

SUFFOLK MILLIPEDES.

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INTRODUCTION

Many aspects of the natural history of the county of Suffolk have been well studied in the past. This has enabled the identification of sites within the county which have a national or even international importance for wildlife. The bird reserves of Minsmere and Havergate Island and the flora of the Brecklands are obvious examples but equally the spiders of Lopham and Redgrave Fens and the mollusca of Carlton Marshes are testimony to the richness of the invertebrate fauna of Suffolk. In view of this history of recording and fieldwork it is surprising that so little was known of the millipede fauna until recently.

This paper summarises current knowledge of the Suffolk millipede fauna. The species of millipede recorded from the county up until April 1993 are listed and their known distribution within the county, using the OS 10km grid squares, are given. The information is based mainly on fieldwork surveys conducted during the three years from April 1990 to April 1993 but records have also been extracted from literature sources and data banks.

THE GEOGRAPHY OF SUFFOLK

For the purposes of this work the boundaries of Suffolk are taken to be those of the Watsonian vice-counties 25 and 26. The county has a land area of 380 020 ha and parts of it lie within 58 different 10km grid squares. Two of these grid squares contain less than 1 sq.km of land considered to be within Suffolk and so have been ignored in fieldwork. The remaining 56 grid squares comprise: TL64, TL65, TL66, TL68, TL74, TL75, TL76, TL77, TL78, TL83, TL84, TL85, TL86, TL87, TL88, TL93, TL94, TL95, TL96, TL97, TL98, TM03, TM04, TM05, TM06, TM07, TM13, TM14, TM15, TM16, TM17, TM23, TM24, TM25, TM26, TM27, TM28, TM33, TM34, TM35, TM36, TM37, TM38, TM39, TM44, TM45, TM46, TM47, TM48, TM49, TM57, TM58, TM59, TG40 AND TG50.

Suffolk is still basically an agricultural area although land is being lost to urbanisation and leisure developments at an increasing rate. Upland habitats are obviously absent in a county which only reaches a maximum 128m above sea level but excepting this a wide range of natural and semi-natural habitats can still be found within its borders albeit in some cases only as small pockets within the agricultural deserts.

Agricultural practises have largely denuded the county of its forest cover. Almost a third of the extant woodland is conifer plantation and patches of truly ancient broadleaved woodland are few and far between. In this environment hedgerows and shelter belts provide important refuges for wildlife. Agriculture has also destroyed many fens and flood meadows by drainage and still threatens much of the valuable fenland which remains in the north of Suffolk. By comparison sandy heathlands are still relatively common in the Breckland to the northwest of the county and along the eastern coastal strip while more calcareous grassland occurs in small patches especially around Newmarket.

The 80km of Suffolk's coastline are indented by half a dozen large estuaries and provide a varied range of maritime habitats including sandy beaches, shingle, mud flats, saltmarshes and unstable soft earth cliffs. Natural hard rock features are absent but the harbour walls and concrete sea defences provide an apparently acceptable alternative for a range of marine organisms.

HISTORICAL RECORDS

William Kirby of Barham, near Ipswich, appears to have made the first recorded observation of a millipede in Suffolk. *Polydesmus complanatus* (= *P. angustus*) was noted by Kirby as a pest of carrot and parsnip crops in the county in his "Introduction to Entomology". Morley (1933a) quotes from an 1859 edition of the book by Kirby and Spence while Brade-Birks (1929) refers to the original paper by Kirby (1823) but notes that it is thus unclear as to whether this record of a Suffolk millipede dates from the first or second half of the last century but in either case it is certainly the earliest record I know of.

By the end of the century the only other species recorded was *Glomeris marginata* noted as being seen "about Ipswich occasionally since 1894" (Morley, 1931). This was the first millipede record published by Claude Morley who dominated Suffolk natural history during the first half of this century. Morley was an entomologist but collected and recorded a variety of other groups of organisms. In the same note in which he mentioned *Glomeris* at Ipswich he also announced that "the Revd. S. Graham Brade-Birks" was willing "to determine the *Centipeds* and *Millipeds* of Suffolk" and offered to forward specimens collected by members of the Society for identification. Later Morley (1932) complains of the postal services restricting knowledge of Suffolk myriapods by reducing "tubes and their contents [sent to Brade-Birks] to the condition of the Augean Stables!" A sentiment no doubt echoed by many modern collectors.

In 1929 Morley added three new species to the county list, namely *Proteroiulus fuscus*, *Blaniulus guttulatus* and *Ommatoiulus sabulosus* (Morley, 1943). The last of these was one of the specimens identified by Brade-Birks (Morley, 1932). The next decade saw the number of published records of Suffolk millipedes triple, not surprising when there were only 5 pre-1930 records

but indicative of Morley's activity and desire to get naturalists involved in working on the "smaller orders". The species list was also extended with *Polyxendus lagurus* recorded from Monks Soham (Morley, 1931: 1935: 1936), *Julus albipes* (= *Tachypodoiulus niger*) from Monks Soham (Morley, 1933b) and *Brachydesmus superus* from Tuddenham Fen (Morley, 1932), the latter again identified by Brade-Birks. Two other species were noted during this period but the names are not attributable to any one species recognised today. *Julus terrestris* is noted from Monks Soham and West Stow and *Julus albilineatus* from Bentley Woods and Westleton Heath (Morley, 1943). Morley continued to publish records of millipedes in the 1940's but with less regularity than in the previous decade and his last record is of *Julus terrestris* (probably *Tachypodoiulus niger* in this case) from Monks Soham (Morley, 1946). He did add a further species to the county list during this period namely, *Cylindroiulus luscus* (= *C. britannicus*) from Knettishall Heath (Morley, 1941).

