

**BASELINE SURVEY OF THE  
FEN RAFT SPIDER *Dolomedes plantarius*  
IN GLAMORGAN  
M. & D. CLARK  
2003**

**CCW CONTRACT SCIENCE No. 603**

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**M. & D. CLARK**

**CCW CONTRACT SCIENCE REPORT No. 603**

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*Dolomedes plantarius* IN GLAMORGAN

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**AUTHOR:** **M. & D. CLARK**

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## Crynodeb

Ar ôl i Michael J Clark ddarganfod corrbyn rafftio'r gors galch, *Dolomedes plantarius* yng Nghamlas Tennant ar 18<sup>fed</sup> Mai 2003, comisiynodd Cyngor Cefn Gwlad Cymru arolwg gwaelodlin mewn safleoedd dethol. Prif amcan yr arolwg oedd canfod cryfder poblogaeth corrbyn rafftio'r gors galch ar Gamlas Tennant ac i ymchwilio i ganfyddiadau cynharach heb eu cadarnhau o gorynnod rafftio'r gors galch yng Ngwarchodfa Natur Genedlaethol Cors Crymlyn ac yng Nghwm Tawe, Llansamlet.

Cynhaliwyd yr arolwg o ganol mis Awst i ddechrau mis Medi 2003. Roedd y cyfnod hwn yn eithriadol o boeth ac ni chafwyd fawr o law. Er y cynhaliwyd yr arolwg yng Nghamlas Tennant yn bennaf o lwybr y gamlas, cynhaliwyd rhywfaint o'r gwaith ymchwil am weoedd ar gwch hefyd. Ymddengys bod y boblogaeth wedi'i chyfyngu i raddau rhwng dwy bont. Ceir tystiolaeth o boblogaeth sy'n cenhedlu. Nododd yr arolwg *Glyceria maxima* fel un o'r prif blanhigion a ddefnyddir wrth greu gwe, canfyddiad nad oedd wedi'i gydnabod yn flaenorol.

Yng Nghors Crymlyn, canfuwyd rhywogaethau o *Dolomedes* ond mae angen ymchwil bellach i bennu ai'r *D. plantarius* ynteu'r *D. fimbriatus* sy'n bresennol ar y safle hwn. Ni chanfu'r gwaith arolwg yng Nghwm Tawe unrhyw rywogaeth *Dolomedes*. Argymhellir y dylid cynnal gwaith arolwg pellach ym mhob ardal yn ystod mis Mawrth a mis Ebrill cyn i lystyfiant a fyddai'n rhwystro'r gwaith ymchwil ddatblygu.

Mae gwybodaeth o'r arolwg a ddarparwyd yn cynnwys:  
Arolwg ysgrifenedig o'r canfyddiadau  
Mapiau â nifer y gweoedd ac ardaloedd yr arolwg wedi'u marcio  
Rhannau o rywogaethau er mwyn dadansoddi eu DNA  
Sachau wyau gwag er mwyn dadansoddi eu DNA

Cofnodwyd gwybodaeth ychwanegol o'r arolwg ar fideo digidol ac ar ffilm 35 mm tryloyw os byddai angen ei hastudio yn y dyfodol. Mae hyn yn cynnwys arddangosfa o genhedlu a chenhedlu gwirioneddol.

## Summary

Following the discovery of the fen raft spider *Dolomedes plantarius* by Michael J Clark at the Tennant Canal on 18<sup>th</sup> May 2003, the Countryside Council for Wales (CCW) commissioned a baseline survey of selected sites. The primary objective of the survey was to ascertain the strength of the fen raft spider population on the Tennant Canal and to follow up earlier unconfirmed sightings of raft spiders on Crymlyn Bog NNR and at Swansea Vale, Llansamlet.

The survey work was carried out during mid August to early September 2003. This period was exceptionally hot and with little to no rainfall. Although the survey at Tennant Canal was conducted primarily from the towpath, some web searching was also carried out by boat. It would appear that the population is somewhat restricted between two bridges. There is evidence of a breeding population. The survey identified *Glyceria maxima* as a major plant utilised in web construction, a finding that had not been recognised previously.

At Crymlyn Bog, specimens of a *Dolomedes* species were found but further research is needed to determine whether *D. plantarius* or *D. fimbriatus* is present on this site. Survey work at Swansea Vale resulted in no *Dolomedes* species being found. It is recommended that further survey work should be carried out in all areas during March and April before obscuring vegetation develops.

Survey information supplied comprises:

Written survey of the findings

Maps with web numbers and survey areas marked

Voucher specimens for DNA analysis

Empty egg sacs for DNA analysis

Additional survey information was recorded on digital video and on 35 mm transparency film if requested for future study. This includes mating display and actual mating.

