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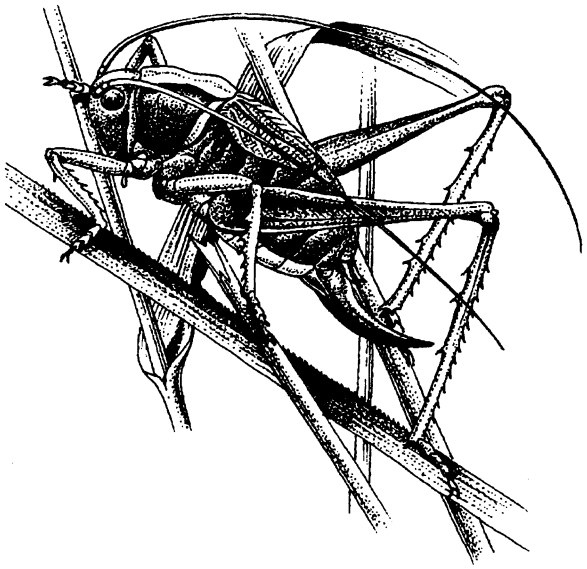
Invertebrate interest of the Mid-Cornwall Moors



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English Nature Research Reports

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(EN Nominated Officer/ Editor: J Stewart)

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English Nature Research Report No. 354
Invertebrate Interest of the Mid-Cornwall Moors

Contents

INVERTEBRATE INTEREST OF THE MID-CORNWALL MOORS: PROJECT DATA SHEET

Sites visited: Newlyn Downs; Ventongimps Moor
Rosenannon Bog and Downs; Retire Common
Tregoss Moor; Redlake Meadows and Hoggs Moor

Survey dates:

First visit: 30th June; 1st, 7th, 10th, 16th, 18th & 28th July 1997

Second visit: 22nd July; 7th, 10th & 21st August 1997

Third visit: 9th, 10th, 12th & 15th September 1997

Surveyors: E.C.M. Haes BSc
A. Spalding MA

Taxonomic groups: Arachnida
Coleoptera
Diptera
Hemiptera
Hymenoptera
Lepidoptera
Odonata
Orthoptera

Report for: English Nature

Report compiled: A. Spalding MA

Report completed: 20th September 1999

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1. SUMMARY

The aim of the work was to record the invertebrate interest and significance of the Mid Cornwall Moors and to generate related site specific and generic management guidelines.

Six heathland Sites of Special Scientific Interest (SSSI) were each surveyed three times during the summer between 24th June and 15th September 1997; 4 man hours were spent on each site visit. Due to their geographic location the sites form part of a group of heathland sites known locally as the Mid Cornwall Moors.

No Red Data Book species were recorded. Five Nationally Scarce species were recorded, with one further species present by inference. These are the ground beetle *Amara equestris* (Nb), Small Red Damselfly *Ceriagrion tenellum* (NS), Marsh Fritillary *Eurodryas aurinia* (NS), the cuckoo bee *Nomada pleurosticta* (Na), Silver-studded Blue *Plebejus argus* (Notable) and the weevil *Polydrusus confluens* (Nb). The solitary bee *Andrena humilis* (Nb) is present by inference.

Three species were recorded which have been listed in *Biodiversity: The UK Steering Group Report. Volume 2: Action Plans*: Marsh Fritillary *Eurodryas aurinia* (Priority species), Silver-studded Blue *Plebejus argus* (Priority species) and *Bombus humilis* (long list).

Three species were recorded which have been listed in *Cornwall's Biodiversity Volume 1: Audit and Priorities*: Marsh Fritillary *Eurodryas aurinia* (short list), Silver-studded Blue *Plebejus argus* (middle list) and *Bombus humilis* (middle list).

Comparisons are made between sites. The site with the highest species diversity was Rosenannon Bog and Downs (181 species recorded), followed by Ventongimps Moor (179 species) and Newlyn Downs (175 species). The poorest site for invertebrates was Redlake Meadows (100 species), despite having the widest variety of habitat (7 habitat types including open water). The single richest habitat was the wet Dorset heathland at Ventongimps Moor, which had more species (155) recorded than in the whole of Redlake Meadows (100 species). Wet heathland was generally rich in species, e.g. at Newlyn Downs (114 species) and Rosenannon Bog and Downs Bog (125 species), although dry *Calluna* heath at Tregoss Moor was comparatively species-rich (128 species). Bare ground species were particularly well represented at Newlyn Downs (75 species), Retire Common (84 species) and Tregoss Moor (60 species).

A list of invertebrates previously recorded is provided for the parts of the sites surveyed. In general, these sites have been poorly studied for invertebrates with the exception of Ventongimps Moor which is a nature reserve.

Over 131 Red Data Book and 314 Nationally Scarce invertebrates have been recorded in Cornwall (Spalding, 1997), of which 61 are listed in *Biodiversity: The UK Steering Group Report*. However, the large majority of these of have not been recorded here since 1950. The lack of Nationally Scarce invertebrates found at the survey sites may be due to a number of reasons:

- unsuitable management of the sites for invertebrates. (Many of the sites are not currently managed or are under unsuitable management regimes; the invertebrate interest of these sites could be enhanced by grazing or controlled burning (see Section 6).
- the lack of nationally scarce invertebrates species in Cornwall due to historical, climatological and geographical reasons. (Over 400 RDB and Nationally Scarce invertebrates have been recorded in Cornwall in the past, indicating that geographic isolation and climate are not key factors in apparent current low invertebrate diversity).
- The brief sampling period allowed in the survey. Some species (e.g. Marsh Fritillary) may occur at such low densities at some sites that they were not recorded during this survey.
- the sampling method adopted during the survey. (It is worth noting that nearly half (153) of the Nationally Scarce species recorded in Cornwall are moths, but none of the nocturnal moths were sampled during this survey.

It is recommended that additional survey work be undertaken on Arachnida (especially *Pardosa* species and Linyphiidae), Diptera (especially *Calliphora, Lucilia* and *Sarcophaga*) and especially nocturnal Lepidoptera.

Management recommendations are given for each of the sites. General points include:

- Heathland invertebrates generally require a **mosaic of habitat types** with different age heathers giving a range of heathland architecture which provides shelter, nesting places and sources of food.
- Areas of **short turf and bare ground** can be utilised by a wide range of thermophilic species. Heathland soils can be utilised by burrowing invertebrates.
- Without management, lowland heath tends to scrub over, suitable habitat may be quickly lost and invertebrate species may become locally extinct. **Traditional management has been by grazing, swaling and cutting.**
- **Wet heathland is best managed by grazing,** as burning encourages the growth of *Molinia caerulea*. However, burning at Rosenannon Bog and Downs, although uncontrolled, appears to have benefited a wide range of thermophilic invertebrates and some management is essential.

Reduced activity on all these sites except Rosenannon Bog and Downs has led to the sites scrubbing over, especially at Ventongimps Moor. There were extensive areas of recently burned dry heathland at Rosenannon Bog and Downs, with the result that there were large areas of warm sparsely vegetated ground suitable for a range of thermophilic invertebrates.

2. METHODOLOGY

2.1 Methods

2.1.1 The aim of the surveys was to record the invertebrate interest and significance of the Mid Cornwall Moors and consider this in relation to site specific and generic management guidelines.

2.1.2 Three visits were made during the summer of 1997 to each site, with 4 man hours spent per site visit so that comparisons could be made between sites. Some visits involved one surveyor spending four hours on site, but most visits were of two hours with two surveyors. Visits were timed in order to cover mid-summer, late summer and early autumn activity. Visits were made only in dry sunny weather. To some extent, the methodology followed that used by Falk *et al* (1996) modified with respect to habitats sampled and with the addition of a standardised sampling time.

2.1.3 Surveys were restricted to the open heathland habitats which are typical of the mid-Cornwall moors ie:

- dry *Calluna* heath mainly NVC H4 *Ulex gallii - Agrostis curtisii* heath,
- dry *Calluna* heath NVC H8 *Calluna vulgaris – Ulex gallii* heath
- wet Dorset heath (NVC H4 *Ulex gallii - Agrostis curtisii* heath, *Erica tetralix* sub-community with M21 *Narthecium ossifragum - Sphagnum papillosum* valley mire).
- *Molinia* mire (NVC M25 *Molinia caerulea – Potentilla erecta* mire).
- *Schoenus nigricans – Narthecium ossifragum* mire (NVC M14)
- bare ground (on mine spoil and along tracks).
- open water (pools and streams)

2.1.4 Areas of tall scrub (e.g. *Ulex europaeus*) or woodland (e.g. *Salix* carr) were not sampled. The habitats surveyed are described in the site descriptions.

2.1.5 The following taxonomic groups were covered: Arachnida (spiders), Coleoptera (beetles), Diptera (flies), Hemiptera (bugs), Hymenoptera (ants, bees and wasps), Lepidoptera (butterflies and moths), Odonata (dragonflies) and Orthoptera (grasshoppers and crickets). Each habitat type at each site was sampled using a range of methods. Sampling included interception netting of flying insects, sweeping and searching (e.g. amongst vegetation, under debris and on bare ground). Species visiting flowers were specifically targeted, with notes being made of availability of nectar sources. Sampling was continued until the sampling period was spent, even if no additional species were found.

2.1.6 No beating was carried out as only low vegetation was sampled. No traps (such as light traps and pitfall traps) were used.

2.1.7 Some species were sent away for expert identification. The help of the following people is gratefully acknowledged: M. Edwards, P. Hodge and A. Stubbs.

2.2 Survey sites

2.2.1 Six sites were chosen from three subsets of Sites of Special Scientific Interest to represent different areas and habitat types present on the mid Cornwall Moors.

2.2.2 The subsets were:

- Carrine Common and Penwethers, Silverwell Moor, Carnkief Pond, Ventongimps Moor, Newlyn Downs. (These are all Dorset heath sites at the western end of the mid Cornwall Moors).
- Borlasevath and Retallack Moor, Rosenannon Bog and Downs, Retire Common. (These sites support valley mire and wet heath).
- Goss and Tregoss Moors, Breney Common, Redmoor, Redlake Meadows and Hoggs Moor. (These are generally large sites towards the eastern end of the mid Cornwall Moors which support a wide variety of habitats including drier heath)

2.2.3 The sites chosen were:

A. Newlyn Downs; Ventongimps Moor.
B. Rosenannon Bog and Downs; Retire Common.
C. Tregoss Moor; Redlake Meadows and Hoggs Moor.

2.2.4 Selection criteria was based on a variety of factors, including ease of access, geographical spread, range of habitat types, previous invertebrate records and current conservation status (in particular management regimes). Each site was divided into compartments according to habitat type. Appendix 9 comprises copies of the SSSI maps and citations for these sites.

2.3 Dates surveyed

2.3.1 The sites were surveyed on the following dates:

Newlyn Downs: 10th & 22nd July; 15th September.
Redlake Meadows: 18th July; 21st August; 9th September
Retire Common: 16th July; 10th August; 10th September
Rosenannon Bog and Downs Common: 7th & 28th July; 9th September.
Tregoss Moor: 30th June; 22nd July; 12th September.
Ventongimps Moor: 1st July; 7th August; 15th September.

2.4. Methods of analysis

2.4.1 Full lists of species recorded for each habitat type are given for each site (Appendices 1-6). The species lists recorded on dry heathland at Tregoss Moor were divided according to two sub-habitats (Appendix 7). Red Data Book and Nationally Scarce species are listed with the habitat in which they were found. National classifications are based on the relevant Red Data Books (Hyman & Parsons, 1992; Hyman & Parsons, 1994; Merritt *et al*, 1996; Shirt, 1987). Lists of species previously recorded at these sites is provided in Appendix 8.

2.4.2 Lists of specialist and characteristic species associated with key habitat types are given in order to highlight which habitats are most important for heathland species, rather than for the widespread generalist species. The key species types are:

Heathland specialists: species feeding on ericaceous shrubs (vegetative parts and as nectar sources); species (e.g. cleptoparasites and predatory invertebrates) feeding on heathland specialists; species using ericaceous shrubs for cover etc.
Wet heath specialists: species associated with wet heathland areas (e.g. those feeding on ericaceous shrubs)
Bare ground specialists: species using bare (or thinly vegetated) ground (e.g. for nesting, hunting prey, temperature regulation).
Wetland species: species associated with open water.

2.4.3 The taxonomic composition of the invertebrates recorded at each site is given, with the number of species associated with each vegetation type. The percentage for each order of the total number of species for each vegetation type at each site is also given.

2.4.4 The invertebrate importance of this group of sites is assessed.

2.4.5 Recommendations on management and at a site specific and generic level are provided.

3. SITE ACCOUNTS

3.1 NEWLYN DOWNS

3.1.1 Site description

The heathland of Newlyn Downs consists of areas of bare ground, dry *Calluna* heath, wet Dorset heath and a small stream with an adjacent streamside marsh. The bare ground is generally heavily compacted and associated with the main tracks across the site and with metal contamination resulting from previous mining activity on the site. The areas of bare ground consist of hummocks and hollows, with heavily compacted soil in places; south and south-west facing slopes provide warm habitat for thermophilic invertebrates.

There are extensive areas of dry heathland dominated by even-age woody *Calluna vulgaris* on hummocky terrain, with some *Erica tetralix* (H4). Much of the dry heath is on the cooler north and east facing slopes, which makes the site less suitable for insects. Wet Dorset Heath (H4 *Erica tetralix* sub-community) occurs on the lower-lying land on the northern edge of the site, with extensive patches of even-age *Erica cinerea* and *Ulex gallii*.

Myrica gale is abundant and there are areas of *Rubus* and *Corylus* scrub, with invasive *Salix* species and some *Acer pseudoplatanus*. Some trees have been planted in the drier areas and are several patches of *Fallopia japonica*. Running through part of the site is a small stream with good open sections and a substantial flow of clear water.

Unusually for this type of derelict mine site there was a small dry area containing a range of plants including *Carlina vulgaris*, *Carex flacca*, *Calluna vulgaris*, *Lotus corniculatus* and *Thymus polytrichus*. This small area has been listed separately as it represents the only site here for Silver-studded Blue.

The site is in low key management under a Countryside Stewardship scheme, but the area surveyed was not being actively managed.

3.1.2 Red Data Book and Nationally Scarce species

No Red Data Book species were recorded. Two Nationally Scarce species were recorded, and by inference a third.

The Nationally Scarce Silver-studded Blue *Plebejus argus* is widespread in Cornwall, but largely restricted to maritime heaths and coastal sand dunes. Prior to this survey, only 4 inland sites (all on heathland) were known in Cornwall, two of which (at Wheal Busy and Tregoss Moor) are probably small isolated colonies, where larval foodplants are heather (*Calluna vulgaris* and *Erica* species).

All of the Cornish inland sites are associated with abandoned industrial land (see, for example Haes & Spalding, 1995). The small colony of Silver-studded Blues at Newlyn Downs appears to be confined to a narrow band of dry open ground adjacent to the small stream running through the site; the larval foodplant here may be *Lotus corniculatus* (as it is on the dunes) or Heather. 3 Silver-studded Blues were seen nectaring on the flowers of *Thymus polytrichus*.

The Nationally Scarce cuckoo bee *Nomada pleurosticta* (Notable A) was recorded in the area of mine spoil at the northern edge of the site. This cuckoo bee is dependent on its host *Andrena humilis* (Notable B), which is associated with disturbed ground on sandy soil in heaths and grasslands. Both species are rarely recorded in Cornwall (since 1980 only recorded from 1 other site) but may be overlooked.

Table 3.1: Nationally Scarce species recorded at Newlyn Downs showing the vegetation types in which they were found

Species	category	vegetation type		
		bare ground	dry Calluna heath	wet Dorset heath
*Andrena humilis**	Nb	✓		
Nomada pleurosticta	Na	✓		
Plebejus argus	Notable		✓	

* by inference

3.1.3 Specialist species

3.1.3.1 Bare ground specialists

The small, isolated areas of bare ground, especially on the south-facing slopes, are important for a range of invertebrates. The spider *Arctosa perita* is a distinctive diurnal species found on dunes and on bare ground in heathland. The Common Groundhopper *Tetrix undulata* and the Mottled Grasshopper *Myrmeleotettix maculatus* were abundant in suitable places. The ground bug *Nysus thymi* is associated with dry sand areas.

The Hymenoptera-Aculeata were well represented, with 15 bare ground species present: *Lasius niger, Ammophila sabulosa, Andrena humilis* (by inference), *Andrena scotica, Andrena thoracica, Andrena wilkella* (by inference), *Argogorytes mystaceus, Colletes similis* (by inference), *Colletes succinctus, Epeolus variegatus, Lasioglossum calceatum, Nomada flavoguttata, Nomada pleurosticta, Nomada rufipes* and *Nomada striata. Nomada striata* is a parasite of *Andrena wilkella.* The only bare-ground beetle recorded was Green Tiger Beetle *Cicindela campestris*.

3.1.3.2 Dry *Calluna* heath specialists

The extensive areas of dry heathland throughout the site are important for a range of invertebrates. Five spiders *(Haplodrassus signifer, Clubiona trivialis, Mangora acalypha, Theridion simele* and *Neoscona adiantum*) are closely associated with heathland; *Theridion simele* was especially abundant here. The small orb-spider *Mangora acalypha* is probably a predator of the two heathland Hemiptera *Scolopostethus decoratus* and *Ulopa reticulata.* Mottled Grasshopper *Myrmeleottix maculatus* was abundant in places. The Mirid bug *Orthotylus ericetorum* and the leafhopper *Ulopa reticulata* feed on *Calluna* and *Erica* species.

Four species of Lepidoptera found here are associated with heathland: Silver-studded Blue (feeding either on *Lotus corniculatus* or ericaceous species), Grass Emerald *Pseudoterpna pruinata* (larval foodplants *Ulex* species), *Pyla fusca* (larval foodplants *Erica* species) and July Belle *Scotopteryx luridata* (larval foodplants *Ulex* species). Four species of Hymenoptera-Aculeata were recorded in this category: *Ammophila sabulosa, Colletes similis, Colletes succinctus* and *Bombus jonellus*. The Hieroglyphic Ladybird *Coccinella hieroglyphica* has a requirement for heather-feeding prey.

3.1.3.3 Wet Dorset heath specialists

The wet Dorset Heath habitat contains a locally important population of Bog Bush-cricket *Metrioptera brachyptera*, of national interest because it is probably the most westerly surviving colony in Britain. In Cornwall, this species is restricted to 4 sites. The Common Shore Bug *Saldula saltatoria* was found in large numbers in the wetter areas. Small Pearl-bordered Fritillary *Boloria selene* was found here; although not restricted to wet heathland it is often associated with wet flushes outside woodland. The beetle *Chrysolina menthastri* was recorded on *Mentha aquatica*. Several nests of the ant *Formica cunicularia* were recorded at the base old Heather plants. Other heathland specialists found here were also recorded on the dry heath.

3.1.3.4 Open wetland specialists

Ten species of Odonata were associated with the stream and associated wetland: Azure Damselfly *Coenagrion puella,* Common Blue Damselfly *Enallagma cyathigerum,* Blue-tailed Damselfly *Ischnura elegans,* Large Red Damselfly *Pyrrhosoma nymphula,* Emerald Damselfly *Lestes sponsa,* Demoiselle Agrion *Calopteryx virgo,* Golden-ringed Dragonfly *Cordulegaster boltonii,* Southern Hawker *Aeshna cyanea,* Keeled Skimmer *Orthetrum coerulescens* and Common Darter *Sympetrum striolatum*. Two pondskaters were recorded in the stream: *Aquarius najas* and *Gerris lacustris*.

3.1.4 Taxonomic composition

175 species of invertebrate were recorded at Newlyn Downs (see Appendix 1.) This list is not meant to be comprehensive but provides a representative sample of the species present at the time of the survey and gives some indication of the taxonomic composition of the fauna present. The Aculeate Hymenoptera were the commonest group (Table 3.2), which indicates the value of the heathland and bare ground constituents of this site. The Diptera, Lepidoptera, Spiders and Hemiptera – Heteroptera were also well represented. 11 species of Odonata were recorded, all adjacent to the stream. The number of moths recorded could have been increased by nocturnal trapping.

75 species were recorded on the bare ground, compared with 91 on the dry heathland. One of the main differences was the number of Lepidoptera recorded in each habitat (2 on bare ground – both adventive - and 17 on heathland), largely because many butterflies and moths were utilising heathers as nectar plants. The wet Dorset heath was the richest area with 114 species (65% of the total for the site) and especially rich in spiders, Hemiptera – Heteroptera and Diptera. 52% of the species recorded at Newlyn Downs were found on the dry heathland.

Table 3.2: Taxonomic composition of the invertebrate assemblages associated with specific vegetation types at Newlyn Downs.

Taxonomic Group	No of species	%	no of species				
			BG	DCH (H4)	WDH (H4c)	OW	Other
Spiders	24	13.71	11	15	19		
Harvestmen	2	1.14	1	2	2		
Odonata	11	6.29	0	3	8	10	
Orthoptera	7	4.00	4	4	6		
Dermaptera	1	0.57	1	1	1		
Hemiptera – Heteroptera	19	9.71	7	7	12	2	
Hemiptera – Homoptera	9	5.14	4	1	8		
Neuroptera	0						
Mecoptera	1	0.57	1	1	1		
Lepidoptera	24	13.71	2	17	7		4
Diptera	29	16.57	15	13	26		
Aculeate Hymenoptera	33	18.86	22	19	15		2
Coleoptera	15	8.57	7	8	9		
Total	**175**		**75**	**91**	**114**	**12**	**6**

key
BG = bare ground
DCH = dry *Calluna* heath
WDH = wet Dorset heath
OW = open water

3.2 VENTONGIMPS MOOR

3.2.1 Site description

There are three main habitat types represented on this Cornwall Wildlife Trust nature reserve: a mosaic of wet Dorset heath and *Molinia* mire, secondary woodland and open pools. Only the wet heath and pools were surveyed. The largest area comprises wet Dorset heath (H4 *Erica tetralix* sub-community) with extensive *Molinia* and several areas of *Sphagnum* bog, fringed by *Salix* carr. Part of the site appears to be drying out as a consequence of encroachment by invasive *Betula* and *Salix*. Part of the northern edge of the reserve has been recently cleared of invasive *Salix* scrub.

There are four ponds on the higher land on the western side of the reserve; the oldest one was caused by a crashing aircraft in the 1940s and this has been supplemented by two smaller dug ponds in the early 80s and one dug more recently. All three have substantial populations of Odonata. The newest pond was seen to be attracting several species by the second visit, although the vegetation is barely established to support many invertebrates. All ponds seem to be very well maintained. There is very little bare ground present here.

The site is grazed by ponies, which preferentially graze grass species including *Molinia*, but appear to avoid *Ulex europaeus*, *Betula* and *Salix*.

3.2.2 Red Data Book and Nationally Scarce species

No Red Data Book species were recorded. Only one Nationally Scarce species was recorded: Small Red Damselfly *Ceriagrion tenellum*. This damselfly is one of the indicator species selected by the National Odonata Recording Scheme for the Key Sites Project (1988 to 1992). The colony at Ventongimps Moor is a major population of county importance.

The Nationally Scarce Marsh Fritillary was re-introduced to the reserve in 1983, but has not been in recent years. The Nationally Scarce Narrow-bordered Bee Hawkmoth *Hemaris tityus* was recorded in 1957 (Smith, 1997) and may still be present but has not been recorded recently. The Nationally Scarce Scarce Blue-tailed Damselfly *Ischnura pumilio* has been recorded in previous years, but was not found during this survey.

The lack of Nationally Scarce species is partly due to the general paucity of Aculeate Hymenoptera (only 13 species were recorded here, compared with 33 at Newlyn Downs).

Table 3.3: Nationally Scarce species recorded at Ventongimps Moor showing the vegetation types in which they were found

Species	category	vegetation type			
		bare ground	dry Calluna heath	wet Dorset heath	open water
Ceriagrion tenellum	NS				✓

3.2.3 Specialist species

3.2.3.1 Bare ground specialists

Only three bare ground specialist were recorded due the absence of large areas of open ground: *Tetrix undulata, Lasius niger* and *Andrena thoracica.*

3.2.3.2 Dry *Calluna* heath specialists

No dry heathland specialist were recorded.

3.2.3.3 Wet Dorset heath specialists

Three heathland specialists were recorded: the ground bug *Scolopostethus decoratus* (which feeds partly on heather and partly on other insects), the leafhopper *Ulopa reticulata* and the Emperor Moth *Saturnia pavonia* (larval foodplant ericaceous species). Also recorded was the moth July Belle *Scotopteryx luridata* which feeds as a larva on *Ulex* species.

