

Kent Rare Plant Register

Draft species accounts

P (second part: Polygo to Pyr)



Kent rare plant register

This section of the register covers:

In Part Pa – Polyga

Parapholis incurva
Parentucellia viscosa
Pedicularis sylvatica
Persicaria minor
Peucedanum officinale
Phelipanche purpurea
Phleum arenarium
Pilosella peleteriana
Plantago media
Platanthera bifolia
Platanthera chlorantha
Poa bulbosa
Poa infirma
Polycarpon tetraphyllum
Polygala amarella
Polygala serpyllifolia

In Part Polygo – Pyr

Polygonum oxyspermum subsp. *raii*
Polygonum rurivagum
Polypodium cambricum
Polypogon monspeliensis
Potamogeton acutifolius
Potamogeton coloratus
Potamogeton friesii
Potamogeton obtusifolius
Potamogeton pusillus
Potentilla anglica
Potentilla argentea
Potentilla erecta
Prunus cerasus
Puccinellia fasciculata
Puccinellia rupestris
Pyrola rotundifolia
Pyrus pyraeaster

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, generally not specific sites with no 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 in white (the boundary between is a black line) and local authority boundaries by red lines. See the Kent webpage of the BSBI website at <http://www.bsbi.org.uk/kent.html> 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:

AC Andrew Cross
 ACH Andrew Henderson
 AL Alex Lockton
 ALw Alan Lewis
 BB Brian Banks
 BS Barry Stewart
 CD Chris Dyson
 CDP Chris Preston
 CEC Carter Ecological Consultants
 CN Chris Newbold
 CO Colin Osborne
 DC Danny Chesterman
 DG Doug Grant
 DK Dorothy Kenward
 EGP Eric Philp
 FB Fred Booth
 FR Francis Rose
 GK Geoffrey Kitchener
 GP G.Pell
 GS Geoff Smith
 HM H. Miller
 HW Hector Wilks
 IS Ian Sapsford

JA Jan Armitage
 JBev Jim Bevan
 JC James Cadbury
 JEL Ted Lousley
 JJ Janet John
 JM Joumana Mobarak
 JOM J.O. Mountford
 JP Joyce Pitt
 JR Julian Russell
 JRP John Palmer
 JS Judith Shorter
 JW Jo Weightman
 KF Kathy Friend
 LR Liam Rooney
 NC Neil Coombs
 NFS Nick Stewart
 OL Owen Leyshon
 PH Peter Heathcote
 PMH Peter Hollingsworth
 PR Pauline Rose
 PW Phil Williams
 RAC Ray Clarke
 RB Ros Bennett
 RJK R.J. Keymer

RM Richard Moyse
 RMB Rodney Burton
 RoF Rosemary FitzGerald
 RR Rosemary Roberts
 SA Sheila Anderson
 SB Sue Buckingham
 SK Sarah Kitchener
 SL Stephen Lemon
 SP Sue Poyser
 TI Tim Inskipp
 VE Vicky Elder
 WJM W.J. Morgan

Other abbreviations:

BM Natural History Museum
 herbarium
 BSBI Botanical Society for Britain &
 Ireland (and predecessor)
 KBRG Kent Botanical Recording Group
 KFC Kent Field Club
 NVC National Vegetation
 Classification

***Polygonum oxyspermum* C.A. Mey & Bunge subsp. *raii* D.A. Webb & Chater (Ray's Knotgrass)**

Draft account

vc15; probably gone from vc16

Rarity / scarcity status

Polygonum oxyspermum subsp. *raii* grows prostrate on the upper parts of sand, shingle or shell beaches around the coast of the British Isles. It is widely distributed, although less so in the east, and its threat status for conservation purposes is regarded as one of 'Least Concern', both in England and Great Britain as a whole. In Kent, it is **scarce**.

Account

Hanbury and Marshall (1899) give a first published record for Ray's Knotgrass as by Francis Bossey in 1839, in an excursion described in the *Proceedings of the Botanical Society of London* of that year, when it was claimed to have been seen on the ditch banks on the east border in the Plumstead military practice-ground. Hanbury and Marshall describe this as a most unlikely station and so it would have been. It is best discounted.¹ Otherwise, the oldest Kent record appears to be a specimen in Kew herbarium, gathered at Sandwich in January 1843.

Graveney Marshes beach. Photo by Liam Rooney,
28 August 2015



The species was regarded by Hanbury and Marshall (1899) as very rare on sandy or shingly beaches, and had been seen at Grain Spit, at Whitstable and on a sandy reach of land at the Sandwich end of Pegwell Bay, as well as by Marshall himself, in 1894, on the beach west of Sandgate. These sightings did not include Sheppey, which has suitable beaches, and it was recorded there, at the Isle of Harty, in 1938 by Lady Davy, and at Leysdown in 1955 by Donald Young. The north Kent and Sandwich locations continued to provide records for Philp (1982), whose 1971-80 survey noted the species in seven tetrads: at Grain, Sheppey, the north coast west of Seasalter as well as Sandwich Bay.

Philp (2010) would appear to indicate that, at least in relation to the period 1991-2005, Ray's Knotgrass had declined. It was specifically searched for at all suitable localities, but only found in three tetrads: on Sheppey (Leysdown-on-Sea and Warden Bay) and at Whitstable. It is, however, a come-and-go plant, annual or sometimes perennial, and our records for 2010-18 cover nine tetrads (13 monads), so it has either recovered or has been more fully recorded. Most records are on Sheppey or the related mainland, from Cleve Marshes eastwards through Whitstable (Tankerton) to Herne Bay. It is still some while since it has been seen at Grain

¹ There is a reference in the *Proceedings* to this '*Polygonum maritimum* of Ray' having been discussed at an earlier meeting, and an alternative version of the *Proceedings*, published in the *Annals of Natural History* (vol. 2, 1839) refers to Daniel Cooper having provided at an earlier meeting a paper of 'Observations on a variety of *Polygonum aviculare*, called *P. marimum* of Hudson, etc. occurring abundantly in the margin of salt-water ditches in Kent and Essex'. This reinforces the inappropriateness of the habitat for *P. oxyspermum*, and no doubt it was a form of *P. aviculare* which was involved.

(where suitability may have been affected by coastal defence works) and Sandwich (which should still be suitable). There are gains at Dungeness and an atypical record for Folkestone (a casual on shingle away from the strandline).

Overall, the species appears to be doing as well in Kent as it has ever done, if not better. There may be a parallel here with *Calystegia soldanella* (Sea Bindweed), *Eryngium maritimum* (Sea-holly) and *Glaucium flavum* (Yellow Horned-poppy): all shingle plants showing an increase in Kent records.

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Graveney Marshes beach. Photo by Liam Rooney,
28 August 2015



However, strandline plants are notoriously erratic in their occurrence, and it has been said (Akeroyd, 2014²) that it is unlikely that Ray's Knotgrass has appeared every year for any length of time on any one beach. Its appearances may depend on winter storm surges turning over beaches; it grows out of reach of ordinary tides. Some local spread may occur without this: a small plant found at Dungeness in August 2012 had, a year later, either grown through the shingle or had seeded a number of smaller plants around it. This last localised effect does not suggest the impact of storm surges, whereas the occasional occurrence as a singleton could. Some occurrences are of substantial colonies: over 100 plants at Herne Bay in 2013; 50-60 at Leysdown-on-Sea in 2010; 16 at Tankerton in 2010. We have no record of plant associates in Kent, although sometimes Ray's Knotgrass is sufficiently isolated that it appears misleading to refer to associates. Akeroyd (1994)³ gives *Atriplex glabriuscula* (Babington's Orache), *Atriplex laciniata* (Frosted Orache), *Cakile maritima* (Sea Rocket) and *Salsola kali* (Prickly Saltwort), any of which one might expect to see in the same habitat in Kent, and there are recent records for all these in locations where Ray's Knotgrass has also been seen, although proximity is not mentioned.

² Akeroyd, J.R. (2014). *Docks and Knotweeds of Britain and Ireland*. Botanical Society of Britain and Ireland, London.

³ Akeroyd, J.R. (1994). *Polygonum oxyspermum* C. Meyer & Bunge ex Ledeb. Ray's Knotgrass. In (eds. Stewart, A., Pearman, D.A. & Preston, C.D.) *Scarce Plants in Britain*, JNCC, Peterborough.

Polygonum oxyspermum is distinguishable from the highly variable *Polygonum aviculare* (Knotgrass) by the glossy brown nuts being strongly exserted from the perianths; in *P. aviculare* they are non-projecting. Its



leaves are also glaucous and fleshier than those of *P. aviculare*. It is also as well to check that plants are not *Polygonum maritimum* (Sea Knotgrass), which occupies similar habitats, although it has not been seen nearer to Kent than Brighton. The latter species does not have its nuts so far exserted, and has longer ochreae with 8-12 veins (4-6 with *P. oxyspermum*).

Tankerton. Photo by Sue
Buckingham, 18 August 2010.

Site	Grid reference	Site status	Last record date	Recorder	Comments
Leysdown-on-Sea	TR0370		13 August 2018	KBRG meeting	TR 03114 70997, shell-sand beach, near cross-beach barrier.
Lydd Ranges	TR0417		(1) 12 August 2013 (2) 10 August 2012	(1) OL (2) OL (conf. TI)	(1) The small plant discovered in 2012 appeared to have grown or smaller plants had sprouted up around it. (2) TR 04449 17060, c. 100 m east of Galloways. Found following advice from a survey team for Environment.
Cleve Marshes	TR0464		18 August 2010	JA, LR	20 plants at TR 04220 64840.
Leysdown-on-Sea, Muswell Manor	TR0469		(1) 14 October 2010 (2) 1991-99	(1) SB (2) EGP	(1) TR 04314 69931, sand & shingle beach - 50 to 60 plants. (2) Recorded as TR06P, may be same location.
Cleve Marshes (east)	TR0564		12 July 2010	GK	TR 05372 64867, sandy shore.
Graveney Marshes	TR0664		(1) 9 August 2016 (2) 28 August 2015	(1) CO (2) LR	(1) One plant on top of shell beach near base of seawall at c. TR 0635 6485. (2) One plant on the shingle at TR 06364 64844.
Seasalter beach	TR0665		6 September 2016	DC	TR 068 650, four plants near yacht club, with ordinary <i>P. aviculare</i> .
Seasalter (west)	TR 0765		8 September 2016	AL, CO & LR	
Seasalter (west)	TR0865		29 July 2017	AL	TR 0817 6508, a few plants by the slipway; recorded at species level.
Seasalter	TR0965		(1) 31 August 2017 (2) 9 October 2010	(1) AL (2) LR	(1) TR 0983 6574; recorded at species level. (2) Shingle beach.
Tankerton	TR1267		(1) 10 September 2012 (2) 18 August 2010	(1) JB (2) SB	(1) several plants on shingle beach at TR 125 674. (2) TR 12208 67340, on the beach, 16 plants in 1 sq metre of shingle over sand.
Herne Bay	TR1768		(1) 18 June 2014 (2) 12 June 2014	(1) CO (2) GK	(1) Mainly east end of East beach but present as far as bandstand:

			(3) 13 September 2013 (4) 19 September 2012 (5) 30 July 2011	(3) CO (4) CO (5) JR	doing well with plenty of seed. (2) Plentiful on sandy beach between bandstand and slipway car park, mostly at each end, TR 175 684 and TR 176 684, TR 177 684. (3) Five plants just east of Exercise equipment; 100+ east of bandstand; present below bandstand; a few west of bandstand. (4) East of bandstand, common. (5) TR 176 684, perhaps on introduced sand. By inner slip way area, about 20 plants.
Folkestone	TR2335		27 December 2016	GK & SK	TR 2315 3575, two plants on site of demolished building, shingly ground just south of Marine Parade, both still in flower. 125m from beach across level ground, but this has all been developed ground for many years, although now mostly cleared.

***Polygonum rurivagum* Jord. ex Boreau (Cornfield Knotgrass)**

Draft account: East Kent records needed.

vc15 and 16

Rarity / scarcity status

An ancient introduced annual (archaeophyte) of arable fields and occasionally waste places, *Polygonum rurivagum* is widespread in England and Wales, much less so in Scotland, and its threat status for conservation purposes is regarded as of 'Least Concern', both in England and Great Britain as a whole. From Philp (2010) it would appear to be in drastic decline in Kent, so as to become **scarce**. This may be an unduly pessimistic assessment.

Account

The first documented occurrence of *Polygonum rurivagum* in Kent appears to be the citation by Hanbury and Marshall (1899) of a specimen from Deptford in the herbarium of Sir Joseph Banks (1743-1820). J.T. Boswell Syme (ed.), in vol. 8 of English Botany (1873), referred to it as a plant of cornfields 'Common in sandy and chalky districts in Kent'. *Polygonum rurivagum* was then commonly regarded as a form or variety of *Polygonum aviculare* (Knotgrass) and the records reported for the purposes of Hanbury and Marshall (including several made by F.J. Hanbury) relate to Eltham, Bromley, Grain, Cuxton/Halling, Lane End, Sheerness, Minster, Upchurch, Hatch Green, Canterbury, Fordwich, Sturry/Stodmarsh, Leybourne and Yalding. This distribution clearly excludes southern parts of the county, including the Weald and Romney Marsh, where arable was less frequent. In view of later developments, it is perhaps surprising that there was no record on the chalk at the eastern end of the county, but there is an 1878 specimen in the National Museum of Wales collected by Charles Bailey at Shakespeare' Cliff, Dover.

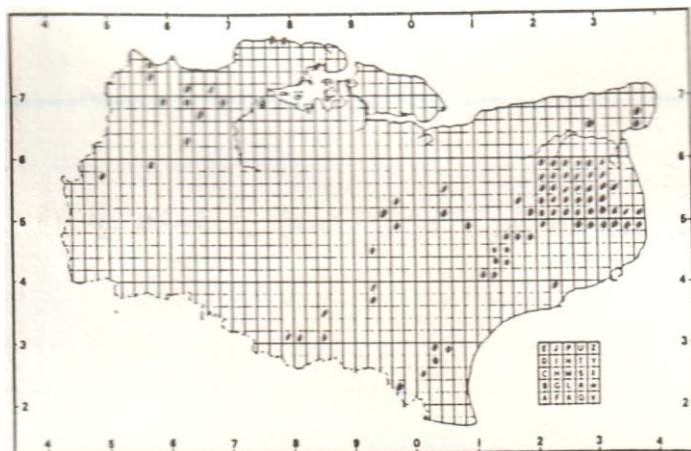


Ranscombe. Photo by Richard Moyse, 11 August 2015

In spite of Syme's reference to it as common, *Polygonum rurivagum* seems to have become sufficiently infrequent, or infrequently recorded, that Francis Rose thought it worth mentioning as one of his more interesting records, when he found it in 1958 on a cornfield on chalk at Pilgrims House, Trottiscliffe⁴. It is all the more surprising that Philp (1982) for the period 1971-80 gives 90 tetrads, although with the explanation 'Rather local but easily overlooked'. It is not possible from Philp (1982) to ascertain in what respects the species was local, as a map is not given, but the relevant map is given in the late Eric Philp's file cards and is reproduced here. Particularly striking is the number of records in and around TR25 (south east of Canterbury and inland of Deal/Sandwich). This area is also significant for a concentration of records shown in the first

⁴ Rose, F. (1960). Botanical records for Kent, 1955-58 – vascular plants. *The Transactions of the Kent Field Club* 1: 56-65.

national mapping of the species, in the *Critical Supplement to the Atlas of the British Flora* (1968); these were verified by B.T. Styles, the expert, who wrote up the taxonomy of *Polygonum rurivagum* and its allies in 1962⁵.



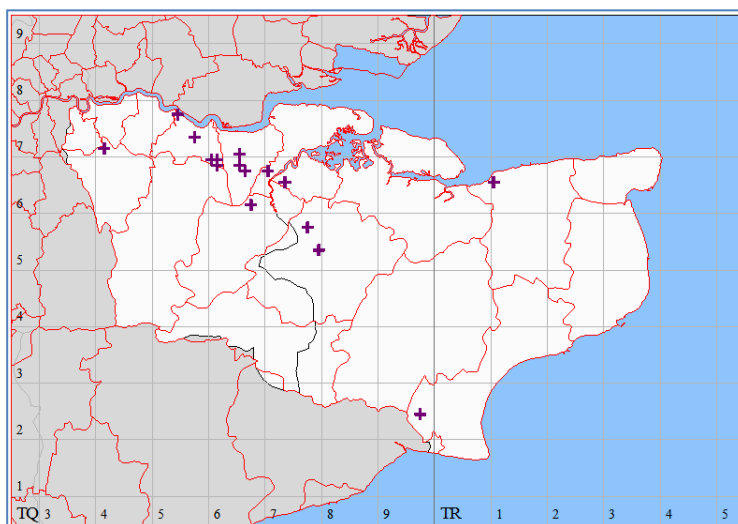
Polygonum rurivagum records 1971-1980

In contrast, Philp (2010) for the period 1991-2005 records only five tetrads for 'Plants fitting the description' (which suggests a degree of wariness about recording): namely, at Knockholt, Istead Rise, near Chilham, Waltham and Stodmarsh. So this is the second time round the cycle of the plant being regarded as not uncommon, and then being virtually unrecorded. That, however, is not the last word; and our most recent

records add to the complexity of interpreting trends in this species' distribution. It will be seen from the accompanying map of 2010-18 records that we have 16 monad records during that period (these relate to 15 tetrads). It is though we have something of the spread of the 1971-80 records in north west Kent, but lack completely the earlier spread of records in east and south east Kent.

Polygonum rurivagum records 2010-18

While *Polygonum rurivagum* may have shared something of the decline affecting arable weeds generally with changed farming methods and the use of herbicides, this does not seem an adequate explanation for the ups and downs of its frequency. It looks as if this is a taxon which has both presented difficulties in recording and is one which few recorders develop a knack of spotting. As for the ability to pick it out from *Polygonum aviculare* (Knotgrass), the BSBI database carries 15 or 16 scattered East Kent records in the mid-1960s by Barbara Nash; and there are 13 records for 2016-18, mostly from West Kent, by David Steere. No-one else is credited with more than three and there is no reason to suppose that the records are other than correct. This is a wider phenomenon than for Kent: Akeroyd (1994)⁶ remarks 'Few recorders report it, but those that do seem to find it repeatedly'.



The difficulties of identification relate to its separation from the rest of the *Polygonum aviculare* complex, which has been divided into different species at various times⁷, but its main constituent in Britain is currently *Polygonum aviculare*, which is very variable. *Polygonum rurivagum* is normally separated by:

- its (generally) more upright habit;

⁵ Styles, B.T. (1962). The taxonomy of *Polygonum aviculare* and its allies in Britain. *Watsonia* 5: 177-214.

⁶ Akeroyd, J.R. (1994). *Polygonum rurivagum* Jordan ex Boreau Cornfield knotgrass. In (eds.) Stewart, A., Pearman, D.A. & Preston, C.D., *Scarce Plants in Britain*, JNCC, Peterborough.

⁷ Indeed, the 4th edition of Clive Stace's *New Flora of the British Isles* (2019) says 'Possibly best amalgamated with *P. aviculare*'.

- its (usually) reddish flowers, as distinct from pink or white (normal with *P. aviculare*, but uncommon with *P. rurivagum*);
- its well divided tepals, whose edges do not overlap;
- its mature nuts projecting from the perianths, whereas those of *P. aviculare* rarely do so slightly and then not consistently); and
- its narrow stem leaves (N.B. there are two types of leaves and these are shed during the season; British Floras place a limit of 4mm on the width, but in Scandinavia up to 4.8 (-8.0)mm seems possible: more important is perhaps the relationship between leaf length and width –more than five times as long in *P. rurivagum*; less than five times in *P. aviculare*).

The qualifications given above as regards what is usual may reduce confidence in identification, and reduce the number of records made. Also, some aspects of descriptions are not easy to apply.⁸ The easiest approach with this species is to look out for conspicuously red-flowered knotgrass plants, and then see how other characters stack up.

Ranscombe, habitat. Photo by Richard Moyse,
11 August 2015

While recent Kent records still include arable margin or fallow field sightings, Cornfield Knotgrass has also been seen in ruderal and roadside habitats. Nearly all recent records have been between late July and November, reflecting its late flowering and fruiting, which assists post-harvest seed dispersal. The quantity of these records is such that the species no longer fulfils the scarcity criteria for inclusion in the rare plant register, but it is being retained in order to encourage a better understanding of its presence, in particular as regards the 'missing' East Kent distribution.



⁸ Akeroyd (2014), in *Docks and Knotweeds of Britain and Ireland*. Botanical Society of Britain and Ireland, London, says that *P. rurivagum* may be distinguished from *P. aviculare* by the large nuts - and then gives measurements in which the range of *P. aviculare* is larger instead.

Polypodium cambricum L. (Southern Polypody)

Draft account

vc15 and 16

Rarity / scarcity status

Polypodium cambricum is a fern of base-rich rocks or mortared walls with a western distribution in the British Isles, but also extending along the south coast, diminishing eastwards. This distribution is sufficiently stable that the risk status of the species is one of 'Least Concern' in both England and Great Britain as a whole. It has, however, always been rare in Kent and, with no records in Philp (2010), it was initially placed on the county- 'probably extinct' list. Despite the lack of record, colonies had continued to exist in both East and West Kent, so that at the end of 2015 Southern Polypody was removed from the 'probably extinct' list and included in the Kent rare plant register; but the species remains **rare** in the county.

