

# Grasshoppers

and allied insects of Norfolk



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## Bibliography

This presentation is based on:

RICHMOND D.I. (2001)

Grasshoppers and Allied Insects of Norfolk,  
*Norfolk & Norwich Naturalists' Society Occasional Publication no. 7.*

For a full description of all British species see:

MARSHALL J.A. and HAES E.C.M. (1988)

Grasshoppers and allied insects of Gt Britain and Ireland  
*Harley Books*

TED BENTON (2012)

Grasshoppers & Crickets  
*Collins New Naturalist Library no 120*

# 1) Grasshoppers

Most people will be familiar with the grasshoppers, which are recognised by their extended back legs and audible stridulations, which are made by rubbing the hind legs against raised veins on the forewings. Most species are fully winged and capable of short flights. All species have short antennae.

Grasshoppers overwinter as eggs laid in loose earth. The larvae hatch in early spring, passing through four nymphal instars before reaching maturity in June or July.

Grasshopper species show substantial variations in colour form and in size and are best identified by a combination of song and the markings on the pronotum (the saddle shaped protective casing to the thorax). The side keels of the pronotum vary from being strongly inflexed (as in Mottled Grasshopper) to almost parallel (as in Meadow and Lesser Marsh Grasshoppers).

In this presentation the species will be treated in decreasing order of the angularity of the markings on the pronotum (see key opposite).



Mottled



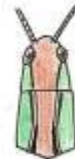
Field



Stripe-winged



Common green



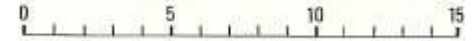
Meadow



Lesser marsh

Diagrams of grasshopper songs

– scale in seconds



# Mottled Grasshopper

*Myrmeleotettix maculata* (Thunberg)

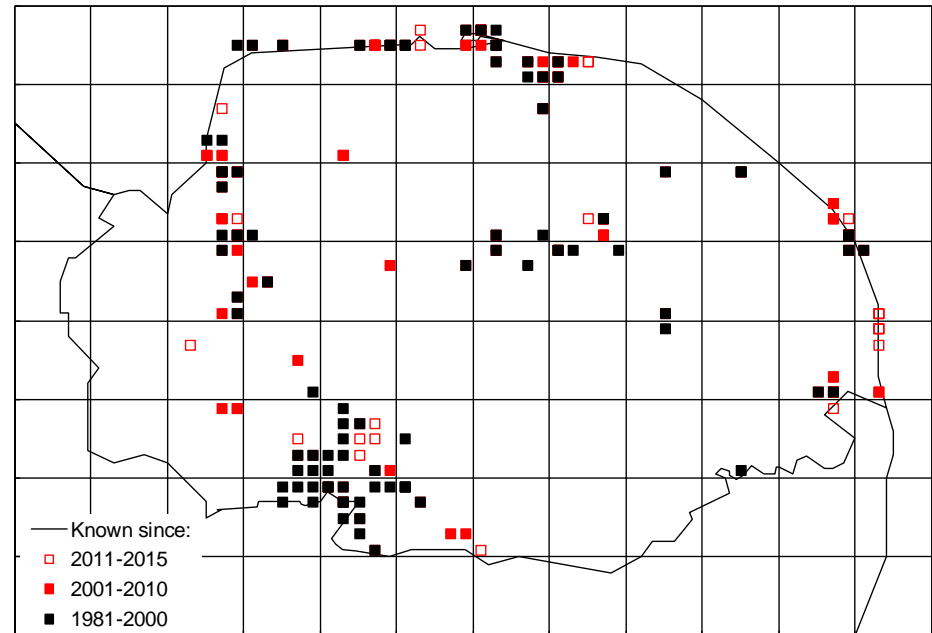
A small grasshopper with strongly inflexed side keels to the pronotum. It occurs in many colour forms often with a broken patterning of greens, greys and browns and sometimes with elements of red on its dorsal surface.

Its song is a series of about twenty buzzing chirps, rising in intensity and becoming longer and louder towards the end.

It occurs on sandy and heathland sites throughout Norfolk. It is most common in the Brecks and in the dune systems along the north Norfolk coast. It also occurs on remnant heathland north-west of Norwich and in west Norfolk.

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*Note: several species have expanded their range in the 21<sup>st</sup> century. In order to illustrate this, the maps show 20<sup>th</sup> century records in black, with red squares showing sites first discovered in the 21<sup>st</sup> century.*



# Field Grasshopper

*Chorthippus brunneus* (Thunberg)

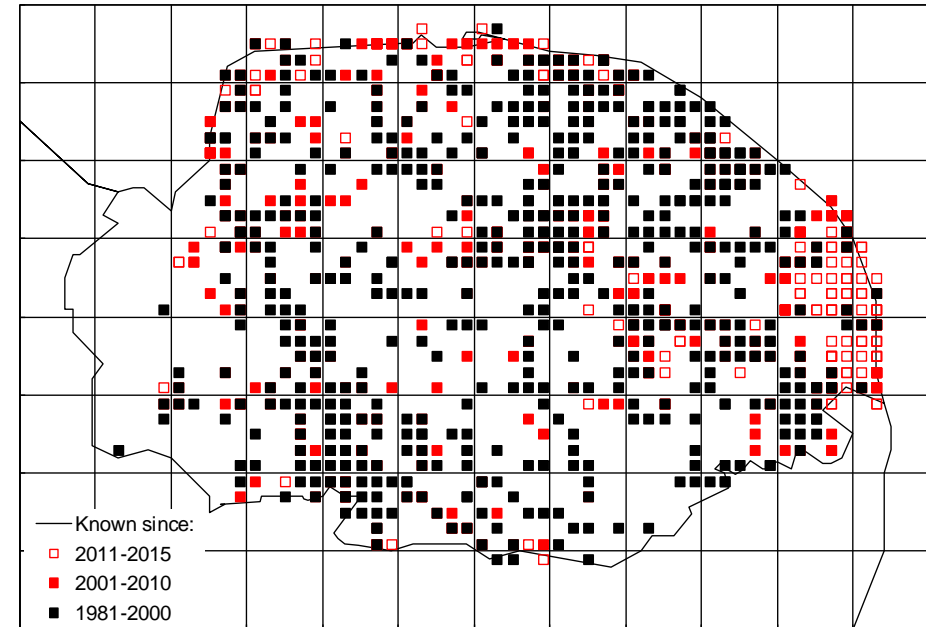
This is a large grasshopper occurring in many colour forms. It can be green, brown or even maroon. Females are significantly larger than males. The most reliable identification features are the song and the strongly inflexed side keels to the pronotum.

