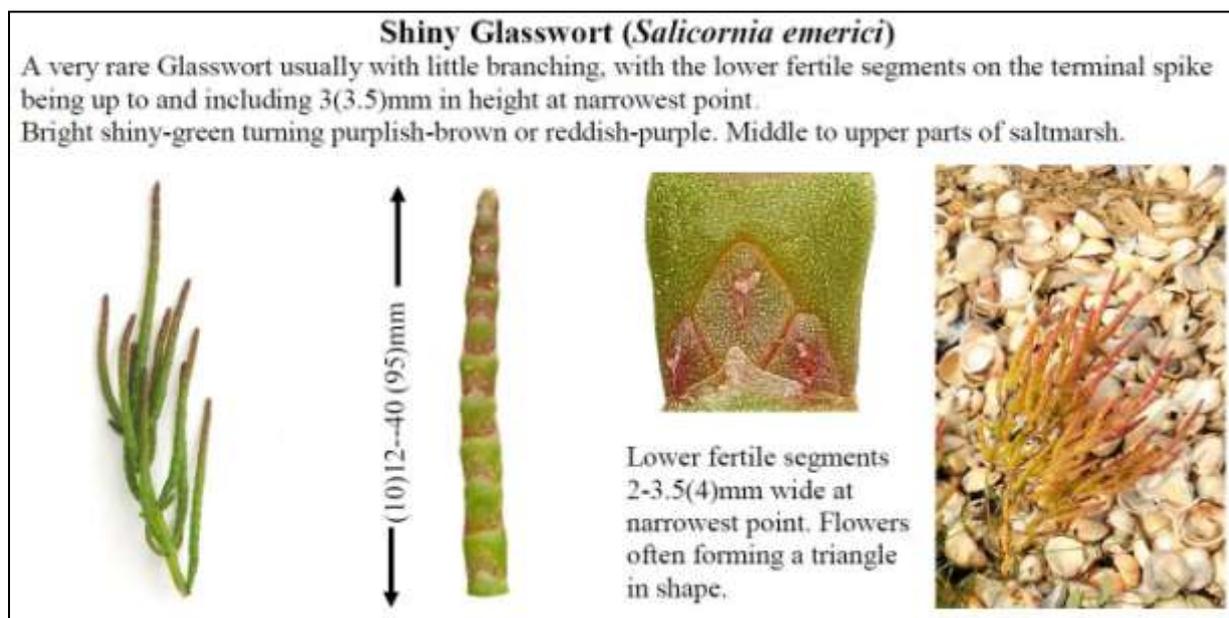
¹⁰ Ball, P.W. & Tutin, T.G. (1959), Notes on annual species of *Salicornia* in Britain. *Watsonia* **4**: 193-205.

¹¹ Sell, P. & Murrell, G. (2018). *Flora of Great Britain and Ireland*, vol.1, Cambridge University Press, Cambridge

¹² Spanish studies cited in Kadereit et al. (2007), A taxonomic nightmare comes true: phylogeny and biogeography of Glasswords (*Salicornia* L., Chenopodiaceae). *Taxon* **56**(4): 1143-1170.

¹³ Lahondère, C. (2004). Les salicornes s.l. (*Salicornia* L., *Sarcocornia* A.J. Scott et *Arthrocnemum* Moq.) sur les côtes françaises. *Bulletin de la Société Botanique du Centre-Ouest* n.s. **24**, 122pp.

Equating our taxon with the French species enables us to compare ecological information. Lahondère mentions *S. emerici* as on the Atlantic shores requiring a substrate which remains damp, such as pools in old saltmarshes, whereas drier conditions favour *Salicornia ramosissima* (Purple Glasswort); also, germination is affected by strong salinity, to which *S. ramosissima* may be more tolerant. *S. emerici* may be the only glasswort present in open areas regularly flooded or where access to the sea is maintained; although in exceptional cases where such areas are transformed into cattle pasturage, the result may be a mosaic of *S. emerici* in the ground trodden down by the cattle and *S. ramosissima* on the raised humps between footprints. For Kent, it would be worth investigating the Fairfield area to see, not just if *S. emerici* has continued there after its 1962 sighting, but also how far similar mosaic conditions may obtain, although the effect of sheep pasturage is likely to be different.



From Glassworts crib sheet prepared by Liam Rooney from Kentish specimens

Salicornia fragilis P.W. Ball & Tutin (Yellow Glasswort)

Draft account

vc 15 and 16

Rarity / scarcity status

Salicornia fragilis is an annual of lower levels of saltmarshes scattered around the coasts of the British Isles although restricted in Scotland. It is a nationally **scarce** species and one whose conservation risk status is regarded as of 'Least Concern'. It is neither scarce nor rare in Kent.

Oare, in *Spartina anglica*. Photo by Liam Rooney, 5 October 2011

Account

Salicornia fragilis was first described in 1959, although there is apparently a specimen in **CGE** collected by E.S. Marshall on 17 September 1891 from Greatstone-on-sea, identified by P. Sell. It is quite possible that anyone seeing this species in Kent between 1912, when *Salicornia dolichostachya* (Long-spiked Glasswort) was described, and 1959, would have assumed that they were seeing *S. dolichostachya*, because of its similarity and this being the only suitable name available. The *Cambridge British Flora* (vol.2, 1914) mentions *S. dolichostachya* in Kent and there are records for 1945-54 from the Thames, Swale, Medway and Stour estuaries which may well have included *S. fragilis* among them. When the latter was named¹⁴, its distribution was given as from E. Suffolk to Kent.



The BSBI database gives a few records for the period 1950-69, but these lack detail beyond the hectad in which recorded, so the first adequate assessment of its Kent status is given in Philp (1982). This gives *S. fragilis* as a plant of soft mud in the lower levels of saltmarshes, particularly on the sides of channels, and common in suitable habitats such as the Medway estuary (also extending to the Swale, and the Thames estuary as far east as Higham Marshes). The total of tetrad records was 29, which increased to 32 in the 1991-2005 survey published in Philp (2010). The change is probably not significant, except that the later records include the mouth of the River Stour, Sandwich. Our 2010-20 records are not substantially different, viz. 31 tetrads, even though there may be some under-recording on the Hoo peninsula and River Medway margins; a new location has been added at Dungeness.



Salicornia fragilis (Yellow Glasswort) 2010-20



Salicornia fragilis
(Yellow Glasswort)
1991-2005

¹⁴ Ball, P.W. & Tutin, T.G. (1959), Notes on annual species of *Salicornia* in Britain. *Watsonia* 4: 193-205.

As Yellow Glasswort is not uncommon in Kent, the distributional data maintained in this register will be at 1km square (monad) level, as shown in the 2010-20 distribution map. This entails recording at a finer scale than the tetrads given in Philp (2010), from which the accompanying 1991-2005 map is taken (with kind permission of the late Eric Philp and the Kent Field Club).



Oare. Photo by Liam Rooney, 5 October 2011

Salicornia fragilis grows in Kent on muddy saltmarshes, generally in the lower levels, below where *Puccinellia maritima* (Common Saltmarsh-grass) grows, but often in the lower reaches of *Atriplex portulacoides* (Sea-purslane) colonies, and sometimes (as at Conyer and Pegwell Bay) in the lowest zone with *Spartina anglica* (Common Cord-grass). It has been seen, but seldom, in the upper saltmarsh with *Salicornia ramosissima* (Purple Glasswort); but where it does extend above the lower or middle saltmarsh, it is most frequently by the edge of muddy channels, which tend to replicate the lower saltmarsh conditions somewhat, with earlier flooding and strong water movement. Zonation of species, with *S.* (cf.) *fragilis* occupying the lower parts was observed by Hambler (2011)¹⁵ on the saltings of Chetney Canal (TQ 883 669), a tidal waterway excavated around 1810 in order to isolate Chetney Hill as a potential quarantine facility. The uncertainty of identification of *S. fragilis* probably reflects the date of his observations, 1951, i.e. before *S. fragilis* was formally described. He related the zonation to tidal 'sorting' of *Salicornia* seeds, so that the smaller seeds of the *S. europaea* aggregate (including *S. ramosissima*) would be deposited higher than the larger seeds of the *S. procumbens* aggregate (including *S.* (cf.) *fragilis*).

The distribution of *S. fragilis* resembles that of *S. dolichostachya* (see accompanying map).

***Salicornia dolichostachya* (Long-spiked Glasswort)**
2010-20



The latter is somewhat scarcer in Kent, so it may seem surprising that it is not a county rare plant register species, but this is a consequence of its wider distribution, as it is not nationally scarce, as is *S. fragilis*. The coincidence in distribution goes beyond appearing in the same monads (which is not altogether unexpected in view of the extent of availability of saltmarsh habitat), but the two species have often been found growing together in Kent. This may contrast with the situation in France, where *S. fragilis* is a species of somewhat higher levels than *S. dolichostachya*, and hence inundated for less time¹⁶. We have noted mixed colonies at many sites, and intermediate plants, which cannot readily be assigned to either taxon, at Conyer, Oare and Stoke Saltings. Hybridity between these species appears not yet to have been claimed, but there are widely varying views about the division of the *Salicornia* genus into species in any event and the characters to be attributed to species. Some of that variation may be covered by a taxon formerly called *Salicornia lutescens*, which is now generally treated as part of *S. fragilis*. Francis Rose

¹⁵ Hambler, D.J. (2011). *Salicornia* 'sorts' (2): zonation, dispersal, seeds and sorting. *BSBI News* **118**: 35-40.

¹⁶ Lahondère, C. (2004). Les salicornes s.l. (*Salicornia* L., *Sarcocornia* A.J. Scott et *Arthrocnemum* Moq.) sur les côtes françaises. *Bulletin de la Société Botanique du Centre-Ouest* n.s. **24**, 122pp.

regarded *S. fragilis* as probably only a modified habitat form of *S. dolichostachya*.¹⁷ A study of morphological variation in tetraploid *Salicornia* in Norfolk, Essex and Sussex saltmarshes found evidence of a variant corresponding to *S. fragilis*, even though the authors preferred to consider it as part of *S. dolichostachya* agg.¹⁸



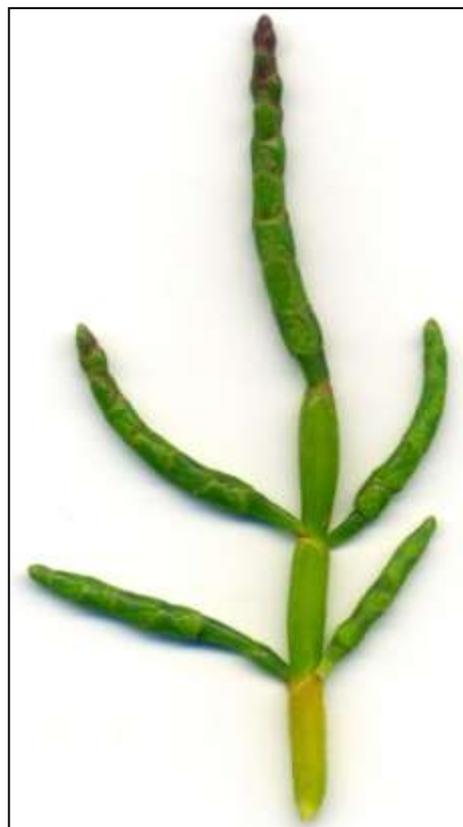
Habitat, Stoke Saltings. Photo by Liam Rooney, 9 October 2012

S. fragilis may be identified as part of the *S. procumbens* aggregate of tetraploid glassworts by the three flowers (cymes) being more or less equal in size; and by the fertile segments being cylindrical, not markedly swollen or 'waisted' like a set of beads. The aggregate includes *S. emericii*, whose distinguishing characters are given in its own rare plant register account. The other British species in the aggregate are *S. fragilis* and *S. dolichostachya*, which are separated by the terminal spike being more or less cylindrical in *S.*

fragilis and usually tapering in *S. dolichostachya* (but 'more or less' and 'usually' imply potential for overlap); by the terminal spike bearing 6-15(22) fertile segments in *S. fragilis* and 12-30 in *S. dolichostachya* (so there is overlap in the range of 12-15(22) segments; and by the colour, with *S. fragilis* becoming yellowish-green to bright yellow, and *S. dolichostachya* becoming dull green, dull yellow or yellowish-brown (these are the colours given in Stace's *New Flora of the British Isles* and are not necessarily easy to interpret where colour is in the course of changing on the plant; and in any event, both generally go yellow before browning, albeit *S. fragilis* does so sooner as it appears to be an earlier flowerer).

Salicornia sp., Oare. Photo by Liam Rooney, 18 October 2019

Setting aside the degree of rapprochement between *S. fragilis* and *S. dolichostachya*, it is possible that *S. fragilis* may hybridise with other species, but there is general reluctance to seek that explanation for anomalous plants in view of the general taxonomic difficulties with *Salicornia*. An example of a problem plant is illustrated here, a glasswort found by Liam Rooney at Oare where both *S. fragilis* and *S. ramosissima* (Purple Glasswort) were growing together. The majority of the fertile segments look to be tetraploid (as is *S. fragilis*) with their straight sides and equal flowers (cymes) within each triad. However, the upper segments of the left branch and terminal spike have greater affinities with diploid species (such as *S. ramosissima*) in that their outline is swollen or beaded and the flower triads have the central flower distinctly larger than the



¹⁷ It is not treated separately in his manuscript *Flora of Kent*, which was laid out with somewhat outdated glasswort names, but this view is stated in Brewis, A., Bowman, P. & Rose, F. (1996), *The Flora of Hampshire*; and *S. fragilis* is given as a var. of *S. dolichostachya* in his Key to annual *Salicornia* species of South England and North France, *BSBI News* (1989) **53**: 12-16.

¹⁸ Ingrouille, M.J., Pearson, J., Havill, D.C. (1990). The pattern of morphological variation in the *Salicornia dolichostachya* Moss group from different sites in southern England. *Acta Botanica Neerlandica* **39**: 263-273.

lateral ones. The purple colouration associated with *S. ramosissima* (reflecting the production of betacyanin as a result of environmental stress) also affects those segments; an occasional speck of red or pink tinge in some plants from the *S. procumbens* aggregate also being noted by Hambler (2012)¹⁹. Liam Rooney comments that *S. ramosissima* can have lower segments tending to a tetraploid appearance, and it may part of normal growth development, but with the generally smooth cylindrical spikes here, this example is well outside usual experience. However, the possibility of hybridization between the two species is not something which may be readily resolved on morphological evidence alone.



From *Salicornia* crib sheet prepared by Liam Rooney from Kentish specimens

¹⁹ Hambler, D.J. (2012). *Salicornia*: photographs – a visual aid. *BSBI News* **120**: 28-30.

Salicornia obscura P.W. Ball & Tutin (Glaucous Glasswort)

Draft account

vc 15, presumed lost from vc16

Rarity / scarcity status

Salicornia obscura is an annual of saltmarshes, very sparsely scattered round the coasts of the British Isles, but mostly in South Essex, and nationally **rare**. It has not been assigned a threat category for conservation purposes as not enough is known about it. In Kent it has seldom been seen, and is **rare**.

Oare. Photo by Liam Rooney, 5 October 2011

Account

Salicornia obscura was first described in 1959. Its first published Kent record (in the sense of publication date) is in Philp (2010): 'Plants fitting the description of this species were recorded from the middle part of the salt-marshes along the Swale at Elmley TQ96N and Oare Marshes TR06C'. The find dates are not given, but for Elmley it was 4 October 1994. The cautiousness of the identification is not unfair, given its difficulty. The finds were predated by a 1951 sighting by David Hambler published in 2013²⁰, identified retrospectively from a photograph. This was of a small stand of plants growing on a barge hulk in Whitewall Creek (TQ7569) by the Chatham Reach of the River Medway (since reclaimed and now under Neptune Close, vc16).



They had the characteristic bulging fertile

segments, lack of secondary branching and upward curvature of the lowest primary branches; another possible stand was noted three or four km upstream, outside the wall fringing Temple Marsh.



Conyer. Photo by Liam Rooney, 26 November 2019

The species was seen again at Oare in October 2011, when Eric Philp led a Kent Botanical Recording Group meeting to review the glassworts there, and it was recorded in the upper saltmarsh from TR 017 644, as occasional through to TR 016 643. A revisit by the KBRG in October 2019 failed to re-find *S. obscura*, but later that month Liam Rooney found a small colony at the extreme lower end of the saltmarsh at Conyer Creek, TQ 96165 65554. As late as 26 November, even after frosts, he and Danny Chesterman found another small

colony further west at Conyer, TQ 95837 65226 and a couple of plant about ten metres further west still. They were the only undecayed glassworts at that time of year, and had developed a dull

²⁰ Hambler, D.J. (2013). The obscure Glaucous Glasswort; *Salicornia obscura*. *BSBI News* **124**: 5-6.

yellow-green colour. They were well down the saltmarsh, in *Spartina anglica* (Common Cord-grass), by a muddy channel.

It is generally considered to be a plant of bare mud, salt pans and the sides of channels in saltmarshes (Ball & Tutin).²¹ Francis Rose noted it as a plant which grows on mud or sandy soil in open communities in lower parts of saltmarshes, below the *Puccinellia maritima* zone²², but this may not be the result of any Kentish observations, as the species does not feature in his manuscript Flora of Kent.



Conyer, habitat. Photo by Liam Rooney, 26 November 2019

It belongs among the diploid species of *Salicornia*, as may be seen by fertile segments being swollen and 'waisted' like a set of beads; also, the flowers (cymes) in their groups of three are markedly unequal, especially in the mid-part of the terminal spike. The other British diploid species are *Salicornia europaea* (Common Glasswort) and *Salicornia ramosissima* (Purple

Glasswort). The latter differs from *S. obscura* in having fertile segments which are more strongly beaded; by having a clear shiny surface which changes colour from green to reddish-purple or red; and by the angle made within the apex of the fertile segments being 110°-120°. *Salicornia europaea* is perhaps closest in appearance to *S. obscura*, and differs from it in being clear green, neither glaucous nor matt, becoming reddish or yellowish-orange with age; and by the angle made within the apex of the fertile segments being 90° or less, as a result of that apex forming a distinct cusp. It is possible that *S. obscura* should be regarded as a variant of *S. europaea*.

S. obscura itself may be characterised as having a glaucous green, matt surface, never reddening, other than sometimes to a minor degree around the flowers, but yellowing in late development; having branches which curve upwards at the end, with little, if any, secondary branching and no tertiary branching; having relatively short lower branches (i.e. usually less than half the length of the main stem, so giving a pyramidal appearance to the whole plant); and with the angle made within the apex of the fertile segments being 140°-150°.

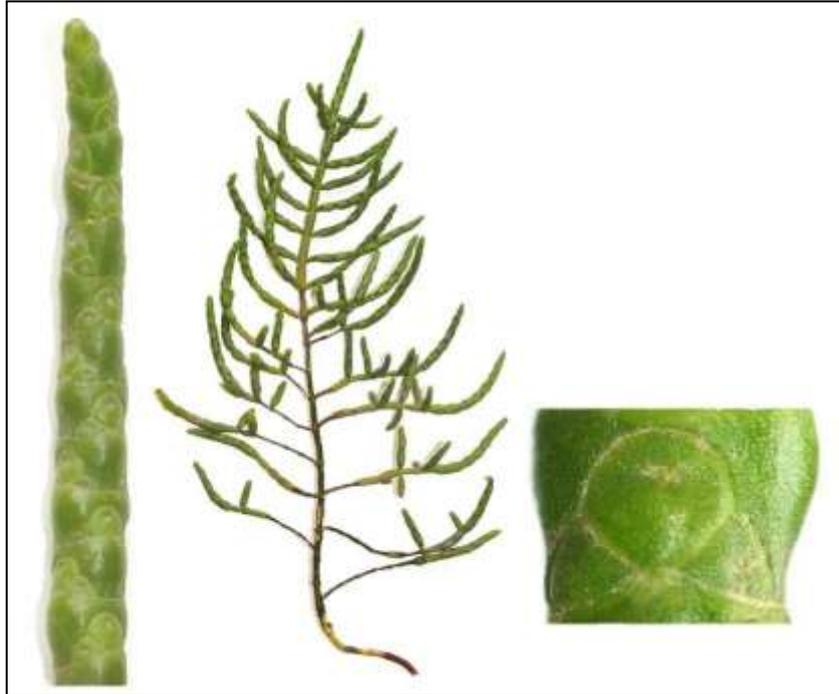
Although the triad flowers are unequal (as with the diploid species generally), those of *S. obscura* are perhaps more equal than those of *S. ramosissima* and *S. europaea*, the lateral flowers may give the impression of being more emergent from the segment below, with the perianth higher above the underlying scarious border than is the case with the other species – in consequence, the lateral flowers sometimes meet, below the central flower. The scarious border at the apex of the border of the fertile segments is broadest with *S. ramosissima*

²¹ Ball, P.W. & Tutin, T.G. (1959), Notes on annual species of *Salicornia* in Britain. *Watsonia* 4: 193-205.

