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Survey for the cranefly *Lipsothrix nigristigma*

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Survey for the cranefly *Lipsothrix nigristigma*

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Summary

The two sites from which *Lipsothrix nigristigma* Edwards 1938 was recorded in 1995 were resurveyed along with several similar sites in Shropshire and just over the county border in Wales.

Cranefly species were collected from all the sites and a list of species is provided in Tables 1A and 1B. Site descriptions were made and are provided in Appendix 1. Virtually all the sites were wooded with unpolluted first-order streams characterised by good flows and abundant coarse woody debris both in the channel and in the surrounding woodland.

Two species of *Lipsothrix* species were recorded, namely *Lipsothrix nervosa* Edwards 1938 and *L. remota* (Walker, 1848). The former is an endemic species and although widespread, is declining and has been given Biodiversity Action Plan status. *Lipsothrix remota* is the most frequent species in this genus in Britain. The target species *Lipsothrix nigristigma* was not found and it is suggested that the further surveys should take place in late May and earliest June (compared with mid-June when this survey was undertaken) since the few available records appear to suggest a very short flight period around this time.

The high quality of the habitats surveyed is indicated by the other Red Data Book and Nationally Scarce cranefly species recorded. These include *Paradelphomyia ecalcarata* (Edwards, 1938) and *Dicranomyia omissinervis* de Meijere, 1918 (both RDB2), *Scleroproctus pentagonalis* (Loew, 1873) (RDB3) twelve Nationally Scarce cranefly species plus the trichocerid midge *Diazosma hirtipenne* (Siebke, 1863) (Nationally Scarce) and three other Nationally Scarce Diptera.

1. Introduction

The cranefly *Lipsothrix nigristigma* is only known from the type specimen taken in Lancashire in 1924 and from two localities near Telford in 1995. The larvae of this genus, develop in wet, rotten wood lying in streams although the detailed ecological needs of *L. nigristigma* are not known.

In Great Britain the status of this species is given as *Endangered.* English Nature require a survey in order to improve understanding of the distribution and habitats occupied so that measures can be put in place to maintain and enhance the existing populations in accordance with the published Species Action Plan (UK Biodiversity Group 1999).

Bearing this in mind the objectives of the survey were as follows:

1. Survey for *Lipsothrix nigristigma* at the three known sites and at least 20 other similar sites.

2. Collect environmental variables that help to define the habitat requirements of *Lipsothrix* or habitats occupied.

3. Identify strong populations where more detailed autecological work can be undertaken in future.

4. Write a detailed species action plan that will lead to meeting the objectives in the published plan.

The Countryside Council for Wales also requested that a number of sites in Wales are surveyed in order to determine whether the species occurs in the principality.

2. Existing Information

Existing information on *Lipsothrix nigristigma*, other British, European and Holarctic *Lipsothrix* species and general studies on aquatic insects associated with submerged deadwood which include *Lipsothrix* records are provided since the information collated is useful in assessment and in determining future research needs and for site management.

2.1 *Lipsothrix nigristigma*

Lipsothrix nigristigma has been recorded from the following sites in Britain:

Clayton-le-Dale, Lancashire Coll. H. Britten. 1st June 1924
Bannister's Coppice, Telford SJ6102 Coll C.M. Drake. 1995
Loamhole Dingle/Lydbrook Dingle, Telford SJ665053 Coll. Alan Stubbs. 1995

The Clayton-le-Dale specimen is the type specimen which was described by Edwards (1938) and is deposited in the Natural History Museum in London (Kidd and Brindle 1959). Clayton-le-Dale is located to the north of Blackburn (NGR SD6733) and there are several narrow valley woodlands approximately 2-5km to the west from where the original specimen might have been taken. On the Continent, the species has been recorded from Roumania, Lithuania and Russia

(Crimea and Georgia) (Soos *et al* 1992). A subspecies, *Lipsothrix nigristigma iranica* Alexander 1975 has been described from Russia (Azerbaijan) and Iran (Alexander 1975).

Edwards (1938) provides keys to the British (and European) species of *Lipsothrix*. Coe (1950) provided more characters to separate the species but excluded the non-British *L. nobilis*. Male genitalia diagrams are provided in these publications for *L. remota*, *L. errans* (Walker, 1848) and *L. ecucullata* Edwards, 1838. The male genitalia of *Lipsothrix nigristigma* are figured by Savchenko (1982) (reproduced in Figure 4 here). No figures of the male genitalia of *L. nervosa* have been located.

2.2 *Lipsothrix nobilis* Loew, 1873

Lipsothrix nigristigma may be synonymous with *Lipsothrix nobilis* which is known from Austria, Bohemia, Moravia, Slovakia, Germany, France, Switzerland and 'Yugoslavia' (Soos *et al* 1992, Chvala 1997, Merz 1998). *Lipsothrix nobilis* may be confined to the montane belt in its range (UK Biodiversity Group 1999). Detailed records of *L. nobilis* available to the author at the time of writing this report are provided below:

Moravia: 31st May 1967: Stary (1971)
Moravia: 1st June 1969: Stary (1971)

The male genitalia of *Lipsothrix nobilis* are depicted by Stary (1971) and have been reproduced in Figure 4 for comparison with those of *L. nigristigma.*

2.3 Other British *Lipsothrix*

Hinton (1955, 1967) described the structure and functioning of the large fan-like pupal horns in *L. nervosa* and *L. remota* as respiratory organs.

Brindle (1967) described the larvae of *Lipsothrix* and provided a description of the conditions under which *Lipsothrix errans* was reared.

Lipsothrix errans, L. ecucullata and *L. nervosa* are also Biodiversity Action Plan species (UK Biodiversity Group 1999). *L. nervosa* has a wide distribution including southern England, the south Midlands and South Wales but is very localised and appears to be declining. It is also endemic to the British Isles. *L. ecucullata* is a rare Scottish species whilst *L. errans* is widespread but uncommon

2.4 Holarctic *Lipsothrix* species

Five species are found in North America and all are associated with submerged dead wood. Detailed studies including descriptions of larvae have been provided by Rogers and Byers (1956), Hynes (1965) and Dudley and Anderson (1987).

Rogers and Byers (1956) studied *L. sylvia* Alexander which occurs in the Appalachian highlands and is the only species on the eastern side of America. They suggested the most critical condition necessary for the continued survival of *L. sylvia* is a stable supply of dead wood, partly submerged in, or continuously wetted by, well-aerated water. The necessary conditions are thus most commonly provided by small spring-fed streams so near their sources that they are not affected by torrential floods.

Hynes (1965) provided a key and larval descriptions for the four species that occur on the Pacific coast.

Dudley and Anderson (1987) found that *Lipsothrix nigrolinea* and *L. fenderi* larvae feed in galleries within decayed red alder *Alnus rubra* in low order streams on the Pacific northwest. *Lipsothrix nigrolinea* emerged in spring and early summer in response to a receding water level whilst *L. fenderi* had an autumn emergence not tied to water levels.

2.5 Invertebrates of submerged wood

Dudley and Anderson (1982) listed over 50 taxa from five orders as closely associated with wood debris in aquatic habitats in North America. Other surveys and summaries which usually include *Lipsothrix* include Anderson and Sedell (1979), Harmon *et al* (1986) and Anderson (1982, 1992).

No comparable studies have been undertaken in Britain or Europe although studies on aquatic wood-feeding riffle beetles (Coleoptera, Elmididae) and Chironomidae have been undertaken.

Despite this, the importance of the microhabitat has been recognised in Britain by the inclusion of *Lipsothrix* as Biodiversity Action Plan species. A number of other Red Data Book and Nationally Scarce species are associated with submerged wood in British streams for example, the beetles *Cyanostolus aeneus* (Richter, 1820), *Pomatinus substriatus* (Mueller, 1806) and *Macrorhyncus quadrituberculatus* Mueller, 1806, the caddis *Hydatophylax infumatus* (McLachlan, 1865), and various other Diptera including Chironomidae and Syrphidae especially *Chalcosyrphus eunotus* (Loew, 1873).

2.6 Coarse woody debris

Workers at Southampton University have been studying the impacts of vegetation debris dams on river channels in Britain. In the New Forest they found that within 12 months 36% of dams were destroyed and another 36% changed character altogether through natural seasonal flooding. They found such dams have a significant effect on flood events and suggested that dams had a more widespread influence when woodland was more extensive (Gregory *et al* 1985).

Gregory and Davis (1992) discuss river channel management in woodlands. By collating and assessing literature on the subject they suggest that debris dams have a significant influence on the character of watercourses. Positive ecological features of dam retention include pool formation (beneficial, for example, for fish), sediment deposition and storage, retention of fine organic matter, bank stability, increased depth variability, increased physical habitat diversity, dissipation of excess potential energy, cover for juvenile fish, a substrate for microbial decay and shelter and food for invertebrates. A useful summary diagram contrasts the impacts of dams on river channel morphology, process and ecology before and after dam removal.

The Environment Agency has a programme of research and development on coarse woody debris (Environment Agency 1997). It is not known whether any reports have been produced.

3. Methods

The choice of survey sites was agreed with English Nature (Shrewsbury office). Biological Sites of Special Scientific Interest, Severn Gorge Countryside Trust sites and Shropshire Wildlife Trust

reserves were preferentially selected since English Nature had details of the landowners and access permission could easily be arranged. Other sites were selected that were accessible by public footpaths. In selecting sites narrow wooded valleys with streams were targeted, particularly in the vicinity of Loamhole Dingle, Lydbrook Dingle and Bannister's Coppice. The sites surveyed are shown in Figure 1a-d.

The survey methods used were mainly sweep netting with some direct searching on logs. Water traps were also used but were not in place for long. Some time was also spent looking for larvae on partly submerged wood but this material has not been examined for this report. Other species of cranefly were identified to help identify the species which are associated with *L. nigristigma.* Dates of visits are given in the site descriptions in Appendix 1.

A description of the habitat and any observations of adult behaviour is provided. Environmental variables likely to be of importance for the species have been noted in Appendix 1.

4. Results

Lists of the craneflies recorded are given in Tables 1A and 1B. Descriptions for the sites surveyed are provided in Appendix 1. Red Data Book and Nationally Scarce species are listed in Appendix 2. The status is taken from Falk (1992).

5. Discussion

Lipsothrix nervosa which is similar to *L. nigristigma*, is a Biodiversity Action Plan species and was recorded from 6 sites whilst *Lipsothrix remota* which is the most frequent species of this genus in Britain was recorded from 10 sites. There was some degree of variation in *L. nervosa* specimens particularly in the intensity of the mark over the stigma which varied from insipid grey to very dark in the individual from the Habberley Valley. A teneral specimen with dark tips to the femora but no mark over the stigma was identified as *L. nervosa.* All however had vein 2A hairy and other features consistent with *L. nervosa* rather than *L. nigristigma.* This variation shows the greater value of physical characteristics over colour features in identification.

The female of *L. nigristigma* is not known according to Coe (1950). Until it is, there is the possibility that females of *L. nervosa* and *L. nigristigma* may be confused. For this reason I have indicated in Tables 1A and 1B whether specimens were represented by males or females.

It is suggested that *Lipsothrix nigristigma* was not found because it may have a narrow flight period which was missed by this contract. Use of flight interception traps across stream channels may be considered for future surveys. Many of the sites including upper parts of Loamhole Dingle and Lydbrook Dingle in particular are overgrown in places with difficult public access and interception traps could safely be left in place for a period of 2 or 3 weeks or so without fear of being tampered with.

It is interesting that there is no overlap in the distribution of *L. nigristigma* and the European *L. nobilis* which strengthens the possibility that the two species are synonymous. There are also close similarities in the male genitalia of the two species which is a further point in favour of synonymy. The aedeagal complex in side view of the two species shows a similar degree of strong curvature which is not present in the other species depicted by Edwards (1938) and repeated by Coe (1950). The male genitalia including surstyli in dorsal view are also similar in both *L. nigristigma* and *L.*

nobilis. It is possible that the genitalia diagrams of the two species have not been compared before because of the obscure nature of the Russian reference. If the two prove synonymous then any ecological information available on *Lipsothrix nobilis* may be of use in designing future survey work and have implications for site management.