The song consists of loud brisk chirps, buzzing rather than shrill, and often delivered alternately by two interacting males. The song is heard from July and the insect can survive until November.

Field grasshopper is widely distributed throughout Norfolk, except for the Fens and Broads. It is tolerant of a wide range of habitats and can be found on heaths, commons, cleared forestry, roadside verges, waste ground and gardens.

It favours south facing banks which provide warm micro-climates. It is less tolerant of longer swards where the sun does not penetrate to ground level.

Recent records in the east of the county reflect intensive field work by local recorders in 2011.



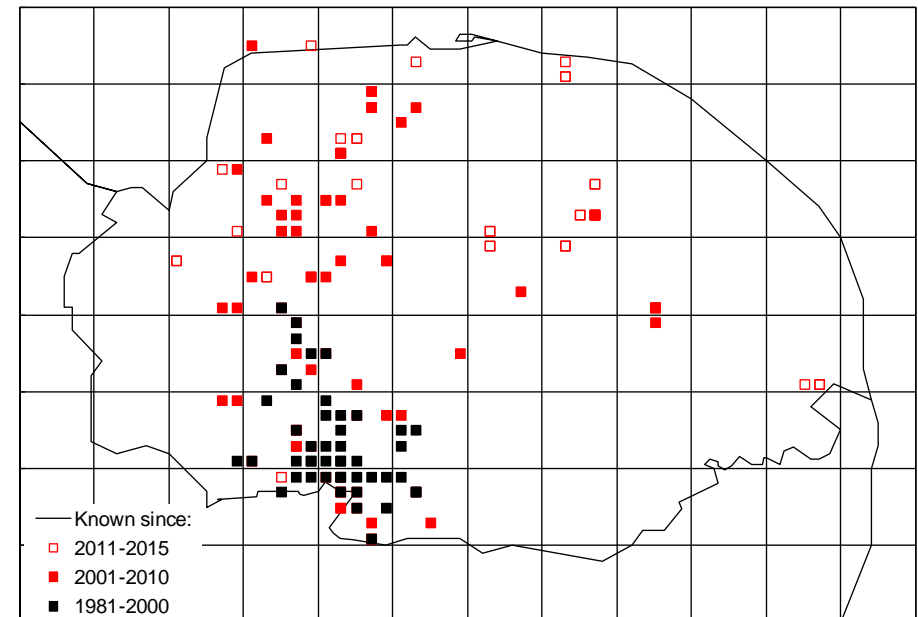
# Stripe-winged Grasshopper

*Stenobothrus lineatus* (Panzer)

Mature adults are green with orange on the legs and abdomen. The side keels of the pronotum are moderately incurved in an hour glass shape. There is a prominent white stigma (comma-like mark) on the forewing. The “stripe-wing” of the name relates to the pattern of venation on the forewing and not to any prominently visible field mark.

The song is a wheezy, undulating metallic sound lasting 10-25 seconds. It is delivered with unusually slow leg movements, one leg rising in advance of the other like a very slow cyclist. There is also a longer, courtship song like the “tick-tock” of a clock. All songs are very quiet and are best heard with a bat detector.

The traditional strongholds of this insect are the chalk grasslands around the brecks, which were originally researched by RM Payne in 1959. The species has been expanding its range at a national level in recent years and this is reflected in the rapid colonisation of NW Norfolk in the early 21<sup>st</sup> century and in a scatter of records across heathland sites in mid-Norfolk stretching down to Waveney Forest in the East of the county.



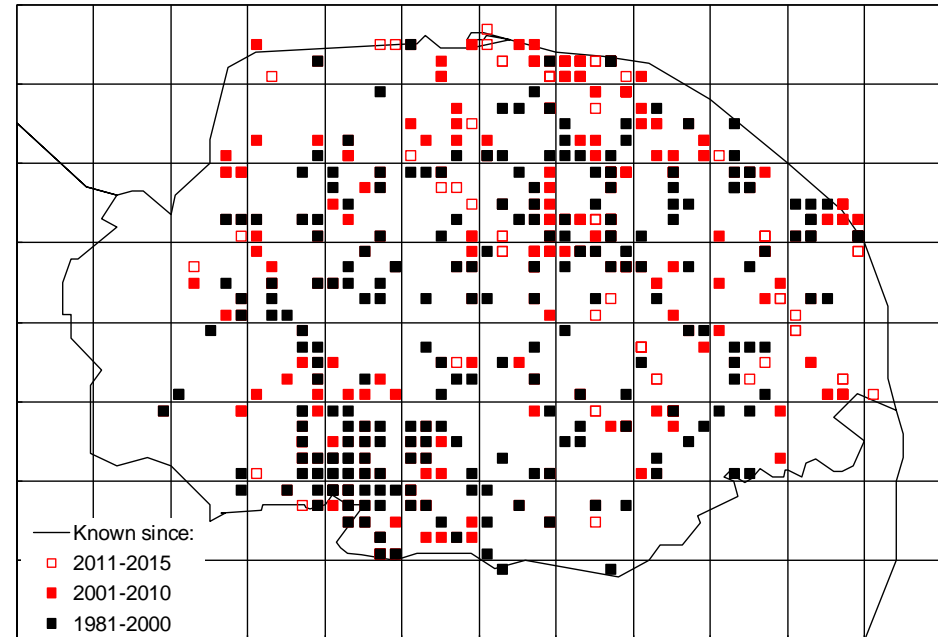
# Common Green Grasshopper

*Omocestus viridulus* (Linnaeus)

Although the usual colour is green, the abdomen and sides of the pronotum may be brown or purple. The side keels of the pronotum are moderately incurved, often with black wedge marks extending to the hind margin.