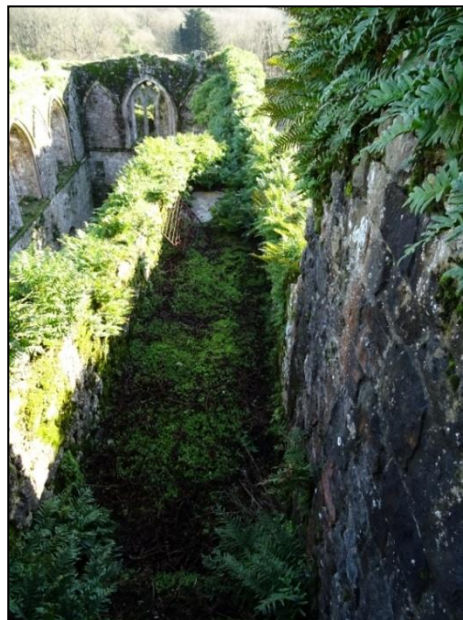
Account

Early records are perhaps obscured by the accepted treatment of this species generally as falling within *Polypodium vulgare*, until it was recognised that three subspecies (one of which, subsp. *serratum* or *serrulatum*, corresponds to the current concept of *P. cambricum*) differed cytologically as well as morphologically, and they were raised in 1961 to specific status. The three species were *P. vulgare* s.s. (Polypody), a tetraploid; *P. interjectum* (Intermediate Polypody), a hexaploid; and Southern Polypody, a diploid, then called *P. australe* Fée. This last name was superseded by *P. cambricum* when it was accepted that this Linnaean name had priority, even though originally applied to an unusual form of the species.

Hanbury and Marshall (1899) refer to a specimen of *P. vulgare serratum* at **BM** as having derived from Saltwood Castle, collected by S.F. Gray, so this will have been a gathering of *P. cambricum*. Earlier information, however, is given in Thomas Moore's *Nature-printed British Ferns* (1859). Under the general heading of *P. vulgare*, two varieties are mentioned as



found at Saltwood Castle by S.F. Gray, var. *semilacerum*, with its deeply serrate pinnae in the lower part of the frond and var. *crenatum*, described as approaching the previous form, but variable with rounded-lobed (rather than serrate), undulate pinnae. These appear to be part of the range of variation encountered with *P. cambricum*.



Saltwood Castle. Photos by Julian Reed, 28 January 2016.

Thereafter, the presence of the species at Saltwood Castle does not seem to have attracted attention, although the buildings have been much photographed and it is evident that ferns are growing along the ruined

walls in great quantity. A determination of *P. cambricum* was made by Julian Reed on 28 January 2016, when he found it so fully established as to be consistent with presence for many decades, if not for centuries. He also found considerable variation in frond shape, some of this consistent with the 19th century record of var. *semilaceratum* (now treated as *Semilacerum* group). Most of the inner walls of the ruined parts of the castle then appeared covered with *P. cambricum*, and the outer walls and gatehouse.



In addition to this East Kent site, there is also one West Kent location for Southern Polypody. This was recorded by W.J. Morgan in 1975 and/or 1976, giving a grid reference (which may not have been wholly accurate) of TQ 528 442, and identity was confirmed by Clive Jermy and Jim Crabbe. It was not re-found in the survey published as Philp (2010), but it appears possible that this may have been due to the inaccessibility of the colonies here. Stephen Lemon in 2015 found some shed fronds below some *Polypodium* plants high up on the north east facing perimeter wall of Penshurst Place garden, of which he had been aware for a couple of years, growing spread between TQ 5290 4410 and around TQ 5293 4405. These enabled confirmation of identity. The population comprised seven separated colonies spread along the brick wall, the smallest an outlier consisting of just one plant and the largest consisting of at least 10 plants. The most luxuriant were growing in the shelter of vine leaves. The overhang of the brick batter capping the wall provides the main rooting zone.

Penshurst Place. Photos by Stephen Lemon, 3 September 2015.

The Penshurst Place location appears less mild in climate than might be expected for this species in south east England, although *P. cambricum* cultivars are readily cultivated in West Kent, including within the national collection of *Polypodium*. The listed building description treats the wall as 18th century. Lime mortar will have afforded the base-rich substrate which the species prefers.



P. cambricum may be distinguished from the similar species *P. vulgare* and *P. interjectum* in that its fronds are proportionately wider (generally not more than twice as long as wide). Technical confirmation, however, requires microscopical examination of the sporangia, amongst which branched hair-structures called paraphyses should be present. There are also differences in the sporangia themselves: they have a dark brown annulus (red-brown in *P. vulgare*, pale in *P. interjectum*) with (4-)5-10 indurated cells and 3-4 basal cells, as compared with (7-)10-14(-17) indurated and 1 basal in *P. vulgare* and (4-)7-9(-13) indurated and 2-3 basal in *P. interjectum*.

The main risks for Southern Polypody are the 'tidying up' of the walls on which it grows.

***Polypogon monspeliensis* (L.) Desf. (Annual Beard-grass)**

Draft account: habitat photo needed

vc15 and 16

Rarity / scarcity status

Annual Beard-grass is a plant of brackish places near the sea or estuaries, mostly in the southern part of the British Isles, with concentrations around the Thames estuary and the Solent. It is classed as **nationally scarce**, although its threat status for conservation purposes is assessed as of 'Least Concern'. In Kent, it is neither rare nor scarce, and there is some evidence of recent spread.

Sheppey. Photo by Liam Rooney, 5 July 2012

Account

The first published county record appears to be Thomas Johnson's record, in his *Descriptio Itineris* (1632), of '*Alopecurus maxima Anglica paludosa* Lob.' which was accepted by Hanbury and Marshall (1899) as likely to be *Polypogon monspeliensis*. Francis Rose, in the 1972 edition of that work, agreed, placing Johnson's locality as probably along the Swale estuary, or near Strood, or in Milton Creek.⁹ Johnson, from his edition of Gerard's *Herball* (1633) also knew the plant elsewhere in Kent, as a 'Fox-taile...which grows naturally in many watry salt places of this kingdome, as in Kent by Dartford....The stalkes of this plant are grassy, and some two foot high...The eare is very large, being commonly four or five inches long, downy, soft like silk, & of a brownish colour'. Hanbury and Marshall (1899) regarded the species as a rare and very local native of sub-maritime marshes and ditches; their records were near the north coast of the county, and also at 'Sandwich Flats, on the margin of the ditches inside the River-wall' (a classic type of habitat).

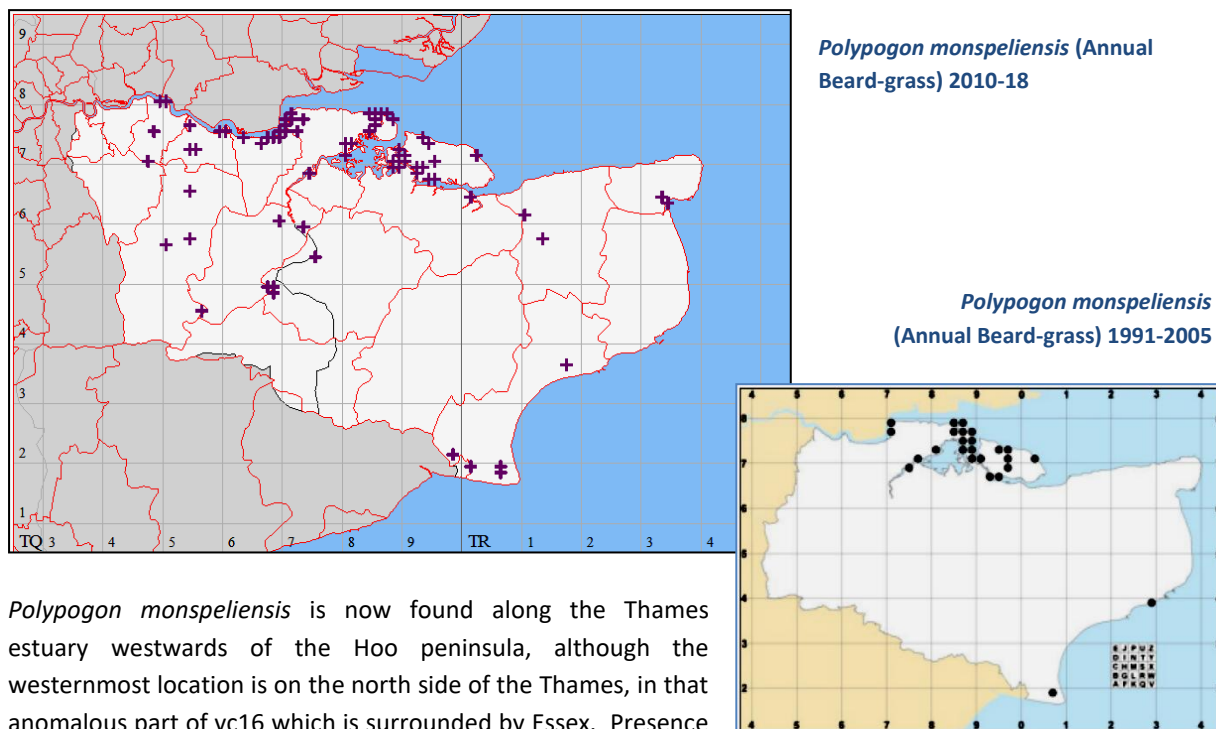


Francis Rose knew of it as a grass of brackish marshes and alluvial dikes, usually on mud drying out in late summer, where it was very rare, but locally plentiful. The main records for the 1940s to 1960s were on the Hoo peninsula and on Sheppey. There were also sightings of Annual Beard-grass as a casual at Sandwich, Comp and Wrotham, where introduced by the use of wool shoddy as an agricultural fertiliser.

These inland occurrences had more or less died out by the time of the 1971-1980 survey covered by Philp (1982). While this noted occasional introductions inland, the records (17 tetrads) were still concentrated on Hoo/Grain, where found in damp meadows, brackish marshes and ground disturbed by cattle or vehicles. The 17 tetrads of 1971-90 became 25 tetrads in 1990-2005 (Philp, 2010) although the focus remained around Hoo and Sheppey, so the increase could have been explicable by the intensity of recording. However, more recent

⁹ Rose also speculated as to whether the same species was intended by Johnson's Sheppey record, in his *Iter Plantarum* (1629), referring to 'Gra. Tomentosum & acerosum *Calamagrostis quorundum* Lob.'. This had been interpreted by Hanbury and Marshall (1899) as *Calamagrostis epigejos* (Wood Small-reed), but Rose suggested that *Polypogon monspeliensis*, which grows in Sheppey, was just as likely. It seems odd to suppose that Johnson would give such different names to the same species (and Rose accepted the name as applying to *Calamagrostis epigejos* in *Descriptio Iter!*); but Johnson clearly had in mind what was illustrated by Lobelius' *Plantarum seu stirpium icones* (1576), where a tall plant looking more like *C. epigejos* than *P. monspeliensis* is shown.

records (2010-18) give 54 tetrads (equivalent to 73 monads) and it is clear that there has been a significant extension of recorded range. Because of this level of frequency in Kent, the distributional data maintained in this register will be at 1km square (monad) level. 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). The apparent increase in occurrences runs counter to the national position, where some decline is thought to have taken place with conversion of arable to grazing marshes and the drainage or infilling of backish pools.



Polypogon monspeliensis is now found along the Thames estuary westwards of the Hoo peninsula, although the westernmost location is on the north side of the Thames, in that anomalous part of vc16 which is surrounded by Essex. Presence at Dungeness has also strengthened, but what is particularly noticeable is the number of inland records. These fall into a number of categories:

- There is possible evidence of introduction through sown roadside grass and proprietary compost.
- Urban street occurrences may be derivative from bird seed, but there is the possibility of transmission on vehicle tyres, as with other saltmarsh grasses. However, it is not seen in quantity along main road verges affected by highway de-icing salt, as are *Puccinellia distans* (Reflexed Saltmarsh-grass) and *Parapholis strigosa* (Hard-grass), although it was found in 2018 below the A21 overbridges at Haysden, where salt run-off had brought a number of halophytes onto the semi-bare gravel below.
- There are occurrences related to present or former sand or gravel quarries, at Chipstead Lakes (now a sailing lake); Sevenoaks Quarry (still operational); Darenth Road Quarry, Dartford (used for materials supply); Hale Street (sand quarrying activities apparently being wound down, but records here over three monads). It is possible that, where such a location is being used for reception / storage / transmission of materials, *Polypogon monspeliensis* may have come in with the movement of vehicles and materials from an estuarial site such as Cliffe, where off-loaded by the Thames (where the grass has been recorded). Where this origin seems unlikely, seed transmission is probably by birds, especially where the habitat includes a waterbody with shallow margins.

Kent coastal or estuarial sites are also often on sandy gravel, but also on London Clay, generally close to pools, ditches, dikes and the hopes or fleets which represent original water channels from reclaimed saltings. The grass grows where cattle have trampled the ground, keeping it open for seedling germination and

establishment. Gray (1994)¹⁰ refers to associates in such habitats as including *Agrostis stolonifera* (Creeping Bent), *Tripolium pannonicum* (Sea Aster), *Bolboschoenus maritimus* (Sea Club-rush), *Juncus gerardii* (Saltmarsh Rush), *Ranunculus sceleratus* (Celery-leaved Buttercup) and *Salicornia* species (Glassworts). These species are very much what we would expect to find in Kent sites; *Hordeum marinum* (Sea Barley) also has similar habitat requirements for saline disturbed ground and we have noted it growing with *Polypogon monspeliensis*.



Cope & Gray (2009)¹¹ state that seeds seem to survive for many years in the soil-bank, as disturbance of former sites by activities such as ditch clearance or the construction of new sea walls takes place. Where the disturbance is of an extensive character, the resultant colonisation and seed production can be enormous: a six acre cleared site at London Medway Commercial Park, Hoo, in 2018 held millions of plants, ranging from large to minute.

Sheppey. Photo by Lliam Rooney, 5 July 2012

With its dense, long-awned panicles, *Polypogon monspeliensis* is unlikely to be confused with other grasses. While *Lagurus ovatus* (Hare's-tail) might be supposed to bear a passing similarity, Hare's-tail's soft, near-globose white panicles are distinct from the greenish-white panicles of *Polypogon monspeliensis* which go brown and disarticulate with age. The latter does, however, hybridise with *Agrostis stolonifera* (Creeping Bent) to produce X *Agropogon lutosus*, whose panicle is somewhat branched (as in the *Agrostis* parent) and lemmas awned (not usually so, in the *Agrostis* parent) but whose spikelets do not

disarticulate with age (as distinct from the *Polypogon* parent). This hybrid has been known in Kent at least since 1803 (when the specimen figured in Smith's English Botany as *Agrostis littoralis* was gathered at Woolwich) and has been found 11 times during the period 2010-18, on Sheppey, Chetney Marshes and the Hoo peninsula.

¹⁰ Gray, A.L. (1994). *Polypogon monspeliensis* (L.) Desf. Annual beard-grass. In (eds.) Stewart, A., Pearman, D.A. & Preston, C.D., *Scarce Plants in Britain*, JNCC, Peterborough.

¹¹ Cope, T. & Gray, A.L. (2009). *Grasses of the British Isles*. Botanical Society of the British Isles, London.

Potamogeton acutifolius Link (Sharp-leaved Pondweed)

Draft account

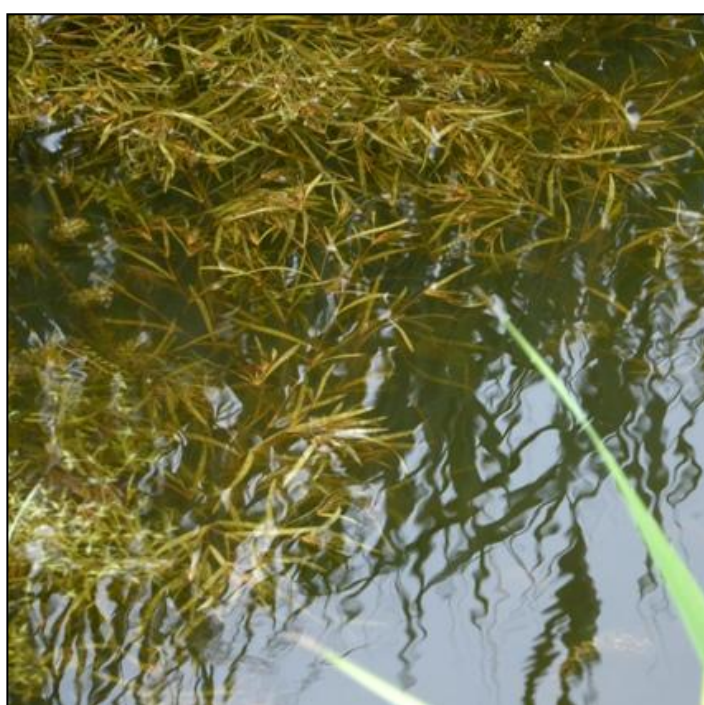
vc15; long extinct in vc16

Rarity / scarcity status

Potamogeton acutifolius is a very local pondweed, found scattered from Dorset to Norfolk, generally in clear ditches of moderately calcareous water, but seemingly in general decline. It is regarded as **Critically Endangered** in Great Britain, **Endangered** in England with less than 2,500 plants left, and is nationally **rare**. It is a priority species for the UK's Biodiversity Action Plan, whose actions include maintaining traditionally managed grazing marsh systems in stronghold areas and monitoring for the prevention of eutrophication. In Kent, it is **rare**.

Account

The first record for Kent also appears to be the first for the British Isles. It is a specimen in the Natural History Museum determined by Dandy and Taylor from the herbarium of Adam Buddle (1662-1715) and collected at Deptford by Christopher Merrett, who died in 1695. Otherwise, there appear to be no early records other than the two cited in Hanbury and Marshall (1899): one from 'Withamdrewe' (presumably Wickhambreaux) by George Dowker; and the other by Marshall himself from ditches between Appledore railway station and the village (1893). Hanbury and Marshall described its Kent status as very rare, in ditches and pools.



Stodmarsh. Photo by Alex Lockton, 10 July 2018

The Wickhambreaux area has remained suitable at least until the 1980s: Trudy Side found it in a fen dike at Preston Marshes in 1962, where it was confirmed by Francis Rose, and there is a subsequent record here, at Newnham Valley, in 1983. The marshes are an SSSI within the Lower Stour catchment, cited as a fen vegetation community with a combination of peaty soils and calcareous waters in the dikes providing a home for *Potamogeton acutifolius*. However, most sightings have not been in the Little Stour catchment, but relate to the nearby Stodmarsh NNR in the parallel Great Stour catchment, separated by a finger of high ground as both Stour rivers wend their way towards their confluence at Plucks Gutter. These sightings began with an unconfirmed report from a dike at Grove Ferry in 1950 (TR 240 264), and have continued to the present (2016). Many are by Alex Lockton, who considers the species to be not uncommon in the eastern half of the NNR, near to Grove Ferry, given that the present record set does not yet amount to a thorough survey.

Both the Preston/Newnham valleys and the Stodmarsh valley are low-lying (parts being at 2m above sea level) and represent former estuary from when the Stour rivers discharged into the Wantsum Channel, which divided the Isle of Thanet from mainland Kent. The Channel gradually silted up, particularly during the 12th and 13th

centuries, and the estuarial lands were embanked and drained: the last boat to use the (by then, narrow) Channel did so in 1672. Alex Lockton points out¹² that

the relevant 'fields of grassland are agriculturally unimproved and, as they have apparently never been ploughed or reseeded, they preserve some elements of the vegetation that arose when they were first drained and grazed. What is perhaps surprising is that this vegetation is characteristic of coastal grazing marshes, and has similarities with that in places like Graveney and Minster Marshes. These marshes are derived from earlier saltmarshes which were drained and isolated from the sea many years ago... a rare and invaluable remnant of an ancient, saline coastal grazing marsh of a quality possibly not equalled elsewhere in Britain'.



Stodmarsh, in flower. Photo by Alex Lockton, 11 June 2014

The Appledore area yielded specimens in 1935 and 1938 and a Kent Field Club meeting in 2015 was successful in finding it growing in a ditch here near the Royal Military Canal. However, the pondweed, infrequent though it is, has been found more widely in Romney Marsh, and its extent of occurrence should be regarded as continuing north eastwards to ditches at the Dowels, a low-lying peaty area (parts being at 1m above sea level) with much sheep pasture, not drained effectively until the 19th century and carrying a dense network of freshwater channels. The soils through which the *Potamogeton* ditches run appear to

be those of the Dowels and Appledore series: thick acid peat overlain by loam and silty clay, originally calcareous but now slightly or deeply decalcified. As with Romney Marsh generally, it is reclaimed land (below the old sea cliffs which ring the lowlands from Appledore to Hythe), and in early Saxon times was probably saltmarsh.

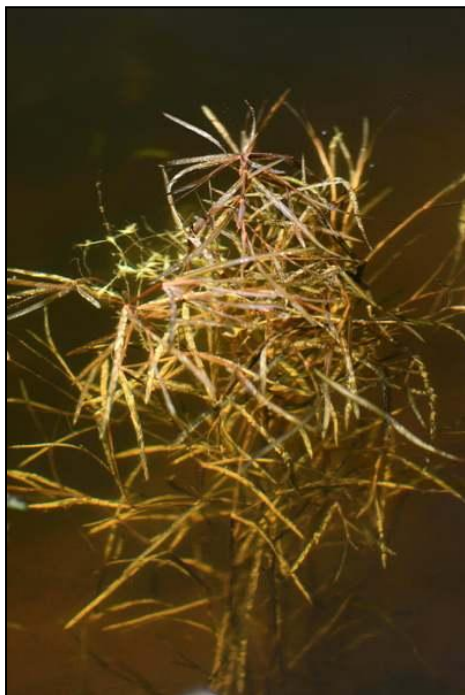
The Dowels, habitat. Photo by Geoffrey Kitchener, 27 June 2012

There are, however, two further related locations for *Potamogeton acutifolius*, apparently unrecognised until the 1980s. Both are on the 'Upper Levels', reclaimed marshland criss-crossed by drainage channels associated with Romney Marsh, but further inland. One is at Smallhythe, which was a port when the River Rother flowed north of the Isle of Oxney, as a result of a diversion operative between c.1300 and the 1630s which led to the permanent inundation of the Upper Levels, including the area of what is



¹² Lockton, A. (2017). The Flora of Stodmarsh National Nature Reserve, <https://bsbi.org/kent>

now grazing marsh near Smallhythe bridge with its drainage channels where *Potamogeton acutifolius* has been recorded 1982-2008. The drainage system of the Rother Levels at this point probably reflects reclamation in the 17th and early 18th centuries. The second site is on that part of the Upper Levels which extends alongside the Newmill Channel running northwards from the Maytham area towards Tenterden. It also formed part of the 'drowned lands' of the Upper Levels in the early 17th century, probably with a similar history of reclamation. The soils here are alluvial, sandy loam/silt over peat.