The only records from the next decade were made in 1950 (*Nemasoma varicorne*, *Ommatoiulus sabulosus*, *Tachypodoiulus niger* and *Ophiulus pilosus*) and in 1951 (*Cylindroiulus latestriatus*). With the exception of *O. sabulosus* (Ellis, 1951) these specimens were all collected by O. Gilbert of the Suffolk Naturalists' Society and identified by J.G. Blower. The records were then submitted to BRC when the millipede recording scheme was established. Thus by this time the species list for Suffolk stood at twelve.

In 1962 P.D. Gabbutt collected a number of specimens from Thorpeness. These were identified by Blower and included a specimen of *Julus scandinavicus* recorded for the first time from Suffolk. Blower himself added *Archiboreoiulus pallidus* in 1966, a species which has not been seen in the county since.

The great majority of records from the 1970s were collected by P.T. Harding. These included seven species recorded for the first time in Suffolk (*Craspedosoma rawlinsii*, *Nanogona polydesmoides*, *Cylindroiulus punctatus*, *Brachyiulus pusillus*, *Polydesmus inconstans*, *P. gallicus* and *P. denticulatus*) and were collected mainly from just two sites; Haughley Agricultural Research Station and Staverton Park (Harding, 1974). An eighth new species, *Choneiulus palmatus*, was collected from Butley by P.C. Tinning and identified by D.T. Richardson. This is also a sole record for the county.

The East Anglian Fen Survey conducted by D. Procter and A. Foster at the end of the 1980s produced a number of millipede specimens which were identified by R.E. Jones. These included specimens of *Craspedosoma rawlinsii* from a second Suffolk location, Wangford Carr near Lakenheath (R.E. Jones, pers. comm.). Despite this survey and further work by Harding and others no new species were added to the county list during this decade.

THE PRESENT SURVEY

The bulk of the records of millipedes from Suffolk, 84% (see

Table 1), are from the current decade. The task of collecting these records was begun in April 1990 at BMG annual meeting based at Thornham Magna. This task has been continued out of personal interest since that time.

Table 1: Total number of millipede records made in Suffolk in each decade.

Time period	pre- 1900	1900 -19	1920 -29	1930 -39	1940 -49	1950 -59	1960 -69	1970 -79	1980 -89	1990 -93
Number of records	2	0	3	16	4	8	11	67	40	782

It was recognition of the paucity of records from the area that led to the BMG meeting being held at Thornham Magna. During the course of one weekend the efforts of BMG members increased to twenty eight the number of species recorded from Suffolk with the addition of *Stygioglomeris crinata*, *Thalassisobates littoralis*, *Cylindroiulus caeruleocinctus*, *C. parisorum*, and *Macrosternodesmus palicola* to the fauna.

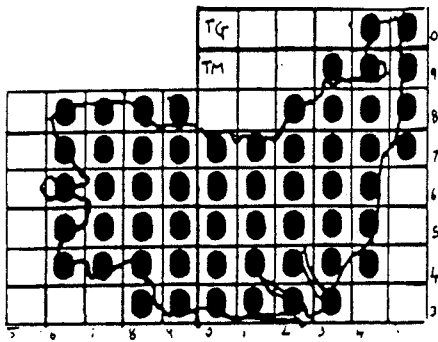
On taking up residence in Lowestoft immediately following the BMG weekend, my first aim was to complete the work begun there and provide a comprehensive picture of the millipede fauna of Suffolk and its distribution on the basis of the OS 10km grid squares. In the course of the present survey all 56 squares have been visited on at least one occasion. The sites visited initially depended on field meeting venues of the Lowestoft Field Club, the Suffolk Naturalists' Society and Conchological Society of Great Britain & Ireland. Later, sites were specifically selected for visits. These sites tended to be nature reserves, easily accessible woodlands with public footpaths and roadside hedges. As an independent effort to gain records of synanthropic species a garden survey was initiated in 1992 resulting in records from fourteen gardens to date (Lee, 1993).

The great majority of records have been made as a result of searching suitable microsites and collecting specimens by hand. Tullgren extraction of animals from moss and leaf litter samples has provided a few records and pitfall trapping even fewer. All records have been submitted to the National Recording Scheme and copies will also be held by Suffolk BRC at Ipswich Museum. Specimens collected in the course of the survey have been lodged with Ipswich Museum in most cases. Where this is not so the specimens are in my own personal collection.