3.2.3.4 Open wetland specialists

25 wetland species were recorded, including several Common Groundhopper *Tetrix undulata* seen swimming and the Brown China-mark moth *Nymphula nympheata* (which has larvae which feed on *Potamogeton*). 2 surface dwelling water bugs were recorded (the Water Measurer *Hydrometra stagnorum* and the Common Pondskater *Gerris lacustris*) in addition to 2 submerged bugs (*Notonecta glauca* and *Corixa punctata)*. The Marsh Damsel Bug *Dolichonabis limbatus* and the fly *Poecilobothrus nobilitatus* were found in the marginal vegetation. There were large populations of aquatic beetles, including *Gyrinus substriatus* and *Hygrobia herrmanni.*

15 Odonata were recorded, including the Nationally Scarce Small Red Damselfly *Ceriagrion tenellum* which is especially associated with acid pools in heathland and bog. 13 species (all but Broad-bodied Chaser *Libellula depressa* and Ruddy Darter *Sympetrum sanguineum*) were recorded laying eggs. The Keeled Skimmer *Orthetrum coerulescens* was especially common.

3.2.3 Taxonomic composition

179 species of invertebrate were recorded at Ventongimps Moor (see Appendix 2.) This list is not meant to be comprehensive but provides a representative sample of the species present at the time of the survey and gives some indication of the taxonomic composition of the fauna present. The Diptera were the commonest group (Table 3.4), which indicates the value of the wet Dorset heathland at this site. The Lepidoptera and Hemiptera – Heteroptera were also well represented. The low number of Coleoptera may be partly due to the difficulty of surveying for invertebrates in dense vegetation.

Table 3.4: Taxonomic composition of the invertebrate assemblages associated with specific vegetation types at Ventongimps Moor.

Taxonomic Group	No of species	%	no of species				
			BG	DCH	WDH (H4c)	OW	Other
Spiders	13	5.88			13		
Harvestmen	2	1.12			2		
Odonata	15	8.38				15	
Orthoptera	3	1.68	1		3	1	
Dermaptera	1	0.56			1		
Hemiptera – Heteroptera	22	12.29			15	4	4
Hemiptera – Homoptera	7	3.91			6		1
Neuroptera	1	0.56			1		
Mecoptera	1	0.56			1		
Lepidoptera	38	21.23			35	1	2
Diptera	45	25.14			40	1	4
Aculeate Hymenoptera	13	5.88	2		13		
Coleoptera	18	10.06			16	2	
Total	**179**		**3**	**0**	**155**	**24**	**11**

key
BG = bare ground
DCH = dry *Calluna* heath
WDH = wet Dorset heath
OW = open water

3.3 ROSENANNON BOG AND DOWNS

3.3.1 Site description

The heathland constituent of Rosenannon Bog and Downs consists of areas of dry *Calluna* heath, wet *Erica* heath, *Molinia* mire and an open pool.

The area of wet heath is separated from the main part of the site by woodland and small marginal reed beds. It is crossed by two streams, with associated small areas of quaking bog. A small area of *Molinia* mire (M25) occurs nearer the road, much of it under standing water at the time of survey. There are extensive areas of invasive *Rubus fruticosus*, *Salix* and *Myrica gale*. When in flower, heathers, *Ulex gallii*, *Potentilla erecta* and *Succisa pratensis* provide ample nectar sources for invertebrates. A small roadside stream flows into a small pond adjacent to the road.

North of the road lies an extensive area of dry heath (H4) with *Molinia,* ericaceous species and *Ulex gallii*, part of which has been recently burned giving rise to large areas of bare and lightly vegetated ground, highly beneficial to diurnal invertebrates. Extensive areas of *Rubus fruticosus* scrub occur in an old quarry or mine near the top of the slope and provides a prime source of nectar for late summer insects. Where still exposed, stone walls and earth banks provide suitable habitat for nesting Hymenoptera. Small areas of bare ground occur here and alongside many of the tracks across the heath. A range of plants, including heathers, *Ulex gallii*, *Lotus corniculatus* and *Thymus polytrichus*, provide nectar sources for invertebrates.

The site is currently unmanaged.

3.3.2 Red Data Book and Nationally Scarce species

The only Nationally Scarce species recorded was the ground beetle *Amara equestris* (Notable B), which is widespread but local in a wide variety of habitats throughout England and Wales. The only post-1950 records for this species in Cornwall are from the Lizard in 1980.

The Nationally Scarce Marsh Fritillary has been recorded previously but was not found during this survey. Much of the sward where Devil's-bit Scabious occurs is too long for Marsh Fritillary.

Table 3.5: Nationally Scarce species recorded at Rosenannon Bog and Downs showing the vegetation types in which they were found

Species	category	vegetation type		
		bare ground	dry Calluna heath	open water
Amara equestris	Nb		✓	

3.3.3 Specialist species

3.3.3.1 Bare ground specialists

Most of the bare ground specialists here are associated with the dry heathland. The following species utilise bare ground for thermophilic regulation: Common Groundhopper *Tetrix undulata*, Mottled Grasshopper *Myrmeleotettix maculatus*, Grayling *Hipparchia semele* and the Wall *Lasiommata megera*. The Green Tiger Beetle *Cicindela campestris* uses bare ground for nesting, thermo-regulation and for chasing prey. *Andrena thoracica*, *Andrena tarsata* and *Lasioglossum calceatum* utilise bare ground for nesting. The Heath Assassin Bug *Coranus subapteus* and the beetle *Notiophilus biguttatus* use bare ground for thermo-regulation and predation. The hoverfly *Paragus haemorrhous* is most often found flying close above dry bare soil.

3.3.3.2 Dry *Calluna* heath specialists

14 dry heathland specialists were recorded at Rosenannon Bog and Downs, including one grasshopper *Myrmeleotettix maculatus*, one leafhopper *Ulopa reticulata* and two bugs (Heath Assassin Bug *Coranus subapteus* and Heath Damsel Bug *Nabis ericetorum*). 3 specialist heathland Aculeate Hymenoptera were recorded here: *Andrena tarsata*, *Ammophila subulosa* and *Bombus jonellus*. There were 5 butterflies and moths typical of heathland, including a large colony of Grayling *Hipparchia semele* in addition to Emperor Moth *Saturnia pavonia*, Beautiful Yellow Underwing *Anarta myrtilli*, Small Purple-barred *Phytometra viridaria* and July Belle *Scotopteryx luridata*. The Hieroglyphic Ladybird *Coccinella hieroglyphica* has a requirement for heather-feeding prey and the beetle *Lochmaea suturalis* is common on *Calluna vulgaris*.

3.3.3.3 Wet heath specialists

One wet heathland specialist was recorded at Rosenannon Bog and Downs (the Bog Bush-cricket *Metrioptera brachyptera*), although the hoverfly *Sericomyia silentis* is often associated with boggy heaths and acid wet meadows.

3.3.3.4 Open wetland specialists

10 open wetland species were recorded, including 7 dragonflies (Common Blue Damselfly *Enallagma cyathigerum,* Blue-tailed Damselfly *Ischnura elegans,* Large Red Damselfly *Pyrrhosoma nymphula,* Demoiselle Agrion *Calopteryx virgo,* Golden-ringed Dragonfly *Cordulegaster boltonii,* Keeled Skimmer *Orthetrum coerulescens* and Common Darter *Sympetrum striolatum*. Also recorded were the Common Pondskater *Gerris lacustris*, *Notonecta glauca* and the fly *Poecilobothrus nobilitatus*.

3.3.4 Taxonomic composition

181 species of invertebrate were recorded at Rosenannon Bog and Downs (see Appendix 3.) This list is not meant to be comprehensive but provides a representative sample of the species present at the time of the survey and gives some indication of the taxonomic composition of the fauna present (Table 3.6). The most well represented groups were the Lepidoptera (21.55%) and Diptera (18.78%). Several groups (Spiders, Hemiptera – Heteroptera, Coleoptera and especially the Diptera) were better represented in wet heath than dry heath. In contrast, there were more species of Aculeate Hymenoptera in dry heath than wet heath, and none at all in the wet tussocky Molinia mire where no bare ground was present. *Molinia* mire was generally species poor (except for Odonata), no doubt partly because there were few nectar sources present.

Table 3.6: Taxonomic composition of the invertebrate assemblages associated with specific vegetation types at Rosenannon Bog and Downs.

Taxonomic Group	No of species	%	no of species			
			BG	DCH (H4)	WH	OW	MM (M25)
Spiders	20	11.05		10	16		7
Harvestmen	3	1.66		2	3		
Odonata	10	5.52		3	8	7	8
Orthoptera	7	3.87	2	7	5		5
Dermaptera	1	0.55		1	1		
Hemiptera – Heteroptera	19	10.50		9	13	2	4
Hemiptera – Homoptera	5	2.76		3	4		3
Neuroptera	0						
Mecoptera	0						
Lepidoptera	39	21.55	2	25	26		21
Diptera	34	18.78	1	15	27	1	12
Aculeate Hymenoptera	18	9.94	3	16	10		
Coleoptera	25	13.81	2	9	12	1	7
Total	**181**		**10**	**100**	**125**	**11**	**67**

key
BG = bare ground
DCH = dry *Calluna* heath
WH = wet heath
OW = open water
MM = *Molinia* mire

3.4 RETIRE COMMON

3.4.1 Site description

The heathland constituent of Retire Common consists of areas of dry *Calluna* heath, wet *Erica* heath, bare ground along the farm road which crosses the site and a pond with associated stream. The dry heath (H4) comprises an extensive area of *Ulex gallii*, *Calluna vulgaris*, *Erica cinerea* and *Erica tetralix* with *Agrostis curtisii*. Thick *Ulex gallii* dominates much of the site, with occasional *Rubus fruticosus*, suppressing the ericaceous species. The vegetation is shorter on part of the site which has been burned in recent years; and grass species are more evident here. Part of the area has been ploughed up in the past and has now reverted to heathland.

The wet heath comprises *Calluna vulgaris*, *Erica cinerea*, *Erica tetralix* and *Molinia caerulea*, with *Sphagnum* bog with *Rhynchospora alba* and *Drosera rotundifolia*. Small areas of bare ground occur along the main farm road and on pathways across the heathland. Nectaring sources for insects include *Ulex gallii*, *Calluna vulgaris*, *Erica cinerea, Erica tetralix*, *Potentilla erecta* and *Succisa pratensis*. A small pond occurs between the dry and wet heath areas and is enclosed on three sides by tall *Salix* scrub. There is extensive submerged growth of pond weeds.

This site is isolated from other heathland areas. Invasive *Pteridium* scrub with *Fallopia japonica* occurs alongside the road. Parts of the area have been deeply buried with tipping of rubble.

The site appears to be currently unmanaged, although there was evidence of limited and patchy cattle grazing. A drainage pipe has been placed in one part of the wet heath, presumably to extract water from this area, and the wet heath is showing signs of drying out.

3.4.2 Red Data Book and Nationally Scarce species

No Red Data Book or Nationally Scarce species were recorded at Retire Common. The lack of Nationally Scarce species is probably partly due to the lack of habitat diversity here. There is a general paucity of Aculeate Hymenoptera (only 14 species were recorded here, compared with 33 at Newlyn Downs).

3.4.3 Specialist species

3.4.3.1 Bare ground specialists

Six bare ground specialists were recorded here, including the Common Groundhopper *Tetrix undulata*, Grayling *Hipparchia semele* (especially common on the recently burned area) and the Wall *Lasiommata megera*. Three Aculeate Hymenoptera were recorded which are associated with bare ground: the ant *Lasius niger*, the bee *Lasioglossum calceatum* (which usually nests in steep banks) and the digger wasp *Mellinus arvensis* (which nests in sand).

3.4.3.2 Dry *Calluna* heath specialists

Twelve dry heathland specialists were recorded at Retire Common, including two spiders (*Neoascona adiantum* and *Clubiona trivialis*), two Hemiptera (Heath Damsel Bug *Nabis ericetorum* and *Ulopa reticulata*), one beetle *Strophosoma nebulosum*, one Aculeate *Bombus jonellus* and six Lepidoptera (Grayling *Hipparchia semele*, Narrow-winged Pug *Eupithecia nanata,* Beautiful Yellow Underwing *Anarta myrtilli,* July Belle *Scotopteryx luridata,* Small Purple-barred *Phytometra viridaria* and Oak Eggar *Lasiocampa quercus*).

3.4.3.3 Wet heath specialists

No wet heathland specialist species were recorded, although the hoverfly *Sericomyia silentis* is often associated with boggy heaths and acid wet meadows. Tipulids (*Tipula oleracea, Tipula paludosa* and *Tipula unca*) were only recorded in this habitat. The invertebrate fauna recorded here was poorer than expected; the low species diversity and lack of wet heathland specialists may be due to a variety of factors, including partial drying out, excessive plant growth e.g. of *Molinia caerulea* and lack of nectar sources.

3.4.3.4 Open wetland specialists

Five wetland species were recorded, including 3 dragonflies (Demoiselle Agrion *Calopteryx virgo*, Keeled Skimmer *Orthetrum coerulescens* and Common Darter *Sympetrum striolatum*), the Water Measurer *Hydrometra stagnorum* and the Brown China-mark moth *Nymphula nympheata*.

3.4.4 Taxonomic composition

145 species of invertebrate were recorded at Retire Common (see Appendix 4.) This list is not meant to be comprehensive but provides a representative sample of the species present at the time of the survey and gives some indication of the taxonomic composition of the fauna present (Table 3.7). The best represented group was the Lepidoptera (24.83%), with several Diptera (15.86%), Coleoptera (11.03%), Hemiptera – Heteroptera (10.34%) and Spiders (10.34%). There was little difference between the number of species found on bare ground, wet heath and dry heath; this was because several heathland species were recorded on the bare ground area. However, 93% of the spider species were recorded from wet heath, compared with 60% from dry heath and 46% from bare ground.

Table 3.7: Taxonomic composition of the invertebrate assemblages associated with specific vegetation types at Retire Common

Taxonomic Group	No of species	%	no of species			
			BG	DCH(H4)	WH	OW
Spiders	15	10.34	7	9	14	
Harvestmen	3	2.07	2	3	1	
Odonata	8	5.52		3	7	3
Orthoptera	5	3.45	4	5	3	
Dermaptera	1	0.69	1	1	1	
Hemiptera – Heteroptera	15	10.34	8	8	10	
Hemiptera – Homoptera	7	4.83	2	3	6	
Neuroptera	1	0.69	1	1		
Mecoptera	1	0.69	1	1	1	
Lepidoptera	36	24.83	20	28	19	1
Diptera	23	15.86	17	15	16	
Aculeate Hymenoptera	14	9.66	10	12	7	
Coleoptera	16	11.03	11	6	7	
Total	**145**		**84**	**95**	**92**	**4**

key
BG = bare ground
DCH = dry *Calluna* heath
WH = wet heath
OW = open water

3.5 TREGOSS MOOR (part of a NATIONAL NATURE RESERVE)

3.5.1 Site description

The heathland constituent of Tregoss Moor consists of areas of dry *Calluna* heath, dry grassy heath with *Agrostis curtisii*, *Molinia* mire and areas of bare ground. The areas of dry *Calluna* heath (H4) have been divided into two types for the purpose of this survey: an area of even age *Calluna vulgaris – Ulex gallii* heath, with almost no bare ground, and an area of short *Calluna vulgaris* heath with occasional *Erica cinerea*, *Erica tetralix,* abundant *Molinia caerulea* and considerable areas of bare and thinly vegetated ground. The area is being invaded by *Rubus fructicosus* and *Fallopia japonica*. The dry grassy heath was dominated by *Molinia caerulea* with abundant *Agrostis stolonifera* and *Agrostis curtisii*. This area had been recently burned in order to clear large areas of *Ulex europaeus*; there was abundant regrowth of *Ulex gallii, Erica cinerea* and *Erica tetralix* and this habitat forms a transitional community reverting to heathland. *Hypochaeris radicata* provided an abundant nectar source for insects here.

The *Molinia* mire (M25) was dominated by tussocks of *Molinia caerulea*, with *Potentilla erecta*, occasional *Schoenus nigricans*, *Erica tetralix*, *Sphagnum* and *Carex* species. There was a wide range of nectar sources here, including *Cirsium* species, *Valeriana officinalis*, *Potentilla erecta* and *Rubus fruticosus*. The bare ground component consists mainly of paths and bridleways.

The site is ungrazed. There has been a considerable amount of scrub clearance, particularly of gorse scrub.

3.5.2 Red Data Book and Nationally Scarce species

Two nationally scarce species were recorded. The Nationally Notable species *Polydrusus confluens* was recorded on the longer heath; this weevil is associated with *Cytisus scoparius* and *Ulex europaeus*. The Nationally Scarce Marsh Fritillary *Eurodryas aurinia* was recorded in the wet heathland.

The Nationally Scarce Silver-studded Blue *Plebejus argus* has been recorded previously (e.g. in 1992) in areas of dry heathland (including areas now dominated by grassy heathland), but was not recorded during this survey.

The Locally Scarce Bog Bush-cricket *Metrioptera brachyptera* has been recorded here previously but was not refound; its previous location has become overgrown with *Salix* and *Rubus* scrub.

Table 3.8: Nationally Scarce species recorded at Tregoss Moor showing the vegetation types in which they were found

Species	category	vegetation type			
		bare ground	dry Calluna heath	wet heath	open water
Eurodryas aurinia	Notable			✓	
Polydrassus confluens	Nb		✓		

3.5.3 Specialist species

3.5.3.1 Bare ground specialists

Eight bare ground specialists were recorded here, including Common Groundhopper *Tetrix undulata*, Grayling *Hipparchia semele*, the spider *Heliophanus cupreus*, the Green Tiger Beetle *Cicindela campestris* and the Heath Assassin Bug *Coranus subapterus*. Three Aculeate Hymenoptera were recorded which are associated with bare ground: the ant *Lasius niger*, and the ground-nesting bees *Lasioglossum calceatum* and *Halictus rubicundus*.

3.5.3.2 Dry *Calluna* heath specialists

Nine dry heathland specialists were recorded at Tregoss Moor, including the common heathland spider *Zygiella atrica,* the Hieroglyphic Ladybird *Coccinella hieroglyphica*, the leafhopper *Ulopa reticulata* and two bugs (Heath Assassin Bug *Coranus subapteus* and Heath Damsel Bug *Nabis ericetorum*). Three heathland species of Lepidoptera were recorded: the Emperor Moth *Saturnia pavonia*, July Belle *Scotopteryx luridata* and the Pyralid *Pempelia palumbella* (the first VC2 record for this moth since 1960). Also recorded was the fly *Tipula confusa*, which is a nationally widespread crane-fly of dry habitat including heathland.

The dry heathland was divided into two sub-habitats for the purpose of this survey: even age dry heath dominated by *Calluna vulgaris* and *Ulex gallii*; short dry heath with abundant *Calluna vulgaris* and *Molinia caerulea*. The short dry heath was considerably richer in invertebrate species than the longer heath, with 105 species compared with 69. The Lepidoptera (26 species compared with 8), the Aculeate Hymenoptera (14 species compared with 7) and the Hemiptera-Heteroptera (12 species compared with 7) were considerably better represented in the shorter heath, largely due to the increased incidence of nectar sources and the larger areas of bare ground. On the other hand, the Diptera were better represented on the longer heath. Grayling was only recorded on the shorter heath. However, the only Nationally Notable species *Polydrassus confluens* was recorded on the longer heath; this weevil is associated with *Cytisus scoparius* and *Ulex europaeus*. The species lists for these sub-compartments are given in Appendix 7.

3.5.3.3 Wet heath specialists

The only wet heathland specialist species recorded was the Marsh Fritillary *Eurodryas aurinia*, which has been previously recorded from the adjacent Goss Moor. The hoverfly *Sericomyia silentis* is often associated with boggy heaths and acid wet meadows.

3.5.3.4 Open wetland specialists

Eight wetland species were recorded, including 7 dragonflies (Common Blue Damselfly *Enallagma cyathigerum,* Blue-tailed Damselfly *Ischnura elegans,* Large Red Damselfly *Pyrrhosoma nymphula,* Demoiselle Agrion *Calopteryx virgo,* Keeled Skimmer *Orthetrum coerulescens,* Southern Hawker *Aeshna cyanea* and Common Darter *Sympetrum striolatum*. Also recorded was the Brown China-mark moth *Nymphula nympheata.*

3.5.4 Taxonomic composition

167 species of invertebrate were recorded at Tregoss Moor (see Appendix 5.) This list is not meant to be comprehensive but provides a representative sample of the species present at the time of the survey and gives some indication of the taxonomic composition of the fauna present (Table 3.9). The best represented groups were Lepidoptera (20.96% of the species recorded), Diptera (16.77%), Coleoptera (14.37%) and Spiders (13.77%). The Diptera were especially well represented in the bare ground areas, but otherwise the dry heathland was the richest area for species numbers (128 species). There were few species present in the dry grassy heath that were not also recorded on the dry *Calluna* heath.

Table 3.9: Taxonomic composition of the invertebrate assemblages associated with specific vegetation types at Tregoss Moor

Taxonomic Group	No of species	%	no of species				
			BG	DCH (H4)	WH	DGH	OW
Spiders	23	13.77	5	17	6	5	
Harvestmen	3	1.80	1	3	2	1	
Odonata	7	4.19	2	4	6		7
Orthoptera	5	2.99	4	5	4	4	
Dermaptera	1	0.60	1		1	1	
Hemiptera – Heteroptera	15	8.98	4	13	5	8	
Hemiptera – Homoptera	7	4.19	3	6	3	2	
Neuroptera	1	0.60		1		1	
Mecoptera	1	0.60		1			
Lepidoptera	35	20.96	8	26	17	25	1
Diptera	28	16.77	20	25	11	13	
Aculeate Hymenoptera	17	10.18	4	15	10	11	
Coleoptera	24	14.37	8	12	7	11	
Total	**167**		**60**	**128**	**72**	**82**	**8**

key
BG = bare ground
DCH = dry *Calluna* heath
WH = wet heath
DGH = dry grassy heath
OW = open water
MM = *Molinia* mire

3.6 REDLAKE MEADOWS AND HOGG'S MOOR

3.6.1 Site description

The heathland constituent of Redlake Meadows and Hogg's Moor consists of three types of mire and two types of dry heath. There are extensive areas of *Molinia caerulea – Potentilla erecta* mire (M25) throughout the site, with occasional *Calluna vulgaris* and *Erica tetralix* growing high on the tussocks; these areas were very difficult to sample.

Areas of Black Bog-rush *Schoenus nigricans – Narthecium ossifragum* mire (M14) occur contiguous to and in a mosaic with *Narthecium ossifragum - Sphagnum papillosum* valley mire (M21) south of the minor road that bisects the SSSI. These areas are grazed by cattle. The drier parts of the *Narthecium ossifragum - Sphagnum papillosum* valley mire contain abundant *Erica tetralix*, *Calluna vulgaris* and *Juncus articulatus*, with *Potamogeton* and *Eriophorum angustifolium* in the wetter areas. Small pools occur throughout this area.

Ulex gallii – Agrostis curtisii heath (H4), with *Carex binervis, Erica tetralix, Molinia caerulea* and *Potentilla erecta*, occurs in drier areas, e.g. on a raised causeway that crosses part of the site. A small area of tall even-age heathland lies to the north of the road; this is *Calluna vulgaris- Ulex gallii* heath (H8), with occasional *Potentilla erecta* and *Erica tetralix* and abundant lichen (*Cladonia* species).

Part of the site is grazed by cattle, including areas of *Schoenus nigricans – Narthecium ossifragum* mire (M14), *Narthecium ossifragum - Sphagnum papillosum* valley mire (M21) and *Ulex gallii – Agrostis curtisii* heath (H4). The *Molinia* mire appeared to be ungrazed. The area of *Calluna vulgaris- Ulex gallii* heath (H8) has been cut in previous years.

3.6.2 Red Data Book and Nationally Scarce species

No Red Data Book species were recorded at Redlake Meadows and Hogg's Moor. The Nationally Scarce Marsh Fritillary *Eurodryas aurinia* was recorded in the *Narthecium ossifragum - Sphagnum papillosum* valley mire.

There were possible signs of larval feeding on *Succisa pratensis* of the Nationally Scarce Narrow-bordered Bee Hawkmoth *Hemaris tityus*, but no larvae were seen.

Table 3.10: Nationally Scarce species recorded at Redlake Meadows and Hogg's Moor showing the vegetation types in which they were found

Species	category	vegetation type			
		bare ground	dry Calluna heath	wet heath	open water
Eurodryas aurinia	Notable			✓	

3.6.3 Specialist species

3.6.3.1 Bare ground specialists

The only bare ground specialist recorded here was the Common Groundhopper *Tetrix undulata*.

