

## ***Eucera longicornis* The long horned mining bee in Cornwall. Patrick Saunders**

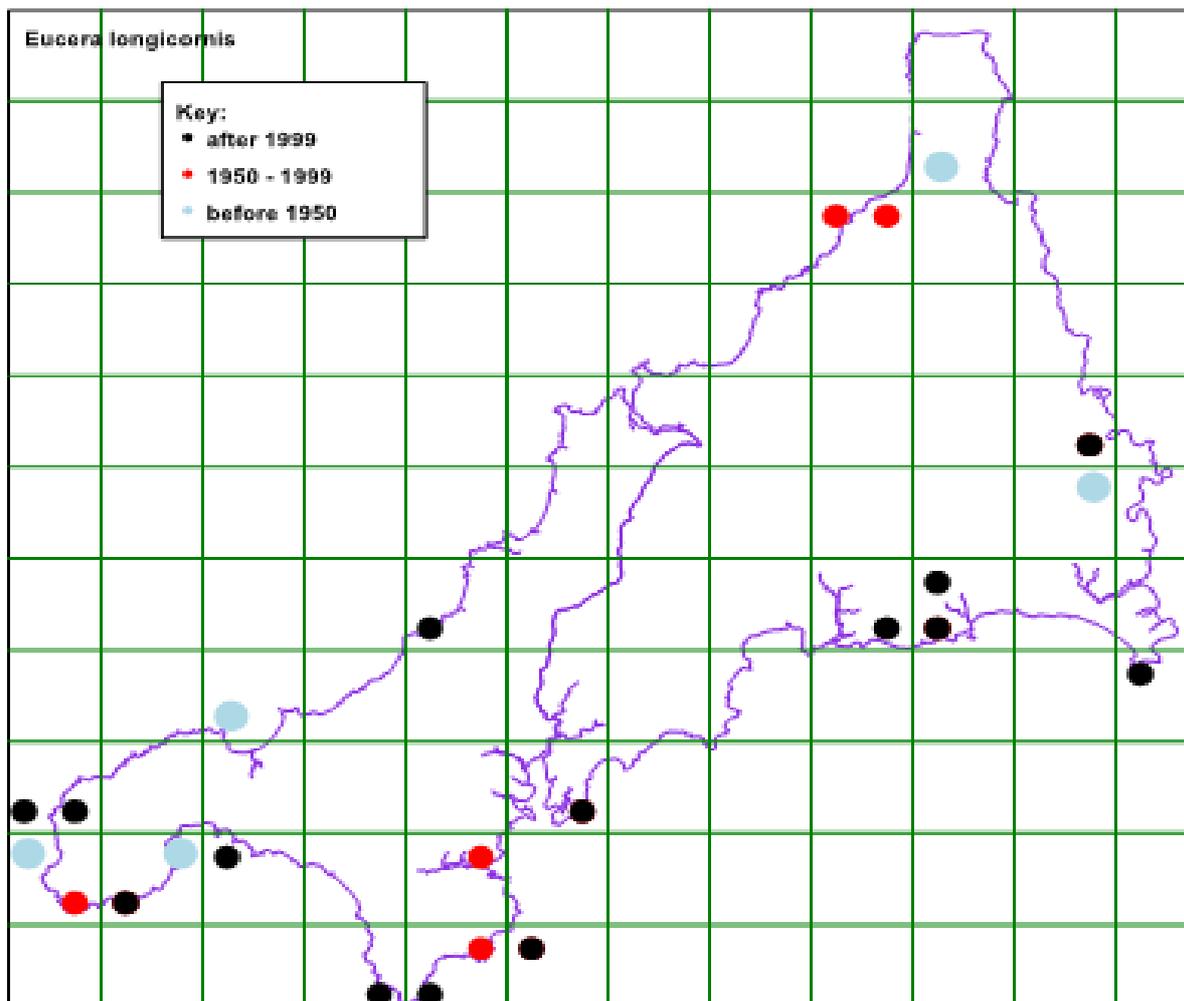
With additional comments by Judy Webb, Steve Falk, John Walters. Dr.Paul Westrich and Andy Foster.  
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### **Cornwall status.**

*Eucera longicornis* is a nationally declining species on the Section 41 list (BAP 2007). Its main strongholds being on the coast of SW England and Wales.