The Dowels. Photo by Liam, Roomey, 27 June 2012

Thus, the two Upper Levels sites, the Appledore/the Dowels sites, the locations at Stodmarsh and at Preston/Wickhambreaux all share origins of having been reclaimed from coastal or estuarial saltmarsh, or land otherwise flooded and subject to tidal influence. The drainage operations have left all with ditch systems, in parts of which *Potamogeton acutifolius* grows. While it is said¹³ that the species grows in calcareous, mesotrophic or meso-eutrophic waters, only the north east Kent sites have a materially calcareous component to their drainage, although pH was measured at Stodmarsh at 7.5, viz. meso-eutrophic, slightly basic (Newbold, 2003).¹⁴ Whether the presence of peat within the soil horizons of the lands through which the ditches run or salt content from previously brackish conditions are relevant factors appears unknown, but Newbold (2003) found conductivity of 700 microsiemens per cm in water sampled at Stodmarsh, which indicates a level of brackishness, and he suggested that the

species may have adapted to two levels of conductivity in the British Isles, of which this is within the higher level. Conductivity readings were also taken by English Nature in 1996 in the survey mentioned below, and were consistent with good freshwater.

It is regarded as most characteristically a species of shallow, species-rich drainage ditches on grazing marshes¹⁵. So far as Kent records are concerned, the fullest evidence of species-richness comes from an English Nature general survey in 1996 which sought to establish the botanical interest of the Stodmarsh NNR, especially in comparing 79ha of land, formerly used as turf fields and newly acquired by English Nature, with the remainder of the NNR. The survey covered 169 ditches and found *Potamogeton acutifolius* in six of them. Ditch species-richness was assumed to be good at 10-14 species, exceptional at 15 or more. The *Potamogeton* ditches scored 14, 13, 17, 17, 15 and 16, an average of 15.3 species and so, exceptional. The plants found at those ditches included rare plant register species *Hydrocharis morsus-ranae* (Frogbit), *Myriophyllum verticillatum* (Whorled Water-milfoil) and *Oenanthe fistulosa* (Tubular Water-dropwort)

We also have a species listing for a 2003 Stodmarsh record, which included *Ceratophyllum demersum* (Rigid Hornwort), *Hydrocharis morsus-ranae* (Frogbit), *Lemna minor* (Common Duckweed), *Potamogeton pusillus* (Lesser Pondweed), and *Utricularia vulgaris* (Greater Bladderwort). Newbold (2003) points out that some associates, such as *Lemna trisulca* (Ivy-leaved Duckweed), *Hydrocharis morsus-ranae* and *Spirodela polyrrhiza*

¹³ Preston, C.D. (1999). *Potamogeton acutifolius* Link (Potamogetonaceae). In Wiggington, M.J. (ed.) *British Red Data Books 1 Vascular plants*. Joint Nature Conservation Committee, Peterborough.

¹⁴ Newbold, C. (2003). The ecology and status of *Potamogeton acutifolius*, Link. [sic] (Sharp-leaved pondweed) in 2003. With reference to the BSBI records for the period 1970 to 1999. *Report to English Nature*.

¹⁵ Preston, C.D. (1995). *Pondweeds of Great Britain and Ireland*. Botanical Society of the British Isles, London.

(Greater Duckweed) may, if they become too dominant, suppress *Potamogeton acutifolius*. The pondweed has been found in Kent where ditches have recently been cleared and in one case it had not been seen there in a survey before such clearance. Newbold (2003) suggests that there is intolerance of competition and it is most abundant around the third and fourth years after ditch management. It would be interesting to have known when management last took place in relation to the ditch recorded at Smallhythe in 1991, where *Potamogeton acutifolius* was the dominant species.

A consequence of this competition intolerance is that records may be discontinuous, even if there were regular surveying. A survey in 2003 (Newbold, 2003) investigating known Kent sites failed to find the plant at any of them (but found one new site, at Stodmarsh). At Stodmarsh, the possibilities for a site with 1974 and 1998 records were overgrown ditches, either with *Sparganium erectum* (Branched Bur-reed) or with *Hydrocharis morsus-ranae*. (However, it has since been found in other sites at Stodmarsh.) At the Newnham valley 1983 site, the ditch was found not to have been managed for 10 to 15 years and was overgrown with dominant *Sparganium erectum* growing into the channel, and with dominant *Phragmites australis* (Common Reed) along the outer edge; *Potamogeton natans* (Broad-leaved Pondweed) covered 99% of the water. At the Dowels 1982 site, an apparently suitable stretch of ditch produced no sightings; vegetation management appeared to have been carried out within perhaps three years, but the water level had recently been artificially raised by 0.5m. (Plants were found in the same ditch system in 2012.) At the Smallhythe 1982 site, vegetation appeared suitably diverse and left 75% of the water surface open, but there was shading along the relevant ditch by *Phragmites australis* and the water appeared iron ochre stained¹⁶. At the nearby Smallhythe 1991 site, the ditch edge was 75% dominated by *Phragmites australis*, with consequent partial shading; for the remainder, *Glyceria maxima* (Reed Sweet-grass) was recorded. So the issues here may have been shading and, perhaps, water-staining again. (The pondweed has been seen at Smallhythe since, in 2008.)

Potamogeton acutifolius is a slender, fully submerged (except for flowers/fruit) pondweed with flattened zig-zag stems. The leaves are grass-like, 1.5–5mm wide (mostly over 2mm), dark green but often tinged reddish-brown, 3-veined (including an obvious mid-rib) with finer strands between them; the stipules are free from, and do not sheath, the leaf base. Identification is usually keyed out against *Potamogeton compressus* (Grass-wrack Pondweed), which is not a Kent plant and has 5-veined leaves.



Leaves showing tip and midrib with flanking veins, from The Dowels. Photo by Liam, Roomey, 28 June 2012

¹⁶ However, iron-stained water from the Lower Greensand appears to be no impediment to the growth of *Potamogeton acutifolius* at Amberley Wild Brooks (ed. Abraham, F. (2018), *Flora of Sussex*, Sussex Botanical Recording Society).

Site	Grid reference	Site status	Last record date	Recorder	Comments
Friezingham, Rolvenden Layne	TQ8630 & TQ8631		(1) 7 August 2003 (2) 25 August 1985	(1) (a) KF (b) KF, FB, NC (2) JP	(1) (a) TQ 8680 3139, watercourse, Friezingham dikes. (b) TQ 869 305; Crayfish Farm, Friezingham Dikes & Newmill Channel. (2) Near Newmill Channel [TQ 869 311 and TQ 869 305 given in different data sources, the former describing site as Tenterden Fish Farm dykes.]
Smallhythe	TQ8929		(1) 15 August 2008 (2) 2 August 2008 (3) 15 August 2000 (4) 1991 (5) 6 August 1982	(1) JW, JP (2) BB (3) EGP & PH (4) BB (5) JOM	(1) TQ 890 295, grazing marsh ditches. (2) In grazing marshes drainage ditch. (3) Recorded as TQ82Z, and assumed to be this monad. (4) TQ 894 298, dominant species in dike. (5) TQ 891 296, ditch south of B2082, SW of Smallhythe Bridge, Romney Marsh Ditch Plants Survey.
Appledore	TQ9630		(1) 16 July 2015	(1) KBRG meeting	(1) TQ 96723 30251, in good quantity in ditch.
Appledore (station)	TQ9829		(1) 1982	(1) EGP	(1) TQ 981 295, dike south of road, near Appledore Station [this gridref does not quite match the description].
The Dowels	TQ9730 & TQ9731		(1) 16 July 2015 (2) 30 September 2012 (3) 27 June 2012 (4) 13 May 2004 (5) c. 2002 (6) 2001 (7) 2 July 1982	(1)KBRG meeting (2) OL & BS (3) KBRG meeting (4) EGP (5) BB (6) BB (7) EGP	(1) TQ 97248 30498, in good quantity in ditch. (2) TQ 979 312. (3) In ditches at the Dowels, west of road, including at TQ 9792 3128 several plants in fairly open deepish water, <i>Stuckenia pectinata</i> (<i>Potamogeton. pectinatus</i>) also present, TQ 9781 3114, TQ 9778 3118. (4) Given as TQ93Q and assumed to be TQ9730 or TQ9731. (5) TQ 9774 3113, appeared in recently cleared ditch. (6) TQ 9771 3111, scattered plants in ditch. (7) TQ 978 312.
Stodmarsh NNR	TR2261		(1) 11 August 2016 (2) 1996	(1) AL, LR (2) PW, BB, VE	(1) TR 2234 6194 and TR 2226 6189, ditches. (2) TR 225 619 ditch 38.
Stodmarsh NNR	TR2262		1996	PW, BB, VE	TR 229 621 ditch 67; TR 226 620 ditch 44; TR 228 620 ditch 56; TR 229 620 ditch 65.
Preston Marshes	TR2360		7 June 1983	GP & RJK	TR 231 602, Newnham Valley, det. EGP.
Stodmarsh NNR	TR2361		August 2003	CN	TR 23104 61958, occasional in ditch 5m wide (so not overshadowed by emergent vegetation), 1.2m deep, perhaps 2 years after ditch management. Cattle-grazed marsh. Associated species: frequent growths of <i>Ceratophyllum demersum</i> , <i>Hydrocharis morsus-ranae</i> , <i>Lemna minor</i> , <i>Potamogeton pusillus</i> , <i>Utricularia vulgaris</i> . Margins diverse, with occasional <i>Alisma plantago-aquatica</i> , <i>Sparganium erectum</i> , <i>Rorippa</i>

					<i>amphibia</i> , <i>Myosotis scorpioides</i> , <i>Rumex hydrolapathum</i> .
Stodmarsh NNR	TR2362		(1) 9 July 2018 (2) 7 July 2018 (3) 31 August 2016 (4) 7 July 2016 (5) 31 July 2015 (6) 7 July 2015 (7) 11 June 2015 (8) 26 June 2014 (9) 30 May 2014 (10) 18 May 2014 (11) 1998 (12) 1996 (13) 3 July 1974	(1) AL (2) AL, RB (3) AL, JM (4) AL, JM (5) AL, JM (6) AL, JM (7) AL, JM (8) AL, JM (9) AL, JM (10) KFC meeting (11) PW (12) PW, BB, VE (13) EGP	(1) TR 2344 6291, abundant in a ditch by the path. (2) (a) TR 2340 6276, in the ditch in front of the dipping platform. (b) TR 2328 6291, ditch 114. (3) TR 2316 6244, ditch 90. (4)(a) TR 2324 6233, ditch 99. (b) TR 2343 6229, a few clumps in Harrison's Drove pond. (5) TR 2342 6227, ditch 117, in front of Harrison's Drove Hide. (6) TR 2326 6235, in a recently dredged ditch. (7) TR 2329 6221, a few plants in a recently dredged ditch. (8) TR 2343 6229, fruiting. (9) TR 2343 6229, occasional in lake in front of Harrison's Drove hide, with two other pondweed species, conf. CP. (10) Ditch at c. TR 234 623. (11) TR 230 620, recorded in a ditch where not previously recorded by 1996 survey following ditch clearance. (12) TR 231 623. (13) TR 230 620, det. Dandy & Taylor.
Stodmarsh NNR	TR26F		After 1970, before 1981	Philp (1982)	Most likely to be TR2261 or TR2361.
Stodmarsh NNR	TR26G		After 1970, before 1981	Philp (1982)	Most likely to be TR2262 or TR2362, linking up with the TQ26F record.

***Potamogeton coloratus* Hornem. (Fen Pondweed)**

Draft account

vc15

Rarity / scarcity status

Potamogeton coloratus is a pondweed of base-rich peaty waters, local throughout much of the British Isles and treated as **nationally scarce**, although its threat status in both England and Great Britain as a whole is assessed as of 'Least Concern'. In Kent, it is limited to a small area in the north east of the county and is **rare**.



Account

The first Kent record for Fen Pondweed is a specimen gathered by W.W. Saunders in 1837 from Ham Ponds, and held in **BM**. It was published by Charles Babington as an aside in his paper On the Botany of the Channel Islands (*Annals of Natural History*, 1838, **2**: 348-350), in which he mentioned 'Mr. W. Wilson Sanders [sic] informs me that he has gathered it in ditches at Ham Ponds, near Sandwich, Kent.'. Hanbury and Marshall (1899), who regarded the species as a very rare plant of peaty ditches and pools, could only otherwise cite specimens collected by Charles Dowker at Preston Court Marshes and Hothfield bogs (they did not mention that both of them, F.J. Hanbury and E.S. Marshall, had also collected from Ham Ponds). The claimed Hothfield record is improbable in view of the acidity of the bogs: Francis Rose thought it an error¹⁷, and Eric Philp omitted it from his listing of Hothfield plants¹⁸, recognising only *Potamogeton polygonifolius* (Bog Pondweed) there.

Worth Minnis. Photo by Liam Rooney, 5 July 2011

Ham Ponds have long ceased to be open water and the site is now Ham Fen KWT reserve, from which Francis Rose knew the pondweed 1949-60, although it could not be found in 1991 or 1996. There are further remnants of fen in this area, including at Hacklinge and Worth Minnis where calcareous waters flow through ditches on modified peaty ground. Francis Rose recorded the pondweed from fen ditches at Hacklinge from 1946, giving it as abundant in ditches, as also was *Hydrocharis morsus-ranae* (Frogbit) and *Elodea canadensis* (Canadian Waterweed); in addition he noted it from Worth Minnis 1946-60¹⁹. The total range of this species within what is a fairly local area amounts, since 1970, to eight monads and the difference between recording by way of sampling accessible areas and recording by intensive survey is shown by data from 1982 and 2003 surveys, which located the species in 9 and 29 ditches respectively.

¹⁷ In his MS Flora.

¹⁸ Philp, E.G. (1975). The Biology of the Reserve. *The Transactions of the Kent Field Club* (A Symposium on Hothfield Local Nature Reserve), **5**:108-121.

¹⁹ Rose, F. (1950). The East Kent Fens, *Journal of Ecology* **38**: 292-302.

The other historic location, Preston Court Marshes, is presumably the residual fens of the Newnham Valley through which runs the Little Stour, and *Potamogeton coloratus* was refound here in 1997. This appears to be about 2km downstream of Wingham Fen, north west of Wingham village, where Francis Rose knew it from 1945. He described Wingham Fen as having a small relic of old fen immediately to the south east of Little Britton Farm, but otherwise, to the north of the farm, cultivated as well-drained pasture or arable, the latter showing a dark, peaty soil but having ditches with a flora highly reminiscent of that at Worth Minnis, including *Potamogeton coloratus*. This area is the valley of the Wingham River, fed by calcareous springs, and joining the Little Stour just before Newnham Valley; it lacks recent records.

Stodmarsh. Photo by Alex Lockton,
13 August 2016

A third location for *Potamogeton coloratus* was discovered by Alex Lockton in 2016, in Stodmarsh NNR, some 2km distant from the Newnham Valley, but in a different river catchment, that of the Great Stour. Here it was present as a sizeable patch in NVC plant community S19 (*Eleocharis palustris* swamp. Quadrat recording data are included in Lockton (2017)²⁰, and this quadrat is described as 'the best example I have found



of this community. Note the presence of brackish plants such as *Carex divisa* and the rarity *Potamogeton coloratus*'. The full quadrat listing (with DAFOR values) is: *Eleocharis palustris* (Common Spike-rush) 10; *Agrostis stolonifera* (Creeping Bent) 3; *Juncus articulatus* (Jointed Rush) 7; *Chara vulgaris* (Common Stonewort) 4; *Juncus inflexus* (Hard Rush) 4; *Galium palustre* (Marsh-bedstraw) 3; *Baldellia ranunculoides* (Lesser Water-plantain) 4; *Carex divisa* (Divided Sedge) 6; *Potamogeton coloratus* (Fen Pondweed) 4; *Ranunculus sardous* (Hairy Buttercup) 2; *Rumex conglomeratus* (Clustered Dock) 1; *Carex hirta* (Hairy Sedge) 2; *Carex otrubae* (False Fox-sedge) 1. The presence of rare plant register species *Baldellia ranunculoides* in this list (although not generally characteristic of S19) is also an indicator of the flora quality of this location.



Potamogeton coloratus has broad leaves which may be floating or submerged; there is little, if any, difference between the two types, and the upper ones may in any event lie slightly under water. The leaves are thin and translucent, often a reddish-brown, and the secondary cross-veins give the leaves a very characteristic netted appearance.

Worth Minnis, leaves with netted cross-veins.
Photo by Liam Rooney, 5 July 2011

²⁰ Lockton, A. (2017). The Flora of Stodmarsh National Nature Reserve, <https://bsbi.org/kent>

Site	Grid reference	Site status	Last record date	Recorder	Comments
Newnham Valley	TR2360		20 September 1997	NFS	[May be TR 2321 6014, gridref from record with no other details except date.]
Stodmarsh	TR2362	NNR	13 August 2016	AL	TR2395 6242, in S19 <i>Eleocharis palustris</i> swamp.
Ham Fen	TR3354	Part KWT reserve	(1) 17 June 2018 (2) 13 July 2013 (3) 26 August 2006 (4) 2 March 1983	(1) SL (2) KFC meeting (3) KF (4) ACH	(1) Hacklinge, west side of A258 (Ham Fen KWT), flooded ditch (Unit 53: Ham Fen Fields), TR 33846 54488 to TR 3376 5442. (2) Common in all shallow ponds. (3) TR 3350 5485, Ham Fen in 5-year old pond. (4) TR 339 543, TR 334 549..
Ham Fen	TR3355	Part KWT reserve	(1) 19 July 2017 (2) 1 August 2012 (3) 2003 (4) 5 August 2001 (5) 5 August 2002	(1) SB, SL (2) SB (3) CEC (4) RM (5) JP	Ham Fen. Well grown plants in shallow water with <i>Chara</i> spp. at TR 3308 5522. Also widespread small terrestrial plants abundant on mud within the surrounding area of wet peaty mire. (2) Ditch at Ham Fen TR 3317 5505. (3) (a) TR 33227 55246, ditch 280, (b) TR 33970 55620, ditch 173, Hacklinge Ditch Survey. (4) & (5) TR3355.
Ham Fen area	TR35H		29 June 2002	EGP	
Lydden Valley	TR3453		(1) 2 March 2003 (2) 1982	(1) ACH (2) ACH	(1) TR 344 535. (2) NE of Northbourne. TR 34241 53615, ditch 192
Hacklinge area	TR35M		23 June 2002	EGP	[May be TQ TR3454, see 1976 record.]
Hacklinge	TR3454		(1) 6 April 1993 (2) 24 July 1991 (3) 2 March 1983 (4) 1982 (5) 8 August 1976	(1) PMH (2) FR (3) ACH (4) ACH (5) EGP	(1) Det. CDP. (2) TR3454 (3) TR 347 546. (4) (a) TR 34320 54050, ditch 241, (b) TR 34543 54977, ditch 364. (5) TR 342 543.
Worth Minnis	TR3455		(1) 5 July 2011 (2) 2003 (3) 2 March 1983 (4) 1982	(1) KBRG meeting (2) CEC (3) ACH (4) ACH	(1) (a) patch of c. 1 square metre in shallow ditch in grazing meadow at TR 34244 55819. (b) small patch in shallow ditch in grazing meadow TR 34241 55826. (2) (a) TR 34398 55419, ditch 159, (b) TR 34430 55230, ditch 162, (c) TR 34472 55879, ditch 130, (d) TR 34175 55790, ditch 128, (e) TR 347675 5784, ditch 140, (f) TR 34856 55397, ditch 155.. Hacklinge Ditch Survey. (3) TR3455. (4) (a) TR 34130 55940, ditch 394, (b) TR 34398 55419, ditch 346, (c) TR 34466 55514, ditch 345, (d) TR 34650 55020, ditch 323, (e) TR 34259 55574, ditch 329, (f) TR 34300 55680, ditch 343, (g) TR 34538 55598, ditch 349, (h) TR 34577 55882, ditch 351, (i) TR 34856 55397, ditch 333, (j) TR 35723 55158, ditch 413, (k) TR 34335 55968, ditch 364, (l) TR 34340 55441, ditch 338, (m) TR 34615 55857, ditch 357, (n) TR 34620 55652, ditch 355, (o) TR 34256 55285, ditch 326, (p) TR

					34472 55879, ditch 363, (q) TR 34790 55180, ditch 322, (r) TR 34795 55593, ditch 356 .
Worth Minnis	TR3456		1982	(1) ACH	Near Temptye (a) TR 34231 56047, ditch 393, (b) TR 34646 56011, ditch 358, (c) TR 34655 56120, ditch 359, (d) TR 34241 56125, ditch 365, (e) TR 34514 56007, ditch 362, (f) TR 34749 56016, ditch 370.
Betteshanger	TR3553		1982	ACH	Near Cottingham Court Farm
Lydden Valley	TQ35N		5 September2006	JC	
Lydden Valley	TR3555		(1) 2003 (2) 1982	(1) CEC (2) ACH	(1) TR 35004 55590, ditch 164. (2) TR 35072 55290, ditch 317.
Cottingham Lakes	TR3653		1982	ACH	TR 36017 53190, ditch 522 .[given as Lydden Valley, but appears to be a ditch by Cottingham Lakes]

***Potamogeton friesii* Rupr. (Flat-stalked Pondweed)**

Draft account

vc15; gone from vc16

Rarity / scarcity status

Potamogeton friesii is a pondweed with a scattered distribution in the British Isles, local and hence treated as **nationally scarce**, with concentrations in the East Midlands and Norfolk. In Great Britain as a whole it is considered to be Near Threatened. In England, a comparison of the species' area of occupancy over the periods 1930-1969 and 1987-1999 produced a calculated decline of 48% in the likelihood of its being recorded, and it is regarded as **Vulnerable** to the risk of extinction. In Kent, it is restricted to the north east of the county and, having regard to the records in Philp (2010), is **scarce**, although subsequent recording suggests that it is a little more frequent than this.