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### Appendix 1: General observations

Figure 1: Location of nursery webs, Tennant Canal, 18 August 2003

Figure 2: Location of Borehole 7, Crymlyn Bog NNR

Figure 3: Survey area, Swansea Vale, Llansamlet

Figure 4: Illustrations of nursery web placement, Tennant Canal 2003

Figure 5: Location of all nursery webs recorded in 2003, Tennant Canal

## 1. Introduction

### 1.1. Brief Introduction

In July 2003, the Countryside Council for Wales (CCW) commissioned Michael J Clark to carry out a Baseline Survey for the fen raft spider *Dolomedes plantarius* in a number of areas in Swansea, South Wales. The fen raft spider is included on Schedule 5 of the Wildlife and Countryside Act 1981 and is rare throughout most of its European range. As such, before survey work was undertaken, Michael Clark had been granted a licence by CCW to carry out the work.

### 1.2. Primary Objective

The primary objective of the survey was to ascertain the strength of the fen raft spider population on the Tennant Canal and to follow up earlier unconfirmed sightings of raft spiders on Crymlyn Bog NNR and at Swansea Vale, Llansamlet.

### 1.3. Selected Sites

As well as the recent discovery of *D. plantarius*, historically there have been several unverified records of *Dolomedes* sp. in the area. CCW were responsible for selecting the sites to be surveyed and supplying maps. Four sites were selected:

- Tennant Canal between SS 712 939 and SS 718 942 (map – Figure 1)
- Tennant Canal between SS 702 936 and SS 712 939
- Crymlyn Bog (to include borehole 7 area) (map – Figure 2)
- Swansea Vale, Llansamlet at SS 692 979 (map – Figure 3)

## 2. Methods

The survey was undertaken by searching the study area for adults, juveniles, nursery webs and spiderlings. On the Tennant Canal this was carried out from the towpath and also by boat to survey the south-facing marginal vegetation for specimens. Survey work on Crymlyn Bog and Swansea Vale, Llansamlet involved wading through the boggy areas and identifying specimens on suitable vegetation throughout the selected areas. All four sites were surveyed during dry, sunny weather conditions.

## 3. Results

### 3.1. Tennant Canal (SS79)

The survey was conducted on two consecutive days, 18<sup>th</sup> and 19<sup>th</sup> August 2003, from a boat loaned from the Tennant Canal Company and arranged by CCW.

#### 3.1.1. Section between SS712 939 and SS718 942

Observations from the boat studying both the south- and north-facing banks.

A total of four adults carrying egg sacs were seen (2 specimens on *Glyceria maxima*, 1 on the water surface and 1 on overhanging greater tussock sedge *Carex paniculata*), plus one adult without egg sac on *Glyceria maxima*.

Four nursery webs were seen:

- a) Greater tussock sedge *Carex paniculata*: Two webs, heights 74 and 76 cms above water level.
- b) Fern (possibly *Thelypteris palustris*)/figwort *Scrophularia* sp.: One web constructed across these two plant species, height 81 cms. above the water level
- c) Reed sweet-grass *Glyceria maxima*: one web, height 76 cms. above water level.

One exuvium, suspended on *Glyceria maxima* approximately 25 cms above the water, was retrieved for DNA analysis.

The absence of any *D. plantarius* on the densely shaded north-facing bank seems to indicate that this species has a preference for the warmer temperature of the south-facing bank.

#### Observations from the towpath (south-facing bank)

On inspection of the marginal vegetation one adult without an egg sac was seen on *Glyceria maxima*. Nursery webs were discovered in three separate greater tussock sedge plants, heights 137cms, 104 cms and 84 cms. above water level.

One exuvium hanging from *Glyceria maxima*, approximately 19 cms above the water, was retrieved for DNA analysis.

#### **3.1.2. Section between SS 702 936 and SS 712 939**

The survey was carried out from boat, studying both the south-facing and north-facing bankside vegetation. Here the canal is flanked by extensive stands of common reed *Phragmites australis*, which is generally believed to be unsuitable for *Dolomedes* species.

There was no sign of the presence of *Dolomedes* on either bank.

#### **3.1.3. Summary of DNA material collected from Tennant Canal**

Two juveniles were netted and metatarsals removed. These were sent for DNA fingerprinting as part of on-going *Dolomedes* research at the Dept of Biology, University of East Anglia, Norwich. Two exuviae, twelve egg sacs and one dead spiderling removed from an egg sac were also sent.

#### **3.2. Crymlyn Bog (SS69)**

The area known as Borehole 7 (SS 689 942) was surveyed on 9<sup>th</sup> September 2003. The weather was overcast with sunny periods. The habitat is predominantly fenland with areas of encroaching willow scrub. *Dolomedes* sp. was discovered but further investigation is required to determine which species is present.