An impressive list of craneflies was assembled by sampling the sites. The presence of three Red Data Book craneflies *Paradelphomyia ecalcarata, Limonia omissinervis*, and *Scleroproctus pentagonalis* and twelve Nationally Scarce species would suggest high quality habitats. In addition a rare trichocerid midge *Diazosma hirtipenne* and three other Nationally Scarce Diptera were casually recorded. None of these species are associated with submerged woody debris but most are associated with other riparian or woodland habitats such as:

- **exposed river sediments**: *Limonia omissinervis*;
- **tufaceous springs and seepages**: *Thaumastoptera calceata* Mik, 1866, *Oxycera pardalina* Meigen, 1822;
- **waterfalls and vertical seepages**: *Dicranomyia aquosa* Verrall, 1886 and the Local *D. didyma* (Meigen, 1804);
- **woodland seepages, wet woodland and carr**: *Paradelphomyia ecalcarata*, *Scleroprocta pentagonalis*, *Molophilus corniger* (de Meijere, 1920), *Tasiocera robusta* (Bangerter, 1947), *Dicranomyia lucida* (de Meijere, 1918), *Pilaria fuscipennis* (Meigen, 1818), *Limonia trivittata* Schummel, 1829;
- **shaded streams**: *Paradelphomyia fuscula* (Loew, 1873),
- **bare mud by streams**: *Pilaria scutellata* (Staeger, 1840);
- **ancient or broad-leaved woodland**: *Tipula helvola* (Loew, 1873), *Diazosma hirtipenne*, *Keroplatus testaceus* (Dalman, 1818) and *Stegana coleoptrata* (Scopoli, 1763).

Other Diptera material was swept and collected in the water traps but has not been identified.

Virtually all the sites had frequent coarse woody debris and impressive debris dams were found in several. All the sites with the exception of Trewern Brook were wooded with native vegetation although plantations were located near some. The watercourses were generally unpolluted, had good flow, were well-oxygenated, showed good riffle and pool sequences and were generally first-order streams. The substrate was generally coarse but was often absent or more limited where bedrock was exposed. Other riparian features such as exposed river sediment, penetrating alder roots, bare rock or vegetated cliffs, waterfalls and natural weirs, bank seepages (tufaceous in Loamhole Dingle, Lydbrook Dingle and Tick Wood) and wet areas with pendulous sedge, butterbur or great wood sedge were often present. It would therefore appear that there is ample habitat available for *Lipsothrix nigristigma* within Shropshire and just over the county border into Wales.

In general most of the sites suffered little from human interference. Pollution was only noted at Short Wood, eutrophication and overgrazing resulting in no regeneration was observed in Coalmoor and minor problems with dumping were seen in Betton Dingle. Loamhole Dingle is

clearly actively and sympathetically managed for nature conservation by the Severn Gorge Countryside Trust.

It may be possible to devise a transect method for calculating the amount and type of woody material to have in a watercourse and trial it in Loamhole Dingle and Bannister's Coppice. Protocols for evaluating large woody material on woodland floors exist in North America (for example Maser *et al* 1979) and similar techniques are used by foresters in Britain for estimating the amount of cut timber available.

Ward, Holmes and Jose (1995) in an important reference to river channel management fail to mention the importance of submerged wood for invertebrates. They recommend woody material should be disposed of with care, provide advice on burning and recommend use of dead or living material for bank stabilisation. Larger material and brashings they suggest can be stored as log piles above the flood level to rot. This advice will not benefit *Lipsothrix* and other invertebrates on submerged wood and there is clearly need to educate non-entomologists of the value in retaining woody debris in channels. It is acknowledged that this may create problems for flood management, may impede drainage and could make migration of fish more difficult but other ways of resolving these could be sought by liaison with the Environment Agency.

A detailed species action plan as requested by the contract has not been included in this document because the survey did not locate the target species. Actions that can sensibly go ahead without more information on life history and habitat information have been mentioned in Section 6. This section incorporates the next steps required of the UK plan. A more detailed species action plan will need to wait for more information on the occurrence of the species.

6. Recommendations for future work

A number of recommendations are provided below.

a. Resurvey the most promising sites visited in this survey and identify with Severn Gorge Countryside Trust, Shropshire Wildlife Trust, Lancashire Wildlife Trust and English Nature further suitable sites for survey. From the few dates available it would appear that *L. nigristigma* has a very narrow flight period restricted for the end of May and early June. It is suggested that survey work for adults is concentrated at this time. Use of an interception trap placed across watercourses may be considered.

   A number of the sites selected in June 1999 were not surveyed for various reasons. These could be included in a programme in future surveys. They are:

   - Cornbrook Dingle SSSI: Geological site. Open access common. NGR SO602757
   - Cuckoopen Coppice SSSI: Biological site somewhat detached from the sites surveyed here. NGR SO538800
   - Oak Dingle SSSI: Geological site. NGR SO565871

   These and other SSSIs are shown in Figure 2. Downton Gorge NNR which is not in Shropshire was also suggested for possible survey and has had visits from Dipterists

Forum members (Tom Wall pers. comm.). Further woodland sites owned and managed by the Severn Gorge Countryside Trust could be surveyed. These are shown in Figure 3.

A search for the distinctive pupae appearing from partly submerged wood could be undertaken at the same time. Remove deadwood for rearing adults in mid-May.

b. Borrow a male and female *Lipsothrix nobilis* and compare with *L. nigristigma* to establish whether they are synonymous. If they are, then the female of *Lipsothrix nigristigma* will then be known and an improved key can be produced and more ecological information may be available.

c. Determine what research and development work the Environment Agency is undertaking on coarse woody debris and discuss possibilities for working together. Contact may also be made with other specialists working on this subject (for example, Gregory and co-workers at Southampton University). Identify and contact key personnel in the Institute of Freshwater Ecology to determine the likelihood of collaborative projects.

d. Remove wood for rearing in mid-May and return the wood in mid-June.

e. Discourage the removal of coarse woody debris from watercourses. Most ecologists are aware of the need to retain dead wood in woodland but there is a need to increase the profile of the value of submerged wood for insects and to encourage site managers and others to retain it. It is suggested a leaflet is produced showing positive management measures such as the retention of woody material that will benefit nature conservation. This should be done in conjunction with the Environment Agency. An article could be placed in the Environment Agency's magazine, *Environment News*.

Contact should be made with the authors of the New Rivers and Wildlife Handbook which is the standard text on river management for nature conservation. The importance of submerged woody material and the need to retain it should be included in the next edition. Similarly, contact should also be made with The River Restoration Centre to ensure that they provide good advice about retaining submerged woody material.

When further supporting evidence has been gathered, consider the implications of woodland grant schemes on the retention of woody debris in streams.

Identify any problems with the clearance of woody material from streams by fishermen (clearance of debris has taken place elsewhere in the Welsh borders at least in order to provide better passage for migrating salmon and trout). Determine what measures can be taken.

f. Cooperate with workers on other groups or families such as Coleopterists, freshwater biologists and hoverfly specialists and encourage these to retain and pass on tipulid material. This could be done by placing notices in *The Coleopterist*, *Latissimus* (the Newsletter of the Balfour Browne Club), *FBA News* and *Freshwater Forum*.

Implementation of the species action plan could benefit other species of wooded streams including the other *Lipsothrix* species, other Diptera such as *Chalcosyrphus eunotus* (RDB2) and *Sphegina* species, the beetles *Cyanostolus aeneus* (Nationally Scarce),

Pomatinus substriatus (Nationally Scarce) and *Macrorhyncus quadrituberculatus* (RDB3) and the caddis *Hydatophylax infumatus* (Local).

g. Undertake a survey of the woods around Clayton-le-Dale in Lancashire, the site of the type specimen. There are several potential narrow valley woodlands mainly to the south of the River Ribble, 2-5km west of Clayton-le-Dale village (SD6733).

h. Liaise with Scottish Natural Heritage on *Lipsothrix ecucculata* research commissioned by them.

7. Conclusions

Two *Lipsothrix* species (*L. nervosa* and *L. remota*) were recorded in the survey. The target species, *Lipsothrix nigristigma* was not found. From the few collection dates available however it would appear that *L. nigristigma* has a narrow flight period at the end of May and earliest June which was missed by this survey. It is therefore suggested that future survey work is undertaken at this time.

It would appear that *Lipsothrix nigristigma* is synonymous with *L. nobilis* based on the basis that the two species have not been recorded together yet share a similar range and male genitalia diagrams of the two species share many similarities. *L. nobilis* is better known in Europe, so that if the two are synonymous, the experience of European tipulid workers of *L. nobilis* can be added to what is known of *L. nigristigma.*

From the site visits and descriptions it is clear that there appears to be plenty of suitable habitat for this species in terms of narrow wooded valleys with unpolluted streams and an abundance of woody debris in the channels. From the cranefly species recorded it is also clear that the sites support a good cranefly fauna with a large number of rare and uncommon species.

8. Acknowledgment

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Table 1A Cranefly species recorded from the sites surveyed

Abbreviations:

BC = Bannister's Coppice
BD = Betton Dingle
CDu = Chermes Dingle - upstream of Dingle Mill
CDn = Chermes Dingle - northern arm
CDd = Chermes Dingle - downstream of Dingle Mill
C = Coalmoor
CC = Crowther's Coppice
D = The Drewin
E = The Ercall
G = Guilsfield
HA = Habberley Valley
HC = Holbrook Coppice
HP = Hope Valley
J = Jackfield
LO = Loamhole Dingle
LY = Lydbrook Dingle
R = Rhos-Goch
Sp = Saplins Wood
S = Short Wood
TW = Tick Wood
TB = Trewern Brook
W = Whitwell Coppice

Nomenclature follows Chandler 1998.

For *Lipsothrix* species (emboldened in the Table), the occurrence of males (m) and females (f) has been indicated

	BC	BD	CDu	CDn	CDd	C	CC	D	E	G	HA
TIPULIDAE											
Dolichopeza albipes								x		x	
Tipula helvola								x			
Tipula unca								x		x	
PEDICIIDAE											
Dicranota bimaculata		x			x	x	x	x	x	x	
Dicranota pavida		x	x								
Dicranota subtilis											x
Ula sylvatica		x		x			x	x			
LIMONIIDAE											
Erioconopa diuturna		x				x	x		x		x
Erioptera lutea	x	x					x			x	
Gonempeda flava	x		x		x	x	x	x	x	x	
Gonomyia lucidula							x				
Gonomyia recta			x	x	x	x	x	x			
Gonomyia sp. (f)	x										
Ilisia maculata								x		x	
Ilisia occoecata					x						
Molophilus appendiculatus				x			x				
Molophilus bifidus			x								
Molophilus cinereifrons			x			x	x	x		x	
Molophilus flavus				x							
Molophilus medius							x				
Molophilus ochraceus	x						x	x		x	

	BC	BD	CDu	CDn	CDd	C	CC	D	E	G	HA
Ormosia nodulosa			x	x				x			
Symplecta stictica	x										
Tasiocera robusta	x		x				x	x			
Tasiocera murina				x							
Austrolimnophila ochracea	x		x	x	x	x	x	x	x	x	x
Eloeophila maculata			x	x			x	x			
Eloeophila submarmorata						x					
Eloeophila ocellaris	x		x	x	x						
Ephylidorea lineola						x					
Neolimnomyia nemoralis			x			x	x	x			
Neolimnomyia batava				x							
Paradephomyia ecalcarata				x							
Paradelphomyia fuscula				x							
Paradelphomyia senilis	x		x		x		x	x	x		x
Pseudolimnophila lucorum	x										
Pseudolimnophila sepium			x								
Pilaria sp.				x		x					
Achyrolimonia decemmaculata				x				x	x	x	x
Atypophthalmus inustus	x			x				x		x	
Dicranomyia chorea				x							
Dicranomyia mitis		x	x				x				x
Dicranomyia fusca		x	x	x	x	x	x	x	x	x	
Dicranomyia modesta				x		x	x	x	x	x	x
Limonia macrostigma	x	x	x		x	x	x	x	x	x	x
Limonia nubeculosa	x	x	x	x	x	x	x	x	x	x	x
Limonia phragmitidis			x			x					
Limonia trivittata	x	x	x		x	x	x		x		
Neolimonia dumetorum			x	x	x						
Lipsothrix nervosa		**m**					**f**				**f**
Lipsothrix remota		**m**		**m**	**f**		**mf**		**mf**	**f**	**m**
Rhipidia maculata						x				x	
PTYCHOPTERIDAE											
Ptychoptera albimana										x	x
Ptychoptera lacustris				x							
Ptychoptera paludosa							x			x	
OTHERS											
Keroplatus testaceus								x			
Oxycera pardalina							x				
Stegana coleoptrata								x			