Common Green Grasshopper has a loud continuous song lasting up to 15 seconds. It is soft in tone but far carrying, rather like the sound of hands being briskly rubbed together. On hot days it can be heard over considerable distances, but in duller weather can be less conspicuous and may be more reliably heard with a bat detector to amplify the sound. The song can be heard from early June or even late May in particularly favourable years.

The insect is abundant on old commons, brecks and unimproved grassland and can also be found in woodland rides and on roadside verges throughout Norfolk. It is less common on the north Norfolk coast and on the high ground of west Norfolk, and is mainly absent from the Fens.



# Meadow Grasshopper

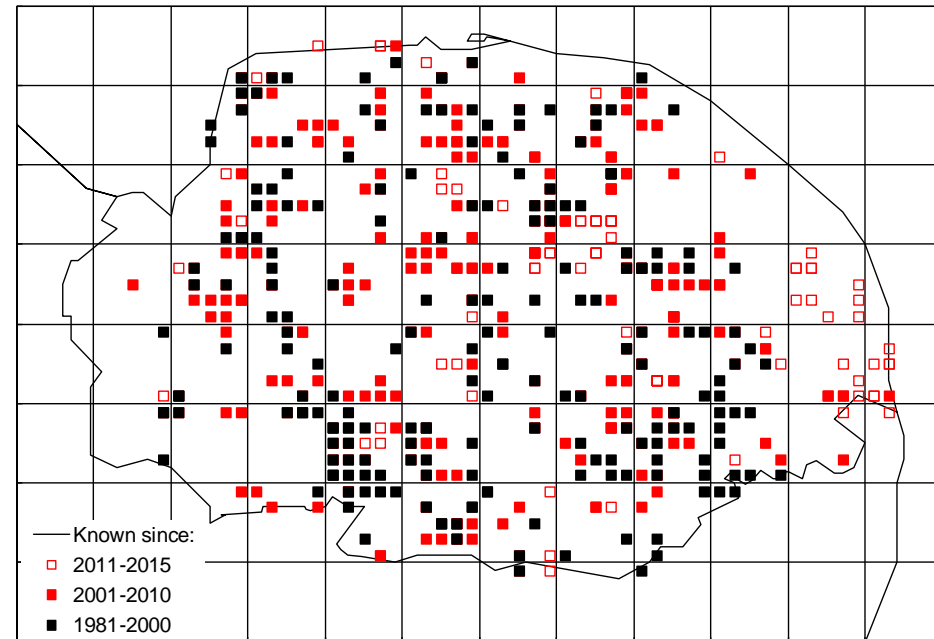
*Chorthippus parallelus* (Zetterstedt)

Meadow Grasshopper is less robust than Field Grasshopper. The usual form is green with a broad brown band on top of the head and pronotum, the side keels of which are gently incurved. Other distinguishing features are a yellow ventral surface to the abdomen and blackish hind knees which distinguish this species from Lesser Marsh Grasshopper. Hind wings are vestigial in both sexes. The forewings of the male extend almost to the tip of the abdomen whereas those of the female (illustrated) are noticeably reduced, extending over only half the length of the abdomen.



Meadow Grasshopper has a short rattling song of 1-2 seconds duration sometimes described as a dry chuckle of 10—15 pulses. Adults mature from late June or early July and can survive until late October.

It occurs in a wide range of grassland types in Norfolk, ranging from dry breck grasslands to damp meadows. It is generally absent from the Fens and from the Broads. Recent records in the east of the county reflect intensive field work by local recorders in 2011.





# Lesser Marsh Grasshopper

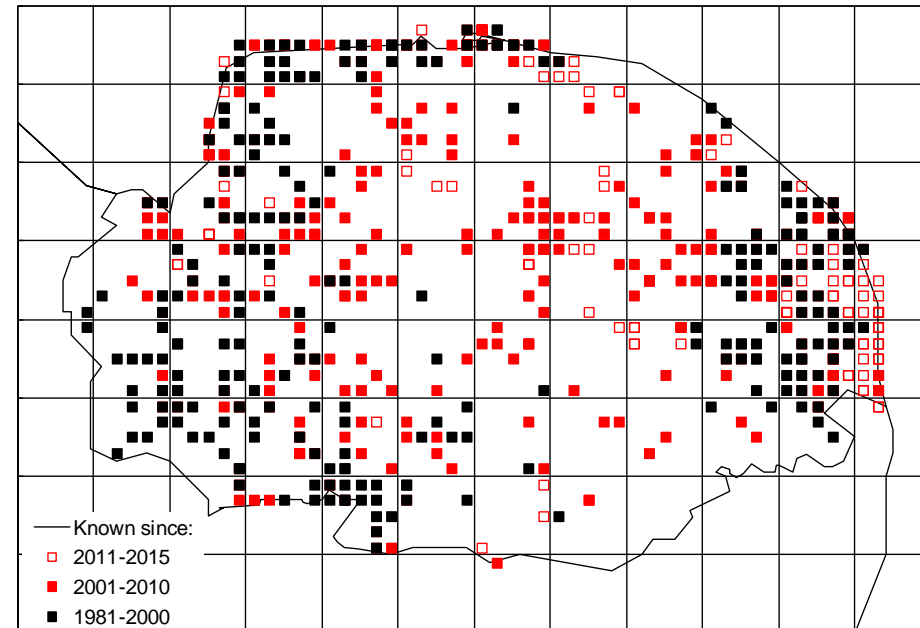
*Chorthippus albomarginatus* (De Geer)

The most usual forms of the Lesser Marsh Grasshopper are a uniform straw brown or a pale grey-green with straw brown dorsal surface. There is also a dark green form in which the white line running along the forewing is particularly prominent. Many other colour forms exist. The side keels of the pronotum are straight and there is often a visible median keel so that the insect is readily recognised by the three parallel lines across the pronotum. The insect is fully winged.

Stridulation is a soft purring trill, like a quiet fluttering of the tongue.

Until recently, the distribution of Lesser Marsh Grasshopper could have been described as the complement of that of Meadow Grasshopper, as it was particularly abundant in the Fens and the Broads. In recent years, however, it has expanded its range into central Norfolk so care is needed when trying to separate the two insects by sight characters alone. The stridulations, however, are quite distinct.

The species occupies a wide range of habitats including coastal sand dunes, dry grassland, roadside verges, cleared forestry and grazing marshes.



