Cumbrian Shieldbugs

Stephen Hewitt

Front cover photograph: *Picromerus bidens*

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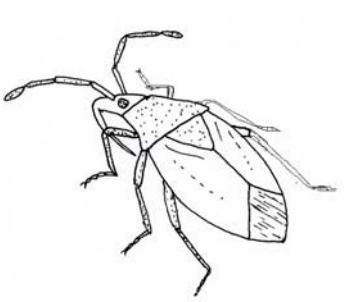
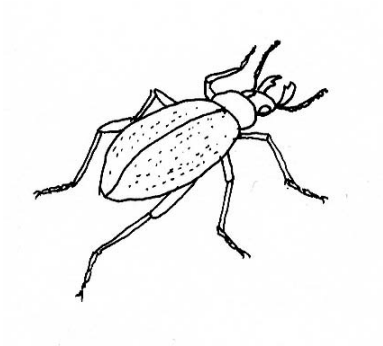
Introduction

Shieldbugs are large, brightly coloured and obvious insects. They are generally slow moving and rather endearing in their bumbling way. There are relatively few species in Britain and with only 14 occurring in Cumbria they are an easy group to learn. With a mixture of common and rare species there is a nice balance between some that will be easy to find and others that will have to be searched for. Few people have studied shieldbugs in Cumbria and further effort will surely prove rewarding. The present knowledge of shieldbug distributions in Cumbria can be improved and new sites for the rare species may be found. Some species are spreading north and their distributions in the county can be expected to change fairly rapidly, with new additions to the county's shieldbug fauna a possibility. This guide aims to help identify Cumbrian shieldbugs and encourage their further study in Cumbria.

What is a shieldbug?



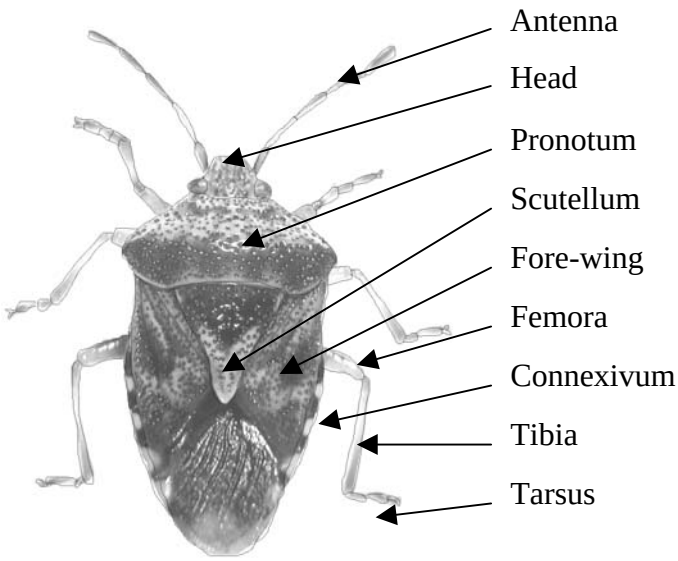
Shieldbugs are True Bugs, which are distinguished from other Orders of insects by their piercing mouthparts and by the membranous tips to their forewings, contrasting with the hardened basal-half of the wings. True bugs belong to the Heteroptera (meaning 'different wings' referring to the membranous wing-tips). Heteroptera can be readily distinguished by the triangular shape at the back of the body frormed by the membranous wingtips when the wings are folded at rest. The Heteroptera also have a large triangular-shaped 'scutellum' which points backwards from behind the thorax. Other members of the Heteroptera include the plantbugs, bedbugs, pondskaters and water boatmen among others. The Heteroptera are a sub-Order of the Hemiptera, which also includes the planthoppers and aphids.



Some beetles might be confused with shieldbugs. However, all beetles have biting mandibles and their forewings are never membranous.

Their large size and distinctive shield-like shape readily distinguish Shieldbugs. They have five-segmented **antennae**, the tubular mouthparts are folded beneath the head

and thorax. The chitinous plate covering the top of the thorax (**pronotum**) is wide, giving shieldbugs a 'broad-shouldered appearance. The pronotum is often expanded into thorn-like processes at its rear angles. The **scutellum** is a large triangular plate, pointing backwards behind the pronotum. When folded at rest, the membranous tips of the forewings overlap and give a characteristic (forward pointing) triangular shape over the tip of the abdomen. The colour of the legs can be useful in identification as can the number of segments (2 or 3) in the feet (**tarsi**).



Like most True Bugs, shieldbugs are generally warmth-loving creatures and several are restricted to the warmest margins of the county. Even the more widespread species are generally only found in lowland areas and although they may occur in the valleys of the Lake District, they are not, with the exception of the Blue Bug, often found on the fells themselves.

True bugs, including shieldbugs undergo incomplete metamorphosis and so do not have a single larval stage, but instead pass through a series of five nymphal stages, called **instars**. They shed their skin between each instar, before finally attaining the sexually mature adult stage. Nymphs can be recognised by their undeveloped wings, the developing wing-buds becoming larger with each succesive instar. Nymphs of each species are variable in appearance both between different instars and, in some cases, within a single instar. No attempt has been made to provide a diffinitve identification key to nymphs here. Instead a series of photyographs of the most frequently encountered forms is provided on the inside back cover.

Identification of Cumbrian shieldbugs

15 species of shieldbug have been recorded in Cumbria. Of these, 14 have recently been recorded in the county. The other species, *Holcostethus vernalis*, a rare vagrant in Britain, has been found only once in Cumbria in the 19th century.

The key below describes characters for identifying the adults of the different species occuring in Cumbria. With experience the different species can be identified with the naked eye, butinitially the use of a handlens or magnifying glass will be eeded to see some of the characters given in the key. The key in this guide generally uses move obvious attributes such as colour and shape. Colour photos of the various species are provided on the inside covers. There are three different families of shieldbug in Cumbria. The checklist here is arranged by Family and the differentiating characters of each family are given to supplement the identification information in the key.