A total of 2 webs were constructed across the following species: mint *Mentha* sp., spearwort *Ranunculus* sp., hard rush *Juncus inflexus*, water horsetail *Equisetum fluviatile*. The webs were 225 cms apart and both were approximately 40 cms above water level. One web, guarded by the adult female, contained spiderlings. The other web contained an egg sac only. Egg sacs from both webs were subsequently removed for DNA analysis.



A live juvenile of approx 7mm body length was collected for the purposes of rearing through to maturity. This individual was passed on to CCW staff the following day and is subsequently being reared, under licence, by R. Gallon.

### **3.3. Swansea Vale, Llansamlet (SS69)**

The survey was carried out on 10<sup>th</sup> September 2003 at area SS 692 979. This site was surveyed as there had been a report of an unconfirmed *Dolomedes* sp. here in 1997, in an area of wet cattle grazed meadow adjacent to *Phragmites* and *Equisetum* swamp.

The general habitat in the area consists of bog with large sections of terrain that could potentially support a population of *Dolomedes plantarius*. A large area was surveyed, mostly around the stands of *Typha* which were identified as the wettest areas, but no open water was seen. It was noted that there was land disturbance due to road building and land clearance adjacent to the site, which could affect the drainage and water level.

Two ponds in the Swansea Vale Nature Reserve were also visited and although these are fairly young in origin they are well vegetated. Another large, suitable area was identified, outside the selected area at Swansea Vale, Llansamlet, that would require several days more survey work to be undertaken (see Figure 3).

No signs of the presence of *Dolomedes* were observed.

## **4. Conclusions**

The survey by boat on the Tennant Canal revealed the presence of four nursery webs that were not visible from the towpath. In total, thirteen nursery webs were found at this site in 2003. The presence of raft spiders on Crymlyn Bog was confirmed and two nursery webs were found, but determination to species level awaits maturity of the juvenile taken into captivity. No *Dolomedes* specimens were found at Swansea Vale but further surveys are required here to confirm whether raft spiders are present.

At the Tennant Canal, several females carrying egg sacs were observed but subsequent searching did not reveal webs within the female's range. However, as many webs were very small they could be overlooked in the dense vegetation (see Figure 4). Population counts of adults would be better carried out between early March and the end of April, when obscuring vegetation would be less prominent.

Future management of the Tennant Canal needs careful review to safeguard existing population of *Dolomedes plantarius* and provide a suitable habitat for enhancement of the species.

## **Acknowledgements**

Thanks are due to: David Painter and Adrian Fowles (Countryside Council for Wales), Dr Helen Smith, and the Tennant Canal Company.

## Appendix 1: General observations

### Information on the Tennant Canal population obtained as a result of further investigations

Approximately 85% of spiders on the water are within 30 cms of the bank margin. Of the adults seen 80% were male.

Favoured plants used to support the spider on the water are:

Water plantain leaf *Alisma plantago-aquatica*

Water Starwort *Callitriche* sp.

Floating *Phragmites* stems

Bank side Grasses

Water horse tail *Equisetum fluviatile*

Reed sweet grass *Glyceria maxima* - stems and leaf

Blackberry leaf *Rubus* sp.

Bindweed leaf *Convolvulus* sp.

Non-organic supports noted are: drinks can, tennis ball.

### **Table of *Dolomedes* findings during and subsequent to the survey period**

Area surveyed	Grid Ref	No. of adults	No. of webs containing egg sacs	Max. no. of immatures seen on any one day in Sept – all approx 7mm
Tennant Canal	SS 712 939 to SS 718 942	21*	14	9
Tennant Canal	SS 702 936 to SS 712 939	0	0	0
Crymlyn Bog	SS 689 942	1	2	6
Swansea Vale	SS 692 979	0	0	0

\* 21 were clearly marked and individually recognisable. Other individuals were plain brown, which made accurate counting impossible, but we would estimate approximately another 7 adults were present.

It was noted that, by visiting the same site on consecutive days, two webs had been constructed overnight. Further research would be required to establish if this is normal practice.

Number of silk tents constructed = nine, the other four constructions (one was inaccessible) were egg balls tied down with sparse webbing (see figure 4. I). All webs become more dense as the spiderlings move about the web adding more silk.

Duration of time that females were observed guarding young was between 4-7 days.

Spiderlings were seen to cluster together in typical spider fashion. Dispersal from the web by spiderlings is sudden and complete, leaving the web containing only the egg sac and the first moults.

It was noted that juveniles were still basking and feeding in late September at both the Tennant Canal and on Crymlyn Bog NNR. Prey species seen eaten were a spider, *Pardosa* sp., mosquito larvae *Culex* sp. and water boatmen *Gerris* sp. in adult and nymphal stages.

