Six-banded Nomad Bee at Prawle Point (Devon)

MoA Report – 2024

November 2024
Patrick Saunders – Kernow Ecology

Saving the small things that run the planet

Picture 1: *Long-horned Bee (Eucera longicornis) © Patrick Saunders*

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Summary

- The survey did not find any Six-banded Nomad Bee (*Nomada sexfasciata*), it has to be presumed the species is either extinct or on the verge of extinction at the last site in the UK for the species.

- Intensive grazing and abandonment of any management on difficult slopes between Salcombe and Start Point is likely to have reduced the area of preferred legumes and reduced the host numbers to a point where the nomad population is too small and too isolated to persist.

- There is still a good population of Long-horned Bees (*Eucera longicornis*) and the population as possibly expanded since the 2019 survey, but numbers counted were lower than 2023 particularly at Gara. Numbers and diversity of most other mining bee species seemed poor in June 2023.

- Observations emphasised the importance of later flowering vetches with Meadow Vetchling, Tufted Vetch and Everlasting Peas being important pollen resources and much more limited than other legumes.

- Nest resources probably not very limiting. Large areas of soft cliff superficially suitable for nesting with historic nest holes.

- Climate change induced extreme weather events are likely to be another risk. 2024 was relatively cool and windy, but 2023 had an exceptionally dry spring, droughts could affect pollen and nectar productivity. Erosion of key nests and under-cliff by extreme storms is another risk. In winter 2023/24 a huge landslip in Gara probably destroyed nests.

- The South Devon coast is highly important for a range of other soft-cliff invertebrates. In 2024 the scarce Dropwort Mining Bee (*Andrena ampla*) and the scarce Long Palped Cranefly (*Ctenophora pectinicornis*) was found.

- It is Critically important to improve management within 1.4km of nest sites. The best areas with flowering vetch flowers were either in less favourable management than 2023 or totally unmanaged and gradually deteriorating. Overall habitat quality has clearly declined since surveys in the 1990's, with most of the SSSI units are described as being in unfavourable condition (MAGIC 2023).

- Conservation actions should primarily focus on boosting tall grassland habitats with flowering vetch (Meadow vetchling, Common Vetch, Tufted Vetch and Everlasting Pea), but also as a secondary aim other legume rich habitat. Management measures for Long-horned Bee could be complementary with actions for Cirl Bunting and a range of other scarce pollinators on the South Devon coast.

Picture 2: Langerstone SX785360 21/5/24 *"Worst of all worlds" improved grassland with White Clover, heavily grazed throughout June and above ungrazed units with bracken and scrub. The stock also were going into the next field unit removing Meadow Vetchling.*

Picture 3: Landslip Gara SX753368, *this massive landslip was next to the biggest nest at Gara, it is likely to have destroyed some sub-nests, although has provided new bare ground.*

Introduction

The Long-horned Bee (*Eucera longicornis*) is one of Britain's most recognisable solitary bees owing to the exceptionally long antennae of the males. Once widespread and locally common, it has declined substantially and is now considered to be one of Britain's most declined bees. Today, it is largely confined to the coastline of southern England and south Wales.

The Long-horned Bee typically nests in aggregations in bare or sparsely vegetated light soils, often showing a preference vertical cliff faces. Along the South Devon coast, soft rock cliffs provide especially important nesting habitat for these bees and Prawle Point is of national significance for the Critically Endangered Six-banded Nomad Bee (*Nomada sexfasciata*) – the special cuckoo bee of Long-horned Bee – that is now seemingly confined to this single site in Britain.

Picture 4: Long-horned Bee female

Patrick Saunders was commissioned by Buglife to investigate the status, habitat and autecological requirements of Long-horned Bee and Six-banded Nomad Bee populations around Prawle Point.

Methodology

Picture 5: Common Vetch Foraging habitat

Surveys were focussed when the Long-horned Bee populations are at peak activity (mid June to early July). The sites were visited over 6 days in 2024. (31 May 12, 13, 19, 20 & 21 June) The survey was also informed by more comprehensive survey in 2023 surveys and previous site visits by Patrick Saunders & John Walters.

Visits took place on days with the most optimal weather for bee activity. Spring 2024 felt particularly late. Met office reporting suggests May was more windy than average, but sightly warmer. With summer overall cooler with less sunlight than the average.

The surveyor did walk- though surveys of important flower habitats. Pollen samples were collected from females entering nest aggregations. Soil samples and some other nest site variables were collected. Other bee and wasp species were recorded where possible (see appendix).