3.6.3.2 Dry *Calluna* heath specialists

Four dry heathland specialists were recorded at Redlake Meadows and Hogg's Moor, including the spider *Clubiona trivialis*, the common leafhopper *Ulopa reticulata* and Heath Damsel Bug *Nabis ericetorum*. Also found was the Neglected Rustic moth *Xestia castanea*, the larvae of which feed on *Calluna* and *Erica* species.

3.6.3.3 Wet heath specialists

No wet heathland specialist species were found.

3.6.3.4 Open wetland specialists

Eight wetland species were recorded, all dragonflies: Common Blue Damselfly *Enallagma cyathigerum,* Blue-tailed Damselfly *Ischnura elegans,* Large Red Damselfly *Pyrrhosoma nymphula,* Demoiselle Agrion *Calopteryx virgo,* Golden-ringed Dragonfly *Cordulegaster boltonii*, Keeled Skimmer *Orthetrum coerulescens,* Southern Hawker *Aeshna cyanea* and Common Darter *Sympetrum striolatum.*

3.6.4 Taxonomic composition

100 species of invertebrate were recorded at Redlake Meadows and Hogg's Moor (see Appendix 6.) This list is not meant to be comprehensive but provides a representative sample of the species present at the time of the survey and gives some indication of the taxonomic composition of the fauna present (Table 3.11). The Diptera were the best represented group with 26 species (26% of the species found), almost equally spread amongst the three main habitats of dry heathland (H4) and mire (M14 and M21). The Lepidoptera (15 species), spiders (12 species), Aculeates (11 species) and Heteroptera (10 species) were well represented. The richest habitat was the dry *Calluna* heathland (H4), much more so than the area of *Calluna vulgaris – Ulex gallii* heath; this may be partly because the sampled area of dry *Calluna* heathland was grazed by cattle and had a less uniform structure. The *Molinia* mire was especially species poor.

Table 3.11: Taxonomic composition of the invertebrate assemblages associated with specific vegetation types at Redlake Meadows and Hogg's Moor

Taxonomic Group	No of species	%	no of species					
			BG	DCH (H4)	DCH (H8)		M14	M21	MM
OW									
Spiders	12	12		14	5	6	3	1	
Harvestmen	2	2		2		2	1		
Odonata	8	8		3		4	7		8
Orthoptera	2	2	1	2	1	1	2		
Dermaptera	1	1		1		1	1		
Hemiptera – Heteroptera	10	10		5	3	4	1	1	
Hemiptera – Homoptera	4	4		3		3	1	1	
Neuroptera	1	1		1	1				
Mecoptera	1	1				1		1	
Lepidoptera	15	15		9	4	3	3		
Diptera	26	26		12	8	13	10		
Aculeate Hymenoptera	11	11		10	2	5	5		
Coleoptera	7	7		4		5	2		
Total	**100**		**1**	**66**	**24**	**48**	**36**	**4**	**8**

key
BG = bare ground
DCH (H4) = *Ulex gallii – Agrostis curtisii* heath
DCH (H8) = *Calluna vulgaris- Ulex gallii* heath
M14 = *Schoenus nigricans – Narthecium ossifragum*
M21 = *Narthecium ossifragum - Sphagnum papillosum* valley mire
MM = *Molinia* mire
WH = wet heath
OW = open water

4. COMPARISON OF SITES AND THEIR CONSERVATION IMPORTANCE FOR INVERTEBRATES

4.1 The standardised methodology of making three 4 hour visits to each site during the course of the 1998 summer allows comparisons to be made between sites (Table 4.1.). The site with the highest species diversity was Rosenannon Bog and Downs (181 species recorded), followed by Ventongimps Moor (179 species) and Newlyn Downs (175 species). The poorest site for invertebrates was Redlake Meadows (100 species), despite having the widest variety of habitat (7 habitat types including open water).

The single richest habitat was the wet Dorset heathland at Ventongimps Moor, which had more species (155) recorded than in the whole of Redlake Meadows (100 species). Wet heathland was generally rich in species, e.g. at Newlyn Downs (114 species) and Rosenannon Bog and Downs Bog (125 species), although dry Calluna heath at Tregoss Moor was comparatively species-rich (128 species). Bare ground species were particularly well represented at Newlyn Downs (75 species), Retire Common (84 species) and Tregoss Moor (60 species).

4.2 The Diptera and Lepidoptera were the best represented groups, with reasonable numbers of Spiders and Heteroptera at each site. The Odonata were well represented at Ventongimps Moor. The Aculeate Hymenoptera were generally poorly represented, except at Newlyn Downs (33 species), showing that most sites lacked suitable areas of bare ground for nesting. Beetle numbers were low, compared for example with expected numbers from woodland and scrub, indicating that these areas are generally poor for Coleoptera.

4.3 No Red Data Book species were recorded. Six Nationally Scarce species were recorded (2 butterflies, 2 beetles, 1 dragonfly and 1 cuckoo bee), and by inference 1 solitary mining bee (*Andrena humilis*). This compares with over 131 Red Data Book and 314 Nationally Scarce invertebrates recorded in Cornwall (Spalding, 1997), of which 61 are listed in *Biodiversity: The UK Steering Group Report.*

The Nationally Scarce invertebrates recorded in Cornwall comprise 4 Nationally Scarce Odonata, 153 Nationally Scarce Lepidoptera, 19 Nationally Scarce Aculeate Hymenoptera and 64 Nationally Scarce Coleoptera so far recorded in Cornwall (Spalding, *loc.cit.*), although the large majority of these of have not been recorded here since 1950. Some RDB and Nationally Scarce species known to occur at these sites were not recorded during this survey and these are listed in Table 4.2. (A full list of invertebrates previously recorded at these sites is given in Appendix 8).

4.4 The lack of Nationally Scarce invertebrates found at the survey sites may be due to a number of reasons:

4.4.1 Unsuitable management of the sites for invertebrates:

Many of the sites are not currently managed or are under unsuitable management regimes; the invertebrate interest of these sites could be enhanced by grazing or controlled burning (see Section 6). The site with the highest invertebrate diversity was Rosenannon Bog and Downs, which had extensive areas of recently burned dry heathland, with the result that there were large areas of warm sparsely vegetated ground suitable for a range of thermophilic invertebrates. The site with the lowest invertebrate diversity was the ungrazed area of Redlake Meadows.

4.4.2 The lack of nationally scarce invertebrates species in Cornwall due to historical, climatological and geographical reasons:

Over 400 RDB and Nationally Scarce invertebrates have been recorded in Cornwall in the past, indicating that geographic isolation and climate are not key factors in apparent current low invertebrate diversity. Many of these invertebrates have not been seen in Cornwall since 1950, which suggests that the causes of low invertebrate diversity are more recent, e.g. unsuitable management or habitat fragmentation.

4.4.3 The brief sampling period allowed in the survey:

Site sampling was limited to 12 man hours per site. Some species (e.g. Marsh Fritillary) may occur at such low densities at some sites that they were not recorded during this survey.

4.4.4 The sampling method adopted during the survey:

It is worth noting that nearly half (153) of the Nationally Scarce species recorded in Cornwall are moths, but none of the nocturnal moths were sampled during this survey. It is likely that night-time surveys would increase the number of RDB and Nationally Scarce present species known to occur on these sites. For example, the priority BAP species Double Line *Mythimna turca* is known to occur at Tregoss Moor.

Table 4.1: Comparative richness of invertebrate faunas at the 6 survey sites, expressed as a total number and as a percentage (figures in brackets) of total site richness

Taxonomic Group	Newlyn		Ventongimps Moor		Rosenannon		Retire		Tregoss		Redlake Meadows	
Spiders	24	(13.71)	13	(5.88)	20	(11.05)	15	(10.34)	23	(13.77)	12	(12)
Harvestmen	2	(1.14)	2	(1.12)	3	(1.66)	3	(2.07)	3	(1.80)	2	(2)
Odonata	11	(6.29)	15	(8.38)	10	(5.52)	8	(5.52)	7	(4.19)	8	(8)
Orthoptera	7	(4.00)	3	(1.68)	7	(3.87)	5	(3.45)	5	(2.99)	2	(2)
Dermaptera	1	(0.57)	1	(0.56)	1	(0.55)	1	(0.69)	1	(0.60)	1	(1)
Hemiptera – Heteroptera	19	(9.71)	22	(12.29)	19	(10.50)	15	(10.34)	15	(8.98)	10	(10)
Hemiptera – Homoptera	9	(5.14)	7	(3.91)	5	(2.76)	7	(4.83)	7	(4.19)	4	(4)
Neuroptera	0	(0.00)	1	(0.56)	0	(0.00)	1	(0.69)	1	(0.60)	1	(1)
Mecoptera	1	(0.57)	1	(0.56)	0	(0.00)	1	(0.69)	1	(0.60)	1	(1)
Lepidoptera	24	(13.71)	38	(21.23)	39	(21.55)	36	(24.83)	35	(20.96)	15	(15)
Diptera	29	(16.57)	45	(25.14)	34	(18.78)	23	(15.86)	28	(16.77)	26	(26)
Aculeate Hymenoptera	33	(18.86)	13	(5.88)	18	(9.94)	14	(9.66)	17	(10.18)	11	(11)
Coleoptera	15	(8.57)	18	(10.06)	25	(13.81)	16	(11.03)	24	(14.37)	7	(7)
Total	**175**		**179**		**181**		**145**		**167**		**100**	

Table 4.2: Invertebrate species of nature conservation concern recorded at the survey sites since 1980 but not found during the present survey

Species	category	sites
Eurodryas aurinia Marsh Fritillary	NS/BAP	Ventongimps (1992)
Cosmopterix orichalcea moth	pRDB3	Goss Moor (1988)
Mythimna turca Double Line moth	Nb/BAP	Tregoss Moor (1999)
Platycheirus immarginatus hoverfly	NS	Redlake (1991), Tregoss Moor (1994)
Plebejus argus Silver-studded Blue	NS/BAP	Tregoss Moor (1992)

5. SPECIES NOTES

5.1 Several early maturing heathland species would have been missed during the course of this survey, which began at the end of June, especially early Aculeate Hymenoptera, spiders and Lepidoptera. However, Odonata and Orthoptera were fully covered and several important heathland indicator invertebrates were recorded, including excellent populations of *Ceriagrion tenellum*, *Orthetrum coerulescens* and *Metrioptera brachyptera*.

5.2 The Nationally Scarce **Small Red Damselfly *Ceriagrion tenellum*** was recorded at Ventongimps Moor. This damselfly is associated with acid water with established vegetation and is one of the indicator species selected by the National Odonata Recording Scheme for the Key Sites Project (1988 to 1992).

5.3 The **Bog Bush-cricket *Metrioptera brachyptera*** was until recently classified as Nationally Scarce but is now considered to be nationally local. It is a sedentary indicator of long-established heathland and its presence at a site indicates long-term historical continuity of suitable habitat. It was found at two sites with major populations, but not refound at Tregoss Moor where the habitat may now be unsuitable.

5.4 The **Common Groundhopper *Tetrix undulata*** is the typical ground-hopper of bare or thinly vegetated ground on damp heathland. It was recorded at all survey sites.

5.5 The **Mottled Grasshopper *Myrmeleotettix maculatus*** is a nationally widespread species, found on dry heathland with abundant bare ground. It thrives in short turf with areas of bare ground for sunbasking; these areas are especially important to it in the exposed places which it inhabits. Sunbasking is important for the growth of the nymphs and for assisting sexual maturation in the adults. It is slow to colonise new areas because of its restricted flight patterns so that the existence of colonies indicates its long-term presence in long-established suitable habitat and it is therefore an ideal indicator species for use in assessing the ecological value of sites (Spalding & Haes, 1995). In these surveys, it was found only at Newlyn Down and Rosenannon Bog and Downs. The areas of dry heathland at the other survey sites appeared to be too overgrown to provide suitable habitat.

5.6 The **Heath Assassin Bug *Coranus subapteus*** is a nationally widespread (usually wingless) predatory insect that chases its prey on bare ground in long-established heathland. It was recorded at Rosennanon Downs and Tregoss Moor.

5.7 The **Heath Damsel Bug *Nabis ericetorum*** is flightless predator on dry heather and, although it is nationally widespread, its presence generally indicates high quality habitat (Spalding & Haes, 1995). This species was recorded at Rosenannon Bog and Downs Downs, Retire Common, Redlake Meadows and Tregoss Moor.

5.8 ***Orthotylus ericetorum*** is a nationally widespread **Mirid bug** which feeds on heathers. It was recorded at only Newlyn Downs.

5.9 The **leafhopper** ***Ulopa reticulata*** is a nationally widespread flightless species of the heather canopy. It was recorded at all survey sites. However, the populations at these sites seemed unexpectedly low.

5.10 The **Silver-studded Blue** ***Plebejus argus*** is a Nationally Scarce species which is associated with two habitats in Cornwall (heath and dune). There are extensive populations on the maritime heathlands of West Penwith, the Lizard and the north coast; smaller populations occur on inland heathland (Wheal Maid, Wheal Busy, Binner Downs, Tregoss Moor, Breney Common and Newlyn Downs). Extensive populations also occur on the north coast dunes.

5.11 The **Grayling** ***Hipparchia semele*** is locally common throughout Britain and found in Cornwall in a wide variety of habitat including acid short-turf grassland, sand dunes, maritime habitat and dry lowland heath (Spalding, 1995). Most (38%) of the Grayling sites are on maritime heathland and grassland, with only 5% on dry inland lowland heath (Spalding, *loc. cit.*). The key habitat feature appears to be bare or disturbed ground where the soils are so thin that a sparse vegetation exists without management (BUTT, 1986), e.g. on compacted or contaminated soil.

5.12 The **Marsh Fritillary** ***Eurodryas aurinia*** is widespread but uncommon in Cornwall, where it is largely restricted to wet heathland in West Penwith, The Lizard, the mid-Cornwall moors, Bodmin Moor and the culm measure grasslands of north Cornwall. Populations seem very low at all sites, with the possible exception of Breney Common nature reserve.

5.13 The **Beautiful Yellow Underwing** ***Anarta myrtilli*** is a widespread but local species in Cornwall, almost entirely restricted to inland heathland. This species was recorded at Rosenannon Bog and Downs.

5.14 ***Pedicia rivosa*** is a nationally local **crane-fly** of wet habitat, including wet heathland. There are few records for Cornwall, but this probably represents under-recording of this species. This species was recorded at Newlyn Downs, Rosenannon Bog and Downs, Tregoss and Redlake Meadows.

5.15 ***Sericomyia silentis*** is a large, conspicuous **hoverfly**, which is nationally widespread in moist localities including boggy heath land. This species was recorded at all sites except Redlake Meadows.

5.16 ***Lasius niger*** was abundant in many situations, being the most common **ant** on these sites. It occupies a special niche on the dry heathland over soils contaminated with heavy metals. It is possible that its presence is essential to the survival of Lycaenid butterflies in these locations.

5.17 ***Ammophila sabulosa*** is a widespread species associated in Cornwall with short vegetation and bare ground on coasts and dry heathland. This species was found at Newlyn Downs and Rosenannon Bog and Downs.

5.18 The Nationally Scarce **cuckoo bee *Nomada pleurosticta*** is dependent on its host *Andrena humilis* (Notable B), which is associated with disturbed ground on sandy soil in heaths and grasslands. Both species are rarely recorded in Cornwall but may be overlooked. *Nomada pleurosticta* was recorded at Newlyn Downs.

5.19 ***Colletes succinctus*** is a widespread late summer **bee** largely dependant for pollen on heathers. This species was recorded only at Newlyn Downs.

5.20 ***Bombus humilis*** is a nationally declining **bumblebee**, recorded in Cornwall in only five sites since 1981, of which two (Rosenannon Bog and Downs and Tregoss Moor) were found during this survey.

5.21 ***Bombus jonellus*** is a widespread but nationally local and declining **bumblebee**, of coastal and inland dry heathland. This species was recorded at Newlyn Downs, Rosenannon Bog and Downs and Retire Common.

5.22 ***Andrena tarsata*** is a nationally local species found throughout Britain on heathland and moorland. It is scarce in Cornwall, being recently recorded only at Rosenannon Bog and Downs (during this survey) and at Rough Tor.

5.23 The nationally widespread **Green Tiger Beetle *Cicendela campestris*** is one of the most characteristic and obvious beetles of coastal and inland dry heathland. The larvae need bare ground in warm sheltered areas in which to nest. This species was recorded at Newlyn Downs, Rosenannon Bog and Downs and Retire Common.

5.24 The **Hieroglyphic Ladybird *Coccinella hieroglyphica*** is a nationally widespread but easily overlooked ladybird of dry heathland. This species was recorded at Newlyn Downs, Rosenannon Bog and Downs and Tregoss Moor.

5.25 The **Chrysomelid beetle *Lochmaea suturalis*** is widespread on heather. This species was found only at Rosenannon Bog and Downs.

5.26 The Nationally Scarce **ground beetle *Amara equestris*** (Notable B) is widespread but local in a wide variety of habitats throughout England and Wales, but since 1950 has been only recorded in Cornwall from the Lizard (1980) and at Rosenannon Bog and Downs (during this survey).

5.27 The nationally local **weevil *Strophosoma nebulosum*** occurs on *Ulex* spp.; this species was found on *Ulex gallii* at Retire Common.

5.28 The Nationally Notable **weevil *Polydrusus confluens*** is associated with *Cytisus scoparius* and *Ulex europaeus*. It was recorded on Tregoss Moor.

6. MANAGEMENT RECOMMENDATIONS

6.1 Introduction

6.1.1 Heathland invertebrates generally require a mosaic of habitat types with different age heathers giving a range of heathland architecture which provides shelter, nesting places and sources of food (Kirby, 1992). Important sources of nectar for flying insects can be provided by heathland and ruderal plants. Areas of short turf and bare ground (e.g. along paths) can be utilised by a wide range of thermophilic species. Heathland soils can be utilised by burrowing invertebrates. Wetter areas provide suitable conditions for damp-loving species.

6.1.2 Neglect of these areas can lead to a loss of bare ground and a decline in structural and foodplant diversity. Without management, lowland heath tends to scrub over, suitable habitat may be quickly lost and invertebrate species may become locally extinct. For example, areas of wet Dorset heath invaded by *Salix* scrub have little open ground with the result that the ground layer is shaded out and too cool for a range of thermophilic invertebrates. In addition, the growth of *Salix* and *Betula* species in areas of wet heathland can result in the drying-out of these areas. Many of these sites are isolated in a fragmented agricultural landscape with the result that when species disappear from a site there may be no adjacent habitat from which they can recolonise.

6.1.3 The continual management of lowland heathland is necessary for this habitat to retain its invertebrate diversity. Traditional management has been by grazing, swaling (burning) and cutting. Wet heathland is best managed by grazing, as burning encourages the growth of *Molinia caerulea*. However, burning at Rosenannon Bog and Downs, although uncontrolled, appears to have benefited a wide range of thermophilic invertebrates. Some management is essential. Reduced activity on all these sites except Rosenannon Bog and Downs has led to the sites scrubbing over, especially at Ventongimps Moor. Generic management recommendations are provided in Table 6.1.

6.1.4 One of the most successful management methods is grazing by cattle, horses or ponies. This is clearly shown at Redlake Meadows and Hogg's Moor, where part of the site is heavily grazed by cattle. The grazed areas has greater structural diversity than the ungrazed area with considerably more invertebrate species recorded (66 to 24), including the Nationally Scarce Marsh Fritillary *Eurodryas aurinia*. By comparison, the ungrazed heathland is of even age, with low structural diversity and little bare ground; as a result, it has low invertebrate diversity.

6.2 Newlyn Downs

6.2.1 Large parts of the heathland lie over mine spoil and consist of self-maintained even-age dry *Calluna* heath. The compacted mine spoil remains devoid of vegetation without management. Fly tipping especially of top soil and garden waste should be discouraged although ruderal plants can provide an important nectar source for a range of invertebrates. Some tree planting has occurred here. These trees are unsuitable for this site and should be removed.

6.2.2 The area of wet Dorset heath is being invaded by scrub, especially *Salix* species and the Dorset heath is largely even-age without structural variety. There is little open ground, with the result that the ground layer is shaded out and too cool for a range of invertebrates, such as the Bog Bush-cricket *Metrioptera brachyptera* which would benefit from the provision of warmer, more open areas. Winter grazing would be beneficial to this area.

6.3 Ventongimps Moor

6.3.1 Large parts of this nature reserve consist of even-age heathland lacking in structural diversity, with little evidence of bare ground. The Nationally Scarce Marsh Fritillary *Eurodryas aurinia* appears to have disappeared from this site, which now seems to be too overgrown for this species. Some scrub clearance has taken place at the northern end of the reserve, but there is considerable growth of *Salix* and *Betula* species with resulting drying-out of the area. The current management is by grazing with Exmoor ponies. This appears to be a successful method of controlling *Molinia caerulea*, but the ponies are not suppressing the invasion of scrub. The trampling of ponies may be too heavy for some of the more delicate bog plants which grow between *Molinia* clumps.

6.3.2 The main requirement of the Marsh Fritillary is a plentiful supply of foodplant *Succisa pratensis*. Larger plants are used, especially where the turf height is 8-20cm (Warren, 1994); there is some evidence that shorter turf height can be utilised in Cornwall (as may occur in Scotland). Light grazing is usually the most successful management method, especially by ponies as these generally avoid the *Succisa pratensis* flowerheads. The current grazing regime appears to be light and could be supplemented with hand cutting of scrub.

6.3.3 The ponds have been kept clear for dragonflies and are well-managed; one pond has been recently dug out.

6.4 Rosenannon Bog and Downs

6.4.1 The extensive area of dry heathland has been recently burned, with the result that there are large areas of warm sparsely vegetated ground suitable for a range of thermophilic invertebrates. Continued burning, preferably of small areas every year, would ensure that the habitat remains of high nature conservation value. (It is noticeable that this site had greater species diversity than any other sampled site). It would be beneficial to increase the amount of bare ground available for nesting and burrowing invertebrates.

6.4.2 The wet heathland is of even-age with few open areas and in places it is becoming overgrown with scrub. Some limited clearance would be beneficial.

6.5 Retire Common

6.5.1 The extensive areas of dry heathland have been managed in the past. Part of the area has been burned, as shown by the dominance of grasses. However, much of the area is covered by even-age heathland, with little structural diversity or bare ground. Management of the dominant *Ulex gallii* (e.g. by burning or cutting) would be beneficial, allowing the ericaceous species to flourish. There is evidence of limited cattle grazing on the wet heath, which is keeping some of the heathland scrub-free. Fly-tipping should be controlled.

6.5.2 Water is being extracted from the area of wet heath, which is showing signs of drying out.

6.6 Tregoss Moor (part of a National Nature Reserve)

6.6.1 Part of the dry heathland consists of even-age heather with poor structural diversity. Current management consists of the clearance of small patches of *Ulex europaeus*. A small part of the area has been burned. It would be beneficial to increase the amount of bare ground available for nesting and hurrowing invertebrates. Grazing by heavy animals such as horses or cattle would have the effect of opening up the area and reducing the amount of gorse scrub.

6.6.2 The wet heath is being invaded by *Salix* scrub. These areas would benefit from scrub clearance. Grazing would reduce the dominance of *Molinia caerulea*, giving more space to other plant species.

6.7 Redlake Meadows and Hogg's Moor

6.7.1 Part of the site is heavily grazed by cattle, which has given the site great structural diversity. There were considerably more invertebrate species recorded in the grazed area than in the ungrazed area (66 to 24), including the Nationally Scarce Marsh Fritillary *Eurodryas aurinia*. The ungrazed heathland north of the road is of even age, with low structural diversity and little bare ground. As a result, it has low invertebrate diversity. Grazing would increase structural diversity.

6.7.2 The areas of mire at the northern end of the Cornwall Wildlife Trust reserve would benefit from grazing, which would reduce the dominance of *Molinia caerulea*, giving more space to other plant species.

Table 6.1: Generic management recommendations for maintaining and enhancing the invertebrate interest of the Mid-Cornwall Moors.

- Fly tipping especially of top soil and garden waste should be discouraged although ruderal plants can provide an important nectar source for a range of invertebrates.

- Where tree planting has occurred, trees should be removed as they are unsuitable for these sites.

- Even-age heathland (wet Dorset heath and dry *Calluna* heath) without structural variety can be improved for a range of invertebrates by winter grazing or controlled burning in areas on rotation.

- Wet heathland is probably best managed by grazing, as burning encourages the growth of *Molinia caerulea*. *Molinia caerulea* may be controlled by grazing with ponies, although trampling by ponies may be too heavy for some of the more delicate bog plants which grow between *Molinia* clumps.

- Growth of *Salix* and *Betula* species in areas of heathland can be controlled by grazing with heavy animals such as horses or cattle; ponies appear to be less successful at controlling the invasion of scrub.