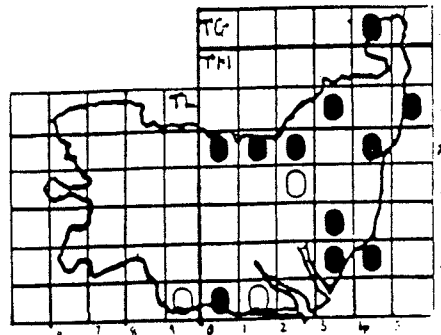
As a result of this personal effort the species list for Suffolk now stands at thirty one with *Brachychaeteuma bradeae*, *Ophiodesmus albonanus* and *Stosatea italica* being added since April 1990.

Table 2: Species list for Suffolk showing details of the frequency with which each species is recorded.

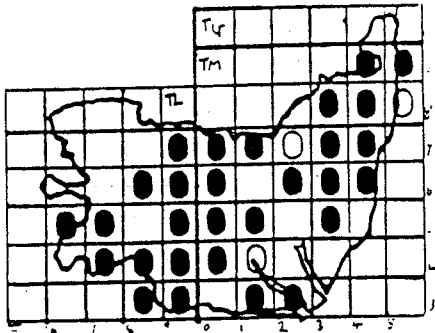
Species name	Total number of records	Number of 10km sqs	% of 10km sqs
<i>Polyxenus lagurus</i>	25	14	25
<i>Glomeris marginata</i>	64	33	59
<i>Stygioglomeris crinata</i>	1	1	2
<i>Craspedosoma rawlinsii</i>	2	2	4
<i>Nanogona polydesmoides</i>	44	28	50
<i>Brachychaeteuma bradeae</i>	3	2	4
<i>Thalassisobates littoralis</i>	1	1	2
<i>Nemasoma varicorne</i>	23	17	30
<i>Proteroiulus fuscus</i>	102	36	64
<i>Choneiulus palmatus</i>	0	1	2
<i>Nopoiulus kochi</i>	2	2	4
<i>Blaniulus guttulatus</i>	13	8	14
<i>Archiboreoiulus pallidus</i>	1	1	2
<i>Ommatoiulus sabulosus</i>	37	22	39
<i>Tachypodoiulus niger</i>	142	43	77
<i>Cylindroiulus caeruleocinctus</i>	6	4	7
<i>C.punctatus</i>	190	53	95
<i>C.latestriatus</i>	35	19	35
<i>C.brittanicus</i>	3	3	5
<i>C.parisiorum</i>	2	2	4
<i>Julus scandinavicus</i>	29	19	34
<i>Ophiulus pilosus</i>	21	18	32
<i>Brachyiulus pusillus</i>	17	11	20
<i>Polydesmus angustus</i>	82	34	61
<i>P.inconstans</i>	10	3	5
<i>P.gallicus</i>	11	2	4
<i>P.denticulatus</i>	15	11	20
<i>Brachydesmus superus</i>	53	25	45
<i>Macrosternodesmus palicola</i>	8	7	13
<i>Ophiodesmus albonanus</i>	2	1	2
<i>Stosatea italica</i>	1	1	2