Stodmarsh. Photo by Liam Rooney, 20 May 2014

Account

The first county record is in Milne & Gordon's Indigenous Botany (1793) as *Potamogeton compressum*: 'Pondweed with a flat stalk grows plentifully...in the river Cray'. Hanbury and Marshall (1899) regarded it as rather rare in ponds, streams and ditches. They cited records from West Kent, which do not amount to a

distribution with any pattern: a find by Marshall in a pond east of Marden, and another in 1866 near Dartford by F.A. Hanbury, a relative of his co-author. Both of these seem questionable, and the Dartford record was re-determined by Dandy and Taylor as *Potamogeton obtusifolius* (Blunt-leaved Pondweed)²¹. Not mentioned by the *Flora of Kent* authors was an 1840 specimen gathered by Dr John W. Curtis at Anerley, now in **BM**. Apart



from these records, and mention in Francis Rose's MS Flora of a find by G.M. Brown in 1963 of the pondweed in a tributary of the Cray near Bexley, which echoes the much earlier Milne & Gordon record, there are no West Kent records, and it is presumed gone from vc16.

Stodmarsh. Photo by
Liam Rooney, 18 May 2014

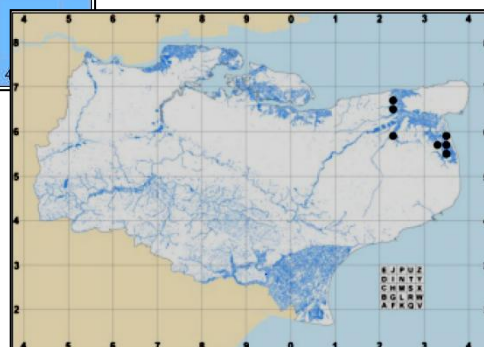
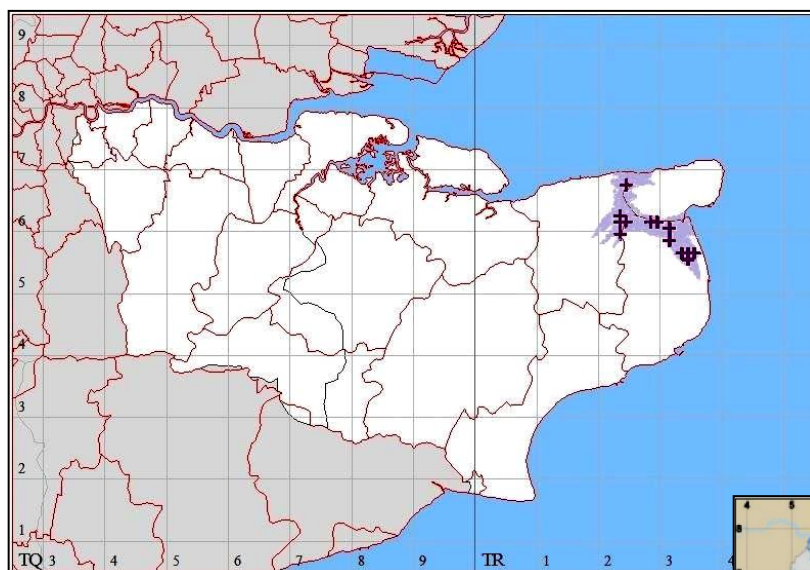
²¹ Botanical Society and Exchange Club Report for 1946-47 (1948), **13(4)**: 371.

More secure, however, is the pondweed's occurrence in north east Kent, where it has long been known as a species of calcareous fen-dikes, with Hanbury and Marshall (1899) mentioning Monkton Marsh, Minster Marsh, Pegwell Bay and Ramsgate, plus a reference to 'Between Pegwell Bay and Reculvers [sic], sparingly',

which is an extract, rephrased, from a list of marsh plants from ditches of the 'flats' or levels originally occupied by the Wantsum Channel, with the broad estuary of the Stour, formerly separating the Isle of Thanet from the mainland.

Potamogeton friesii (Flat-stalked Pondweed 2010-18

Potamogeton friesii (Flat-stalked Pondweed 1991-2005



These East Kent fens have their origins in the deposition of alkaline peat in former fresh waterbodies associated with the rivers and streams discharging towards the Wantsum, the area being shown shaded on the accompanying 2010-19 distribution map. They have continued to supply records for *Potamogeton friesii*: by Francis Rose in fen dikes at Hacklinge (1946), between Preston and Grove Ferry (1949), at Preston Marshes (1962); and by Eric Philp at Stodmarsh (1958). Philp (1982) gave it in four tetrads between Canterbury and Sandwich, but these had become seven in Philp (2010), in which the species was assessed as scarce, in lakes, marsh dikes and slow-flowing rivers or streams. The 1991-2005 distribution map is taken from Philp (2010) with the kind permission of the late Eric Philp; our 2010-18 data show 13 monads, the equivalent of 11 tetrads (which the 1991-2005 map dots represent).



Stodmarsh, habitat. Photo by Lliam Rooney, 18 May 2014

It is possible, but unlikely, that the increase in records represents an expansion of distribution; it is more likely to be an artefact of recording. Thorough recording can show a significant presence in the pondweed's core areas: an English Nature survey in 1996 at Stodmarsh found it in 4.1% of the 169 ditches surveyed - on a par with *Potamogeton natans* (Broad-leaved Pondweed); more widespread than

P. acutifolius (Sharp-leaved Pondweed) and *P. lucens* (Shining Pondweed); less widespread than *P. crispus* (Curled Pondweed), *Stuckenia pectinata* (*P. pectinatus*, Fennel Pondweed) and *P. pusillus* (Lesser Pondweed). Its associates are said to include these last three pondweeds, *Ceratophyllum demersum* (Rigid Hornwort), *P. perfoliatus* (Perfoliate Pondweed) and *Ranunculus circinatus* (Fan-leaved Water-crowfoot).²² These last three species were not strongly associated in the 1996 survey: *P. perfoliatus* was not present; *C. demersum* was only found in two ditches also occupied by *P. friesii*, and *R. circinatus* only once. *Hydrocharis morsus-ranae* (Frogbit) was a more constant associate, occupying five out of the six ditches in which *P. friesii* was present. The number of Stodmarsh ditches in which *P. friesii* is known has since been substantially increased by Alex Lockton's investigations.

P. friesii is perhaps closest in appearance to *P. obtusifolius* (Blunt-leaved Pondweed), a species with a somewhat enigmatic distribution in the county. The former, however, has stipules which are prominently veined and tubular at the base; well-developed, semi-globose glands at the nodes; shorter, narrower leaves



with, usually, five unequally spaced veins. The characteristic of tubular stipules (and, occasionally, discernible nodal glands) is shared by *P. pusillus*, which, however, normally has narrower (less than 1.5mm wide), generally 3-veined leaves with an acute apex (rather than the abruptly contracted and mucronate apex of *P. friesii*.)

Nodal glands (above) and leaf tip (below), from Stodmarsh.

Photos by Liam Rooney, 20 May 2014



Site	Grid reference	Site status	Last record date	Recorder	Comments
Westbere Marshes	TR1860		June 1991	CD	TR 1870 6007, River Corridor Survey Great Stour – Stodmarsh Valley.
Wickhambreaux	TR25J		1991-99	EGP	
Wickhambreaux - Preston	TR2359		(1) 5 July 2016 (2) 4 May 1996	(1) KBRG meeting (2) NFS	(1) A small amount in a channel at TR 23079 59979. (2) East of Frognall Fruit Farm, North half of gravel pit lake.
Stodmarsh NNR	TR2261	NNR	(1) 11 August 2016 (2) 3 July 1974	(1) AL, LR (2) EGP	(1) TR 2234 6194, un-numbered ditch. (2) Det. Dandy & Taylor.
Stodmarsh	TR2262		(1) 11 August 2016 (2) 4 August 2016 (3) July/August 1996 (4) June/July 1991	(1) AL, LR (2) AL (3) PW & others (4) CD	(1) TR 2236 6200, un-numbered ditch. (2) (a) TR 2262 6219, at end of ditch 36. (b) TR 2293 6205, ditch 65. (c) TR 2281 6205, ditch 56.

²² Preston, C.D. (1994). *Potamogeton friesii* Rupr. Flat-stalked Pondweed. In (eds.) Stewart, A., Pearman, D.A. & Preston, C.D., *Scarce Plants in Britain*, JNCC, Peterborough.

					(d) TR 2296 6200, ditch on edge of compartment 17E. (3) Stodmarsh NNR ditch survey. Ditch 36. (4) River Corridor Survey Great Stour – Stodmarsh Valley: (a) TR 2224 6223; (b) TR 2259 6244 [Sites are on north side of Stour, not NNR.]
Chislet Marshes	TR26H		10 June 2000	EGP, JBev	
Chislet Marshes	TR26I		1991-99	EGP	
Stodmarsh	TR2361		(1) 10 July 2013 (2) July/August 1996	(1) AL, JM (2) PW & others	(1) TR 2314 6197, ditch 86, conf. CDP. (2) Stodmarsh NNR ditch survey. Ditch 120.
Stodmarsh	TR2362		(1) 7 July 2018 (2) 30 May 2017 (3) 4 September 2016 (4) 31 August 2016 (5) 30 May 2014 (6) 23 May 2014 (7) 18 May 2014 (8) 10 July 2013 (9) July/August 1996	(1) AL, RB (2) AJ (3) AJ, JM (4) AJ, JM (5) AJ, JM (6) AJ, JM (7) KFC meeting (8) AL, JM (9) PW & others	(1) (a) TR 2340 6276, ditch in front of dipping platform. (b) TR 2328 6291, ditch 114. (c) TR 2326 6260, ditch in front of Feast's Hide. (2)(a) TR 231 621, ditch 84. (b) TR 230 620, ditch 77. (3) TR 234 628, ditch 135. (4) TR 2316 6244, ditch 90. (5) TR 2343 6229, compartment 44, in front of Harrison's Drove. (6) (a) TR 2327 6260, ditch 103 in front of the Feast's Hide. (b) TR 2340 6276, ditch 118. (7) abundant in a ditch from TR 23042 62076 to TR 23124 62172 (8) TR 2307 6210, ditch 77. (9) Stodmarsh NNR ditch survey. Ditches 76, 83, 103, 118, 139.s
Marshside	TR2366		1997	ACH	TR 2316 6636.
Preston Valley	TR2461		(1) 30 July 2015 (2) 1997	(1) SB (2) ACH	(1) Small amount in ditch by sluice at TR 2445 6190 with <i>Potamogeton crispus</i> . (2) TR 240 610, Preston Marshes.
North West of St Nicholas at Wade	TR2467		13 May 2016	SB	Wade Marsh stream by the A299, TR 2480 6733. Identified using characters: leaf width, venation, leaf tip and pronounced nodal glands.
Ash Level, Paramour Street	TR2861		15 June 2016	SB	Abundant in a fishing lake at TR 2803 6141, with <i>Stuckenia pectinata</i> (<i>Potamogeton pectinatus</i>). No fruits and plants beginning to age. Identification made from conspicuous nodal glands, distinct lateral veins on leaves which were tapering to a distinct mucronate apex.
Ash Level, Lower4 Goldstone	TR2961		20 June 2014	SB	Marsh dyke at TR 29491 61503, with <i>Lemna gibba</i> , <i>L. trisulca</i> , <i>Spirodela polyrrhiza</i> and <i>Callitriche obtusangula</i>
Worth	TR35I		1991-99	EGP	
Worth	TR3356		24 June 2014	SB	A few plants at TR 33992 56723 in the Delf Stream by bridge
Hacklinge	TR35M		1991-99	EGP	
Worth Minnis	TR3455		1 August 2015	SL, LR	Worth Minnis farmland east of Cornfield Wood, inlet of culvert on ditch beside footpath, TR 34217 55689, (two lateral veins either side of midrib).
North East of Worth	TR35N		22 June 2002	EGP	
Worth, Temptye	TR3456		29 July 2014	SB	(a) Occasional in Fry Dike e.g. at TR

					3458 5632. (b) A few plants in shaded channel at TR 345 5638.
Royal St George's	TR35P		1991-99	EGP	
Sandwich Levels	TR3556		29 July 2014	SB	A few sparse plants in dike at footbridge, TR 3505 5637.
Richborough Farm	TR3160		20 June 2014	SB	Abundant in ditch at TR 31344 60515 by footbridge with <i>Elodea nutallii</i> , <i>Lemna trisulca</i> , <i>Lemna minor</i> and <i>Spirodela polyrhiza</i> .

***Potamogeton obtusifolius* Mert. & W.D.J. Koch (Blunt-leaved Pondweed)**

Draft account

vc15; not seen recently in vc16

Rarity / scarcity status

Potamogeton obtusifolius is locally frequent throughout most of the British Isles in lake, ponds, canals and streams and its threat status for conservation purposes is regarded as of 'Least Concern', both in England and in Great Britain as a whole. Despite having been recorded as widely scattered in the Kent Weald in the 1970s, it has seldom been found in Kent after then²³, and so is **rare**.

From Ray's Synopsis, 1724

Account

The first record for the British Isles is a manuscript description by the Rev. Adam Buddle (died 1715) '*Potamogiton gramineum latiusculum, foliis et ramificationibus densissime stipatis*'. This was cited by Dillenius, editor of the third edition of John Ray's *Synopsis Methodica Stiripium Britannicarum* (1724), as '*In fossis prope Deptford*' (in ditches near Deptford) and is illustrated in the *Synopsis*.

Hanbury and Marshall (1899) considered the species to be 'not common' in the county and gave a few, widely scattered records: in the River Cray (1793); in ditches about Greenhithe (1836); in shallow waters about the Faversham Powder Mills (1777); at Stourmouth and Ham; in the Stour near Wye; marshes near the Medway above Tonbridge; pond at Marden²⁴.



It is not easy to see what these records have in common, beyond aquatic habitat, although continuity in the vicinity of the Marden record is suggested by its discovery by Francis Rose and Ronald Boniface in 1952 in two ponds one mile north of Marden. Also, the River Cray seems to have continuity with its finding in 1980 above the Five Arches of Fooks Cray Meadows, TQ 481 717, by Rodney Burton, Elizabeth Norman and Geoff Joyce.



Shadoxhurst. Photo by Stephen Lemon, 24 August 2014

Francis Rose considered the pondweed very rare, to be found in a few Wealden ponds, although the only such ponds that he mentioned in his MS Flora as (then) being recent sites, apart from Marden, were at Leighbridge, W.N.W. of Headcorn (1935-49) and

²³ Records made in May/June 1991, as part of a survey of Richborough Stream (TR 2925 6165, TR 2975 6145, TR 3015 6135), are discounted here. On distribution alone, these are likely to be *Potamogeton friesii*.

²⁴ Hanbury and Marshall (1899) gave Edward Jenner's Flora of Tunbridge Wells (1845) as the source for this, but there are specimens collected by Marshall in Manchester Museum labelled Pools near Marden, and in the University of Birmingham herbarium labelled just as Marden, both gathered on the same day in 1893.

north of Scarletts, Cowden. A non-Wealden record was Luddenham Marshes (1961, found by Hector Wilks). Subsequent recording developments are somewhat mysterious. Philp (1982) gave records for 1971-80 in 13 Wealden tetrads²⁵, including a cluster near Cowden. Philp (2005), however, gave none for 1991-2005, saying that 'The only explanation is that the correct habitats have not been looked at during the right time of year, as

the plant must surely exist in a few ponds in the county'.



From Shadoxhurst. Photo by Lliam Rooney, 29 May 2015

The period after the Philp (1982) survey of 1971-80 is not devoid of records, however. There are a couple of sightings in the Smallhythe area, the first in 1987, TQ 893 300, by D.K. Clements and E.K. Goldie-Smith, and in second in 2008, TQ 893 300, by Joyce Pitt. Also in 2008, the Environment Agency noted the pondweed in the

irrigation reservoir at the extension of Hothfield nature reserve, TQ 96341 45889.

After then, however, there were no reported sightings until the pondweed was found in August 2014 by Stephen Lemon at a pond near Shadoxhurst, TQ 96103 36485, in the middle of an arable field. This had been dredged by the farmer some 15 years beforehand, to prevent sheep getting stuck in the silt, and ongoing maintenance consisted of clearing the banks more or less annually. *P. obtusifolius* was growing abundantly in submerged patches appearing reddish under the water. It may have benefited from the pond being on high ground without ditches feeding nutrients into it, and with any earlier nutrient assemblage having been removed by dredging. Associated species included *Potamogeton natans* (Broad-leaved Pondweed) and (probably) *Potamogeton berchtoldii* (Small Pondweed). It was still present in May 2015 and 2017.

Shadoxhurst, habitat. Photo by Stephen Lemon, 24 August 2014

It is curious that recording has been so patchy in the past, and it is difficult to



²⁵ These were: TQ43P, TQ44F, TQ44K, TQ44V, TQ44W, TQ54P, TQ54U, TQ63N, TQ83A, TQ83K, TQ83P, TQ83Q, and TQ93Q. Records for Philp (1982) were often contributed, rather than made by Eric Philp, and there are other sources which give detail for some otherwise submerged in the plain tetrad records of Philp (1982). Thus, TQ43P is Furnace Pond, Cowden, TQ4539 (RAC, 1973); TQ44K relates to the east slopes of Dry Hill (RAC, 1973) [NB the vice county boundary runs along these slopes]; TQ54U is TQ5549 (east pond at Bourne Place, Hildenborough: RAC, 1972); TQ83A is presumably a site called south of Benenden; TQ83K is TQ8530, Rolvenden Layne (WJM, 1973); TQ83P is presumably Biddenden (WJM, 1974); TQ83Q is another Rolvenden Layne record (WJM, 1972), but may also apply to a site south of Tenterden (WJM, 1974). All these more detailed records were of specimens confirmed by Dandy and Taylor, so there is no doubt about identity. The fact that the same two recorders were involved suggests that they were adept at spotting the species and/or habitat.

draw any conclusions as regards trends. It would be unsafe to suppose that there has been a decline since the early 1970s, when the number of records probably reflected recorder effort and expertise, and it would be worth reinvestigating some of those sites where the details are sufficient to enable this.

Potamogeton obtusifolius is generally treated²⁶ as a plant of still, shallow waters, seldom those which are rich in nutrients. It can be very abundant in small water-bodies, forming a mass of foliage just below the water surface, pale green in colour, often tinged pink along the midrib, or pinkish or reddish brown throughout. Differences between this species and *Potamogeton friesii* are described under the latter's account. *Potamogeton obtusifolius* and *Potamogeton berchtoldii* (Small Pondweed) have similarities, but may usually be separated by the leaves of *P. berchtoldii* being narrower (most less than 2mm wide), shorter (generally less than 5cm) and pale to olive or brownish green (not pinkish/reddish).



From Shadoxhurst. Photo by
Liam Rooney, 29 May 2015

²⁶ E.g., in Preston, C.D. (1995). *Pondweeds of Great Britain and Ireland*. Botanical Society of the British Isles, London.

***Potamogeton pusillus* L. (Lesser Pondweed)**

Draft account: Kent photo of habitat needed; and further search in Aylesford area and southwards

vc15 and 16

Rarity / scarcity status

Potamogeton pusillus is a pondweed fairly frequent across much of the British Isles, whose threat status for conservation purposes is of 'Least Concern', both in England and Great Britain as a whole. From Philp (2010), it appears to be **scarce**, but there may be issues of under-recording which would make it less uncommon than this.

Account

The earlier history of Lesser Pondweed in Kent is complicated by confusion between *Potamogeton pusillus* and *Potamogeton berchtoldii* (Small Pondweed), not fully resolved until the 1940 studies of Dandy and Taylor²⁷. The first Kent (and British) record of *P. pusillus* is sometimes given as in William Howe's *Phytologia Britannicarum* (1650), 'Potamogeton pumilum non descriptum...Between Carleton [Charlton] and Wulwich [Woolwich]'; but there is no way of telling whether this was *pusillus* or *berchtoldii*. Hanbury and Marshall (1899), unusually for a Flora of that time, distinguish *berchtoldii* in giving a record by Marshall for it at Marden, although treating it as a form of *pusillus*.

Early records are best treated as those which Dandy and Taylor identified from specimens. In West Kent, they included: 1875 Greenhithe; 1880 Erith; 1881 Northfleet; 1922 Gravesend; 1939 Thames & Medway Canal, Higham. In East Kent, they included: 1875 Romney Marsh; 1880 Royal Military Canal; 1930 west of Seasalter; 1933 Lydd; 1938 Cleve Marshes; 1938 Great Stour below Grove Ferry. The pattern here seems to be one of still or slow-moving water in ditches, canals and the River Stour, focussed on north Kent and Romney Marsh.