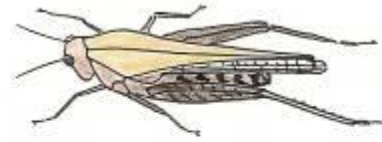
## 2) Groundhoppers

The groundhoppers are like diminutive grasshoppers rarely more than 15mm long. Their wings are hidden by an extended protective casing to the thorax (known as the pronotum) which covers the whole of the abdomen. Their antennae are short and they have no stridulation.

Two species occur in Norfolk,

- the Slender Groundhopper in which the pronotum extends beyond the tip of the abdomen, giving a characteristic diamond or kite shape when viewed from above;
- the Common Groundhopper in which the pronotum is shorter.

In contrast to grasshoppers and bush-crickets, the eggs of groundhoppers begin to develop immediately they are laid and hatch within 3-4 weeks. The insects overwinter as nymphs or adults, becoming dormant in very cold weather.



Slender



Common

# Slender Groundhopper

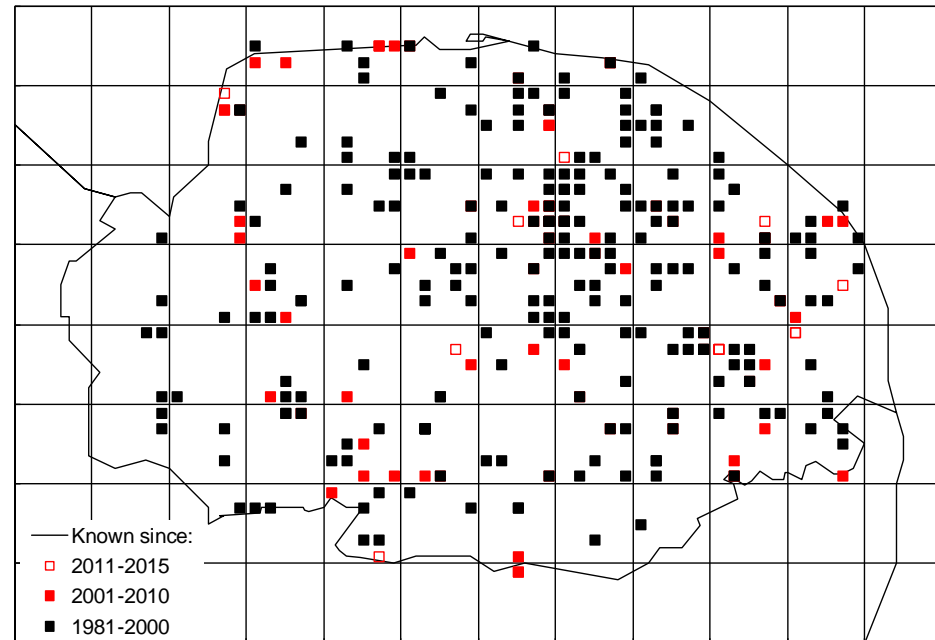
*Tetrix subulata* (Linnaeus)

Slender Groundhopper is an insect of wet places, being found in a range of fen-like habitats, marshes, damp commons, stream sides, grazing meadows and dune slacks.

The pronotum extends beyond the tip of the abdomen giving a characteristic diamond or kite shape when viewed from above.

It varies in colour from pale brown to black, often matching the colour of the substrate making it very difficult to see. Dark forms often have white blotches on the legs.

Eggs are laid in the ground or in moss, and hatch within 3-4 weeks of laying. The insect overwinters as an adult or late instar nymph, becoming active again in April.



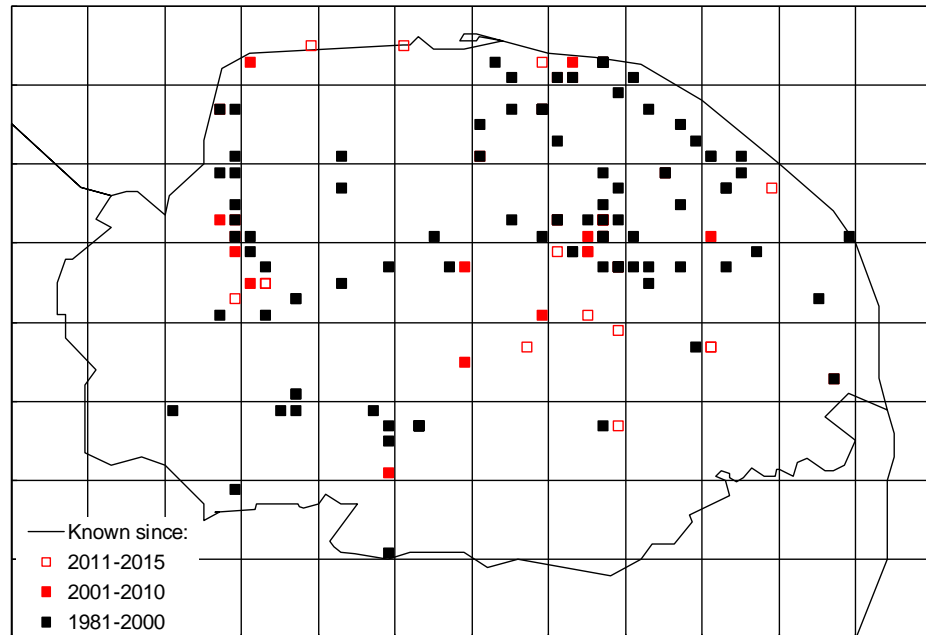
# Common Groundhopper

*Tetrix undulata* (Sowerby)

A sturdy groundhopper, whose pronotum has a prominent central keel which extends only as far as the tip of the abdomen. The hindwings are reduced and are much shorter than the pronotum. It is very variable in colour often mimicking the substrate.

Eggs are laid in crevices in the ground or in moss, and do not undergo diapause so adults and nymphs can be seen together at any time of year from April to September.

Common Groundhopper can be found in both wet and dry habitats where it exploits bare ground among low vegetation with a substantial moss flora. It has been recorded from heaths, commons and woodlands particularly in the north-east quadrant of the county, and from wet areas and dry heaths in the west. There are very few records from the agricultural areas of south Norfolk.