Results

The 2023 survey identified two strong population clusters (Table. 1.). One around Gara area and another between Sharper Cove, East Prawle. With a few small colonies in between such as near Mercer Cove (Table 1.). In 2024 a female was found at Mattiscombe on this survey. Numbers recorded in 2023 and 2024 were higher than suggested in the 2019 survey (Mitson 2019).

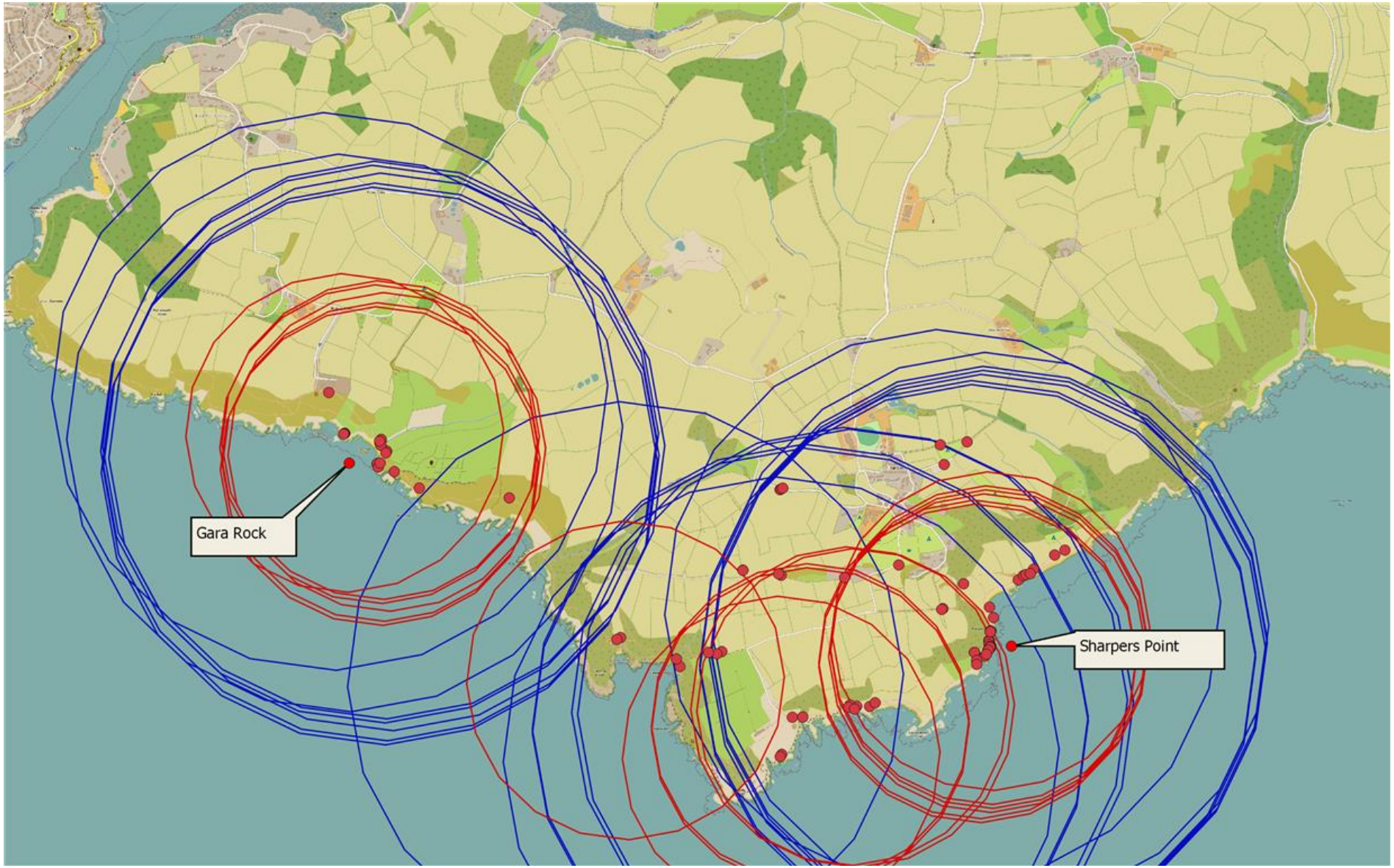
Key foraging habitats were identified at Sharpers Cove Meadow, Copstone Meadow Prawle Point (NT) (SX774352), Gara Rock cliff NT (SX753368) and meadows NT (SX757369). With some additional important foraging habitats at Mercer Cove (SX76663585) Elender Cove area (NT) (SX77003569).