- Management for Marsh Fritillary involves maintaining a plentiful supply of foodplant *Succisa pratensis*, in particular larger plants where the turf height is 8-20cm (there is some evidence that shorter turf height can be utilised in Cornwall). Light grazing is usually the most successful management method, especially by ponies as these generally avoid the *Succisa pratensis* flowerheads.

- Controlled burning (preferably of small areas every year) maintains areas of warm sparsely vegetated ground suitable for a range of thermophilic invertebrates. Many sites would benefit from an increase in the amount of bare ground available for nesting and burrowing invertebrates.

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APPENDIX 1: COMPLETE SPECIES LIST FOR NEWLYN DOWNS 1997

1.1 BARE GROUND

Spiders
Dictynidae: Dictyna arundinacea
Gnaphosidae: Haplodrassus signifer
Clubionidae: Clubiona trivialis
Thomisidae: Xysticus cristatus
Lycosidae: Arctosa perita
Pardosa sp.
Pisauridae: Pisaura mirabilis
Theridiidae: Enoplagnatha ovalis
Theridion simele
Araneidae: Araneus diadematus
Neoscona adiantum
Harvestmen
Phalangiidae: Leiobunum rotundum
Orthoptera
Tetrigidae: Tetrix undulata
Acrididae: Chorthippus parallelus
Chorthippus brunneus
Myrmeleotettix maculatus
Dermaptera
Forficulidae: Forficula auricularia
Hemiptera-Heteroptera
Pentatomidae: Dolycoris baccarum
Coreidae : Coreus marginatus
Lygaedae: Nysus thymi
Scoloptethus decoratus
Miridae: Dicyphus errans
Lygocorus pabulinus
Orthotylus ericetorum
Hemiptera-Homoptera
Aprophoridae: Neophilanius lineatus
Philaenus spumarius
Cixiidae: Cixius nervosus
Cicadellidae: Ulopa reticulata
Mecoptera
Panorpidae: Panorpa communis
Lepidoptera
Phlogophora meticulosa
Pieris brassicae
Diptera
Tipulidae: Tipula oleracea
Bibionidae: Bibio marci
Bibio pomonae
Syrphidae: Episyrphus balteatus
Eristalis arbustorum
Helophilus pendulus
Leucozonia lucorum
Neoascia podogrica
Rhingia campestris
Scaeva pyrastri
Sphaerophia scripta
Syrphus ribesii
Calliphoridae: Calliphora sp/spp.
Lucilia sp/spp.
Scathophagidae sp.
Hymenoptera-Aculeata
Formicidae: Formica cunicularia
Formica lemani
Lasius niger
Sphecidae: Ammophila sabulosa
Mellinus arvensis
Vespidae: Vespula vulgaris
Colletidae: Colletes similis (by inference)
Colletes succinctus
Andrenidae:**Andrena humilis** (by inference)
Andrena thoracica
Andrena wilkella (by inference)
Anthophoridae: Epeolus variegatus
Nomada flavoguttata
Nomada pleurosticta
Nomada rufipes
Nomada striata
Apidae: Apis mellifera
Bombus hortorum
Bombus lapidarius
Bombus lucorum
Bombus pascuorum
Bombus terrestris
Coleoptera
Carabidae: Cicindela campestris
Trechus obtusus
Staphylinidae: Philonthus marginatus
Coccinellidae: Coccinella 7-punctata
Oedemeridae: Oedemera nobilis
Tenebrionidae: Lagria hirta
Cuculonidae:Sitonia lineatus

1.2 DRY *CALLUNA* HEATH

Spiders
Dictynidae: Haplodrassus signifer
Clubionidae: Clubiona trivialis
Thomisidae: Misumenia vatia
Xysticus cristatus
Lycosidae: Pardosa sp/spp.
Pisauridae: Pisaura mirabilis
Agelenidae: Agelena labyrinthica
Theridiidae: Enoplognathus ovata
Theridion simele
Tetragnathidae: Tetragnatha extensa
Araneidae: Araniella cucurbitinus
Areneus diademata
Mangora acalypha
Linyphiidae: Gonatium rubens
Linypha triungularis
Harvestmen
Phalangiidae: Leiobunum rotundum
Phalangium opilio
Odonata
Aeshnidae: Aeshnea juncea
Libellulidae: Sympetrum striolatum
Cordulegaster boltonii
Orthoptera
Tetrigidae: Tetrix undulata
Acrididae: Chorthippus brunneus
Chorthippus parallelus
Myrmeleottix maculatus
Dermaptera
Forficulidae: Forficula auricularia
Hemiptera-Heteroptera
Acanthosomidae: Acanthosoma haemorrhoidale
Pentatomidae : Dolycoris baccarum
Palomina prasina
Lygaedae: Scolopostethus decoratus
Miridae: Dicryphus errans
Lygocoris pabulinus
Orthotylus ericetorum
Hemiptera-Homoptera
Aphrophoridae: Neophilanius lineatus
Philaenus spumarius
Cicadellidae: Ulopa reticulata
Cixidae: Cixius nervosus
Mecoptera
Panorpidae: Panorpa communis
Lepidoptera
Celastrina argiolus
Coenonympha pamphilus
Crambus lathoniellus
Crambus perlella
Endotricha flammealis
Inachis io
Oclodes venata
Macroglossum stellatarum
Maniola jurtina
Phlogophora meticulosa
Pieris brassicae
Polyommatus icarus
Pseudoterpna pruinata
Pyla fusca
Scotopteryx luridata
Thymelicus sylvestris
Ypsolopha dentella
Diptera
Tipulidae: Tipula marmorata
Tipula oleracea
Bibionidae: Bibio pomonae
Syrphidae: Episyrphus balteatus
Eristalis arbustorum
Eristalis pertinax
Helophilus pendulus
Leucozonia lucorum
Neoascia podograrica
Rhingia campestris
Scaeva pyrastri
Spherophoria scripta
Syrphus ribesii
Hymenoptera-Aculeata
Formicidae: Lasius flavus
Lasius niger
Sphecidae: Ammophila sabulosa
Argogorytes mystaceus
Crabro cribarius
Mellinus arvensis
Vespidae: Vespula vulgarus
Colletidae: Colletes succinctus
Andrenidae: Andrena thoracica
Andrena scotica
Halictidae: Lasioglossum calceatum
Anthophoridae: Nomada flavoguttata
Apidae: Apis mellifera
Bombus hortorum
Bombus jonellus
Bombus lapidarius
Bombus lucorum
Bombus pascuorum
Bombus terrestris
Coleoptera
Carabidae: Cicendela campestris
Silphidae: Nicrophorus vespillo
Cantharidae: Cantharis rustica
Rhagonycha fulva
Coccinellidae: Coccinella hieroglyphica
Coccinella 7-punctata
Oedemeridae: Oedemera nobilis
Chrysomellidae Oulema melanoplus

1.3 WET DORSET HEATH

Spiders
Gnaphosidae: Drassodes lappidosus/cupreus
Clubionidae: Clubiona reclusa
Clubiona trivialis
Thomisidae: Misumenia vatia
Philodromodae: Tibellus oblongus
Salticidae: Euophrys frontalis
Salticus scenicus
Lycosidae: Pardosa spp.
Pisauridae: Pisaura mirabilis
Agelenidae: Agelena labyrinthica
Theridiidae: Enoplognatha ovata
Theridion simele
Theridion sisyphrum
Tetragnathidae: Tetragnatha extensa
Araneidae: Araniella cucurbitinus
Araneus diadematus
Araneus quadratus
Neoscona adiantum
Linyphidae Linypha triangularis
Harvestmen
Phalangiidae: Leiobunum rotundum
Phalangium opilio
Odonata
Coenagridae: Enallagma cyathigerum
Ischnura elegans
Pyrrhosoma nymphula
Agriidae: Calopteryx virgo
Cordulegasteridae: Cordulegaster boltonii
Libellulidae: Libellula depressa
Orthetrum coerulescens
Sympetrum striolatum
Orthoptera
Tettigoniidae: Metrioptera brachyptera
Pholidoptera griseoaptera
Tetrigidae: Tetrix undulata
Acrididae: Chorthippus brunneus
Chorthippus parallelus
Omocestus viridulus
Dermaptera
Forficulidae: Forficula auricularia
Hemiptera-Heteroptera
Acanthosomidae: Acanthosoma haemorrhoidale
Pentatomidae: Aelia acuminata
Dolycoris baccarum
Palomina prasina
Picromeris bidens
Piezodorus lituratus
Nabidae: Dolichonabis limbatum
Nabis rugosus
Cimicidae: Anthocoris nemorum
Miridae: Lygocorus pabulinus
Pithanus maerkeli
Saldulidae: Saldula saltatoria
Hemiptera-Homoptera
Aphorophoridae: Aphrophora alni
Neophilaenus lineatus
Philaenus spumarius
Cicadellidae: Aphrodes bifasciatus
Cicadella viridis
Evacanthus interruptus
Eupelix cuspidata
Ulopa reticulata
Mecoptera
Panorpidae: Panorpa communis
Lepidoptera
Autographa gamma
Boloria selene
Coenonympha pamphilus
Crambus pascuella
Hemithea aestivaria
Maniola jurtina
Scotopteryx luridata
Diptera
Tipulidae: Pedicia rivosa
Tipula maxima
Tipula oleracea
Tipula marmorata
Bibionidae: Bibio pomonae
Dilophus febrilis
Stratiomyidae: Chloromyia formosa
Odontomyia viridula
Oxycera pulchella
Rhagionidae: Rhagio scolopacea
Tabanidae: Chrysops caecutiens
Haematopota pluvialis
Syrphidae: Bacca elongata
Episyrphus balteatus
Eristalis arbustorum
Eristalis pertinax
Eristalis tenax
Helophilus pendulus
Leucozonia lucorum
Rhingia campestris
Sericomyia silentis
Syrphus ribesii
Volucella pelluscens
Calliphoridae Calliphora sp/spp.
Lucilia sp/spp.
Sarcophaga sp.
Hymenoptera-Aculeata
Formicidae: Formica cunicularia
Lasius niger
Myrmica ruginodis
Sphecidae: Mellinus arvensis
Vespidae: Vespula rufa
Vespula vulgaris
Colletidae: Colletes succinctus
Andrenidae: Andrena thoracica
Megachilidae: Megachile centuncularis
Apidae: Apis mellifera
Bombus hortorum
Bombus lapidarius
Bombus lucorum

1.3 WET DORSET HEATH (cont.)

Hymenoptera-Aculeata (cont.)
Bombus pascuorum
Bombus terrestris

Coleoptera
Elateridae: Agriotes lineatus
Cantharidae: Cantharis rustica
Malthinus flaviolus
Rhagonycha fulva
Coccinellidae: Adelia 10-punctata
Coccinella hieroglyphica
Coccinella 7-punctata
Oedemeridae: Oedemera nobilis
Chrysomelidae: Chrysolina menthastri

1.4 STREAM AND STREAMSIDE MARSH

Odonata
Coenagridae: Coenagrion puella
Enallagma cyathigerum
Ischnura elegans
Pyrrhosoma nymphula
Lestidae: Lestes sponsa
Agriidae: Calopteryx virgo
Cordulegasteridae: Cordulegaster boltonii
Aeshnidae: Aeshna cyanea
Libellulidae: Orthetrum caerulescens
Sympetrum striolatum
Hemiptera -Heteroptera
Gerridae: Aquarius najas
Gerris lacustris

1.5 SMALL DRY AREA

Lepidoptera
Coenonympha pamphilus
Plebejus argus
Thymelicus sylvestris
Zyagaena filipendula
Hymenoptera-Aculeata
Ammophila sabulosa
Lasius niger

APPENDIX 2: COMPLETE SPECIES LIST FOR VENTONGIMPS MOOR 1997

2.1 WET DORSET HEATH

Spiders
Clubionidae: Cheiracanthium erraticum
Thomisidae: Misumena vatia
Xysticus cristatus
Philodromidae: Tibellus oblongus
Lycosidae: Pardosa sp/spp
Pisauridae: Pisaura mirabilis
Theridiidae: Enoplagnatha ovata
Tetragnathidae: Tetragnatha extensa
Araneidae: Araniella cucurbitina
Araneus diadematus
Araneus quadratus
Nunctenea cornuta
Linyphiidae: Linyphia triangularis
Harvestmen
Phalangiidae: Leiobunum rotundum
Phalangium opilio
Orthoptera
Tettigoniidae: Pholidoptera griseoaptera
Tetrigidae: Tetrix undulata
Acrididae: Chorthippus parallelus
Dermaptera
Forficulidae: Forficula auricularia
Hemiptera-Heteroptera
Acanthosomidae: Acanthosoma haemorrhoidale
Scutelleridae: Eurygaster testudinaria
Pentatomidae: Dolycoris baccarum
Palomina prasina
Pentatoma rufipes
Coreidae: Coreus marginatus
Lygaidae: Scolopostethus decoratus
Nabidae: Doliconabis limbatus
Kalomanius flavomarginatus
Cimicidae: Anthocoris nemorum
Miridae: Calocoris norvegicus
Dicryphus epilobii
Lygocorus contaminatus
Lygocoris pabulinus
Saldulidae: Saldula saltatoria
Hemiptera-Homoptera
Anthrophoridae: Anthrophora alni
Neophilaenus lineatus
Philaenus spumarius
Cicadellidae: Cicadella viridis
Evacanthus interruptus
Ulopa reticulata
Neuroptera
Chrysopidae: Chrysoperla carnea
Mecoptera
Panorpidae: Panorpa communis

Lepidoptera
Hesperiidae: Ochlodes venata
Thymelicus sylvestris
Pieridae: Goneopteryx rhamni
Pieris brassicae
Pieris napi
Pieris rapi
Lycaenidae: Celastrina argiolus
Lycaena phlaeas
Polyommatus icarus
Nymphalidae: Aglais urticae
Argynnis aglaja
Argynnis paphia
Cynthia carduui
Inachis io
Polygonia c-album
Vanessa atalanta
Satyridae: Aphanthopus hyperantus
Maniola jurtina
Pararge aegeria
Pyronia tithonus
Zygaenidae: Zygaena trifolii
Lasiocampidae: Macrothylecia rubi
Philudoria potatoria
Saturnidae: Saturnia pavonia
Sphingidae: Smerinthus ocellata
Arctiidae: Callimorpha dominula
Spilosoma lubricipeda
Tyria jacobaea
Noctuidae: Autographa gamma
Mythimna impura
Noctua pronuba
Drepanidae: Cilix glaucata
Geometridae: Abraxas grossulariata
Aplocera plagiata
Scotopteryx luridata
Diptera
Tipulidae: Nerophtoma flavipalpis
Tipula fulvipennis
Tipula maxima
Tipula paludosa
Tipula unca
Bibionidae: Bibio pomonae
Dilophus febrilis
Stratiomyidae: Chloromyia formosa
Rhagionidae: Rhagio scolopacea
Tabanidae: Haematopota pluvialis
Hybromitra distinguenda

2.1 WET DORSET HEATH (cont.)

Diptera (cont.)

Syrphidae: Bacca elongata
Cheilosa impressa
Cheilosa vernalis
Chrysotoxum bicinctum
Episyrphus balteatus
Eristalis arbustorum
Eristalis nemorum
Fristalis pertinax
Eristalis tenax
Helophilus pendulus
Leucozonia lucorum
Metasyrphus corollae
Myathropa floraea
Neoascia podogrica
Rhingia campestris
Scaeva pyrastri
Sericomyia silentis
Sphaerophora scripta
Syritta pipiens
Syrphus ribesii
Syrphus vitripennis
Volucella bombylans
Volucella pelluscens

Conopidae: Sicus ferrugineus

Tachinidae: Eriothrix rufomaculatus
Tachina grossa

Calliphoridae: Calliphora sp/spp.
Lucilia spp.
Sarcophaga sp.

Hymenoptera-Aculeata

Formicidae: Lasius niger
Myrmica ruginodis

Vespidae: Vespula vulgarus

Andrenidae: Andrena thoracica

Halictidae: Lasioglossum calceatus

Apidae: Apis mellifera
Bombus hortorum
Bombus lapidarius
Bombus lucorum
Bombus pascuorum
Bombus pratorum
Bombus terrestris
Psithyrus campestris

Coleoptera

Carabidae: Elaphrus cupreus
Loricera pilicornis
Nebria brevicollis
Pterostichus nigrita

Staphylinidae: Paederus littoralis

Cantharidae: Cantharis livida
Cantharis rustica
Rhagonycha fulva

Coccinellidae: Adalia 10-punctata
Coccinella 7-punctata
Propylea 14 punctata

Oedemeridae: Oedemera nobilis

Chrysomelidae: Gastrophysa viridula
Lochmaea caprae
Oulema melanoplus

Brentidae (Apionidae):Protapion dichroum

2.2 OPEN WATER

Odonata
Coenagridae: Ceriagrion tenellum
Coenagrion puella
Enallagma cyathigerum
Ischnura elegans
Pyrrhosoma nymphula
Lestidae: Lestes sponsa
Agriidae: Calopteryx virgo
Cordulegasteridae: Cordulegaster boltonii
Aeshnidae: Aeshna cyanea
Aeshna juncea
Anax imperator
Libellulidae: Libellula depressa
Orthetrum coerulescens
Sympetrum sanguineum
Sympetrum striolatum
Orthoptera
Tetrigidae: Tetrix undulata
Hemiptera-Heteroptera
Nabidae: Dolichonabis limbatus
Nabis rugosus
Miridae: Mecomma ambulans
Saldulidae Saldula sp/spp
Hydrometridae: Hydrometra stagnorum
Gerridae: Gerris lacustris
Notonectidae Notonecta glauca
Corixidae: Corixa punctata
Lepidoptera-Moths
Pyralidae: Nymphula nympheata
Diptera
Dolichopodidae: Poecilobothrus nobilitatus
Coleoptera
Hygrobiidae: Hygrobia herrmanni
Gyrinidae: Gyrinus substriatus

2.3 RECENTLY CLEARED AREA

Hemiptera-Homoptera
Cixidae: Cixius nervosus
Lepidoptera
Sphingidae: Dielephila elpenor
Geometridae: Camptogramma bilineata
Diptera
Stratiomyidae: Oxycera pulchella
Syrphidae: Chrysogaster solstitalis
Syrphus torvus
Xylota sylvarum

APPENDIX 3: COMPLETE SPECIES LIST FOR ROSENANNON BOG AND DOWNS 1997

3.1 WET HEATH

Spiders
Gnaphosidae: Drassodes lapidosus/cupreus
Clubionidae: Clubiona subtilis
Zoridae: Zora spinimana
Thomisidae: Misumena vatia
Philodromidae: Tibellus oblongus
Salticidae: Salticus scenicus
Lycosidae: Pardosa sp/spp
Pisauridae: Pisaura mirabilis
Agelenidae: Agelena labyrinthica
Theridiidae: Enoplagnatha ovata
Tetragnathidae: Tetragnatha extensa
Metidae: Meta segmentata
Araniedae: Araniella cucurbitina
Araneus diadematus
Araneus quadratus
Nuctenea cornuta

Harvestmen
Phalangiidae: Leiobunum rotundum
Paroligolophus agrestis
Phalangium opilio

Odonata
Coenagriidae: Enallagma cyathigerum
Ischnura elegans
Pyrrhosoma nymphula
Lestidae: Lestes sponsa
Agriidae: Calopteryx virgo
Cordulegasteridae: Cordulegaster boltonii
Aeshnidae: Aeshna cyanea
Libellulidae: Sympetrum striolatum

Orthoptera
Tettigoniidae: Metrioptera brachyptera
Pholidoptera griseoaptera
Tetrigidae: Tetrix undulata
Acrididae: Chorthippus parallelus
Omocestus viridulus

Dermaptera
Forficulidae: Forficula auricularia

Hemiptera-Heteroptera
Acanthosomatidae: Acanthosoma haemorrhoidale

Pentatomidae: Aelia acuminata
Dolycoris baccarum
Palomena prasina
Pentatoma rufipes
Coreidae: Coreus marginatus
Nabidae: Dolichonabis limbatus
Nabis rugosus
Cimicidae: Anthocoris nemorum
Miridae: Heterotoma merioptera
Lygocoris pabulinus
Lygus pratensis
Saldulidae: Saldula saltatoria

Hemiptera-Homoptera
Aphrophoridae: Aprophora alni
Neophilaenus lineatus
Philaenus spumarius
Cicadellidae: Cicadella viridis

Lepidoptera
Hesperiidae: Ochlodes venata
Thymelicus sylvestris
Pieridae: Gonepteryx rhamni
Pieris brassicae
Pieris napi
Nymphalidae: Aglais urticae
Argynnis aglaja
Argynnis paphia
Cynthia cardui
Inachis io
Polygonia c-album
Vanessa atalanta
Satyridae: Aphanthopus hyperantus
Maniola jurtina
Pararge aegeria
Pyronia tithonus
Sphingidae: Deilephila elpenor
Smerinthus ocellata
Lymantriidae: Eupoctis similis
Arctiidae: Miltochrista miniata
Tyria jacobaea
Noctuidae: Autographa gamma
Mythimna impura
Xanthia aurago
Geometridae: Camptogamma biliniata
Scotopteryx luridata

Diptera
Tipulidae: Pedicia rivosa
Stratiomyidae: Chloromyia formosa
Odontomyia viridula
Rhagionidae: Atherix ibis
Rhagio scolopacea
Tabanidae: Chrysops caecutiens
Haematopota pluvialis
Syrphidae: Cheilosa pegana
Episyrphus balteatus
Eristalis arbustorum
Eristalis nemorum
Eristalis pertinax
Eristalis tenax
Helophilus pendulus
Leucozonia lucorum
Meredon equestris
Myathropa florea

3.1 WET HEATH (cont.)

Diptera

Syrphidae: (cont.)
Rhingia campestris
Scaeva pyrastri
Sericomyia silentis
Syrphus ribesii
Syritta pipiens
Voluchella pelluscens

Calliphoridae: Calliphora sp/spp
Lucilia sp/spp
Sarcophagidae sp

Muscidae Mesembrina meridiana

Hymenoptera-Aculeata

Formicidae: Lasius niger

Vespidae: Vespula germanica
Vespula vulgaris

Andrenidae: Andrena thoracica

Apidae: Apis mellifera
Bombus hortorum
Bombus lapidarius
Bombus lucorum
Bombus pascuorum
Bombus pratorum

Coleoptera

Staphylinidae: Ocypus olens

Geotrupidae: Geotrupes stercorosus

Cantharidae: Rhagonycha fulva

Coccinellidae: Calvia 14-guttata
Coccinella 7-punctata

Cerambycidae: Strangalia maculata

Chrysomelidae: Chrysolina menthrastri
Chrysolina polita
Lochmaea caprea
Luperus longicornis

Curculonidae: Phyllobius pomaceus
Sitonia lineatus

3.2 MOLINIA MIRE (NVC M25)

Spiders
Lycosidae: Pardosa sp/spp
Pisauridae: Pisaura mirabilis
Agelenidae: Agelena labyrinthica
Theridiidae: Enoplognatha ovata
Tetragnathidae: Tetragnatha extensa
Araneidae: Araneus diadematus
Araneus quadratus
Harvestmen
Phalangiidae: Leiobunum rotundum
Odonata
Coenagridae: Enallagma cyathigerum
Ischnura elegans
Pyrrhosoma nymphula
Agriidae: Calopteryx virgo
Cordulegasteridae: Cordulegaster boltonii
Aeshnidae: Aeshna cyanea
Libellulidae: Orthetrum coerulescens
Sympetrum striolatum
Orthoptera
Tettigoniidae: Metrioptera brachyptera
Pholidoptera griseoaptera
Tetrigidae: Tetrix undulata
Acrididae: Chorthippus parallelus
Omocestus viridulus
Dermaptera
Forficulidae: Forficula auriculata
Hemiptera-Heteroptera
Pentatomidae: Palomina prasina
Coreidae: Coreus marginatus
Cimicidae: Anthocoris nemorum
Saldulidae: Saldula sp.
Hemiptera-Homoptera
Aphrophoridae: Aphrophora alni
Neophilaenus lineatus
Philaenus spumarius
Delphacidae: Delphax pulchellus
Cicadellidae: Evacanthus interruptus
Lepidoptera
Hesperiidae: Ochlodes venata
Thymelicus sylvestris
Pieridae: Gonepteryx rhamni
Pieris brassicae
Pieris napi
Nymphalidae: Aglais urticae
Argynnis aglaja
Inachis io
Vanessa atalanta
Satyridae: Aphanthopus hyperantus
Coenagrion pamphilus
Maniola jurtina
Pararge aegeria
Pyronia tithonus
Lycaenidae: Lycaenus phlaeas
Polyommatus icarus
Pyralidae Agrophilla tristella
Zygaenidae: Zygaena filipendulae:
Geometridae: Abraxas grossulariata
Hydriomena furcarta
Pseudoterpna pruniata
Diptera
Tipulidae: Tipula maxima
Bibionidae: Bibio pomone
Dolichopodidae: Poecilobothrus nobilitatus