Acanthosomidae

Tarsi with just two segments. Underside of thorax with a central ridge running front to back and projecting forwards beneath the head in some species.

Hawthorn Shieldbug	*Acanthosoma haemorrhoidale*
Juniper Shieldbug	*Cyphostethus tristriatus*
Birch Shieldbug	*Elasmostethus interstinctus*
Parent Bug	*Elasmucha grisea*

Cydnidae

Tibiae with strong spines. Tarsi with three segments.

Sehirus biguttatus

Thyreocoris scarabaeoides

Pentatomidae

Tibiae without strong spines, or if present bug is hairy. Tarsi with three segments.

Holcostethus vernalis

Green Shieldbug	*Palomena prasina*
Sloe Bug	*Dolycoris baccarum*
Gorse Shieldbug	*Piezodorus lituratus*
Forest Bug	*Pentatoma rufipes*
	Picromerus bidens
	Troilus luridus
	Rhacognathus punctatus
Blue Shieldbug	*Zicrona caerulea*

Key to Cumbrian Shieldbugs

1 Entirely black. Small shining bug. Scutellum very large, covering most of back.

Thyreocoris scarabaeoides 4mm.
Coastal sand dunes. Rare (page 12)

- Not entirely black, at least some pale markings ⇨ 2

2 Black with a pair of cream spots in the middle of the back. Edges of pronotum and wings with narrow cream edge.

Sehirus biguttatus 5mm.
Open oak woodland on Common Cow-wheat. Very Rare (page11)

- Not predominantly black ⇨ 3

3 Entirely shining metallic blue or green.

Blue Shieldbug *Zicrona caerulea* 5mm.
Heathland and moorland. Local. (page 20)

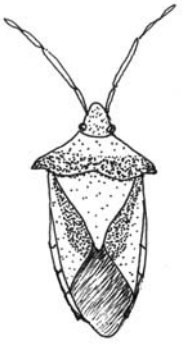
- Not metallic blue or green ⇨ 4

4 Green, with or without other markings. Connexivum not obviously chequered (except in the Green Shieldbug where the connexivum is covered in black punctures with narrow pale intervals)⇨ 5

- Not largely green. If in doubt connexivum is boldly chequered dark and pale. ⇨ 9

5 Bright green with orange-brown markings. Tarsi with just two segments. Central ridge present on underside of the thorax ⇨ 6

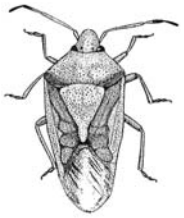
- Colour pattern not as above. Tarsi with three segments. No central ridge on the underside of the thorax ⇨ 8



6 Large (13-15mm long). Rear angles of pronotum produced into short pointed spikes. Bright green with orange-brown markings on base of pronotum and inner margins of the wings.

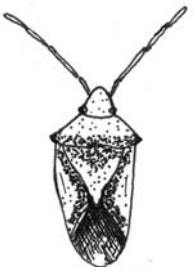
Hawthorn Shieldbug *Acanthosoma haemorrhoidale* 14mm.
On hawthorn and whitebeam. Widespread but local. (page 7)

- Smaller (8-10 mm. long). Rear angles of pronotum without obvious projections ⇨ 7



7 First antennal segment not extending beyond the front of the head. Bright green with ‘boomerang’-shaped markings on the inner margins of the wings.

Juniper Shieldbug *Cyphostethus tristriatus* 9mm.
On juniper. Local. (page 8)



- First antennal segment extending beyond front of head. Bright green with orange-brown markings on base of pronotum and scutellum and along inner margins of the wings.

Birch Shieldbug *Elasmostethus interstinctus* 9 mm.
On birch. Common. (page 9)

8 Connexivum with dark punctures. Rear angles of pronotum slightly expanded. Large bright green bug with fine black punctures (over-wintering adults go dark).

Green Shieldbug *Palomena prasina* 13mm.
Trees & shrubs. Spreading into south Cumbria (page 13)

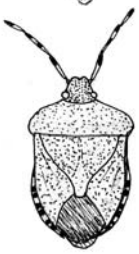
- Connexivum yellow. Yellow margin to pronotum. Rear angles of pronotum not obviously developed. Plain green with black punctures in spring. Autumn generation has pinkish markings on pronotum and wings.

Gorse Shieldbug *Piezodorus lituratus* 12mm.
On gorse and broom. Widespread (page 15)

9 Small. Brown, orange or olive-green ground colour with darker, blotchy markings. Tarsi with two segments.

Parent Bug *Elasmucha grisea* 7mm.
On birch. Common. (page10)

- Brown or bronze. Tarsi with three segments. ⇨ 10



10 Covered in fine, erect hairs.

Sloe Bug *Dolycoris baccarum* 12mm.
Dry coastal grassland and scrub. Local. (page14)

- Not obviously hairy. ⇨ 11

11 Tip of scutellum paler than surrounding body colour. ⇨ 12

- Tip of scutellum not paler than surrounding body colour ⇨

12 Pronotal processes long and pointed.

Picromerus bidens 12mm.
In rough, marshy grassland and wet heathland. Local (page17)

- Pronotal processes squared-off.

Forest Bug *Pentatoma rufipes* 13 mm.
In woodland and hedgerows. Common. (page16)

13 Larger (12 mm.). Rear angles of pronotum expanded into short, rounded processes. Legs pale, with dark speckles and bands.

Troilus luridus 12 mm.
In woodland. Local but increasing. (page 18)

- Smaller (8 mm.). Shoulders not obviously extended. Legs dark with pale bands on the tibiae.

Rhacognathus punctatus 8 mm.
On lowland mosses and heathland. Scarce. (page 19)

Species accounts and distribution maps

Species accounts and distribution maps are given for each species recorded in Cumbria. The exception is *Holcostethus vernalis,* which is not mapped, having been recorded only once from Cumbria – in Borrowdale (NY21) in the 19th century. We are fortunate in having a good account of the Heteroptera of Cumberland published almost a century ago (Day, 1928), which provides a valuable perspective to our contemporary records.