²² Rose, F. (1989). Key to annual *Salicornia* species of South England and North France (modified from a key by Prof. Géhu (1979) by Dr. F. Rose with some additional material), *BSBI News* 53: 12-16.

(0.1-0.2mm), then *S. europaea* (c.0.1mm) and narrowest is *S. obscura* (c.0.5mm, although Lahondère (2004)²³ refers to measurements up to 0.15mm); however, the distinction between the scarious margin and the general border tissue is not always clear.

From *Salicornia* crib sheet prepared by Lliam Rooney from Kentish specimens



²³ Lahondère, C. (2004). Les salicornes s.l. (*Salicornia* L., *Sarcocornia* A.J. Scott et *Arthrocnemum* Moq.) sur les côtes françaises. *Bulletin de la Société Botanique du Centre-Ouest* n.s. **24**, 122pp.

Salix purpurea L. (Purple Willow)

Draft account. Check presence at Leybourne Lakes (TQ 7063 6004) and Bedgebury Park School (TQ 724 344).

vc 15 and 16

Rarity / scarcity status

Purple Willow grows scattered throughout the British Isles, frequently planted although it is not always practicable to distinguish between native and introduced occurrences may not be readily distinguishable. Its conservation risk status is of 'Least Concern'. There are some parts of the British Isles where it is much less frequent, and these include Kent/Sussex. On the basis of the data in Philp(2010) it would be treated as **scarce** in the county. From our subsequent records it would seem to be **near scarce**, so its inclusion in this register is marginal.

Stodmarsh. Photo by Liam Rooney,
25 March 2014



Account

The first Kentish record is given by Hanbury and Marshall (1899) as by Joseph Woods junior in relation to what was called *Salix Lambertiana* (a broad-leaved form), 'About Ham Ponds near Sandwich', published in Turner and Dillwyn's *The Botanist's Guide through England and Wales* (1805). Hanbury

and Marshall assessed 'Bitter Purple Willow' as a rather scarce native of streamsides, marshes and wet thickets, giving records across the county. These included water-meadows at Northfleet; by the river above Darenth; Davington Osiers (this suggests cultivation, perhaps to supply charcoal for the gunpowder works, although it is a basket-making willow); in the marshes at Sarre, Minster and Monkton; fields, thickets and rough swampy ground at Snodland; and by the Eden near Chiddingstone.



Fairfield. Photo by Liam Rooney, 4 August 2013

Francis Rose considered it probably native and very rare in Kent. To the older records he was only able to add presence in a hedgebank at Stone Street, Seal (1949), a roadside spinney at Five Wents, Eastry (1960) and near Fordwich Church (undated). Twelve tetrads, however, were noted in Philp (1982), by ponds and streams and in marshes across the county, but with a concentration in TR02, including around St Mary in the Marsh, Old Romney and Ivychurch. TR02C, west of Old Romney, also featured in Philp (2010) together with another Romney Marsh record at Fairfield, but these with Nettlestead Green and Harrietsham were the only sites found in the 1991-2005 survey. Despite the records total having reduced by two-thirds between surveys, this is not indicative of a real decline, as our 2010-20 records reverted to 12 tetrads again. However, one of these (not included in the accompanying map) is obviously an urban ecology park planting); plants near Conningbrook Lakes, Ashford

shown on the map may well be planted; and trees by the Stour at Stodmarsh are described by Alex Lockton²⁴ as appearing to be an old withybed. Indeed, there is uncertainty about the status of many of our recorded trees and bushes.



Salix purpurea (Purple Willow) 2010-20

Plants have continued to be seen in the Old Romney and Fairfield areas, and it is interesting that recent records have picked up presence at Stodmarsh, Pluck's Gutter and the Ash Levels relating to the Stour catchment, since these may reflect some continuity with historic Sarre, Monkton and Minster Marshes occurrences. This raises the question as to whether *Salix purpurea* here has any

connection (other than the general association of willows with water) with the fact that both these areas represent reclaimed marshland, the Stour originally having a wider channel which, with the Wantsum provided a marine inlet surrounding the Isle of Thanet, and the River Rother before 1287 having taken a course through tidal flats via Old Romney.

Our recent records have tended to be the odd one or two small trees or bushes growing alongside a river, stream or roadside ditch. There are no sustained populations (other than the presumed old withybed mentioned above) and the most extensive recorded occurrence has been along 10m of roadside near Fairfield, with a neighbouring outlier. Where we have noted associated species, these have tended to be other willows, e.g. *Salix viminalis* (Osier), but may be expected to be species of damp habitats, such as *Carex acutiformis* (Lesser Pond-sedge) and *Petasites hybridus* (Butterbur) at Bearsted. The absence of recent records for West Kent is a little surprising, and it may be worth checking not-so-recent records such as at Leybourne Lakes (TQ 7063 6004 in 2006) and Bedgebury Park School (TQ 724 344 in 1999).

Salix purpurea scarcely reaches the stature of a tree and generally does not have a distinct trunk. The leaves are characteristic, being usually opposite, sub-entire, bluish-green with a pale central vein: they look more blunt and rounded towards their apical point than most other willows. The flowers appear before the leaves, the male ones with reddish-purple anthers. The two filaments are joined so that each flower appears to have only one stamen, and this is the only one of our willows which does this.

Stodmarsh. Photo by Liam Rooney, 18 August 2018



It hybridizes with various other species and we have records from various sources given in Hanbury and Marshall (1899) of *Salix purpurea* x *viminalis* and (queried) *Salix purpurea* x *triandra*; but none more recent.

²⁴ *The Flora of Stodmarsh National Nature Reserve* (2017).

Salix repens L. (Creeping Willow)

Draft account. Needs re-finding at Tunbridge Wells Common.

vc 15 and (but not recently) 16

Rarity / scarcity status

Salix repens is found throughout the British Isles, other than much of the Midlands on acid heaths and moors, fens and dunes. It is treated as **Near Threatened** in England as a comparison over the periods 1930-1969 and 1987-1999 showed that its area of occupancy had declined so that there was a calculated 20% reduction in the likelihood of recording the species. In Kent, there is limited suitable habitat and it is **scarce**.

Account

The first mention of Creeping Willow in Kent is by Parkinson in his *Theatrum Botanicum* (1640)²⁵, at Romney Marsh, presumably near New Romney where there is a nineteenth century record by J.G. Baker which may reflect an earlier stage of development of duneland around the Warren.



Covert Wood. Photo by Alfred Gay, May 2011

Subsequent early records are mostly focused in the two areas. The first is the acid commons of north west Kent (West Wickham, Keston, Hayes, St Mary Cray and Chislehurst), from which *Salix repens* has since disappeared, probably largely due to the development of secondary woodland, the last records being 1966 (Rodney Burton, by a pond at the north edge of Chislehurst

Common) and 1951 (Keston Bog²⁶). The second is the duneland and fens of East Kent: from Sandwich, where noted by John Ray in 1690²⁷ to the Deal sandhills (1777), about Walmer Castle (1804) and Ham Ponds (1839), with outliers at New Romney and Dungeness, although this last site will have been on consolidated shingle rather than sand-dunes²⁸.

The Sandwich Bay dunes have provided continuity from 1690 to the present between Sandwich and Deal. Francis Rose described Creeping Willow as locally abundant there in 1958 and recently (2011-13) it has been noted in dune-slacks on both Royal St George's and Royal Cinque Ports golf courses, as well as a bird scrape margin on Bird Observatory Land. Inland, the former site of Ham Ponds, now Ham Fen, had continuity from William Pamplin's observations published in 1839 in Matthew Cowell's *A Floral Guide for East Kent* through to Francis Rose finding it from very abundant to locally dominant in the period 1946-52, forming open scrub 1-4

²⁵ He dealt with a number of plants under the heading '*Salix pumila latifolia*. The low broad leafed Willow' which appear to include *Salix repens*, and their sites (although not assigned to any one of these named Willows) include 'Romney Marshes'. Separately he dealt with '*Salix pumila angustifolia*. Low narrow leafed Willows', also appearing to include *Salix repens*, but without sites. Presumably this disparate treatment reflects the wide level of variation of what has now long been one species.

²⁶ John, J. & Price, J. (20'4). Heathland restoration at Keston and Hayes Commons: Part of Darwin's landscape: past and present. *Transactions of the Kent Field Club* **19**: 75-99.

²⁷ *Synopsis Methodica Stirpium Britannicarum* (1690): 'in arenosis prope Sandvicum Cantii maritimum oppidum' (in sand-dunes near the Kentish coastal town of Sandwich).

²⁸ Given by George Dowker at p34 of the *Report of the East Kent Natural History Society* (Session 1867) as at a pond, Dungeness, presumably the Open Pits, although he was not wholly sure whether it was *Salix repens* or *Myrica gale*.

feet high and growing with *Cladium mariscus* (Great Fen-sedge) and *Thelypteris palustris* (Marsh Fern). In his manuscript Flora of Kent, he noted that it could not be found after the site became temporarily flooded with seawater in January 1953, but his notebooks show that he re-found it in 1991. Of the other coastal sites, occasional records have continued in the New Romney area but there have been many at Dungeness, not just by the Open Pits, but also more widely there, in seven different monads 2010-20, at times frequent and apparently spreading.

Apart from the north west Kent commons and the east and south east coastal sites there have been some scattered inland sites. Eric Philp's Tunbridge Wells Common record of 1991-98 may be the same as Clive Stace's record by Brighton Lake, Eridge Road at the southern end of the common. It was also known at Southborough Common before 1899 but seems likely to have disappeared by 1918. In 2016 a young plant was found growing in cleared woodland on the Scotney estate near where a small pond or scrape had been opened up; and there is also a Bedgebury pinetum sighting by Francis Rose 1946-57, originally found by A.B. Jackson (died 1947). All these records are on the acid Tunbridge Wells Sand Formation which also includes clay elements which can impede drainage locally and which may be a factor in some of these records.

An early eighteenth century specimen from Southfleet²⁹ was considered by Francis Rose to relate to ancient valley fen between Northfleet and Southfleet, since terribly polluted. It is, however, echoed by the presence of *Salix repens* in very calcareous conditions of the Eastern Quarry at Swanscombe, found by a Kent Field Club meeting in September 1998 (the area is in course of redevelopment). Another isolated site is a community field facility near Stonebridge Green in the Great Stour catchment, a degenerated water meadow on the Hythe Formation where Creeping Willow was found by Eric Philp and Brian Woodhams in 2005. A further site not falling into any obvious pattern is Covert Wood, a remarkable location in which the underlying chalk appears to have been modified by head deposits so that an acid flora, with plants such as *Polygala serpyllifolia* (Heath Milkwort) and *Calluna vulgaris* (Heather) has developed. This was most recently investigated in May 2011 Alfred Gay discovered a single patch of *Salix repens* growing in a slight ditch beside one of the main paths, but it is not a one-off, as Joyce Pitt has been aware of two locations here, earlier on. This woodland context is very surprising for *Salix repens*, which is normally a plant of open ground and has an Ellenberg light value of 8, applicable to light-loving plants rarely found where relative illumination in summer is less than 40%.



Sandwich, var. *argentea*. Photo by Sue Buckingham, 29 October 2011

Salix repens is distinctive by virtue of its low creeping habit (but not as ground-hugging as the alpine willows), never developing as a tree or substantial shrub, but generally less than 1m high. The leaves do not exceed 3.5 x 2.5cm and are generally hairy at least on the underside. It is an extremely variable species and currently separated into three varieties, although they may intergrade. The most conspicuous is var. *argentea* (formerly treated as a separate species, *Salix arenaria*), with ascending silky-hairy stems and with silvery larger leaves densely hairy on both sides. We

²⁹ Stated in Hanbury and Marshall (1899) to be in the herbarium of Dillenius, but *The Dillenian Herbaria. An account of the Dillenian collections in the Herbarium of the University of Oxford* (1907) gives Southstreet rather than Southfleet, so a mistranscription appears to be involved.

have recorded this in 2010-20 frequently at Dungeness (as far north as Littlestone) and Sandwich Bay which is appropriate, as this is usually a plant of dune slacks. The commonest variant in the British Isles (but not Kent) is var. *repens*, a plant of heaths and moors, which has procumbent stems, soon becoming near-glabrous, with small, sparsely hairy leaves. We have only recorded this at Tunbridge Wells Common and Scotney, but it is likely that this is the identity of nearly all our inland records (but not the Swanscombe plant, which was var. *argentea*). Francis Rose named this from plants he saw at Keston and Chislehurst Commons and Bedgebury. A third variant, var. *fusca*, has somewhat erect hairy stems and the leaves are similar to those of var. *repens*. It is a plant of East Anglian fens, but the Stonebridge Green record was assigned to this variety, the only one for Kent; drainage through the sandstone and interbedded limestone of the Hythe Formation here may be capable of producing local fen-like conditions.

Sandwich, var. *argentea*. Photo by Sue Buckingham,
29 October 2011

Despite the north west Kent losses, it is supposed to be a resilient species, capable of coping with both dry and very wet conditions (although not so much as regards dry conditions in south and east England). It is found on infertile soils; obviously the Dungeness consolidated sand/shingle fits this, but also the sand dunes and acid inland Kent sites. There may be some limitations on areas of occurrence due to its mycorrhizal associations, which are with both arbuscular mycorrhiza and ectomycorrhiza. These have been much studied in recent years, and the diversity of mycorrhiza involved may assist the plant in coping with a range of environmental conditions. *Salix repens* is also considered to be resilient to increased temperatures and carbon dioxide of climate change, in spite of being slow-growing³⁰.



Salix aurita x *repens* (*S. x ambigua*) has been reported by the Rev. H.A. Stowell in 'Faversham Plants' (*The Phytologist* (1857) 2: 155) as 'By a stream in Hernhill Wood', which Hanbury and Marshall (1899) thought very doubtful (and so it is). Dillenius' herbarium includes a specimen (determined by Dr. Druce) from Mr. Littleton Brown 'By ye foot way on ye first enclosure going from Tunbridge Wells to ye Cold Bath shrubby 6 foot high'³¹; the Cold Bath (built 1708, discontinued by 1780) was at what is now Beacon Hotel, Tea Garden Lane, and the general area would be consistent with existence then of the *Salix repens* parent.

Salix cinerea x *repens* (*S. x subsericea*) was noted by Francis Rose, 1948-54, at Ham Ponds, var. *argentea* of *Salix repens* being involved. The cross was also recorded by David Holyoak on 10 October 2006 at Dungeness, TR 066 197 by the ARC pits; *Salix repens* is abundant here, and *Salix cinerea* is the most likely willow to accompany it generally in Kent.

Site	Grid reference	Site status	Last record date	Recorder	Comments
Tunbridge Wells	TQ53U		1991-98	EGP	Var. <i>repens</i> . May have been near

³⁰ Nissinen, K. et al. (2016). Slow-growing *Salix repens* (Salicaceae) benefits from changing climate. *Environmental and Experimental Botany* 128: 59-68.

³¹ G.C. Druce, ed. S.H. Vines (1907). *The Dillenian Herbaria. An account of the Dillenian collections in the Herbarium of the University of Oxford*.

Common					Brighton Lake, where recorded by CAS (in early 1960s?).
Eastern Quarry Swanscombe	One or other of TQ5974, TQ5973 or TQ5873		6 September 1998	KFC meeting	Var. <i>argentea</i> . Former chalk quarry with wet floor.
Scotney estate	TQ6934		15 May 2016	KBRG meeting	Var. <i>repens</i> . Very young plant, recently cleared area in woodland, c. TQ 6917 3466
Stonebridge Green, Lenham	TQ9148		13 July 2005	EGP, BW	Var. <i>fusca</i> . Degenerate water meadow, just beyond field boundary fence.
Dungeness, Denge Marsh	TR01P		After 1970, before 1981	Philp (1982)	Var. <i>argentea</i> . TR01P
Dungeness (Muddymore, Pen Bars)	TR0617		10 August 2013	TI	Var. <i>argentea</i> .
Dungeness (Boulderwall, , Denge Beach)	TR01U (includes TR0618, TR0619, TR0719)	RSPB reserve	(1) 1 August 2019 (2) 22 May 2019 (3) 10 July 2016 (4) 24 September 2013 (5) 5 August 2012 (6) 20 August 2011 (7) 19 July 2010 (8) 15 June 2010 (9) 3 June 2010 (10) 10 October 2006 (11) 30 October 2004 (12) 22 October 2002 (13) 5 September 2002 (14) 26 June 1996	(1) AW (2) AW (3) KBRG meeting (4) CO (5) BW (6) SB (7) JA (8) GK (9) DG (10) DTH (11) DTH (12) DTH (13) MG (14) EGP	(1) TR0618 & TR0719. (2) TR0618. (3) Var. <i>argentea</i> , TR0618. (4) Frequent, opposite Boulderwall farmhouse. (5) TR0618. (6) Var. <i>argentea</i> . TR0619. (7) one plant at TR 06758 18459 and prolific at TR 06753 18118. (8) TR 016 583, <i>Cladium</i> pit. (9) Dungeness RSPB Reserve (ARC side), TR 0743 1917, large patch. (10) TR 066 197. (11) TR 065 198. (12) TR 066 198. (13) TR0719, ARC pit. (14) Var. <i>argentea</i> , TR01U.
Dungeness	TR01Y		(1) 3 July 2011 (2) 27 June 1996 (3) After 1970, before 1981	(1) TI (2) EGP (3) Philp (1982)	(1) Var. <i>argentea</i> , TR0817. (2) Var. <i>argentea</i> , TR01Y. (3) Var. <i>argentea</i> , TR01Y.
Dungeness, Long Pits	TR01Z (including TR0818)		(1) 23 August 2013 (2) 30 July 2011(2) (3) 27 June 1996 (4) After 1970, before 1981	(1) CO (2) TI (3) EGP (4) Philp (1982)	(1) TR0818. (2) Var. <i>argentea</i> , TR0818 (3) Var. <i>argentea</i> , TR01Z. (4) Var. <i>argentea</i> , TR01Z.
Lydd-on-Sea	TR02Q (including TR0620)		(1) 15 June 2013 (2) 1991-99	(1) TI (2) EGP	(1) Var. <i>argentea</i> . TR0620 (2) Var. <i>argentea</i> . TR02Q
New Romney/ west Littlestone	TR0724		3 October 2013	OL	Var. <i>argentea</i> .
Covert Wood	TR1848		(1) May 2011 (2) 18 June 2004	(1) AG (2) JP	(1) Covert Wood, a single clump growing in a slight ditch beside one of the main paths at TR 184 485 with species such as <i>Polygala serpyllifolia</i> , <i>Calluna vulgaris</i> , <i>Teucrium scorodonia</i> and <i>Ajuga reptans</i> . (2) TR 181 484, plateau area, distinct from where found some four years before.
Monkton	TR26X		After 1970, before 1981	Philp (1982)	
Ham Fen	TR3454		24 July 1991	FR	
Sandwich Bay	TR3458		19 May 2020	SB	TR 3556 5828, St Georges golf course, old dune slack.
Sandwich Bay	TR3557		2 March 1983	ACH	TR 353 578.
Sandwich Bay	TR35P (includes TR3558, TR3559)		(1) 21 May 2013 (2) 4 August 1996 (3) After 1970, before 1981	(1) CO (2) FR (3) Philp (1982)	(1) TR3558, one patch by footpath across golf links. (2) TR3559, dune slack. (3) Var. <i>argentea</i> , TR35P
Sandwich Bay (Deal Sandhills)	TR35S (includes TR3755)		(1) 17 July 2020 (2) 6 May 2013 (3) 1991-99	(1) SB (2) SB (3) EGP	(1) TR3755. (2) Var. <i>argentea</i> . Frequent on the dunes on Royal Cinque Ports golf

			(4)After 1970, before 1981	(4) Philp (1982)	course (3) & (4) <i>Var. argentea</i> , TR35S.
Sandwich Bay	TR35T (Includes TR3656, TR3657)		(1) 6 August 2020 (2) 1 August 2011 (3) 1991-99 (4) 2 March 1983 (5)After 1970, before 1981	(1) SB (2) SB (3) EGP (4) ACH (5) Philp (1982)	(1) TR3657, var. <i>argentea</i> , new enlarged bird-scrabe. (2) (a) <i>Var. argentea</i> , TR3656. (b) <i>Var. argentea</i> . Five plants TR 36094 57043 margin of bird scrape, managed by Sandwich Bay Bird Observatory. (c) <i>Var. argentea</i> . Twelve or more large plants in dune slack at TR 36300 57265, part of Sandwich Bay Bird Observatory protected land. (3) <i>Var. argentea</i> , TR35T. (4)TR 363 485. (5) <i>Var. argentea</i> , TR35T.
Sandwich Bay / Pegwell Bay	TR36		2 March 1983	ACH	TR 349 618.