From the Dowels. Photo by Liam Rooney, 19 July 2014



This pattern continued into the 1950s and 60s. In the north Kent marsh areas, it was found in a bomb crater at Shornmead Fort by Clive Stace in 1963 and a pit north of Shorne by Peter Hall. In the Stour catchment, Francis Rose's records include Stodmarsh (1955) and in a ditch west of Sandwich (1946). In Romney Marsh, Francis Rose also noted it in dikes by Selby Farm south of Lympne (1958) and in the canal west of Kenardington bridge (1959). For the first time, however, it was being confirmed from the Medway catchment (including its Beult tributary): in a stream north of Collier Street (1958), in a gravel pit west of Brandbridges (1958), and in gravel pits east of Aylesford (found by Eric Philp in 1962).

²⁷ Dandy, J.E. & Taylor, G. (1940). Studies of British Potamogetons – XII *Potamogeton pusillus* in Great Britain; XIII *Potamogeton berchtoldii* in Great Britain. *Journal of Botany* **78**: 1-11; 49-66.

The 1971-80 county survey (Philp, 1982) accounted for 37 tetrads, where *P. pusillus* was present in rivers, dikes and flooded gravel pits. Most finds continued to be in the Stour catchment, the inner fringes of Romney Marsh and its Wealden hinterlands, and the catchment of the lower, but non-tidal, Medway.



From the Dowels. Photo by Liam Rooney, 23 August 2012

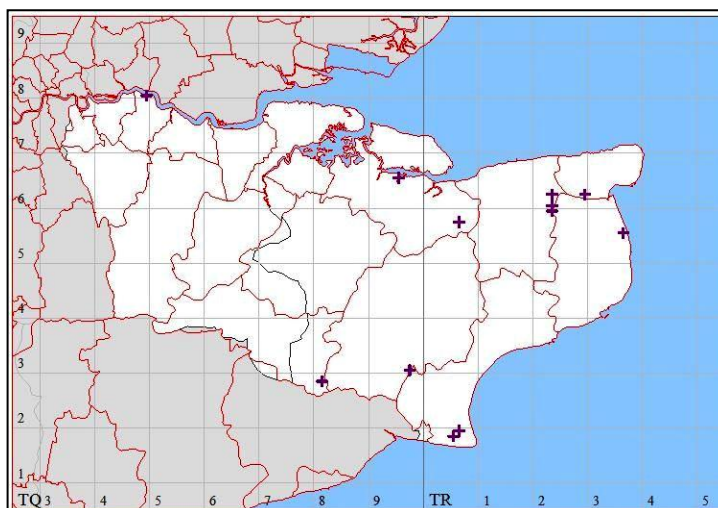
Yet, Philp (2010) gives only five records for 1991-2005²⁸. While some aquatic plants have seen rapid increase and then decline, this is normally a characteristic of introductions, not natives. It seems more likely that the decrease is substantially an artefact of recording, rather than any population change.

Eric Philp was not convinced

that *P. pusillus* and *P. berchtoldii* were distinct species, and said so in Philp (1982). This was particularly because he considered that specimens were found with the characters of both species. In his 1982 account he stated under *P. berchtoldii* that the records used were for plants which had characters clearly only for that species (and, by implication, this applied to *P. pusillus* as well). When in Philp (2010) he wrote that all five 1991-2005 specimens had been sectioned and carefully examined under a microscope before being confirmed, this indicates a continued level of scepticism about the species which may have affected willingness to record. That willingness, however, was not an issue in relation to *P. berchtoldii*, which had more records in Philp (2010) than in Philp (1982).

Potamogeton pusillus (Lesser Pondweed) 2010-18

Our more recent records do not show *P. pusillus* as this scarce: there are 12 monad records for the period 2010-18 (equivalent to the same number of tetrads), as shown on the accompanying distribution map. These show something of its long-standing presence in the Stour catchment, and of continuation at Dungeness; but there is probably more investigation to be made in north Kent and the Medway catchment.



²⁸ A dike on Swanscombe Marshes TQ57X; a flooded gravel pit at Aylesford TQ75J; A marsh dike on The Dowels TQ93Q; a flooded gravel pit at Dungeness; and a marsh dike at Stodmarsh TR26G.

P. pusillus is regarded as growing in a wide range of aquatic habitats, sometimes with *P. berchtoldii*, but it is more tolerant of brackish conditions than that species²⁹. Kent records for 2010 onwards include presence in ponds, gravel pits, lakes and drainage channels. It was found in 2018 in a pond in Lydden Valley which had only been created the previous year and was much visited by birds, presumably responsible for its arrival. Associated species have been little recorded in Kent, but it has been found growing with *Stuckenia pectinata* (*P. pectinatus*, Fennel Pondweed) and with *Potamogeton trichoides* (Hairlike Pondweed).



From the Dowels. Photo by Liam Rooney, 24 August 2012

It is variable in habit and leaf width, and can be quite similar to several other pondweeds. From *P. berchtoldii* and *P.*

trichoides it is separable by its tubular stipules, i.e. the stipules form a fully connected ring of tissue, not just a tube created by overlapping tissue. It is a fiddly business checking these; best done by sectioning a young shoot with its stipule and examining the cross section under a microscope, having removed the shoot from the surrounding stipule if practicable. It should be borne in mind that the stipule may not be tubular for its full enclosing length and the tube tends to split with age. The presence of a tubular stipule, together with (normally) 3-veined leaves not more than 2mm wide will point to *P. pusillus*.

²⁹ Preston, C.D. (1995). *Pondweeds of Great Britain and Ireland*. Botanical Society of the British Isles, London.

***Potentilla anglica* Laichard. (Trailing Tormentil)**

Draft account: Kent habitat photo needed

vc15 and 16

Rarity / scarcity status

Potentilla anglica grows scattered across the British Isles, although some records may be of its hybrid, *Potentilla x mixta*, and its threat status for conservation purposes is of 'Least Concern'. In Kent, it appears to be declining, and is **scarce**.

Account

Trailing Tormentil was first recorded in Kent by Edward Jacob in his *Plantae Favershamienses* (1777) 'In Broom fields at Hernhill – common'. Francis Rose acknowledged this as apparently the first, but qualified it as 'if correct'. The habitat sounds appropriate, but it is curious that Jacob did not also record common *Potentilla. reptans* (Creeping Cinquefoil).

Lamberhurst Quarter. Photo by Lliam Rooney, 13 June 2015

Hanbury and Marshall (1899) described it as a plant of woods and banks, not really uncommon, but confounded with *Potentilla erecta* (Tormentil) by many observers. This confusion seems a little surprising, given that there is greater scope for mixing up the hybrids between *P. erecta* and *P. anglica* (*P. x suberecta*), between *P. erecta* and Creeping Cinquefoil *P. reptans* (*P. x italica*), and between *P. anglica* and *P. reptans* (*P. x mixta*). Hanbury and Marshall dealt with all these hybrids, which was a fairly advanced position for a Flora at that time, given that they (probably Marshall in particular) felt it necessary to comment on the scepticism still felt by the more conservative botanists about hybrids generally. They listed records for *Potentilla anglica* widely across the county, apparently on a preponderance of acid and neutral soils.



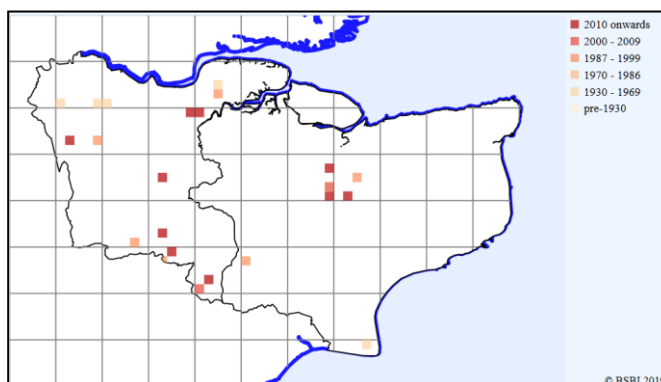
Lamberhurst Quarter. Photo by Lliam Rooney, 13 June 2015

Francis Rose in his manuscript *Flora* described the species as a native of wood borders, rides, heaths, and scrub, usually on light soils, but occurring on heavy loams and even on Weald and Wadhurst Clays: well distributed, especially in the Weald and on the Greensand, but uncommon generally. Similarly, Eric Philp in relation to the county 1971-80 survey (Philp, 1982) found Trailing Tormentil, a plant of woodland rides, woodland edges, heaths and sandy banks, to be rather scarce in the county and many records, on being checked, had proved to be mis-identified. His confirmed or reliable records amounted to 14 tetrads, given without a distribution map. In the 1991-2005 survey (Philp, 2010), only seven tetrad records were given and the plant was described as scarce and probably declining. The extent of decline since the 1970s is not easy to ascertain, given that our 2010-18 records amount to ten tetrads/monads so that the 50% drop for 1991-2005 could be

regarded as overstated. Even so, the reasons for any decline are not apparent.

Potentilla anglica (Trailing Tormentil)

The accompanying distribution map includes not only our 2010-18 records, but also those from earlier periods recorded at least to tetrad level: this enables the Philp (1982) records to be seen, at least where not overlain by a more recent sighting. There are clusters, both recent and older, in the Weald and in TQ95/TR05, on the Downs dip slope, but the latter are likely to be on somewhat acid soils, clay with flints or plateau drift, rather than chalk. This clustering may not bring out that there are three hectads where there were records from the 1970s onwards (Sissinghurst area; Chattenden; Speldhurst/Southborough) which have not yielded any since 2000, and so would show noticeable decline if mapped at 10km square level.



Identification difficulties³⁰ arise because *P. anglica* arose as a species through hybridisation between *P. erecta* and *P. reptans*, followed by chromosome doubling. It therefore has some characters which are intermediate between those two species and others which are derivative from the chromosome doubling. It has at least some 4-petalled flowers (from *P. erecta*), but may also have 5-petalled ones (from *P. reptans*). It is fertile and can self-pollinate, which is an effect of chromosome doubling (a straight hybrid between *P. erecta* and *P. reptans* or between *P. erecta* and *P. anglica* would be sterile), so the fertile swollen carpels should be observed after flowering. Clearly, a plant has to be sufficiently mature for this observation to be made. In practice, this should be possible if there are at least three withered flowers further back down the stem from an open flower or bud, when the third – or any older one – is the one to test.

Lamberhurst Quarter. Photo by Liam Rooney, 13 June 2015

There are other relevant characters relating to leaves and their stalks, but those of *P. anglica* may vary during the growing season so that at the outset they may look closer to *P. reptans* and later in the season, more like *P. erecta*. *P. anglica* can form large patches, as it roots at the nodes in late summer, although not as readily as *P. reptans*. The hybrid *P. anglica* x *P. reptans* (*P. x mixta*) also forms patches and can be found apparently quite independent of any parents; but *P. erecta* x *anglica* (*P. x suberecta*) does not, and this inability to spread means that it is unlikely to be found otherwise than near the parents.

³⁰ Dealt with by B. Harold (1998). *Potentilla erecta* / *P. reptans* / *P. anglica* and hybrids. In (ed. Rich, T.C.G. & Jermy, A.C.) *Plant Crib*, Botanical Society of the British Isles, London. Also Harold, B. (1994). *The Potentilla erecta-reptans* group – some practical hints for identification. *BSBI News* 66: 13-15.

Potentilla argentea L. (Hoary Cinquefoil)

Draft account:

vc15 and 16

Rarity / scarcity status

Potentilla argentea is fairly widespread on dry sandy or gravelly ground in Great Britain, more frequent in the south east than elsewhere, especially in East Anglia, but less so in Kent and East Sussex. In both England and Great Britain as a whole it is considered to be **Near Threatened**. A comparison of the species' English area of occupancy over the periods 1930-1969 and 1987-1999 produced a calculated decline of 26% in the likelihood of its being recorded. In Kent, the decline between 1971-1980 and 2010-19 could be regarded as 22%, but this is not statistically significant. Hoary Cinquefoil is **scarce** in the county.

Littlebourne. Photo by Liam Rooney, 29 July 2011

Account

The first published Kent record is by John Blackstone in his *Specimen Botanicum* (1746), 'In pascuis arenosis aut glareosis.' [In sandy or gravelly pastures] 'On *Blackheath* in the Road to *Charlton, Kent*'. Hanbury and Marshall (1899) regarded Hoary Cinquefoil as locally frequent on sandy and gravelly ground and gave many other records for north west Kent with comparable soil conditions, including Keston, Hayes Common, Bostall Heath, Chislehurst and near Abbey Wood. Gravel pits were mentioned near Chalk, at Cockset Wood near Faversham, and at Newnham near Faversham (where Edward Jacob recorded it



in a road hedge in 1777; and it was still to be found in a gravel pit in 1890); but East Kent records were much more patchy.

Francis Rose noted many gravel- and sand-pit records (six out of 20 of his twentieth century sites) and described Hoary Cinquefoil as a native of dry sandy or gravelly banks, open grassland and old pits; frequent on the Eocene and later sands and gravels north of the Downs, but local; very rare south of the Downs, on Folkestone Sands in the non-tidal Medway catchment only, unrecorded in the Weald³¹.

Littlebourne. Photo by Liam Rooney, 29 July 2011

Philp (1982) noted nine tetrads for the species, all in the northern half of the county, and generally relating to finds on or near footpaths. Although it was looked for at all former known

³¹ As for Wealden records, Thomas Forster in his *Flora Tonbrigensis* (1816) describes it as 'In pastures, not uncommon' but this sounds unlikely. Indeed, Hanbury and Marshall (1899) mis-quote this as 'not common', which would be a little more plausible, but they remark that Edward Jenner (*Flora of Tunbridge Wells*, 1845) did not find it, so the pointers are towards the record being an error.

sites for the purposes of the 1991-2005 survey published in Philp (2010), it could only be found in four tetrads, of which just one corresponded to a Philp (1982) tetrad. The reason for the decline was considered to be loss or destruction of habitat. The decline is not as great as this, given that our 2010-19 records are for seven tetrads/monads. However, as well as being a plant of the northern half of the county, it is now almost entirely a West Kent plant; a gravelly bank at Littlebourne (in an area where known at least since 1949) is the only survivor of previous East Kent records.

Kent habitats are those more widely characteristic of *Potentilla argentea*: infertile, well-drained, sandy or gravelly soils, often on banks (which may accentuate drainage and sun exposure) and in open conditions without other vegetation over-shading. Whilst it is said³² that in eastern England, particularly Breckland, it has a preference for light soils of heathland and uncultivated areas not subject to disturbance, in Kent its occurrences are often related to disturbance. This is apparent from the number of gravel- or sand-pit related occurrences, and to the comments in Philp (1982) about presence on or near footpaths. The footpath sites may well be related to a need for competition to be reduced through open ground created by trampling.

Blackheath, habitat, c.1814.



This is also reflected in our first county record: 'On Blackheath' (with its sandy, pebbly open ground) 'In the road' (obviously, eighteenth century roads were not tarmacadamed, and this route would have been a well-used dusty, rutted track across the unenclosed common and, being unconstrained, it would have no doubt have spread across the terrain, such that growing in the road would have been no surprise. Similarly, the pit sites have clearly been affected by significant disturbance, initially clearing competitive vegetation, but also through accentuating infertility by the removal of any soil covering.

As it appears that *Potentilla argentea*, a perennial reproducing from seed, is slow to colonise new sites, it may need locations which themselves are slow to accept colonisation by any perennial species, and hence delaying the onset of competition; the precise requirements for dispersal and establishment in situ are still not fully understood.³³ Some efficiency of pollination has been suggested by the observation that the petals of *Potentilla argentea* wilt and are shed speedily after pollination, and unpollinated flowers continue with fully turgid petals. However, as a pseudogamous apomict, its pollination would simply trigger asexual reproduction. Accordingly, there may be a level of local variation of population due to the general absence of male inheritance, and Sell & Murrell³⁴ place *Potentilla argentea* in five microspecies, not yet adopted in general British recording: *Potentilla decumbens*, *P. confinis*, *P. demissa*, *P. tenuiloba* and *P. argentata*, which are keyed out on the height and inclination of flowering stems, together with leaflet width and degree of tothing.

Its associated species at Littlebourne included, in 1985, the rarity *Lotus angustissimus* (Slender Bird's-foot-trefoil) – since gone from that locality – and at Dartford Heath, plants of dry acid ground: *Agrostis capillaris* (Common Bent), *Cerastium semidecandrum* (Little Mouse-ear), *Rumex acetosella* (Sheep's Sorrel) and *Spergularia rubra* (Sand Spurrey).

³² P.J.O. Trist (1994). *Potentilla argentea* L. Hoary Cinquefoil. In (eds.) Stewart, A., Pearman, D.A. & Preston, C.D., *Scarce Plants in Britain*, JNCC, Peterborough.

³³ Stroh, P.A. 2014. *Potentilla argentea* L.. Hoary Cinquefoil. Species Account. Botanical Society of Britain and Ireland.

³⁴ Sell, P. & Murrell, G. (2014). *Flora of Great Britain and Ireland*, vol.2. Cambridge University Press, Cambridge.

Potentilla argentea is readily distinguishable from all other *Potentilla* species by the dense white woolly undersurface of the leaves, whose edges curve inward below, so that the green upper surface appears as a margin when viewed from underneath.

Site	Grid reference	Site status	Last record date	Recorder	Comments
Keston Common (metropolitan vc16)	TQ4163		(1) 14 August 2016 (2) 2013 (3) 1990 (4) 1988	(1) SL (2) JJ (3) JP (4) JP	(1) TR 41800 63867, Keston Common, gravel extraction gulley (Blackheath Pebbles), open south west end of gulley. Spread-out patches of plants, some in flower, across an c.10 metre scrubby strip of vegetation dominated by Bramble and Gorse. (2) TQ 416 638, Keston Common: extraction gulley south of car park (3) Over 50 plants. (4) TQ 418 638 B, at foot of earthwork, several – reappeared after 4 years' absence...
Keston (Holwood) (metropolitan vc16)	TQ4263, TQ4264		(1) 7 June 2010 (2) 2010 (3) July 1988	(1) JP (2) JP (3) JP	(1) TQ4264, entrance area north of 'Cricket Ground', small colony, very local. (2) Small colony, very local, TQ4263. (3) TQ4263. [Known at Holwood Park at least since 1916.]
Dartford Heath	TQ5272		(1) 24 October 2017 (2) 12 July 2013	(1) DS (2) GK	(1) (2) TQ 52095 72862. Three plants on sandy/pebbly ground, looking as though it had been scarified for management purposes. Associated spp: <i>Agrostis capillaris</i> , <i>Rumex acetosella</i> , <i>Spergularia rubra</i> , <i>Cerastium semidecandrum</i> .
Dartford Heath	TQ5273		13 July 1997	JS	TQ 5225 7315
Dartford Heath	TQ57G		1991-98	EGP	Called 'Wilmington', but may be same as TQ5272 or TQ5273 above.
Dartford Marshes	TQ57N		(1) 1 November 2002 (2) 2002	(1) EGP, PH (2) MG	(1) Tetrad reference only, no detail. (2) TQ 5405 7647, Joyce Green Lane, west side. [Known on a gravelly bank at TQ 546 761, 1931-62.]
Stone	TQ57S		Before 1981, after 1970	Philp (1982)	This may be the same as a 1972 record by JRP at Atlas Stone Co pit.
Wrotham Heath	TQ65I, TQ65J		Before 1981, after 1970	Philp (1982)	Tetrad reference only, no detail given. [Known at sand pit west of Wrotham Heath, 1961.]
Whitehorse Wood	TQ6561		1 October 1973	FR, PR, DK	
Shorne	TQ67V		Before 1981, after 1970	Philp (1982)	Maybe Gad's Hill (GS)
Chalk	TQ67W		Before 1981, after 1970	Philp (1982)	
Eccles [?]	TQ76A		1987-88	EGP	BSBI monitoring scheme
Ranscombe	TQ7167	Plantlife reserve	(1) [not seen 2017] (2) 16 June 2012 (3) 9 May 2012	(1) [RM] (2) KBRG meeting (3) RM	[(1) comm. RM, In Jan 2017, not seen since 2012, despite management intended to favour it and deliberate searches each year, so this may well have been a temporary population introduced by forestry vehicles.] (2) c. TQ 715 675, as previously

					found by RM, on a path through Merral's Shaw, just off the public footpath, a scattering of plants in flower, spread along a few metre stretch of path. (3) c.TR 715 676, thirty plants of various sizes, first found by recorder on 9 May 2012 in a ride in Merrals Shaw. within Ranscombe Farm Reserve. Looks settled in and has clearly been present a while, though the ride was only widened in 2009. On gravelly soil, appears to be head material with sand and gravel.
Higham	TQ7171		(1) 17 June 2015 (2) 26 May 2014 (3) Before 1981, after 1970	(1) JS (2) SP, DG (3) Philp (1982)	(1) TQ 7147 7125 (2) TQ 7146 7124, scattered thinly over two open glades. (3) Recorded as TQ77A, but assumed to be TQ7171.
Norton Court	TQ96Q		1991-99	EGP	
Ospringe	TQ 9860		(1) 24 June 1980 (2) 29 May 1977 (3) Before 1981, after 1970	(1) FR, HW (2) EGP, FR (3) Philp (1982)	(1) Six plants. (2) Putt Wood, one shoot. (3) Recorded only as TQ96V, but probably same as record (1).
Littlebourne	TR15Y		(1) 1991-99 (2) Before 1981, after 1970	(1) EGP (2) Philp (1982)	May be same as TR1857 below.
Littlebourne	TR1857		8 August 2005	JP	TR 188 578, east of Canterbury, in Trenleypark Wood complex, close to footpath on small acid thin-soiled grassy bank. [There are records for Fishpool Hill, 1949-63.]
Trenleypark Wood, etc.	TR1958		1985	JP	TR 191 585.
Swanton, north of Littlebourne	TR2059		(1) 21 July 2011 (2) 18 July 2000 (3) 12 August 1985	(1) SB (2) JP (3) ACH, RoF	(1) (a) Abundant on dry sandy bank from TR 20311 59055 to TR 20370 59085. (b) 12 plants on sandy grassland at TR 20330 59019. (2) TR 292 590, Swanton Aerial site. (3) TR 203 591, associated species with <i>Lotus angustissimus</i> . [Known at gravel pits here, 1949-63.]
Seaton	TR25J		Before 1981, after 1970	Philp (1982)	

***Potentilla erecta* (L.) Raeusch. (Tormentil)**

Draft account: Kent photos of whole plant and habitat needed.

vc15 and 16

Rarity / scarcity status

Tormentil is widespread across the British Isles, mostly on acid soils of moors, heaths and mountains. It is by no means rare, but a comparison of its English area of occupancy over the periods 1930-1969 and 1987-1999 produced a calculated decline of 26% in the likelihood of its being recorded. This may be associated with loss or eutrophication of lowland heath habitat. It is accordingly now classified as **Near Threatened** in England, although its threat status in Great Britain as a whole remains as of 'Least Concern'. In Kent, there is evidence of 38% decline between 1971-80 and 1991-2005, although it still remains neither rare nor scarce.