The species distribution maps indicate presence of the species for each tetrad (2km x 2km square) in the county, thus omitting records with more vague grid references. Solid circles indicate records from 1980 to 2005 and open circles represent older records.

The maps are based on information from the Tullie House Museum collections, various literature sources (see references) and most importantly the local amateur naturalist community. The maps are far from complete and are intended as an aid to further investigation rather than as definitive statements of distribution. Please send any records of shieldbugs in Cumbria to Stephen Hewitt at Tullie House Museum.

Literature sources & further reading

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Hawkins, R. (2002) *Shieldbugs of Surrey*. Surrey Wildlife Trust

Hewitt, S.M. (1993) Heteroptera account in Kydd (1993) Insect Report, *Birds and Wildlife in Cumbria*. Cumbria Naturalists Union.

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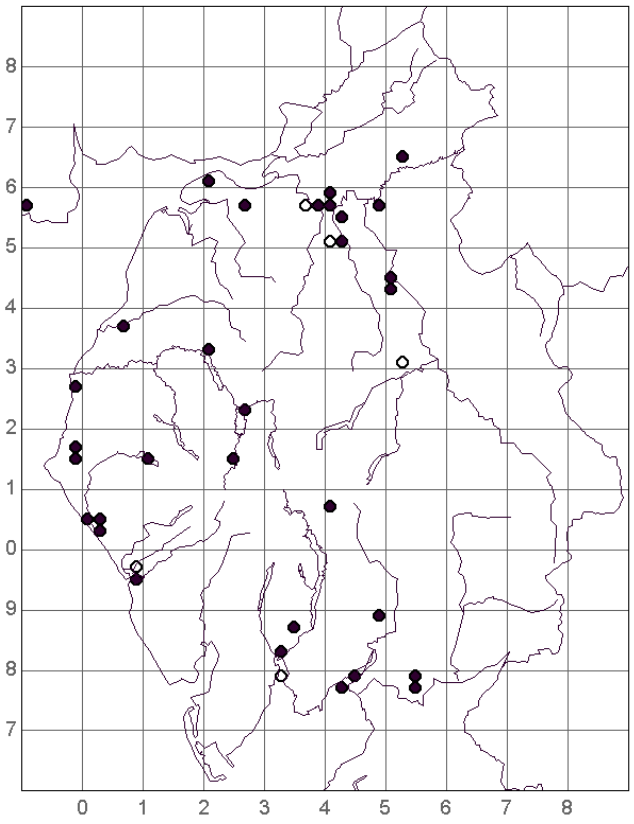
Saunders, E. (1892*) Hemiptera-Heteroptera of the British Isles*. London: L. Reeve & Co.

Southwood, T.R.E. & Leston, # (1959) *The land and water bugs of Britain*. Warne.

Thomas, J.R.A. (2005) The occurrence of the Juniper Shieldbug (Cyphostethus tristriatus) (Fabr.) in South Cumbria. *Carlisle Naturalist* **13 (1)**.

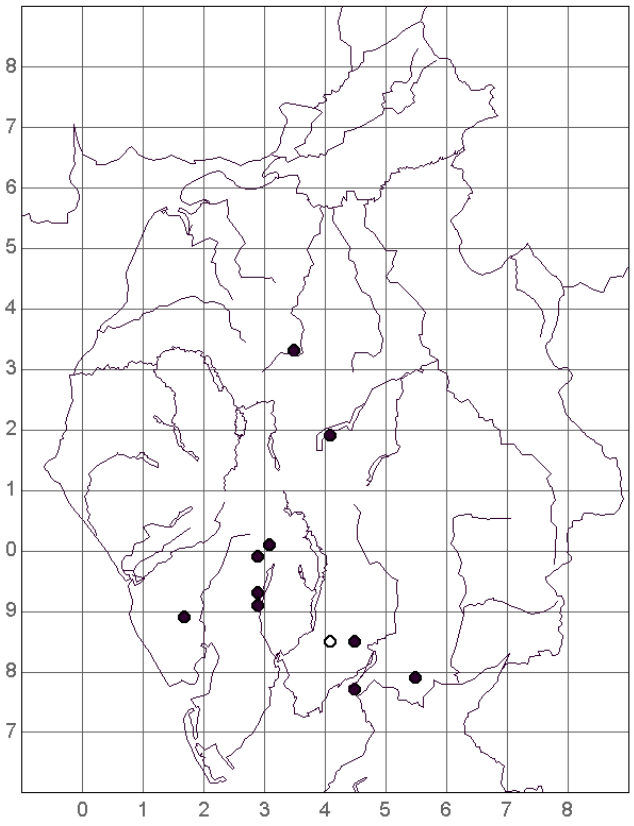
Hawthorn Shieldbug *Acanthosoma haemorrhoidale*



A large, 14 mm., bright green shieldbug with orange-brown markings on the base of the pronotum and along the inner margins of the wings. The shoulders are extended into short, pointed spikes. The tip of the abdomen is often red, as in the Birch Shieldbug. Hawthorn Shieldbugs feed mainly on Hawthorn and whitebeam shoots and fruits, but these insects can also be found on a variety of other trees and shrubs.

This species was unknown in Cumbria when F.H. Day produced his list of Cumberland Heteroptera 80 years ago (Day, 1928). It was at that time restricted to southern England although had already be reported to be expanding its range northwards. Saunders (1892) reported it only as far north as Birmingham. The first Hawthorn Shieldbug was found in Cumbria in 1947, at Ravenglass and expanding northwards. Recently reported from the Scottish Highlands. The first records for Cumbria were at Ravenglass, 28th September 1947 (W.F. Davidson); Carlisle 29th September 1947 (Ms D. Croft) and Pooley Bridge, August 1949 (W.F. Davidson). The species is now widely distributed and increasingly common in the county. It has continued its march northward in Britain, having recently been found in the Scottish Highlands.