### 3) Bush-crickets

The bush-crickets are recognisable by their extended back legs, but are more likely to crawl about their preferred habitat of scrub or rank vegetation. All species have long antennae and in older texts were referred to as long-horned grasshoppers. Several species have much shortened wings and are incapable of flight.

Stridulation, which is by rubbing the wings together, is higher pitched than that of the grasshoppers and for some species is beyond the range of human hearing. A bat detector is a useful accessory for locating such species by sound.

Bush-crickets overwinter as eggs, often laid in crevices in bark or rotting vegetation. In some species the eggs will not hatch until the spring of the second year, the embryo having developed through the summer and autumn of the first year, but then entering diapause until the second spring. Nymphs emerge in May or June, reaching maturity in July or August. Most species are omnivorous, surviving as adults until October or even November in the case of Dark and Speckled Bush-crickets.

As an aid to recognition, species are presented in the following order:

Insects of the wider countryside (including gardens):

- Dark Bush-cricket
- Speckled Bush-cricket
- Oak Bush-cricket

The *metrioptera*:

- Bog Bush-cricket
- Roesel's Bush-cricket

The coneheads:

- Long-winged Conehead
- Short-winged Conehead

Species with restricted range:

- Great Green Bush-cricket

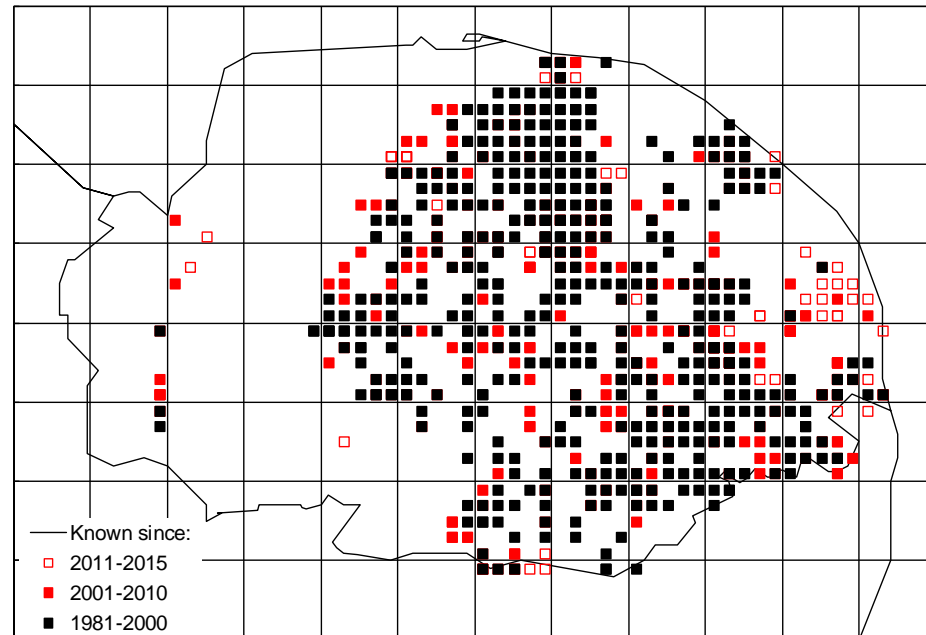
# Dark Bush-cricket

*Pholidoptera griseoptera* (De Geer)

A robust insect with vestigial wings covering less than half the abdomen in the male, and reduced to tiny lobes in the female. The adult male is grey/brown and the female yellow/brown. The underside is yellow in both sexes. The nymphs are black with a pale dorsal band and greenish ventral surface, and can often be seen sunning themselves on low vegetation during June and July.

The song of the male is a brisk chirp delivered from thick vegetation at all times of day but particularly noticeable at dusk. It can be heard from late July until the end of October. Adults survive until the first frosts of November.

Dark Bush-cricket is an insect of ancient hedgerows and commons, found only where there is persistent dense cover usually of nettles and brambles. It is common in the ancient countryside of mid and south Norfolk, but mainly absent from the west of the county and the intensely arable north-east where the majority of hedgerows date from the time of the 19th century parliamentary enclosures. There are interesting outlying colonies along the Gt Ouse, where it is found in brambles along the flood banks.



# Speckled Bush-cricket

*Leptophyes punctatissima* (Bosc)

The adult bush-cricket is a plump, green insect with brown dorsal stripe, covered in minute dark spots; hindwings absent, forewings vestigial. Nymphs hatch in May and with practice can be easily located as they sun themselves on hedgerow nettle or bramble, often in the vicinity of mature trees particularly ash or oak. Later in the season the insects become difficult to find as they move higher or deeper into the vegetation. In autumn it can be found on walls and windows and will sometimes find its way indoors.

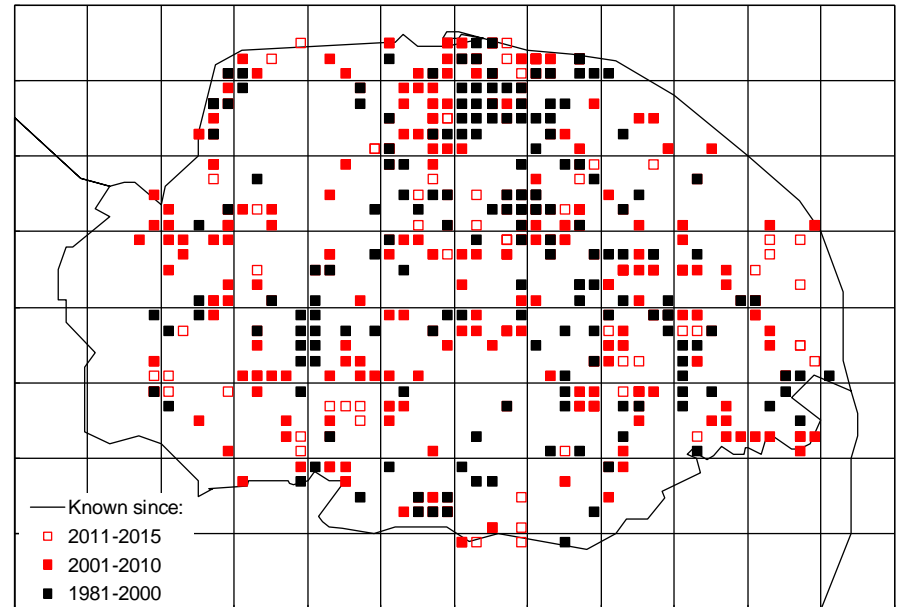


The male song is an abrupt, high pitched chirp which is best heard with a bat detector from August to October, and exceptionally into November, or even early December in the absence of frosts.