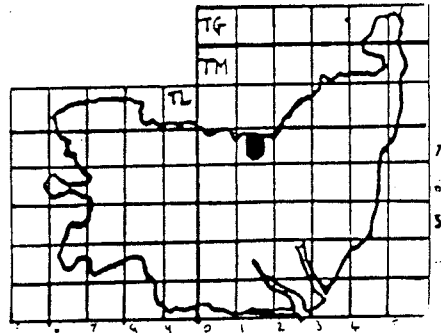
MAP 1. Suffolk millipede records



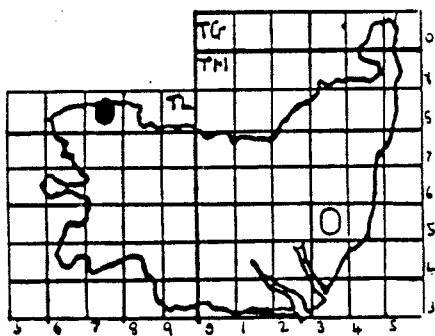
MAP 2. *Polyxenus laurus*



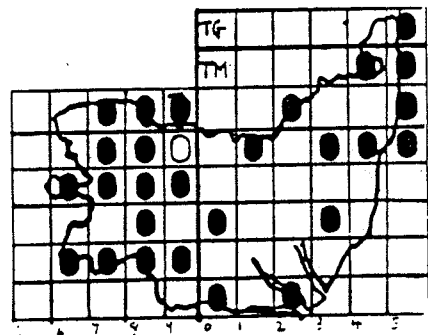
MAP 3. *Glomeris marginata*



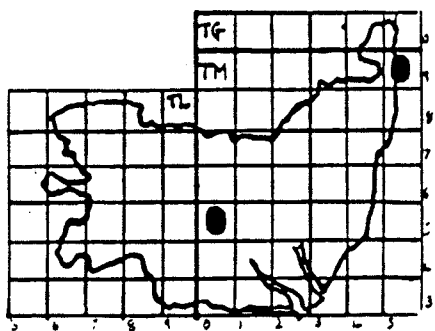
MAP 4. *Stygioglomeris crinata*



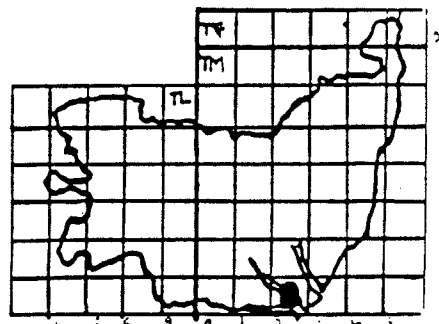
MAP 5. *Craspedosoma rawlini*



MAP 6. *Nanogona polydesmoidea*



MAP 7. *Brachychaeteuma bradeae*



MAP 8. *Thalassiosobates littoralis*

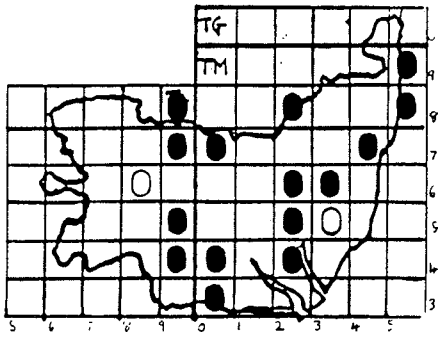
DISCUSSION

The twenty commonest British species of millipede are all found within Suffolk and their relative abundances here are similar to the national pattern (British Myriapod Group, 1988). The most obvious deviations involve *Polyxenus lagurus* (ranked 20th nationally but 10th in Suffolk), *Cylindroiulus britannicus* (15th nationally, 21st in Suffolk), and perhaps *Ophiulus pilosus* (7th nationally, 13th in Suffolk). However it must be stressed that the Suffolk figures are based on a relatively small sample and just a handful of new records could easily alter the position of any of these species. The distribution maps must also be treated with caution in view of the small number of records involved. However there do seem to be a few interesting patterns emerging which are worthy of comment.

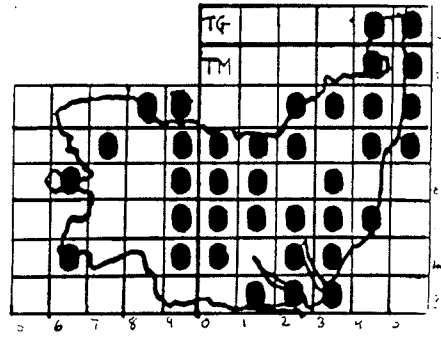
Polyxenus lagurus owes its apparent abundance in Suffolk to collector bias. The peculiar nature of the species attracted the interest of the early Suffolk naturalists leading to no less than seven records by Morley mostly from his home at Monk Soham. A further intensive period of collecting by Dr.C.J.B.Hitch whilst recording lichens in 1982 produced another ten records. The species is widespread in East Suffolk (see Map 2) and will probably prove to be so in the west when an intensive survey of suitable sites is carried out. It has been found in all the microsites noted by Blower (1985) with old walls and lichens being the commonest due to Morley and Hitch respectively. Morley also writes of finding large numbers amongst the roots of heather at the lip of a gravel pit (Morley, 1936).

Stygioglomeris crinata (see Map 4) has only once been recorded, from Thornham Magna in 1990. It is probably far more widespread than this suggests but its small size and soil dwelling habits mean that a specialised survey is likely to be necessary in order to map its true distribution. In contrast *Glomeris marginata* (see Map 3) is widespread in Suffolk except that it is apparently absent from the Brecklands of the north-west. This area has been popular with naturalists in general in the past and in the last three years the area has been visited on more occasions than anywhere in the rest of West Suffolk so recording bias seems an unlikely explanation. The acidic nature of the litter in the coniferous plantations of this area may be the reason for this restriction in distribution but further work is needed to establish the reality or otherwise of this pattern.

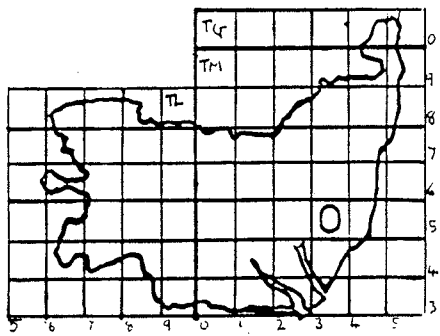
Harding (1974) recorded *Craspedosoma rawlinsii* (see Map 5) from Staverton Park since which there has been only one other site discovered at Wangford Carr. This species might be expected to occur more widely in the woodlands of the Breckland and parts of central south Suffolk and in some of the fens of the Waveny and Little Ouse valleys. *Nanogona polydesmoides* (see Map 6) is widespread and will no doubt be found on every 10km square. Its presence in the Brecklands despite being commoner on base rich soils (Blower, 1985) only adds to the difficulty of explaining the distribution of *Glomeris marginata*.