Flower rich habitats were very poor East of Maelcombe undercliff. Further East Mattiscombe area (SX817369) did have some good areas of flower rich grassland and undercliff habitat. This area was only visited once (20/6/24) and at this time was under low input grazing which was working well in some very large units of very good flower-rich short grassland with mosaics of bracken, but as throughout the South Devon coast, the most important flowers (Meadow Vetchling, Everlasting Peas and Tufted Vetch) were almost absent.

The Six-banded Nomad Bee was not found, with the last record being only one male in 2019, historically the species has been recorded between Stinking Cove (Maelcombe) and Prawle Point (See Appendix).

Table 1. 2023/4 The highest recorded Long-horned Bee numbers.
The counts were probably under-estimates. (JW estimated 500-800 males at Gara in 2023). Females difficult to count. Population monitoring by timed counts or capture-mark recapture should be considered.

Key nests	**males**	**females**	**comment**
East Prawle Sharpers Cove	110 (6/6/23) 150 11/6/24	88 (29/6/23) 80 21/6/24	A large cluster of nesting aggregations.
Gara Rock (SX75313686)	270 (5/6/23) 120 12/6/23	153 (31/6/23) 68 19/6/24	A large cluster of nesting aggregations.
Sub nests			
Wollow Cove (or Willow) (SX77843543)	7 (4/6/23)	2 (4/6/23)	A small nesting area.
Copstone Cove (SX77453519)	24 (4/6/23) 3 11/6/24	2 (4/6/23) 1 21/6/24	A small nesting area.
Mercer Cove (SX76663585)	36 (15/6/23)	0	Individuals on flowers probable nest in area.
Mattiscombe (SX817369)		1 20/6/24	Probable nest area on undercliff.



Picture 6: Fig. 1. 2023 Locations of Long-horned Bee records with 800m (Red) and 1.4km buffer (Blue).

2024 conservation** recommendations**/observations

***Picture 7: Copstone SX774352 11/6/24.** NT meadow in rich in Birdsfoot Trefoils, Restharrow and Common Vetch, no grazing.*

***Picture 8: Copstone SX774352 21/6/24, Later on same area** cattle preferentially eating the vetch sp. and drastically reducing the flowering even of prostrate trefoils.*

Discussion

Clearly there has been decline in the population of Six-banded Nomad Bee since the 90's. Spooner in 1984 mentions "almost a glut of females at cliff exposures, outnumbering eucera" between Lannacombe to Prawle (see Appendix). The Long-horned Bee records and frequency of unoccupied nest holes (particularly around Copstone and Langerstone) suggest that the host population was more extensive previously.

Picture 9: Gara SX754368 21/6/24 *cattle have preferentially grazed all the common vetch, the grazing pressure should be higher in early spring and autumn, not june to mid july.*

In 2023 Gara supported the largest population of Long-horned Bee. Mitson (2019) suggests the Gara colony is a recent site. Stubbs (1994) found none west of Mercer Cove to Gara Rock. Spooner also recorded at Gara between 1940-84 but not Long-horn Bee.

Pollen resources are confined to very small areas with much of the surrounding landscape having either intensive farming or flower-poor scrub habitats. Lathyrus and/or Vicia sp. was very rare and even the usually ubiquitous White Clover was not found in great quantities. The bee is large and probably a strong flyer. It was travelling some distance to find Meadow Vetchling (c.a. 1.2km) with the landscape in-between was very legume poor, making foraging very inefficient (see appendix).

Information in Stubbs (1993) and 1888-1914 25 inch maps suggest flower poor scrub habitat (in some cases developing into secondary woodland) has greatly increased between the 1900's to present day within SSSI area from Gammon Head to Gara and many of the slopes at Woodcombe, Maelcombe, and Lannacombe.

The 2023 survey highlighted the importance of vetches (Lathyrus & Vicia sp.) above other legume species (see appendix). The right balance of too much/too little management is very important, Lathyrus and/or Vicia are much more vulnerable to summer grazing and/or cutting than prostrate legumes such as clovers and Birds-foot Trefoils, but also can be negatively affected by scrub/bracken succession.

Picture 10: Meadow vetchling *is more important than other commoner legume species, it does best in habitats with no summer grazing, this is difficult balance as scrub or bracken is a problem.*

Summer grazing can be in some cases the most practical option to conserve shorter grassland rich in trefoils and reduce bracken. At Gara the grazing was rotated leaving availability of clover and trefoils in different fields. But the timing (early/mid June) was very bad in the most important coastal edge units at Gara as the cattle browsed all the Common Vetch as it was flowering (see appendix for recommendations).