Juniper Shieldbug *Cyphostethus tristriatus*



A 9 mm long, bright green shieldbug with 'boomerang'-shaped orange markings on the inner margins of the wings. This species is superficially similar to the Birch Shieldbug (Elasmostethus interstinctus) and has recently been put in the same genus as that species. However the first antennal segment of the Juniper Shieldbug does not extend beyond the front of the head, which it clearly does in both adults and nymphs of the Birch Shieldbug.

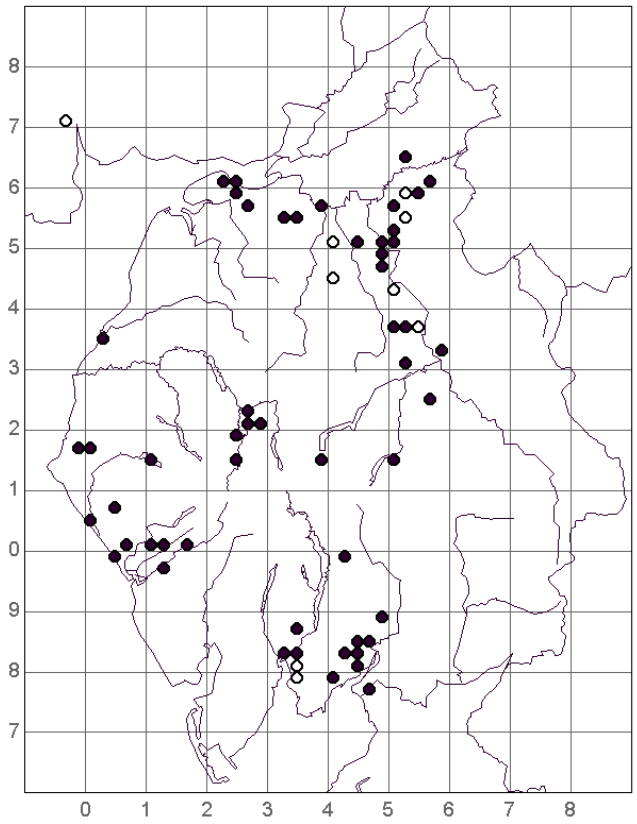
This is another southern species that ws unknown in the county in F.H. Day's time. A record of this shieldbug at Witherslack (SD48) in 1935 (southwood & Leston, 1959) was considered the only confirmed northern British record until the species was found on Juniper on Arnside Knott (SD47) in 1985 (S. Judd). In 1991, shieldbug nymphs found on Juniper in Mosedale (NY33) by Mike and Betty Clementson were identified as Juniper Shieldbugs and a follow up visit revealed adults there too (Hewitt, 1992). In recent years Jim Thomas has found this species on wild Juniper at several sites in south Cumbria (Thomas, 2005).

Previously regarded as restricted to native Juniper in southern English counties (Southwood & Leston, 1959) it was noted to be spreading north in Britain on Juniper and exotic conifers *(Chamaecyparis spp.)* growing in gardens and was found in such a situation in Liverpool in 1991. To date, all the Cumbria records are on wild, natuive Juniper and the reported northern spread on garden plants does not yet seem to have reached the county. It therefore seems likely that the Juniper Shieldbug is a longtime native of Cumbria that has been overlooked in the past. It may well be that the Cumbria population has increased in numbers and distribution in the county in response to climate change in the same way as the national population. The existence of a native Cumbrian population is supported by an old Northumberland record (Butler, 1924), considered dubious until Eales confirmed the presence of the species in that county (Eales, 1993)

Birch Shieldbug *Elasmostethus interstinctus*

A 9 mm. long, bright green shieldbug with orange-brown markings on the base of the pronotum and scutellum and along the inner margins of the wings. It can be separated from the rather similar Juniper Shieldbug by the length of the first antennal segments, which clearly extend beyond the front of the head in both adults and nymphs of this species

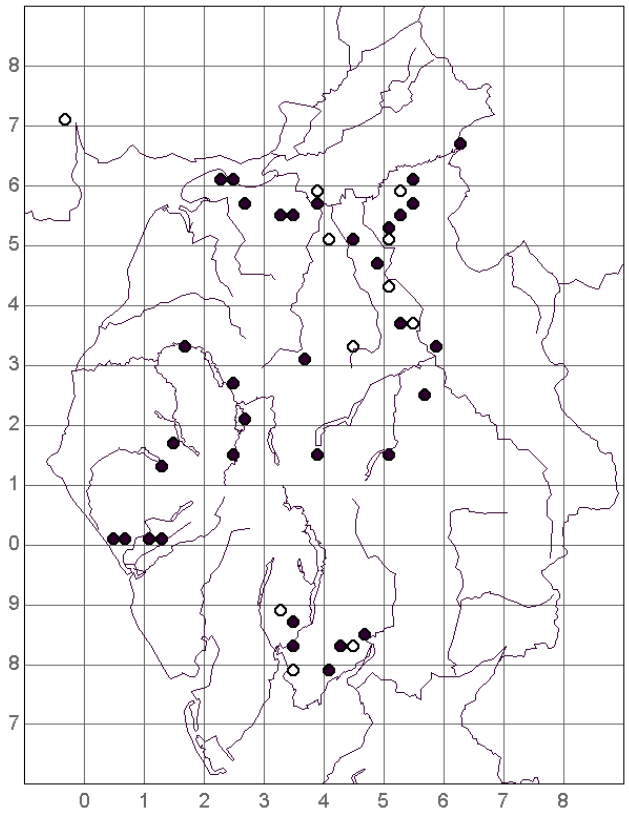
The Birch Shieldbug is common and widespread on birch in Britain and in Cumbria. The developing nymphs and adults are most often found on trees with an open aspect that develop catkins on which the bugs feed.