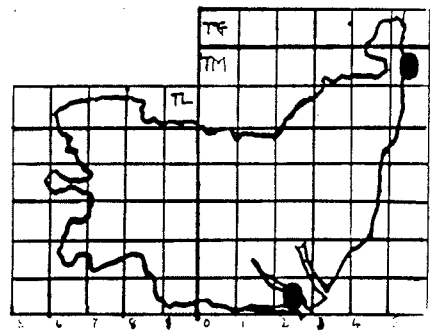
MAP 9. *Nemasoma varicorne*



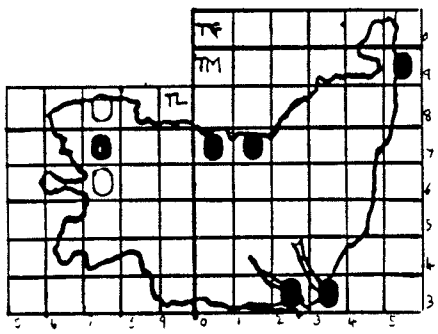
MAP 10. *Proteroiulus fuscus*



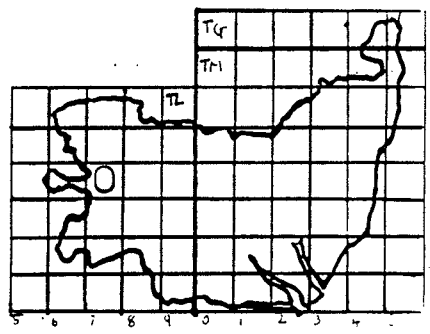
MAP 11. *Choneiulus palmatus*



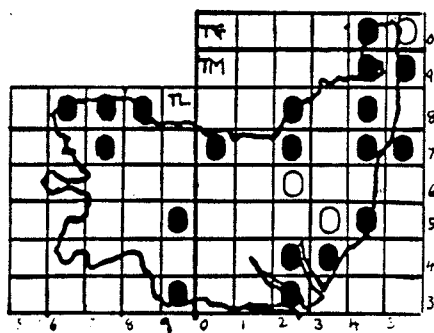
MAP 12. *Nopoiulus kochii*



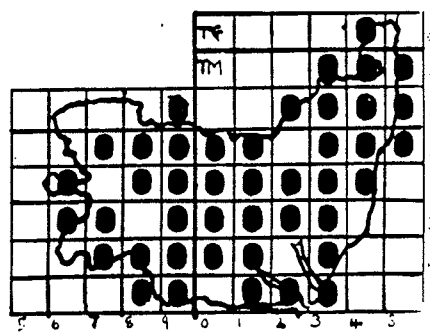
MAP 13. *Blaniulus guttulatus*



MAP 14. *Archiboreoiulus pallidus*



MAP 15. *Onnatoiulus sabulosus*



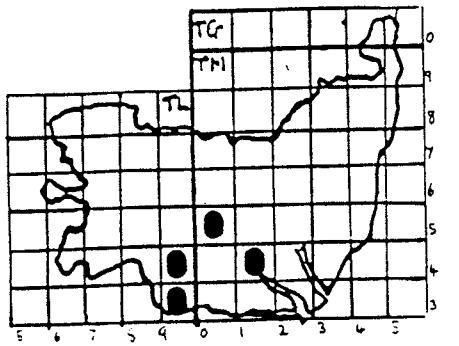
MAP 16. *Tachypodoiulus niger*

A rarity, *Brachychaeteuma bradeae* has been recorded from just two Suffolk gardens (see Map 7). As millipedes have been collected from only fourteen gardens so far and only four of these were visited at suitable times of year to find *B.bradeae* this suggests the species may well turn out to be more widespread than currently thought.

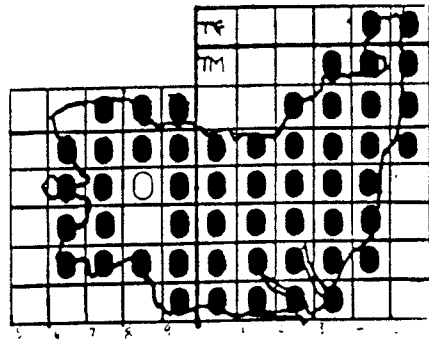
The coastal species *Thalassisobates littoralis* has only been recorded from Felixstowe Docks (see Map 8). However there seems to be no reason why it should not be present at other sites along the coast. *Nemasoma varicorne* has been widely recorded in East Suffolk (see Map 9). It appears to be restricted to the extreme east of West Suffolk but this distribution is most likely an artifact and further recording will prove it to be widespread across both vice-counties.