Salsola kali L. (Prickly Saltwort)

Draft account

vc 15 and (but not recently) 16

Rarity / scarcity status

Prickly Saltwort grows in sand coastal places around the coasts of the British Isles, although as an annual it can be erratic in its appearances and faces pressure through recreational use of beaches. Its conservation risk assessment in Great Britain is **Vulnerable** to the risk of extinction, but in England, 1930-99 data would indicate that decline of this species has been insufficient to warrant a status other than of 'Least Concern'. However, if 1987+ data were assessed as a proportion of all records, including pre-1930 data, then this would show a substantial 39% decline. It is (from before the re-assessment of its English conservation status) a UK Biodiversity Action Plan priority species by virtue of its decline and being a good indicator of a conservation issue. The plan seeks to have its needs taken into account in coastal defence strategies and to give encouragement to the availability of strandline / embryo dune habitat systems. On the basis of records in Philp (2010) it would be assessed as scarce in Kent, but our 2010-20 indicate that it is verging on scarce. It is being retained in the rare plant register in view of its previous history of scarcity.

Sandwich Bay. Photo by Lliam Rooney, 9 July 2010

Account

The first Kent record for Prickly Saltwort is by Thomas Johnson (*Iter Plantarum*, 1629), exploring the sea shore from Queenborough Castle, Sheppey. Francis Rose considered that Johnson's plant listing was probably made at the site of present Sheerness, where shell-sand beaches were probably well-developed, as with present-day Grain and Leysdown. The listing included other coastal sand plants such as *Glaucium flavum* (Yellow Horned-poppy), *Euphorbia paralias* (Sea Spurge) and *Eryngium maritimum* (Sea-holly). Johnson also recorded it at Margate (*Descriptio Itineris Plantarum*, 1632). Hanbury and Marshall (1894) regarded it as sufficiently frequent on sandy and shingly shores from Sheppey eastwards and along the north east coast that they did not give individual records: only for outliers at Grain, Folkestone, New Romney and Dungeness.



Francis Rose regarded it as a native of sandy shores, usually along the strand zone, where its seeds are deposited by high spring tides: very local, as the extent of suitable sandy shores is limited. In West Kent, he recorded it as frequent on the north beach of Grain, 1945-71; and it was also reported from the beach west of Allhallows in 1958. In East Kent, he was familiar with it at the eastern end of Sheppey, where common on the shell-sand of Shellness, 1946-56, being long extinct from Johnson's site at the western end, and it was also at Minnis Bay (1946). On the east coast of the county, he knew it at Cliffsend (1945) and as abundant from Shellness in Pegwell Bay to Sandwich Bay (1954). It was reported at Lydden Spout in 1945, and he was familiar with it at Greatstone, at intervals from 1946 to 2000.

Philp (1982) considered that the species had probably declined during the twentieth century due to pressure on sandy shore habitats, and that it had become rather scarce, with six tetrads recorded 1971-80. These had become seven tetrads by Philp (2010), for the period 1991-2005, most of them different, emphasizing the erratic nature of its occurrences, although constrained by limitations of habitat. Our 2020-20 records, however, are for 14 tetrads (18 monads), so clearly it is not as scarce as had been supposed. This may be a

consequence of more effective recording, even though we have not located it recently in West Kent. The last West Kent records have been at Greenhithe (TQ57X, John Palmer 1979-80) and Grain (TQ87Y, Eric Philp 1991-99). In view of the number of records, this register is being maintained as mapping the species at monad level.

The increased number of East Kent sightings may be connected with an increase of records for other strandline species such as *Eryngium maritimum* (Sea-holly) and *Polygonum oxyspermum* subsp. *raii* (Ray's Knotgrass).

Salsola kali (Prickly Saltwort) 2010-20

Our 2010-20 observations record it as growing on sandy or shingly beaches, generally at the strand-line, including where this extends to the foreshore of dunes. If on shingle, it prefers the presence of some sand as well. Associated flora includes *Atriplex laciniata* (Frosted Orache) and *Cakile maritima* (Sea Rocket). We have also found it on sandy accumulations in man-made habitats, within the fencing of Ramsgate ferry terminal and the neighbouring roundabout on Military Road.

As a strandline annual, *Salsola kali* at least in part has its fruits dispersed by the autumnal and vernal equinoctial tides, with germination geared to take place afterwards, mostly in May and June³². Inhibition of autumn germination is likely to arise substantially from the enclosure of the seed in a persistent perianth, which presumably decays over winter, after which temperature and salinity are relevant factors: at certain temperature levels, salinity stimulates germination. The fruits are to a degree buoyant, but experiments showed that all sank within a period of 22 days' immersion and prolonged immersion reduces seed viability.



There are no species with which *Salsola kali* is likely to be confused in its characteristic British habitat, but *Salsola tragus* (Spineless Saltwort) has been treated as a subspecies of *Salsola kali*: it is a relative spineless alien, unrecorded in Kent since 1900 (as *S. kali* subsp. *ruthenica*) or 1923 (as *S. kali* var. *tenuifolius*).

Sandwich Bay. Photo by Liam Rooney, 9 July 2010

³² Ignaciuk, R. & Lee, J.A. (1980). The germination of four annual strand-line species. *New Phytologist* **84**: 581-591.

Salvia pratensis L. (Meadow Clary)

Draft account

vc 15 and 16

Rarity / scarcity status

Salvia pratensis has few native localities in the British Isles (variously put at around a dozen, or twenty, depending on interpretation), generally in calcareous grassland, scrub or wood-borders, and its status is uncertain or introduced elsewhere. It is **nationally scarce** and treated as **Near Threatened** in both England and Great Britain as a whole. This risk assessment is in England based on a reduction both in the overall geographical extent of its occurrence and in the area of occupancy within that range. A comparison over the periods 1930-1969 and 1987-1999 showed that its overall range had reduced by 21% and its area of occupancy had similarly declined, so that there was a 21% reduction in the likelihood of recording the species. Reductions in some UK populations as between 1986-88 and 1994 have been noted.³³ It is protected from picking and sale under the Wildlife and Countryside Act 1981 as amended. The main concentration of the species is in Oxfordshire, but there are two, possibly three, current sites in Kent of presumed good native standing, including the classic British location at Ranscombe Farm, Cobham, where it is looked after by Plantlife, and it is **rare** as a native in the county.

Ranscombe. Photo by David Steere, 7 July 2014

Account

Cobham/Cuxton

Hanbury and Marshall (1899) gave the first Kentish record as by Morison in his *Plantarum Historiae Universalis Oxoniensis*, vol.3 (1699): 'in Septa Cobhamiano Essexiae [sic] in Anglia. D. Watsius detexit.'³⁴ However, this is preceded by Leonard Plukenet's *Almagestum Botanicum sive Phytographiae Plukenetianae Onomasticon* (1690), where it is said to have been found recently 'in agri Cantiani Vivario Cobhamense' – 'Vivario' refers to a game preserve or park, and presumably relates to Cobham Park, then divided into the inward or Deer-park and the out park. This is the first British as well as Kentish record and the site became well-known to botanists generally, so that specimens may be found in all the main British herbaria providing a roll-call of distinguished botanists (Boswell Syme, Druce, Henslow, Leighton, Lousley, Pugsley, Salmon, Winch, Wheldon, etc.). The Botanical Society of London conducted an expedition here in 1838, following traditional directions with mixed success, as described in the rare plant register account for *Malva setigera* (Rough Mallow), and 'In a hilly field immediately behind Brick House Farm³⁵ on the Cuxton Road, which has recently been converted into a fir plantation, we found *Salvia pratensis* and *Rosa Rubiginosa*, particularly at the upper part of the field about forty paces from the hedge bordering it on the left. All over this field *Campanula glomerata* and *Chlora* [*Blackstonia*] *perfoliata* were abundant.'



There are many subsequent old records here, of which these are the more informative:

³³ Rich, T.C.G., Lambrick, C.R. & McNab (1999). Conservation of Britain's biodiversity: *Salvia pratensis* L. (Lamiaceae), Meadow Clary. *Watsonia* 22: 405-411.

³⁴ In an enclosure at Cobham [Essex in error]. D. Wat[t]s discovered it. [Septa or Saepta has been translated as hedges in this context, but this is not a plural noun, and the sense may be that it was within the park enclosure.]

³⁵ This was part of Lower Brick Farm, and as Lower Bush Farm does not feature in the Cuxton tithe apportionment schedule, it is likely that these are one and the same.

4 July 1844	Field east of Cobham Park (Edward Palmer).
1889	In some quantity on the south side of Great Wood, Cuxton (A.H. Wolley Dod).
1904	Dry pasture, Cobham (C.E. Pye).
1905	Slopes under Cobham Great Wood (R. Roffey).
30 September 1928	West Cobham Park, bank by turnip field (A.R. Horwood).
1943-55	Abundant in rough chalk grassland here for about half a mile along the edge of the wood (n.d.). Abundant for 200yds (1943). (Francis Rose)
12 July 1945	Between the arable fields and the Great Wood, plentiful (R.A. Boniface).

More detailed information was collected once Plantlife initiated a Back from the Brink project for this species in 1994 and English Nature included it in a Species Recovery Programme the same year. The main colony then grew between the Cobham Wood commercial woodland and the fence protecting the adjoining arable field (now the plant grows primarily on the field side of the boundary, as seems to have been the case in some of



the earlier records, but essentially it is a transitional habitat between woodland and open field margin). It was damaged in 1997/98 by a forestry vehicle, following the coppicing of adjacent woodland, and direct conservation work was at first held up by ownership complications. In 2000, Cobham was assessed as having between five and ten plants/clumps (although 20 in 1994; 13 in 1995; 19 in 1996).³⁶

The importance of *Salvia pratensis* (in conjunction with the presence of other plants of national significance at Ranscombe Farm) eventually led to the acquisition of Ranscombe by Plantlife in 2005, so that the species has since received the attention on inclusion in a nature reserve. Some of this attention was unwanted, however, in that the population suffered a serious set-back when 12 plants were dug up and stolen on 28 January 2008, even though at that non-flowering time of year they would not have been conspicuous. This theft received national news and BBC coverage.

Ranscombe. Photo by Stephen Lemon, 16 June 2012

After the theft, the reduced population was necessarily more vulnerable to survival. A selection of records for the years following is given below, but during this period a study was initiated into how recruitment of seedlings might most effectively encourage the long-term survival of the colony (Moyses, 2017).³⁷

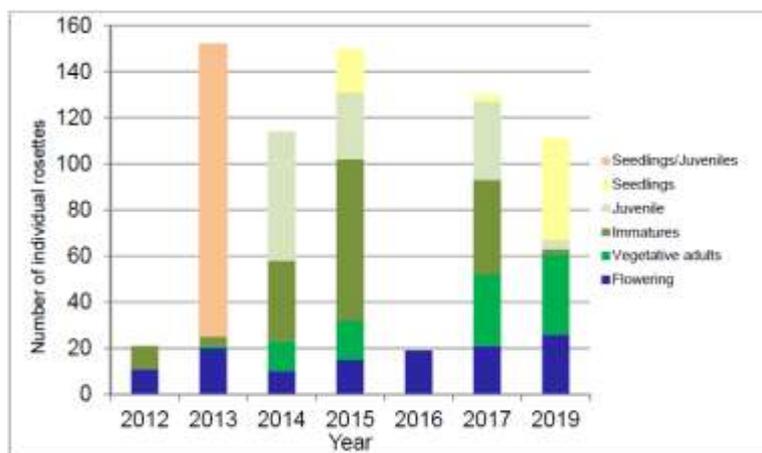
9 June 2010	(a) TQ 70216 67949, two plants at margin of woodland and field. (b) TQ 70248 67931, ten plants at margin of wood and field. (c) TQ7068, close on boundary with TQ6968, margin of wood and field. (d) TQ 70170 68001, two plants in open area by track in woodland, ten seedlings on track. (Geoffrey Kitchener)
2012	21 rosettes, adult or immature, distributed in four patches along c.320m of south-facing woodland edge (Richard Moyses). 16 June 2012, three separate areas of flowering plants along the northern edge of Kitchen Field: TQ 70244 67937, TQ 70161 67997 and TQ 69993 68071; c. ten 10 flower spikes (KFC meeting).

³⁶ Wheeler, B.R. (2001). Meadow Clary *Salvia pratensis* in 2000. English Nature / Plantlife Report 176.

³⁷ Moyses, R.I. (2017). Response of meadow clary *Salvia pratensis* L. to localised ground disturbance at Ranscombe Farm Reserve, Kent, UK. *Transactions of the Kent Field Club* **20**: 4-10.

20 October 2014	(a) TQ 7016 6799, 93 plants at Twenty Acre Field. (b) TQ 7021 6795, 24 plants at Twenty Acre Field. (c) TQ 7024 6793, 3 plants at Twenty Acre Field (Richard Moyse).
2019	26 flowering rosettes, plus 35 apparently adult but non-flowering rosettes; 44 new seedlings (Richard Moyse).

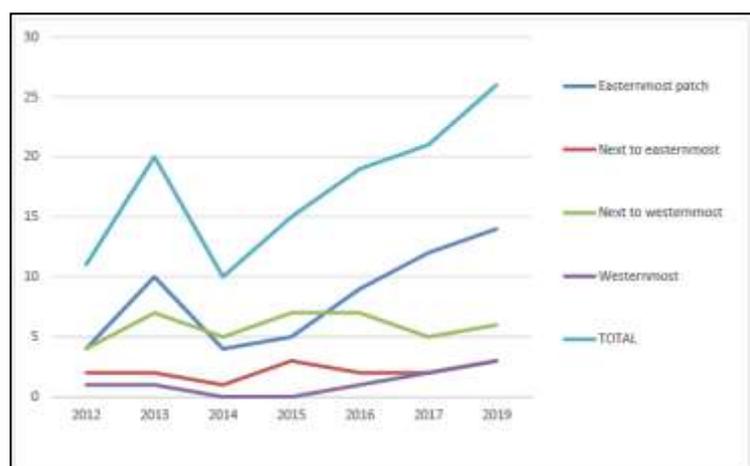
The Ranscombe study sought to address the prospect that an aging population of *Salvia pratensis* could fall into extinction debt, by which the recruitment of new individuals is insufficient to replace older ones. This is especially important as although *Salvia pratensis* plants may, from Dutch studies, live for decades, there is evidence that they may cease to flower towards the end of their life cycle, and there is probably not a persistent seed-bank. In order to encourage seedlings, an area of bare ground was created in July 2013 between existing plants in one of the Ranscombe patches. In July 2014 this was extended, and areas of bare ground created around two other patches. No further treatment was applied in 2015, and in October of that year the position was assessed: 119 seedlings/juveniles remained from germination since July 2013. Some 55% of new plants survived the first year; 42% survived for a second year. After the results given in Moyse (in press), no further disturbance was undertaken in 2016, some small-scale disturbance was carried out in 2017, and again in 2019.



Resultant changes in the population structure are shown in the accompanying table (courtesy of Richard Moyse). The initial flush of seedlings in 2013 can be seen to have matured, developing into juveniles and immature plants (as well as with some losses), as might be expected. Note that only flowering rosettes were counted in 2016. Overall, the population structure has rapidly become more diverse. Although

2017 ground disturbance was not very successful in stimulating germination, the 2019 disturbance resulted in 44 new seedlings. There is a noticeable increase in flowering rosettes, but perhaps not as much as might have been expected if flowering takes place four to five years from the date of germination onwards (subject to reaching a critical rosette size), as Ouborg & Treuren (1994)³⁸ indicate.

The trends in flowering rosette numbers are given here (table also by courtesy of Richard Moyse). It is possible that the increase for the easternmost patch is at least in part attributable to winter trampling by cattle which may have resulted in branching of established plants, although Stroh *et al.* (2019) state that grazing at other times of year, when flowering shoots are present, may promote growth of small addressed vegetative shoots but few or no flowering stems.



³⁸ Ouborg, N.J. & van Treuren, R. (1994). The significance of genetic erosion in the process of extinction. IV. Inbreeding load and heterosis in relation to population size in the mint *Salvia pratensis*. *Evolution* **48**(4): 996-1008.

Queendown Warren

This site is a chalk valley slope where a mediaeval rabbit warren was located; Hasted (1798)³⁹ described it as a long tract of waste ground, disused as a warren for some time past. It was declared a local nature reserve in 1973 and managed by the Kent Wildlife Trust (then Kent Trust for Nature Conservation) from 1977, since becoming part owned by Plantlife. It has enjoyed considerable floral continuity. *Salvia pratensis* was listed by Matthew Cowell as present, with several orchid species, in his *A Floral Guide for East Kent, etc.* (1839). Various botanists including W.H. Beeby, W.W. Newbould and H. Trimen subsequently collected specimens from here, but the site never received as much attention as Cobham and there appears to have been a decline after c.1930, when seen by 'F. F.' (Fred Forsyth?). There are no records for some 30 years after, as Francis Rose's manuscript Flora of Kent (a section probably written in the 1950s) refers to it as 'now gone! (it was by the chalk pit at the N.E. end)'. Nevertheless, Francis Rose had apparently seen it there in 1960 and his notebooks pick up its subsequent presence, with four plants (two flowering spikes) seen in 1969; present in 1971; two good clumps in 1993; present in 1994 (one plant is mentioned in a record by Eric Philp and Tim Rich that year); and three clumps noted to the far east of the Middle Bank in 1996. At that time, the population seems to have been emerging from being in recovery, although so far as concerns numbers, it is not always straightforward identifying whether a clump constitutes one or more plants (and flowering spikes may be different yet again). As at 1997/98, there were three separate 'patches' of Meadow Clary, constituting about ten plants overall. Subsequently (see selection of records below) the population at Queendown has continued at sustainable levels.