Table 1b Cranefly species recorded from the sites surveyed

	HC	HO	J	LO	LY	R	S	Sp	TW	TB	W
TIPULIDAE											
Dolichopeza albipes		x	x		x	x			x		
Nephrotoma analis				x							
Nephrotoma quadrifaria									x		
Tipula fulvipennis				x							
Tipula fascipennis	x										
Tipula unca	x						x		x		
Tipula oleracea							x				
Tipula scripta							x				
Tipula lateralis										x	
PEDICIIDAE											
Dicranota pavida											x
Dicranota subtilis						x			x		
Pedicia straminea	x				x						
Ula sylvatica					x						
LIMONIIDAE											
Cheilotrichia cinerescens		x									
Ellipteroides lateralis									x		x
Erioconopa diuturna				x			x		x		x
Erioptera lutea	x	x	x	x							x
Gonempeda flava		x		x	x			x			x
Gonomyia lucidula						x					x
Gonomyia recta	x			x	x	x		x			x
Ilisia maculata				x		x	x				x
Ilisia occoecata	x										
Molophilus appendiculatus						x					x
Molophilus bifidus				x		x			x		x
Molophilus cinereifrons	x					x			x		x
Molophilus corniger	x								x		x
Molophilus curvatus						x					
Molophilus flavus							x				
Molophilus obscurus									x		
Molophilus ochraceus			x			x			x		x
Molophilus undulatus		x				x					
Ormosia nodulosa	x		x			x	x				
Scleroprocta pentagonalis						x					

	HC	HO	J	LO	LY	R	S	Sp	TW	TB	W
Tasiocera robusta			x	x	x	x	x				
Tasiocera murina							x				
Tasiocera sp								x			
Austrolimnophila ochracea	x	x	x	x	x	x	x	x	x		x
Eloeophila maculata											x
Eloeophila mundata		x									
Eloeophila submarmorata				x							
Epiphragma ocellaris	x			x					x		x
Euphylidorea aperta							x				
Neolimnomyia adjuncta				x							
Neolimnomyia nemoralis	x			x	x	x		x	x		x
N.eolimnomyia batava	x			x							x
Neolimnomyia filata				x							
Paradelphomyia ecalcarata											x
Paradelphomyia fuscula				x							x
Paradelphomyia senilis	x		x	x	x			x	x		x
Phylidorea fulvonervosa	x										
Pilaria decolor	x										
Pilaria fuscipennis	x										
Pilaria scutellata						x					
Pilaria sp.	x	x						x			x
Pseudolimnophila lucorum				x					x		x
Pseudolimnophila sepium	x			x					x		x
Achyrolimonia decemmaculata			x								x
Atypophthalmus inustus	x			x		x			x		
Dicranomyia chorea				x			x				
Dicranomyia didyma				x	x						
Dicranomyia lucida									x		
Dicranomyia mitis		x		x					x		
Dicranomyia modesta	x	x	x	x	x	x	x	x	x		x
Dicranomyia omissinervis	x										
Dicranomyia fusca	x	x	x	x	x	x	x	x	x		
Dicranomyia aquosa				x							
Helius flavus				x							
Limonia flavipes	x			x	x		x		x		x
Limonia macrostigma	x	x	x	x	x	x	x	x			x
Limonia nubeculosa	x	x	x	x	x	x	x	x	x		x

	HC	HO	J	LO	LY	R	S	Sp	TW	TB	W
Limonia phragmitidis				x	x			x	x		x
Limonia trivittata	x	x	x	x	x			x	x		x
Neolimonia dumetorum	x			x	x		x	x	x		x
Lipsothrix nervosa					**f**	**f**			**f**		
Lipsothrix remota	**f**		**mf**	**mf**					**mf**		
Rhipidia maculata					x						
Thaumastoptera calceata					x						
TRICHOCERIDAE											
Diazosma hirtipenne											x
PTYCHOPTERIDAE											
Ptychoptera albimana											x
Ptychoptera contaminata				x							
Ptychoptera lacustris		x		x							
Ptychoptera paludosa				x					x	x	x

Appendix 1 Site descriptions

Shropshire

BANNISTER'S COPPICE 20th June 1999

The stream here bisects the wood (SJ6102), has a meandering course and shows a typical riffle and pool sequence. It is 4-5cm wide, 2cm-1m deep and is slow flowing. Bedrock is exposed in places and there is mud and silt in places. Liverworts and mosses are present in the banks. Vegetation includes bramble *Rubus fruticosus*, butterbur *Petasites hybridus*, garlic mustard *Alliaria petiolata*, wild garlic *Allium ursinum*, dog's mercury *Mercurialis perennis*, nettle *Urtica dioica*, honeysuckle *Lonicera periclymenum*, dogwood *Thelycrania sanguinea*, crab apple *Malus sylvestris*, guelder-rose *Viburnum opulus*, oak *Quercus* sp., hawthorn *Crataegus monogyna*, alder *Alnus glutinosa*, sycamore *Acer pseudoplatanus* and hazel *Corylus avellana*. Shingle bars support Himalayan balsam *Impatiens glandulifera*, pendulous sedge *Carex pendula*, broad leaved dock *Rumex obtusifolius* and nettle *Urtica dioica*. The banks are overhanging in places. Coarse woody debris is frequent.

BETTON DINGLE SSSI 19th June 1999

This site forms part of Betton Dingle and Gulley Green SSSI. The upper end of the site is at SJ315015 and the lower end at SJ317023. This site comprises a gully in woodland with shale exposed in the channel and forming cliffs. A gravel substrate is present in parts and shingle banks are occur downstream. Parts of the section are correspondingly very shaded and dark although there are clearings due to landslips and tree falls. There are some large fallen trees and coarse woody debris is frequent. The stream is 3-50cm deep, 1m wide and has good flow. Seepages are frequent in the banks and cliffs. Vegetation comprises dog's mercury *Mercurialis perennis*, opposite-leaved saxifrage *Chrysoplenium oppositifolium*, wood-sorrel *Oxalis acetosella*, ferns, ivy *Hedera helix*, hawthorn *Crataegus monogyna*, holly *Ilex aquifolium*, ash *Fraxinus excelsior*, wych elm *Ulmus glabra* and sycamore *Acer pseudoplatanus*. Conifers have been planted on the western side midway down the section. Some litter has been dumped in the stream particularly at the upstream end at Lydel which is also the most accessible point.

CHERMES DINGLE SSSI 17th June 1999

This site which comprises two narrow valleys meeting was divided into three for the purposes of the survey, namely the two valleys and the section downstream. Th downstream section and one of the upstream sections (Chermes Dingle) form a geological SSSI.

Upstream of Dingle Mill

This section is between Dingle Mill (SJ627062) and the new large pond (not shown on the 1:50,000 scale OS map). This section is outside the SSSI boundary. At the Mill itself woodland has been cleared with the lower part of the southern valley side ripped and seeded. In the wood, the ground layer includes wild garlic *Allium ursinum*, dog's mercury *Mercurialis perennis*, pendulous sedge *Carex pendula* and opposite-leaved saxifrage *Chrysoplenium oppositifolium* with much bare ground. Hazel *Corylus avellana* is the dominant cover whilst other shrubs include elder *Sambucus niger*, holly *Ilex aquifolium* and occasional rhododendron *Rhodendron ponticum*. The stream has a meandering course, is 0.5-1.5m wide, 5cm-25cm deep and comprises riffles, slacks and pools. The substrate comprises sand and shale pebbles and shaly berms are present in

the channel. Cliffs and exposed bedrock (shale) are present along the course of the stream. Ferns including hartstongue *Phyllitis scolopendrium* are present on the cliffs in particular.

Northern arm

This section includes Chermes Dingle upstream of Brockholes Bank (SJ655052). The stream is 20cm-1.5m wide, barely 3cm deep in places, has low flow and a substrate of stones and gravel. Coarse woody debris is abundant. Vegetation comprises opposite-leaved saxifrage *Chrysoplenium oppositifolium*, cleavers *Galium aparine*, hartstongue *Phyllitis scolopendrium*, bluebell *Endymion non-scriptus*, dog's mercury *Mercurialis perennis*, nettle *Urtica dioica*, ferns, wood millet *Milium effusum*, hazel *Corylus avellana*, holly *Ilex aquifolium*, elder *Sambucus niger* and alder *Alnus glutinosa*.

Downstream of Dingle Mill

This section includes the section downstream of Brockholes Bank and Dingle Mill. The stream has good flow, comprises riffles and pools and is 1-1.5m wide and 5cm to ?0.5m deep. The substrate is of mud and pebbles and coarse woody debris is frequent. Small eroding cliffs are present along the stream margins whilst alder *Alnus glutinosa* roots create natural weirs in places. Vegetation comprises dog's mercury *Mercurialis perennis*, wild garlic *Allium ursinum*, gooseberry *Ribes uva-crispa*, ferns, red campion *Silene dioica*, bramble *Rubus fruticosus*, rose *Rosa* sp., pendulous sedge *Carex pendula*, wood avens *Geum urbanum*, herb robert *Geranium robertianum* and yellow archangel *Galeobdolon luteum* and nettle *Urtica dioica* under hazel *Corylus avellana*, sycamore *Acer pseudoplatanus*, elm *Ulmus* sp. and occasional ash *Fraxinus excelsior*. The section below Dingle Mill through the field is poached.

COALMOOR 20th June 1999

This site was selected partly because it lies upstream of Loamhole Dingle and Lydbrook Dingle from where *Lipsothrix nigristigma* has been taken. The NGR is 657073. The stream is 70-80cm wide, 3-25cm deep with poor to moderate flow and poor riffles. The substrate comprised mud and pebbles. Eroding banks were present along its course. The stream was clearly eutrophicated upstream possibly due to provision of drinking points for cattle although there is a large new eutrophicated pond upstream of the site. Coarse woody debris and shingle berms are frequent. The woodland is used for sheep grazing hence there is no regeneration. Vegetation comprised open woodland with liverworts, cow parsley *Anthriscus sylvestris*, opposite-leaved saxifrage *Chrysoplenium oppositifolium*, dog's mercury *Mercurialis perennis*, wood-sorrel *Oxalis acetosella*, yellow pimpernel *Lysimachia nemorum*, *Deschampsia* sp., nettle *Urtica dioica*, buttercup *Ranunculus* sp., red campion *Silene dioica*, herb robert *Geranium robertianum*, bluebell *Endymion non-scriptus*, Himalayan balsam *Impatiens glandulifera*, foxglove *Digitalis purpurea*, holly *Ilex aquifolium*, elder *Sambucus niger*, sycamore *Acer pseudoplatanus*, alder *Alnus glutinosa* and ash *Fraxinus excelsior*.