Syrphidae: Eristalis arbustorum
Eristalis pertinax
Helophilus pendulus
Rhingia campestris
Sericomyia silentis
Syrphus ribesii
Calliphoridae: Calliphora sp/spp
Lucilia sp/spp
Sarcophaga sp
Coleoptera
Carabidae: Nebria brevicollis
Pterostichus nigrita
Cantharidae: Rhagonycha fulva
Coccinellidae: Coccinella 7-punctata
Coccinella 11-punctata
Oedemeridae: Oedemera nobilis
Chrysomelidae: Chrysolina polita

3.3 OPEN WATER

Odonata
Coenagridae: Enallagma cyathigerum
Ischnura elegans
Pyrrhosoma nymphula
Agriidae: Calopteryx virgo
Cordulegasteridae: Cordulegaster boltonii
Libellulidae: Orthetrum coerulescens
Sympetrum striolatum
Hemiptera-Heteroptera
Gerridae: Gerris lacustris
Notonectidae: Notonecta glauca
Diptera
Dolichopodidae: Poecilibothus nobilitatus
Coleoptera
Gyrinidae: Gyrinus sp

3.4 DRY HEATH

Spiders
Thomisidae: Misumenia vatia
Xysticus cristatus
Salticidae: Euophrys frontalis
Lycosidae: Pardosa spp
Pisauridae: Pisaura mirabilis
Theridiidae: Enoplagnatha ovata
Agelenidae: Agelena labyrinthica
Araneidae: Araneus diadematus
Araneus quadratus
Neoscona adiantum
Harvestmen
Phalangiidae: Leiobunum rotundum
Phalangium opilio
Odonata,
Aeshnidae: Aeshna juncea
Libellulidae: Orthetrum coerulescens
Sympetrum striolatum
Orthoptera
Tettigoniidae: Metrioptera brachyptera
Pholidoptera griseoaptera
Tetrigidae: Tetrix undulata
Acrididae: Chorthippus parallelus
Chorthippus brunneus
Myrmeleotettix maculatus
Omocestus viridulus
Dermaptera
Forficulidae: Forficula auricularia
Hemiptera-Heteroptera
Pentetomidae: Aelia acuminata
Dolycoris baccatum
Palomina prasina
Coreidae: Coreus marginatus
Lygaedae: Scolopostethus decoratus
Reduviidae: Coranus subapteus
Nabidae: Nabis ericetorum
Nabis rugosus
Miridae: Lygocoris pabulinus
Hemiptera-Homoptera
Aphrophoridae:
Neophilaenus lineatus
Philaenus spumarius
Cicadellidae: Ulopa reticulata
Lepidoptera
Hesperiidae: Ochlodes venata
Thymelicus sylvestris
Pieridae: Gonepteryx rhamni
Pieris brassicae
Pieris rapae
Nymphalidae: Aglais urticae
Argynnis aglaja
Inachis io
Vanessa atalanta
Satyridae: Coenonympha pamphilus
Hipparchia semele
Lasiommata megera
Maniola jurtina
Pararge aegeria
Pyronia tithonus
Lycaenidae: Lycaena phlaeas
Polyommatus icarus
Lepidoptera
Pyralidae: Agriphilla tristella
Zygaenidae: Zygaena filipendulae
Saturnidae: Saturnia pavonia
Arctiidae: Tyria jacobaea
Noctuidae: Anarta myrtilli
Autographa gamma
Phytometra viridaria
Geometridae: Pseudoterpna pruinata
Scotopteryx luridata

Diptera
Bibionidae: Bibio pomonae
Syrphidae: Episyrphus balteatus
Eristalis arbustorum
Eristalis pertinax
Helophilus pendulus
Paragus haemorrhous
Rhingia campestris
Sericomyia silentis
Syrphus ribesii
Tabanidae: Haematopota pluvialis
Tachinidae: Eriothrix rufomaculatus
Tachina grossa
Calliphoridae: Calliphora sp/spp
Lucilia sp/spp
Sarcophaga sp/spp
Hymenoptera-Aculeata
Formicidae: Lasius niger
Sphecidae: Ammophila subulosa
Mellinus arvensis
Vespidae: Vespula vulgaris
Andrenidae: Andrena tarsata
Halictidae: Lasioglossum calceatum
Apidae: Apis mellifera
Bombus hortorum
Bombus humilis
Bombus jonellus
Bombus lapidarius
Bombus lucurum
Bombus pascuorum
Bombus pratorum
Bombus terrestris
Psithyrus vestalis
Coleoptera
Carabidae: Amara equestris
Cicindela campestris
Carabus granulatus
Notiophilus biguttatus
Geotrupidae: Geotrupes stercorarius
Cantharidae: Rhagonycha fulva
Coccinellidae: Adelia 10-punctata
Coccinella hieroglyphica
Coccinella 7-punctata
Oedemeridae: Oedemera nobilis
Chrysomelidae: Lochmaea suturalis
Timarchia tenebricosa

APPENDIX 4: COMPLETE SPECIES LIST FOR RETIRE COMMON 1997

4.1 DRY HEATH

Spiders
Lycosidae: Pardosa spp
Pisauridae: Pisaura mirabilis
Agelenidae: Agelena labyrinthica
Theridiidae: Enoplagnatha ovata
Araneidae: Areneus diadematus
Araneus quadratus
Neoascona adiantum
Nuctenea cornuta
Linyphiidae: Linypha triangularis
Harvestmen
Phalangiidae: Leiobunum rotundum
Mitopus morio
Phalangium opilio
Odonata
Coenagriidae: Enallagma cyathigerum
Aeshnidae: Aeshna cyanea
Libellulidae: Sympetrum striolatum
Orthoptera
Tettigoniidae: Pholidoptera griseoaptera
Tetrigidae: Tetrix undulata
Acrididae: Chorthippus parallelus
Chorthippus brunneus
Omocestus viridulus
Dermaptera
Forficulidae: Forficula auricularia
Hemiptera-Heteroptera
Pentatomidae: Dolycorus baccarum
Palomina prasina
Piezodorus lituratus
Nabidae: Nabis ericetorum
Nabis rugosus
Cimicidae: Anthocoris nemorum
Miridae: Lygocorus pabulinus
Stenodema laevigatum
Hemiptera-Homoptera
Aphrophoridae: Neophilaenus lineatus
Philaenus spumarius
Cicadellidae: Ulopa reticulata
Neuroptera
Chrysopidae: Chrysoperla carnea
Mecoptera
Panorpidae: Panorpa communis
Lepidoptera
Hesperiidae: Ochlodes venatus
Thymelicus sylvestris
Pieridae: Pieris brassicae
Nymphalidae:
Aglais urticae
Cynthia cardui
Inachis io
Vanessa atalanta
Satyridae: Coenonympha pamphilus
Hipparchia semele
Lasiommata megera
Maniola jurtina
Pararge aegeria
Pyronia tithonus
Lycaenidae: Lycaena phlaeas
Polyommatus icarus
Tortricidae: Cydia succedana
Alucitidae: Alucita hexadactyla
Pyralidae: Agriphila inquinatella
Agriphila straminella
Lasiocampidae: Lasiocampa quercus
Arctiidae: Tyria jacobaea
Noctuidae: Anata myrtilii
Autographa gamma
Mythimna impura
Phlogophora meticulosa
Phytometra viridaria
Geometridae: Petrophora chlorosata
Scotopteryx luridata
Diptera
Bibionidae: Bibio pomonae
Tabanidae: Haematopota pluvialis
Syrphidae: Episyrphus balteatus
Eristalis arbustorum
Helophilus pendulus
Meredon equestris
Neoascia podagrica
Rhingia campestris
Sericomyia silentis
Sphaerophoria scripta
Syritta pipiens
Syrphus ribesii
Calliphoridae: Calliphora sp/spp
Lucilia sp/spp
Sarcophaga sp
Hymenoptera-Aculeata
Formicidae Lasius niger
Myrmica rubra
Vespidae: Vespula germanica
Vespula vulgaris
Halictidae: 2b Lasioglossum calceatum
Apidae: Apis mellifera
Bombus hortorum
Bombus jonellus
Bombus lapidarius
Bombus lucorum
Bombus pascuorum
Bombus terrestris
Coleoptera
Cantharidae: Rhagonycha fulva
Coccinellidae: Adalia 10-punctata
Coccinella 7-punctata
Oedemeridae: Oedemera nobilis
Brentidae(Apionidae): Protopirapion atratulum
Cucurlionidae: Strophosoma nebulosum

4.2 WET HEATH

Spiders
Clubionidae: Clubiona subtilis
Clubiona trivialis
Zoridae: Zora spinimana
Thomisidae: Misumena vatia
Lycosidae: Pardosa sp/spp
Pirata sp
Pisauridae: Pisaura mirabilis
Agelenidae: Agelina labyrinthica
Theridiidae: Enoplagnatha ovata
Tetragnathidae: Tetragnatha extensa
Araneidae: Araneus diadematus
Araneus quadratus
Nuctenea cornuta
Linyphiidae: Linypha triangularis
Harvestmen
Phalangiidae: Leiobunum rotundum
Odonata
Coenagriidae: Enallagma cyathigerum
Ischnura elegans
Pyrrhosoma nymphula
Agriidae: Calopteryx virgo
Cordulegasteridae: Cordulegaster boltonii
Libellulidae: Orthetrum coerulescens
Sympetrum striolatum
Orthoptera
Tettigoniidae: Pholidoptera griseoaptera
Tetrigidae: Tetrix undulata
Acrididae: Chorthippus parallelus
Dermaptera
Forficulidae: Forficula auricularia
Hemiptera-Heteroptera
Pentatomidae: Dolycoris baccarum
Palomina prasina
Picromeris bidens
Coreidae: Coreus marginatus
Nabidae: Dolichonabis limbatus
Nabis rugosus
Miridae: Dicryphus errans
Lygocorus pabulinus
Saldulidae: Saldula sp/spp
Hydrometridae: Hydrometra stagnorum
Hemiptera-Homoptera
Aphrophoridae: Aphrophora alni
Neophilaenus lineatus
Philaenus spumarius
Cicadellidae: Cicadella viridis
Eupteryx aurata
Evacanthus interruptus
Mecoptera
Panorpidae: Panorpa communis

Lepidoptera
Hesperiidae: Ochlodes venatus
Thymelicus sylvestris
Pieridae: Gonepteryx rhamni
Nymphalidae: Aglais urticae
Cynthia cardui
Inachis io
Vanessa atalanta
Satyridae: Coenonympha pamphilus
Maniola jurtina
Pararge aegeria
Pyronia tithonus
Tortricidae: Cydia succedana
Endothenia marginana
Pyralidae: Agrophila tristella
Agriphila inquinatella
Myelois cribella
Geometridae: Epirrhoe alternata
Arctiidae: Tyria jacobaea
Noctuidae: Autographa gamma
Diptera
Tipulidae: Tipula oleracea
Tipula paludosa
Tipula unca
Bibionidae: Bibio pomonae
Stratiomyidae: Chloromyia formosa
Tabanidae: Haematopota pluvialis
Syrphidae: Eristalis arbustorum
Eristalis pertinax
Helophilus pendulus
Rhingia campestris
Scaeva pyrastri
Sericomyia silentis
Calliphoridae: Calliphora sp/spp
Lucillia sp/spp
Sarcophaga sp
Scathophagiadae: Scathophaga sp
Hymenoptera- Aculeata
Vespidae: Vespula germanica
Vespula vulgaris
Apidae: Apis mellifera
Bombus lapidarius
Bombus lucorum
Bombus pascuorum
Bombus terrestris
Coleoptera
Cantharidae: Cantharis rustica
Rhagonycha fulva
Pyrochroidae: Pyrochroa serraticornis
Coccinellidae Adalia 10-punctata
Coccinella 7-punctata
Oedemeridae: Oedemera nobilis
Chrysomelidae: Cassida rubiginosa

4.3 BARE GROUND

Spiders
Clubionidae: Clubiona trivialis
Lycosidae: Pardosa spp
Pisauridae: Pisaura mirabilis
Theridiidae: Enoplagnatha ovata
Araneidae: Araneus diadematus
Araneus quadratus
Linyphiidae: Linypha triangularis
Harvestmen
Phalangiidae: Leiobunum rotundum
Phalangium opilio
Orthoptera
Tettigoniidae: Pholidoptera griseoaptera
Acrididae: Chorthippus brunneus
Chorthippus parallelus
Omocestus viridulus
Dermaptera
Forficulidae: Forficula auricularia
Hemiptera-Heteroptera
Acanthosomatidae: Acanthosoma haemorrhoidale

Pentatomidae: Dolochorus baccarum
Palomina prasina
Picromeris bidens
Piezodorus lituratus
Nabis rugosus
Cimicidae: Anthocoris nemorum
Miridae: Lygocoris pabulinus
Hemiptera-Homoptera
Aphrophoridae: Neophilaenus lineatus
Philaenus spumarius
Neuroptera
Chrysopidae: Chrysoperla carnea
Mecoptera
Panorpidae: Panorpa communis
Lepidoptera
Hesperiidae: Ochlodes venata
Thymelicus sylvestris
Pieridae: Pieris brassicae
Pieris rapae
Nymphalidae: Aglais urticae
Inachis io
Vanessa atalanta
Satyridae: Aphantopus hyperantus
Coenonympha pamphilus
Maniola jurtina
Pararge aegeria
Pyronia tithonus
Lycaenidae: Lycaena phlaeas
Polyommatus icarus
Pyralidae: Agriphila tristella
Agriphila straminella
Noctuidae: Autographa gamma
Phlogophora meticulosa
Geometridae: Camptogamma bilineata
Eupithecia nanata
Diptera
Bibionidae: Bibio pomonae
Stratiomyidae: Chloromyza formosa
Rhagionidae: Rhagio scolopacea
Syrphidae: Chrysotoxum bicinctum
Episyrphus balteatus
Eristalis arbustorum
Eristalis pertinax
Eristalis tenax
Leucozona lucorum
Neoascia podagrica
Rhingia campestris
Sphaerophoria scripta
Syritta pipiens
Syrphus ribesii
Calliphoridae: Calliphora sp/spp
Lucilia sp/spp
Sarcophaga sp
Hymenoptera-Aculeata
Formicidae: Lasius niger
Myymica ruginodis
Sphecidae: Mellinus arvensis
Vespidae: Vespula germanica
Vespula vulgaris
Apidae: Apis mellifera
Bombus lapidarius
Bombus lucorum
Bombus pascuorum
Bombus terrestris
Coleoptera
Carabidae: Amara aenea
Notiophilus biguttatus
Scarabidae: Aphodius fimetarius
Cantharidae: Cantharus fusca
Cantharis livida
Rhagonycha fulva
Pyrochroidae: Pyrochroa serraticornis
Coccinallidae: Coccinella 7-punctata
Oedemeridae: Oedemera nobilis
Chrysomelidae: Oulema melanopus
Timarcha tenebricosa

4.4 POND

Odonata
Agriidae: Calopteryx virgo
Libellulidae: Orthetrum coerulescens
Sympetrum striolatum
Lepidoptera
Pyralidae: Nymphula nympheata

APPENDIX 5: COMPLETE SPECIES LIST FOR TREGOSS MOOR 1997

5.1 BARE GROUND

Spiders
Thomisidae: Xysticus cristatus
Salticidae: Heliophanus cupreus
Lycosidae: Pardosa sp/spp
Tetragnathidae: Tetragnatha extensa
Araneidae: Araneus diadematus
Harvestmen
Phalangiidae: Leiobunum rotundum
Odonata
Coenagriidae: Ischnura elegans
Libellulidae: Sympetrum striolatum
Orthoptera
Tetrigidae: Tetrix undulata
Acrididae: Chorthippus brunneus
Chorthippus parallelus
Omocestus viridulus
Dermaptera
Forficulidae: Forficula auricularia
Hemiptera-Heteroptera
Pentatomidae: Dolycoris baccarum
Coreidae: Coreus marginatus
Nabidae: Nabis rugosus
Miridae: Lygocoris pabulinus
Saldidae: Saldula saltatoria
Hemiptera-Homoptera
Aphrophoridae: Neophilanus lineatus
Philaenus spumarius
Cicadellidae: Evarcanthus interruptus
Lepidoptera
Hesperiidae: Thymelicus sylvestris
Pieridae: Pieris brassicae
Nymphalidae: Aglais urticae:
Vanessa atalanta
Satyridae: Coenonympha pamphilus
Maniola jurtina
Pararge aegeria
Pyronia tithonus
Diptera
Tipulidae: Tipula maxima
Tipula oleraceae
Tipula paludosa
Bibionidae: Bibio pomonae
Stratiomyiadae Chloromyia formosa
Tabanidae: Chrysops cacutiens
Haematopota pluvialis
Syrphidae: Episyrphus balteatus
Eristalis arbustorum
Eristalis pertinax
Eristalis tenax
Helophilus pendulus
Rhingia campestris
Syrphus ribesii
Conopidae: Sicus ferrugineus
Tachinidae: Eriothrix rufomaculatus
Calliphoridae: Callifora sp/spp
Lucilia sp/spp
Sarcophaga sp
Muscidae: Mesembrina meridiana
Hymenoptera-Aculeata
Formicidae: Formica lemani
Lasius niger
Myrmica ruginodis
Halictidae: Halictus rubicundus
Coleoptera
Silphidae: Necrophorus vespillo
Cantharidae: Cantharis rustica
Rhagonycha fulva
Coccinellidae: Coccinella 7-punctata
Oedemeridae: Oedemera nobilis
Salpingidae (Pythidae) Salpingus reyi
Chrysomelidae: Olema melanopus
Timarcha tenebricosa

5.2 DRY CALLUNA – ULEX GALLII HEATH

Spiders
Philodromidae: Tibellus oblongus
Lycosidae: Pardosa sp/spp
Pisauridae: Pisaura mirabilis
Agelenidae: Agelena labyrinthica
Theridiidae: Enoplagnatha ovata
Tetragnathidae: Tetragnatha extensa
Araneidae: Araniella cucurbitinus
Araneus diadematus
Araneus quadratus
Zygiella atrica
Linyphiidae: Linypha triangularis
Gnaphosidae: Drassodes lapidosus/cupreus
Thomisidae: Misumena vatia
Salticidae: Heliophanus cupreus
Salticus scenicus

Harvestmen
Phalangiidae: Leiobunum rotundum
Mitopus morio
Phalangium opilio

Odonata
Coenagriidae: Enallagma cyathigerum
Libellulidae: Orthetrum coerulescens
Sympetrum striolatum
Aeshnidae: Aeshna cyanea

Orthoptera
Tettigoniidae: Pholidoptera griseoaptera
Tetrigidae: Tetrix undulata
Acrididae: Chorthippus brunneus
Chorthippus parallelus
Omocestus viridulus

Dermaptera
Forficulidae: Forficula auricularia

Hemiptera-Heteroptera
Pentatomidae: Aelia acuminata
Dolocoris baccarum
Palomina prasina
Coreidae: Coreus marginatus
Lygaeidae: Scolopostethus decoratus
Reduviidae: Coranus subapterus
Nabidae: Nabis ericetorum
Nabis rugosus
Cimicidae: Anthocoris nemorum
Miridae: Ascoidema obsoletum
Capsus ater
Leptoterna dolobrata
Lygocoris pabulinus

Hemiptera-Homoptera
Aphrophoridae: Neophilaenus lineatus
Philaenus spumarius
Cixiidae: Cixius nervosus
Cicadellidae: Eupelix cuspidata
Macrostelis sexnotatus/laevis
Ulopa reticulata

Neuroptera
Chrysopidae: Chrysoperla carnea

Mecoptera
Panorpidae: Panorpa communis

Lepidoptera
Hesperiidae: Ochlodes venata
Thymelicus sylvestris
Pieridae: Gonepteryx rhamni
Pieris brassicae:
Pieris napi
Pieris rapae
Nlmphalidae: Aglais urticae
Argynnis aglaja
Inachis io
Vanessa atalanta
Satyridae: Coenonympha pamphilus
Hipparchia semele
Maniola jurtina
Pararge aegeria
Pyronia tithonus
Lycaenidae: Lycaena phlaeas
Polyommatus icarus
Pyralidae: Agriphila tristella
Nomophila noctuella
Pempelia palumbella
Zygaenidae: Zygaena filipendulae
Lasiocampidae: Macrothylacia rubi
Saturnidae: Saturnia pavonia
Noctuidae: Autographa gamma
Geometridae: Camptogramma bilineata
Scotopteryx luridata

Diptera
Tipulidae: Tipula confusa
Tipula maxima
Tipula oleraceae
Tipula paludosa
Bibionidae: Bibio pomonae
Stratiomyiadae Chloromyia formosa
Asilidae: Dioctria rufipes
Tabanidae: Chrysops cacutiens
Haematopota pluvialis
Syrphidae: Episyrphus balteatus
Eristalis arbustorum
Eristalis pertinax
Eristalis tenax
Helophilus pendulus
Melanostoma scalare
Neoascia podagrica
Rhingia campestris
Scaeva pyrastri
Syrphus ribesii
Conopidae: Sicus ferrugineus
Tachinidae: Eriothrix rufomaculatus
Calliphoridae: Callifora sp/spp
Lucilia sp/spp
Sarcophaga sp
Muscidae: Mesembrina meridiana

Hymenoptera-Aculeata

Formicidae: Formica lemani
Lasius flavus
Lasius niger
Vespidae: Vespula vulgaris
Andrenidae: Andrena semilaevis (saundersella)
Halictidae: Lasioglossum calceatum
Megachilidae: Megachile centuncularis
Halictus rubicundus
Apidae: Apis mellifera
Bombus hortorum
Bombus humilis
Bombus lapidarius
Bombus lucorum
Bombus pascuorum
Bombus terrestris

Coleoptera

Carabidae: Cicindela campestris
Amara aenea
Anisocactylis binotatus
Harpalus aeneus
Cantharidae: Cantharis rustica
Rhagonycha fulva
Coccinellidae: Coccinella hieroglyphica
Coccinella 7-punctata
Oedemeridae: Oedemera nobilis
Chrysomellidae: Oulema melanopus
Curculonidae: Polydrassus confluens
Sitonia striatellus

5.3 DRY GRASS HEATH

Spiders
Lycosidae: Pardosa sp/spp
Pisauridae: Pisaura mirabilis
Agelenidae: Agelena labyrinthica
Metidae: Meta segmentata
Araneidae: Araneus diadematus
Harvestmen
Phalangiidae: Leiobunum rotundum
Orthoptera
Tetrigidae: Tetrix undulata
Acrididae: Chorthippus brunneus
Chorthippus parallelus
Omocestus viridulus
Dermaptera
Forficulidae: Forficula auricularia
Hemiptera-Heteroptera
Pentatomidae: Aelia acuminata
Dolycoris baccarum
Palomina prasina
Coreidae: Coreus marginatus
Nabidae: Nabis rugosus
Cimicidae: Anthocoris nemorum
Miridae: Dicryphus errans
Lygocoris pabulinus
Hemiptera-Homoptera
Anthrophidae: Neophilaenus lineatus
Philaenus spumarius
Neuroptera
Chrysopidae: Chrysoperla carnea
Lepidoptera
Hesperiidae: Ochlodes venata
Thymelicus sylvestris
Pieridae: Gonepteryx rhamni
Pieris brassicae
Pieris napi
Pieris rapae
Nymphalidae: Aglais urticae
Argynnis aglaja
Vanessa atalanta
Satyridae: Coenonympha pamphilus
Hipparchia semele
Maniola jurtina
Pyronia tithonus
Lycaenidae: Lycaena phlaeas
Polyommatus icarus
Plutella xylostella
Cydia succedana
Pyralidae: Agrophila tristella
Crambus pratella
Myelois cribrella
Zygaenidae: Zygaena filipendulae
Noctuidae: Autographa gamma
Ceramica pisi
Geometridae: Camptogramma bilineata
Scotopteryx luridata
Diptera
Bibionidae: Bibio pomonae
Syrphidae: Episyrphus balteatus
Eristalis arbustorum
Eristalis pertinax
Eristalis tenax
Helophilus pendulus
Melanostoma scalare
Rhingia campestris
Scaeva pyrastri
Sphaerophoria scripta
Calliphoridae: Calliphora sp/spp
Lucilia sp/spp
Sarcophaga sp
Hymenoptera-Aculeata
Formicidae: Lasius flavus
Lasius niger
Vespidae: Vespula germanica
Vespula vulgaris
Halictidae: Halictus rubicundus
Apidae: Apis mellifera
Bombus lapidarius
Bombus lucorum
Bombus pascuorum
Bombus pratorum
Bombus terrestris
Coleoptera
Elateridae: Agriotes lineatus
Cantharidae: Cantharis rustica
Rhagonycha fulva
Coccinellidae: Adelia 10-punctata
Coccinella 7-punctata
Oedemeridae: Oedemera nobilis
Chrysomellidae: Cassida rubiginosa
Oulema melanopus
Sermylassa halensis
Curculonidae: Phyllobius pomaceus
Sitonia lineatus