23 June 2001	11 plants supporting 25 flowering spikes, TQ 831 630 (Paul Lazarus).
8 June 2002	11 flowering plants TQ 831 630; one 3m from fence TQ 831 629 (Paul Lazarus & Mike Platten).
14 June 2003	14 plants, the majority flowering or fruiting although some mature non-flowering plants also in evidence (24 flowering spikes), TQ831 630; one at TQ 831 629 (five flowering spikes) (Paul Lazarus).
2 June 2004	(a) TQ 83116 63007, one clump (eight flowering spikes); (13 June 2004), all the flowers checked were fertile. (b) TQ 83178 63036, four plants (one flowering spike). (c) TQ 83187 630[97], ten plants, one new, (18 flowering spikes); (13 June 2004) all the flowers checked were fertile. (d) TQ 83195 63087, one flowering spike. (e) TQ 83206 63093, two clumps (17 flowering spikes, only 2 left, rest eaten or picked; (13 June 2004) all the flowers checked were fertile. (Paul Lazarus)
11 June 2005	(a) TQ 83116 63007, one clump (six spikes); good healthy population; enter main bank from eastern end, take path into reserve, at fence go over stile and turn down bank 1.5m. (b) [TQ 83178 63036 – no record data] (c) TQ 83187 63079 [NB TQ 83187 63097 was referenced in 2004], nine plants, a good healthy population with one new plant; one main clump (six spikes), nine rosettes (two spikes). Enter main bank from eastern end, take path into reserve, look for large beech on your left, walk on 40m and turn down bank 15m. (d) TQ 83195 63087, one clump (one spike); good healthy population. Enter main bank from eastern end, take path into reserve, look for large Beech on your left, walk on 40m and turn down bank 15m. Walk back to beech 10m. (e) TQ 83206 63093, one plant (one less this year, scrub to be cut back). Enter main bank from eastern end, take path into reserve, look for large Beech on your left, walk on 40m and turn down bank and pick up lower path, walk on 20m. (Paul Lazarus & Selwyn Dennis)
17 June 2006	(a) TQ 83116 63007, one clump found. Enter main bank from eastern end, take path into reserve, at fence go over stile turn down bank 1.5m. This plant had not done well this year, has been damaged, cause unclear, but can be seen clearly from the road. (b) TQ 83178 63036, four adult plants, viz. one clump of four rosettes (no flowering spikes). Enter main bank from eastern end, take path into reserve, look for large Beech on your left, walk on 40m and turn down bank and pick up lower path, walk on 20m. (c) TQ 83187 63079, ten 'plants', viz. (i) main clump (19 spikes); (ii) small clump (two spikes); (iii) rosettes (one spike); (iv) small clump (one spike); (v) small clump (one spike); (vi) small clump (one spike); (vii) small clump (two spikes); (viii) rosettes (four spikes); (ix) rosettes (two 2 spikes); (x) rosettes. (d) TQ 83195 63087, one clump (one spike). (e) TQ 83206 63093, two clumps (one with seven spikes and one with one spike). Enter main bank from eastern end, take path into reserve, look for large Beech on your left, walk on 10m and turn down bank 15m (these directions are different from 2005). (Paul Lazarus).
26 May 2018	(a) TQ 8311 6299, four flowering plants, 'the original site beside footpath'. (b) TQ 8318 6307, about 20 rosettes on reserve. (KFC meeting)

³⁹ Hasted, E. (1798). *The History and Topographical Survey of the County of Kent*, vol.6. W. Bristow, Canterbury.

Other sites

Apart from the two main native sites there have been other occurrences although, as Hanbury and Marshall (1899) state, the species has always been very rare in Kent. As a native, it is to be expected on banks and rough grassland on chalk. As regards elsewhere, Rich, T.C.G. et al. (1999)⁴⁰ state that it has been introduced to many sites in Britain with foreign grain, especially during the period 1880-1930, and it was a regular contaminant of imported grass/clover permanent pasture seed mixtures. Such origins may apply to pre-1899 occurrences in a meadow at **Mersham Hatch** and a hayfield between **West Malling and Wrotham**.

More recent seed introduction probably accounts for a 2019 site along the banks of the HS1 railway line near **Mersham** (rather than any survival from the 19th century Mersham Hatch site, which was ploughed up before 1899). The geology is Lower Greensand Group which, although the presence of the Hythe Formation may account for slightly calcareous content, is far from the species' classic chalky habitat. The railway line was constructed during 1999-2003 and, although seeding was supposed to have been of native species and sourced as much as practicable (some 98%⁴¹) from woodlands and meadow in Kent and the south and east of England, it is evident from finds elsewhere (e.g. *Trisetum flavescens* subsp. *purpurascens*, a central European subspecies) that seed of foreign origin has been involved.

3 June 2019	TR 056 389, on a very hot, dry, south-facing Ragstone bank of HS1 railway line, observed with binoculars.(Ade Jupp)
16 June 2019	TR 061 387, TR 063 386 and TR 064 385, one plant/clump at each grid-reference, on the hot, dry banks of the HS1 railway line, observed with binoculars. Some of the grassland is still subject to cut and removal of arisings once a year, so there is a possibility of transfer by machinery as well as arrival as seed contaminant. (Ade Jupp)

There are records for **Dover** (Fox Hill Down or Langdon Cliffs) as a possible native site at least since 1949 (TR 335 421), and Francis Rose noted this also in 1954 (specimen in **MNE**) as well as receiving reports from Mrs. K.D. Rowlands (1958) and Mrs. B. Dodds (1960). While it was not found in the county 1971-80 survey (Philp, 1982), there are many subsequent records, but new plants were introduced there in June 2004, and Philp (2010) comments that 'new plants have been planted out (in the name of 'conservation'), so we shall never know if the old population ever survived'. The habitat is very suitable for native occurrence, although it is perhaps surprising that it was so late being discovered in such a well-botanised area⁴², but any native status of what is there now has been compromised to a degree. However, the records at the time of planting out (included in the table below) are quite thorough: it appears that there were about a dozen wild clumps, some quite close to the National Trust car park and generally protected by hawthorn. They adjoined the car park on the north and west sides, with outliers further south and also well to the west, between Upper Road and A2.



Dover, *Salvia pratensis* 2004 records: **right**, wild plants; **left**, introduced plants

⁴⁰ See above.

⁴¹ According to Paul Johnson (2004), CTRL and the Environment, *The Arup Journal*, 1/2004.

⁴² Although if it had originated as a planting within Langdon prison/barracks (constructed in the 1880s), this would explain both location and the lateness of discovery.

These are shown on the satellite view above, with the introduction sites given separately. From comparison, it will be seen that, subject to the effect of any natural spread, only subsequent records in the vicinity of the original wild outliers or similarly remote from the introductions have a reasonable chance of representing continuity from the original population. There is an interesting contrast to be made between the respective means taken to promote continuance of the populations at Dover and at Ranscombe, and the difficulties which the former site now presents for crediting future records as native.

Including the introduction data, the following table provides a selection of records for the site.

1954	TR 335 422, below barracks west of Langdon Bay, east of Dover, in Tor Grass on chalk cliffs. (Francis Rose)
16 June 1985	TR 340 423. (John Puckett)
11 July 1986	TR 336 423, Langdon Barracks, one plant at the junction of two tracks at the top viewpoint car park. (Rosemary FitzGerald)
1997	Small population on Langdon Cliffs. (Phil Chantler)
19 August 2002	(a) TR 3344 4234, one flowering plant within grazing compartment. (b) TR 3347 4220, Langdon Cliffs, one plant. (c) TR 3350 4210, Langdon Cliffs, two plants, majority of clump flowering/fruited. (Tim Wilkins)
22 May 2004	(a) TR 33050 42108, four clumps containing 5-15% seedlings/immature, <5% mature non-flowering, 50-75% flowering plants. Located on Langdon cliff bank below first car park. [Also surveyed again on 11 August 2004, protected by hawthorn, no flowering spikes left.] (b) TR 33527 423351, four wild clumps located c. 15m east of cage 4, protected from grazing by hawthorn branches; containing 25-50% seedlings/immature, 25-50% mature non-flowering plants. (Alexandra Jones)
17 June 2004	TR 33474 42208, two clumps, both had 1 sq foot coverage each. Located by hawthorn adjacent to coach park, middle site. 'Wild' protected by hawthorn branches. Clump1 – undamaged flowering spike, still in flower, male OK. Clump 2 – nine flowering spikes, most going to seed. [Also surveyed 11 August 2004, when (clump 1) one flowering spike left and seed shed and (clump 2) eight flowering spikes (two broken), est. 200 seeds left on plants.] TR 33527 42351, one 'wild' clump protected by hawthorn branches, approximately 15m east of cage 4; no flowering spikes. TR 33545 42412, one plant (no flowering spikes). TR 33561 42128, one clump sq foot coverage located on bank below first car park, below bench; 'wild', protected by hawthorn branches; six flowering spikes but all severely damaged (rabbits?). [Also surveyed 11 August 2004, when three flowering spikes, no seed left.] (Alexandra Jones)
17 June 2004	Introductions TR 335 421. '60. Introduction by seeds. Scattered wild plants'. TR 33278 42086, one clump planted out protected by cage 04/19; two flowering spikes going to seed with one broken. TR 33287 42155, one clump planted out, protected by cage 04/17; five healthy flowering spikes, three quite short. TR 33301 42121, one clump planted out, protected by cage 04/18; healthy three flowering spikes, undamaged male. TR 33303 42178, one clump planted out, protected by cage 04/16, clumps yellowing and not very happy, remains of one flowering spike with no seeds. TR 33316 42211, small clump planted out protected by cage 04/14, suffering from slug damage. [duplicated? by entry for TR 33315 42234, one clump planted out, protected [purportedly also!] by cage 04/14; healthy plants with two flowering spikes in bud.] TR 33319 42153, one clump planted out protected by cage 04/20; healthy six flowering spikes, one broken male. TR 33324 42286, one clump planted out, protected by cage 04/12; healthy population, no flowering spikes. TR 33335 42260, one clump planted out, protected by cage 04/13; healthy with two flowering spikes, one broken, one re-shooting, possibly male sterile as flowers smaller but many are in bud. TR 333431 42294, one clump planted out, protected by cage 04/08; healthy two flowering spikes to seed. TR 33345 42320, one clump planted out, protected by cage 04/11; four flowering spikes, two snapped to seed. TR 33389 42325, one clump planted out, protected by cage 04/10; four flowering spikes, three damaged, male ok. TR 33397 42267, one clump planted out and protected by cage 04/09; four flowering spikes, one damaged to seed. TR 33431 42294, one clump planted out, protected by cage 04/08; healthy two flowering spikes to seed. TR 33431 42331, one healthy clump planted out, protected by cage 04/07; three flowering spikes all damaged. TR 33345 42320, one clump planted out by cage 04/11, four flowering spikes, two snapped to seed. TR 33463 42355, one healthy clump planted out and protected by cage 04/06, one flowering spike to seed. TR 33431 42331, healthy clump planted out, protected by cage 04/07, three flowering spikes all damaged. TR 33482 42379, one clump planted out and protected by cage 04/05; one flowering spike to seed. TR 33510 42348, one clump planted out protected by cage 04/04. Very unhealthy population (yellowing/dry), four flowering spikes, one broken likely to die (unlucky transplantation). TR 33512 42377, one, healthy plants protected by cage 04/03; two flowering spikes to seed. TR 33519 42405, one clump protected by cage 04/01; healthy, three flowering spikes to seed. (Alexandra Jones)
11 August 2004	TR 3347342207, plant on bank next to coach park, seed sampled for Kew Millennium Seed Bank. (Alexandra Jones)
22 June 2007	(a) TR 334 422, ten plants, SAC, SSSI chalk grassland, AONB, mechanically cut and arisings removed, favourable

	condition. At present hawthorn is used to prevent grazing damage by rabbits (and is unobtrusive) but will use cages for 2008. (b) TR 334 423, 22 plants, all were (apart from two clumps) were planted in May [sic] 2004 and are caged to prevent grazing damage from rabbits. Clumps were counted: 37 flowering spikes. SAC, SSSI chalk grassland, AONB, grazed by Exmoor ponies over winter months; favourable condition. (Robert Sonnen)
12 July 2010	(a) TR 33468 42203, four plants close to Visitor Centre, vulnerable from rabbit grazing, origins noted as questionable [rightly so; it is close to an old 'wild' site, but planting had taken place near by] (b) TR 33504 42108, five plants in grassland currently under a mowing regime [this appears to correspond to an original 'wild' site]. (KBRG meeting)

Lost Kent sites include **Boxley Warren**, which Francis Rose regarded as a native site, where Meadow Clary grew in chalk grassland at the lower edge of woods. First noted by Hubert Elgar in 1917, it was seen by Cyril West in 1944, and a specimen gathered by Ted Lousley in 1948 is associated with the comment that there was a large patch which never flowers, due to rabbit attacks. Francis Rose knew it from 1944 to 1955 at least; it is noted in the 1971-80 county survey (Philp, 1982), and there is also a sighting by Rosemary FitzGerald in 1986 (TQ 774 596, one flowering clump in a small clearing in scrub just west of the main footpath through Boxley Wood). The last record appears to have been in 1997. There are records on the chalk, or possibly so, by Farnborough churchyard (1936-44, extinct by 1946); Biggin Hill (1950); downs above Otford (before 1960; destroyed); Trottscliffe (c.1930); Thurnham hills near the castle (1904, perhaps related to Detling Downs, c.1935, quite possibly native) and chalk scrub north east of Gravel Castle, Barham (where seen by Jocelyn Brooke and Francis Rose in 1939, a good case for being native, but ploughed up in 1950).

Ranscombe. Photo by Liam Rooney, 9 June 2010

Ecology⁴³

Meadow Clary is a long-lived plant, reproducing by seed and but also spreading out as rosettes from vegetative shoots which make it difficult to interpret how many plants there may be in a patch. Populations can include hermaphrodite plants and female plants (male-sterile, with abortive stamens, shrunken anthers and shorter flowers overall), sometimes as different shoots on the same plant. Seed production in English populations is supposed to be some 1,500 per plant. A non-random sample of four flowering plants at Ranscombe produced an average of 262 flowers per plant, with potential (at four ovules per flower) for more than 1,000 seeds per season (Moyses, in press). Seeds each weigh over 2mg and, being relatively heavy, are unlikely to fall far from the parent plant; although they are mucilaginous, enabling attachment to animals, they are not likely to come into contact while still enclosed by the calyx, but the calyx with its sticky glandular hairs could adhere to grazing animals. The mucilage may be more effective in anchoring to soil particles preliminary to germination. Moyses (in press) gives a map of the scatter of seedlings over a 2.5 x 1.2m disturbed area and the presence of open ground clearly encouraged germination. Seedlings had already been observed at Ranscombe (2010) on a woodland track, but the disturbance which presumably created the germination opportunity was likely to continue and be prejudicial to survival. There are no observations as regards seedlings at Dover, but the difficulties with rabbit grazing which led to the caging of introduced plants ought in theory to have also had the benefit of providing favourable conditions for seedling establishment, with rabbit scrapes providing suitable niches⁴⁴. Meadow Clary's habitat preference for well-drained calcareous



⁴³ The main sources for non-Kent data here are:

(1) Stroh et al. (2019). Grassland plants of the British and Irish lowlands: ecology, threats and management. Botanical Society of Britain and Ireland, Durham.

(2) King, M. (2004) *Salvia pratensis* (Plantlife species dossier), http://adlib.eversite.co.uk/resources/000/091/214/MC_dossier.pdf

⁴⁴ Wigginton, M.J. (1999). *Salvia pratensis* L. (Lamiaceae), in *British Red Data Books 1 Vascular plants*, JNCC, Peterborough.

soils with a sloping, southern aspect probably reflects its position at the edge of a Continental distribution which diminishes considerably in the west: although it is a plant of meadows with a wider range of soils in central and eastern Europe, presence in a meadow in Kent would normally be indicative of introduction. It is sold as wildflower seed.

Description

Salvia pratensis is a distinctive sage-scented herb, rosette-forming with stems up to 90cm bearing whorls of violet- or dark- blue flowers, sometimes pale blue. It may be distinguished from *Salvia verbenaca* (Wild Clary) in that the latter is generally a smaller plant, especially in corolla size, and may be found on more sandy soils. The longest calyx hairs of *S. verbenaca* are white and non-glandular (it has short glandular hairs as well), whereas the longest calyx hairs of *S. pratensis* are brownish and glandular (it has short non-glandular hairs as well). The lower leaves of *S. verbenaca* vary but may be distinctly lobed; those of *S. pratensis* are rarely shallowly lobed and normally at most doubly-serrate.

Salvia verbenaca L. (Wild Clary)

Draft account

vc 15 and 16

Rarity / scarcity status

Salvia verbenaca (subsp. *horminoides*) is a not uncommon perennial of dry and rather bare ground, roadsides and dunes, largely absent from Scotland, Ireland and central Wales. Its risk assessment for Great Britain is one of 'Least Concern'; but for England it has from 2014 been treated as **Near Threatened**. A comparison over the periods 1930-1969 and 1987-1999 showed that its area of occupancy had declined so that there was a calculated 21% reduction in the likelihood of recording the species, which is just sufficient to be concerning, despite its remaining fairly widespread. In Kent, it is neither rare nor scarce. There is evidence of a 31% decline between 1971-80 and 1991-2005, although 2010-20 data suggest that this is an overstatement.

Greatstone. Photo by David Steere, 19 May 2019

Account

The first Kentish record for *Salvia verbenaca* is by Charles de l'Écluse (Clusius) in his *Rariorum Plantarum Historia* (1601), where he refers to a visit to England in 1579, when he discovered it at Greenwich, frequent enough at the racecourse of the royal principal place⁴⁵, beginning flowering in September, then laden with seed. Hanbury and Marshall (1899) described the species as a native of dry banks; 'frequent, though decidedly local'. The records which they collated were particularly numerous in north west Kent. Habitats included roadsides and lanes, dry banks, sandhills, waste land and notably churchyards: Bromley, Farnborough, Plumstead, Crayford, Davington, Ore, Minster in Thanet, East Malling and Lydd. In or near churchyards were records from a lane by Charlton Church, by Darenth Church, near Harbledown Church; and



Forster's *Flora Tonbridgensis* (1816) cited Wild English Clary as 'Not uncommon in churchyards and stony places', although giving a Sussex churchyard example. Churchyard occurrences have been attributed to mediaeval sowing, although documentary support for this is extremely limited.⁴⁶

Reculver. Photo by Liam Rooney, 28 April 2010



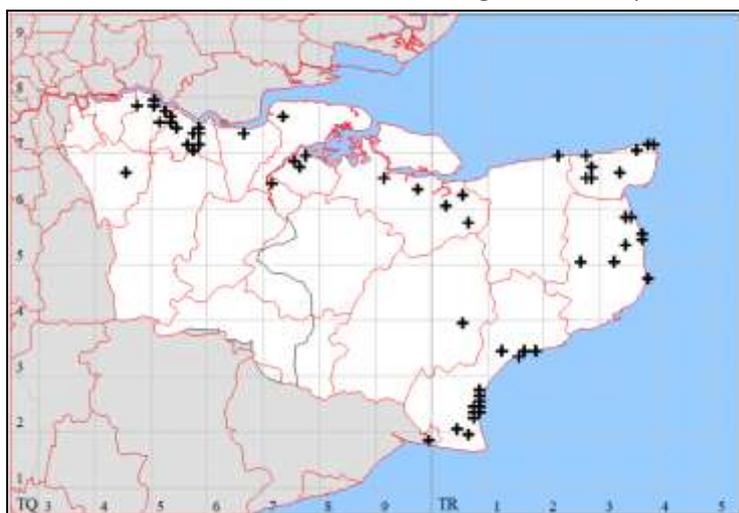
Francis Rose noted it as a native of 'dry pastures, roadsides, churchyards, and banks especially on sandy, chalky or gravelly soils; fixed dunes and shingle beaches; rather common on and near the coast and near tidal estuaries, rare inland'. The churchyards which he noted were Minster in Sheppey, Blean, Stone, Darenth and Shoreham. The county 1971-80 survey (Philp, 1982) found *Salvia verbenaca* to be rather local but often quite frequent where it does occur, and there

⁴⁵ 'satis frequentem ad Regiae arcis Hippodromum inveniebam'. The royal establishment here would be Greenwich Palace and, while *Hippodromum* translates as racecourse, this may have been Henry VIII's tiltyard.

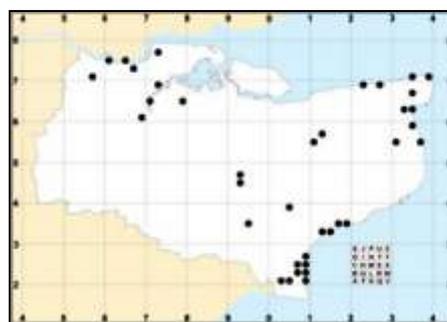
⁴⁶ Sturt, N. (1995) Wild Clary (*Salvia verbenaca*) in churchyards. *BSBI News* 68: 28-29. Abraham, F. (1995). Wild Clary (*Salvia verbenaca*) in churchyards. *BSBI News* 69: 28.

were distribution clusters in north west Kent, around Rochester, at Thanet and around Sandwich, and from Sandgate to Lydd. The total of 54 tetrads then recorded were much reduced in the 1991-2005 survey (Philp, 2010), down to 37 tetrads, in spite of increased coverage at Dungeness. Ostensibly, this would appear to be a significant decline, but it is not borne out by 2010-20 recording, which shows a total of 53 tetrads (62 monads), although some records belong to metropolitan West Kent, which was not covered by Philp(1982) or (2010).