Speckled Bush-cricket appears to have the same habitat requirements as Dark Bush-cricket, and given that both species are flightless, it is intriguing that Speckled Bush-cricket is found in areas of the county where Dark Bush-cricket is absent.

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*Note: 21<sup>st</sup> century records reflect the increased use of bat detectors by recorders, not range expansion.*



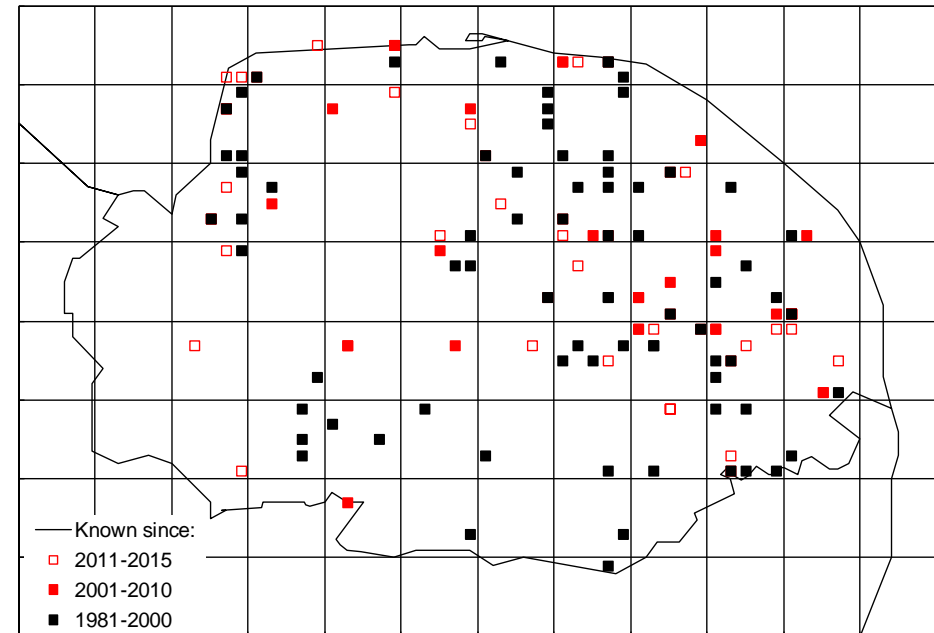
# Oak Bush-cricket

*Meconema thalassinum* (De Geer)

A slender, pale green insect with yellowish legs; it is fully winged and attracted to light. Oak Bush-cricket has no stridulatory mechanism. Instead it makes a barely audible drumming noise by striking a hind leg against a leaf, producing short rapid bursts of sound.

This is a completely arboreal species, which is mainly carnivorous. It can be found in broad-leaved woodland, hedgerows and gardens but is significantly under-recorded in Norfolk because of its habitat preferences, its nocturnal habits and lack of audible song.

It can be searched for by beating young oaks or birch, or by sweeping ivy covered tree trunks. Occasionally it may be found as a nymph, sunning itself on exposed vegetation. As an adult, it is attracted to light, frequently being found in moth traps or at lit windows, particularly in the autumn when it may sometimes enter houses. The fully-winged nature of this species distinguishes it from speckled bush-cricket which is the other green bush-cricket to come indoors in the autumn.





# Bog Bush-cricket

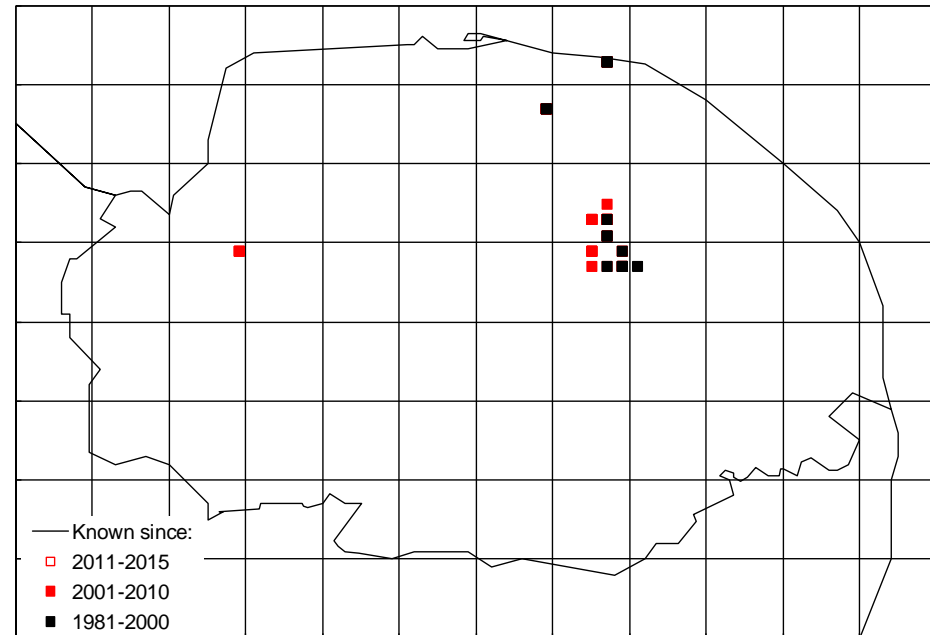
*Metrioptera brachyptera* (Linnaeus)

A dark brown insect with green ventral surface to the abdomen, and with green (or occasionally light brown) on top of the head and pronotum. Wings are shortened covering only half the abdomen.

The song is a continuous, high pitched stridulation which can be heard at all times of day in hot weather. A bat detector can be helpful in picking up the less intense sounds emitted in dull weather.

Bog Bush-cricket is an insect of lowland heath and clearings in damp woodland where the dominant plants are cross-leaved heath *Erica tetralix* and purple moor grass *Molinia caerulea*. Nymphs can be readily swept from these plants in June and July but more intensive searches are required to find the cryptically coloured adults in August and September.