The species occurs on about 10 recent sites throughout Cornwall (see fig.1) with an additional 2 post 2000 sites where the species probably has become extinct very recently. A further 8 sites have been recorded historically. The recorded sites are mostly coastal. There are good areas on both the Lizard and Penwith peninsular and there is a good chance of finding a few new colonies within these areas. It is a distinctive bee and is likely the records represent a reasonable fit to the true distribution.

Fig.1 *Eucera longicornis* distribution in Cornwall



The species is single-brooded (univoltine), flying from mid-May to mid-July (Baldock 2008). In Cornwall the species can occur later well into August being synchronised by forage availability. One site (the probably extinct colony) at Deer Park woods used Bitter vetch *Lathyrus montanus*? and had the main peak in mid May whereas the Looe site utilising only Narrow everlasting pea *Lathyrus sylvestris* peaks in end of July/first week August. These two sites are extreme examples of interest such as if the Bitter vetch population has a good year and tries to expand are they going to be able to identify other sites with suitable later foraging resources that flower in 2 months time ? Will they alter their emergence time to exploit them? Has this population been pushed into only being able to use Bitter vetch and isolation as it seems too early for the main flowering of most *Lathyrus* and *Vicia*. P.westrich notes mid-May seems very early for longicornis.



Eucera nest site Prawle point Devon (J.Walters)

**Fig 2. Summary of top counts on most recent recorded sites**

The table includes recent or relevant records and is not comprehensive. It is to be noted that I have only found 2 Cornish sites that have good numbers. The rest seem really weak with isolated or small areas of potential forage resources. (although Caerthillian may be stronger than the table suggests).

Site	Gridref	Date	Count	observations
Deer park lockett	SX3873	30/05/09	3f	Bitter vetch
Penlee CWT	SX4349	02/06/09	1m	unknown
Caerthillian Lizard	SW6912	21/06/10	3	Meadow vetchling only although pollen not recorded
East looe	SX2553	04/07/13	9f	Narrow everlasting pea pollen obs.
East looe	SX2553	10/07/13	15f	Narrow everlasting pea pollen obs.
Lansallos cliff	SX1651	12/07/13	5m	Narrow everlasting pea, males also observed on kidney vetch in 2012
Lansallos cliff	SX1651	12/07/13	1f	Narrow everlasting pea pollen obs.
Causeland Sta	SX2459	20/07/13	1f	Meadow vetchling pollen obs.
Causeland Sta	SX2459	20/07/13	1m	Meadow vetchling
Killgerran head	SW8732	05/07/13	15m	Mostly on white clover also common vetch and meadow vetchling
Killgerran head	SW8732	05/07/13	1f	Meadow vetchling pollen obs.
Perranunthoe	SW534293	19/05/09	2m	Most abundant flower resources close to nest site kidney vetch and bird's-foot trefoil. Vicia sativa was occasional just inland around some field margins. (Andy Foster)
Prawle point (Devon)	SX7735	19/06/13	40	At least 40 males and females on kidney vetch (J.Walters)
Prawle point (Devon)	SX7735	04/07/13	7	At least 7 females at nest site (J.Walters)

## Forage plants in Cornwall.

Various accounts suggests is a *Eucera* is a Fabaceae specialist. Westrich found the species to be Oligolectic on Fabaceae, including bush vetch *Vicia sepium*, common bird's-foot-trefoil *Lotus corniculatus*, lucerne *Medicago sativa*, narrow-leaved everlasting-pea *Lathyrus sylvestris*, red clover *Trifolium pratense*, tuberous pea *Lathyrus tuberosus*, tufted vetch *Vicia cracca* and white clover *Trifolium repens* (Westrich Paul 1990). Some accounts and observations suggest Meadow vetchling *Lathyrus pratensis* is major requirement on many English sites (Knowles A 2013)(Baldock 2008).