As *Salvia verbenaca* is not uncommon in Kent, the registration data for this species is given by monad mapping, as below. Tetrad data for 1991-2005 are given for comparison in the accompanying map taken from Philp (2010) with kind permission of the late Eric Philp and the Kent Field Club.



Salvia verbenaca (Wild Clary) 2010-20



Salvia verbenaca (Wild Clary) 1991-2005

It looks as though Philp (2010) has under-recorded generally, including a hot-spot area in TQ57, north west Kent. It is possible that some more recent records come from deliberate sowing in the wild: this was suspected at Gillingham (TQ7769) and at arable margins at Barfreton (TR2650) and East Studdal (TR3250).

Recent records include churchyards at Hythe, Mersham, Monkton Stone and St. Paulinus (Crayford); given persistence of habitat, it would be worth checking other churchyards with older records for continuity.



Greatstone. Photo by David Steere, 19 May 2019

Our Kent plant is *Salvia verbenaca* subsp. *horminioides* var. *horminioides*. It has variable corollas: those which are relatively conspicuous, measuring 10-17mm, will encourage pollination by bees (although there is capability for selfing, if out-crossing pollen is not received early on)⁴⁷. Less conspicuous flowers, with corollas 6-12mm, are cleistogamous and so will set seed without insect intervention, although the seeds are lighter and may not be as advantageous for germination and initial growth.

The largest flowers of *Salvia verbenaca* slightly overlap in size with *Salvia pratensis* (Meadow Clary) and differences between the two species are given in the account for the latter.

⁴⁷ Navarro, L. (1997). Is the dichogamy of *Salvia verbenaca* (Lamiaceae) an effective barrier to self-fertilization? *Plant Systematics & Evolution* **207**: 111-117.

Sambucus ebulus L. (Dwarf Elder)

Draft account

vc 15 and 16

Rarity / scarcity status

Sambucus ebulus is an archaeophyte, or ancient introduction, which grows scattered over much of the British Isles, on waysides and waste ground. Its conservation risk assessment is one of 'Least Concern'. However, despite a reputation for persistence, it is considered to show a 49% decline in England if 1987+ data are viewed in relation to all previous records, including before 1930. Its wayside and waste habitats are presumably susceptible to tidying up and development. In Kent, it is **scarce**.

Boughton (Brickfield Lane). Photo by Liam Rooney, 18 July 2010

Account

The first Kent record is by John Gerard in his *Herball* (1597): 'Dane woort'⁴⁸ growth in untoyled places neere common waies, and in the borders of fields: it groweth...in a field by S. Jones [S. Joans in the 1633 edition; this is probably St. John's Jerusalem, Sutton-at-Hone] neer Dartford in Kent'. Presence in this locality continued at least until the late nineteenth century when A.H. Wolley Dod noted it by the 'Lane leading from Sutton to the Darenth River'. Other early records include Thomas Johnson's after-dinner encounter with it in abundance at Gillingham churchyard (*Iter Plantarum*, 1629: no longer present). James Petiver also noted it, as he travelled from Canterbury in the course of a botanical tour with James Sherard in 1714⁴⁹: 'we observed *Ebulus* plentifully near a town about three miles before we came to Faversham'. Edward Jacob's record 'By the Road sides near



Boughton Street – not uncommon' (*Plantae Favershamienses*, 1777) is presumably the same, Boughton Street being some three miles from Faversham on the (then) Canterbury Road. *Sambucus ebulus* is still abundant here (2014).

Boughton Street (the 1714 site). Photo by Liam Rooney, 15 August 2017



Hanbury and Marshall (1899) gave a range of records, treating it as a local denizen of roadsides, hedges and pastures, usually near ruins including Queenborough Castle ruins, St. Radigund's Abbey, Reculver and Cooling Castle. Presence near ancient buildings was also a characteristic recognised by Francis Rose and is not unexpected for an introduced species. He recorded the species in 1941 and 1961 at a

roadside south of Cooling Castle, with continuity from Marshall's pre-1899 sighting; this was still there in 2014. He also noted it as abundant near Stowting Church in 1947, which picks up G.E. Smith's observation of Dwarf

⁴⁸ The use of the term Dane-woort is explained by John Parkinson in his *Theatrum Botanicum* (1640): 'It is supposed it took the name Danewort, from the strong purging quality it hath, many times bringing them that use it unto a fluxe, which then we say they are troubled with the Danes'.

⁴⁹ Published in *Phytologist* (1862) 6: 114-120.

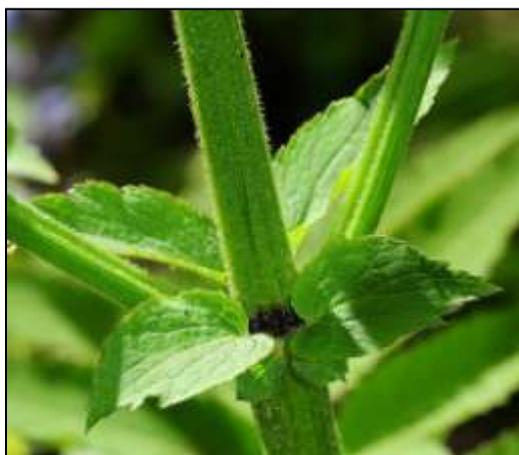
Elder at Stowting, probably between 1830 and 1832⁵⁰. Another record with continuity is that supplied from the papers of Dr. R.E. Hunter (d. 1824) for Matthew Cowell's *A Floral Guide for East Kent, etc.* (1839) as at the 'bottom of the hill from Birchington to Brook-end'. Francis Rose's manuscript *Flora of Kent* gives a report by Miss B. Nash of it still being here at a roadside in 1957; this has continued at least to 2013. The manuscript *Flora* also notes losses: the plant had apparently gone by 1958 from Radfield near Bapchild where Miss E.M. Burrows had seen it in 1932. This was a roadside location whose history went back to 1661.

Philp (1982) considered Dwarf Elder to be rather local and scarce: only seven tetrads were recorded, three of them in TQ55 (south west and north Sevenoaks). Four of these sites were re-found for Philp (2010), but only six tetrads in the county overall were noted. However, for 2010-20, we have the same number of tetrads, six (seven monads), and it may yet be possible to recover one or two more old sites.

Boughton (Brickfield Lane). Photo by Liam Rooney, 18 July 2010



Sambucus ebulus has, if not native, been long introduced in the British Isles (there are Saxon references to it, generally as walewort) for its traditional uses, as a medicinal and dye plant, although it seems not to have achieved formal status in the British Pharmacopoeia. It is a perennial which spreads by horizontal underground rhizomes sending up annual stems to form large colonies, so that once it has gained a foothold in a hedgerow (and many of its appearances are of a wayside nature) it would be a matter of great difficulty to remove it. This degree of persistence accounts for the longevity of many of its sites, as in some of the Kent localities described above. It is unclear to what extent, if



at all, it may spread here by seed (Sir Edward Salisbury noted how established colonies were more or less continuous with a sparsity of isolated outliers and a lack of observed seedlings⁵¹).

Boughton Street, stipules. Photo by Liam Rooney, 26 May 2013

As regards identification, it might be mistaken at a hasty glance for *Sambucus nigra* (Elder), but it does not develop into a shrub/tree, the stems being annual; its leaves have (5)7-13 leaflets in comparison with Elder's (3)5-7 leaflets; and it has conspicuous stipules.

Site	Grid reference	Site status	Last record date	Recorder	Comments
Greenwich north (metropolitan vc16)	TQ3979		17 October 2015	LNHS meeting (NB)	
Erith Marshes (metropolitan vc16)			1999	RMB	TQ 490 800, north side of Eastern Way.
Hever	TQ44S		After 1970, before 1981	Philp (1982)	[There is a 1953 record for roadside west of Hever Church,

⁵⁰ From his manuscript notes, upon which Matthew Cowell drew for *A Floral Guide for East Kent, etc.* (1839).

⁵¹ Salisbury, E.J. (1975). Does *Sambucus ebulus* reproduce by seed in Britain? *Watsonia* 10: 293.

					seen FR (specimen in MNE).]
Sevenoaks Weald	TQ55A		After 1970, before 1981	Philp (1982)	TQ55A.
South west Sevenoaks	TQ55B, includes TQ5153		(1) 5 August 2020 (2) After 1970, before 1981	(1) GK (2) Philp (1982)	(1) TQ 514 535, for c.5m alongside forestry track, Mill Bank Wood. (2) TQ55B.
North Sevenoaks	TQ55I		(1) 1991-99 (2) After 1970, before 1981	(1) EGP (2) Philp (1982)	TQ55I. [May have been Sevenoaks Wildlife Reserve.]
Horton Kirby	TQ6957		May 2005	JF	Horton Kirby Paper Mill.
Cooling Street	TQ77M		(1) 28 September 2014 (2) 1991-99 (2) After 1970, before 1981	(1) SP, DG (2) EGP (2) Philp (1982) {AGS, KCS, EGP}	(1) TQ 754 756, scattered along roadside verge. Known here for many years. (2) & (3) TQ77M. [Records go back to pre-1899.]
Ashford	TR04B		(1) 1 September 2010 (2) 28 July 2005	(1) HS (2) EGP, DG	Near Ashford International Station, TR 014 421, on a bank by the footpath spreading over an area of c.25m in length and up to 3m on the bank. (2) TR04B.
Molash Church	TR05G		(1) 1991-99 (2) After 1970, before 1981	(1) EGP (2) Philp (1982)	
Boughton Street	TR05P (includes TR0578, TR0559)		(1) 9 July 2014 (2) 2 June 2012 (3) 14 June 2010 (4) 1991-99	(1) DAB (2) LR (3) LR (4) EGP	(1) (a) TR 0572 5864, Brickfield Lane, several stems emerging from steep roadside bank at woodland edge. (b) TR 0532 5950, scattered stands cumulatively covering 35 sq m, edge of stream. (2) 1000+ plants from TR 05262 59546 to TR 05293 59532. Masses besides and on a footpath that runs parallel to a stream and the A2 bypass. Most were concentrated around a drain tunnel that runs under Stockers Hill, Boughton under Blean. 12 more plants at TR 05238 59572, the other side of Stockers Hill around the drain. (3) TR 057586. 57 plants on the south facing bank on Brickfield Lane. A 16m stretch with 2 lone plants and two patches; one of 4m and the other of 7m. (4) TR05P, understood to have been the same site as in (2) above, in TR0559. [Records go back to 1714.]
Brooks End, Birchington.	TR26Y (includes TR2967)		(1) 25 May 2013 (2) 1991-99	(1) LR (2) EGP	(1) 36+ plants from TR 29355 67892 to TR 29352 67874 by the side of Seamark Road near Acol. 100+ plants from TR 29311 67896 to TR 29338 67907 by the side of a pond and the A28 Canterbury Road near Acol. (2) TR26Y. [Records go back before 1824.]

Sanicula europaea L. (Sanicle)

Draft account

vc 15 and 16

Rarity / scarcity status

Sanicula europaea is an ancient woodland indicator species, found throughout the British Isles in suitable habitat. In Great Britain as a whole, its conservation risk status is one of 'Least Concern'. In England, however, it has been treated as **Near Threatened**, not because of any current scarcity, but a comparison over the periods 1930-1969 and 1987-1999 showed that its area of occupancy had declined so that there was a calculated 27% reduction in the likelihood of recording the species. In Kent, it is an axiophyte, or indicator of good quality habitat, and is neither rare nor scarce, but there is evidence of decline since 1971-80.

Account

Hanbury and Marshall (1899) give the first Kent record of *Sanicula europaea* as by Thomas Johnson (*Descriptio Itineris Plantarum*, 1632). They state that this was in course of Johnson travelling between Nash (near Margate) and Queakes (Quex), but this seems to be a misreading of the text. Johnson and his fellow apothecaries were staying at the inn of Richard Pollard at Margate and from there botanised around Margate fort; following which they were guided to Nash Court and returned to the inn for dinner (an early afternoon meal then), afterwards setting off for Quex; so Sanicle was found between Margate and Quex, or at Quex. It is a surprising record, however, given the absence of ancient woodland on Thanet, now and for long past⁵², and the absence of any modern record. The only other species of comparable habitat which Johnson recorded here was *Daphne laureola* (Spurge-laurel), possibly still at Quex.

There is, however, an earlier record and one with a clearly characteristic habitat, and that is in John Gerard's *Herball* (1597), given in the course of describing *Neottia nidus-avis* (Bird's-nest Orchid) found in the middle of a wood near Hook Green, Southfleet (for further details see the register account for that species). At the orchid's location 'the ground is covered all over in the same place neere about it with the herbe Sanycle'. Elsewhere he comments: 'It groweth in shadowy woods and copses almost every where, it joieth in fat and fruitfull moist soile'.

Ranscombe. Photo by David Steere, 17 May 2016

Hanbury and Marshall (1899) considered Sanicle to be so common that they gave no records for it. Only the earlier Flora writers who aimed at completeness of record for an area mentioned it, and then cursorily, e.g. Edward Jacob (*Plantae Favershamienses*, 1777) 'In Woods – very common'; Thomas Forster (*Flora Tonbridgensis*, 1816) 'In woods, very common'; Edward Jenner (*A Flora of Tunbridge Wells*, 1845) 'Woods, common'. Francis Rose considered it to be a native of 'old woodlands; abundant in the chalk woodlands, especially in dense beechwoods on slopes, where it is often dominant in the herb layer frequent on base-rich clays and loams on the Gault, and on the Hastings Beds; plentiful in

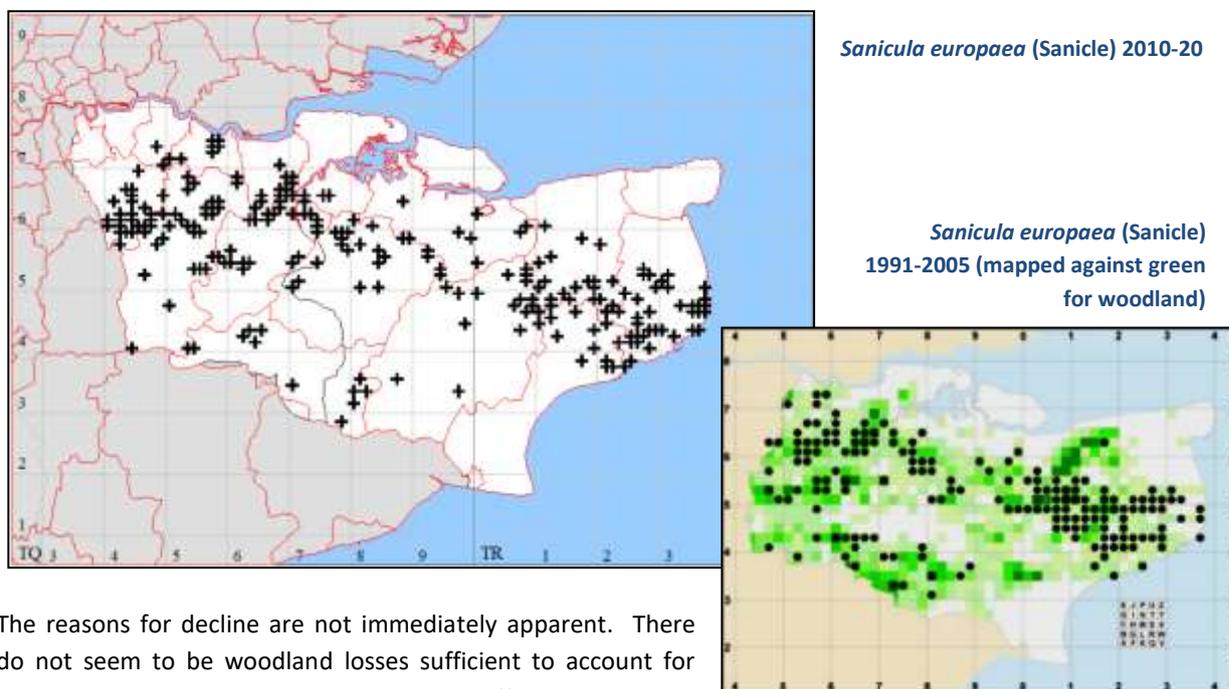


⁵² By the time of Edward Hasted, he was able to say (in *The History and Topographical Survey of the County of Kent*, vol. 10. 1800) that only from place names could one tell 'that there was antiently much more woodland in this island than at present; but whatever there was, almost all of it has been grubbed up and converted into tillage'.

woodlands on ragstone soils; less common on sands and heavy clays, avoiding base-poor soils; extremely shade-tolerant, in fact shade-demanding’.

Philp (1982) found it present in 314 tetrads, in beechwoods on the chalk and oakwoods on well drained loams elsewhere: it was noticeably absent from the marsh districts of north Kent, including the Hoo peninsula and Sheppey, from Thanet, Romney Marsh and from areas of Weald Clay across the county. However, Philp (2010) shows a substantial decline (46%), to 171 tetrads, for the period 1991-2005; a general thinning-out. This decline is endorsed by our 2010-20 records, which total 181 tetrads (231 monads). Indeed, it may well be continuing, since some 19 of those 181 tetrads were in metropolitan West Kent and so not included in coverage by Philp(2010).

Register data are here given by monad (1 km square) mapping and hence at finer resolution than the tetrads of 1991-2005 mapping (given here by kind permission of the late Eric Philp and of the Kent Field Club).



The reasons for decline are not immediately apparent. There do not seem to be woodland losses sufficient to account for this; any reduction in coppicing should not affect, because the plant is shade-loving. As the decline is also a national one, resulting in the plant’s Near Threatened status, the cause is presumably similarly wide-reaching, such as might arise from changes in climate or air quality. Atmospheric nitrogen deposition, which may affect species of infertile soils, does not seem likely to apply here (cf. Gerard’s reference to a ‘fat and fruitfull moist soile’). Summer droughts would be capable of affecting flowering the year after and may be an important factor in the mortality of young plants⁵³. Also, there may be competitive issues if the dense carpet of *Hedera helix* (Common Ivy) so often found in such woodland is being favoured for some reason. Whatever the cause, it may well apply also to *Oxalis acetosella* (Wood-sorrel), a woodland species showing a 30% decline in Kent between the 1971-80 and 1991-2005 surveys.

Our 2010-20 observations do not say much about associated flora in Kent, although this is in any event limited by tree shade. Even though many sightings are given for pathsides, and some are for roadsides, it is not necessarily the case that the habitat is more open than for woodland occurrences. Populations have been noted over an area of 30 square metres at Trosley Country Park, well over 100 plants concentrated in an area

⁵³ Inge O. & Tamm, C.O. (1985). Survival and flowering of perennial herbs. IV The behaviour of *Hepatica nobilis* and *Sanicula europaea* on permanent plots during 1943-1981. *Oikos* 45: 400-420.

of Hartley Woods, and along 200m of path at Bredhurst Woods; but on the whole, sightings appear to be of few and scattered plants. Swedish studies⁵⁴ suggest that there is considerable irregularity in the flowering of Sanicle (so that they have 'flowering years' as with some trees), together with very high mortality of seedlings. Coupled with the longevity of individual plants (which may have a half-life of over 50 years), then it may be that recruitment of populations should not be taken for granted. Pollination is by small flies (see illustration) and beetles, although self-pollination is possible.

Oxford. Photo by David Steere, 22 May 2016

Sanicle is not readily capable of being confused with any other British species when in flower. When in leaf only, there may be a resemblance to some forms of basal leaf of various microspecies of *Ranunculus auricomus* (Goldilocks Buttercup), found in similar habitats. The latter, however, has mostly smaller leaves, of thinner texture and lacks Sanicle's bristle tips to the leaf lobes.



Sanicle leaves from Larkey Valley Wood. Photo by Liam Rooney, 30 May 2015

⁵⁴ Tamm, C.O. (1956). Further observations on the survival and flowering of some perennial herbs, I. *Oikos* 7: 273-292. Cf. also Harper, J.L. (1967). A Darwinian Approach to Plant Ecology, *Journal of Ecology* 55: 247-270.

Sarcocornia perennis DA.J. Scott (Perennial Glasswort)

Draft account

vc 15 and 16

Rarity / scarcity status

Sarcocornia perennis is a succulent perennial of saltmarshes in the south and east British Isles, especially on the coast of Hampshire, around the Wash and from Suffolk, down through Essex and along the north Kent coast. It is nationally **scarce**, but its threat assessment for conservation risk purposes is one of 'Least Concern'. In Kent, it is neither rare nor scarce. There is possible evidence of decline in the county between 1971-80 and 1991-2005, but this has limited support from later records.