THE DREWIN 26th June 1999

This site comprises a narrow wooded gully (NGR SJ2690). The stream here is 1m wide, 3-15cm deep and has good flow. The substrate comprises 50% gravel and 50% stones and gravel/shingle berms are frequent. Log jams were not too frequent. The stream margins are poached in places. Vegetation comprises *Deschampsia* sp., opposite-leaved saxifrage *Chrysoplenium oppositifolium*, broad-leaved willowherb *Epilobium montanum* , greater stichwort *Stellaria holostea*, butterbur

Petasites hybridus, dog's mercury *Mercurialis perennis*, ivy *Hedera helix*, ferns, hogweed *Heracleum sphondylium*, herb robert *Geranium robertianum*, wild garlic *Allium ursinum*, valerian *Valeriana officinalis*, wild arum *Arum maculatum*, wood avens *Geum urbanum*, honeysuckle *Lonicera periclymenum*, red campion *Silene dioica*, bramble *Rubus fruticosus*, woodruff *Galium odoratum*, bluebell *Endymion non-scriptus*, enchanter's-nightshade *Circaea lutetiana*, rose *Rosa* sp., hazel *Corylus avellana*, alder *Alnus glutinosa*, hawthorn *Crataegus monogyna* and ash *Fraxinus excelsior*.

THE ERCALL 20th June 1999

This site forms part of the Wrekin and the Ercall SSSI. The small stream at SJ639091 has poor flow and is 30cm wide and 3-8cm deep with a substrate of 60% stones and 40% mud. The stream joins a larger stream near the road (Cluddely to Little Wenlock Road). This larger stream is 30-40cm wide, 3-12cm deep with better flow (although still slow) and poor riffles. Coarse woody debris is abundant. Vegetation comprises wavy hair-grass *Deschampsia flexuosa*, cleavers *Galium aparine*, opposite-leaved saxifrage *Chrysoplenium oppositifolium*, herb robert *Geranium robertianum*, wild garlic *Allium ursinum*, wood anemone *Anemone nemorosa*, valerian *Valeriana officinalis*, bluebell *Endymion non-scriptus*, dog's mercury *Mercurialis perennis*, bramble *Rubus fruticosus*, rose *Rosa* sp., ferns, elder *Sambucus niger*, holly *Ilex aquifolium*, hazel *Corylus avellana*, lime *Tilia* sp., rowan *Sorbus aucuparia*, beech *Fagus sylvatica* and ash *Fraxinus excelsior*.

HABBERLEY VALLEY SSSI 19th June 1999

This site forms part of Earl's Hill and Habberley Valley biological and geological SSSI. Sampling commenced in Oaks Wood adjacent to the barn at SJ414050 and continued downstream passed the footbridge towards Radlith.

The stream is 3-4m wide and 5-25cm deep with good flow. Bedrock is exposed in the stream bed, whilst boulders are very frequent and shingle banks are present. Fallen trees and other coarse woody debris is frequent. northern and western bank is steep-sided whilst gentler slopes are present on the opposite side. The mature woodland here comprised wild garlic *Allium ursinum*, dog's mercury *Mercurialis perennis*, ferns, ivy *Hedera helix*, woodrush *Galium odoratum*, gooseberry *Ribes uva-crispa*, cow parsley *Anthriscus sylvestris*, bramble *Rubus fruticosus*, herb robert *Geranium robertianum*, foxglove *Digitalis purpurea*, wavy hair-grass *Deschampsia flexuosa*, holly *Ilex aquifolium*, hazel *Corylus avellana*, field maple *Acer campestre*, alder *Alnus glutinosa*, lime *Tilia* sp., sycamore *Acer pseudoplatanus* and wych elm *Ulmus glabra*.

HOPE VALLEY SSSI 19th June 1999

The stream sampled forms part of this geological SSSI and is also part of a Shropshire Wildlife Trust site.

The sampling started below Hope Mill (SJ352019) where the stream flows northeast in a steep-sided valley with the A488 running parallel. The stream has good flow, is 10-25cm deep and 2-3m wide with a substrate comprising 60% boulders, 30% stones and 10% gravel/silt. The bedrock is exposed in the bed where it forms natural weirs and in the cliffs. Small gravel berms are present. Coarse woody debris is frequent often in the form of fallen trees. Vegetation includes liverworts (especially on wet cliffs), great wood rush *Luzula sylvatica*, wild garlic *Allium ursinum*, valerian *Valeriana officinalis*, herb robert *Geranium robertianum*, dog's mercury *Mercurialis perennis*,

bramble *Rubus fruticosus*, opposite-leaved saxifrage *Chrysoplenium oppositifolium*, cleavers *Galium aparine*, honeysuckle *Lonicera periclymenum*, elm *Ulmus* sp. and hazel *Corylus avellana*. Downstream the stream passes through a culvert under the road and reappears on the other side where it flows along the southeastern side of the road. Sampling continued as far as the barbed wire fence that crosses the stream. Gooseberry *Ribes uva-crispa* and woodruff *Galium odoratum* were observed in this lower section.

HOLBROOK COPPICE 17th June 1999

Two streams are depicted on the 1:50,000 scale OS map for this site, one to the northeast and the other to the southwest (NGR SJ6505). The northeastern stream is about 12cm wide, the flow is moderate to low and the substrate muddy. Vegetation includes dog's mercury *Mercurialis perennis*, cleavers *Galium aparine*, ferns, hazel *Corylus avellana* and there is a lot of bare ground. Coarse woody debris is present. Pendulous sedge *Carex pendula* and ragged-robin *Lychnis flos-cuculi* are present in open wet areas and along wet tracks.

The southwestern stream is up to 20cm wide, has low flow, flows along a gentler gradient than the above and has a muddy margin 1.5m wide. Vegetation includes opposite-leaved saxifrage *Chrysoplenium oppositifolium*, wild garlic *Allium ursinum*, ferns, mosses whilst there is a lot of bare ground. Scrub is frequent and comprises field maple *Acer campestre*, hazel *Corylus avellana* and some rowan *Sorbus aucuparia*.

JACKFIELD 21st June 1999

This comprises a wooded gully centred on NGR SJ690021 with a small stream 30cm wide and 3-12cm deep. At the upstream end there was very little flow and throughout much of the section the flow was slow. The section was flanked by steep bare rock cliffs which meant that the stream was heavily shaded. Coarse woody debris was frequent. Rocks comprised 80% of the substrate and small gravel patches were also present. Vegetation included liverworts, mosses, nettle *Urtica dioica*, enchanter's-nightshade *Circaea lutetiana*, wood avens *Geum urbanum*, wood-sorrel *Oxalis acetosella*, dog's mercury *Mercurialis perennis*, cow parsley *Anthriscus sylvestris*, wild garlic *Allium ursinum*, opposite-leaved saxifrage *Chrysoplenium oppositifolium*, herb robert *Geranium robertianum*, bramble *Rubus fruticosus*, ash *Fraxinus excelsior*, elm *Ulmus* sp. and sycamore *Acer pseudoplatanus*. Wet muddy areas are present.

LOAMHOLE DINGLE 15th -16th June 1999

A) North of culvert to the roadbridge

This area in upstream of the culvert in which the stream enters through an iron grill (approximately SJ663057). The stream is 2.5 metres wide with a maximum depth of 10-12 cm in the vicinity of the culvert although deep pools are present further upstream. The stream has good flow and the substrate is mainly stony with some exposed gravel berms. Coarse woody debris is present in the stream. The bedrock is increasingly exposed upstream. Rocks in the stream are covered with mosses and liverworts. The ground layer includes wood millet *Milium effusum*, wood-sorrel *Oxalis acetosella*, red campion *Silene dioica*, dog's mercury *Mercurialis perennis*, hogweed *Heracleum sphondylium*, nettle *Urtica dioica*, cleavers *galium aparine*, ground-elder *Aegopodium podagraria* and ferns with occasional wild garlic *Allium ursinum* and wood avens *Geum urbanum*. There are areas of very wet mud which support pendulous sedge, opposite-leaved saxifrage *Chrysoplenium oppositifolium*, horsetail *Equisetum* sp., occasional marsh

marigold *Caltha palustris*, water avens *Geum rivale*, goat willow *Salix capraea* and alder *Alnus glutinosa*. Ditches are present in which there is no apparent flow. Away from the wettest areas hazel may be present and bramble *Rubus fruticosus* and elder *Sambucus niger* scrub is frequent, whilst the canopy comprises ash *Fraxinus excelsior* and sycamore *Acer pseudoplatanus*. Dead standing trees and fallen timber are frequent, with logs often half submerged in the wet mud. Seepages are present on the western side of the valley above the footpath and are indicated by valerian *Valeriana officinalis* and great wood rush *Luzula sylvatica*. Upstream the section becomes gorge-like and very shaded above a natural weir, with frequent waterfalls and seepages some of which are tufaceous.

B) Downstream of the culvert

Vegetation as upstream plus hawthorn, rowan and beech with some holly, field maple, yew and lime. From the point where the stream discharges from the culvert to where the footpath crosses the watercourse (SJ665054), the stream is flanked by steeper banks and marked by frequent log-jams. Small landslips in the banks where present here and may have accounted for the observed muddy condition of the water. From just above where the footpath crosses, the valley opens out somewhat and a footpath follows the course of the stream downstream. Log-jams and gravel berms continue to be frequent in this downstream section. At the downstream end the stream enters a open marsh which was not sampled in detail. Meadowsweet *Filipendula ulmaria* and bittersweet *Solanum dulcamara* occur in this downstream section.

LYDBROOK DINGLE SSSI 16th June 1999

The downstream end of this section (which continues down into Loamhole Dingle) was taken as the A4169 roadbridge just north of Leason's Farm (SJ660060). Strictly speaking part of the section downstream of the road forms part of Lydbrook Dingle and some of the records from the uppermost part of Loamhole Dingle should belong here. The physical characteristics and vegetation were similar to the upstream part of Loamhole Dingle, described above. The stream was 1. 5m. wide, normal depth 8-10cm with a good flow and substrate comprising 70% rocks and 30% gravel. The course of the stream proved difficult to follow due to the large amount of coarse woody debris, rock outcrops, deep pools, dense thorny scrub and so on. Scrub was frequent and included gooseberry *Ribes uva-crispa*. The ground layer comprised dog's mercury *Mercurialis perennis*, herb robert *Geranium robertianum*, wild garlic *Allium ursinum*, pendulous sedge *Carex pendula* (less frequent than in Loamhole Dingle), red campion *Silene dioica*, hartstongue *Phyllitis scolopendrium* and other ferns, mosses, wood millet *Milium effusum*, cleavers *Galium aparine* and nettles *Urtica dioica*. Wet areas were vegetated by opposite-leaved saxifrage *Chrysoplenium oppositifolium*, horsetails *Equisetum* sp. and alder *Alnus glutinosa*. On the west bank, tufaceous seepages were encountered

SAPLIN'S WOOD 17th June 1999

The NGR is SJ6305. The stream which runs up the western side of the wood was followed and comprised poor riffles, slacks and pools and log jams were frequent. The substrate comprises 40% silt, 40% sand/gravel, 10% mud and 10% stones. The channel is 30cm-1m wide (widest at the pools) and water depth 2.5-5cm. The stream meanders and gravel berms are present. Upstream the channel is deeply incised with 1m+ vertical banks below the level of the woodland floor (except where slippage has taken place).Vegetation comprises dog's mercury *Mercurialis perennis*, wild garlic *Allium ursinum*, ivy *Hedera helix* (on the ground), ferns under hazel *Corylus avellana*, elder *Sambucus niger*, alder *Alnus glutinosa* (roots often present in the channel),

hawthorn *Crataegus monogyna* and sycamore *Acer pseudoplatanus* saplings. Sections of the wood have been planted with conifers whilst other areas are dominated by young ash *Fraxinus excelsior*. Above a clearing, progress was difficult due to encroaching scrub.

SHORT WOOD 20th June 1999

The stream which marks the western edge of the wood (at SJ657093) was polluted with noticeable sewage fungus and was discoloured red-brown. Coarse woody debris was very abundant often forming natural weirs. Vegetation included liverworts, great wood rush *Luzula sylvatica*, dog's mercury *Mercurialis perennis*, wood-sorrel *Oxalis acetosella*, wavy hair-grass *Deschampsia flexuosa*, ferns, wild garlic *Allium ursinum*, bluebell *Endymion non-scriptus*, valerian *Valeriana officinalis*, bramble *Rubus fruticosus*, honeysuckle *Lonicera periclymenum*, hazel *Corylus avellana*, alder *Alnus glutinosa*, sycamore *Acer pseudoplatanus*, rowan *Sorbus aucuparia* and ash *Fraxinus excelsior* (saplings). A large patch of great wood rush *Luzula sylvatica* near the stream was swept.