5.4 MOLINIA MIRE

Spiders
Lycosidae: Pardosa sp/spp
Pisauridae: Pisaura mirabilis
Agelenidae: Agelena labyrinthica
Areneidae: Araneus diadematus
Araneus quadratus
Nuctenea cornuta
Harvestmen
Phalangiidae: Leiobunum rotundum
Phalangium opilio
Odonata
Coenagriidae: Enallagma cyathigerum
Ischnura elegans
Pyrrhosoma nymphula
Agriidae: Calopteryx virgo
Libellulidae: Orthetrum coerulescens
Sympetrum striolatum
Orthoptera
Tettigoniidae: Pholidoptera griseoaptera
Tetrigidae: Tetrix undulata
Acrididae: Chorthippus parallelus
Omocestus viridulus
Dermaptera
Forficulidae: Forficula auricularia
Hemiptera-Heteroptera
Pentatomidae: Dolycorus baccarum
Palomina prasina
Cimicidae: Anthocoris nemorum
Saldulidae: Saldula sp/spp
Gerridae: Gerris lacustris
Hemiptera-Homoptera
Aphrophoridae: Neophilaenus lineatus
Philaenus spumarius
Cicadellidae: Evacanthus interruptus
Lepidoptera
Hesperiidae: Ochlodes venata
Thymelicus sylvestris
Pieridae: Gonepteryx rhamni
Pieris brassicae
Nymphalidae: Aglais urticae
Inachis io
Vanessa atalanta
Eurodryas aurinia
Satyridae: Coenonympha pamphilus
Maniola jurtina
Pararge aegeria
Pyronia tithonus
Lycaenidae: Lycaena phlaeas
Polyommatus icarus
Pyralidae: Nymphula nympheata
Crambus pascuella
Sphingidae Smerinthus ocellata
Diptera
Tipulidae: Pedicia rivosa
Syrphidae: Episyrphus balteatus
Eristalis arbustorum
Eristalis pertinax
Eristalis tenax
Helophilus pendulus
Sericomyia silentis
Syrphus ribesii
Calliphoridae: Calliphora sp/spp
Lucilia sp/spp
Sarcophagus sp/spp
Hymenoptera-Aculeata
Formicidae: Lasius niger
Vespidae: Vespula germanica
Vespula vulgaris
Halictidae: Halictus rubicundus
Apidae: Apis mellifera
Bobbus hortorum
Bombus lapidarius
Bombus lucorum
Bombus pascuorum
Bombus terrestris
Coleoptera
Cantharidae: Cantharis pallida
Canthsris rustica
Rhagonycha fulva
Coccinellidae: Coccinella 7-punctata
Scirtidae (Helodidae) Cyphon hilaris
Chrysomellidae: Gastrophysa viridula
Oulema melanopus

APPENDIX 6: COMPLETE SPECIES LIST FOR REDLAKE MEADOWS AND HOGG'S MOOR SSSI 1997

6.1 *SCHOENUS NIGRICANS – NARTHECIUM OSSIFRAGUM* MIRE (NVC TYPE M14)

Spiders
Lycosidae: Pardosa sp/spp
Pisauridae: Pisaura mirabilis
Agelenidae: Agelena labyrinthica
Theridiidae: Enoplagnatha ovata
Tetragnathidae: Tetragnatha extensa
Araneidae: Araneus diadematus
Harvestmen
Phalangiidae: Leiobunum rotundum
Phalangium opilio
Odonata
Coenagridae: Enallagma cyathigerum
Agriidae: Calopteryx virgo
Libellulidae: Orthetrum coerulescens
Sympetrum striolatum
Orthoptera
Acrididae: Chorthippus parallelus
Dermaptera
Forficulidae: Forficula auricularia
Hemiptera-Heteroptera
Pentatomidae: Palomina prasina
Piezodorus lituratus
Nabidae: Nabis rugosus
Saldidae: Saldula sp/spp
Hemiptera-Homoptera
Aphrophoridae: Neophilaenus lineatus
Philaenus spumarius
Cicadellidae: Ulopa reticulata
Mecoptera
Panorpidae: Panorpa communis
Lepidoptera
Hesperiidae: Ochlodes venatus
Thymelicus sylvestris
Pyralidae: Crambus pascuella
Diptera
Tipulidae: Pedicia rivosa
Tipula fulvipennis
Tipula paludosa
Bibionidae: Bibio pomonae
Syrphidae: Episyrphus balteatus
Eristalis pertinax
Eristalis tenax
Helophilus pendulus
Syrphus ribesii
Volucella pelluscens
Calliphoridae: Calliphora sp/spp
Lucilia sp/spp
Sarcophaga sp
Hymenoptera-Aculeata
Vespidae: Vespula vulgaris
Apidae: Apis mellifera
Bombus hortorum
Bombus lucorum
Bombus pascuorum
Coleoptera
Carabidae: Elaphrus riparius
Cantharidae: Cantharis fusca
Rhagonycha fulva
Coccinallidae: Coccinella 7- punctata
Chrysomeidae: Luperus longicornis

6.2 M21 *NARTHECIUM OSSIFRAGUM - SPHAGNUM PAPILLOSUM* VALLEY MIRE

Spiders
Lycosidae: Pardosa sp/spp
Agelenidae: Agelena labyrinthica
Araneidae: Araneus diadematus
Harvestmen
Phalangiidae: Phalangium opilio
Odonata
L, observed laying
Coenagridae: Enallagma cyathigerum
Ischnura elegans
Pyrrhosoma numphula
Agriidae: Calopteryx virgo
Cordulegasteridae: Cordulegaster boltonii
Libellulidae: Orthetrum coerulescens
Sympetrum striolatum
Orthoptera
Tetrigidae: Tetrix undulata
Acrididae: Chorthippus parallelus
Dermaptera
Forficulidae: Forficula auricularia
Hemiptera-Heteroptera
Saldulidae: Saldula sp/spp
Hemiptera-Homoptera
Aphrophoridae: Neophilaenus lineatus
Lepidoptera
Hesperiidae: Thymelicus sylvestris
Nymphalidae: Aglais urticae
Geometridae: Eulithis testata
Diptera
Tipulidae: Dicronomyia (Limnophila) autumnalis
Limnophila meiquni
Pedicia rivosa
Tipula flavipennis
Tipula oleracea
Tipula paludosa
Syrphidae Eristalis arbustorum
Eristalis pertinax
Calliphoridae: Calliphora sp/spp
Lucilia sp/spp
Hymenoptera-Aculeata
Vespidae: Vespula vulgaris
Apidae: Apis mellifera
Bombus hortorum
Bombus lucorum
Bombus pascuorum
Coleoptera
Carabidae: Elaphrus riparius
Coccinellidae: Coccinella 7-punctata

6.3 MOLINIA MIRE M25

Spiders
Araneidae: Araneus diadematus
Hemiptera-Heteroptera
Nabidae: Nabis ericetorum
Hemiptera-Homoptera
Aphrophoridae: Neophilaenus lineatus
Mecoptera
Panorpa communis

6.4 *ULEX GALLII – AGROSTIS CURTISII* HEATH (H4)

Spiders
Gnaphosidae: Drassodes lapidosus/cupreus
Clubionidae: Clubiona trivialis
Thomisidae: Misumena vatia
Salticidae: Heliophanus cupreus
Lycosidae: Pardosa sp/spp
Pisauridae: Pisaura mirabilis
Agelenidae: Agelena labyrinthica
Araneidae: Araneus diadematus
Araneus quadratus
Linyphiidae: Linypha triangularis
Harvestmen
Phalangiidae: Leiobunum rotundum
Phalangium opilio
Odonata
Aeshnidae: Aeshna cyanea
Libellulidae: Orthetrum coerulescens
Sympetrum striolatum
Orthoptera
Tetrigidae: Tetrix undulata
Acrididae: Chorthippus parallelus
Dermaptera
Forficulidae: Forficula auricularia
Hemiptera-Heteroptera
Pentatomidae: Dolycoris baccarum
Palomina prasina
Piezodorus lituratus
Nabidae: Nabis rugosus
Miridae: Lygocoris pabulinus
Hemiptera-Homoptera
Aphrophoridae: Neophilaenus lineatus
Philaenus spumarius
Cicadellidae: Ulopa reticulata
Neuroptera
Chrysidae: Chrysoperla carnea
Lepidoptera
Pieridae: Gonepteryx rhamni
Pieris brassicae
Nymphalidae: Aglais urticae
Vanessa atalanta
Satyridae: Coenympha pamphilus
Maniola jurtina
Pararge aegeria
Lycaenidae: Lycaena phlaeas
Polyommatus icarus
Diptera
Tipulidae: Pedicia rivosa
Bibionidae Bibio pomonae
Syrphidae: Eristalis arbustorum
Eristalis pertinax
Helophilus pendulus
Myathropa florea
Sphaerophoria scripta
Syrphus ribesii
Caliphoridae: Calliphora sp/spp
Lucilia sp/spp
Sarcophagus sp
Conopidae: Sicus ferrugineus
Hymenoptera-Aculeata
Formicidae: Lasius flavus
Lasius niger
Myrmicidae: Myrmica ruginodis
Vespidae: Vespula germanica
Vespula vulgaris
Apidae: Bombus lapidarius
Bombus hortorum
Bombus lucorum
Bombus pascuorum
Bombus terrestris
Coleoptera
Cantharidae: Rhagonycha fulva
Coccinellidae: Adelia 10-punctata
Coccinella 7-punctata
Oulemidae: Oulema melanopus

6.5 DRY HEATH: *CALLUNA VULGARIS-ULEX GALLII* (H8)

Spiders
Zoridae: Zora spinimana
Theridiidae: Theridion pictum
Theridiidae: Enoplagnatha ovata
Pisauridae: Pisaura mirabilis
Araneidae: Araneus diadematus
Orthoptera
Chorthippus parallelus
Hemiptera-Heteroptera
Aphrophoridae: Neophilaenus lineatus
Miridae: Adelphocoris lineolatus
Stenodema calcaratum
Neuroptera
Chrysopidae: Chrysoperla carnea, sensu stricto
Lepidoptera
Nymphalidae: Vanessa atalanta
Satyridae: Pyronia tithonus
Pyralidae: Agriphila tristella
Noctuidae: Xestia castanea
Diptera
Tipulidae: Tipula paludosa
Rhagionidae: Rhagio subopacea
Dolichopodidae: Dolichopus atratus, looked like empid
Syrphidae: Syrphis vitripennis
Rhingia campestris
Tachinidae: Eritherix rufomaculata
Calliphoridae: Sarcophaga sp
Lucilia sp/spp
Hymenoptera-Aculeata
Apidae:
Bombus pascuorum
Bombus hortorum

APPENDIX 7: TREGOSS DRY HEATH SUB-COMPARTMENTS

7.1 DRY HEATH (Mainly *Calluna* with *Ulex gallii* rank heath)

Spiders
Philodromidae: Tibellus oblongus
Lycosidae: Pardosa sp/spp
Pisauridae: Pisaura mirabilis
Agelenidae: Agelena labyrinthica
Theridiidae: Enoplagnatha ovata
Araneidae: Araneus diadematus
Araneus quadratus
Zygiella atrica
Linyphiidae: Linypha triangularis
Harvestmen
Phalangiidae: Leiobunum rotundum
Mitopus morio
Phalangium opilio
Odonata
Aeshnidae: Aeshna cyanea
Libellulidae: Sympetrum striolatum
Orthoptera
Acrididae: Chorthippus brunneus
Chorthippus parallelus
Omocestus viridulus
Dermaptera
Forficulidae: Forficula auricularia
Hemiptera-Heteroptera
Pentatomidae: Dolycoris baccarum
Palomina prasina
Coreidae: Coreus marginatus
Nabidae: Nabis ericetorum
Miridae: Ascoidema obsoletum
Leptoterna ferrugata
Lygocoris pabulinus
Hemiptera-Homoptera
Aphrophoridae: Neophilaenus lineatus
Philaenus spumarius
Cicadellidae: Macrostelis sexnotatus/laevis
Lepidoptera
Hesperiidae: Thymelicus sylvestris
Pieridae: Pieris brassicae
Nymphalidae: Aglais urticae:
Vanessa atalanta
Satyridae: Coenonympha pamphilus
Maniola jurtina
Pararge aegeria
Pyronia tithonus
Diptera
Tipulidae: Tipula maxima
Tipula oleraceae
Tipula paludosa
Bibionidae: Bibio pomonae
Stratiomyiadae Chloromyia formosa
Tabanidae: Chrysops cacutiens
Haematopota pluvialis
Syrphidae: Episyrphus balteatus
Eristalis arbustorum
Eristalis pertinax
Eristalis tenax
Helophilus pendulus
Rhingia campestris
Syrphus ribesii
Conopidae: Sicus ferrugineus
Tachinidae: Eriothrix rufomaculatus
Calliphoridae: Callifora sp/spp
Lucilia sp/spp
Sarcophaga sp
Muscidae: Mesembrina meridiana
Hymenoptera-Aculeata
Vespidae: Vespula vulgaris
Halictidae: Lasioglossum calceatum
Megachilidae: Megachile centuncularis
Apidae: Apis mellifera
Bombus lucorum
Bombus pascuorum
Bombus terrestris
Coleoptera
Carabidae: Anisocactylis binotatus
Harpalus aeneus
Cantharidae: Rhagonycha fulva
Coccinellidae: Coccinella 7-punctata
Curculonidae: Polydrassus confluens
Sitonia striatellus

7.2 SHORTER HEATH (with *Molinia caerulea* and less *Ulex gallii*)

Spiders

Gnaphosidae: Drassodes lapidosus/cupreus
Thomisidae: Misumena vatia
Salticidae: Heliophanus cupreus
Salticus scenicus
Lycosidae: Pardosa sp/spp
Pisauridae: Pisaura mirabilis
Agelenidae: Agelina labyrinthica
Theridiidae: Enoplagnatha ovata
Tetragnathidae: tetragnatha extensa
Araneidae: Araniella cucurbitinus
Araneus diadematus
Araneus quadratus
Linyphiidae: Linypha triangularis

Harvestmen

Phalangiidae: Leiobunum rotundum
Phalangium opilio

Odonata

Coenagriidae: Enallagma cyathigerum
Libellulidae: Orthetrum coerulescens
Sympetrum striolatum

Orthoptera

Tettigoniidae: Pholidoptera griseoaptera
Tetrigidae: Tetrix undulata
Acrididae: Chorthippus brunneus
Chorthippus parallelus
Omocestus viridulus

Dermaptera

Forficulidae: Forficula auricularia

Hemiptera-Heteroptera

Pentatomidae: Aelia acuminata
Dolocoris baccarum
Palomina prasina
Coreidae: Coreus marginatus
Lygaeidae: Scolopostethus decoratus
Reduviidae: Coranus subapterus
Nabidae: Nabis ericetorum
Nabis rugosus
Cimicidae: Anthocoris nemorum
Miridae: Capsus ater
Leptoterna dolobrata
Lygocoris pabulinus

Hemiptera-Homoptera

Aphrophoridae: Neophilaenus lineatus
Philaenus spumarius
Cixiidae: Cixius nervosus
Cicadellidae: Eupelix cuspidata
Macrostelis sp. f.
Ulopa reticulata

Neuroptera

Chrysopidae: Chrysoperla carnea

Mecoptera

Panorpidae: Panorpa communis

Lepidoptera

Hesperiidae: Ochlodes venata
Thymelicus sylvestris
Pieridae: Gonepteryx rhamni
Pieris brassicae:
Pieris napi
Pieris rapae
Nlmphalidae: Aglais urticae
Argynnis aglaja
Inachis io
Vanessa atalanta
Satyridae: Coenonympha pamphilus
Hipparchia semele
Maniola jurtina
Pararge aegeria
Pyronia tithonus
Lycaenidae: Lycaena phlaeas
Polyommatus icarus
Pyralidae: Agriphila tristella
Nomophila noctuella
Pempelia palumbella
Zygaenidae: Zygaena filipendulae
Lasiocampidae: Macrothylacia rubi
Saturnidae: Saturnia pavonia
Noctuidae: Autographa gamma
Geometridae: Camptogramma bilineata
Scotopteryx luridata

Diptera

Tipulidae: Tipula confusa
Tipula paludosa
Bibionidae: Bibio pomonae
Tabanidae: Haematopota pluvialis
Asilidae: Dioctria rufipes
Syrphidae: Episyrphus balteatus
Eristalis arbustorum
Helophilus pendulus
Melanostoma sclare
Neoascia podagrica
Rhingia campestris
Scaeva pyrastri
Syrphus ribesii

Hymenoptera-Aculeata

Formicidae: Formica lemani
Lasius flavus
Lasius niger
Vespidae: Vespula vulgaris
Andrenidae: Andrena semilaevis
Halictidae: Lasioglossum calceatum
Halictus rubicundus
Apidae: Apis mellifera
Bombus hortorum
Bombus humilis
Bombus lapidarius
Bombus lucorum
Bombus pascuorum
Bombus terrestris

Coleoptera

Carabidae: Cicindela campestris
Amara aenea
Cantharidae: Cantharis rustica
Rhagonycha fulva
Coccinellidae: Coccinella hieroglyphica
Coccinella 7-punctata
Oedemeridae: Oedemera nobilis
Chrysomellidae: Oulema melanopus

APPENDIX 8. INVERTEBRATES PREVIOUSLY RECORDED FROM THESE SITES WITH DATE RECORDED

8.1 Newlyn Downs

Lepidoptera

Elophila nymphaeata	1943

8.2 Ventongimps

Arachnida	
Misumena vatia	1978
Odonata	
Aeshna cyanea	1989
Aeshna juncea	1981
Anax imperator	1991
Calopteryx virgo	1991
Coenagrion puella	1990
Ischnura elegans	1986
Lestes sponsa	1990
Libellula depressa	1986
Libellula quadrimaculata	1986
Pyrrhosoma nymphula	1989
Orthoptera	
Pholidoptera griseoaptera	1991
Tetrix undulatus	1987
Hemiptera	
Cicadella viridis	1981
Gerris lacustris	1981
Nepa cinerea	1981
Notonecta obliqua	1981
Lepidoptera	
Aglais urticae	1990
Agrotis exclamationis	1987
Alcis repandata	1987
Anthocharis cardamines	1986
Apamea lithoxyla	1987
Apamea monoglypha	1987
Apamea remissa	1987
Aphantopus hyperantus	1991
Autographa jota	1987
Boloria selene	1992
Cabera exanthemata	1987
Cabera pusaria	1987
Campaea margaritata	1987
Celastrina argiolus	1990
Ceramica pisi	1987
Chloroclysta truncata	1987
Coleophora caespititiella	1987
Diarsia brunnea	1987
Diarsia mendica	1987
Ebulea croceata	1987
Eupithecia tenuata	1987
Eurodryas aurinia	1992
Gymnoscelis rufifasciata	1987
Habrosyne pyritoides	1987
Inachis io	1976
Jodis lactearia	1987
Lacanobia oleracea	1987
Lasiommatta megera	1990
Lomospilis marginata	1987
Lycaena phlaeas	1990
Lycophotia porphyrea	1987
Maniola jurtina	1990
Mythimna pudorina	1987
Noctua pronuba	1987
Ochlodes venata	1992
Ochropleura plecta	1987
Pararge aegeria	1992
Pieris brassicae	1976
Pieris napi	1990
Pieris rapae	1990
Philudoria potatoria	1987
Plagodis dolabraria	1987
Polygonia c-album	1991
Polyomattus icarus	1990
Pyronia tithonus	1976
Rusina ferruginea	1987
Schrankia costaestrigalis	1987
Spilosoma lubricipeda	1987
Spilosoma lutea	1987
Thymelicus sylvestris	1976
Timandra griseata	1987
Vanessa atalanta	1990
Xestia triangulum	1987
Diptera	
Sarcophaga carnaria	1979
Coleoptera	
Coccinella 7-punctata	1989
Rhagonycha fulva	1979

8.3. Rosenannon Bog and Downs

Orthoptera

Omocestus viridulus	1990

Lepidoptera

Aglais urticae	1992
Apamea monoglypha	1993
Aphantopus hyperantus	1993
Autographa gamma	1993
Cabera exanthemata	1992
Cerura vinula	1991
Coenonympha pamphilus	1993
Crambus perlella	1990
Diarsia brunnea	1992
Eligmodonta ziczac	1992
Hydriomena furcata	1992
Idaea aversata	1992
Idaea dimidiata	1993
Mythimna ferrago	1993
Mythimna impura	1993
Noctua comes	1993
Noctua janthina	1993
Phalera bucephala	1992
Philudoria potatoria	1993
Pseudoterpna pruinata	1992
Pterophorus pentadactyla	1992
Scotopteryx luridata	1990
Selene dentaria	1992
Thyatira batis	1992
Xanthorhoe fluctuata	1993
Xanthorhoe spadicearia	1993
Zygaena filipendulae	1993
Zygaena trifolii	1993

8.4. Retire Common

Lepidoptera

Callimorpha dominula	1996
Mompha raschkiella	1996
Phyllonorycter lautella	1995

8.5. Tregoss Moor

Lepidoptera

Inachis io	1992
Mythimna turca	1999
Parornix anglicella	1990
Parornix devoniella	1990
Phyllonorycter corylifoliella	1990
Plebejus argus	1992
Stigmella perpygmaeella	1990

8.6. Redlake Meadows and Hogg's Moor

(These records cover the area surveyed only, and exclude much of the Cornwall Wildlife Trust nature reserve)

Lepidoptera

Cabera exanthemata	1986
Calliteara pudibunda	1986
Cerastis rubricosa	1986
Colocasia coryli	1986
Cosmorhoe ocellata	1986
Epirrhoe alternata	1986
Eriocrania subpurpurella	1986
Gymnoscelis rufifasciata	1986
Nola confusalis	1991
Ochropleura plecta	1986
Opisthograptis luetolata	1986
Pararge aegeria	1989
Thyatira batis	1986
Xanthorhoe spadicearia	1986

Diptera

Episyrphus balteatus	1991
Eristalis horticola	1991
Eristalis tenax	1993
Heliophilus pendulus	1991
Meliscaeva cinctella	1993
Neoascia podagrica	1991
Platycheirus albimanus	1993
Platycheirus immarginatus	1991
Rhingia campestris	1993

Hymenoptera

Myrmica scabrinoides	1985

Coleoptera

Luperus longicornis	1991
Melolontha melolontha	1986

APPENDIX 9: SSSI MAPS AND CITATION FOR SURVEY SITES ON THE MID CORNWALL MOORS

Newlyn Downs SSSI

Ventongimps Moor SSSI

Rosenannon Bog and Downs SSSI

Retire Common SSSI

Tregoss Moor (part of Goss and Tregoss Moors SSSI and Goss Moor NNR)

Redlake Meadows and Hogg's Moor SSSI

Site Notified to the Secretary of State on 3 June 1997

CITATION SHEET

COUNTY : **CORNWALL** SITE NAME : **NEWLYN DOWNS**

DISTRICT : **CARRICK**

Status : Site of Special Scientific Interest (SSSI) notified under Section 28 of the Wildlife and Countryside Act 1981 (as amended)

Local Planning Authority : Cornwall County Council ; Carrick District Council

National Grid Reference : SW834545 Area : 115.71 ha.

Ordnance Survey Sheet 1 : 50,000 : 200 1 : 10,000 : SW85SW

Date Notified (Under 1949 Act) : Not applicable Date of Last Revision : Not applicable

Date Notified (Under 1981 Act) : 1997 Date of Last Revision : Not applicable

Other Information : A new site.

Description and Reasons for Notification

Newlyn Downs supports the largest area of Southern Atlantic wet heath with Dorset Heath *(Erica ciliaris)* and Cross-leaved Heath *(E tetralix)* in Cornwall, which is an internationally rare vegetation type. The site supports dry and wet heath/mire communities and stands of willow scrub where these are contiguous with the heath.