Oare. Photo by Liam Rooney, 30 September 2010

Account

The first Kent record of Perennial Glasswort is from Sheppey: 'There was observed near the island of Sheppey by Dr Sloane a geniculate glasswort or another new perennial species of glasswort' (*Kali geniculatum majus sive alia nova species Kali perennis a D. Sloane observatum est prope insulam Shepey*). This was given in the Appendix of additions in vol.2 of John Ray's *Historia Plantarum* (1688), the record being too late for inclusion in the first volume (1686). The finding was communicated by Dr. Hans Sloane in a letter to Ray dated 10 August 1686⁵⁵. 'In our simpling journey to Sheppey we found a perennial Kali differing somewhat from that on the Mediterranean shores; and Mr. Watts assures me it is a perennial. It grows near King's Ferry, in Sheppey, where also is cast upon the shore the *Fucus spongiosus* Ger. emac. In the same place, in the ditch, grows plentifully *Atriplex maritima folio sinuato candicante angusto*...I send you down specimens of them' Ray replied on 24 August: 'The *Kali geniculatum*, I agree with you and Mr. Wattes to be different from that of the Mediterranean shores, and a new species, as far as I can discern from the dried plant'.



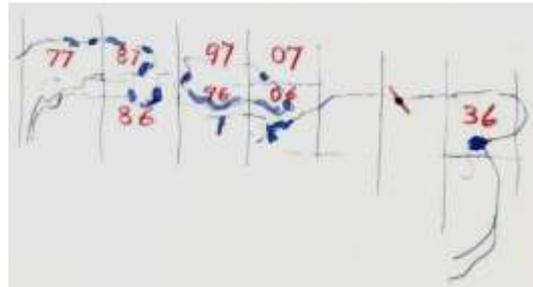
Harty, habitat. Photo by Liam Rooney, 2017

This correspondence shows not only the contemporary network for exchange of botanical information, but also how discoveries were bound up with herbal investigations for medicinal purposes. The find was on a 'simpling' (i.e. herborizing) expedition, just as Johnson had undertaken with his fellow apothecaries in 1629 and 1632. Hans Sloane had already taken his MD at the University of Orange, and his interest in

⁵⁵ (ed.) Lankester, E. (1848), *The correspondence of John Ray*. The Ray Society, London.

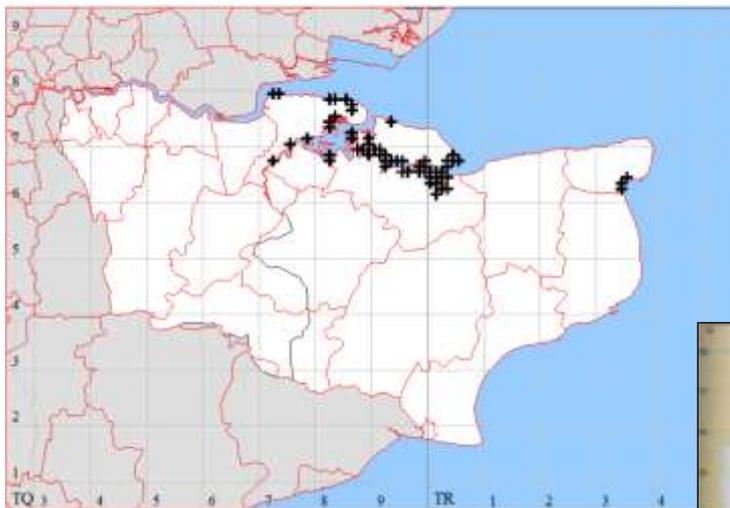
botany helped him to membership of the Royal Society in 1685. He had a close association with Chelsea Physic Garden, the curator then being John Watts, whose opinion on the perennial status of the plant was obviously worth having (and who had helped, or promised to help, Ray with information regarding rare plants).

It was also given as growing abundantly in the Isle of Grain by Dillenius in the third edition of Ray's *Synopsis Methodica Stirpium Britannicarum* (1724). Hanbury and Marshall (1899) gave additional records for other locations: Whitstable, Pegwell Bay, Deal and New Romney, considering it to be locally plentiful on muddy shores. Francis Rose, in his manuscript *Flora of Kent*, treated it as a plant on firm consolidated mud in the general salt marsh community; sometimes on more sandy mud; not extending up estuaries far away from the zone of highest salinity; and no longer to be found on the S. Kent coast. He mapped it as present in eight hectads.



Map by Francis Rose: *Sarcocornia perennis* distribution, 1945-56.

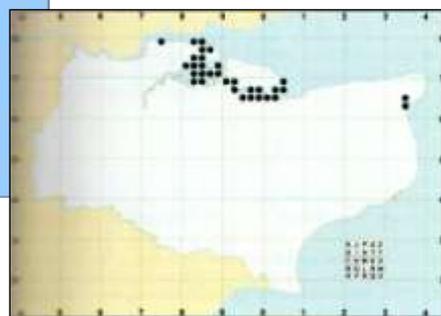
This is the same total as given in Philp (1982) for 1970-81, although the latter omits Pegwell Bay, but includes a Dungeness sighting. The eight 1970-81 hectads were represented by 39 tetrad records. These had become 32 tetrads by the 1991-2005 survey published in Philp (2005), suggesting an 18% decrease. If there had been a decrease, then it has not been of that order, as our 2010-20 records cover 36 tetrads. These are shown in the accompanying 2010-20 distribution map, which gives 61 sites, as the register data is being maintained at 1km



Sarcocornia perennis (Perennial Glasswort) 1991-2005

square (monad) level, and these equate to 34 tetrads. Tetrad data are provided in the accompanying 1991-2005 map, taken from Philp (2010), with kind permission of the late Eric Philp and the Kent Field Club.

Sarcocornia perennis (Perennial Glasswort) 2010-20



The fundamental distribution remains the same, clustered around the Swale and Medway estuaries and the neighbouring Thames estuary, with an outlier at Pegwell Bay. The species can readily be overlooked, especially in large areas of saltmarsh with varying accessibility as a result of interruption by deep, sinuous channels, and where it may be concealed by other vegetation.

The norm in Kent is for it to be found, as mentioned in Philp (2010), in the middle and upper parts of saltmarshes. This is often in muddy areas dominated by *Atriplex portulacoides* (Sea-purslane), but we have also seen it at a saltmarsh margin with sand (Rainham), and on flat mud of channels and pools, not intermixed with other species (Kemsley Marshes). It has been claimed for ditches near Sheerness, which is unusual, and Kent

records include at tidal creeksides and around saltmarsh pools, which tend to be in the upper saltmarsh. This versatility is also indicated by Leach (1994)⁵⁶, who refers to presence in both eroding lower parts of saltmarshes and in higher levels along drift-lines and on shell- and shingle-banks, including occasionally bare ground above the drift-line, such as trackways behind sea walls. While we have noted Kent habitats as frequently muddy, the species is considered intolerant in relation to a waterlogged substrate (Davy, A.J. et al., 2006⁵⁷, despite its regular inundation, and so underlying sediments may be expected to be relatively well-drained. We have not kept records of associated species, but have recorded, as present in the same saltmarsh, species such as *Puccinellia maritima* (Common Saltmarsh-grass), *Suaeda maritima* (Annual Sea-blite), *Atriplex portulacoides*, *Salicornia* spp., *Limonium vulgare* (Common Sea-lavender), *Tripolium pannonicum* (*Aster tripolium*, Sea Aster) and *Spartina anglica* (Common Cord-grass). All these are mentioned by Davy, A.J. et al. (2006) as most frequently associated with *S. perennis* in English saltmarshes, in this order of frequency.



Oare. Photo by Liam Rooney, 26 September 20150

It is readily distinguishable from *Salicornia* spp. by its perennial character, and so is difficult to pull up. The woody stems are often procumbent, rooting at the nodes, and Leach (1994) refers to 'bushes' up to 1 metre across. The triads of flowers (cymes) are distinctive in that all three, ranging alongside above the base of a fertile segment, are almost of equal height. Not all stems bear fertile spikes and they are usually little-branched, developing from green to yellow-, orange- or reddish-brown.

⁵⁶ Leach, S.J. (1994), in (eds.) Stewart, A., Pearman, D.A. & Preston, C.D., *Scarce Plants in Britain*, JNCC, Peterborough.

⁵⁷ Davy, A.J. et al., (2006). Biological Flora of the British Isles: *Sarcocornia perennis* (Miller) A.J. Scott. *Journal of Ecology* **94**: 1035-1048

Saxifraga granulata L. (Meadow Saxifrage)

Draft account

vc 15 (although not seen recently) and 16

Rarity / scarcity status

Saxifraga granulata is a perennial of damp but well-drained ground, locally common through much of Britain, although decreasing towards the west. Its conservation risk status in both England and Great Britain as a whole is one of 'Least Concern'. It is neither rare nor scarce in Kent, but was included in this register on the basis of substantial loss (e.g. through land improvement or development). However, from recent recording the extent of loss is not quite as great as is envisaged and the species is being retained on the register for continued assessment.

Platt. Photo by Liam Rooney,
13 May 2012

Account

First publication of its Kentish presence was by Edward Jacob in his *Plantae Favershamienses* (1777): 'Upon Beacon Hill – uncommon' (this is a hill to the west of Faversham, the geology of the top being Lambeth Group sands). However, *Saxifraga*



granulata is more of a West Kent plant, and subsequent historic records reflect this. Hanbury and Marshall (1899) described it as locally plentiful in hedgebanks, heaths and moist meadows giving many records in north west Kent, such as at West Wickham, Hayes, Chislehurst, between Orpington and Farnborough, Halstead Place, Chelsfield, Greenstreet Green, meadows above and below Darent, and wood-borders about Shoreham. Another cluster was from Bessel's Green through Seal and Ightham to Borough Green, which might be regarded as continuing on similar geology at Ryarsh and Bearsted. These and other records prompted a very full analysis by Francis Rose in his manuscript *Flora of Kent*:

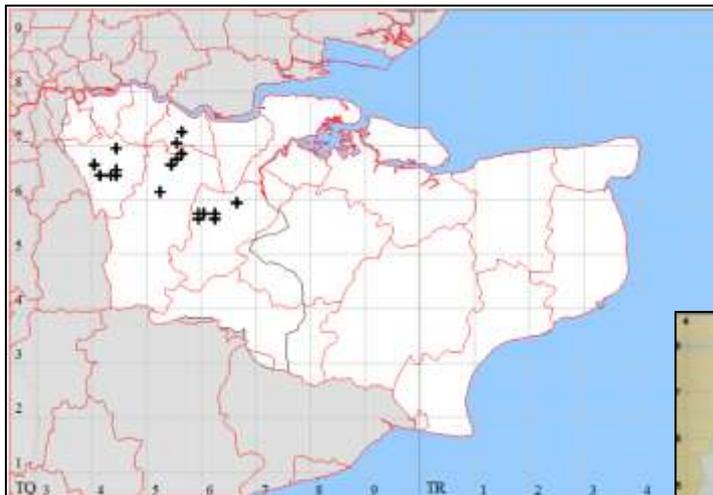
'Dry grasslands, hedgebanks, and old pits on sandy or gravelly, not markedly acid soils; drier parts of alluvial meadows on valley gravels; only locally common; woods on (?Pliocene) sandy loams on the chalk plateau of the North Downs, rare. This species has a very peculiar distribution in Kent. It is, or was, common on the Tertiary and river terrace sands and gravels near London and down the Thames and extends up the gravels of the Darent Valley meadows to the Folkestone Sand E. (but not W.) of Sevenoaks, and extends intermittently along the Folkestones as far E. as Hollingbourne. On the plateau of the North Downs it is found E. and W. of the Darent Valley and NW of the Medway occasionally; at one place between the Medway and the Stour; and in two places east of the Stour. It is unknown elsewhere in Kent, being absent from the Stour Valley; from the Greensand east of Hollingbourne; and from the Hastings Sands.... Its habitats have in common that they are all on free draining soils, and of neutral or very weakly acid reaction: both v[ery] calcareous and very acid soils are avoided. The pattern of distribution in Kent suggests relatively recent spread from the Thames valley up the Darent to the L[owe]r Greensand, possibly largely by vegetative means after forest clearance: long range dispersal of some kind may account for the very isolated colonies on the Downs plateau of mid and E. Kent.'

To this perceptive account, probably drafted in the late 1950s, Francis Rose added a large collection of records and it is striking how much these have since diminished. By the time of the 1971-80 survey (Philp, 1982) presence had reduced to 22 tetrads, mostly in TQ56 and TQ57 (north west Kent) and from Ightham to Ryarsh,

on roadsides, railway banks, sandy meadows and waste places. There was a further, and very substantial, reduction in the 1991-2005 survey (Philp, 2010), down to six tetrads, with the plant apparently lost from several sites due to land use changes.

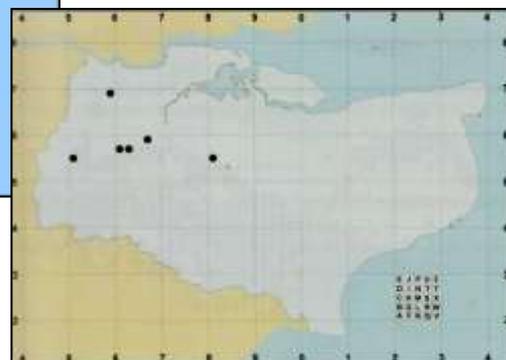
Platt churchyard. Photo by Liam Rooney, 13 May 2012

Our 2010-20 records, however, give 19 tetrads: seven of these are from metropolitan West Kent which was not covered by the Kent surveys, leaving twelve tetrads from the administrative county of Kent. The decline from 1971-80 is therefore not quite as great as had appeared, but remains substantial. The register for this species is being maintained on a monad (1 km square) mapping basis and the 2010-20 data are shown here in comparison with 1991-2005 mapping, with kind permission of the late Eric Philp and the Kent Field Club. The 1991-2005 records show the last occasion on which *Saxifraga granulata* was recorded in East Kent, in TQ85C, which comprises east Bearsted and Milgate Park.



Saxifraga granulata (Meadow Saxifrage)
1991-2005

Saxifraga granulata (Meadow Saxifrage)
2010-20



As well as including metropolitan West Kent sites, the 2010-20 map shows a series of records on gravelly alluvial soils along the Darent Valley, missed in the 1991-2005 survey, although known in many locations there before. Our recent records also refer to occurrences in sandy grassland, especially by roads, and there are numerous records for churchyards: Hayes, Chislehurst, Shoreham, Farningham, Horton Kirby, Ightham, Borough Green, Platt. Churchyards are especially likely to have kept unimproved grassland maintained as a short sward, suitable for the survival of *Saxifraga granulata*, but it may also be introduced in such locations; introduction may well be the case for the disused Darent Park Hospital cemetery, for example, and will certainly be for a *flore pleno* form at St Mary's Riverhead.

Meadow Saxifrage can easily be overlooked when only in leaf. When in flower it is conspicuous, but it can get mown down in roadside locations. This is not necessarily disadvantageous for reproduction as seed set in



British gynodioecious populations and seedling survival is in both cases apparently low, and spread is more likely by means of axillary bulbils⁵⁸. These form in the axil of each basal leaf, globular structures 3-5mm in diameter, which are capable of detachment and dispersal, forming a new rosette in autumn and over-wintering. The rosette is low and delicate-looking, and the plant is likely to be out-competed if its sward is not kept low.

It is unlikely to be confused with any other British lowland plant, although in churchyard situations one should be mindful that *Saxifraga hypnoides* (Mossy Saxifrage), also with white flowers, may be planted – that species has moss-like mats of leaves with linear lobes, quite distinct from the rounded gently lobed leaves of *Saxifraga granulata*.

Platt churchyard. Photo by Liam Rooney, 13 May 2012

⁵⁸ Stroh, P. (2019). *Saxifraga granulata* Meadow Saxifrage, in Stroh, P. et al., *Grassland plants of the British and Irish lowlands*, Botanical Society of Britain and Ireland, Durham.

Scandix pecten-veneris L. (Shepherd's-needle)

Draft account

vc 16

Rarity / scarcity status

Scandix pecten-veneris is an archaeophyte (or ancient introduction) which, with some other arable weeds, was formerly abundant in the British Isles and has since undergone major decline. It is now not common, found mostly in central and southern England, especially East Anglia, and is treated as **Critically Endangered** in Great Britain as a whole, **Endangered** in England. It is a Biodiversity Action Plan priority species. From the data in Philp (2010) it could be considered as rare in Kent, but it is better regarded as **scarce**.

Haysden. Photo by Liam Rooney, 12 May 2011

Account

The first published Kent record is by Thomas Johnson (*Iter Plantarum*, 1629), found on the way between Gravesend and Rochester. There is archaeological evidence for earlier presence: seed has been found from early Roman ditch fill at Thurnham⁵⁹; from an 8th/9th century context in a ditch at Lyminge⁶⁰; from Anglo-Saxon deposits at Cliffs End⁶¹; and possibly (as the seed may have been *Chaerophyllum* or *Scandix*) from an early Romano-British context in a pit at Springhead⁶². Hanbury and Marshall (1899) do not list any other records after the first, as it was ubiquitous through the county, in fields and cultivated ground, especially on chalk and clay. Other local Floras do not add much to this: '*In Fields among Corn – very common*' (Edward Jacob, *Plantae Favershamienses*, 1777); '*In cornfields, very common*' (Thomas Forster, *Flora Tonbrigensis*, 1816). Perhaps more flavour is given by Anne Pratt, not writing specifically about Kent, but much of her life was spent in the county: 'A common and troublesome weed is this plant, for it is found in almost every cornfield, from May to September, and in some fields seems almost as abundant as the corn itself' (*The Flowering Plants and Ferns of Great Britain*, 1855-66).



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Haysden. Photo by Sue Buckingham, 17 May 2010

Changing agricultural practices in the twentieth century, especially herbicide use from the 1950s, transformed ubiquity into scarcity. Francis Rose, writing probably in the late 1950s, possibly 1960, was able to say that it was then not very common,

⁵⁹ Smith, W. & Davis, A. (2006). *The charred plant remains from Thurnham Roman Villa, Kent (ARC THM 98)*. CTRL Specialist Report. London and Continental Railways.

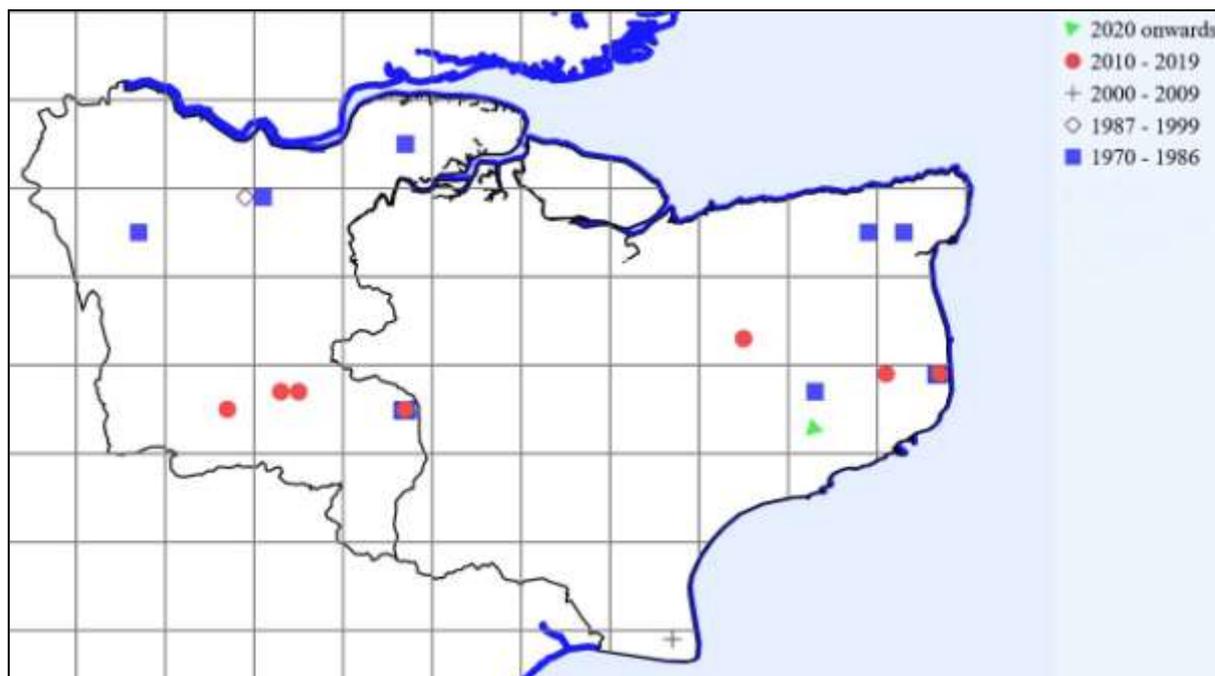
⁶⁰ Campbell, G. (2012). Assessment of charred and mineral-replaced macroscopic plant remains from excavation at Lyminge, Kent 2008-10 (University of Reading), https://www.reading.ac.uk/web/files/archaeology/Campbell2012-palaeobotanical_assessment.pdf

⁶¹ McKinley, J.I. et al. (2014) *Cliffs End Farm, Isle of Thanet, Kent. A mortuary and ritual site of the Bronze Age, Iron Age and Anglo-Saxon Period with evidence for long-distance maritime mobility*. Wessex Archaeology Report 31.