**Plant species supporting nursery webs on the Tennant Canal (SS712939 to SS718942)**

Greater Tussock Sedge	Sweet Reed Grass	Fern/ Figwort	Bindweed/ sweet reed grass	Bramble/Hemp Agrimony	Bramble
5	5	1	1	1	1

Dispersal

It is our concern that the area where the species is found is in itself a strange phenomenon where the boundaries are between two bridges. As the species is confined to areas of natural vegetation, it is my belief that these structures, under which there is no marginal vegetation, are restricting the dispersal of the species. There is a cluster of webs against the railway bridge (see Figure 5) which may also indicate that the distribution of species is being restricted.

It appears that the adult females have a limited range of approximately 150cms or less when carrying an egg ball, whereas a male was observed leaving the vicinity of a female and travelling around an area of approximately 8m x 5m eventually to return to the same female. This may be significant to the species being trapped between the two bridges.

Crymlyn Bog SSSI

**Plant species supporting nursery webs on Crymlyn Bog NNR (SS689942)**

Incorporating Mint sp., Spearwort, Hard Rush, and Water Horsetail
2

Management suggestion for Crymlyn Bog SSSI

As only two webs have been found so far, this does not indicate a viable population and the species appears to be under threat. Creating small areas of open water as breeding pools (as found at the other *Dolomedes* sites in the UK) would, we feel, be beneficial.







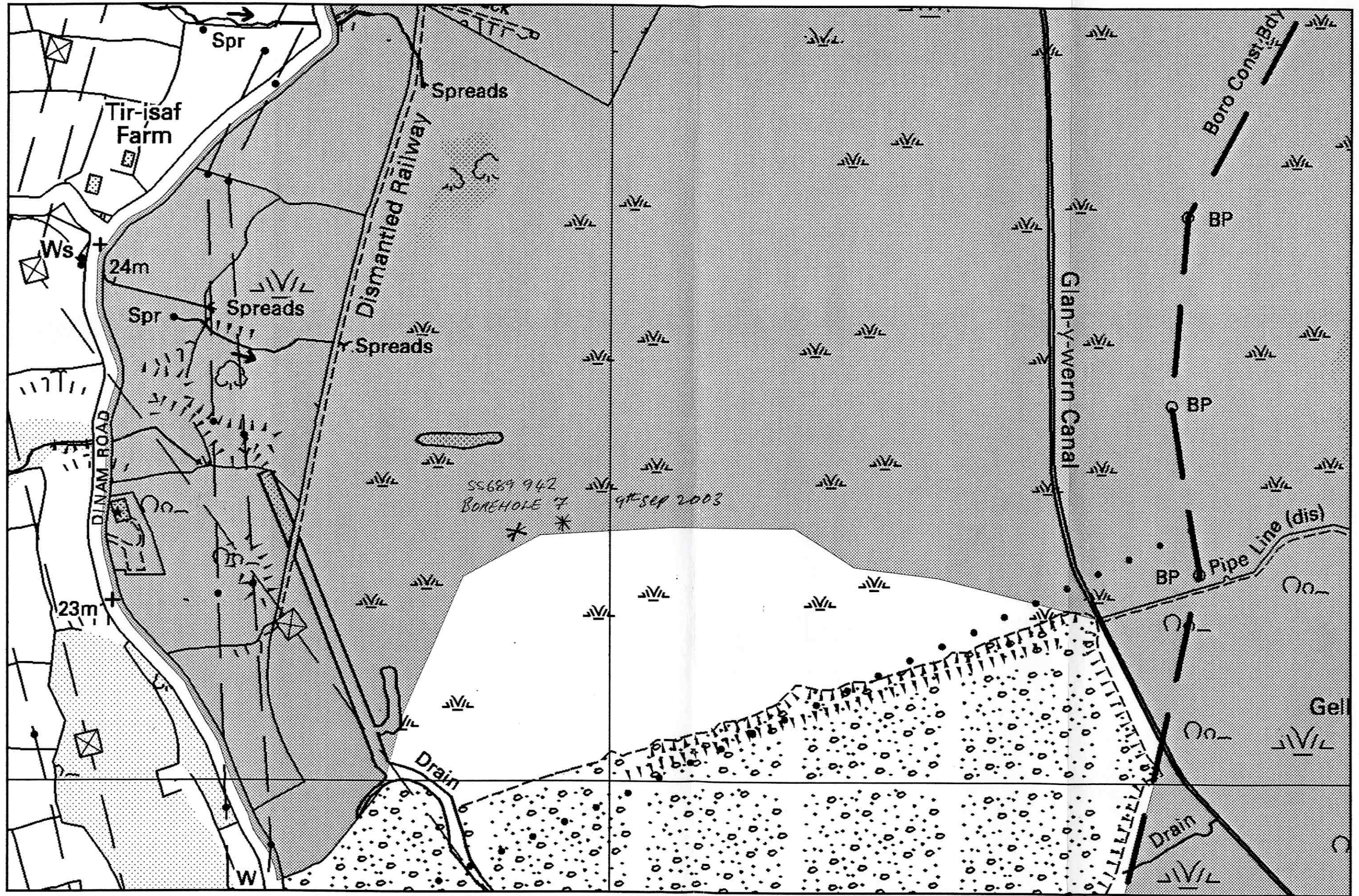
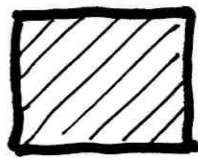
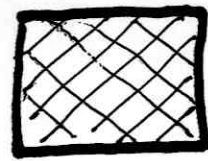