TICK WOOD SSSI 18th June 1999

This site forms part of Tick Wood and Benthall Edge SSSI. The stream section sampled flows along Hunger Dale and forms the western edge of Spratts Coppice (these names are taken from the SSSI map). The NGR is SJ646026 to SJ648030.

The stream is 1m wide, 3cm-12cm deep, has good flow and features a series of tufa terraces in the stream bed. Liverworts and lime-encrusted mosses are present along the margins of the stream. Coarse woody debris is frequent. Wet areas are present with pendulous sedge *Carex pendula* and opposite-leaved saxifrage *Chrysoplenium oppositifolium*. The vegetation comprises wild garlic *Allium ursinum*, dog's mercury *Mercurialis perennis*, cleavers *Galium aparine*, ferns, nettle *Urtica dioica* and bramble *Rubus fruticosus* under hawthorn *Crataegus monogyna*, hazel *Corylus avellana*, sycamore *Acer pseudoplatanus*, elm *Ulmus glabra* and ash *Fraxinus excelsior*. The stream is very shaded in parts but downstream flows out of the wood into a marsh comprising false water cress *Apium nodiflorum*, willowherb *Epilobium* sp., rushes *Juncus* sp., mint *Mentha* sp., dock *Rumex* sp. and pendulous sedge *Carex pendula*. Sampling continued as fast as the new track cleared through the wood and which crosses the stream. Several large trees have been cut down here to make way for the track.

WHITWELL COPPICE SSSI 18th June 1999

Whitwell Coppice is both a biological and geological SSSI and the sampling took place wholly within the SSSI boundaries. Whitwell Coppice lies upstream of and adjacent to Bannister's Coppice, one of the sites from which *Lipsothrix nigristigma* was taken in 1995.

Sneinton Brook was sampled between Sheinwood (SJ615025) and the weir at SJ614023. The Brook here is 2-5m wide, 12cm-1m deep, has low flow and comprises riffles and deep pools. The water is turbid in the deeper sections. Mud, sand and shingle banks are present and whilst some are bare, others are vegetated by Himalayan balsam *Impatiens glandulifera*, butterbur *Petasites hybridus*, dog's mercury *Mercurialis perennis*, nettle *Urtica dioica* and garlic mustard *Alliaria petiolata*. Along the banks are bramble *Rubus fruticosus*, dogwood *Thelycrania sanguinea*, elder *Sambucus niger* and hazel *Corylus avellana*. In the wooded sections herb robert *Geranium robertianum*, wood avens *Geum urbanum*, wild garlic *Allium ursinum*, guelder rose *Viburnum opulus*, hawthorn *Crataegus monogyna*, and lime *Tilia* sp. are present with hazel dominant. Log

jams can be large. Cut-off pools are present. Along the footpath near the weir there is a wet area of butterbur *Petasites hybridus* and pendulous sedge *Carex pendula*. The much smaller tributary stream crossed by a wooden bridge here which forms the southwestern boundary of the SSSI was followed. This was 1m wide, 2.5cm to 1m deep, had poor to good flow and was riffly and gravelly. Alder *Alnus glutinosa* roots cut across the channel here and in Sneinton Brook.

Wales

CROWTHER'S COPPICE 26th June 1999

This site lies 3km west of Guilsfield. The stream at the southwestern part of the wood was sampled (SJ 239108). The stream was 3-75cm deep, had moderate flow and the substrate generally comprised 50% gravel and 50% stones although mud was also present in places.. The vegetation comprised opposite-leaved saxifrage *Chrysoplenium oppositifolium*, hogweed *Heracleum sphondylium*, *Rumex* sp., cleavers *Galium aparine*, butterbur *Petasites hybridus*, bramble *Rubus fruticosus*, red campion *Silene dioica*, dog's mercury *Mercurialis perennis*, nettle *Urtica dioica*, alder *Alnus glutinosa*, hawthorn *Crataegus monogyna*, honeysuckle *Lonicera periclymenum*, dog rose *Rosa canina*, hazel *Corylus avellana*, rowan *Sorbus aucuparia*, elm *Ulmus* sp. and sycamore *Acer pseudoplatanus*. Coarse woody debris was frequent.

GUILSFIELD 26th June 1999

The section sampled comprised woodland north of Guilsfield village from the point where the stream enters the wood at SJ216130 to the pig farm at SJ219125. The stream here is 3-9cm deep, 0.5-1.5m wide, has good flow and the substrate comprises 50% gravel and 50% rocks. Coarse woody debris is frequent and pools are present in the stream. Bedrock outcrops in the stream bed and forms cliffs along its course. The surrounding vegetation comprises opposite-leaved saxifrage *Chrysoplenium oppositifolium*, wood-sorrel *Oxalis acetosella*, hartstongue *Phyllitis scolopendrium* and other ferns, Himalayan balsam *Impatiens glandulifera*, wild arum *Arum maculatum*, dog's mercury *Mercurialis perennis*, marsh marigold *Caltha palustris*, wood avens *Geum urbanum*, herb robert *Geranium robertianum*, bluebell *Endymion non-scriptus*, bramble *Rubus fruticosus*, ivy *Hedera helix*, hazel *Corylus avellana* and sycamore *Acer pseudoplatanus*. Plantations are present on either side of the stream.

RHOS-GOCH 26th June 1999

This site (NGR SJ2806) comprises a narrow wooded gully with the stream flowing northeast into Rowley Brook which constitutes the English/Wales boundary. The stream is 1m wide and 3-30cm deep with a good flow. Much of the channel is through bedrock with little substrate although where present this comprises gravel and stones and small shingle berms are present upstream. Coarse woody debris is frequent creating occasional impressive log jams. Vegetation comprises opposite-leaved saxifrage *Chrysoplenium oppositifolium*, cleavers *Galium aparine*, valerian *Valeriana officinalis*, yellow pimpernel *Lysimachia nemorum*, nettle *Urtica dioica*, bluebell *Endymion non-scriptus*, enchanters nightshade *Circaea lutetiana*, wood-sorrel *Oxalis acetosella*, herb robert *Geranium robertianum*, red campion Silene dioica, ferns, hazel *Corylus avellana*, hawthorn *Crataegus monogyna* and ash *Fraxinus excelsior*.

TREWERN BROOK SSSI 19th June 1999

Sampling was only undertaken from the Welsh side of the brook only. The NGR is SJ303116. The brook comprises poor riffles, slacks and pools. Rock outcrops in the stream bed and shingle and gravel berms are present to the southern end of the section. Bankside vegetation comprises red campion *Silene dioica*, nettle *Urtica dioica* (abundant), dog rose *Rosa canina*, hogweed *Heracleum sphondylium*, bramble *Rubus fruticosus*, cleavers *Galium aparine*, hazel *Corylus avellana*, dogwood *Thelycranium sanguineum*, hawthorn *Crataegus monogyna* and blackthorn *Prunus spinosa*. The section is surrounded by cattle pasture and is poached in places. Sampling was abandoned due to the unpromising habitat particularly the lack of adjacent woodland.

Appendix 2 Red Data Book and Nationally Scarce species recorded

Red Data Book 2

Limonia omissinervis
Paradelphomyia ecalcarata

Red Data Book 3

Scleroproctus pentagonalis

Nationally Scarce

Tipula helvola
Molophilus corniger
Tasiocera robusta
Eloeophila mundata
Paradelphomyia fuscula
Pilaria fuscipennis
Pilaria scutellata
Atypophthalmus inustus
Dicranomyia lucida
Dicranomyia aquosa
Limonia trivittata
Thaumastoptera calceata