⁶² Barnett, C. et al., *Settling the Ebbsfleet Valley: High Speed 1 Excavations at Springhead and Northfleet, Kent. The Late Iron Age, Roman, Saxon and Mediaeval Landscape, vol.3 (Late Iron Age to Roman Human Remains and Environmental Reports (Charred plant remains from Springhead Sanctuary))*. <https://owarch.co.uk/hs1/springhead-northfleet/pdf/springhead-volume-3-tables.pdf>

but well distributed on arable land and waste open ground, especially on sand and chalk. He gave 1940s/50s records from Old Swanley (in fields); Cuxton (railway bank); east of Seasalter Church (cornfields); Graveney (farm weed); Hacklinge (field); south of Sandwich (field); west of Shoreham (cornfields); east of Westerham Hill (cornfield); Leaves Green (arable); Coombe Vale, Dover; Bishopsbourne; Bossingham; east of Dover; west of Penshurst (field by R. Eden); Platt; south west of Pembury (sandy arable land). This is the last snapshot of a relatively wide distribution of Shepherd's-needle, dwindling fast. By the time of the 1971-80 county survey (Philp, 1982), it was 'Rare and decreasing', only found in seven tetrads. This total reduced to three (Longfield, Marden and Dungeness) in the 1991-2005 survey (Philp, 2010), but was restored to eight (ten monads) by our 2010-20 records.

Scandix pecten-veneris (Shepherd's-needle)



This mapping is extracted from the BSBI database to show the full extent of records after the mid-twentieth century decline had taken effect. It includes records from Philp (1982) and Philp (2010), the latter of which did not have a map, but it does not include records tabulated in this register not in the database. The 1970-86 records are well scattered, mostly on chalk, and only two represent locations where Shepherd's-needle has continued to be found: Marden and Ashley. There have, however, been some interesting discoveries of the species in the upper Medway valley, by arable both east and west of Tonbridge on alluvial soils.

Haysden. Photo by Liam Rooney, 12 May 2011



*Scandix pecten-veneris*⁶³ grows as an annual especially with winter-sown crops, but pre-sowing cultivation of the ground is likely to be detrimental to its main germination, which takes place from October to late

⁶³ Much of the following information is derived from (1) Smith, A. (1999) *Scandix pecten-veneris* L. Shepherd's-needle, In (eds.) Stewart, A., Pearman, D.A. & Preston, C.D. *Scarce Plants in Britain*, JNCC, Peterborough. (2) Liopa-Tsakalidi, A. (2014). *Scandix pecten-veneris* L.: A wild green leafy vegetable. *Australian Journal of Crop Science* **8**(1): 103-108.

November, with a smaller flush of seedlings in spring. Seed dormancy appears low and seed longevity in the soil is five years maximum, so there is limited ability to survive periods of unfavourable cultivation patterns. It is this vulnerability, together with the effect of continued herbicidal treatment of crop margins in exhausting the seed-bank, which has brought about the scarcity of the species. The fruit or 'needle' of Shepherd's-needle can reach up to 6cm and consists of two seeds with appendages which remain joined together until ripe, when the appendage acts as a spring dispersal mechanism. Held up in groups from each umbel (hence the 'comb' of *pecten-veneris*, Venus' comb), these fruits yield some 50-150 seeds per plant.

It is a very distinctive plant in fruit; before that stage it might perhaps be taken for young *Coriandrum sativum* (Coriander) which, however, is glabrous and foetid.

Site	Grid reference	Site status	Last record date	Recorder	Comments
Green Street Green / Orpington (metropolitan vc16)	TQ4664		2 May 2004	JoA	TQ 462 645, three plants on chalky lawn edge of garden in Glentrammon Road.
Chelsfield	TQ4764		1971	JD	TQ 470[7] 642[5], field near station.
Shoreham, Sepham Farm	TQ56A		(1) 1990 (2) 1989	(1) JP (2) GJ	(1) Sepham Farm, 50 or more. (2) One plant at edge of pick your own strawberries field.
Shoreham	TQ5262		10 June 2002	JP	TQ 528 622, arable below downland, two large plants.
Mabledon / Haysden, Tonbridge	TQ5744		17 May 2010	SB	Fishponds Farm, S W Tonbridge. TQ 57141 44944, TQ 57321 44984. ± all around sprayed southern edge of wheat field. Plants tolerant of field edge spray but weaker.
Haysden	TQ5745		(1) 7 March 2019 (2) 17 May 2010	(1) DC (2) SB	(1) TQ 57037 45001, hundreds of young plants coming up around field margin. (2) Fishponds Farm, taking part in Countryside Stewardship Scheme. TQ 57036 45006, TQ 57024 45142, TQ 57390 45057. Prolific ± all around edge of wheat field. Highest density of plants in a 250m x 5m unsprayed stretch amongst the crop on western field margin alongside public footpath as at 1st grid reference (Other references indicate 2 northern field corners).
Dean Bottom	TQ56Z (includes TQ5868)		(1) 20 September 1995 (2) 1991-99	(1) JP (2) EGP	(1) TQ 589 685, 30 plants in flower and fruit. (2) TQ56Z.
East Tonbridge	TQ6357		12 June 2014	KBRG meeting	Margin of arable field from TQ 63276 47037 for about 7 metres eastwards.
East Tonbridge	TQ6447		(1) 12 June 2014 (2) 12 May 2012	(1) KBRG meeting (2) DCa	[Site subject to minerals extraction application, January 2020] (1) (a) At margin of arable field and well into the crop at TQ 6422 4707 and for some distance east and west. (b) Several plants at margin of arable field at TQ 641 470. (2) Initially recorded as TQ 64219 47078, a few plants on footpath edge leading into arable field on heavy clay, just north of the westernmost of Whetsted gravel pits, covering 1 or 2 sq metres. May be longer term threat of extension of gravel extraction (site

					71 in county minerals extraction plan). Later in May, reassessed by recorder as quite a few hundred individual plants, the vast majority of which are in a narrow strip between the headland and the current barley crop, within about 0.5m of the edge of the crop. The strip of plants stretches along about 150m along one edge of one section of the crop from west to east from about TQ 64148 47063 to TQ 64296 47084.
Longfield	TQ66E		After 1970, before 1981	JRP, EGP (Philp, 1982)	TQ66E.
East Gravesend	TQ67S		After 1970, before 1981	Philp (1982)	TQ67S
Marden	TQ74S (includes TQ7644)		(1) 11 May 2019 (2) 5 May 2019 (3) 28 May 2010 (4) 16 May 2010 (5) 9 May 2009 (6) 26 May 2003 (7) 1991-99 (8) 24 July 1986 (9) After 1970, before 1981	(1) SL (2) DC (3) SP (4) SB (5) DM (6) JP (7) EGP (8) RoF, AS (9) Philp (1982)	(1) South of Marden Meadow KWT Reserve, TQ 64504 4454. Recently harrowed arable field, northern border along the southern side of Marden Road. A few patches together in flower and seeding. (2) TQ 76421 44444. About 20 flowering plants with Field Pepperwort at the margin of arable field where it meets hedge. (3) TQ 76425 44460, field opposite Marden Meadow Reserve, many plants all along edge of Rape field nearest the road. (4) TQ 76393 44466. (5) TQ 746 445. (6) TQ 763 444, some in fruit, others in flower, also young plants seen along the headland area, northern edge of arable. (7) TQ74S. (8) TQ 761 444. (9) TQ74S. [This is a selection of records.]
Cooling / High Halstow	TQ77S		After 1970, before 1981	Philp (1982)	TQ77S.
Dungeness	TR01U (includes TR0619)		(1) 18 May 2000 (2) 18 May 2000	(1) EGP (2) MGT, BCE	(1) TR01U. (2) TR0619, old ARC works.
Lower Hardres	TR1453		18 May 2011	JA	TR 14385 53564, one patch of c. 10 plants at edge of wheatfield, and another plant about a foot away.
Swingfield Minnis	TR2342		14 March 2020	SC, ML	(a) 5 metre patch on road edge, TR 2352 4202. (b) TR 23520 42028, on clay-with-flints, a large patch c.5 x 0.5m along a roadside where the field had been ploughed to the road edge, plenty of flowers, and a single plant a few metres away had mature and immature seedcases, including some that had already opened early in the year.
Wootton	TR24I		After 1970, before 1981	Philp (1982)	TR24I.
Monkton	TR26X		After 1970, before 1981	Philp (1982)	TR26X.
Ashley	TR34U (includes TR3048, TR3148)		(1) 27 May 2019 (2) 6 May 2017 (3) 12 June 2016 (4) 3 May 2011 (5) After 1970, before 1981	(1) DC (2) SC (3) SC (4) GH (5) Philp (1982)	(1) TR 31119 48360, one in flower on east side of path, several unhealthy-looking seedlings on the west side. (2) 50 plants alongside a barley field TR312 484

					(3) TR 3103 4844, In rape edge for 70 yards. (4) Plentiful along about 2m of edge of arable by North Downs Way between Ashley and Roman road. (5) TR34U.
Deal	TR3649		(1) 15 July 1987 (2) 22 July 1986	(1) RoF, PJW (2) RoF, AS	(1) TR 365 495, between Coldblow Farm and Kings Farm. (2) TR 365 495, A258 south of Deal.
Cliffs End	TR36H		After 1970, before 1981	Philp (1982)	TR36H.



Haysden, habitat.
Photo by Sue Buckingham, 17 May 2010

***Schoenoplectus tabernaemontani* (C.C. Gmel.) Palla x *triqueter* (L.) Palla
(*Schoenoplectus x kuekenthalianus* (Junge) D.H. Kent) (Hybrid Club-rush)**

Draft account

vc 15; gone from vc16

Rarity / scarcity status

Schoenoplectus x kuekenthalianus is included in this register in substitution for *Schoenoplectus triqueter* (Triangular Club-rush) which was formerly a Kent plant but now appears extinct, so its genes continue only in the hybrid. *Schoenoplectus triqueter* itself is **Critically Endangered** in England and in Great Britain as a whole, and is thought to survive in Britain only as introduced plants, with all native plants lost; the other parent, *Schoenoplectus tabernaemontani* (Grey Club-rush) is not uncommon, and its conservation risk status is one of 'Least Concern'. The hybrid has no conservation risk assessment for England independent of its parents, but in Great Britain it is treated as **Vulnerable** to the risk of extinction. The hybrid grows by all the British rivers from which *Schoenoplectus triqueter* has been recorded: the Tamar, Arun, Thames and Medway. It is very **rare** in Kent and is seldom recorded, because it is inaccessible safely except by boat.

Account:

The *S. triqueter* parent was long known in Kent, being first mentioned by John Ray (*Catalogus Plantarum Angliae*, 1670) as reported to him from 'By the River Thames-side, both above and below London'. Although seen by Daniel Cooper (*Flora Metropolitana*, 1836) between Greenwich and Woolwich, it was extinct in Kent alongside the Thames by the end of the century (Hanbury and Marshall, 1899). The first reference to it growing by the Medway appears to be by Hanbury and Marshall (1899), where it is said to have been found by A.H. Wolley Dod in 1894 as plentiful on the right bank of the Medway, between Aylesford and Forstal (i.e. on the vc15 East Kent side). Marshall also added a note that it occurred also on the left bank, both above and below Aylesford Bridge.

The position is complicated by Marshall also having recorded as a species along the right bank of the Medway above Aylesford what was then called *Scirpus carinatus*, albeit noting in Hanbury and Marshall (1899) that there were views that *Scirpus carinatus* was really a hybrid between species which are now called *Schoenoplectus lacustris* (Common Club-rush) and *Schoenoplectus triqueter* (this has since become accepted, and the hybrid is *Schoenoplectus x carinatus*). However, Marshall separately commented that his *Scirpus carinatus* was 'probably a hybrid between *S. Tabernaemontani* and *S. triqueter*, with which it seems to be usually, if not always, associated'⁶⁴. He did not follow this up in the 1899 Flora and should have stayed with his instincts, for this is probably the first Kent record for *Schoenoplectus x kuekenthalianus*. This hybrid did not appear to be then recognized in the British Isles, and botanists long persisted in recording *S. carinatus* (*S. x carinatus*) instead. For example, this applies to a record by T.J. Foggitt in 1927 from the River Medway at Aylesford (vc15) and, indeed, all Medway *S. carinatus* (*S. x carinatus*) was probably recorded in error, the putative parent *Schoenoplectus lacustris* not being present by the river.

The last record for *S. triqueter* by the Medway appears to have been by N.D. Simpson in 1938⁶⁵, and it is thought to have disappeared after the river walls were constructed and a new cut straightened the river, although some plants may have survived for a while along by the Friary. The hybrid, *Schoenoplectus x kuekenthalianus*, continued and there were, for example, sightings by R.A. Boniface in 1950 at Aylesford, and

⁶⁴ Marshall, E.S. (1895). Notes on Kentish plants observed during 1894. *Journal of Botany* **33**: 164-165.

⁶⁵ Rich, T.C.G. & FitzGerald, R. (2002). Life cycle, ecology and distribution of *Schoenoplectus triqueter* (L.) Palla (Cyperaceae), Triangular Club-rush, in Britain and Ireland, *Watsonia* **24**: 57-67.

by Eric Philp, who stated (Philp, 1982) that there was one patch of about eight plants along the edge of the River Medway near New Hythe (TQ 715 600).

Schoenoplectus x kuekenthalianus (Hybrid Club-rush), mislabelled as to identity. Aylesford, 1926, herbarium of Birmingham University.



In August 1987, an attempt was made to ascertain what the position was generally as regards the presence of the hybrid and possible survival of *S. triqueter*.⁶⁶ Eric Philp, as Honorary Swan Master for Maidstone Borough Council, and involved in the annual swan upping or census on the river, had contacts including the owner of a cabin cruiser who was prepared to take Eric, together with Rosemary FitzGerald and Jim Bevan along the Medway. A rubber dinghy was also brought, so it was possible to leave the cruiser to approach and examine each clump, collecting specimens from most. The expedition followed the tide upstream, and many clumps of *S. tabernaemontani* were seen on the mud at the outer edge of stands of *Phragmites australis* (Common Reed). Then, two partly inundated clumps of a noticeably different nature were encountered when the bends between Snodland Common and Burham Marshes were reached, at TQ 713 614 and TQ715 614 (east bank, vc15). These were shorter and more slender, darker green, barely coming into flower and of a rather floppy habit quite different from the stiff clumps of *S. tabernaemontani*. The colour, small size and late flowering were all characteristic of *S. triqueter*, but the stems, although three-angled, were somewhat smooth-angled rather than sharply defined. The glumes, which in *S. tabernaemontani* have obvious red papillae, seemed to show slight papillae in some cases; and although the flowers were immature, they should not in the case of *S. triqueter* have shown any such indication. The known clump of *Schoenoplectus x kuekenthalianus* at TQ 715 600 was also examined, but further search was constrained by the need to reach Allington lock before the tide turned down. The find of the two clumps was initially publicised as *S. triqueter*, at the BSBI Annual Exhibition (1987) and in *BSBI News* (49:49). However, the contra-indications mentioned above, together with a re-examination of the clumps in 1996 by Eric Philp and Tim Rich resulted in the determination being withdrawn, and the two clumps were confirmed as *Schoenoplectus x kuekenthalianus*.⁶⁷

The hybrid was sought in 2000, when putative material was collected from alongside the Medway at TQ 7132 6143 (vc15), but AFLP genetic fingerprinting showed that this was *S. tabernaemontani* after all.⁶⁸ By contrast, some material from non-Kent localities which resembled *S. tabernaemontani* turned out to be the hybrid instead. In August 2018 Richard Lansdown secured access by boat to obtain material from a putative hybrid plant forming part of a clump on the outer edge of a band of *Phragmites australis* (Common Reed) on the edge of deep, soft mud on the east bank of the Medway opposite Snodland (TQ 715 614) for comparison with samples analysed from other (non-Kent) sites. The material strongly resembled *S. tabernaemontani*, but with the shoot sub-triangular in cross-section immediately below the inflorescence.

The distinguishing characters of the hybrid include: glumes somewhat papillose; stems often glaucous; stigmas mostly two; inflorescence usually lacking secondary branching.⁶⁹

⁶⁶ Details from manuscript notes by Rosemary FitzGerald, 1987.

⁶⁷ Rich, T.C.G. & FitzGerald, R. (2002), as cited above.

⁶⁸ Fay, M.F., Cowan, R.S. & Simpson, D.A. (2003). Hybridisation between *Schoenoplectus tabernaemontani* and *S. triqueter* (Cyperaceae) in the British Isles. *Watsonia* 24: 433-442.

⁶⁹ *Schoenoplectus* (Rchb.) Palla. In (eds.) Stace, C.A., Preston, C.D. & Pearman, D.A. *Hybrid Flora of the British Isles*, Botanical Society of Britain and Ireland, Bristol.

Sceleranthus annuus L. (Annual Knawel)

Draft account

vc 16

Rarity / scarcity status

Sceleranthus annuus is widespread in open sandy ground across most of the British Isles, but absent from the far north and rare in Ireland. Despite the breadth of its range, it is regarded as Endangered in both England and Great Britain as a whole due to the severity of decline. In England, the extent of its occurrence, or geographical spread, was taken to have declined by 64% in comparing records for 1930-69 and 1987-99; and during this period the area of occupancy within the extent of its occurrence – this is a measure of the likelihood of encountering the plant – had declined by 67%. In Kent there is evidence of a decline of 80% between 1971-80 and 1991-2005, and the species is now **scarce**.

Dartford Heath. Photo by David Steere,
14 May 2019

Account

The first Kent (and British) record for Annual Knawel appears to be Thomas Johnson's, but whether attributable to his 1629 or 1632 Kentish journey is debatable. If the former (given in his *Iter Plantarum*, 1629), then the plant was encountered between Gravesend and Rochester. This could have been when



encountering sandy ground from the Thanet Formation near Shorne and Higham (a later find is recorded in Francis Rose's manuscript Flora of Kent as near Shorne windmill, some 500m from the Gravesend-Rochester road). If the latter (given in his *Descriptio Itineris*, 1632), then this was a find between his party's inn at Margate, and Quex at Birchington, probably before reaching Westgate Bay (there are no other localised records in this area and the geology does not suit, except for consolidated shingle, which is not a common habitat for the species).⁷⁰

Hanbury and Marshall (1899) considered it to be a locally plentiful of heathy or sandy dry fields, with records across the county, including Edward Jacob in *Plantae Favershamienses* (1777) ('On barren dry sandy soils – very common') and Thomas Forster (*Flora Tonbrigensis*, 1816) ('In cornfields and barren places, very

⁷⁰ The 1629 record is of *Saxifraga Anglicana*, *Alsines minimum* genus *Daleschampii polygonum selinoides Gerardii*, and hence refers back to John Gerard. The plant so named by Gerard in his *Herball* (1597) was listed among the knot-grasses and called Parsley Piert as well as Knawel (a German vernacular name), but Johnson in his 1633 edition of the *Herball* pointed out that Gerard had muddled up his illustrations and descriptions here. It is likely as well that Johnson's views of correct nomenclature had been changing, not only after he wrote his 1629 journal, but also between his 1632 journal and the 1633 *Herball* publication, having received help from John Goodyer. Johnson in his *Descriptio* (1632) refers to *Polygonum selinoides* Ger. sive Knawel Germanorum; an *Vermiculata nova planta montana Col?*, i.e. he was naming it as Gerard's *Polygonum selinoides*, but querying whether it might instead have been a different plant named by Fabio Columna or Colonna. In the event, by 1633 he was thinking it might be neither of these.