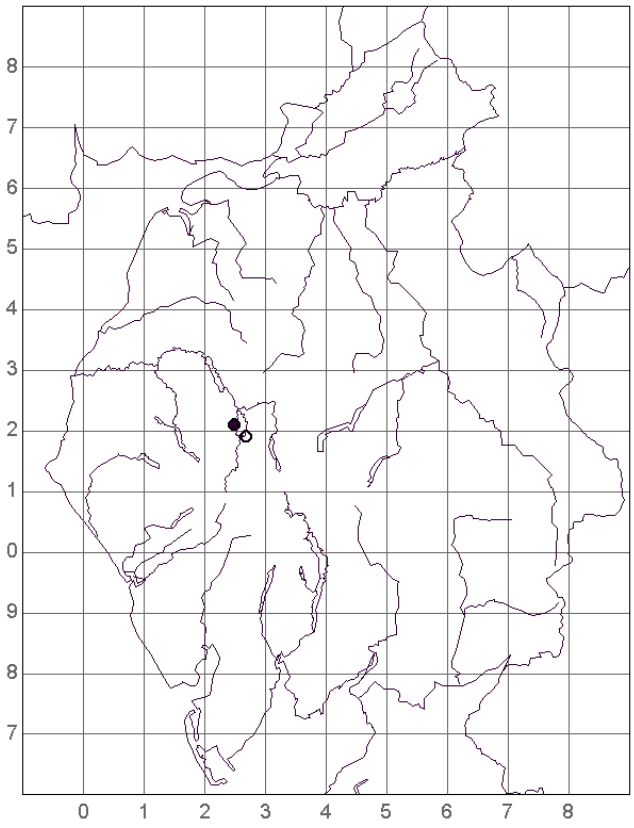
Parent Bug *Elasmucha grisea*

7 mm. long. Brown, orange or olive-green with darker mottling. Shoulders without obvious projections. Tarsi with two segments.

The Parent Bug, named after the female's habit of standing guard over her egg batch, is widespread and common on birch in Britain and in Cumbria.



Sehirus biguttatus



A 5 mm. Long, black shieldbug with a cream margin and a pair of cream spots in the middle of the back.

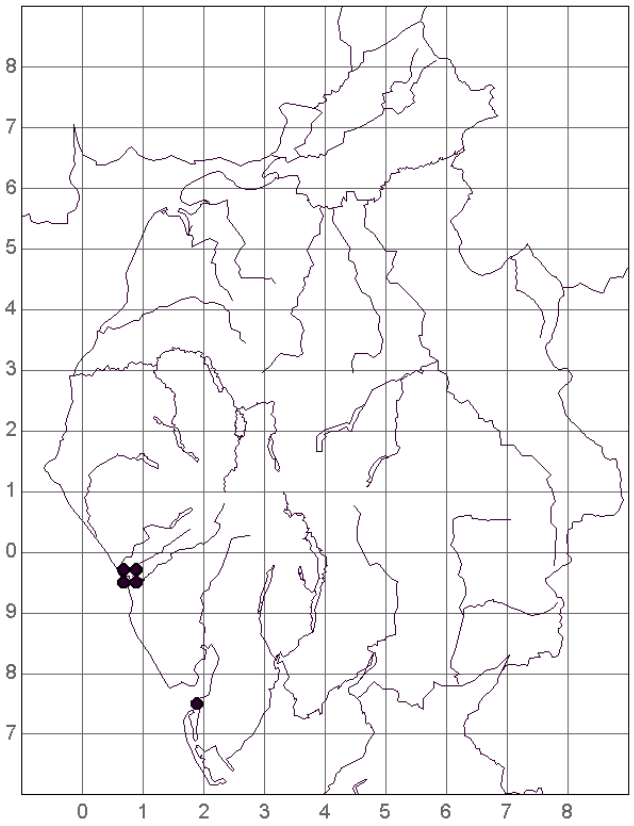
This ground-dwelling shieldbug feeds on Common Cow-wheat *(Melampyrum pratense)*. It is chiefly a southern species, but with scattered records in northern England and Scotland. The species has declined seriously in the last 50 years and many of the northern populations may have been lost.

S. biguttatus has only been reported four times in cumbria – all records are from the Borrowdale woods. It was first found in Ashness Wood by F.H. Day in 1905 "*swept off bleaberry*" and seen by him again in the same locality in 1910 (Day, 1928). The species was 'rediscovered' on the opposite side of the lake in Brandlehow Woods in 1992 and again in 1995, when adults were found hibernating in moss. Despite several searches, this bug has not been refound in Ashness Woods in recent years, although Cow-wheat remains abundant there. Hawkins (2002) associates the national decline of this species with the cessation of coppicing in oak woodlands leading to a closed canopy, which eventually shades out the foodplant of the bug.

Negro Bug *Thyreocoris scarabaeoides*

A small (4 mm.), black beetle-like shieldbug. The scutellum is very large and almost entirely covers the abdomen.