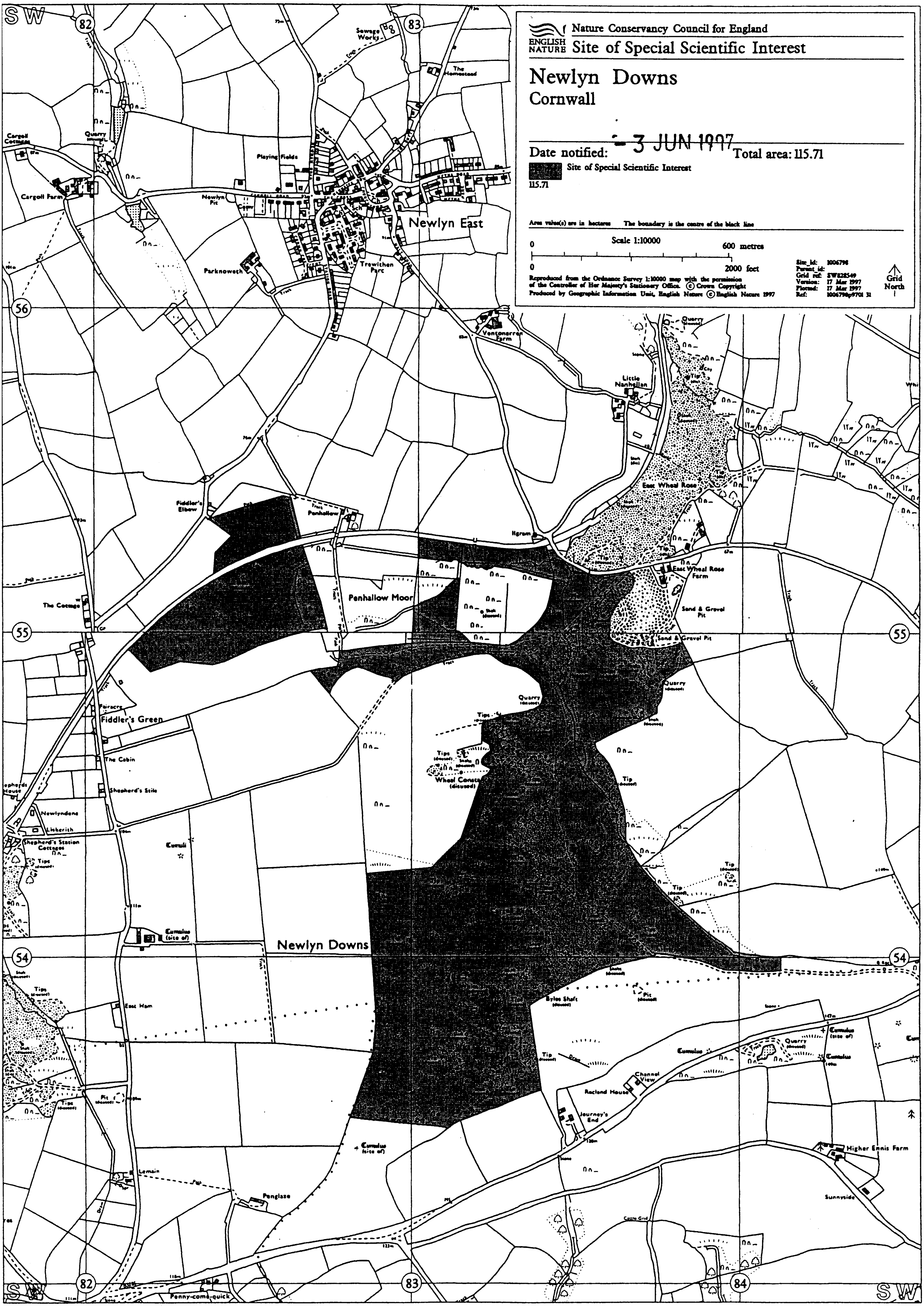
The main part of the site occupies the valley bottom and slopes of one of the headwaters of the River Gannel and extensive areas are permanently waterlogged. The soils are largely derived from slaty mudstones and siltstones with bare rock in places and there are extensive areas of mine spoil which are vegetated to varying degrees.

The steeper valley sides are vegetated by dry heathland, characterised by abundant Heather (*Calluna vulgaris*), Western Gorse (*Ulex gallii*), frequent Bell Heather (*Erica cinerea*) and occasional Purple Moor-grass (*Molinia caerulea*) and Bristle Bent (*Agrostis curtisii*). Scattered stands of European Gorse (*U. europaeus*), Bracken (*Pteridium aquilinum*) and Bramble (*Rubus sp.*) occur. Patches of the nationally rare Dorset Heath are also present. Where the drier areas of mine spoil occur the colonising vegetation mainly consists of scattered clumps of Heather.

The wetter parts of the site adjacent to streams and springs support mire or wet heath communities. Here Purple Moor-grass dominates the vegetation, forming tussocks with locally frequent species including Cross-leaved Heath and Bog Myrtle (*Myrica galè*), occasional Western Gorse and, less frequently, Bog Asphodel (*Narthecium ossifragum*) Common Fleabane (*Pulicaria dysenterica*), Creeping Willow (*Salix repens*), Saw-wort (*Serratula tinctoria*) and Royal Fern (*Osmunda regalis*). Dorset Heath occurs in greater abundance in these wetter areas and Black Bog-rush (*Schoenus nigricans*) characterises the more mineral-rich flushes.

The wettest areas support quaking mats of vegetation with pools of standing water. Additional species here include Pondweed (*Potamogeton sp*), Bog Pimpernel (*Anagallis tenella*), Common Cottongrass (*Eriophorum angustifolium*), Lousewort (*Pedicularis sylvatica*) and Bog mosses (*Sphagnum spp.).*

In places, there are stands of carr with dominant Willows (*Salix spp*) and occasional Silver Birch (*Betula pendula*).


Nature Conservancy Council for England
ENGLISH NATURE
Site of Special Scientific Interest
Newlyn Downs
Cornwall
Date notified: 3 JUN 1997
Total area: 115.71
Site of Special Scientific Interest
115.71
Area value(s) are in hectares
The boundary is the centre of the black line
Scale 1:10000
0
600 metres
0
2000 feet
Reproduced from the Ordnance Survey 1:10000 map with the permission of the Controller of Her Majesty's Stationery Office. © Crown Copyright
Produced by Geographic Information Unit, English Nature © English Nature 1997
Site_id: 1006798
Grid ref: SW828549
Version: 17 Mar 1997
Plotted: 17 Mar 1997
Grid North
SW
82
83
84
56
55
54
Newlyn East
Newlyn Downs
Penhallow Moor
Penhallow
Fiddler's Elbow
Fiddler's Green
East Wheal Rose
East Wheal Rose Farm
Sand & Gravel Pit
Little Nanhellan
Vantonarren Farm
Trewithen Parc
Parknoweth
Cargoll Farm
Cargoll Cottages
Playing Fields
Newlyn Pit
Sewage Works
The Homestead
Ilgram
Wheal Constance (disused)
The Cottage
Fairacre
The Cabin
Shepherd's Stile
Newlyndene
Lieberith
Shepherd's Station Cottages
East Ham
Lemain
Penglaze
Penny-come-quick
Byles Shaft (disused)
Channel View
Racland House
Journey's End
Higher Ennis Farm
Sunnyside
Cumulus (site of)
Quarry (disused)
Tips (disused)

COUNTY: CORNWALL SITE NAME: VENTONGIMPS MOOR

DISTRICT: CARRICK

Status: Site of Special Scientific Interest (SSSI) notified under Section 28 of the Wildlife and Countryside Act 1981

Local Planning Authority: Carrick District Council, Cornwall County Council

National Grid Reference: SW 781510 Area: 8.2 (ha) 20.4 (ac)

Ordnance Survey Sheet 1:50,000: 200 1:10,000: SW 75 SE

Date Notified (Under 1949 Act): 1951 Date of Last Revision: July 1973

Date Notified (Under 1981 Act): 1984 Date of Last Revision:

Other Information:

Owned by the Cornwall Trust for Nature Conservation

Description:

Ventongimps Moor is situated in a valley basin about 3km south-east of Perranporth. The moor has developed on black alluvial peat and impervious white clay which blankets the underlying Devonian strata.

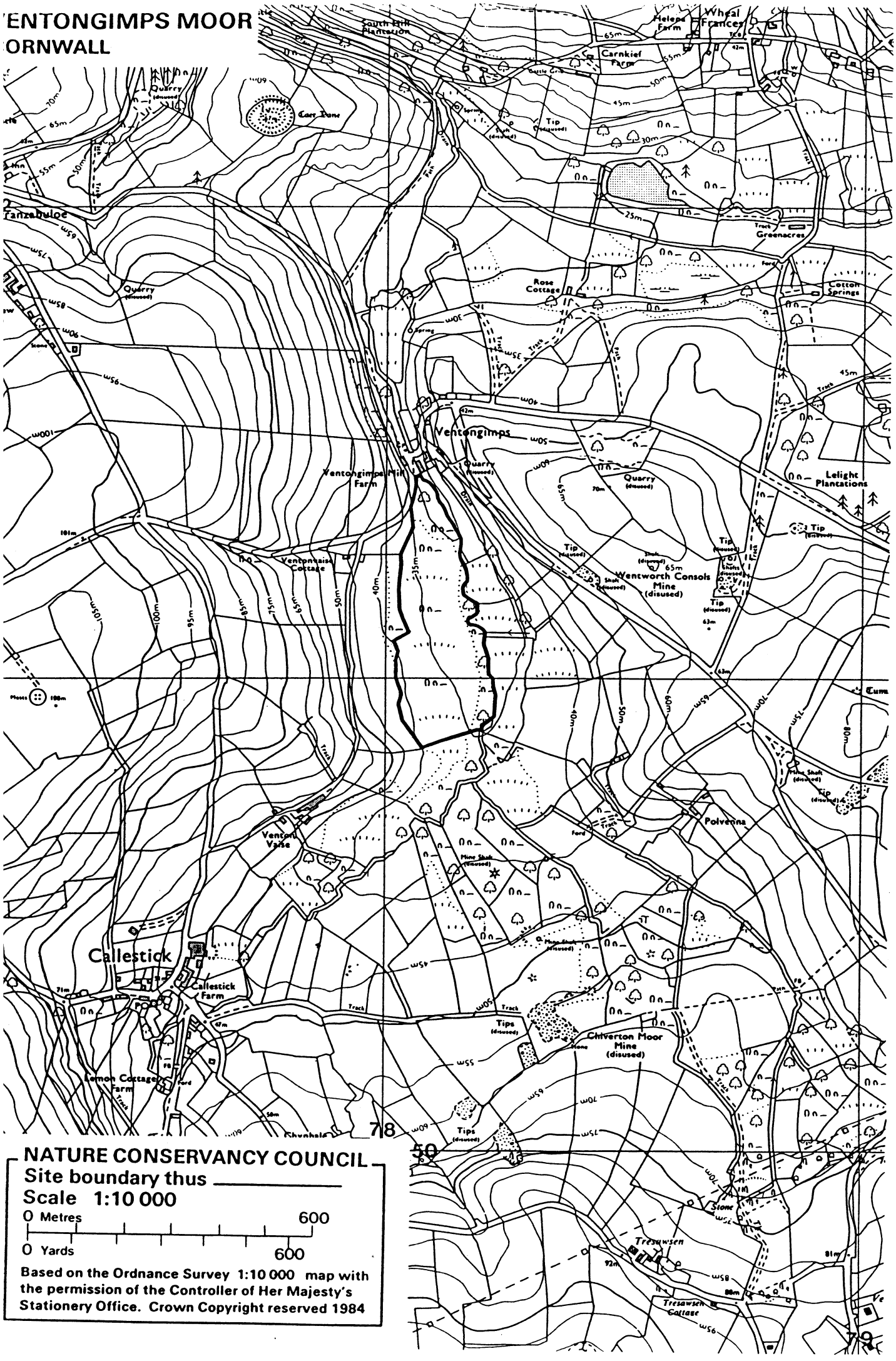
The site is mainly composed of wet dwarf shrub heath with areas of bog and a fringe of willow-alder carr. Other habitats present here include small areas of mixed deciduous woodland, marsh and open water.

The moor is of particular importance for its flora and there are two Red Data Book species present - Dorset Heath (Erica ciliaris) and Eyebright (Euphrasia virgursii). Other species include the hybrid heath Erica x watsonii, Wavy-leaved St John's Wort (Hypericum undulatum), Cornish Moneywort (Sibthorpia europaea), Yellow Bartsia (Parentucellia viscosa), Yellow Centaury (Cicendia filiformis), Hay-scented Buckler Fern (Dryopteria aemula) and Great Sundew (Drosera anglica) - last recorded here in 1975.

Ventongimps Moor is one of the best Odonata sites in Cornwall, supporting 13 species, including the nationally rare Scarce blue-tailed Damselfly (Ischnura pumilio). Some 99 species of Lepidotera have been recorded with the Narrow-bordered Bee Hawk Moth (Hemaris tityus), being of particular note.

Ventongimps Moor is a Nature Reserve owned and managed by the Cornwall Trust for Nature Conservation. Their management programme includes periodic burning, partial removal of scrub, and the maintenance of open water habitats.

ENTONGIMPS MOOR
CORNWALL



NATURE CONSERVANCY COUNCIL

Site boundary thus _____

Scale 1:10 000

0 Metres 600

0 Yards 600

Based on the Ordnance Survey 1:10 000 map with the permission of the Controller of Her Majesty's Stationery Office. Crown Copyright reserved 1984

Site Notified to Secretary
of State on 29 August 1986

CITATION SHEET

COUNTY: CORNWALL SITE NAME: ROSENANNON BOG AND DOWNS

DISTRICT: RESTORMEL

Status: Site of Special Scientific Interest (SSSI) notified under Section 28 of the Wildlife and Countryside Act 1981(as amended)

Local Planning Authority: CORNWALL COUNTY COUNCIL, RESTORMEL DISTRICT COUNCIL

National Grid Reference: SW 955675 Area: 135.5 (ha) 334.7 (ac)

Ordnance Survey Sheet 1:50,000: 200 1:10,000: SW 96 NW, NE

Date Notified (Under 1949 Act): 1951 Date of Last Revision: 1973

Date Notified (Under 1981 Act): 1986 Date of Last Revision:

Other Information:

Previously known as Rosenannon Bog. Site boundary amended by extension.

Description and Reasons for Notification:

Rosenannon Downs lie 5 kilometres to the north-east of St Columb Major on an exposed south-east facing slope. A small stream flows southwards across the east side of the Downs widening into Rosenannon Bog. The bedrock, formed by the Lower Devonian Staddon Grits, is overlain on the valley floor, by alluvial deposits and locally by accumulations of head and valley gravel. The soils developed on the slopes are peaty ferric stagnopodzols whilst those on the valley floor and at the south-east corner of the Downs are poorly drained raw oligo-amorphous peat soils. These acidic, nutrient-poor conditions support a variety of heathland types and have a rich flora and fauna.

The dry heath is dominated by Heather (Calluna vulgaris) with frequent Western Gorse (Ulex gallii) and Bell Heather (Erica cinerea), forming a mosaic with Purple Moor-grass (Molinia caerulea) and Bristle Bent (Agrostis curtisii). Associated species include Lousewort (Pedicularis sylvatica), Saw-wort (Serratula tinctoria), and Heath Milkwort (Polygala serpyllifolia). Locally, there are good populations of Heath Spotted-orchid (Dactylorhiza maculata) and Deer Grass (Trichophorum cespitosum), a plant of restricted occurrence on Cornish heathland.

Cross-leaved Heath (Erica tetralix) and Purple Moor-grass dominate the wet heath with abundant Bog Myrtle (Myrica gale). Black Bog-rush (Schoenus nigricans) flourishes in the wet, more base-rich areas. Wet hollows support the bog mosses (Sphagnum spp.) along with large populations of the insectivorous Round-leaved Sundew (Drosera rotundifolia).

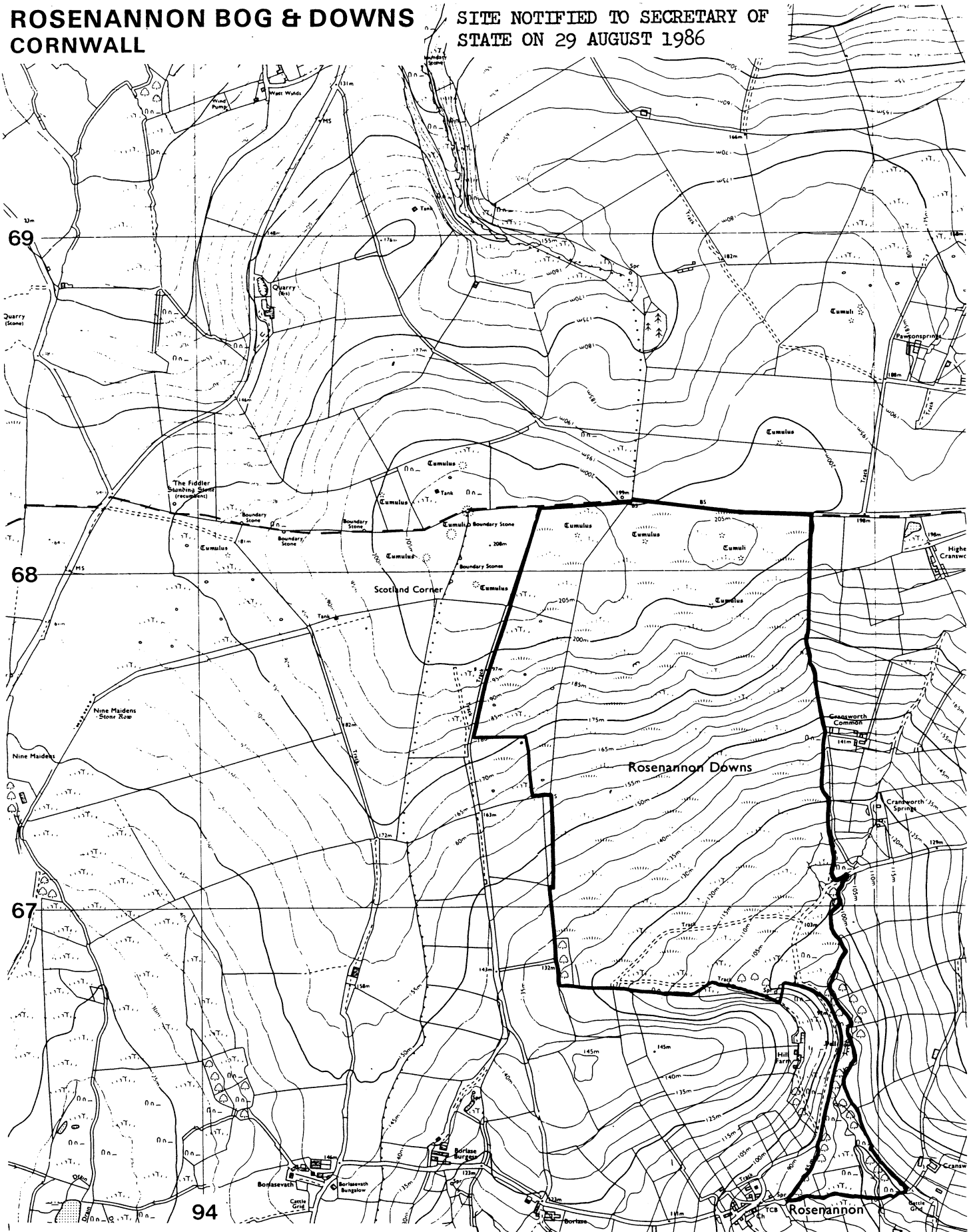
The valley-bog is enclosed by a fringe of broad-leaved woodland consisting largely of Willows (Salix spp.) and Sessile Oak (Quercus petraea). The wood is notable for its large stands of Royal Fern (Osmunda regalis), a plant of decreasing occurrence nationally.

The valley bog has remained largely undisturbed for a long period, and supports a rich flora. Amongst the Purple Moor-grass and Cross-leaved Heath there is abundant Bog Asphodel (Narthecium ossifragum), Common Cottongrass (Eriophorum angustifolium), White Beak-sedge (Rhynchospora alba), Pale Butterwort (Pinguicula lusitanica), Bog Pimpernel (Anagallis tenella), Royal Fern and Lesser Skullcap (Scutellaria minor). Of particular note is the presence of Wavy St. John's Wort (Hypericum undulatum), a plant of very limited distribution in Britain.

Rosenannon Bog and Downs provide important feeding and nesting habitat for a number of heathland birds. Snipe (Gallinago gallinago), Curlew (Numenius arquata) and Meadow Pipit (Anthus pratensis) breed here; as has the Stonechat (Saxicola torquata), a species which has declined nationally in recent years. Both Hen Harrier (Circus cyaneus) and Montagu's Harrier (C. pygargus) have been recorded.

ROSENANNON BOG & DOWNS
CORNWALL

SITE NOTIFIED TO SECRETARY OF STATE ON 29 AUGUST 1986



NATURE CONSERVANCY COUNCIL

Site boundary thus

Scale 1:15000

0 Metres 600

0 Yards 600

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COUNTY: CORNWALL **SITE NAME:** RETIRE COMMON

DISTRICT: RESTORMEL

Status: Site of Special Scientific Interest (SSSI) notified under Section 28 of the Wildlife and Countryside Act 1981

Local Planning Authority: Restormel District Council, Cornwall County Council

National Grid Reference: SX 005635 **Area:** 31.5 (ha) 77.8 (ac)

Ordnance Survey Sheet 1:50,000: 200 **1:10,000:** SX 06 SW

Date Notified (Under 1949 Act): 1951 **Date of Last Revision:** 1973

Date Notified (Under 1981 Act): 1984 **Date of Last Revision:**

Other Information:
The site is registered as a Common.

Description:

Retire Common is located some 6 km south-west of Bodmin in the headwaters of a tributary of the River Camel. The eastern side of the Common lies in a shallow water-logged valley fed by several north flowing springs.

The underlying strata are composed of grits and shales of the Lower Devonian Meadfoot Beds. These are overlain by alluvial gravel deposits, giving rise to peaty, acidic soils.

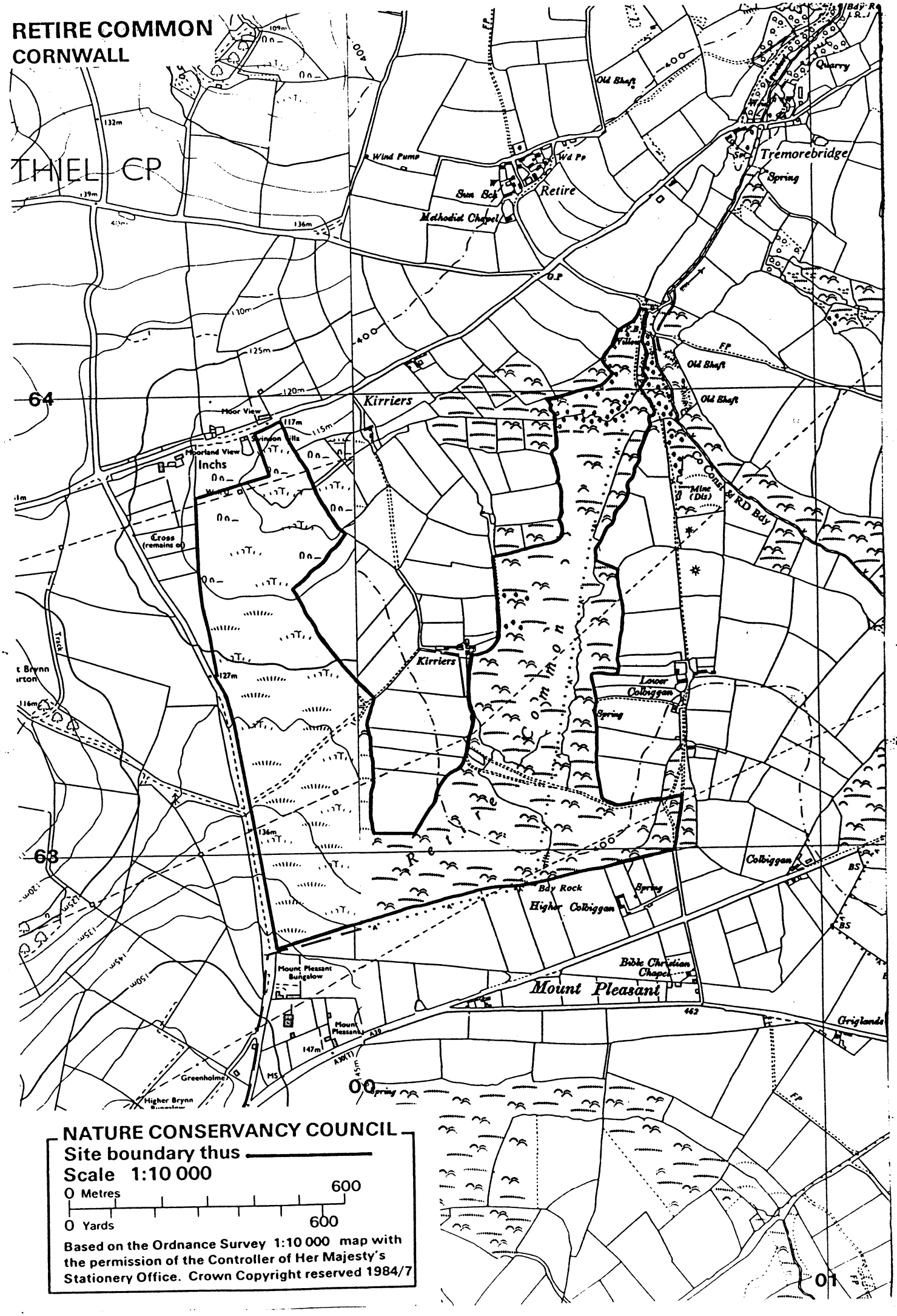
The majority of the site is covered by wet lowland heath, grading into bog vegetation. This wet heath is an uncommon type being intermediate between those on granite and those on the north coast of Cornwall. Slightly higher land in the south-east corner of the site supports a small area of dry heath. Semi-natural broadleaved woodland fringes the northern boundaries, giving way to Salix carr with areas of marshy vegetation in the extreme north.