Brenchley. Photo by David Steere, 8 May 2016

Account

The first Kent record is by Thomas Johnson in his *Descriptio Itineris* (1632), found between Sandwich and Canterbury, probably as he approached the woodlands east of Canterbury, on the sandy Thanet Formation. Hanbury and Marshall (1899) gave no other records, in view of its then common status: it was, they considered, an exceedingly common native of woods, banks, heaths, hedges, but apparently unreported from Thanet (this lack of report still stands). There were, of course, early records from those botanists who did not confine their Floras to the more interesting species (e.g. Forster's *Flora Tonbrigensis*, 1816, gives it as 'In barren pastures and fields, very common'), but as unimproved acid grassland was by no means a scarce habitat, as it later became, Tormentil was not held in any regard.

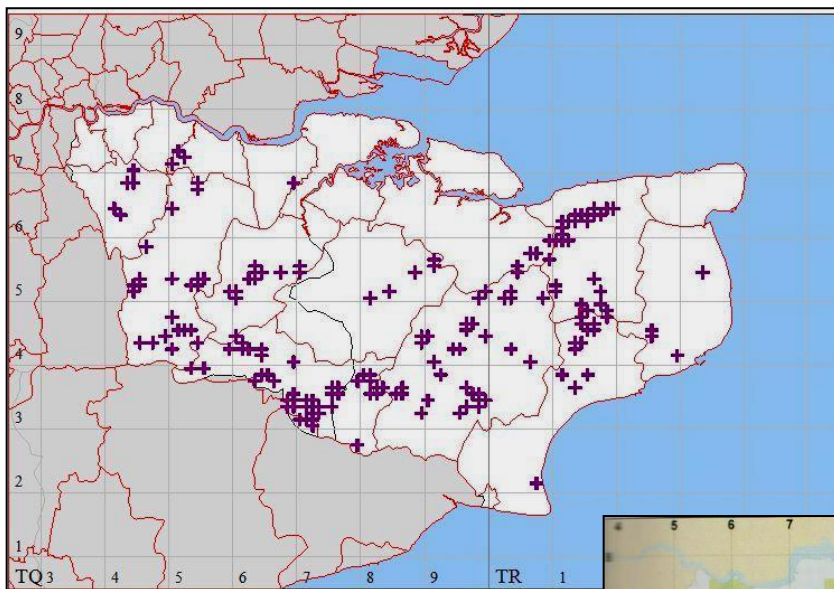


Francis Rose treated it as a native of heaths, dry open woods, nearly always on light, acid soils; common inland, but absent from the Hundred of Hoo, Sheppey, and the coastal marshes, except on shingle at Dungeness and on sand dunes at Sandwich. Philp (1982) gives 242 tetrad records, usually on the more acid soils, confirming absence from Hoo, Sheppey, Thanet and coastal north Kent, and with concentrations in the Weald, the Blean, around Ashford and on the Hythe Formation west of Maidstone. However, by the time of the 1991-2005 survey (Philp, 2010), the number of tetrads had declined to 150. The focal areas of distribution remained similar, but very much diluted. This evidence of decline is reinforced by our 2010-19 data, which show 131 tetrads (175 monads).

If one takes a plant of fairly similar habitats, such as *Calluna vulgaris* (Heather), then this would be expected to show a similar pattern. Heather (see the rare plant register account for that species) declined during between the county surveys of 1971-80 and 1991-2005, with loss of heathland moving towards a position of gain towards the end of that time and afterwards; but 2010-18 tetrad records for Heather were still 9% below the total for the 1991-2005 survey. In the case of *Potentilla erecta*, the 2010-18 records stand at 13% less than the

1992-2005 survey. So, it is likely that similar factors are governing the decline of both species, with *Potentilla erecta* showing a little more sensitivity.

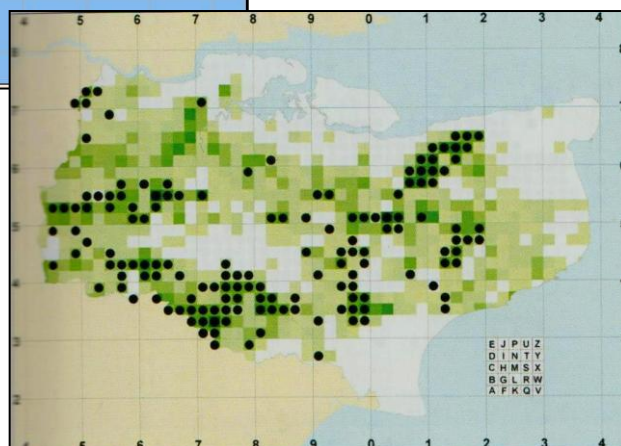
The current recording position is shown on the accompanying 2010-18 map, in which records are given for monads (1km squares, the level at which the register will be maintained for this species) across both vice counties, and so extending beyond the administrative county towards London. The 1991-2005 distribution



data map (in which woodland density is shown by green colour and the dots indicate tetrads, not monads) is reproduced by kind permission of the late Eric Philp and the Kent Field Club.

Potentilla erecta (Tormentil)
2010-18

Potentilla erecta (Tormentil)
1991-2005



The distribution map from Philp (2010) shows quite a strong relationship between *Potentilla erecta* and woodland, although this will be in open areas: margins and rides. It is also consistent with the geology of acid soils, although there have been exceptions in its soil preferences. Francis Rose in his manuscript *Flora* mentioned the occurrence of *Potentilla erecta* north west of St Margarets at Cliffe in 1955, on leached soil in chalk grassland, with *Calluna vulgaris* also present. He also noted records by Peter Hall at Preston Hill, Shoreham and the top of Beechy Lees Wood, Kemsing, where Tormentil was growing over what he called curf (a term normally applied to the Portland Chert member of the Limestone Portland Stone Formation, and presumably it was considered that the chalk here contained something analogous).

Potentilla erecta has two subspecies in the British Isles: subsp. *erecta* and subsp. *strictissima*. The latter is normally taller, with more extensively and coarsely dentate upper leaves and larger flowers, but does not occur in Kent. Hybrids between *P. erecta* and *P. anglica* (Trailing Tormentil) occur, and also between *P. erecta* and *P. reptans* (Creeping Cinquefoil). The first of these has been frequently recorded in Kent, often in the apparent absence of parents: the second, hardly at all, but is barely distinguishable from the first. If a plant is found to have 4-petalled flowers and it is fertile, but with less than 20 carpels, then this will be *Potentilla erecta*.

Prunus cerasus L. (Dwarf Cherry)

Draft account: Kent photos needed.

vc15 and 16

Rarity / scarcity status

Prunus cerasus is a suckering shrub or small tree, fairly widespread across the British Isles. In Great Britain as a whole its threat status for conservation purpose is regarded as of 'Least Concern', but in England a comparison of its area of occupancy over the periods 1930-1969 and 1987-1999 produced a calculated decline of 29% in the likelihood of its being recorded, and so it is considered to be **Near Threatened**. The reasons for such an apparent decline are unclear, given that a suckering colony is not easy to destroy; but



there may be issues of recording, whether mistakes as between this species and *Prunus avium* (Wild Cherry), or a reluctance to record where more obviously planted. Indeed, *Prunus cerasus* has a long history of planting, but is treated as an archaeophyte, or ancient introduction, so that, with natives, it falls within the scope of this register. In Kent, it is neither rare nor scarce.

Dunkirk. Photo by Liam Rooney, 12 May 2013

Account

Hanbury and Marshall (1899) refer the first Kent record to Edward Jacob, whose *Plantae Favershamienses* (1777), but this attribution appears perverse³⁵. The earliest literature reference apart from this seems to be H.C. Watson's *Topographical Botany* (1873), which notes *Prunus cerasus* as present in East Kent, but 'Planted?' (this may have been Watson's own sighting near Deal and Ham). Earlier specimens are likely to exist: there is an 1864 gathering in **BM** by J.B. Syme from near Sandwich. Hanbury and Marshall both made and received some 35 records across the county. They considered the cherry to be native (which is not the view taken more recently), a shrub or small tree of woods and hedges; frequent, but appearing to be much rarer than *Prunus avium* and 'In Kent, at any rate, this seems as truly wild as *P. avium*'.

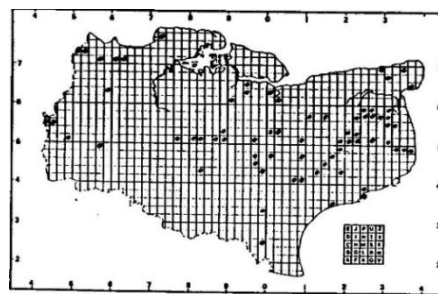
Francis Rose regarded Dwarf Cherry as a rare native or denizen, of hedges and woodland, usually on sandy or loamy non-calcareous soils. Of his records, made by or reported to him, 12 are within the period 1938-1962, although others are clearly contemporary, and they range across the county, from Farnborough in the west to St Margarets at Cliffe in the east. It is difficult to know what to conclude from the 1971-80 records from Philp (1982) as these total 70 tetrads, a quantity not recorded before or after. A distribution map was not

³⁵ It is said to be because Jacob refers to it as a shrub (which is not apparent) and the fruit is described as red (*Cerasus sylvestris fructu rubro*). But Jacob refers to his plant as the 'Common wild Cherry', naming it as *Prunus avium* according to Hudson's *Flora Anglica* (1762), which gives *Cerasus* (etc.) as a synonym. *Prunus avium* of course can have red fruits, and as Jacob described his plant as common in woods and gave no other cherry, it is difficult to avoid the conclusion that this was *Prunus avium* after all. Francis Rose (in his manuscript *Flora*) thought that *P. avium* was more probable.

published, which may indicate that it was not regarded as being particularly helpful, but the unpublished map is given here.

Prunus cerasus (Dwarf Cherry) 1971-80

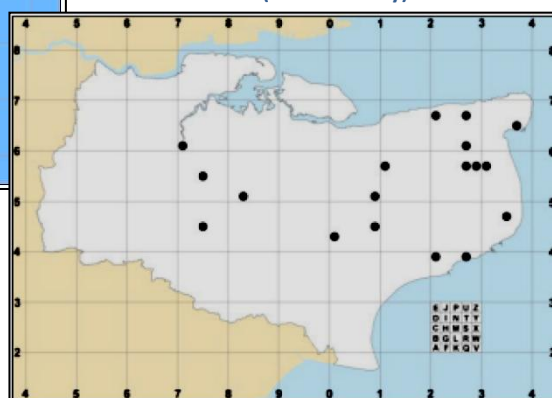
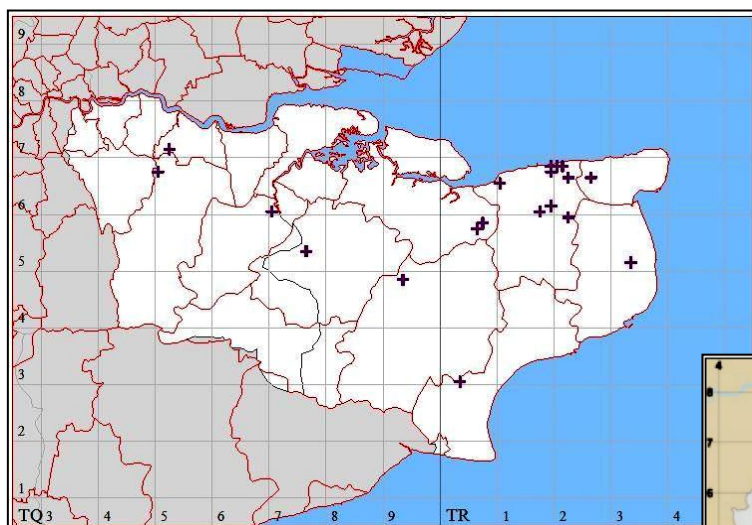
By contrast, Philp (2010) only gave 18 tetrad records for 1991-2005, describing it as an introduced species of wood borders and hedgerows. Our 2010-18 records are in alignment with this, a total of 18 tetrads (equivalent to 19 monads, so the records are well scattered), although very few of them are the same as those in Philp (2010). The 2010-18 map gives records for monads (1km squares, the level at which the register will be maintained for this species)) across both vice counties, and so extending beyond the administrative county



towards London. The 1991-2005 distribution data map (in which the dots indicate tetrads, not monads) is reproduced by kind permission of the late Eric Philp and the Kent Field Club.

Prunus cerasus (Dwarf Cherry) 2010-18

Prunus cerasus (Dwarf Cherry) 1991-2005



All surveys agree in the preponderance of records being in East Kent, and virtually absent from the Weald; but they differ substantially in totals. Given that a suckering tree should not come and go very readily, the burst of records in the 1970s must have a recording explanation. Networked recording can have a different effect from solo recording, and Philp (1982) took records from a range of Kent

Field Club recorders, whereas Eric Philp was fully responsible for the data in Philp (2010). However, the 2010-18 finds were also the product of networked recording, and they have not restored the numbers from the 1970s.



Dunkirk. Photo by Liam Rooney, 19 July 2012

The possible explanations are not new. Kent and Lousley's *Hand List of the Plants of the London Area* (1951-57) called *Prunus cerasus* 'Rare, overlooked or confused with *P. avium*'. Either we have overlooked *Prunus cerasus* both before

and after the 1970s; or some of the 1970s recorders confused the species with *P. avium*. Overlooking of

course need not imply failure to see and recognise. It may be that it was seen, but no record was taken, because it appeared likely to be of planted origin. Certainly 2010-18 recorders appear to have been sensitive to the status of finds, generally noting if plants formed a hedge, if there were apparent seedlings, if the origin appeared to be bird-sown and if there was suckering.

It is the same species as the Morello Cherry and 'wild' trees are likely to be descended from this.

Prunus cerasus is distinguishable from *Prunus avium* by its darker green leaves held somewhat erect at maturity, shiny and more or less glabrous below and usually with no more than 8 pairs of secondary veins (11-



15 in *P. avium*); by its saucer-to cup-shaped (rather than cup-to bowl-shaped) flowers in clusters of 2-4 (*P. avium* up to 6); by some of its bud-scales at the base of flowers being green and leaf-like; and by its winter bud-scales usually being minutely warty or pitted. It suckers much more than *P. avium* and may form thickets of small trees.

Dunkirk. Photo by Liam Rooney, 12 May 2013

Puccinellia fasciculata (Torr.) E.P. Bicknell (Borrer's Saltmarsh-grass)

Draft account: habitat photo needed.

vc15 and 16

Rarity / scarcity status

Puccinellia fasciculata is a southern coastal plant, mostly found in Kent, Essex and Suffolk, occasionally inland on salt-treated roads. Its threat status for conservation purposes in both Great Britain as a whole and in England is **Near Threatened**. A comparison of its area of occupancy in England over the periods 1930-1969 and 1987-1999 produced a calculated decline of 23% in the likelihood of its being recorded. It is a **nationally scarce** plant and a priority species for the UK Biodiversity Action Plan due to its status as a good indicator of a threatened habitat and its decline with loss of grazing marsh to development and arable conversion. Planned actions include ensuring appropriate habitat including an increase of stock grazing and trampling; monitoring; and seeking to prevent further losses of brackish/saline habitats. In Kent it is neither rare nor scarce, although there is evidence of decline; but Kent still holds more of this grass than any other county in the British Isles except Essex.

From Halling. Photo by Liam Rooney, 26 June 2013

Account

The first published Kent record seems to be Matthew Cowell's reference (in *A Floral Guide for East Kent, etc.*, 1839, p.67) to the finding, by G.E. Smith, of *Glyceria Borreri* at Dymchurch in 'muddy places by the sea'. This was culled by Cowell from Smith's notes in an interleaved copy dated 1838³⁶ of Smith's own work, *A catalogue of rare or remarkable phaenogamous plants collected in South Kent* (1829), and Cowell adds later (p.90) Smith's notes on identification characteristics. Hanbury and Marshall(1899) described the grass as a locally plentiful native of muddy salt marshes. Along the north Kent coast, it was known in the nineteenth century at Plumstead Marshes, from Greenhithe to Gravesend, Higham Marshes, the Isle of Grain and in the Medway estuary at Frindsbury and south of Rochester; further east, on Sheppey, and at Faversham Creek and east of Whitstable. On the north east coast, it was known between Ramsgate and Sandwich.



Francis Rose, through his records from the 1940s to 1960s, was aware of a broadly similar coastal distribution in the north and north east. On the south east coast, he found it at St Mary's Bay (which suggests some continuity with G.E. Smith's Dymchurch record) and saw, or had reports, of it by the Royal Military Canal near Hythe, and near Littlestone. It was also reported from Fairfield

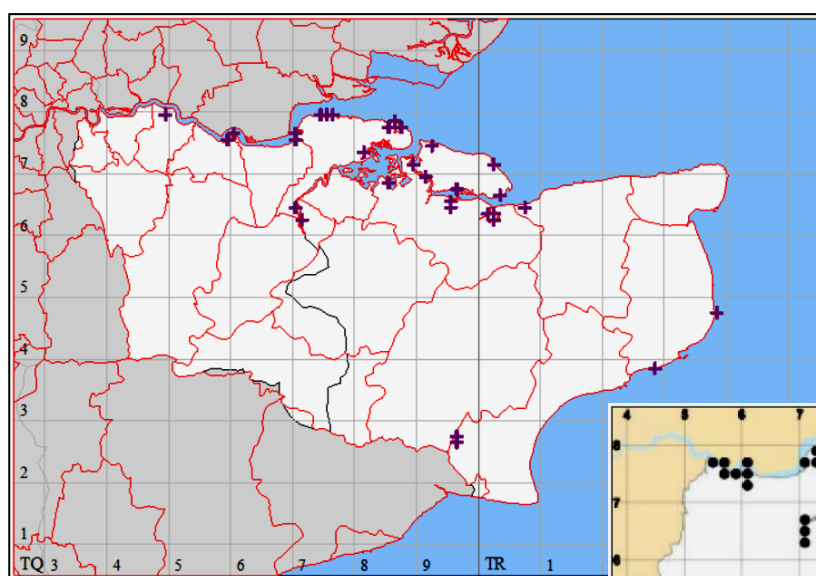
³⁶ The copy is actually marked by Smith in 1833 as with corrections and additions in 1830, 31, 32, etc., although it is not impossible that some were later, and presumably Cowell borrowed the copy in 1838. Smith's original note refers to *G. dubia*, Doubtful Sweet Grass (a name without any currency), but to this is added later 'now distinguished as *G. Borreri*, Suppl. to E.B. f.', which is a reference to Charles Babington's naming of the grass in the Supplement to English Botany, volume 3, published in 1843. Cowell was already using this name in 1839, although Babington had earlier called it *Festuca Borreri* in a paper (Description of a new British Grass) read to the Linnean Society in February 1837 (*Transactions of the Linnean Society* (1837) 17: 565).

So there may have been some expectation that Babington was going to re-name this grass of which Smith and Cowell were aware indeed, the plate in the 1843 publication is dated May 1837, so its associated account may have been held over for volume publication, while subsequent plates and species accounts were prepared; but in any event Smith was clearly in touch with the latest plant developments of the time.

1952-62 (where it remained present in 2013), a location which, although inland on Romney Marsh, is still saline from former sea incursions. From the 1971-80 county survey (Philp, 1982) a comparable distribution was identified, amounting to 78 tetrads. It was seen on sea walls, the drier parts of salt-marshes and bare muddy areas near the coast. Rarely, it was seen away from the coast on roadsides, as a consequence of winter road-salting creating new habitat; and a survey in 1982³⁷ located it in four tetrads along the A21, north and south of Sevenoaks.