FIGURE 2





AREA SURVEYED



AREA TO BE RE-SURVEYED

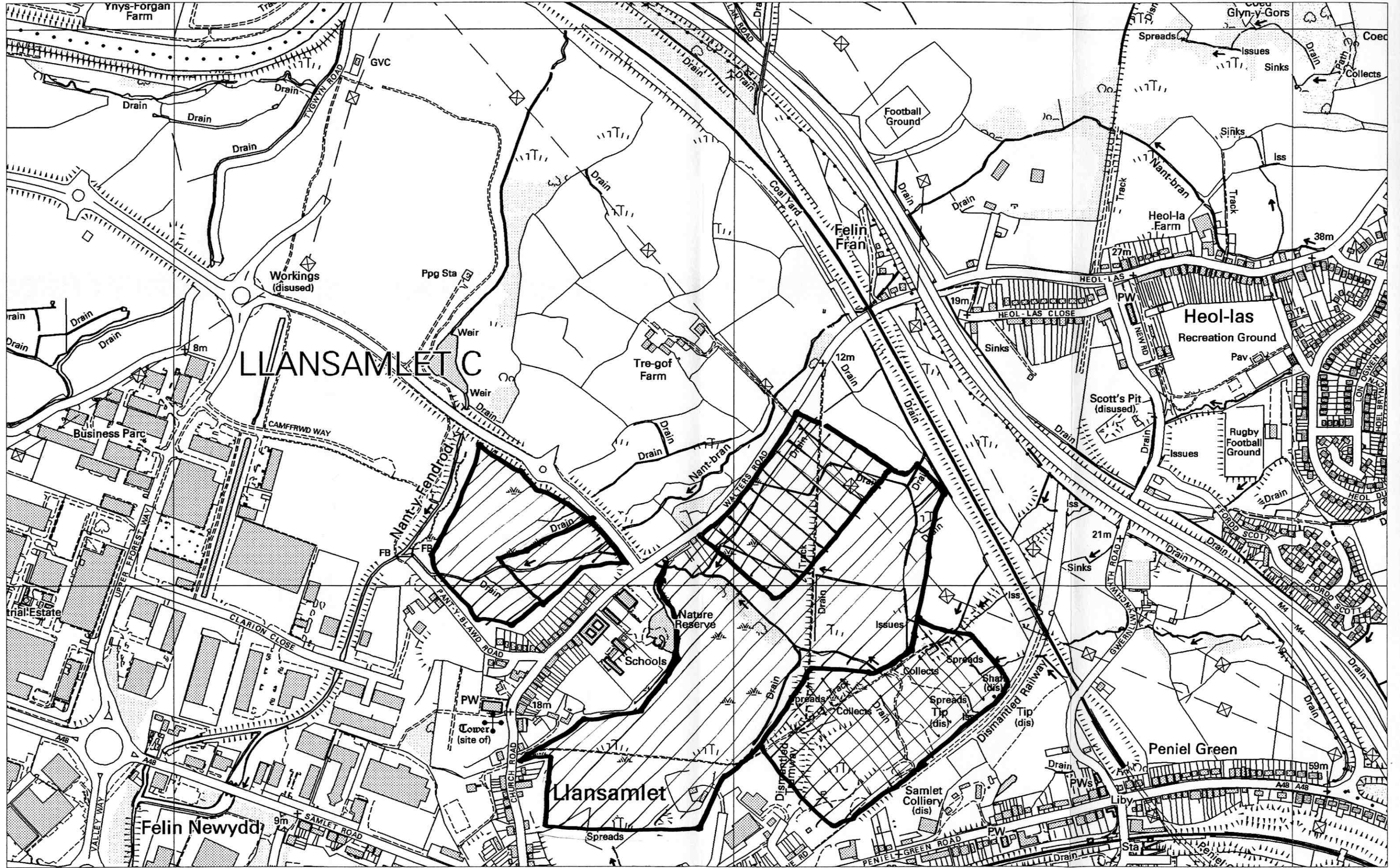


FIGURE 3



**Figure 4**

Explanation of web diagrams.