These complications make it difficult to decide whether Johnson had seen the plant in 1629, 1632 or at all. W.A. Clarke (*First records of British flowering plants*, 1900) purported to follow Hanbury and Marshall (1899) in accepting the 1629 record as Knawel; but presumably forgot he had already given this as the first British record for *Sagina procumbens*. Francis Rose accepted both 1629 and 1632 records as being Knawel in his manuscript Flora of Kent (probably written in the 1950s or 1960s); but in the 1972 edition of Johnson's journeys in Kent, he treated the 1632 plant as probably Annual Knawel, but the 1629 plant as *Sagina* sp., either *Sagina apetala* or *Sagina procumbens*. David Pearman (*The Discovery of the Native Flora of Britain & Ireland*, 2017) accepts the 1632 record, but treats the 1629 one as *Sagina procumbens*.

There is no satisfactory answer to any of this. Likelihood of occurrence in the relevant spot would favour the 1629 record as valid.

common'). That breadth of coverage was still evident from Francis Rose's records in his manuscript *Flora of Kent*. Plants ranged from (e.g.) the gravels of the north west Kent metropolitan commons, to cliff tops on Bagshot sand at Minster in Sheppey; a gravel pit near Littlebourne; sandy fields south of Darenth Wood; a chert pit at Fawke Common; a cornfield on Folkestone Sand near Chegworth; Hothfield Heath; the Toad Rock, Rusthall; and many arable fields. Much of that range persisted in the 1971-80 survey published in Philp (1982), when Annual Knawel was considered rather local on dry sandy or gravelly ground, particularly on heaths and sandy roadside verges; mapping showed 25 tetrads, including a number of sites tracking the sands of the Folkestone Formation which crosses the county. However, the 1991-2005 survey (Philp, 2010) showed a drastic decline, to five tetrads (Farningham Wood, TQ56J; Dartford Heath, TQ57G; Addington, TQ65P; Lydd, TR02K; and St. Mary's Bay (Littlestone Warren), TR02Y). The decline was recognised as reflecting the national position, but without considering what might be the cause. Annual Knawel occurs in two distinct habitats: arable fields and dry, heathy grassland.⁷¹ At least part of the decline since the 1950s relates to its arable habitats. Francis Rose's records from fields, where dated, all relate to the 1940s and 1950s, except for one in 1962. There have been no recent arable records at all. This may be another manifestation of the general decline in classic cornfield weeds, largely due to agricultural herbicide, although Walker et al. (2017) found the greatest losses in England and Wales associated with a lack of disturbance and closed conditions on small farm tracks, an absence of uncropped field margins and conversion of fields to a sown grass ley. It is not clear whether any of the 25 tetrad records in Philp (1982) was from an arable context; but clearly they came in the main from heaths and sandy roadside verges. So it looks as though the 80% decline between then and the



1991-2005 survey (Philp, 2010) should have another explanation, whatever that may be.

Dartford Heath. Photo by David Steere, 14 May 2019

This last decline does not seem to have worsened, in that our 2010-20 records cover seven tetrads (eight monads), including all those in Philp (2010). This period included the BSBI's Threatened Plants survey, which involved an attempt to re-find

historic sites, with only 35% success nationally. In Kent, the two selected sites for 2013 were at Addington (where the species was re-found) and Dartford Heath (where the species could only be relocated in an adjoining monad). The Addington habitat was a disused quarry on the sands of the Folkestone Formation; such sites offer a greater probability of re-finding because of localised erosion opening up an early successional niche, and in this case the availability of open, mobile sand seemed to derive from falls from the quarry walls, and windblow through a gap in them. The population was on the dry sandy quarry floor, largely unvegetated, but with associated species including *Aira praecox* (Early Hair-grass), *Cerastium fontanum* (Common Mouse-ear) and *Rumex acetosella* (Sheep's Sorrel), all cited by Walker et al. (2017⁷²) as amongst most frequent associates generally. Also present were rare plant register species *Filago germanica* (Common Cudweed) and *Logfia mimina* (Small Cudweed). The Dartford Heath site also reflected the suitability of old quarry workings, as the Annual Knawel was associated with the Glory Bumps, a series of ridges formed by soil removal for the extraction of brickearth in the mid-nineteenth century. These may well still provide opportunities for erosion

⁷¹ Lockton, A.J. & Pearman, D.A. (accessed 3 November 2020). Species account: *Scleranthus annuus*. Botanical Society of Britain and Ireland, <http://sppaccounts.bsbi.org/content/scleranthus-annuus-1.html>

⁷² Walker, K.J., Stroh, P.A. & Ellis, R.W. (2017). *Threatened Plants in Britain and Ireland*. Botanical Society of Britain and Ireland, Bristol.

and abrasion producing open ground without being excessively trampled. The same generally frequent associates as at Addington were present, plus some interesting plants of sandy habitats: *Cerastium semidecandrum* (Little Mouse-ear), *Cerastium diffusum* (Sea Mouse-ear), *Logfia minima* (Small Cudweed) and *Spergularia rubra* (Sand Spurrey).

Other current Kent sites are not the product of mineral workings, but in their different ways reflect the needs of Annual Knawel for open, free-draining, highly infertile terrain: on sands of the Thanet Formation at Farningham; on sands of the Folkestone Formation at Ashford; and on old coastal sand and consolidated shingle ridges at Lydd and Littlestone Warren. These habitats provide open ground for seedling establishment and limited competition for a generally decumbent plant which, according to Francis Rose, behaves as an annual in arable habitats but can be biennial (which he equated with var. *hibernus*) in heathy habitats. A seedbank may persist under closed conditions, to be revived upon disturbance; Walker et al. (2017) cite a study of vole burrowing in the Pyrenees as enabling reappearance of the plants after many years, but although Annual Knawel seeds germinated abundantly from the burrow mounds, the length of persistence in the soil bank does not seem to have been investigated. By contrast, a study of abandoned fields in Finland⁷³ placed this species in a group of plants which disappeared within six years of abandonment, but a few seeds were found to germinate from soil samples taken 21 years after abandonment, so viability for at least 15 years was demonstrated.

Dartford Heath, habitat.
Photo by David Steere, 14 May 2019

There are two subspecies: *Scleranthus annuus* subsp. *annuus* with divergent sepals when ripe; and subsp. *polycarpus* with parallel or convergent sepals when ripe. The former subspecies is the usual Kent taxon. subsp. *polycarpus* has been identified by Peter Sell from material gathered by Professor J.S. Henslow from West Kent in 1826. Sell also identified as this subspecies material gathered by St. John Marriott in 1933; this is presumably part of what the latter distributed through the Watson Botanical Exchange Club as var. *hibernus* from Dartford Heath⁷⁴. In Sell & Murrell (2018), subsp. *polycarpus* is noted as the subspecies of sandy heaths, especially in East Anglia; subsp. *annuus* as of cultivated and waste ground, although intermediates are supposed to grow as populations, Annual Knawel being highly inbreeding. In Kent, we have not generally been recording to subspecies, although Eric Philp (Philp, 2010) mentioned that all plants examined had proved to be subsp. *annuus*.



Site ⁷⁵	Grid reference	Site status	Last record date	Recorder	Comments
Farningham Wood	TQ56J (including TQ5368)	SSSI, Local Nature Reserve	(1) 13 May 2011 (2) 20 May 1998 (3) 1991-99 (4) 1994	(1) SB (2) JS (3) EGP (4) RMB	(1) 100 plants in 4 sq metres of sandy bank, TQ 53651 68506, in danger of scrubbing over. (2) TQ 540 684.

⁷³ Kiirikki, M. (1993) Seed bank and vegetation succession in abandoned fields in Karkali Nature reserve, southern Finland. *Annales Botanici Fennici* **39**: 139-152.

⁷⁴ The Watson Botanical Exchange Club Report for 1923-24: **3**(7) at p.258.

⁷⁵ This table excludes 1971-1980 records from the 25 tetrads given in Philp (1982), viz. TQ45X, TQ53Z, TQ54M, TQ54T, TQ57B, TQ57G, TQ65J, TQ65P, TQ67V, TQ75J, TQ85C, TQ85H, TQ85L, TQ85Q, TQ85V, TQ94T, TQ97R, TR01J, TR02Y, TR04C, TR14G, TR14Z, TR15U, TR16B, TR36F.

			(5) 28 June 1982	(5) RMB	(3) TQ56J (4) TQ 5363 6859, several small plants W of wood. (5) Rabbit-grazed slope at TQ 536 681, a few plants. Records for W border of wood go back at least to 1945 (FR).
Dartford Heath east	TQ5173	Dartford Borough Council owned & managed common	(1) 10 June 2011 (2) 16 May 2010 (3) 24 May 1986	(1) SB (2) GK (3) RMB	(1) Sandy heathland, TQ 51909 73246. (2) (a) TQ 51438 73247, frequent on semi-bare gravelly ground. (b) TQ 51949 73199, frequent for at least 10m of semi-bare gravelly bank on heath. (3) Abundant on clinker TQ518734.
Dartford Heath west	TQ57G (including TQ5273)	Dartford Borough Council owned & managed common	(1) 14 May 2019 (2) 12 July 2013 (3) 10 June 2016 (4) 27 April 1997 (5) 1991-99 (6) 24 May 1986 (7) 1974-5	(1) DS (2) GK (3) SB (4) JS (5) EGP (6) RMB (7) RMB	(1) Hundreds of plants, mainly on north side of path all across this area. From TQ 5202 7323 to TQ 5209 7330 and all point between. Further plants scattered about TQ 5215 7329. (2) TQ 52420 731766, about 30 plants on s-e facing pebbly/sandy mound slope, part eroded. TPP survey. (3) On Glory Mounds at TQ 52426 73160. (4) TQ 5213 7312. (5) TQ57G. (6) On gravel ridges, TQ5273. (7) TQ5273, abundant on ground disturbed by gravel digging.
Sevenoaks Wildlife Reserve	TQ5256	KWT managed reserve	5 July 1981	KFC	TQ523567, scarce on sandy path.
Between Nepicar and Addington	TQ65J		14 September 1978	EGP & JF	A few plants, survey of verges of M20 motorway.
Addington	TQ65P, includes TQ6459		(1) 13 July 2013 (2) 1991-2000	(1) GK (2) EGP	(1) Five plants at TQ 64889 59008, one at TQ 64924 59036 and one at TQ 64881 59018, all in mobile sand of disused quarry. TPP survey. (2) TQ65P.
Ashford Eureka Park	TR0044 and TR0045		(1) 21 June 2020 (2) 7 June 2018	(1) SC (2) SB	(1) (a) Three plants around TR 0078 4499. (b) A dozen plants around TR 0078 4500. (2) (a) Subsp. annuus, 100 or more plants on sandy grassland area at TR 0076 4497, Eureka park. Covering an area of some 3 x 3 metres with accompanying plants: <i>Aira caryophyllacea</i> , <i>Lagfia minima</i> , <i>Ornithopus perpusillus</i> etc. (b) Subsp. annuus, at least 50 plants at TR 0078 4501 on bare sand in dry grassland area, Eureka park. Accompanying species included <i>Aira caryophyllea</i> , <i>Lagfia minima</i> and <i>Vulpia bromoides</i> and <i>V. ciliata</i> .
Lydd	TR02K, includes TR0521		(1) 31 May 2013 (2) 14 May 2005 (3) 1991-99	(1) OL (2) RM (3) EGP	(1) In two places on Lydd Common (old sand/shingle ridges), at TR 05095 21853 and TR 05223 21906. (2) TR 0509 2180. (3) TR02K.
Littlestone Warren	TR02Y (including TR0826)		(1) 23 May 2019 (2) 28 April 2014 (3) 5 June 2010	(1) DC (2) GK (3) KBRG	(1) TR 08885 26695, in dunes. (2) TR 0889 2671, scattering of plants on sparsely vegetated flat or

			(4) 23 June 2007 (5) 28 May 2005 (6)1991-99	meeting (4) BL (5) JP (6) EGP	slightly undulating sandy ground. (3) Many plants scattered on sandy ground of The Warren in vicinity of TR 08887 26813. (4) TR08868 26798, abundant in area of grassland between sea wall and Littlestone Golf Course. (5) TR 088 262, widespread. (6) TR02Y.
Chequers Wood, Canterbury	TR15U		22 June 1981	FR	

Serapias vomeracea Burm. F. (Briq.) (Long-lipped Tongue-orchid)

Draft account

vc 15

Rarity / scarcity status

Serapias vomeracea has a Mediterranean-Atlantic distribution and, setting aside a deliberate introduction in Somerset, has no record as a wild plant in the British Isles other than a single plant in East Kent, discovered in 2020. It has no formal designation as regards threat status, in view of its recent discovery and single occurrence, .but self-evidently could not be rarer, both on a county and national basis.

Photo by Daphne Mills, May 2020

Account

A fuller account of this plant is given in Kitchener et al. (2021)⁷⁶. It was discovered on 23 May 2020 by Daphne Mills on motorway-related land in East Kent, the exact location of which is being maintained confidential⁷⁷, to reduce the risk of damage to the plant and its immediate habitat. The means of arrival of this plant in Kent cannot be known for certain, but its location is such that planting is highly unlikely. The species is cultivated, and can be acquired commercially in the British Isles, but cultivation in the general area is not known. There is potential for wind-blown seed to have arrived from the Continent, and Kent is favourably placed for this. However, there is another strong possibility as regards the relevant vector, and that is vehicle-assisted dispersal. Most traffic from the Continent comes through Kent. In 2019, 2 million cars, over 73,000 coaches and nearly 2.4 million road haulage vehicles passed through the port of Dover – presumably half of these were incoming (similarly as regards Eurotunnel, whose 2019 figures are for more than 2.6 million passenger vehicles and almost 1.6 million road haulage vehicles). Potential for seed dispersal via Continental road traffic is evidenced by recent records for *Atriplex micrantha* (Twoscale Saltbush), *Dittrichia graveolens* (Stinking Fleabane) and *Pastinaca sativa* subsp. *urens* (Eastern Parsnip).



The site is in full sun, albeit with some shelter. Associated species within a couple of metres or so include *Anacamptis pyramidalis* (Pyramidal Orchid), *Carex flacca* (Glaucous Sedge), *Galium album* (Hedge Bedstraw), *Leucanthemum vulgare* (Oxeye Daisy) and *Pulicaria dysenterica* (Common Fleabane). Observations on 1 June showed that the pollinia in at least the lower four flowers of the *S. vomeracea* plant had been removed from their column and stuck to the stigmatic cavity, with the ovaries beginning to swell in the lower three. By 13 June at least seven ovaries were swollen, so spontaneous seed-set appeared to have occurred. This was a surprise. *S. vomeracea* is highly self-compatible (as artificial pollination demonstrates); but its morphological structure generally (i.e. in

⁷⁶ Kitchener G., Mills, D., Buckingham, S., Johnson, D. & Lemon, S. (2021). *Serapias vomeracea* Burm. f. (Briq.) (Long-lipped Tongue-orchid): first wild record for Britain and Ireland. *BSBI News* **146**: 7-10.

⁷⁷ This is not a normal approach for the rare plant register, but risk is particularly high in relation to the rarest orchids. It is hoped that, whether by seed or vegetative reproduction, the single plant may be capable of building up a colony (cf. *Serapias lingua* near Tiptree in Essex, which built up to a colony of 61 flowering spikes, assumed to be by vegetative spread, before it received general attention in 2017).

some 97% of cases) prevents self-fertilisation without some form of intervention; natural fruit-set in open-pollinated populations has been recorded at 13.4% to 20.9% (Pellegrino *et al.*, 2006⁷⁸).



Photo by Daphne Mills, May 2020

The pollination strategy of this species is based on the sepals, petals and lateral lobes of the hypochile forming a small tube in which insects may rest or shelter, removing and transferring the pollinia in the process. This insect behaviour is described by Dafni *et al.* (1981⁷⁹) from observations in Israel of male solitary bees. Female solitary bees usually sleep in their own nest-holes, but males apparently may seek holes more widely for rest after their morning activity and *Serapias* flowers, through mimicry, offer what appear to be appropriate bee-refuges, with their dark colour. Such light as may penetrate through the reddish flowers is in the part of the spectrum invisible to bees and so will appear even darker to them. Given that the male bees moved from flower to flower after investigating them (and in the process, pushing the column and dislodging the pollinia), Dafni *et al.* considered that the shortness of the tube may discourage a stay; although for those bees which settle overnight, the morning flower temperature exceeds the ambient temperature by up to 3°C, enabling the bees to become active earlier at less expense of energy. The sleeping behaviour was observed mostly in Israeli species of *Eucera*, but also *Andrena*, *Osmia* and *Tetralonia*. Pellegrino *et al.* (2005)⁸⁰ have observed Italian *Eucera* and *Osmia* pollinating, as well as *Ceratina*. All these genera except *Tetralonia* are represented in the British

Isles and Kent has, for example, 56 species of *Andrena* and nine of *Osmia*, of which several in both genera are common (Allen, 2009).

Fructing. Photo by Daphne Mills, 13 June 2020

Pollination of the Kent plant suggests that similar solitary bee behaviour may occur here, and the warm sunny weather at the time of lowering will have been conducive to bringing out bees. It is possible, however, that more generalist pollinators were also involved, Pellegrino *et al.* (2005) having found the main pollinators in the populations they examined to be *Oedemeridae* spp. (False Blister Beetles, or Pollen-feeding Beetles) and *Lymexylidae* spp. (Timberworm Beetles), which also have British representatives. The former are more likely to be relevant as frequenters of flowers, with *Oedemera lurida* and *O. nobilis* commonly recorded in Kent (Laurence Clemons, pers.



⁷⁸ Pellegrino, G., Noce, M.E., Bellusci, F. & Musacchio, A. 2006. Reproductive Biology and Conservation Genetics of *Serapias vomeracea* (Orchidaceae). *Folia Geobotanica* 41: 21-32

⁷⁹ Dafni, A., Ivri, Y. & Brantjes, N.B.M. 1981. Pollination of *Serapias vomeracea* Briq. (Orchidaceae) by imitation of holes for sleeping solitary male bees (Hymenoptera). *Acta Bot. Neerl.* 30: 69-73.

⁸⁰ Pellegrino, G., Gargano, D., Noce, M.E. & Musacchio, A. 2005. Reproductive biology and pollinator limitation in a deceptive orchid, *Serapias vomeracea* (Orchidaceae). *Plant Species Biology* 20: 33-39.

comm.). So far as concerns the potential of this plant to develop into a colony, seed set is encouraging, but the species is also generally regarded as capable of spreading vegetatively by the production of one to four new tubers on long stolons in years with favourable climatic conditions; ordinarily, a plant may be found with two tubers, one giving rise to the current year's growth, the other being a remnant from the previous growth season.

Capsule. Photo by Daphne Mills, 8 July 2020



There are three other tongue-orchids which have been recorded in the British Isles in recent years: *Serapias parviflora* (Small-flowered Tongue-orchid), *S. lingua* (Tongue-orchid) and *S. cordigera* (Heart-flowered Tongue-orchid). They are separated from *S. vomeracea* by the latter having flowers with the outer part of the lip (epichile) narrower than the cup-shaped inner part (hypochile), so distinguishing from *S. cordigera*; by the hypochile having two parallel protuberances at its base, so distinguishing from *S. lingua*, which has only one; and by the epichile usually pointing vertically downwards and being at least twice the length of the hypochile (scarcely longer in *S. parviflora*). The *S. vomeracea* complex has received varied taxonomic treatments, but whether adopting splitters' or lumpers' views, the Kent plant has been confirmed as *S. vomeracea*, as distinct from any segregates which may have received different names.