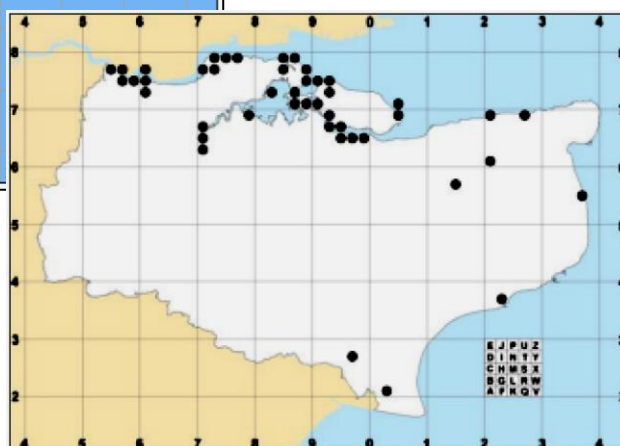
However, in contrast with the 78 tetrads of 1971-80, Philp (2010) gave only 45 tetrads for 1991-2005, an apparent decline of 42%. No reason was assigned for this; its habitats were described as much the same, noting also its occurrence in bare patches near gateways in coastal marshes. Our recent records do not offer any more encouragement as regards the tenure of this species: they amount only to 29 monads (equivalent to 34 tetrads). The current recording position is shown on the accompanying 2010-18 map, in which records are given for monads (1km squares, the level at which the register will be maintained for this species) across both vice counties, and so extending beyond the administrative county towards London. The 1991-2005 distribution data map (in which the dots indicate tetrads, not monads) is reproduced by kind permission of the

late Eric Philp and the Kent Field Club.



Puccinellia fasciculata (Borrer's
Saltmarsh-grass) 2010-18

Puccinellia fasciculata (Borrer's
Saltmarsh-grass) 1991-2005



If the limited number of recent records reflects limitations of survey, rather than increased scarcity, we should be concentrating search in the areas of Dartford, Sheppey, the Swale and between Herne Bay and Margate; there may also be more scope for roadside investigations.

The habitats noted under 2010-18 records mostly relate to saline gravelly, coastal tracks, often just landward of the sea wall. These areas are likely to be winter-wet, open and with limited vegetation generally. We have noted the grass in company with *Puccinellia distans* (Reflexed Saltmarsh-grass), with *Puccinellia rupestris* (Stiff Saltmarsh-grass) and with *Alopecurus bulbosus* (Bulbous Foxtail); the same habitats ought also to produce *Hordeum marinum* (Sea Barley). In saltmarsh, where it might be expected to favour the higher levels, it has been seen with *Tripolium pannonicum* (Sea Aster), *Salicornia ramosissima* (Purple Glasswort) and *Spartina*

³⁷ Kitchener, G.D. (1983). Maritime plants on inland roadsides of west Kent, *Transactions of the Kent Field Club* 9: 87-94. The tetrads were not published, but were: TQ45V, TQ55F, TQ55K and TQ54P. It was also found at TQ55G in 1991

anglica (Common Cord-grass). It has been seen in grazing marshes, where the ground is bare or cattle-trampled. Such habitats restrict competition by virtue of salinity and trampling.

It is a short-lived perennial, self-pollinating, and it spreads by seed, forming small tufts, sometimes clustered together in patches. It is a glaucous grass, the straw-coloured remains of older leaves often remaining at the base of the tuft, and is characterised by the panicle being stiff and one-sided. The panicle branches do not deflex, as do the lower the lower branches of *P. distans*, and those branches are not bare for much of their length towards the base (as are those of *P. distans*). The lemmas have a very slightly projecting middle nerve and are less than 3mm long (those of *P. rupestris* are ≥ 3 mm).



From Halling. Photo by Liam Rooney, 26 June 2013

The occasional existence of intermediates between *P. fasciculata* and *P. distans* creates complications. If sterile, with indehiscent anthers, they may be expected to be the hybrid, and this was recorded by Eric Philp on Swanscombe Marshes, TQ67C, in 2006; Philp (2010) refers to this at Dartford Marshes, TQ57N, and Northfleet, TQ57X, as well.

If fertile, it may be expected to be what has been called *P. pseudodistans*, but which is now generally considered to be a variety of *P. fasciculata*. This variety, which Eric Philp thought to be a fertile form of the hybrid, was more fully recorded when thought to be a species in its own right and has 18 tetrad records in Philp (1982), mainly on the north west Kent coast and in the Medway estuary, but also inland on a roadside and on road sweepings, as well as the inland saline terrain of Fairfield. Philp (1982) described it as very local but sometimes abundant where it does occur. We have no recent records, but the recording infrastructure of the MapMate database does not support it as a separate taxon in any event.

A further variant was named by Marshall in 1894³⁸ as var. *humilis*, a small prostrate plant with a short and compact inflorescence found on dried-up, or drying, mud close to the (now long vanished) station at Port Victoria, Isle of Grain. Little, if any, attention seems to have been paid to this since.

³⁸ Marshall, E.S. (1894). Notes on Kentish plants observed during 1893. *Journal of Botany* **32**: 144-9.

Puccinellia rupestris (With.) Fernald & Weath. (Stiff Saltmarsh-grass)

Draft account.

vc15 and 16

Rarity / scarcity status

Puccinellia rupestris is a southern coastal plant, mostly found by the Bristol Channel, the Solent, Kent, Essex and Suffolk. It is a **nationally scarce** plant with a fairly similar distribution and behaviour to *Puccinellia fasciculata*. Although not much more frequent than the latter (with 68 hectad records in the British Isles for 2000-18, in comparison with 57 for *P. fasciculata*), it is not so highly regarded for conservation purposes, its threat status being one of 'Least Concern', both in relation to England and to Great Britain as a whole. This status was assessed having regard to its decline in comparing the periods 1930-1969 and 1987-1999; but if records for 1987 onwards were assessed against 'all time' records (so as to include those before 1930), a significant decline of 45% would be shown. This suggests that much of the decline had preceded 1930; but in Kent, there is some evidence of decline since the 1970s. The species is neither rare nor scarce in Kent.

Account

The first Kent record appears to be a specimen mentioned by Hanbury and Marshall (1899) as gathered by Professor Henslow at Frindsbury in 1827, and held by Northampton Museum (who have since parted with their collection). Another early record was by Matthew Cowell (*A Floral Guide for East Kent, etc.*, 1839), bordering Oare Creek. Hanbury and Marshall treated the grass as a native of muddy shores, banks, salt marshes; local, and apparently absent from the south coast. They listed it from Plumstead, where not uncommon on roadsides and ditch banks in the marshes, along the Thames estuary eastwards to Higham, by the tidal Medway, on Sheppey, from Oare to Herne Bay, and on salt marshes at Thanet. Absence from the south coast was not total: there is an 1839 specimen at Kew collected by John Ball at Dover; and Miss Cobbe noted it at Folkestone Harbour³⁹; but these records are exceptional. Francis Rose made or received records in the 1940s-60s corresponding to the historic distribution, fleshing out a little more the presence of the grass along the Hoo peninsula.



Nagden Marshes. Photo by Liam Rooney, 3 August 2011

Philp (1982) gave *Puccinellia rupestris* as present on sea-walls, and along tracks on clayey soils on the coast from Gravesend to west of Birchington, overall rather local and scarce, with 28 tetrad records. Until this point, it had been very much a coastal plant. Then in 1982⁴⁰, six colonies were found on a 12km stretch of the A21 (constructed 1967-71), one of these occupying over 400m of verge. The spread of de-icing salt had clearly created suitable habitat, but the arrival of the grass (considered likely to have been introduced south of Sevenoaks, and to have spread north from there) involved a jump of at least 25km, in a direct line, from the nearest population, in the north Kent saltmarshes. No other populations could then be traced on suitable intervening roads. It seems probable that introduction was via vehicle tyres, although the areas where the grass grows naturally are generally not subject to public vehicular access. These roadside sites were not

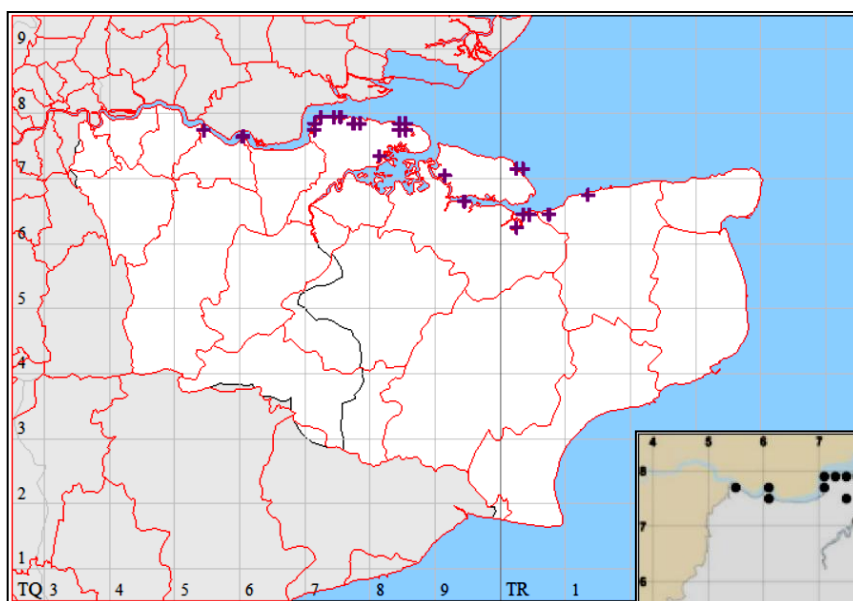
³⁹ BEC Report for 1923 (1924), 7(1): 223.

⁴⁰ Kitchener, G.D. (1983). Maritime plants on inland roadsides of west Kent, *Transactions of the Kent Field Club* 9: 87-94

included in the 1991-2005 survey (Philp, 2010), and indeed a systematic survey of the road has not been carried out again; some aspects of road construction and drainage have since been altered, and traffic intensity has increased considerably.

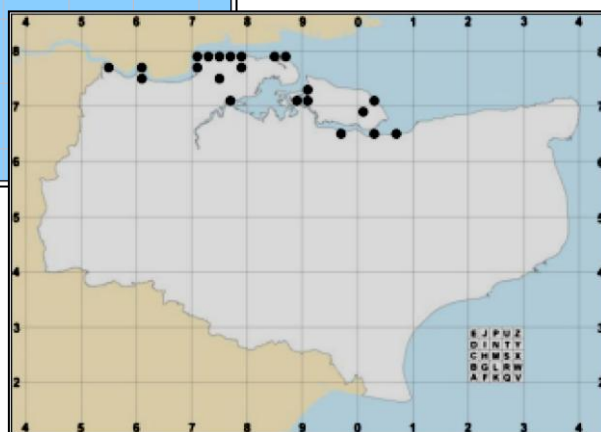
However, Philp (2010) did note presence in 22 tetrads, on bare or sparsely vegetated patches along sea walls and tracks over coastal marshes. Ostensibly this is a decline of 21% between the two survey periods, and our more recent records (for 2010-18, 19 tetrads, equivalent to 23 monads). The current recording position is shown on the accompanying 2010-18 map, in which records are given for monads (1km squares, the level at which the register will be maintained for this species) across both vice counties, and so extending beyond the administrative county towards London. The 1991-2005 distribution data map (in which the dots indicate

tetrads, not monads) is reproduced by kind permission of the late Eric Philp and the Kent Field Club.



Puccinellia rupestris (Stiff
Saltmarsh-grass) 2010-18

Puccinellia rupestris (Stiff
Saltmarsh-grass) 1991-2005



Nagden Marshes. Photo by Lliam Rooney, 3 August 2011

Although the exact sites differ to a degree, the distribution pattern is very similar. Areas where the 1971-80 survey did better are Gravesend to Higham and the Swale; these may repay further investigation, as habitats remain fairly similar.

Puccinellia rupestris is an annual or biennial, self pollinating and it spreads by seed on open ground, avoiding the competition of closed grassland. Our recent records mostly refer to the open ground of tracks by sea walls: saline, gravelly/shingly and compacted, sometimes seasonally flooded; occasionally on cattle-trampled near field entrances

or dikes on the grazing marshes. Gray (1994)⁴¹ mentions its being found on the facing stones of sea walls, resembling *Catapodium marinum* (Sea Fern-grass); our sea wall records are not explicit enough to confirm Kent occurrences of this nature. The plant is susceptible to being under-recorded, because when it is heavily trampled, with the panicle barely emerging from the upper leaf sheath, there is a temptation to pass on, seeking a more developed specimen to identify.

Nagden Marshes. Photo by Lliam Rooney, 3 August 2011

Apart from immature plants, identification is reasonably straightforward. It is a low growing plant, the culms usually starting as prostrate, then curving up. The panicles are very dense and one-sided, with short, stiff branches. The lemmas are over 2.8mm, longer than our other *Puccinellia* species except for *Puccinellia maritima* (Common Saltmarsh-grass), a much larger and patch-forming plant of true saltmarsh, also differentiated by having longer anthers (over 1mm) than *Puccinellia rupestris*.

The hybrid with *Puccinellia distans* (Reflexed Saltmarsh-grass), *P. x pannonica*, was found by A.H. Wolley Dod⁴² in Plumstead Marshes and on the canal towpath at Higham Marshes. There may have been a perennial population at the latter site, for it was re-found in 1899, 1902 and 1904; there were also records in 1945-47 on the canal bank at Gravesend.



⁴¹ Gray, A.J. (1994). *Puccinellia rupestris* (With.) Fern & Weath. Stiff saltmarsh-grass. In (eds.) Stewart, A., Pearman, D.A. & Preston, C.D. *Scarce plants in Britain*, JNCC, Peterborough

⁴² Wolley Dod, A.H. (1895). *Glyceria distans* var. *pseudoprocumbens*, n. var. *Journal of Botany* **33**: 84-85.

Pyrola rotundifolia L. (Round-leaved Wintergreen)

Draft account.

vc15 and 16

Rarity / scarcity status

Pyrola rotundifolia has been treated as two subspecies. One, subsp. *maritima*, is primarily western in distribution, and its threat status for conservation purposes is considered to be of 'Least Concern'. The other, subsp. *rotundifolia*, is sparsely scattered across the British Isles, but hardly in the west except for central Ireland. Its threat status is regarded as Near Threatened in Great Britain as a whole; but in England it is considered **Vulnerable** to the risk of extinction. A comparison of its area of occupancy in England over the periods 1930-1969 and 1987-1999 produced a calculated decline of over 30% in the likelihood of its being recorded. The position is complicated by the distinction between the two subspecies being regarded as of doubtful value by Stace (2019, and earlier editions), and this seems to be the case for Kent. The species itself, however, is very **scarce** in Kent.

From Stowting. Published in *The Wild Flowers of Great Britain* (1866) by R. Hogg & G.W. Johnson, vol. III

Account

The first published Kent record for Round-leaved Wintergreen is in H.C. Watson's *The New Botanist's Guide* (1835) in which he mentions having received a checked catalogue from G.E. Smith, from which the species was noted as in 'Single stations in M[id] and S[outh] Kent'⁴³. It is possible to identify these sites, both from Smith's own notes and from the listings in Hanbury and Marshall (1899) as (1) in a wood near Milstead (from which Smith collected a specimen which went to William Borrer's herbarium, now at Kew); and (2) at Coombe Wood, Hawkinge. The latter site may have been the same as a copse near Coombe Farm, where F.J. Hanbury found it to be abundant in 1894; but there were other nineteenth century records in the same general area: Hastingleigh, Stowting and, further north, Petham, Kingston and Shepherdswell. Hanbury and Marshall regarded it as a rare and local native, in woods, chiefly on chalk. The only West Kent record then noted seems at first sight anomalous, at Joyden's Wood, where the geology is sand and gravel, but presumably the record was from the southern end (Chalk Wood), where the ground is more calcareous.



⁴³ This appears to be a catalogue distinct from Smith's published *Catalogue of rare or remarkable phaenogamous plants, collected in South Kent* (1829), and included all species known to Smith in South Kent 'with some others from different parts of the county, but not falling under his own observations in the south'. Smith's manuscript notes in his own interleaved copy of his published *Catalogue* include a crossed-out entry for *Pyrola rotundifolia* as follows: 'In full flower in July, Coombe Wood. The Reverend A. Barker [?] – In a wood at Milstead. This plant is noticed in a M.S. catalogue of Kentish plants written by Mr. Lindley or Mr Sabine [?] – but without locality'.

Lindley would have been John Lindley (1799-1865).

Further East Kent records were made in 1946: at Brook, by Colin Pope; and at Waltham and Chartham, by Miss D. Long⁴⁴. After then, the focus of records appears to move from woods on chalk, to old chalk pits. Philp (1982) refers to *Pyrola rotundifolia* as a plant of woods, old quarries and scrub on chalk, citing records at Nackholt, Yockletts Bank, and two pits: Berengrave near Rainham and Horns Cross Pit. The former pit is now a local nature reserve (the discovery of the *Pyrola* there in 1974 contributing to the site's designation); the latter has been infilled and even at the time of publication of Philp (1982), the locality had been destroyed.



Swanscombe Marshes. Photo by Liam Rooney, 23 August 2015

The records in Philp (1982) amounted to four tetrads. Similarly, the 1991-2005 survey (Philp, 2010) amounted to four tetrads, but this time, all sites were on old industrial workings. Berengrave pit continued to host plants: it is a former chalk quarry, part of cement works which closed down in 1931. *Pyrola rotundifolia* was also recorded in a disused chalk quarry at Swanscombe, and along a disused chalk quarry railway track, also at Swanscombe. The latter was part of the internal railway system within Swanscombe Cement Works, which declined from 1970 onwards with final shutdown in 1990 (when wagons can still be seen on the line in aerial photographs). The fourth *Pyrola rotundifolia* site was at Beacon Wood Country Park: this was a pit excavated for London Clay, pumped along a pipeline to cement works, but closed for these purposes in 1964 and has been slow to re-vegetate, with little ground cover in many parts. London Clay is somewhat alkaline due to the presence of calcium salts; concentrations of calcium carbonate and phosphate may be found where there are bands of septarian

nodules.

All these locations have in common a long period of disuse, a slow colonisation by plants generally, because of the relative absence of soil, and all are highly calcareous, except for Beacon Wood, which is less so. There is also a link with dampness, in that plants tend to grow in the vicinity of seasonally flooded areas, but perched above normal water levels and so only periodically inundated, if at all. Additionally, they tend to grow around the roots of willows (*Salix* spp.). This is particularly evident at Beacon Wood, where plants have been observed in damp mossy areas under *Salix caprea* (Goat Willow). The Swanscombe Marshes railway site is a chalk embankment shaded by *Salix caprea*, draining from higher ground above and with a winter-flooded area below.

At least five other sites have been known, during or after the 1991-2005 survey, with similar characteristics, although one, possibly two, has been destroyed. Bamber pit, Swanscombe, is an old chalk quarry where *Pyrola* formerly grew on chalk humps at the damp quarry floor with *Epipactis palustris* (Marsh Helleborine) before tipping encroached and affected the pit drainage. Both species disappeared, but *Pyrola* has reappeared elsewhere in the pit. Craylands Gorge is a former minerals railway in deep chalk cuttings, where *Pyrola* has been recorded at the damp base with *Epipactis phyllanthos* (Green-flowered Helleborine). The third site is, or was, the Eastern Quarry between Bluewater and Ebbsfleet, which had a tunnel connection with Craylands Gorge and is the subject of the proposed development of Ebbsfleet Garden City. In 2000, the north western part of this site comprised a damp quarry floor beginning to scrub over with, inter alia, *Salix caprea*; in

⁴⁴ BEC Report for 1946-47 (1948), 13: 301.

association with this, 1,017 flowering spikes of *Pyrola rotundifolia* were counted, and ten years later its population was estimated at 70,000 plants; but it is possible that this is virtually all gone, in consequence of preparatory works for development. The fifth site is a chalk pit at Cuxton which ceased operation in the 1970s and was developed for housing as the Medway Gate estate, c. 2010. The fifth site is at Shorne Wood Country Park, which has a similar geology and history to Beacon Wood, having been leased from the 1930s to the 1970s for extraction of London Clay in connection with cement manufacture. In addition, there is an unconfirmed report of the presence of *Pyrola* at the southern edge of the former chalk pit containing the Bluewater retail development.

So, during the period 2000-18, at least eight sites were known, in comparison with the four identified in Philp (2010). However, this apparent expansion may be a passing phase. All recent sites are associated with the former cement industry. Until the 1870s the Thames and Medway had a virtual monopoly of Portland cement manufacture; Swanscombe works were the largest in Britain until 1930; and even by 1970 the north Kent cement industry was the largest in Europe, but has since declined considerably. The result has been the abandonment of many industrial sites, offering opportunities for colonisation by *Pyrola*, but these have been reducing with their development. Also, the remaining former pits have been increasingly secured from any access by palisade fencing, presumably to avoid prejudice to their development potential, and for safety considerations.

Pyrola rotundifolia is a patch-forming perennial, capable of spreading to new sites by seed, which is very small and capable of wind dispersal. It is, however, mycorrhizal, dependent on the presence of fungal associates for germination and establishment. This may explain the association with *Salix caprea* noted in Kent. It may also be relevant to the length of time before these former industrial sites become suitable for *Pyrola*, if the mycorrhizal fungi are to establish first; and it is interesting that two of these sites had associations with rare *Epipactis* species which also have mycorrhizal requirements, although not necessarily the same.



From Swanscombe Marshes. Photo by Lliam Rooney, 24 August 2015

Pyrola rotundifolia subsp. *maritima* and subsp. *rotundifolia* are usually separated on the basis of leaf shape (rarely orbicular in *rotundifolia*; usually orbicular in *maritima*); scale-leaves on stems above true leaves (1-2 in *rotundifolia*; 2-5 in *maritima*); sepals (acute in *rotundifolia*; obtuse in *maritima*); anthers (2.2-2.8mm in *rotundifolia*; 1.9-2.4mm in *maritima*); and style (6-

10mm in *rotundifolia*; 4-6mm in *maritima*). However, Philp (2010) found that some plants measured up as *rotundifolia* and others as *maritima*, whilst most plants showed characteristics of both subspecies. So the subspecific distinction may not be particularly helpful in Kent. The possibility that subsp. *maritima* occurred in Kent at all (which is remote from its normal distribution) was raised by John Palmer in relation to plants at Bamber pit first seen in 1976, but measured up in 1984, and falling within the criteria for subsp. *maritima*.⁴⁵ He conjectured that these may have arrived as seed from Holland.