Diazosma hirtipenne

Keroplatus testaceus
Oxycera pardalina
Stegana coleoptrata

Biodiversity Action Plan Species

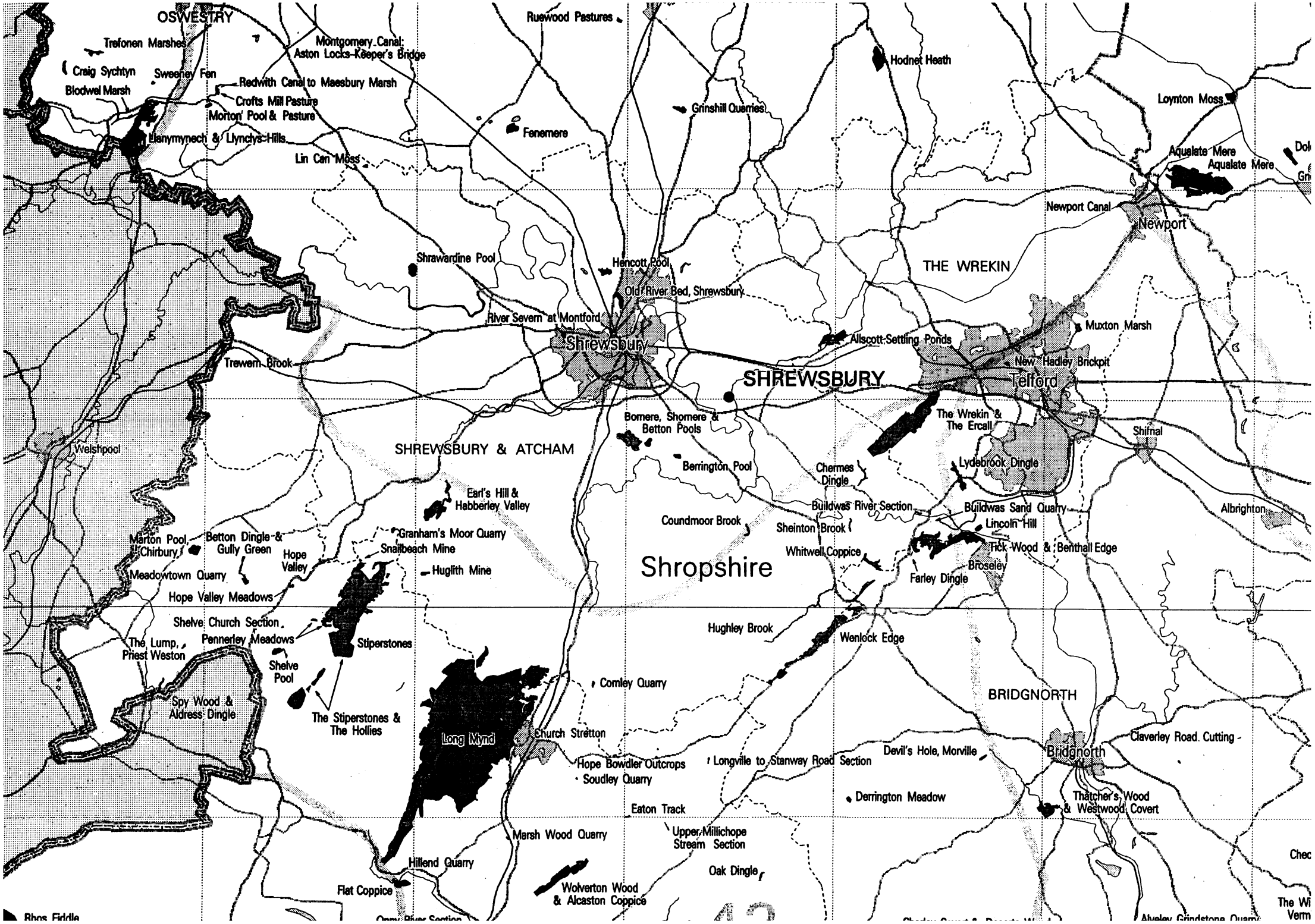
Lipsothrix nervosa

Figure 1a: Location of Sites

Figure 1b: Location of Sites

Figure 1c: Location of Sites

Figure 1d: Location of Sites


OSWESTRY
Trefonen Marshes
Craig Sychtyn
Sweeney Fen
Blodwel Marsh
Montgomery Canal: Aston Locks-Keeper's Bridge
Redwith Canal to Maesbury Marsh
Crofts Mill Pasture
Morton Pool & Pasture
Llanymynech & Llynclys Hills
Lin Can Moss
Ruewood Pastures
Fenemere
Grinshill Quarries
Hodnet Heath
Loynton Moss
Aqualate Mere
Aqualate Mere
Newport Canal
Newport
THE WREKIN
Shrawardine Pool
Hencott Pool
Old River Bed, Shrewsbury
River Severn at Montford
Shrewsbury
Allscott Settling Ponds
Muxton Marsh
New Hadley Brickpit
Telford
SHREWSBURY
Trewern Brook
Bomere, Shomere & Betton Pools
The Wrekin & The Ercall
Shifnal
Welshpool
SHREWSBURY & ATCHAM
Berrington Pool
Chermes Dingle
Lydebrook Dingle
Earl's Hill & Habberley Valley
Buildwas River Section
Buildwas Sand Quarry
Albrighton
Coundmoor Brook
Sheinton Brook
Lincoln Hill
Marton Pool, Chirbury
Betton Dingle & Gully Green
Granham's Moor Quarry
Snailbeach Mine
Hope Valley
Whitwell Coppice
Tick Wood & Benthall Edge
Broseley
Meadowtown Quarry
Hugliith Mine
Shropshire
Farley Dingle
Hope Valley Meadows
Shelve Church Section
Pennerley Meadows
Stiperstones
Hughley Brook
Wenlock Edge
The Lump, Priest Weston
Shelve Pool
Comley Quarry
BRIDGNORTH
Spy Wood & Aldress Dingle
The Stiperstones & The Hollies
Long Mynd
Church Stretton
Claverley Road Cutting
Devil's Hole, Morville
Bridgnorth
Hope Bowdler Outcrops
Longville to Stanway Road Section
Soudley Quarry
Derrington Meadow
Thatcher's Wood & Westwood Covert
Eaton Track
Marsh Wood Quarry
Upper Millichope Stream Section
Hillend Quarry
Oak Dingle
Flat Coppice
Wolverton Wood & Alcaston Coppice
Rhos Fiddle

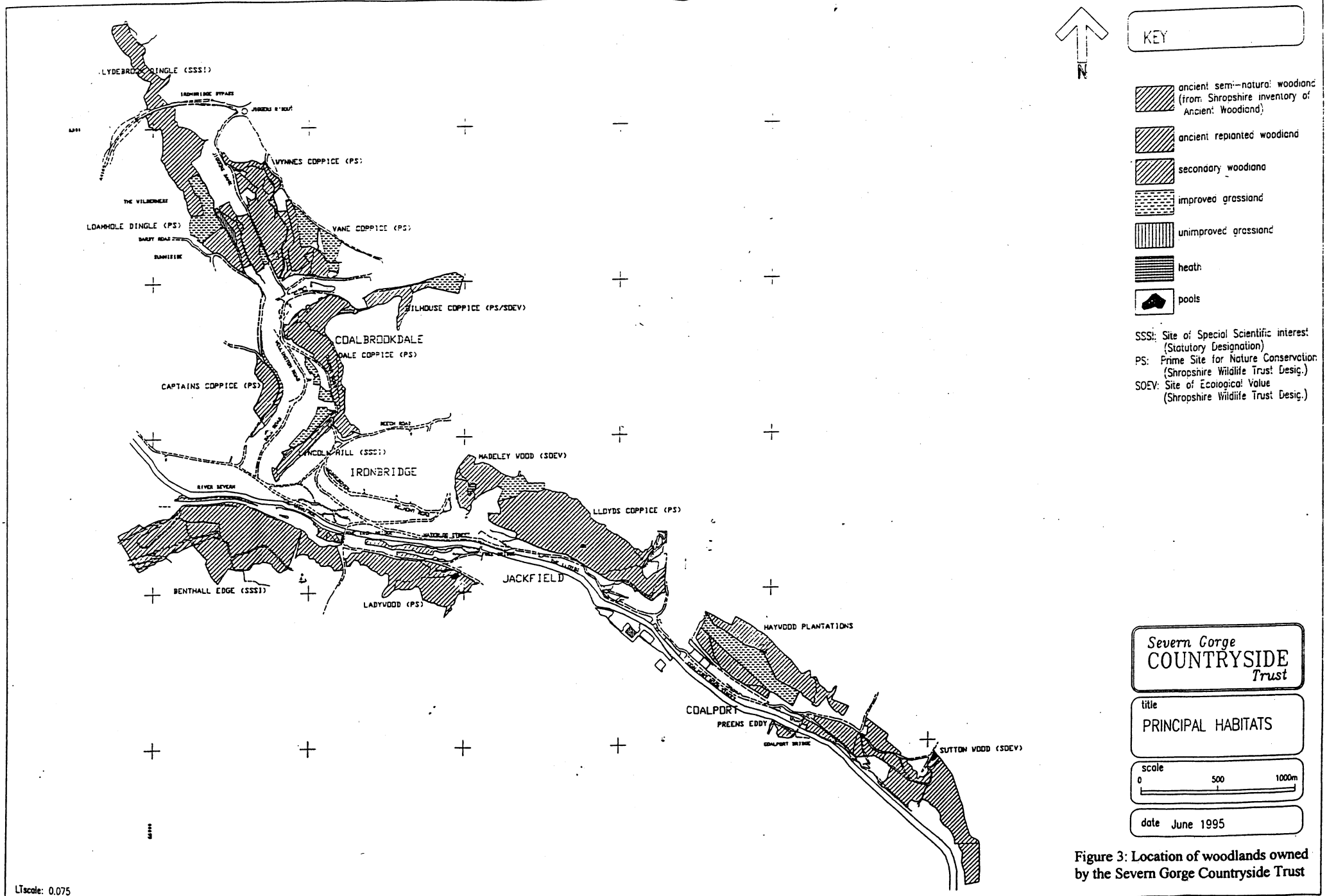
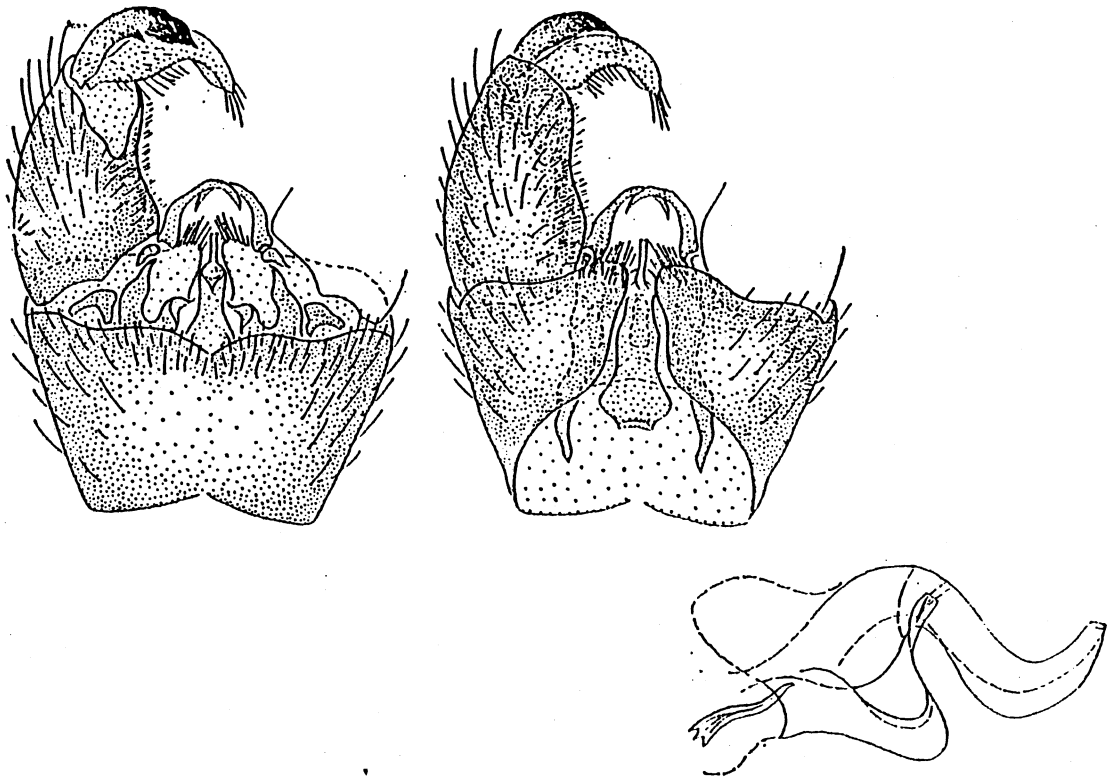


Figure 3: Location of woodlands owned by the Severn Gorge Countryside Trust



Lipsothrix nigristigma
(after Savchenko 1982)

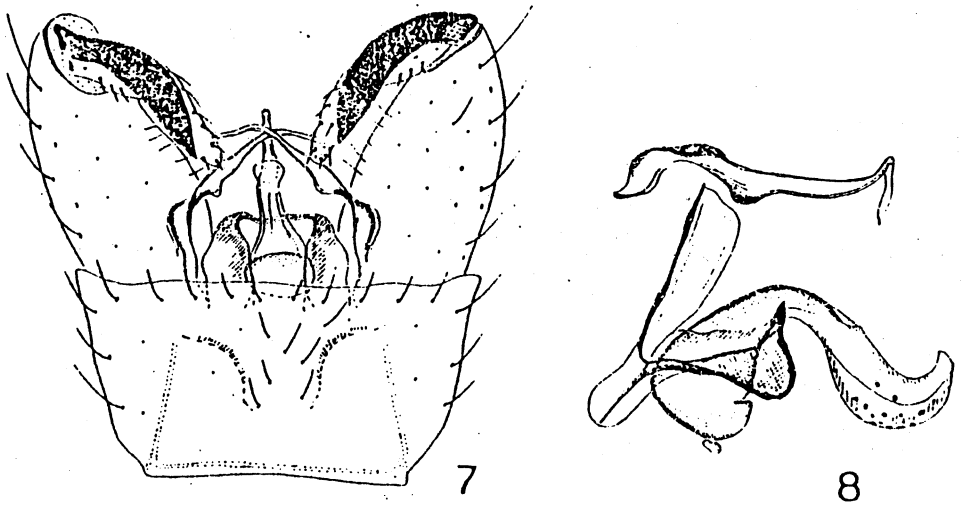


Abb. 7—8: *Lipsothrix nobilis* L o e w, männliche Genitalien: 7 — Gesamtansicht, dorsal. 8 — Aedeagalkomplex, lateral.

Lipsothrix nobilis
(after Stary 1971)

Figure 4: Figures of the male genitalia of *Lipsothrix* species taken from literature.