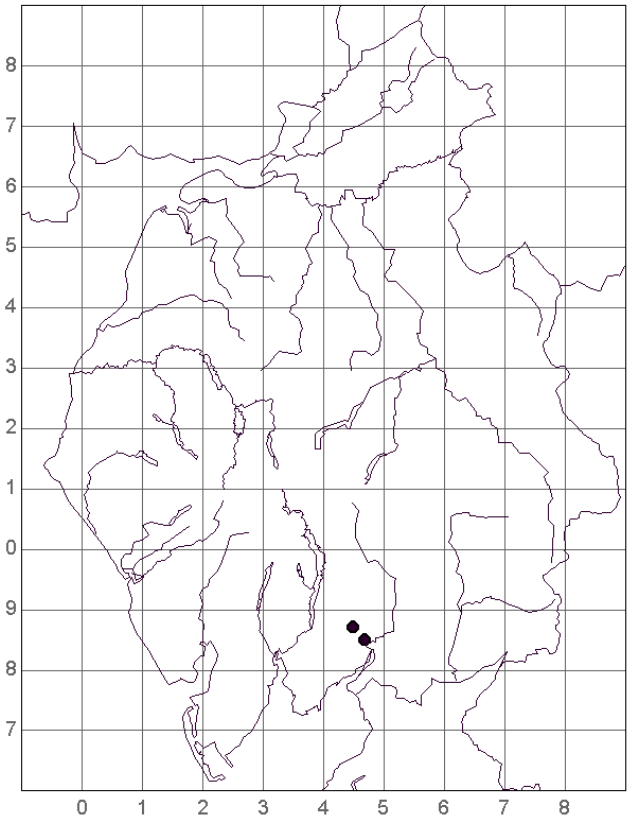
Widespread but local in England and Wales, this species is largely coastal in the north. Cumbria is at the north-western limit of this shieldbug's British distribution. In Cumbria this species is restricted to coastal sand dune sites where it is generally found wandering on bare sand. It is very easily overlooked as one of the small black Histerid beetles. It has been reported from Sandscale Haws and Eskmeals Nature Reserve.



Green Shieldbug *Palomena prasina*

A large (13 mm. long), bright green shieldbug with slightly expanded shoulders. Connexivum with dense black punctures and narrow, pale intervals. Over-wintering adults are dark coloured.

New to Cumbria in 2003, when a nymph was swept from hazel in woodland below Whitbarrow Scar, Witherslack. Rare but increasing - colonising south Cumbrian woodlands from Lancashire.

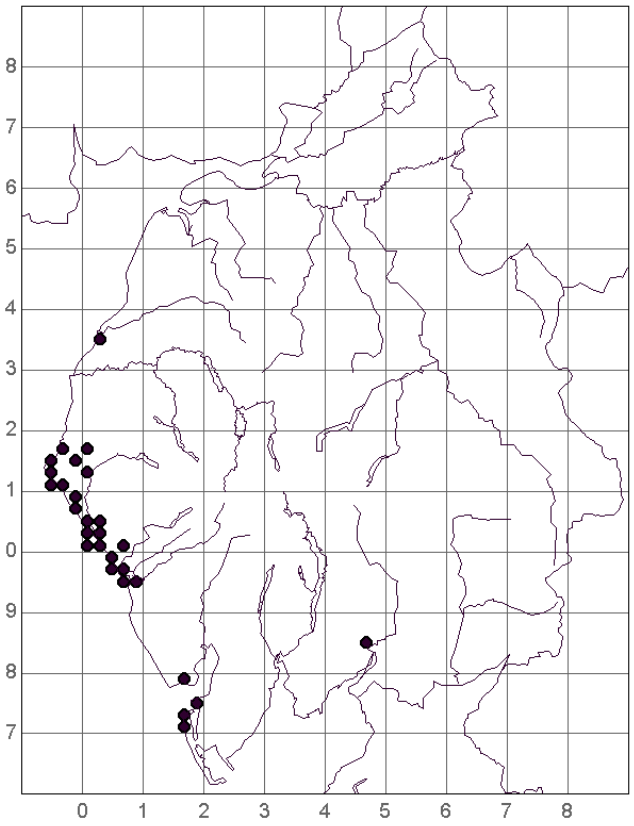


Sloe Bug *Dolycoris baccarum*

A 12 mm long. Covered in fine, erect, hairs. Antennae with alternate dark and pale bands.

Widespread in southern Britain, but extremely local in the north. *D. baccarum* is entirely restricted to dry, coastal, grassland and scrub in Cumbria.

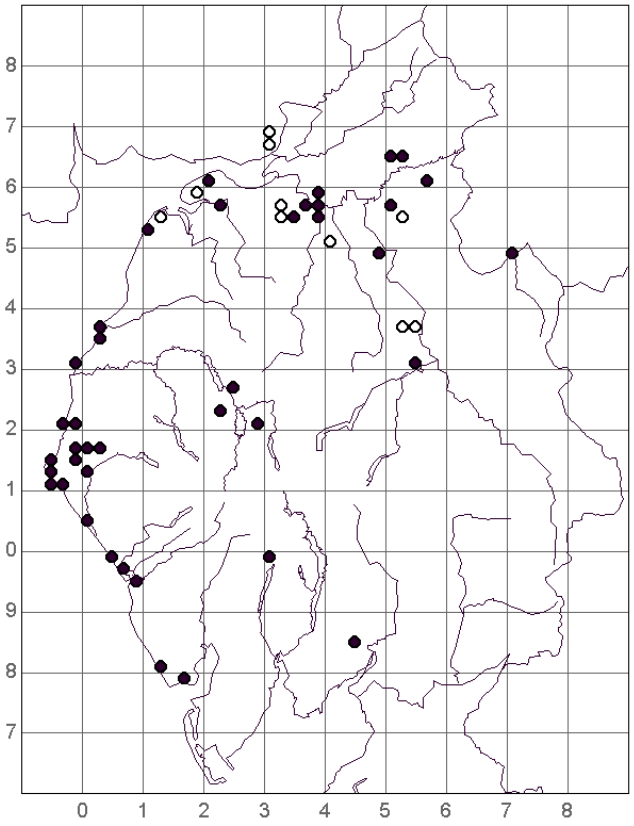
These bugs are thought to feed on various herbaceous plants but have also been found on different shrubs on occasion. The name Sloe Bug is taken from its localname in Sussex (Butler 1924) but there does not appear to be any particular association with this shrub.