In Norfolk the species is currently known only from Beeston Common, Holt Lowes, Buxton, Cawston and Marsham Heaths and from woodland clearings on the former Horsford and Newton Heaths. In the west of the county it is known from a single site in the Leziate area where it was rediscovered in 2006, after a gap of more than 80 years.



# Roesel's Bush-cricket

*Metrioptera roeselii* (Hagenbach)

A dark brown insect with prominent cream-coloured line around the side margins of the pronotum and with three distinctive yellow or green spots on the body behind the pronotum. Head and abdomen can sometimes be green. The insect is normally short-winged, though a macropterous form with wings extending well beyond the tip of the abdomen can occur in relatively high numbers in very hot summers, and is a form likely to be encountered in Norfolk as the species spreads across the county.

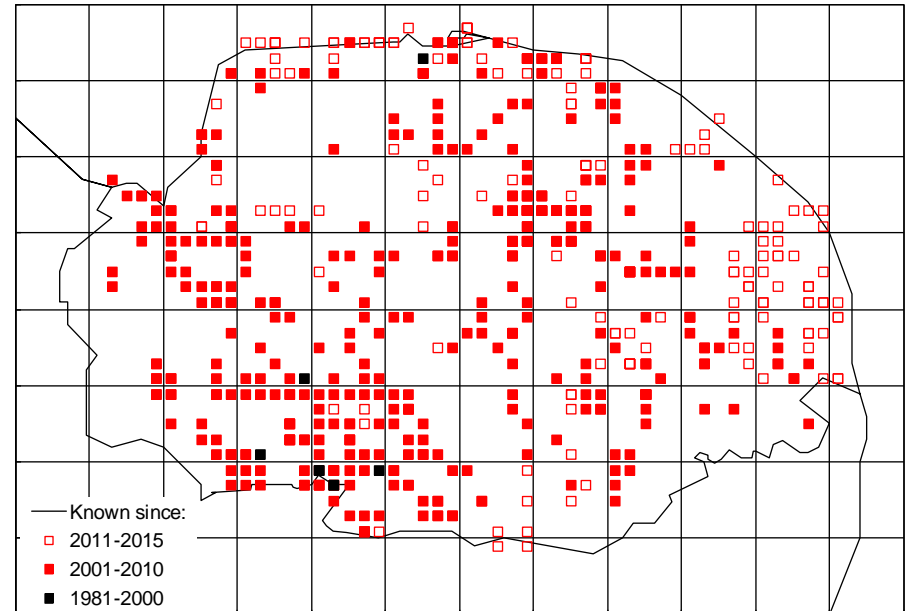
The song is a continuous, penetrating buzz best likened to the electrical discharge emitted by pylons in damp weather. It can be heard at considerable distance with a bat detector, but only the most intense song can be heard unaided.

Nationally, the species has undergone significant range expansion from its original strongholds in the Thames basin and was first recorded in Norfolk in 1997. Initial colonisation was in the Breckland area, subsequently spreading around the Wash coast and across central Norfolk. It is now widespread across the county and can be expected to be found among rough dry grasses almost anywhere.



Short winged form

Long winged form



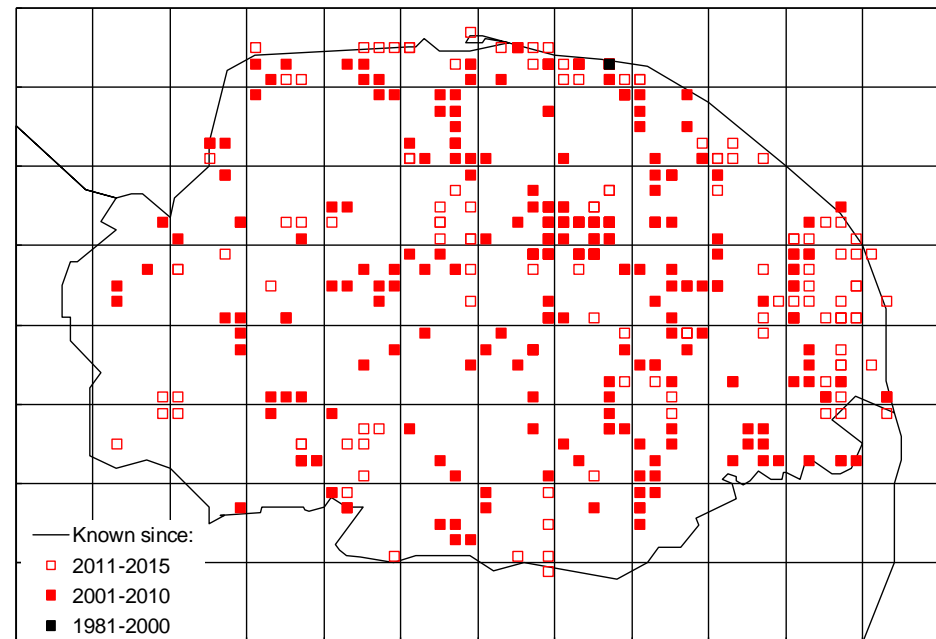
# Long-winged Conehead

*Conocephalus discolor* (Thunberg)

A slender green bush-cricket, with brown dorsal stripe and brownish wings extending just beyond the tip of the abdomen. The female has a long straight ovipositor (illustrated).

Stridulation is a faint, prolonged hiss, best heard with a bat detector. Stridulation is similar to that of Short-winged Conehead but without the alternating sounds which are such a feature of that species. Through a bat detector, the stridulation is a harsh staccato sound which distinguishes it from the buzz of Roesel's Bush-cricket, and from the softer stridulation of Common Green Grasshopper.

Like Roesel's Bush-cricket, Long-winged Conehead is expanding its range nationally and was first recorded in Norfolk in the year 2000. The main spread of the insect seems to have followed the hot summer of 2003, and it is now widespread across the county. Coneheads have a single year egg cycle (unlike the 2-year cycle of most other bush-crickets) and this has probably contributed to its rapid colonisation of the county. It can be found in coarse vegetation along roadsides, and in waste ground or agricultural set-aside.