Other habitats occurring include a small pool, streams and springs.

Retire Common has a rich flora including several rarities. Of particular importance is Cornish Eyebright (Euphrasia virgursii), a species listed in the British Red Data Book of rare plants. Other notable species include Way St John's Wort (Hypericum undulatum), Yellow Centaury (Cicendia filiformis), Pale Dog Violet (Viola lactea), White-beaked Sedge (Rhynchospora alba), Marsh Orchid (Dactylorhiza incarnata subsp pulchella), Common Sundew (Drosera rotundifolia) and the rather local Bramble Rubus plicatus .

The site supports several noteworthy lower-plant species including the nationally rare Marsh Clubmoss (Lycopodium inundatum) which occurs in 3 separate colonies. Other species present include the mosses Hookeria lucens, Acrocladium sarmentosum and the liverworts Riccardia latifrons and Cladopodiella francisci.

RETIRE COMMON
CORNWALL



NATURE CONSERVANCY COUNCIL

Site boundary thus

Scale 1:10 000

0 Metres 600

0 Yards 600

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CITATION SHEET

Notified to Secretary of State on 20 May 1988

COUNTY: CORNWALL SITE NAME: GOSS AND TREGOSS MOORS

DISTRICT: RESTORMEL

Status: Site of Special Scientific Interest (SSSI) notified under Section 28 of the Wildlife and Countryside Act 1981(as amended)

Local Planning Authority: CORNWALL COUNTY COUNCIL : RESTORMEL DISTRICT COUNCIL

National Grid Reference: SW 950600 Area: 701.9 (ha) 1734.4 (ac)

Ordnance Survey Sheet 1:50,000: 200 1:10,000: SW 95 NE SW 96 SE / SW 95 NW SW 96 SW

Date Notified (Under 1949 Act): - Date of Last Revision: -

Date Notified (Under 1981 Act): 1988 Date of Last Revision: -

Other Information: New Site. The importance of this site is such that, although not included in "A Nature Conservation Review" at the time of its publication in 1977, it has nevertheless since been recognised as an integral part of the national series of lowland heathlands. Part of site leased and managed by NCC to be declared National Nature Reserve.

Description and Reasons for Notification:

Goss and Tregoss Moors are located 12 km south-west of Bodmin. Tregoss Moor is underlain directly by metamorphosed Meadfoot Beds of Lower Devonian age comprised of calcareous slate, grit and thin limestones. Elsewhere this bedrock is overlain by extensive granite gravels. Soils on Goss Moor are raw, man-made and disturbed due to previous mining operations, which have also resulted in poor drainage, and the development of perched water tables with numerous open water pools. The site probably originated as an ombrotrophic mire, but subsequent peat removal, soil disturbance and the influence of calcareous bedrock has led to the formation of an extensive and actively developing mesotrophic fen. Sites at such an early stage in peatland development are rarely seen. Goss and Tregoss Moors exhibit a mosaic of different habitats including dry and wet heathland, acid grassland, bog, swamp, fen and inundation communities, open water and dense Willow (Salix) spp carr.

The dry heathland community of Heather (Calluna vulgaris), Bell Heather (Erica cinerea) and Bristle Bent (Agrostis curtisii) with scattered Western Gorse (Ulex gallii), forms a mosaic with acid grassland dominated by Purple Moor-grass (Molinia caerulea) with Wavy Hair-grass (Deschampsia flexuosa), and Heath Spotted Orchid (Dactylorhiza maculata). Wet hollows, and areas with impeded drainage support wet heath vegetation with Purple Moor-grass, Cross-leaved Heath (Erica tetralix), Early Marsh Orchid (Dactylorhiza incarnata) and the locally distributed Lesser Butterfly Orchid (Platanthera bifolia). Wet heath merges into Bog Moss (Sphagnum) spp dominated bog vegetation with Common Cotton Grass (Eriophorum angustifolium), Round-leaved Sundew (Drosera rotundifolia), Bog Myrtle (Myrica gale), Bog Asphodel (Narthecium ossifragum), Black Bog-rush (Schoenus nigricans) and Bog Pimpernel (Anagallis tenella). Of particular note are the presence of Yellow Centaury (Cicendia filiformis), Marsh Clubmoss (Lycopodiella inundatum) and Pillwort (Pilularia globulifera) all nationally scarce species. In addition, old cattle tracks support important populations of the rare Three-lobed Crowfoot (Ranunculus tripartitus).

There are at least 15 ponds exhibiting a range of turbidity, acidity and degree of hydroseral succession. The more open ponds have Broad-leaved Pondweeds, (Potamogeton natans), Spiked Water-milfoil (Myriophyllum spicatum) and Greater Bladderwort (Urticularia vulgaris). Emergent vegetation includes Water Horsetail (Equisetum fluviatile), Bogbean (Menyanthes trifoliata) and Marsh Cinquefoil (Potentilla palustris), and many of the ponds are surrounded by tall fen vegetation with Bullrush (Typha latifolia), Common Reed (Phragmites australis) and Bottle Sedge (Carex rostrata). Other marshland plants found in the pond margins and across the more shallow ponds include Marsh St Johns-wort (Hypericum elodes), Sharp flowered Rush (Juncus acutiflora) and Ivy-leaved Bellflower (Wahlenbergia hederacea). Of particular note are the presence of the nationally scarce Cornish Moneywort (Sibthorpia europaea) and Wavy-leaved St Johns-wort (Hypericum undulatum). Surrounding marshy grasslands support Yellow Loosestrife (Lysimachia vulgaris), Marsh Violet (Viola paulstris), Tussock Sedge (Carex panicea) and Greater Bird's-foot-trefoil (Lotus uliginosus).

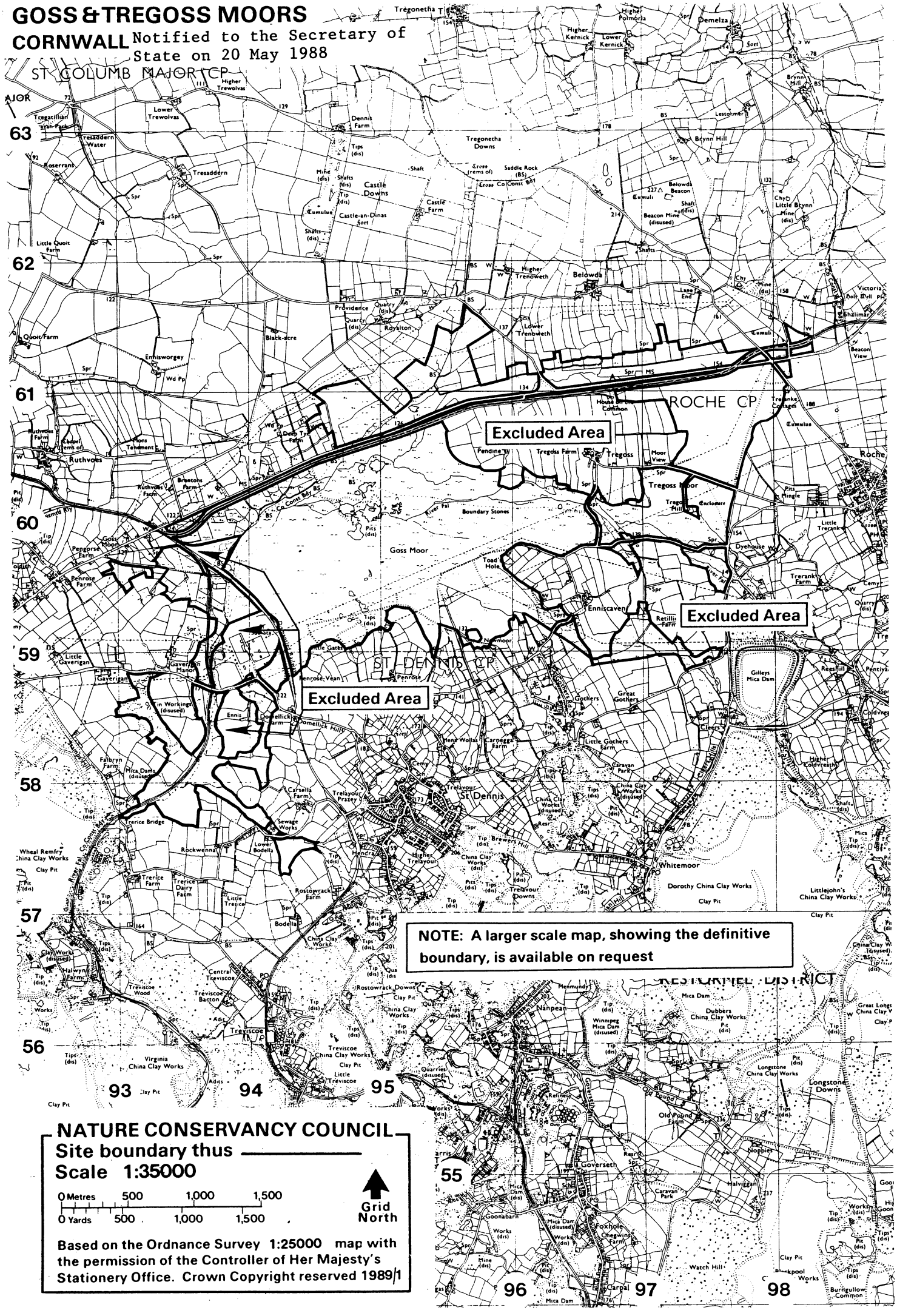
Extensive Willow carr has developed over much of the central part of Goss Moor and supports a rich epiphytic flora including the uncommon lichen Usnea articulata. Abundant ferns include Broad Buckler fern (Dryopteris dilata), Lady Fern (Athyrium filix-femina) and a large population of the uncommon Royal Fern (Osmunda regalis).

The diverse wetland habitats on Goss and Tregoss Moors support an outstanding assemblage of 16 breeding species of Odonata. Keeled Orthetrum (Orthetrum coerulescens) and Black Darter (Sympetrum danae) breed in the more acidic pools, whereas Beautiful Demoiselle (Calopteryx virgo) and Golden-ringed Dragonfly (Cordulegaster boltonii) breed along the streams and open ditches. The neutral ponds support Azure Damselfly (Coenagrion puella), Common Darter (Sympetrum striolatum) and the regionally uncommon Red-eyed Damselfly (Erythromma najas). Of particular note are the presence of large populations of Small Red Damselfly (Ceriagrion tenellum) and Variable Damselfly (Coenagrion pulchellum), both nationally scarce species. Over 100 species of Lepidoptera have been recorded, including 30 species of butterfly. Of note are Silver-studded Blue (Plebejus argus) and Marsh Fritillary (Eurodryas aurinia). Amongst a diverse moth community, Silky Wave (Idaea dilutaria) and Narrow-bordered Bee Hawk-moth (Hemaris tityus) are both nationally scarce. Other rare invertebrates include the beetles Ilybius guttiger and Chrysolinia menthastri and the Bog Bush-cricket (Metrioptera brachyptera). In addition some 58 bird species nest here. Stonechat (Saxicola torquata) and Tree Pipit (Anthus trivialis) breed amongst scattered scrub on the heathland. Buzzard (Buteo buteo), Sparrowhawk (Accipiter nisus), Little Owl (Athene nocuta) and Raven (Corvus corax) have also been recorded nesting in Willow carr and scrub communities.

GOSS & TREGOSS MOORS

CORNWALL

Notified to the Secretary of State on 20 May 1988



NATURE CONSERVANCY COUNCIL

Site boundary thus ——

Scale 1:35000

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Site Notified to Secretary of State on 12 October 1995

CITATION SHEET

COUNTY: CORNWALL SITE NAME: **REDLAKE MEADOWS & HOGGS MOOR**

DISTRICT: CARADON

Status: Site of Special Scientific Interest (SSSI) notified under Section 28 of the Wildlife and Countryside Act 1981 (as amended)

Local Planning Authority : Cornwall County Council. Caradon District Council:

National Grid Reference:SX128590 Area: 30.53 (ha)

Ordnance Survey Sheet 1:50,000: 200 1:10,000: SX 15 NW

Date Notified (Under 1949 Act): - Date of Last Revision: -

Date Notified (Under 1981 Act): 1995 Date of Last Revision: -

Other Information: A new site

Description and Reasons for Notification:

Redlake Meadows and Hoggs Moor are of special interest for the occurrence of the only Cornish population of the nationally rare Heath Lobelia *(Lobelia urens). The site also supports two nationally scarce plants, Yellow Bartsia (Parentucellia viscosa) and Wavy-leaved St. John's-Wort (Hypericum undulatum). In addition, two nationally rare mire communities occur here, together with a mire sub-community having its core national distribution in Cornwall and Devon.

Redlake Meadows and Hoggs Moor are located 1.5 km. east of Lostwithiel on an interfluve at 95m, between two tributaries of the River Lerryn. The site is contained within a broad valley basin which drains both to the south and north east via Lerryn to the Fowey Estuary.

The calcareous slates, grits and thin limestones of the Lower Devonian Meadfoot Beds are overlain across much of the site by Head and Valley Gravels and Alluvium. The poorly drained wetter areas support typical cambic gley soils of the Yeollandpark Series, while typical brown earths of the Denbigh Series occur on drier parts of the site.

Redlake Meadows and Hoggs Moor support a diverse range of habitats. Mire and wet meadow communities predominate, often occurring as vegetational mosaics, with important transitions into other habitat types including wet heath, Phragmites swamp, Salix carr, scrub and broadleaved woodland.

A series of herb-rich enclosed meadows in the south of the site which support Purple Moor-grass - Tormentil (Molinia caerulea - Potentilla erecta) mire vegetation are of particular importance for their populations of the nationally rare Heath Lobelia, occurring here at its only site in Cornwall. These grazed meadows also support two nationally scarce plant species, Wavy-leaved St. John's-wort and Yellow Bartsia. Other notable plants are Marsh Lousewort (Pedicularis palustris) and Lesser Skullcap (Scutellaria minor) which have a local distribution in Cornwall and also Smooth-stalked Sedge (Carex laevigata) and Southern Marsh-orchid (Dactylorhiza praetermissa). Additional herb species which occur frequently include Lesser Spearwort (Ranunculus flammula), Ragged-robin (Lychnis flos-cuculi), Greater Bird's-foot-trefoil (Lotus uliginosus), Common Fleabane (Pulicaria dysenterica) and Devil's-bit Scabious (Succisa pratensis).

Also of particular importance here is the occurrence of two rare, highly localized mire communities. Black Bog-rush - Bog Asphodel (Schoenus nigricans - Narthecium ossifragum) mire frequently occurs as a vegetational mosaic with Bog-Asphodel-Sphagnum moss (N. ossifragum - Sphagnum papillosum) valley mire. These community types are dominated by Purple Moor-grass.

In the north of the site Purple Moor-grass and Black Bog-rush form dense tussocks, providing drier habitats for species such as Cross-leaved Heath (Erica tetralix), Lousewort (Pedicularis sylvatica), Heath Milkwort (Polygala serpyllifolia) and Creeping Willow (Salix

repens). Intervening areas support species such as Bog Asphodel and Carnation Sedge (Carex panicea). In addition, cushions of Sphagnum moss including Sphagnum subnitens and S.papillosum grow in the wetter hollows together with Round-leaved Sundew (Drosera rotundifolia), Marsh Violet (Viola palustris), Bog Pimpernel (Anagallis tenella) and Pale Butterwort (Pinguicula lusitanica).
Common Cottongrass (Eriophorum angustifolium), Sphagnum papillosum, S.auriculatum and Common spike-rush (Eleocharis palustris) characterize the wettest mire habitats, which also support White Beak-sedge (Rhynchospora alba).

An area of Cross-leaved Heath - Sphagnum moss (Erica tetralix - Sphagnum compactum) wet heath in the north of the site is dominated by Purple Moor-grass and Cross-leaved Heath. Western Gorse (Ulex gallii) is locally abundant with Heather (Calluna vulgaris) and European Gorse (Ulex europaeus) occurring less frequently. Cushions of Sphagnum mosses occur throughout together with Lousewort and Bog Asphodel.
This wet heath grades into drier Western Gorse - Bristle Bent (Ulex gallii - Agrostis curtisii) heath characterized by the occurrence of Bristle Bent grass and Cladonia spp. lichens.

Much of the central and southern sections of the site are dominated by Purple Moor grass - Tormentil (Molinia caerulea - Potentilla erecta) mire. This vegetation community is dominated by Purple Moor-grass, forming tussocks up to 1m. in height. Bramble (Rubus fruticosus) and Bog Myrtle (Myrica gale) are locally abundant, associated herb species include Tormentil, Angelica (Angelica sylvestris), Water Mint (Mentha aquatica), Marsh Thistle (Cirsium palustre), Honeysuckle (Lonicera periclymenum) and Hemp Agrimony (Eupatorium cannabinum). Grey Willow (Salix cinerea) and Silver Birch (Betula pendula) are invading ungrazed areas of this mire vegetation.

A small area of Soft Rush/Sharp-flowered Rush - Marsh Bedstraw (Juncus effusus/J.acutiflorus - Galium palustre) rush-pasture in the north-east of the site is dominated by rushes with associated herb species such as Water Mint, Angelica, Greater-Bird's-foot-trefoil, Hemlock Water-dropwort (Oenanthe crocata), Marsh Pennywort (Hydrocotyle vulgaris), Cuckooflower (Cardamine pratensis) and Bog Pondweed (Potamogeton polygonifolius). Large tussocks of Greater Tussock-sedge (Carex paniculata) occur extensively.

A small reedbed in the central part of the site is dominated by Common Reed (Phragmites australis) and contains Bog Pondweed.

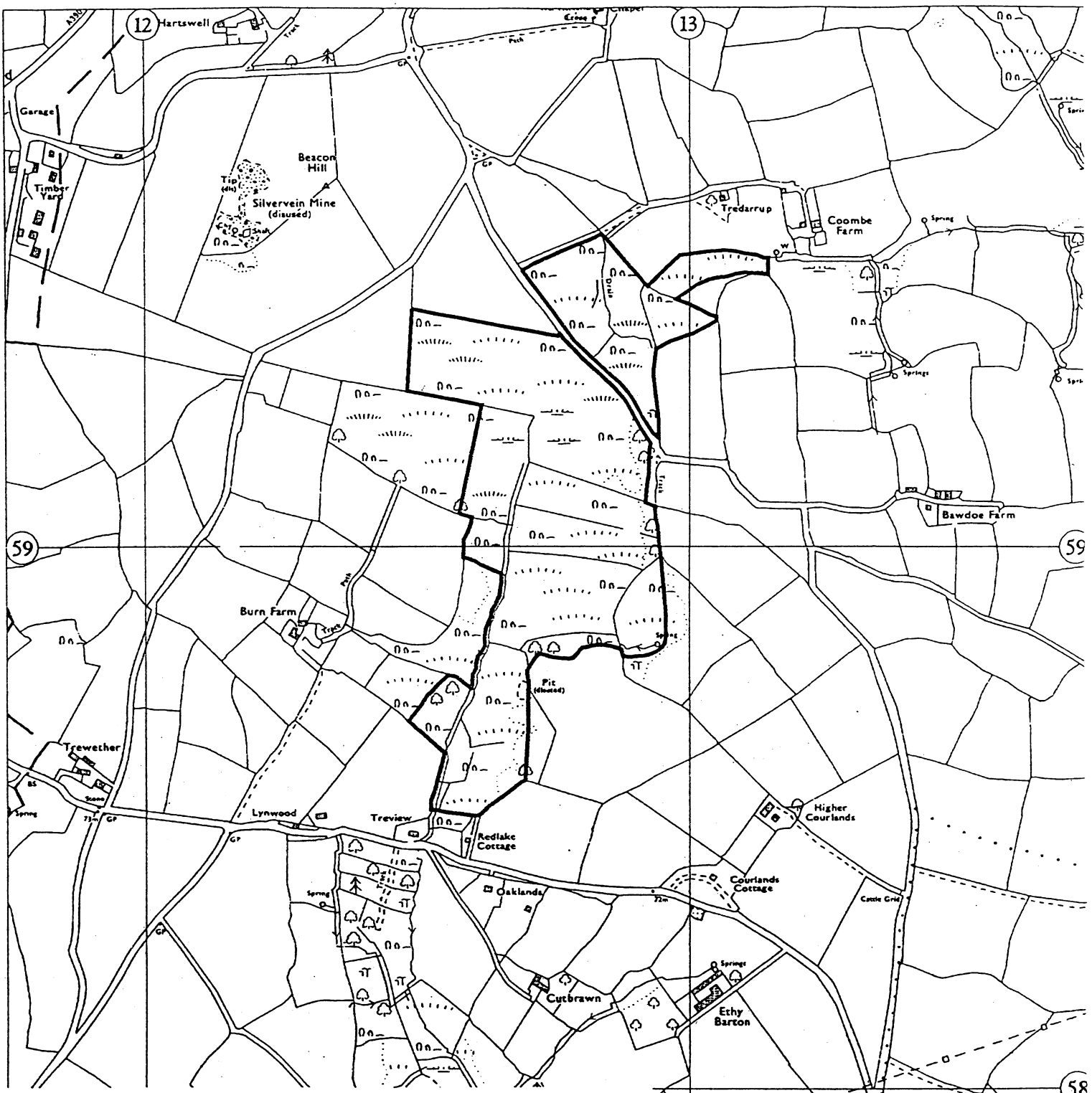
The wet heath, mire communities, pond and stream margins are often fringed by wet Willow carr woodland. These woodlands are mainly composed of Grey Willow with Alder (Alnus glutinosa) and Royal Fern (Osmunda regalis).

Drier margins in the north and east of the site support broad-leaved woodland with mature Sessile Oak (Quercus petraea), Silver Birch , Holly (Ilex aquifolium) and Hazel (Corylus avellana) with small amounts of Ash (Fraxinus excelsior) and Beech (Fagus sylvatica). Groundflora includes Bramble, Hard Fern (Blechnum spicant), Broad Buckler-fern (Dryopteris dilatata), Lady-fern (Athyrium filix - femina) and Broad-leaved Helleborine (Epipactus helleborine) which has a local distribution in Cornwall.

Well-drained slopes in the south-east of the site support mesotrophic grassland with abundant Yorkshire-fog (Holcus lanatus), Sweet Vernal-grass (Anthoxanthum odoratum), Common Knapweed (Centaurea nigra) and Ribwort Plantain (Plantago lanceolata).

This diverse range of habitats supports a rich fauna. Up to 22 breeding bird species have been recorded including Tree-Pipit (Anthus trivialis), Garden Warbler(Sylvia borin), Sedge Warbler (Acrocephalus schoenobaenus), Grasshopper Warbler (Locustella naevia), Reed Bunting (Emberiza schoeniclus) and Sparrowhawk (Accipiter nisus). Records for Lepidoptera include 20 species of butterfly and 74 moth species.

* Heath Lobelia - (Lobelia urens) is included in the Red Data Book of rare and endangered species.



Nature Conservancy Council for England

ENGLISH NATURE Site of Special Scientific Interest

Redlake Meadows & Hogg's Moor Cornwall

Site boundary (centre of line): ——— Hectares: 30.53

Date notified: 12 October 1995

Scale 1:10000

0 500 metres

0 1500 feet

Grid North

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Prepared by Geographic Information Unit, English Nature 25 Apr 1995 © English Nature 1995