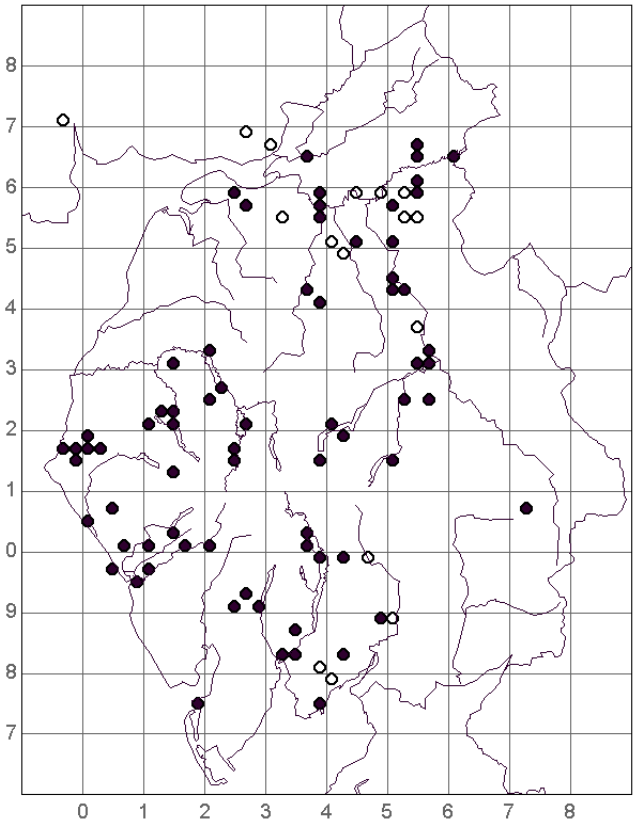
Gorse Shieldbug *Piezodorus lituratus*

A 12 mm. Long,. green shieldbug with yellow margin to pronotum and plain yellow connexivum. Antennae are red with darker tips. Gorse Shieldbugs are plain green in spring but the autumn generation of adults have obvious pinkish markings. Over-wintering adults are dark.

Widespread on gorse throughout Britain and sometimes also found on broom and other Leguminous plants. Adults and nymphs feed on the seed-pods. Frequent and widespread in Cumbria, large numbers can sometimes be seen swarming on gorse bushes in spring and autumn. A record from Alston (alt. 250 m.) is one of the few reports of shieldbugs in the uplands of Cumbria



Forest Bug *Pentatoma rufipes*

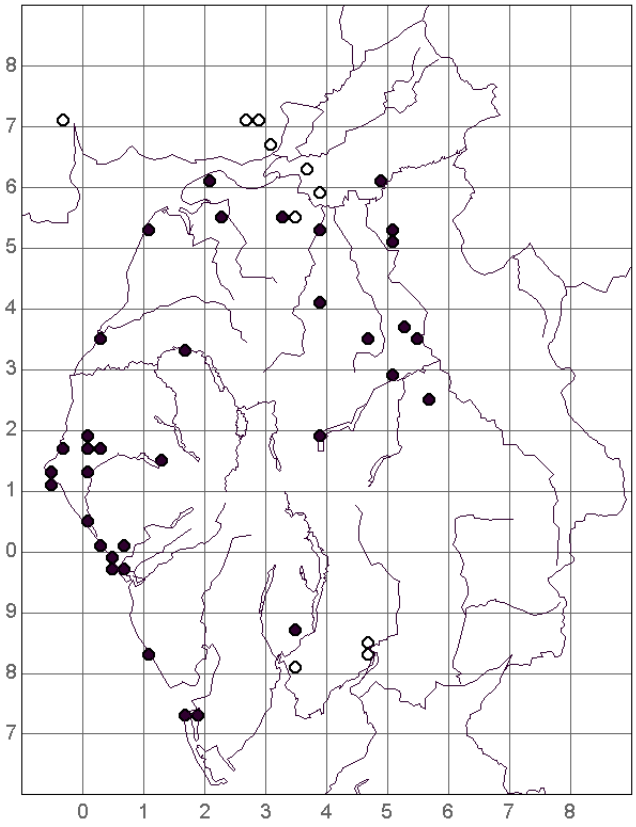


13 mm. long. Tip of scutellum, antennae and legs orange. Shoulders extended into squared-off processes.

A common, shieldbug found in woods throughout most of Britain. It feeds on buds and shoots of oak, but is also an opportunistic predator/scavenger of other invertebrates. Widespread and frequent in Cumbria.

This species overwinters as a nymph and instars can be found on tree trunks in spring. The adults appear in mid-summer and are often noticed basking on fence-posts and tree trunks, tilting their bodies to adjust the amount of sunlight they receive.

Picromerus bidens



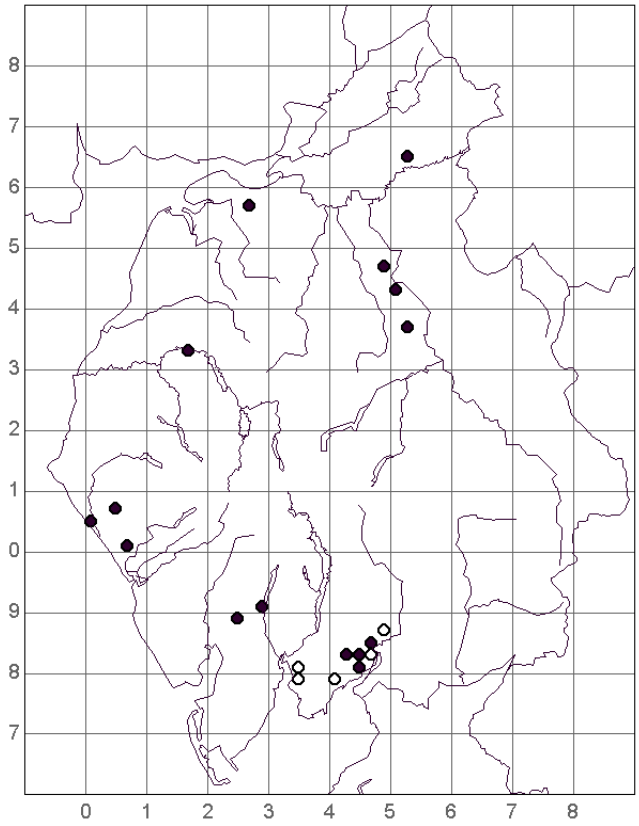
A 12 mm. long, Brownish-bronze shieldbug. The shoulders are produced into sharp, thorn-like points. The antennae, legs and tip of the scutellum are orange. The tibiae have a pale band in the middle. Widespread in rank, marshy grassland and wet heathland.