There is little research to answer "How big does the host population need to be to sustain a viable Nomad population?". The Nomad has only once been recorded in Cornwall (1909) despite a cluster of colonies some being large, in West Cornwall. A study of the rare Tormentil Nomad Bee (*Nomada robertjeotiana*) at a Cornish site from 2016-23 (Saunders 2023) found the mean ratio of nomad to host of 0.22 (The most frequent host to nomad ratio being in the range of 4-1 or 5-1). The rarity of Six-banded Nomad Bee and small number of records could suggest the nomad needs a huge population of the host across multiple sites.

Brown-banded Carder Bee (*Bombus humilis*) was not found on this survey. Brown-banded Carder Bee has suffered a dramatic decline in South Devon, pre 1970's the species was frequently recorded on the South Devon coast and Dartmoor, post 2000's there are only a handful of records (Saunders 2019). Brown-banded Carder Bee has a similar requirement for high quality legume rich habitats, but in landscape scale quantities. It is highly unlikely there is sustainable population at present in Prawle as flower habitats are too small and isolated. The one record of Bilberry Bumblebee (*Bombus monticola*) at Prawle, which almost certainly dispersed from Dartmoor, shows how caution is needed in interpreting single records.

Other species of interest were recorded including the Red-data book Spider hunting wasp *Cryptocheilius notatus*. The provisionally Red-data book Water-dropwort Mining Bee (*Andrena ampla*).The nationally scarce Black Mining Bee (*Andrena pilipes s.s.*), the Orange-horned Nomad Bee (*Nomada fulvicornis*) and Hawk's-beard Mining Bee (*Andrena fulvago*) and the scarce Spotted-vein Crane-fly (*Dicranomyia goritiensis*) and the long palped cranefly (*Ctenophora pectinicornis*).

Picture 11: Common Spiny Digger Wasp (Oxybelus uniglumis)

Conclusion

If there has been a small recent recovery in the host population, this has been balanced with long term increased isolation and landscape scale decline of the Long-horned Bee population. The Nomad may have been vulnerable for some time having a small population size making recovery from "bad years" and/ or expanding to new sites difficult.

Targeted conservation measures at Prawle are urgent and necessary for the Long-horned Bee, they should mainly focus on boosting tall Lathyrus and Vicia flowers as highest priority and to a lesser extent other general legumes.

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Appendix 1. Flower and Nest survey 2023

2023 Flower and Foraging observations

Female foraging behaviour was recorded and suggested a strong preference for Lathryus and Vicia rather than general legumes, although foraging observations were not collected systematically. Discriminating in the field between pollen collection (crucial limiting factor) and nectar collection (likely not an important limiting factor) can be unreliable. Published pollen analysis by flower family (Hennessy 2020) confirmed a strong association with Legumes but the only analysis by pollen species Saunders (2020) found a smaller group with the legumes mainly Lathyrus and/or Vicia sp to be most important. Pollen collection on Restharrow (*Ononis repens*) was also often observed at Prawle. Males were observed patrolling Kidney Vetch (*Anthyllis vulneraria*) and Bush Vetch (*Vicia sepium*) which are also of some importance at Cornish sites (Saunders 2020). Pollen samples were also collected and some future reporting is planned.

Table 2. 2023 Long-horned Bee Female Foraging observations

flower	
Common Vetch (Vicia sativa)	11
Narrow-leaved Everlasting-pea (Lathyrus sylvestris)	52
Meadow Vetchling (Lathyrus pratensis)	2
Restharrow (Ononis repens)	9
Tufted Vetch (Vicia cracca)	27
Bramble (Rubus fruticosus agg.)	1
Total Result	102