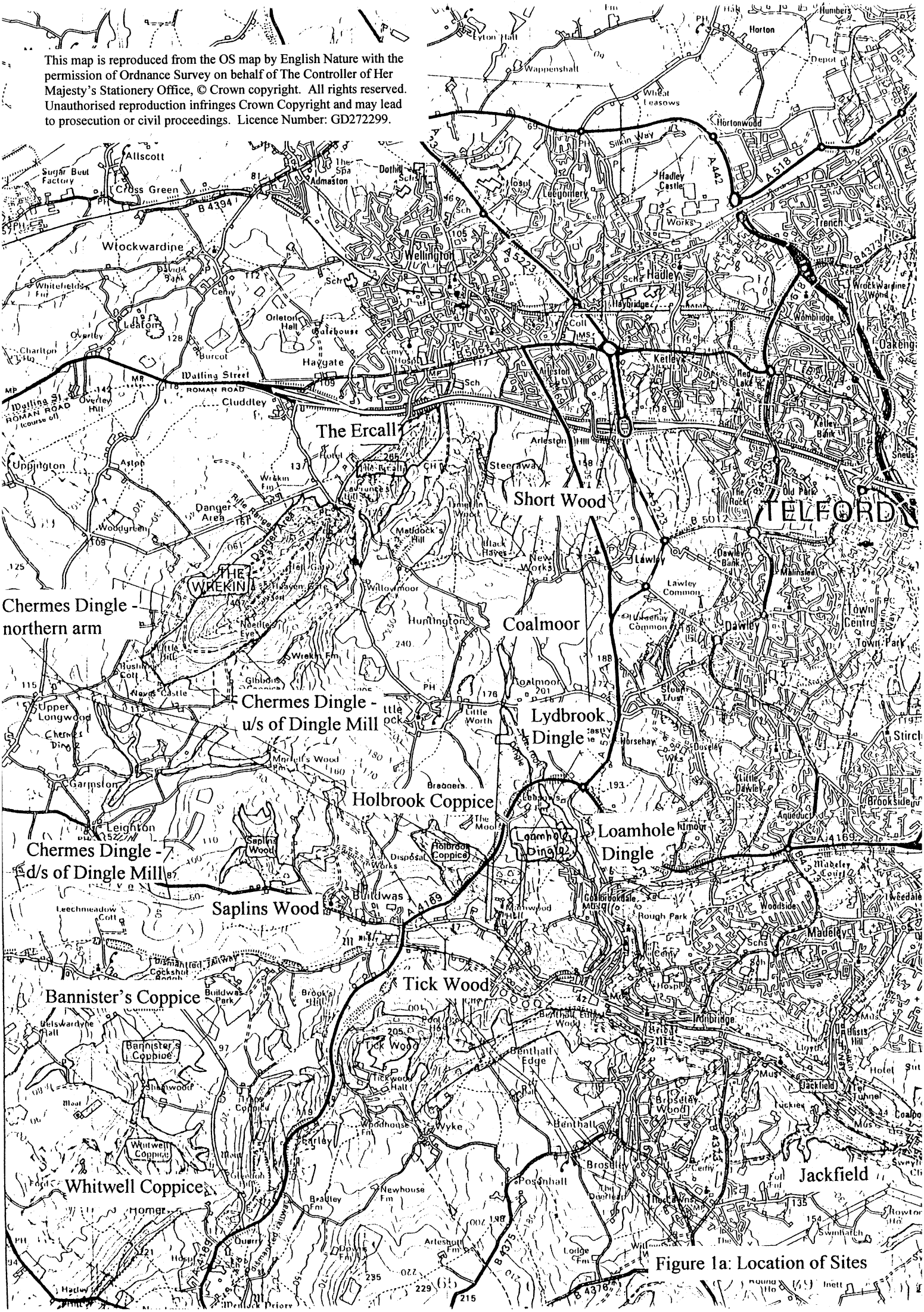


Figure 1a: Location of Sites

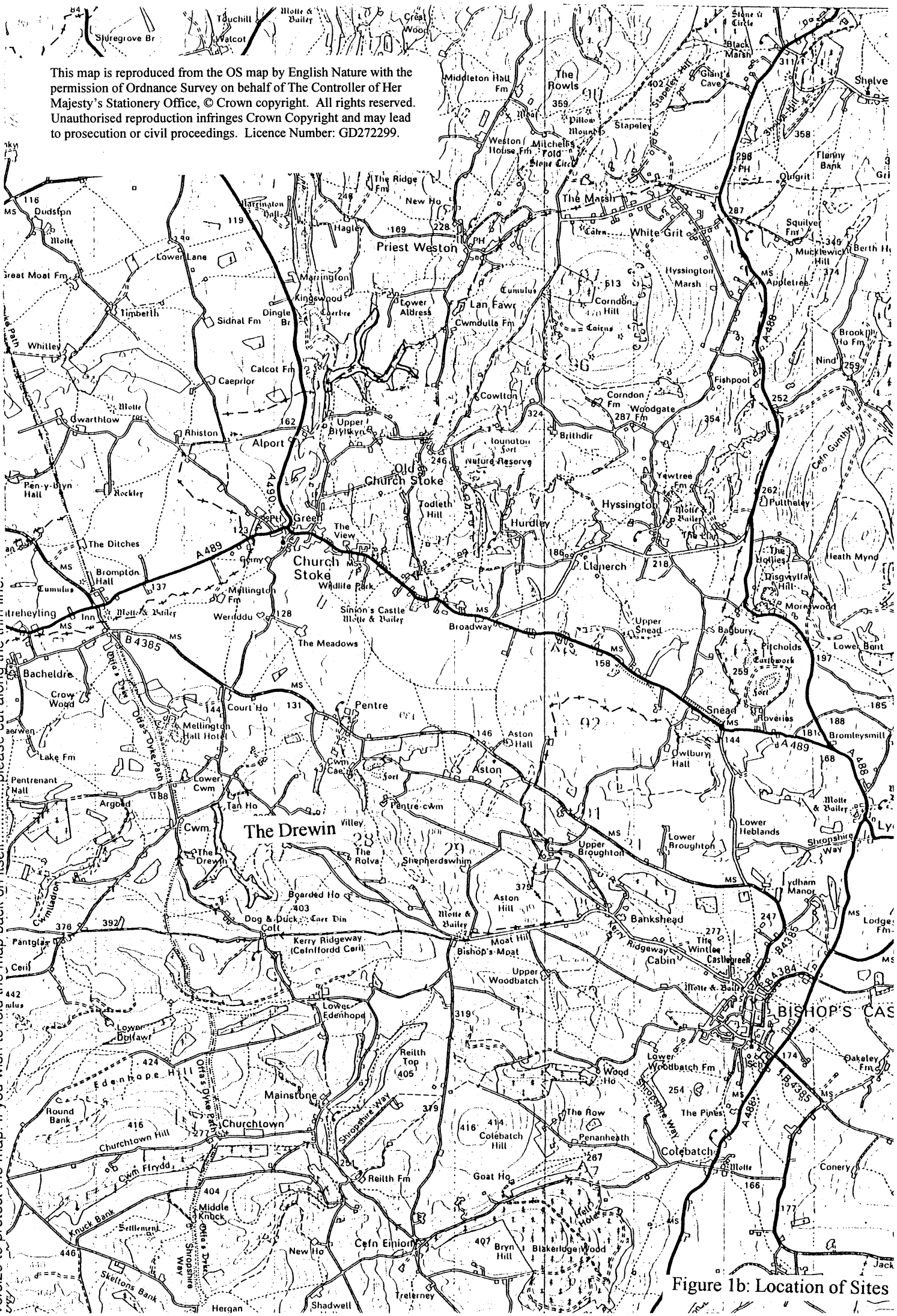
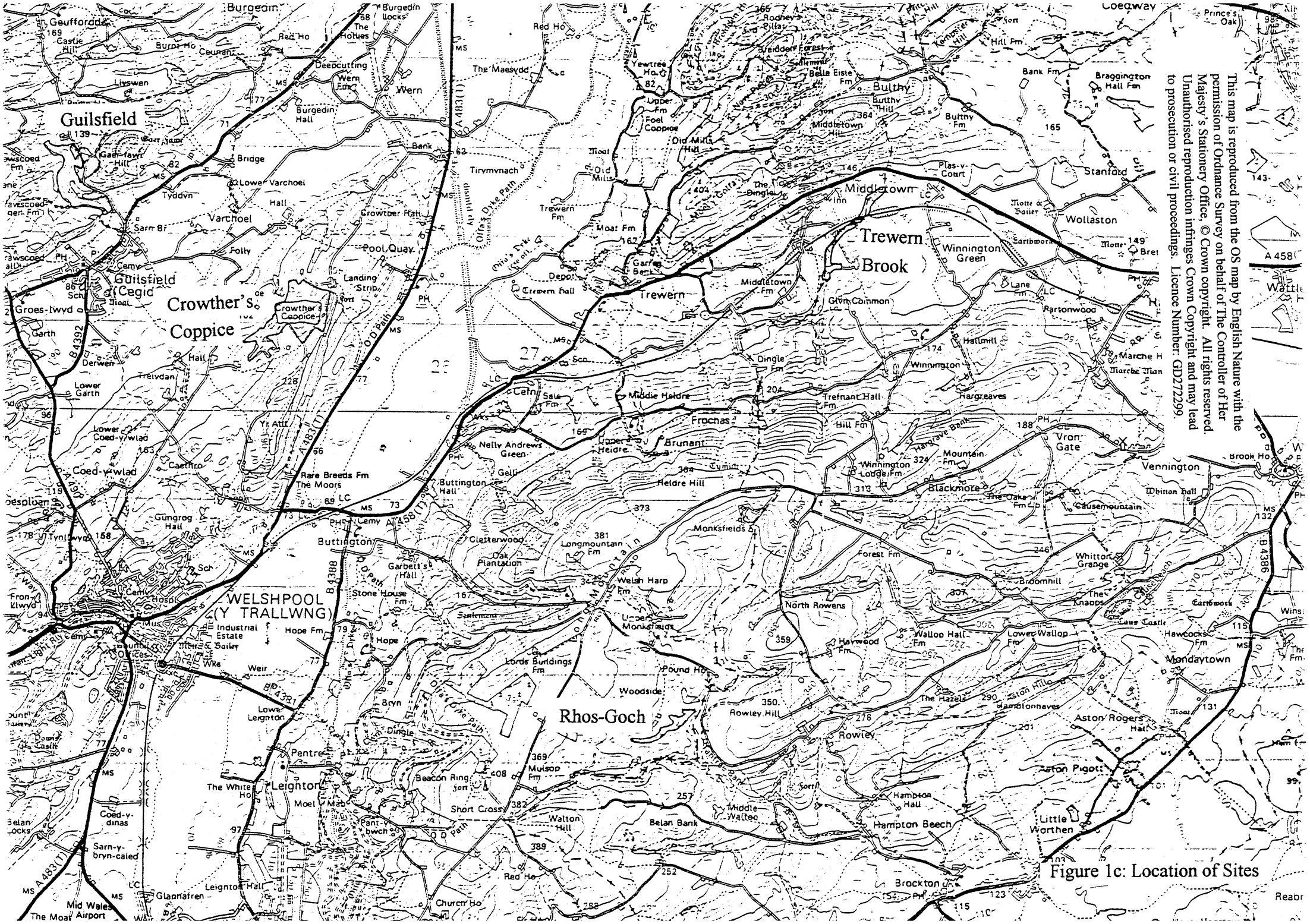


Figure 1b: Location of Sites

please cut along the trim line. If you wish to fold the map back on itself, resize to protect the map.