Of the Blaniulidae *Proteroiulus fuscus* is easily the most common and widespread (see Map 10). It is currently the third most frequently recorded species in the county and will probably be found in every 10km square. With the exceptions of the national rarities *Nopoiulus kochii* and *Choneiulus palmatus* it is the scarcity of the remaining species in this family which is surprising. Considering the attention which has been paid to domestic gardens as a myriapod habitat (Lee, 1993) the number of records of *Blaniulus guttulatus* (see Map 13) indicate the species may be more uncommon in Suffolk than initially thought. The absence of records of *Boreoiulus tenuis* from anywhere in the county is even more unexpected and probably does not represent the true situation when one considers its distribution in the rest of East Anglia. Still, the gardens of Lowestoft have been well worked and these would appear to be prime habitat! *Nopoiulus kochii* has been recorded from both Felixstowe and Lowestoft in the last three years (see Map 12). Two records of this rarity in a relatively short time suggest it may be found at other sites in the near future. The remaining two species, *Choneiulus palmatus* and *Archiboreoiulus pallidus*, have not been seen in the county since the original records. *Choneiulus palmatus* (see Map 11) was recorded from Staverton by Harding (1974) and it is perhaps not surprising it has not been seen since. *Archiboreoiulus pallidus* (see Map 14) on the other hand seems long overdue for another appearance. Blower's original record was made way back in 1966!

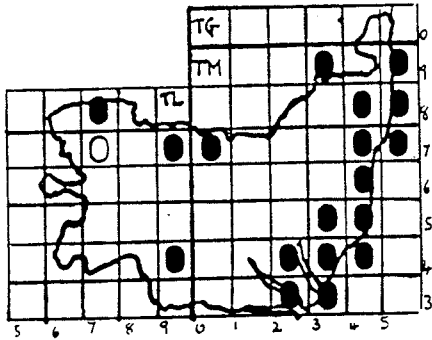
The Suffolk Julidae include the two commonest millipedes within the county, *Cylindroiulus punctatus* (see Map 18) and *Tachypodoiulus niger* (see Map 16). Both are widespread although *T.niger* like *Glomeris marginata* appears to be absent from large areas of the Breckland. Blower (1985) notes that *T.niger* is more frequent in base rich sites so, as for *G.marginata*, the acidity of the conifer plantations may account for its scarcity in Breckland. Exactly the opposite is true for *Ommatoiulus sabulosus* which, although less common than *T.niger*, is also widespread and occurs most frequently on the sandy soils of the coastal strip and in the Brecklands (see Map 15). Of the remaining Julids only *Julus scandinavicus* and *Ophiulus pilosus* are widespread. *Julus scandinavicus* also shows the pattern of absence from the