Site	Grid reference	Site status	Last record date	Recorder	Comments
Horns Cross Pit, Atlas Stone Co Pit	TQ57S		(1) 1975 (2) 1974	(1) (2) JRP, JEL	(1) Atlas Stone Co pit. In plenty; pit being filled in, autumn 1975.

⁴⁵ Palmer, J.R. (1993). *Pyrola rotundifolia* subsp. *maritima* in E England, *BSBI News* 64: 17.

			(3) After 1970, before 1981	(3) Philp (1982)	(2) Atlas Stone Co Pit, (3) Recorded as subsp. <i>rotundifolia</i> . Locality destroyed before 1982.
Beacon Wood Country Park	TQ5871, TQ5971	Country Park	(1) 16 May 2015 (2) 28 July 2012 (3) 6 August 2011 (4) 12 July 2011 (5) 12 June 2006 (6) 8 May 2001 (7) 8 September 1996 (8) 1991-98 (9) 8 September 1990	(1) KFC meeting (RMB) (2) RR (3) GK (4) RR (5) JP (6) JP (7) KFC / LNHS meeting (8) EGP (9) JP	(1) a few hundred plants, some flowering, in damp area about 18x4m, TQ 5900/1 7165/6. (2) About 280 flowering plants counted, also many non-flowering plants, at TQ 59009 71668. (3) At edge of periodically inundated area on clay, shaded under <i>Salix caprea</i> (inter alia), hundreds of plants, between TQ 58995 71658, TQ 59006 71654 and TQ 59004 71670. (4) TQ 588 717, in an area c20m x 10m, 190 flowering spikes in country park plus many non-flowering. (5) TQ 589 718, under willows at edge of pond. (6) TQ 590 717, large patch, c. 4 x 6 metres on barish ground NE of pine tree on central path. Under birch and goat willow. (7) Under willows of pond edges. (8) Recorded as old quarry in Beacon Wood Country Park, TQ57V, and so assumed to be TQ5871 &/or TQ5971. (9) TQ 589 718.
Eastern Quarry	TQ5873		(1) 13 July 2010 (2) 17 August 2000	(1) (2) GK	(1) Reported as at TQ 5880 7395, estimated population 70, 000. (2) 27 populations under <i>Salix caprea</i> , totalling 1,017 flowering spikes within the area bounded by TQ 589 736, TQ 586 734 and TQ 585733; survey was not considered fully comprehensive.
Greenhithe / Swanscombe	TQ57X		23 July 1999	EGP, PH	Disused chalk quarry at Swanscombe.
Craylands Gorge, etc.	TQ5974		(1) 13 July 2010 (2) 2001 (3) 17 August 2000	(1) DJ (2) JW, JP (3) GK	(1) Craylands Gorge, large patch growing roughly between TQ 5976 7479 and TQ 5987 7478, among ivy and horsetail. Estimated population 20,000. (2) Large colonies growing on damp calcareous floor of Craylands Gorge, [Given grid references TQ 597 744 and TQ 599 745 seem to be rough approximations.] (3) TQ 598 748, 11 populations in gorge, 877 flowering spikes.
Swanscombe, Bamber Pit	TQ6074		(1) 13 July 2010 (2) 1995 (3) September 1984 (4) 10 July 1976	(1) HM (2) ALw (3) JRP (4) JRP	(1) TQ 6075 7455, estimated 80-100 plants. (2) TQ 608 746, non-flowering. (3) Recorded as subsp. <i>maritima</i> (leaves round, stem scales 3-5, calyx teeth short, broad and blunt, anthers < 2mm) and later conf. EGP. (4) Growing with <i>Epipactis palustris</i> , <i>Dactylorhiza praetermissas</i> , <i>Anacamptis pyramidalis</i>
Swanscombe Marshes	TQ6075		(1) 26 September 2017 (2) 23 August 2015	(1) DC (2) KBRG meeting	(1) TQ 603 754, c.20 plants on shady mossy bank, one still flowering. (2) TQ 60075 75705, on and at foot

			(3) 13 July 2014 (4) 1991-99	(3) GK (4) EGP	of shaded west-facing chalk embankment, near damp ground, flowering and flowered plants spread over several metres. (3) TQ60075 75705, on west-facing steep chalk bank (perhaps former industrial light railway formation), dampish at bottom, growing amidst ivy under shade of <i>Salix caprea</i> and <i>Betula pendula</i> , several loosely associated groups, of 16, 18 and 10 flowering spikes, with plants in leaf being more extensive. (4) Recorded as subsp. <i>maritima</i> originally, but plain <i>P. rotundifolia</i> in Philp (2010), where given as along a disused chalk quarry railway track in TQ67C, so assumed to be TQ6075.
Shorne Woods Country Park	TQ6869		(1) 14 May 2015 (2) 3 November 2010	(1) IS, SA (2) JP	(1) TQ 68156 69810 to TQ 68150 69821, Shorne Woods Country Park in secondary woodland, mainly birch, over a moss ground layer on London Clay. In winter the water table is at, or slightly above, ground level. There are very shallow drainage runs meandering through the woodland, and the <i>Pyrola</i> grows in and along one of these - abundant leaf, and about 5 flowering spikes. (2) Two colonies, under willow in dried up pond area.
Cuxton	TQ7268		(1) 2003 (2) 1995	(1) AC (2) JW, JP	(1) TQ 724 679. (2) TQ 724 680, No. 3 pit. [Since developed as housing estate.]
Berengrave Pit, Rainham	TQ8267	Local nature reserve, part of Riverside Country Park, managed by Medway Council	(1) 13 August 2012 (2) 20 July 2009 (3) 1991-99 (4) 22 July 1997 (5) 5 September 1996 (6) 1 August 1983 (7) After 1970, before 1981	(1) SB (2) SP (3) EGP (4) JS (5) FR (6) FR (7) Philp (1982)	(1) Three plants at TQ 8209 6710. (2) A few plants holding on with increasing ivy cover over the ground. (3) Recorded as TQ861, old chalk quarry within Berengrave nature reserve. (4) TQ8267 (5) TQ 820 671. (6) TQ 820 671, locally very abundant. (7) Recorded as Berengrave pit, TQ861.
Nackholt	TR04R		After 1970, before 1981	Philp (1982)	[There is a 1948 record, considered to be at TR 064 425.]
Yockletts Bank	TR14I	KWT nature reserve	(1) 24 June 1986 (2) 27 May 1984 (3) After 1970, before 1981	(1) FR (2) FR (2) Philp (1982)	(1) TR1247, rare. (2) TR1247. Overgrown, needs much management. (3) TR14I.

Pyrus pyraster (L.) Burgsd. (Wild Pear)

Draft account.

vc15 and 16

Rarity / scarcity status

There are pears (*Pyrus* sp.) growing in the wild in Kent and across the British Isles, but setting aside *Pyrus cordata* (Plymouth Pear) which grows in Devon and Cornwall, there is unlikely to be any native pear, and pear's status is at best an archaeophyte-denizen (an ancient introduction behaving as a native). Pears with the characteristics of *Pyrus pyraster* appear to be the 'wildest', but the distinction between *Pyrus pyraster* (Wild Pear) and *Pyrus communis* (Pear, the edible pear to which escapes from cultivation are usually assigned) was not made in mainstream botanical recording until the first edition of Clive Stace's *New Flora of the British Isles* (1991). There is a good case for not separating *P. pyraster* and *P. communis*, but treating them (as in Sell & Murrell, 2014)⁴⁶ as one species, *P. communis*. Sell & Murrell (2014) divide up the one species into: subsp. *communis* (as equivalent to *P. pyraster*); subsp. *achras* (the perry pear); and subsp. *sativa* (the edible pear). This at least offers recorders the ability to record pears as *P. communis* where there is uncertainty about whether they fit *P. pyraster* (although this is generally done by recording as pear in the wide sense, viz. *P. communis* sensu lato).

The upshot of this is that: pears in the wild are not necessarily the same as Wild Pears; and pear records before 1991 may or may not be of *Pyrus pyraster*. A threat status for conservation purposes has not been assigned to *P. pyraster*, although for England, that of *P. communis* sensu lato is regarded as of 'Least Concern'. The number of records assigned to *P. pyraster* in Kent indicates that we should regard the species as **scarce** in the county, if present.

Account

As for the early presence of pear in Kent, Godwin (1975)⁴⁷ refers to archaeological evidence of pear charcoal in Kent, from the Iron Age Hill Fort at Bigbury Camp near Harbledown and from Canterbury; but this must be uncertain, because determinations of *Pyrus* might have followed the older use of this generic name, which formerly included *Sorbus* species. Better evidence is provided by the citation of Perie as a place-name in the Domesday Book for Perrywood, and the combination of both perry (from the Old English *peru*, pear) and wood (from the Old English *wudu*, wood) in a 1485 mention of Perywode. Documented pear introduction goes at least back to 1533 when 'Pear grafts of diverse sorts' were imported by Richard Harrys to Teynham for growth in orchards.

The first documented Kent record of pear in the wild was by Edward Jacob in his *Plantae Favershamienses* (1777) where he mentioned Wild Pear Tree as very uncommon, 'In the Wood leading from Keneways to Wilderton'; this looks as though it would have been Wilderton Wood, south of Painter's Forstal. From the botanical nomenclature of the time, we cannot tell whether this would now have keyed out to *P. pyraster*. Similarly as regards other records listed by Hanbury and Marshall (1899) under *P. communis*, which they regarded as an uncommon denizen or alien of woods and hedges, probably always bird-sown.

Francis Rose considered Wild Pear (as *P. communis*) to be probably introduced, but possibly native. He saw it in 1946 at Keston Common (also known here by Ted Lousley in 1922) where it was attributed to var. *pyraster*. Intriguingly, he noted with David McClintock in 1958, a pear resembling *Pyrus cordata* in a roadside copse at

⁴⁶ Sell, P. & Murrell, G. (2014). *Flora of Great Britain and Ireland*, vol.2, CUP, Cambridge.

⁴⁷ Godwin, H. (1975). *History of the British Flora*, 2nd edition, CUP, Cambridge.

Paustre Court, 1½ miles west of Wittersham. His manuscript *Flora* contains 16 locations for Wild Pear, most in metropolitan north west Kent and in the Weald.

Philp (1982) gave *P. pyrastrer* as native in woods and scrub, very rare with five tetrad records⁴⁸, but perhaps confused with *P. communis*. Clearly a proper attempt was being made to differentiate, given that the main British Flora of the time⁴⁹ did not separate out *P. pyrastrer*. Philp (2010) stated that the few plants seen, in hedgerows and woodland edge, had a good claim to be regarded as native. They amounted to three tetrad records only, near Bough Beech TQ44T, Four Elms TQ44U and Ightham TQ55X: all differing from the Philp (1982) finds. A record not included in this set was in 2000, by John Palmer at New Barns, Swanley, TQ 511 699 (leaves lustrous above, fruits globular, white-speckled). Also, outside the scope of Philp (1982 & 2010), because in the London Borough of Bromley, is a record of a mature tree from Summerhouse Hill Wood, Beckenham Place Park, TQ 383 703 (1992-95) an area of ancient woodland with many tree plantings.

Since 2010, there have been four claimed sightings for *P. pyrastrer* in Kent: Hoo St Werburgh (TQ7872) in 2014; Four Elms (TQ 47614 48989, the original tree accepted by Eric Philp for Philp, 2010, plus a second bush nearby) in 2014; Orlestone Forest (TQ 97870 35036) in 2014; and Jubilee Country Park, Bromley (TQ4368) in 2015. A fuller study has been made of some of them, and other plants, by Stephen Lemon (**Problems with Pyrus in Kent**) and extracts from this study are included below.

During May 2014 I found a Pear tree west of Hever (TQ 465 455). This offered the opportunity of a comparison with another Pear tree just east of Winkhurst Green (TQ 498 494). Subsequently I was also provided with details of another two Pear trees, one at Orlestone Forest (TQ 978 350) and another at Four Elms (TQ 476 489). Pear records submitted to the Kent Botanical Recording Group are for both *Pyrus pyrastrer* (Wild Pear) and *Pyrus communis* (Pear). Fewer records exist for *P. pyrastrer*, to such an extent that it has been placed in the Kent Rare Plant Register. Two further species of Pear are known in the British Isles, *Pyrus cordata* (Plymouth Pear) and *Pyrus salicifolia* (Willow-leaved Pear), but so far neither has been recorded wild in Kent and the four Pear trees examined were not these two species.

Stace (2010) and Poland & Clemen (2009)⁵⁰ take a more or less consistent approach to identification of Pears with both recognising *P. communis* and *P. pyrastrer* as separate species. This has been standard for British botanists since the first edition of Clive Stace's *New Flora of the British Isles* (1991); previously the various editions of the *Flora of the British Isles* had lumped both together under one name, whether *P. pyrastrer* or *P. communis*. More recently the publication of Sell & Murrell (2014) has provided an alternative approach. Sell & Murrell recognise *P. communis* as a species, but not *P. pyrastrer*. *P. pyrastrer* is re-classified as one of three subspecies of *P. communis* and re-named *Pyrus communis* subspecies *communis* (Wild Pear). A remark in Stace that *P. pyrastrer* and *P. communis* are '...perhaps not specifically distinct', gives some justification to Sell & Murrell seeking an alternative approach. In addition Sell & Murrell provide a way of identifying their subspecies without fruit by reference to how soon leaf hairs are lost. They also recognise another form of Pear: *Pyrus communis* subspecies *achras* (Perry Pear), which has fruit of a similar size to *Pyrus communis* subsp. *communis*. I have attempted to apply the Sell & Murrell approach to my assessment here. The following key to the *P. communis* subspecies is based on detail taken from Sell & Murrell:

1. Leaves soon glabrous after opening or nearly so; spines usually present on spur shoots; fruits 1.3-3.5 x 1.8-3.5 cm, globose or turbinate, often with conspicuous lenticels, hard and gritty to taste

***Pyrus communis* subspecies *communis* (Wild Pear)**

1. Leaves woolly beneath well into the summer
2. Leaves densely hairy beneath throughout the summer; spines sometimes present on spur shoots; fruits 2.5-3.0 x 2.5-3.0 cm, globose or turbinate, hard, gritty and sour to taste

***Pyrus communis* subspecies *achras* (Perry Pear)**

⁴⁸ Not identified in Philp (1982), but they were: TQ56X, 57F, 57Q, 57V and 67F; so all West Kent. The TQ57F, TQ67F and TQ57Q are John Palmer's, the last of these made in company with Eric Philp and Peter Hall.

⁴⁹ Clapham, A.R., Tutin, T.G. & Warburg, E.F. (1962) *Flora of the British Isles*, 2nd edition, CUP, Cambridge.

⁵⁰ Poland, J. & Clement, E.J. (2009). *The Vegetative Key to the British Flora*, John Poland/Botanical Society of the British Isles, Totton.

2. Leaves densely hairy at first but slowly becoming glabrous through the summer; spines not usually present on spur shoots; fruits (5-)6-16 x 4-12 cm, subglobose, turbinate, pyriform or oblong, soft and sweet to taste

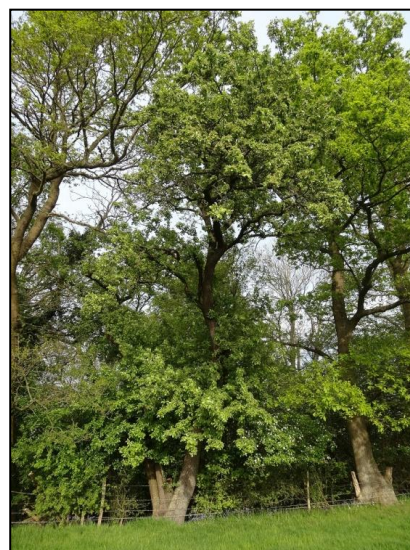
***Pyrus communis* subspecies *sativa* (Edible Pear)**

Hever and Winkhurst Pears

Both the Hever and Winkhurst Pears grow within farmed countryside, not immediately next to human habitation. Historic imagery from Google Earth back to the 1940s does not show orchards in the fields adjacent to either and earlier Ordnance Survey maps back this up. Neither displays obvious signs of a planted origin. The Hever Pear is a large coppiced tree at the edge of a shaw with an open canopy of three tall trunks, presumably coppiced with the rest of shaw over fifty years ago. In contrast the Winkhurst Pear is a standard tree in a hedge dividing fields, with a short trunk and a dense wide crown. The Winkhurst Pear becomes visible in its hedge on Google Earth's historic imagery from 1960.



Winkhurst Pear



Hever Pear

The Hever Pear has pale green leaves with a dull shine, the edge of the leaf entire and glabrous brown buds. The Winkhurst Pear has dark green leaves with a bright shine, a crenate/serrate leaf edge and hairy brown buds. When visited in April 2015 the newly emerged leaves on both trees were found to have a fairly dense coating of hairs on the underside of the leaf. Both trees had spiny growth on their non-fruit bearing lower branches; much less on the Hever Pear and probably encouraged by cattle grazing on the Winkhurst tree.



Hever Pear (left) and Winkhurst Pear (right), July 2014.

The importance of selecting ripe fruit was demonstrated when considering the size, shape, texture and taste, as these factors changed right up to the time of ripening. A selection of ripe fruit collected from both Pears was between 4 and 5 cm in length, although a single fruit of just over 5 cm was found for the Hever Pear. Neither Pear could be described as having "pear" shaped fruit. The Winkhurst Pear's fruit had an even spread of tiny white lenticels across the skin and was uniformly globose when first examined in July 2014, widening by the time it ripened in September to become more apple shaped. The pedicels of the Winkhurst Pear were long; just over 3 cm which made them stand out in the early stages of development although this was less obvious at maturity.

Ripe fruit of Winkhurst Pear (left of ruler) and Hever Pear (right of ruler), 7 September 2014.



The Hever Pear had a more turbinate shaped fruit with a pedicel half the size of the Winkhurst Pear. Both Pears had sweet tasting fruit with firm rather than hard flesh when ripened in early September 2014 but were deceptively sour and hard before ripening. The Winkhurst Pear had the most pleasant tasting fruit and made excellent jam!

Orlestone Pear

In early October 2014 Owen Leyshon provided me with the fruit from another Pear tree on the north side of Longrope Wood at Orlestone Forest. He confirmed that this Pear tree grows a short distance into the woodland from the road and is very tall with a bifurcated trunk and spiny growth. Its fruit resembles the shape of the Hever Pear and like the Hever and Winkhurst Pears is between 4 and 5 cm in length. In contrast its fruit was harder when ripe, but still had a sweet taste.

Ripe fruit of Orlestone Pear, 7 October 2014.



Summary of the Hever, Winkhurst and Orlestone Pears

All three Pears described have the sweet tasting ripe fruit of *P. communis* subsp. *sativa*. However they display an intermediate fruit length, below the lower range of *P. communis* subsp. *sativa* and above the upper range of *P. communis* subsp. *communis*. The densely hairy underside to the leaves of the Hever and Winkhurst trees brings them closer to *P. communis* subsp. *sativa*. The Hever tree's virtual lack of spines suggests that it is closer still to *P. communis* subsp. *sativa*. In contrast the Winkhurst Pear's more obvious spines and globose fruit with lenticels brings it back nearer to *P. communis* subsp. *communis*. The Orlestone Pear's hard ripe fruit and spiny growth also suggests it has some affinity with *P. communis* subsp. *communis*.

The most obvious point from the above is the mix of features displayed by all three trees. With these examples one wonders how far the three Sell & Murrell *P. communis* subspecies hold true in the farmed landscape of Kent? A hybrid origin for these Pears might account for their mixed characters. The *Hybrid Flora of the British Isles* (Stace, Preston & Pearman, 2015) refers to many wild Pears being difficult to place and the suspicion that hybridisation is the cause. However it also refers to the lack of studies into *Pyrus* hybrids with no formal records and an unproven existence in the British Isles. In light of this the most appropriate description for these Pears at present seems to be *P. communis sensu lato* (so as not to assign any subspecific name, as used by Sell & Murrell). It is worth noting that the same conclusion was reached when assessing these Pears using Stace (2010) and Poland & Clement (2009) (so as not to commit to the name *P. pyraeaster*).

Four Elms. Photo by Lliam Rooney, 28 August 2008

Four Elms Pear

Lliam Rooney provided the location of a Pear within a roadside hedge near Four Elms that was originally discovered by Eric Philp and was one of the three *P. pyraeaster* records given in (Philp, 2010). Google Earth's historic imagery indicates the hedge is all that now remains of a shaw that was grubbed out after 1960. There are some large coppice stools within the hedge from a variety of tree species, but not in the section with the Pear. On visiting the site, a second Pear was located five metres from the original. This all suggests the section of hedge with the Pears did not originate from the woodland shaw, but there were no obvious indications of it having been planted. The Pears are both no more than large bushes that lack fruit due to annual cutting, but have substantial spiny growth that is probably encouraged by the annual cutting. The leaves have a similar crenate edge to the Winkhurst Pear but are smaller and almost spherical in shape. Significantly the leaves were glabrous on the upper surface and almost glabrous on the underside when examined in April 2015, with just a few hairs along the veins and leaf edge. In lieu of ripe fruit, the



prolific spiny growth and the almost hairless leaves soon after opening seem sufficient to place this Pear as *P. communis* subsp. *communis*.

Stephen Lemon's thorough assessment means that a degree of doubt must attach to Kent records of *P. pyraeaster*, particularly as regards those examined by him. He also found no evidence of mature fruit of the size and sourness which might indicate that *P. communis* subsp. *achras* is present in the wild in Kent.