A widely distributed predatory shieldbug, but much more common in the south. Generally found in lush, unimproved grassland in Cumbria. Although not frequent it is often found in numbers where it occurs.

Troilus luridus

12 mm. long. Scutellum without pale tip, legs with dark speckles and bands. Shoulders developed into blunt-ended processes.

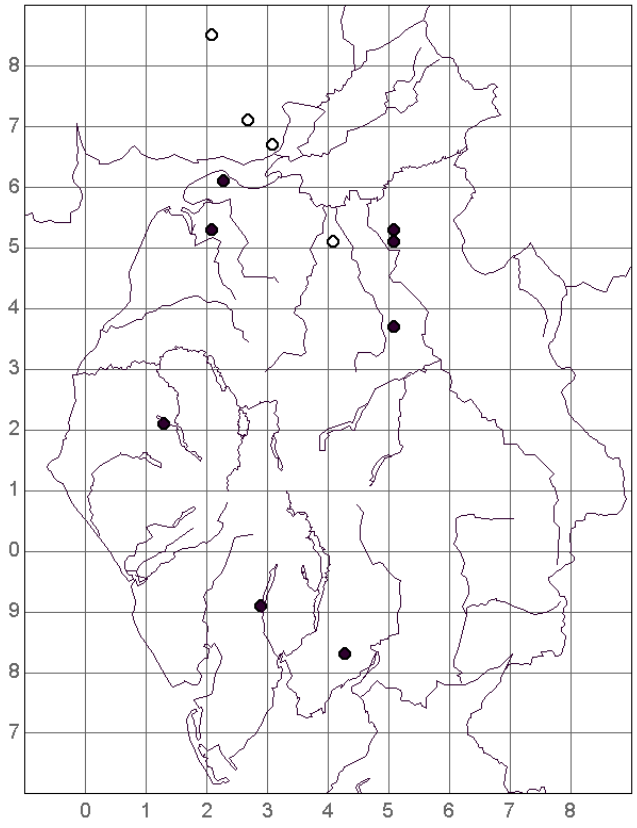
A common arboreal shieldbug in the south of England, rarer or absent in the north but spreading. Probably a recent colonist of Cumbria it is becoming increasingly common in our woods and gardens.



Rhacognathus punctatus

An 8 mm. long. Bronze-coloured shieldbug, with metallic reflections. Shoulders not obviously extended. Legs dark with pale bands on the tibia.

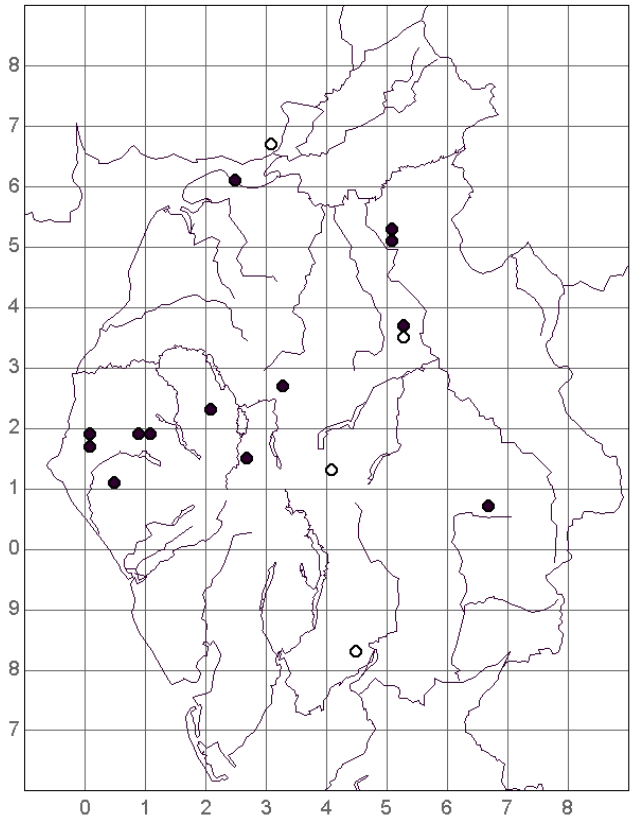
A shieldbug found on the margins of heaths and moors where it feeds on the larvae of Chrysomelid beetles. Records of this species in Cumbria are all from lowland mires and heaths.



Blue Shieldbug *Zicrona caerulea*

A very pretty 5 mm. long, shining metallic blue or green shieldbug. This predatory shieldbug feeds on leaf-beetle larvae in open situations, usually on heathland and moorland. In particular, larvae of flea beetles (*Altica spp*.) have been recorded as prey items.

Widespread but local in Cumbria the Blue Shieldbug has been found on lowland mosses, lowland heaths, heather-clad fellsides and rough grassland and scrub.



The Cumbria Biological Records Database at Tullie House Museum

Tullie House Museum operates a local biological records centre covering the county of Cumbria. Some 300,000 records of various wildlife groups, received from various sources, are stored on computer. The Museum aims to record and monitor the status and distribution of wildlife in Cumbria. The information is used to increase the knowledge of the wildlife of the county and to inform decisions affecting the wildlife and countryside of Cumbria.

The Museum welcomes information and records concerning the flora and fauna of Cumbria.

Please direct all correspondence to The Keeper of Natural Sciences, Tullie House Museum, Castle Street, Carlisle CA3 8TP.
Email: nature@tulliehouse.co.uk

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The distribution maps are produced from records entered onto the RECORDER database developed by JNCC and mapped using DMAP software developed by Dr. Alan Morton.