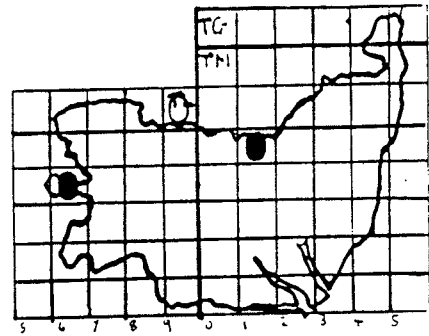
MAP 17. *Cylindroiulus caeruleonictus*



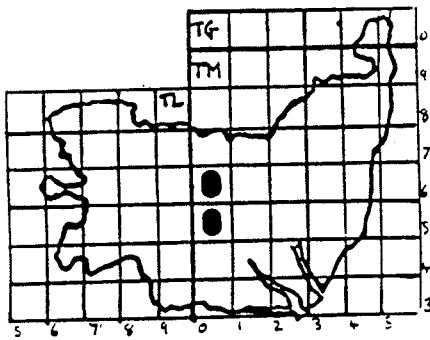
MAP 18. *Cylindroiulus punctatus*



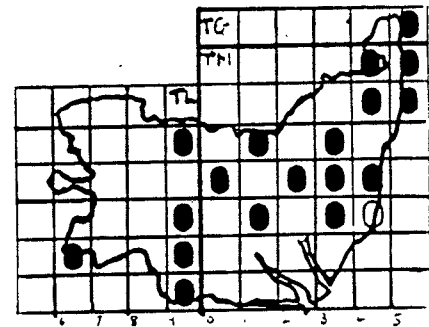
MAP 19. *Cylindroiulus latestriatus*



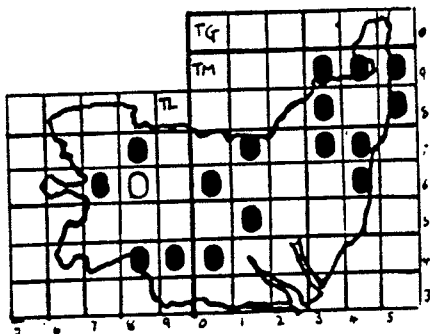
MAP 20. *Cylindroiulus britannicus*



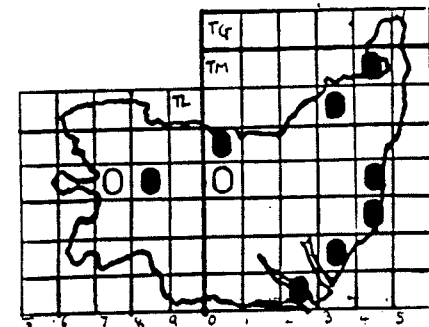
MAP 21. *Cylindroiulus parisiorus*



MAP 22. *Julus scandinavius*



MAP 23. *Ophiulus pilosus*



MAP 24. *Erachyiulus pusillus*

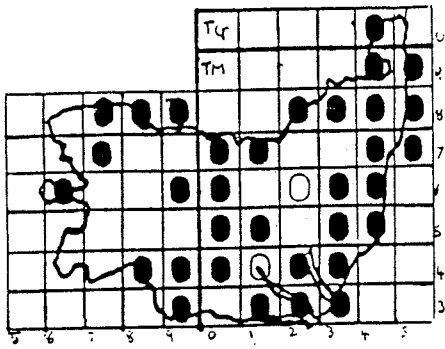
Brecklands (see Map 22) although this may well be a result of the relatively small number of records to date. Again there appear to be contradictions in the distributions as *Julus scandinavicus* is reported to have a preference for acidic sites whereas *Ophiulus pilosus* favours moderate to base rich sites (Blower, 1985) but is found in the Brecklands (see Map 23).

Cylindroiulus latestriatus (see Map 19) is a common millipede of the sandy coastal area but it appears to be uncommon away from this stronghold. If this is the case then the closely related *C. britannicus* (see Map 20) does not appear to be filling the vacant ecological niche in central and western parts and does appear to be truly uncommon in Suffolk as a whole. By comparison *Cylindroiulus parisiorum* (see Map 21) could be said to be unexpectedly common with recent records from Barking churchyard and Northfield Wood, Stowmarket. A third site for the species has been reported from Thrandeston (Read, pers.comm.) but it was not refound here when the site was visited in 1990. *Cylindroiulus caeruleocinctus* has been found in one natural site and several gardens all in the south of the county (see Map 17). The national distribution suggests it should be present right across the county therefore it is surprising it has not yet been found in the gardens of Lowestoft. The only other julid recorded from Suffolk is *Brachyiulus pusillus* (see Map 24). This species is generally associated with agricultural activity and coastal sites (Blower, 1985). Most Suffolk records are from one or other of these habitats, the agricultural research station at Haughley providing the bulk of them. However one recent record was from a garden in Trimley St.Mary.

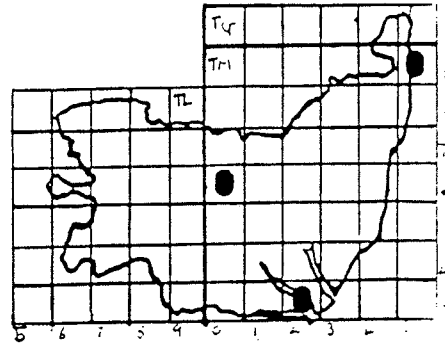
Of the flat-backs only *P. angustus* (see Map 25) and *Brachydesmus superus* (see Map 29) are widespread and common. *P. gallicus* (see Map 27) and *P. inconstans* (see Map 26) have both proved elusive in Suffolk with the majority of the records coming from Haughley Agricultural Research Station. In contrast to the national pattern *P. denticulatus* (see Map 28) seems to be more common than either of them. The garden survey (Lee, 1993) has produced a number of records of the rarer species, indeed *Macrosternodesmus palicola* (see Map 30) no longer appears to be such a rarity and will probably turn out to be present right across the county. *Ophiodesmus albonanus* on the other hand has been recorded from just two gardens, both in Lowestoft (see Map 31). The most recent addition to the county list is *Stosatea italica* found near Assington in October, 1992 (see Map 32). This represents the most northerly record for the species in the east of the country although it has reached further northwards in the west (R.E.Jones, pers.comm.).

THE FUTURE

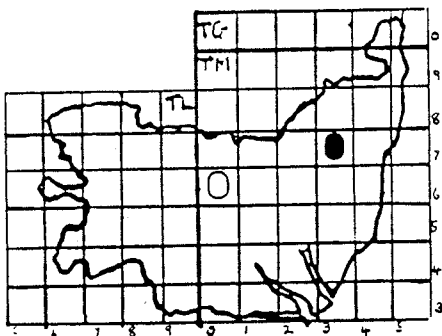
With the initial aim achieved the survey is entering a second phase. In common with the recording of better known groups of organisms in Suffolk, the distribution of the millipedes is now being plotted on the basis of the 1089 tetrads which make up the county. Records have been obtained from just 196 (18%) of these