I - smallest web found on *Glyceria maxima*

II – typical web shape in *Glyceria maxima*

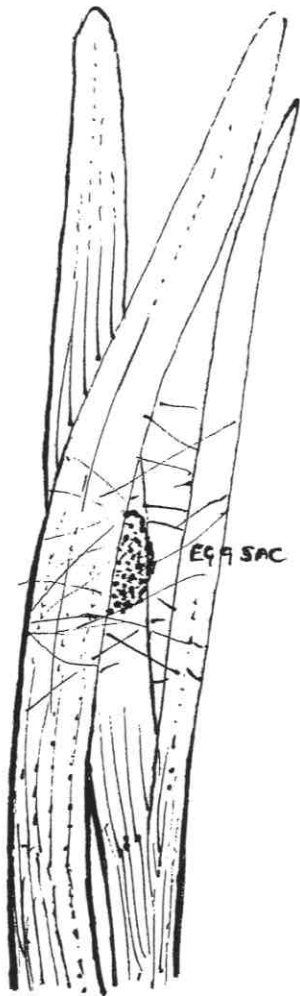
III – web in bramble

IV – web in fern

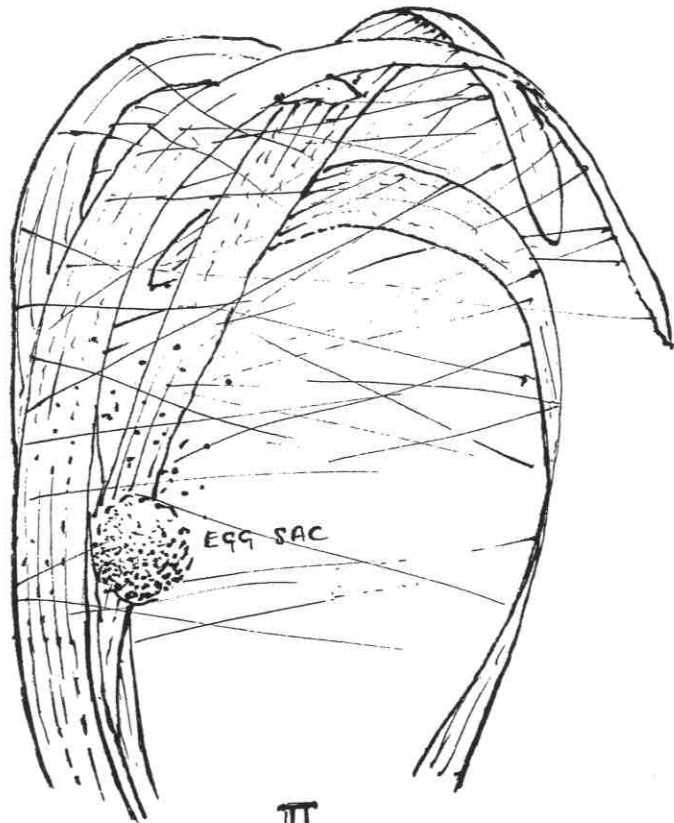
V – web in *Carex paniculata*

Egg sacs are normally placed between approximately 1 cm and 17 cms below the top of the web structure.