## Short-winged Conehead

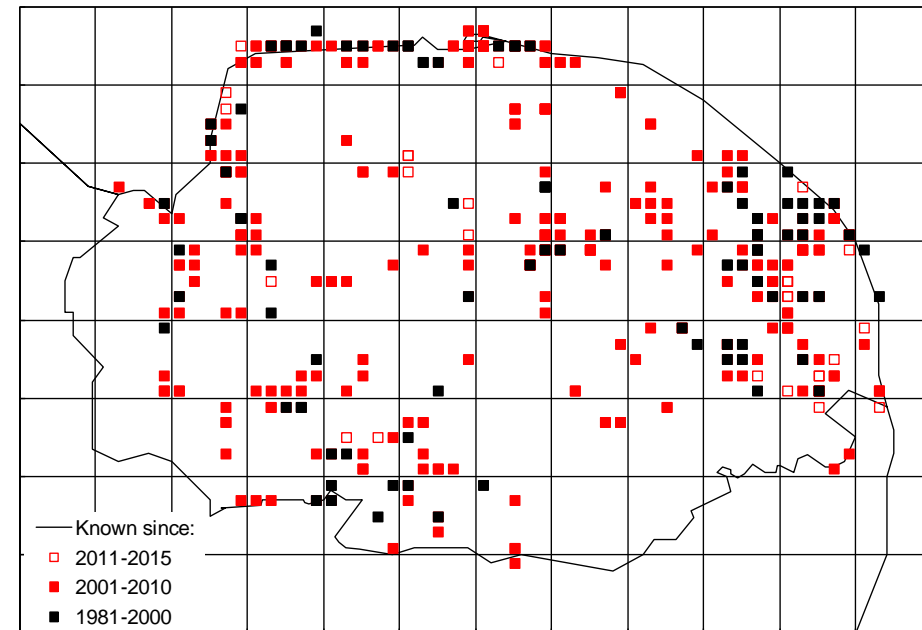
*Conocephalus dorsalis* (Latreille)

A small, bright green bush-cricket, with a brown dorsal stripe. Hind wings vestigial, forewings brown in colour, extending over half the abdomen. The nymph is a lurid green colour with prominent black dorsal stripe and excessively long antennae.

The high pitched stridulation is inaudible to many people and is best heard with a bat detector. It has two alternating sounds, a wavering hiss and a slower ticking sound. Eggs are laid in the stems of grass, rushes and reeds.

The traditional strongholds of Short-winged Conehead are the Broads area and the coastal saltmarsh and dunes in the north-west of the county. It also occurs in the Brecks, where it occupies dry grassland, and in wet rushy meadows in central Norfolk.

The species has been extending its range in recent years, and in central Norfolk has been turning up as a new coloniser of previously well worked sites.



# Great Green Bush-cricket

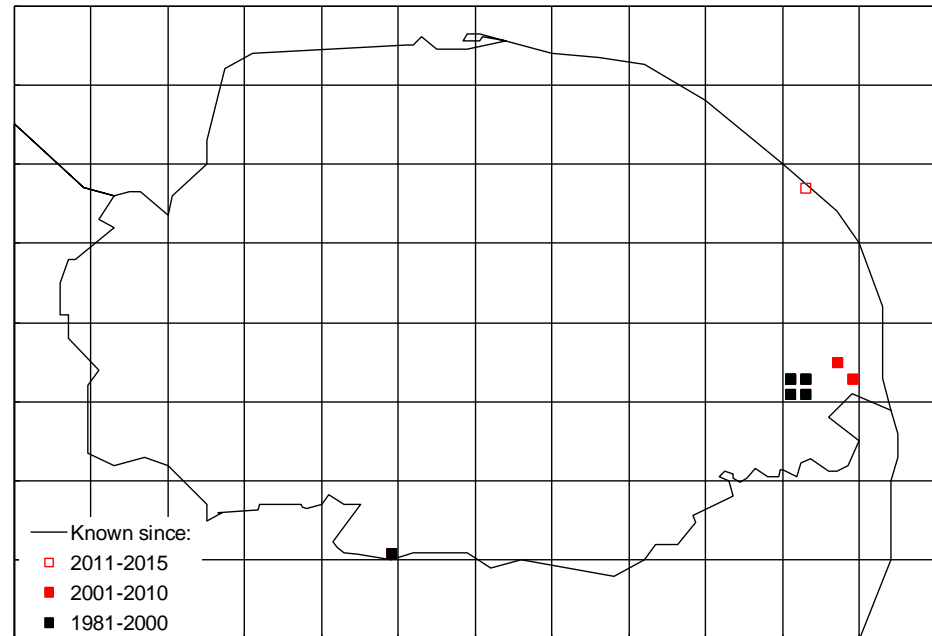
*Tettigonia viridissima* (Linnaeus)

A large green insect with brown dorsal stripe, and wings extending well beyond the tip of the abdomen.

Song is loud, continuous and far carrying, like that of a grasshopper warbler, but more ringing, and can be heard on warm afternoons and evenings from late July onwards. Considering the size of the insect, it is notoriously difficult to see.

In Norfolk, it is known only from Reedham, where it occupies bramble scrub in the station yard and the Mill Road areas; and on the county boundary at Thetford (Euston Bridge) where the main colony is on the Suffolk side of the river. There have also been casual records from Burgh Castle and Belton in 2005-11, and most recently at Sea Palling where three were heard stridulating in dunes near the car park in 2013.

It is an insect of wasteland with rough herbage including thistles, bramble and scrub, and can also be found along reed fringed dykes.





## Checklist of Norfolk Grasshoppers and Crickets.

Print out this page to record your sightings of Norfolk Grasshoppers and Crickets.

Species	Where	When
Mottled Grasshopper		
Field Grasshopper		
Stripe-winged Gh		
Common Green Gh		
Meadow Grasshopper		
Lesser Marsh Gh		
Slender Groundhopper		
Common Groundhopper		

Species	Where	When
Dark Bush-cricket		
Speckled Bush-cricket		
Oak Bush-cricket		
Bog Bush-cricket		
Roesel's Bush-cricket		
Long-winged Conehead		
Short-winged Conehead		
Great Green Bush-crkt.		