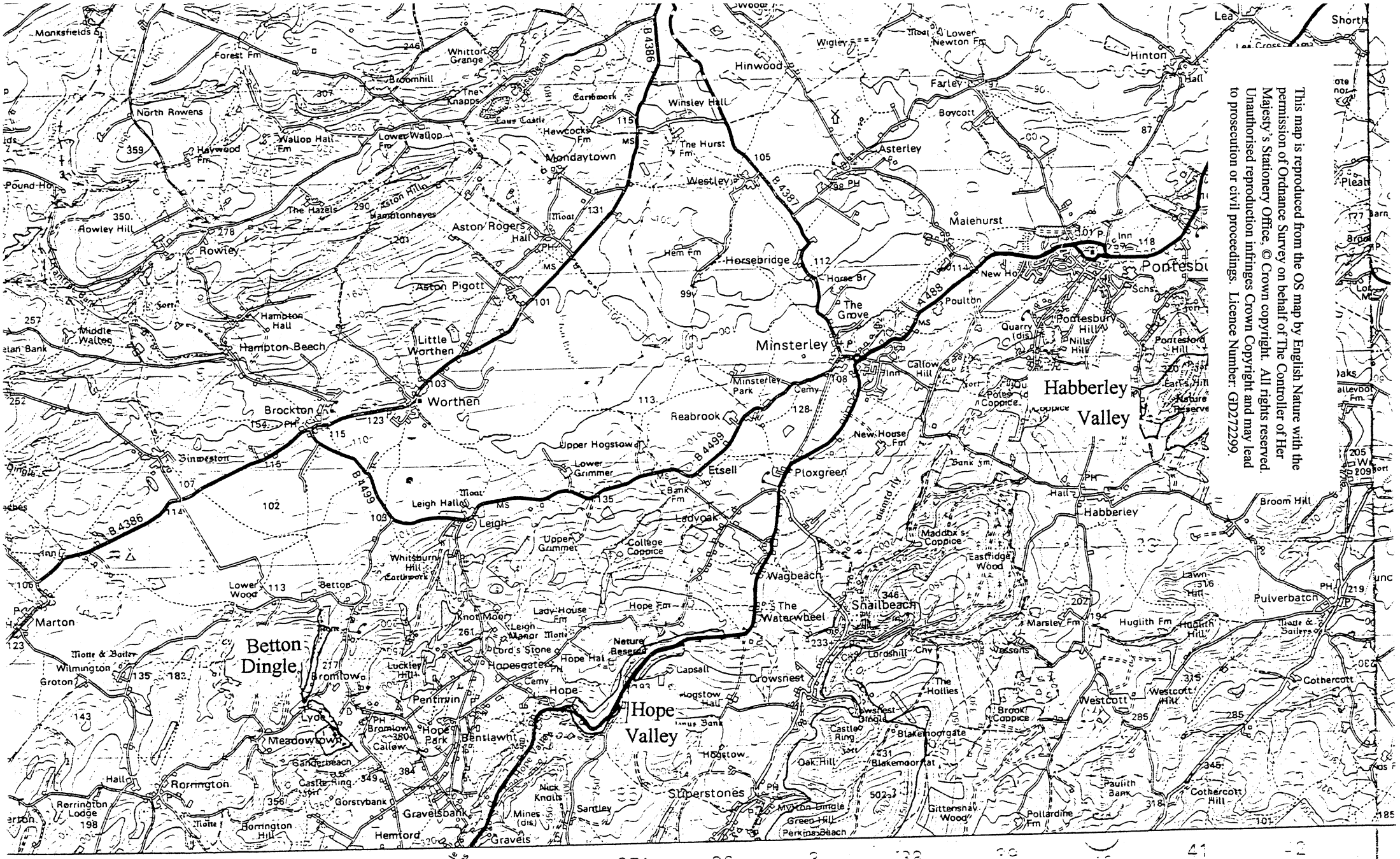
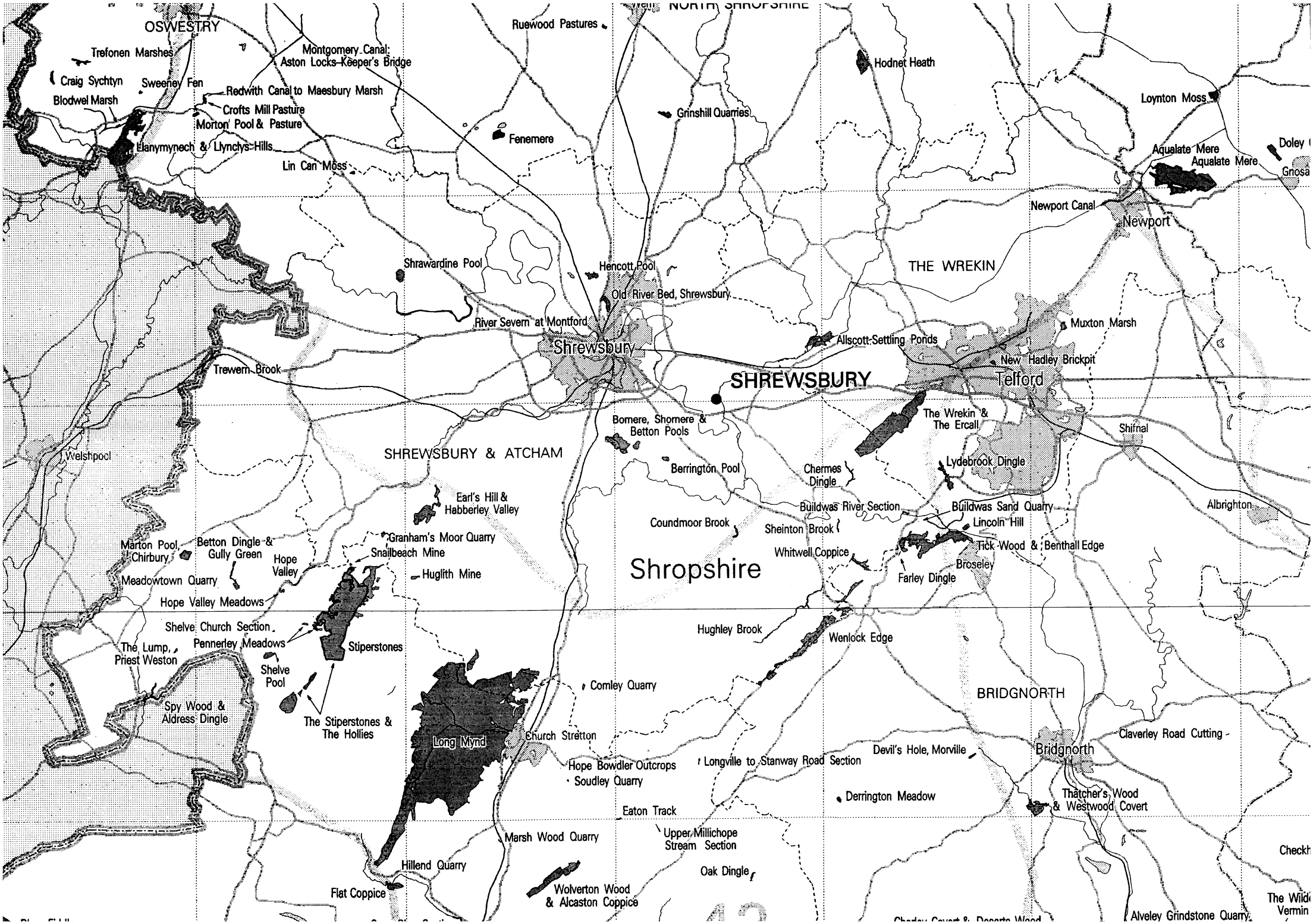


Figure 1d: Location of Sites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Morton Pool & Pasture
Llanymynech & Llynclys Hills
Lin Can Moss
Ruewood Pastures
Fenemere
Grinshill Quarries
Hodnet Heath
Loynton Moss
Aqualate Mere
Aqualate Mere
Newport Canal
Newport
THE WREKIN
Shrawardine Pool
Hencott Pool
Old River Bed, Shrewsbury
River Severn at Montford
Shrewsbury
Muxton Marsh
Allscott Settling Ponds
New Hadley Brickpit
Telford
SHREWSBURY
Trewern Brook
The Wrekin & The Ercall
Shifnal
Bomere, Shomere & Betton Pools
SHREWSBURY & ATCHAM
Welshpool
Berrington Pool
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Granham's Moor Quarry
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Marton Pool
Chirbury
Betton Dingle & Gully Green
Hope Valley
Meadowtown Quarry
Huglith Mine
Whitwell Coppice
Tick Wood & Benthall Edge
Broseley
Farley Dingle
Shropshire
Hope Valley Meadows
Shelve Church Section
Pennerley Meadows
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Hillend Quarry
Oak Dingle
Wolverton Wood & Alcaston Coppice
Flat Coppice
Alveley Grindstone Quarry

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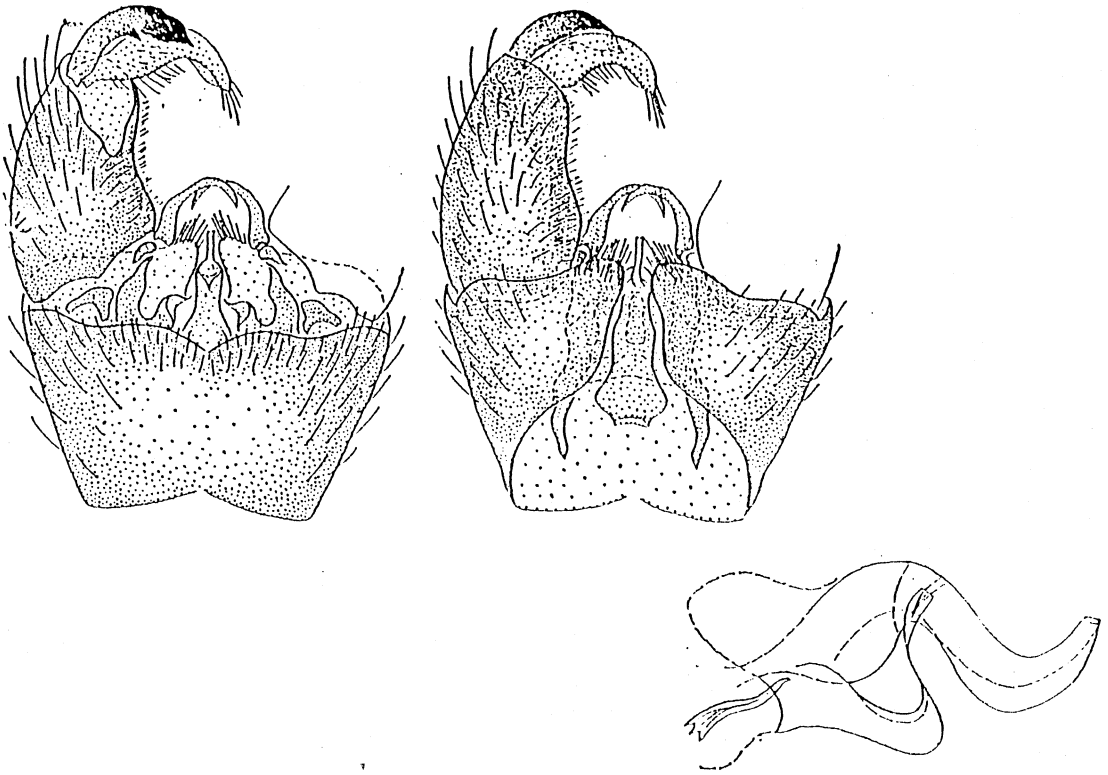
LTscale: 0.075
AutoCAD R12



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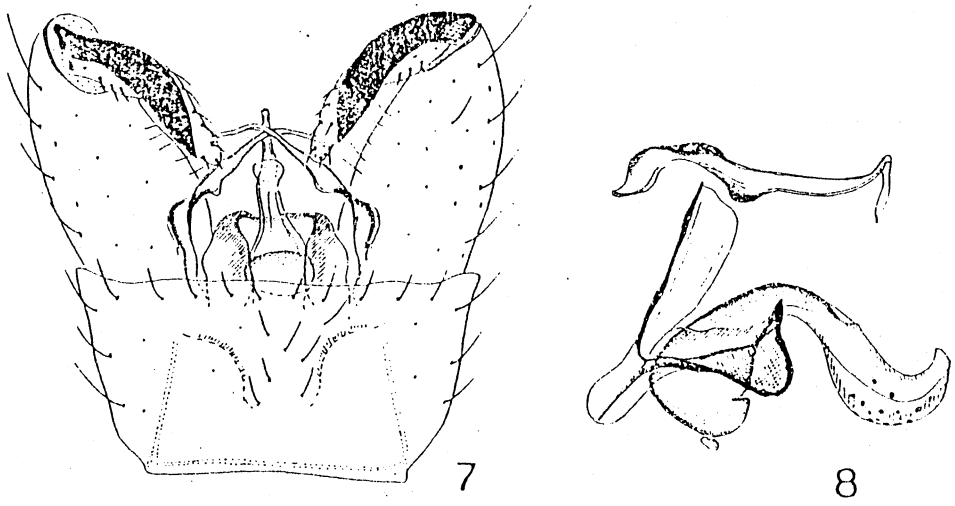
(after Savchenko 1982)



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