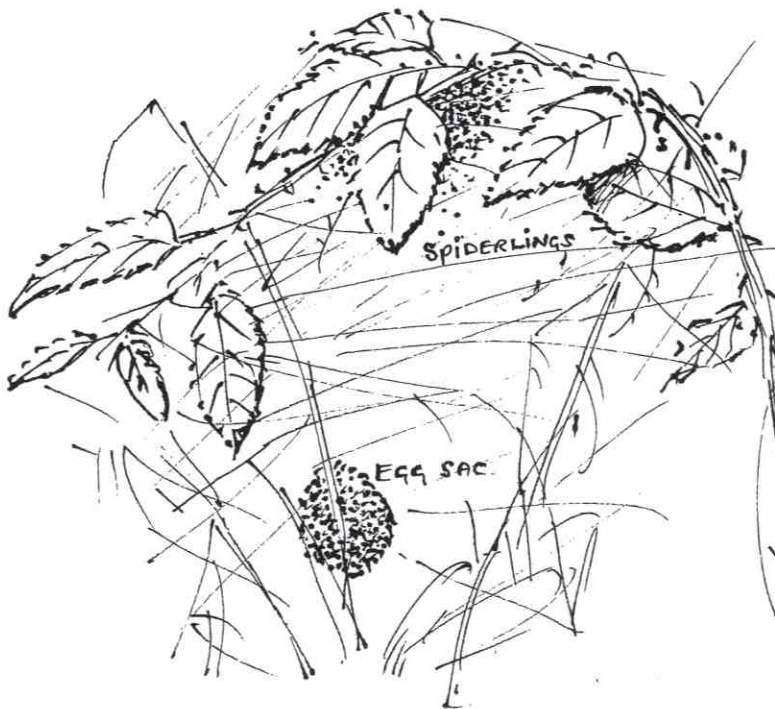
FIGURE 4



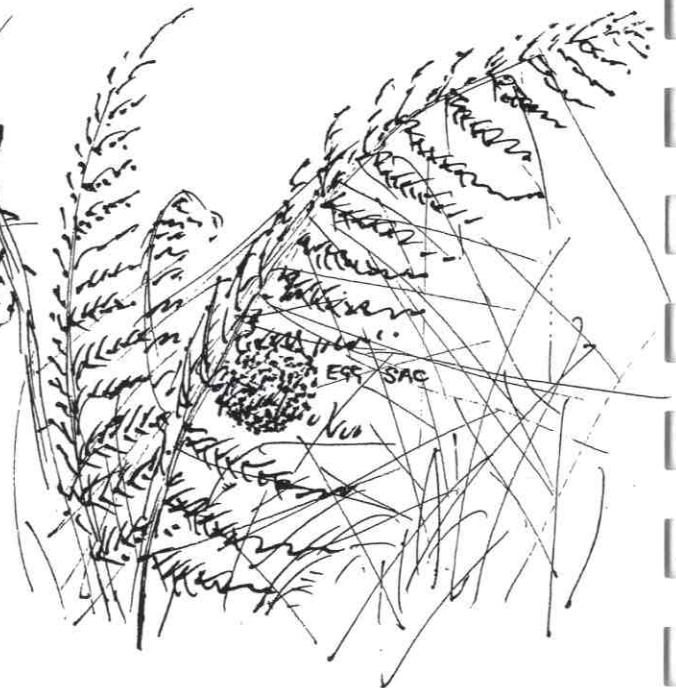
II



II



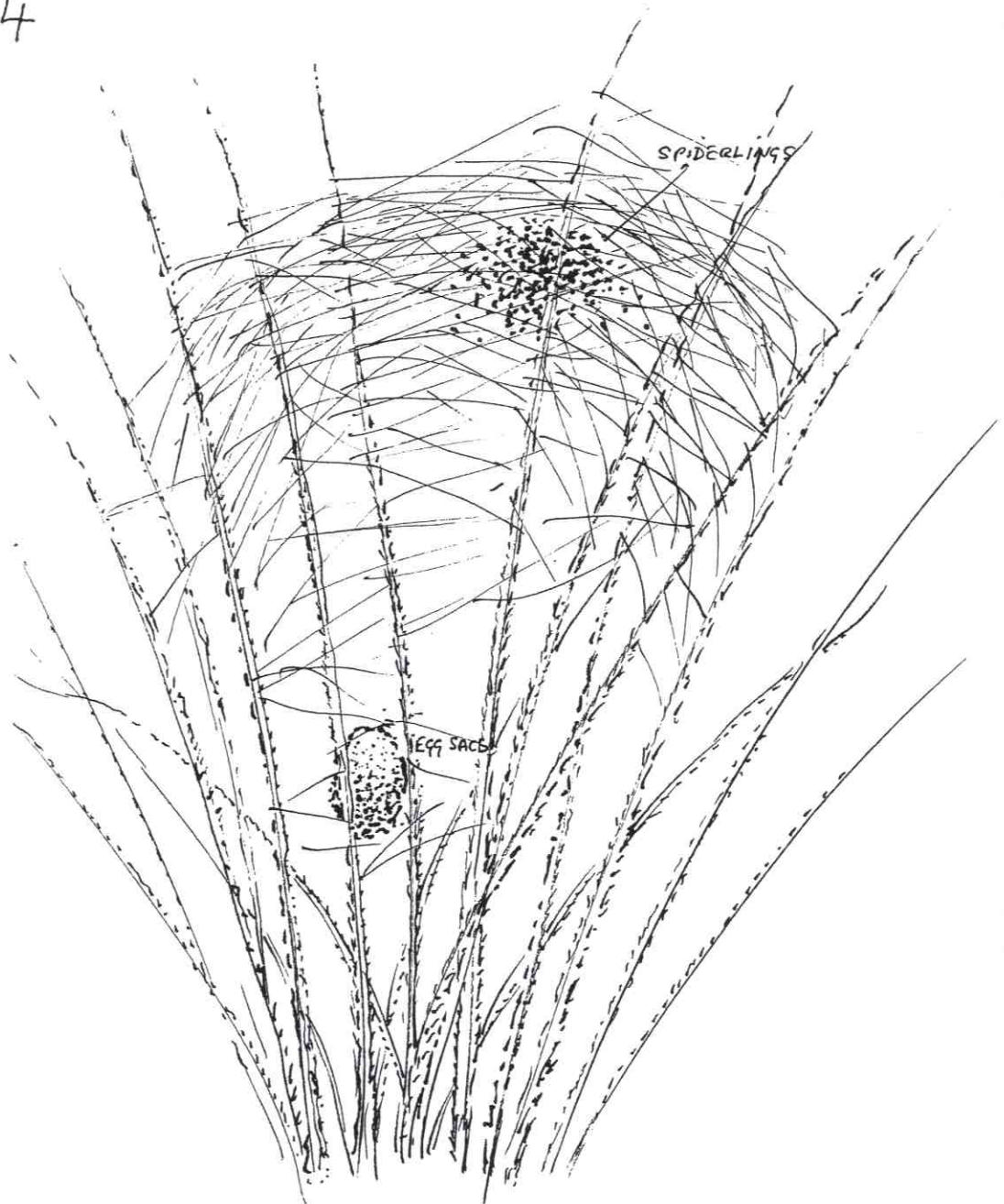