Andy Foster discovered a Wiltshire population in a hay meadow on 15/6/2010 2 males and 2 females were exclusively visiting meadow vetchling *Lathyrus pratensis*, whilst ignoring abundant bird's-foot trefoil and red clover, along with many other herbs. Although one other female did visit white clover. Subsequent observations on 26/6/2011 found males and females visiting *L. pratensis* along the edges of a nearby lane - a pollen sample taken from one female was passed to Judy Webb for analysis: *Vicia* type - approx. 25% this could include *Lathyrus pratensis* or *Vicia sativa*, Fabaceae indet. - approx 75% - smaller grains which could possibly be *Trifolium repens*, but not *T. pratense* and not *Lotus corniculatus*. (Andy Foster per.comm.2013)

I have only seen the species collecting pollen on *Lathyrus* of three species. Although I have seen males on a bigger range of plants. In Devon at Prawle point J.Walters has found the species on Kidney vetch. (J.Walters per.comm). Of interest the Lansallos site has a lot of Kidney vetch but i have not found the females using it. Birdsfoot trefoil and White clover are abundant 3 large fields about 700m from the Looe site but are not used.

Kidney vetch, Birdsfoot trefoil and White clover are abundant at coastal sites all over Cornwall which don't have *Eucera*. The *Vicia sp.* and *Lathyrus pratensis* are common but rarely found in very large stands.

Research on solitary bees emphasise the importance of abundant forage close to nest sites. At the Looe site the bee has only been observed within a discrete strip of *Lathyrus sylvestris* about 500m long. They have not been observed at the other nearest potential foraging areas of *Lathyrus* located about 400m and 2000m from their foraging patch. This fits quite well with (Zurbuchen A 2010) who suggest optimum foraging ranges within the 100-300m range for small-medium sized solitary bee species, (i.e. smaller than *Eucera* )

This article does not deal with nest requirements. Undoubtedly sheltered warm suitable nest sites are extremely important but I believe nest sites is usually less of limiting factor than forage requirements in S. Cornwall. As some of the Cornish sites do not have large areas of friable south-facing bare ground and also there are miles of soft cliff where the bee is not present. Perhaps nesting limitations explain why the bee is absent from the north coast of Cornwall which has some huge areas of Kidney vetch but a wetter and wilder climate and also harder cliffs.



Eucera female on Everlasting pea with pollen load

### **Tentative conclusions**

The Bee appears to have narrower optimum forage preferences within the fabaceae particularly *Lathyrus*, *Vicia* and probably Kidney vetch in Devon or Cornwall. With the species probably needing a 'super-abundance' of a chosen primary forage plant. (Falk per comm.). They seem able to adapt to use a wider range of Fabaceae but the limits of this flexibility may be important (the high quantity of probable white clover in the pollen sample are also of interest).

For pragmatic conservation of this species the main focus should be on conserving large tall flowering stands of *Lathyrus* and *Vicia* near nest sites and/or flowering Kidney vetch. Within 0-500m radius. Conservation of possible nest sites such as South facing banks or cliffs is important, but management or creation of additional large areas of friable bare ground and short vegetation is unlikely to be beneficial.

Further pollen foraging observations and identification of collected pollen is needed to clearly establish the ecological requirements of this declining bee. I would be very keen to hear from members with any observations on this species to share.

## Management for *Eucera*

Both Meadow vetchling, Everlasting pea and *Vicia sp.* are likely to be negatively affected by typical mid summer meadow cuts and in my experience flower badly in grazing systems. This obviously creates management problems for this bee. Stands of *Lathyrus* with large quantities of flowers i believe occur in areas with low or no management and are thus also very prone to scrubbing over. This was notable at Killgerran Head where Meadow vetchling occurred in prostrate form with little or no flowers on the areas under conservation grazing but occurred in bushy forms with lots of flowers on a completely un-managed field edge.

Nearly all of the records of *Eucera longicornis* in Southern Germany were not on regularly managed grassland but on unmanaged field edges or on ruderal sites or along hedges the the typical pollen sources were in flower. (P.westrich Per. comm.)

Either biennial cuts, winter cuts or winter grazing are likely to be the best management regime for this species. In my small backyard wildflower meadow even with only an annual autumn cut the flowering of the meadow vetchling is poor in comparison with a uncut grassland nearby. There is a need for more detailed research comparing management regimes to actual flowering units to protect such sites. I believe even sites with conservation management are often actively skewed away from these taller semi- ruderal flower-rich habitats to the probable detriment of the bees of these habitats.

## References

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