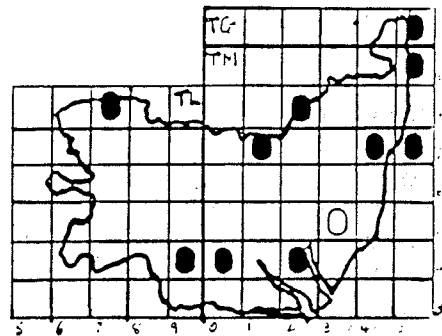
MAP 25. *Polydesmus angustus*



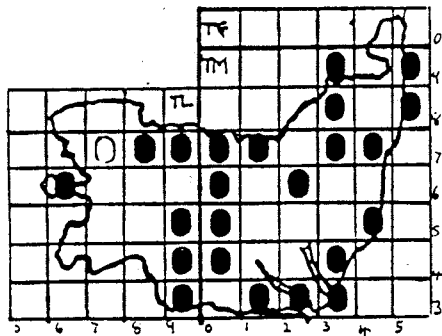
MAP 26. *Polydesmus inconstans*



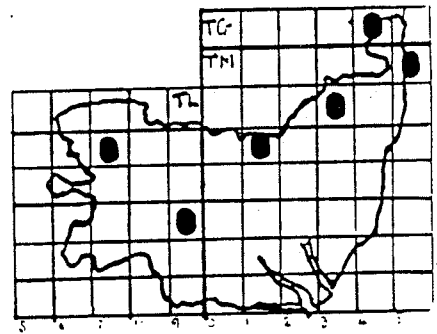
MAP 27. *Polydesmus gallicus*



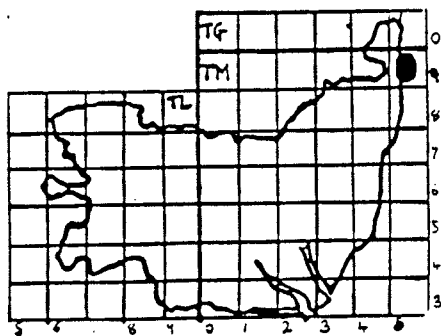
MAP 28. *Polydesmus denticulatus*



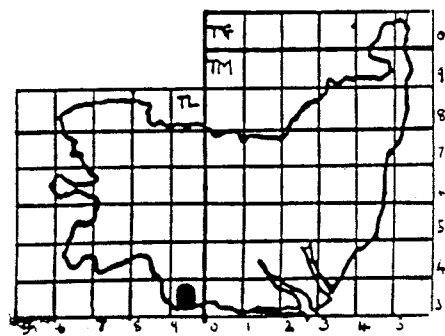
MAP 29. *Brachydesmus superus*



MAP 30. *Macrosternodesmus palicola*



MAP 31. *Ophiodesmus albanus*



MAP 32. *Stosacta italica*

tetrads to date and there is obviously a long way still to go.

There is still the possibility of adding species to the county list. Perhaps *Boreoiulus tenuis* is the most likely candidate but *Cylindroiulus nitidus* and *C.londinensis* will probably be found here in time and even some of the Chordematidae may turn up. Such possibilities add spice to the ongoing accumulation of data on the commoner species.

A number of unanswered questions have also raised in this paper. In particular the apparent restrictions in distribution of species such as *Glomeris marginata* and *Julus scandinavicus* need confirming or otherwise. The tetrad survey will be important here but for other species such as *Stygioglomeris crinata* and *Thalassisobates littoralis* specialised surveys of particular habitats and microsites are needed.

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REFERENCES

- Blower, J.G., (1985) *Millipedes*. Synopses of the British Fauna (New Series) no.35. E J Brill/W Backhuys. London.
- Brade-Birks, S.G., (1929) Notes on Myriapoda XXXIII: The Economic Status of Diplopoda and Chilopoda and their allies. Part 1. *Journ.S.E.Agric.Coll.Wye*.26:214
- British Myriapod Group (1988) *Preliminary Atlas of the Millipedes of the British Isles*. ITE. Unpublished.
- Ellis, E.A., (1951) A handsome milliped. *Trans.Suffolk Nat.Soc.* 7:126
- Harding, P.T., (1974) A preliminary list of the fauna of Staverton Park, Suffolk. Part 1. *Trans.Suffolk Nat.Soc.*16:232-238
- Kirby, W., (1823) *Introduction to Entomology*. Deutsche Ausgabe, Stuttgart, 1:204
- Lee, P., (1993) Some Garden Goodies from Suffolk. *British Myriapoda Group Newsletter* No.18. Unpublished.
- Morley, C., (1931) Observations. Myriapoda. *Trans.Suffolk Nat.Soc.* 1:227

- Morley.C., (1932) Observations. Myriapoda. *Trans.Suffolk Nat.Soc.* 2:80
- Morley.C., (1933a) Luminous Centipeds. *Trans.Suffolk Nat.Soc.* 2:99
- Morley.C., (1933b) Observations. Death-Watches' Origin. *Trans. Suffolk Nat.Soc.* 2:179
- Morley.C., (1935) Observations. *Polyxenus lagurus*, Linn. again. *Trans.Suffolk Nat.Soc.* 3:78
- Morley.C., (1936) Observations. The Home of *Polyxenus*. *Trans. Suffolk Nat.Soc.* 3:184
- Morley.C., (1941) Proceedings. *Trans.Suffolk Nat.Soc.* 4, cxxxi
- Morley.C., (1943) The Total living Fauna of Suffolk. *Trans.Suffolk Nat.Soc.* 5:87
- Morley.C., (1946) Observations. Millipeds peculiarly numerous. *Trans.Suffolk Nat.Soc.* 6:49