III



IV



FIGURE 4



V



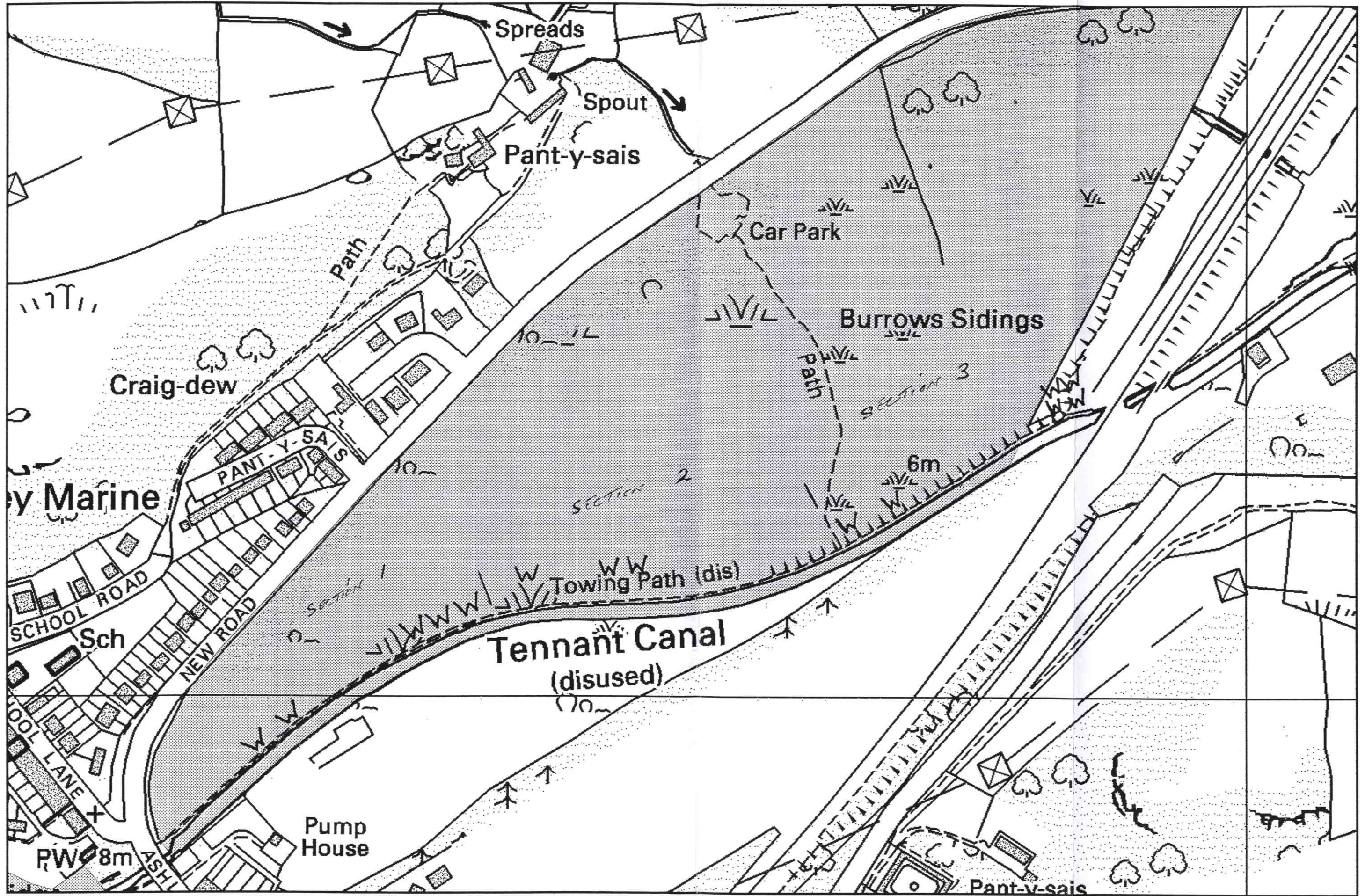


FIGURE 5

Cyngor Cefn Gwlad Cymru  
 Countryside Council for Wales