Picture 12: Long-horned Bee collecting *Restharrow (Ononis repens)*

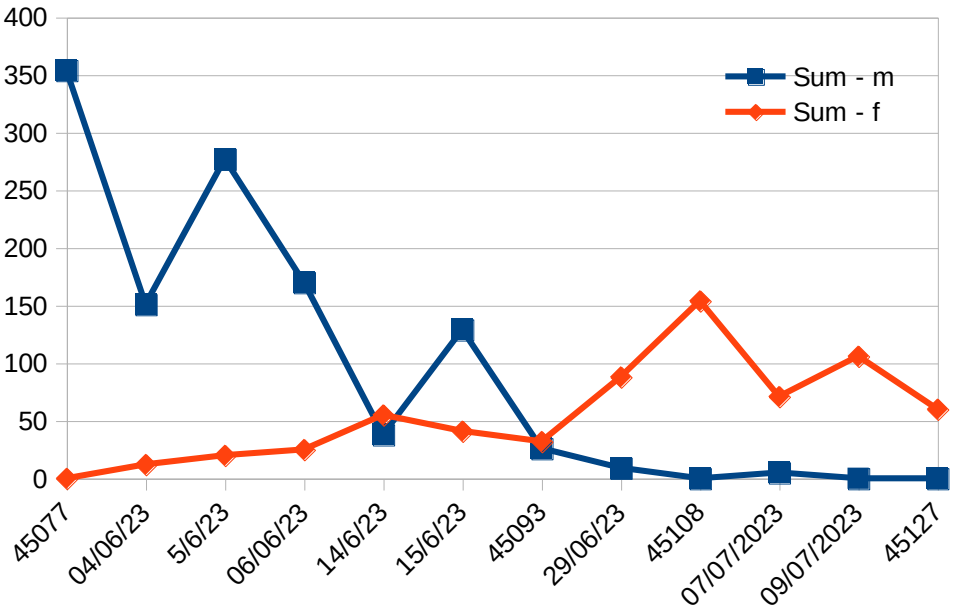
No females were observed collecting pollen on Common Bird's-foot Trefoil despite it being probably the most abundant legume in the coastal edge habitats. Tufted Vetch (*Vicia cracca*) and Meadow Vetchling were very scarce only found in any quantity in one field, although occasional odd plants were scattered in hedgerows and scrub edges. Narrow-leaved Everlasting-pea (*Lathyrus sylvestris*) was only found on the edge of the undercliff. Restharrow was quite abundant but only in very restricted patches, such as the undercliff at Gara. Restharrow was very rare in fields, apart from one field near near the Coastguard cottages. White Clover (*Trifolium repens*) was probably the most abundant legume in the whole area, on some Cornish sites this plant is very important, but no females were observed to use it at Prawle, although use of clovers is more likely to be missed as they were scattered throughout inland semi-improved pastures across the survey area.

Greater Birds-foot Trefoil (*Lotus pendunculatus*) Red Clover (*Trifolium pratense*) was occasionally present and are used in Cornwall. Small flowered legumes including Lesser Trefoil (*Trifolium dubium*) and *Medicago* sp. were sometimes frequent in field edges, these legumes are sometimes used in Cornwall, but are unlikely to be very important. Pale Vetch (*Vicia lutea*) was found in Sharpers Cove Meadow (SX78433567). This plant may be used but was not observed. Males were observed on wide range of plants but may not indicate pollen preferences.

The period of July/ August is particularly important both as period of peak foraging activity and more limited pollen resources. Many common legumes such as White Clover usually have a flowering peak slightly earlier.

Bramble collection was observed at Prawle. The author (or PS) has observed this in Cornwall and suggests this could be an indication of poor legume resources (Saunders 2020).

Fig. 2. Phenology of records



2023 Foraging distance observations

The survey recorded female activity throughout the survey area (Fig 1.). The paucity of suitable habitat in the area meant survey cover of important areas was good, although all secondary habitats inland were not possible to survey (see appendix for key areas). Most of the secondary habitats such as agricultural habitats inland were scanned at a distance for large flowering stands.

The survey did get some valuable observations which can inform (or infer) foraging distance, an extremely important factor in conservation targetting.

A female (or possibly 2 females) was found on two occasions foraging on Meadow Vetchling in the same road verge near East Prawle at approx 1.1km/1.2km from the nearest 3 nest sites. This was very interesting and useful indication of foraging range. Most Long-horned Bee females were recorded within 800m of the coast which was consistent with Cornish observations (Saunders 2020).

800m and 1.4m was applied as a buffer to the records (map 1.). This is an estimated figure of optimal and maximum foraging range to be used to inform conservation delivery. Quantifying foraging range is very difficult and questionable.

2023 Nest observations

The nests where mainly clustered in discrete areas (Sharpers Cove and Gara Rock) with large sections of cliff which looked superficially similar not occupied. Some unoccupied areas such (Langerstone Point) were peppered with old holes which also suggests historically the population was larger and more extensive, but it is likely there are climatic and soil suitability factors which are also very important.

Long-horned Bee nests were mainly found on vertical cliff areas dominated by bare ground, usually having a south to east aspect, although a range of micro aspects were found.

Picture 13: Sharpers Cove nest site

Nest aggregations mainly occurred within finer silt and clay often as a layer between strips having more large stones or rubble, probably being classed as Loess deposits. Usually sites were almost totally un-vegetated but one nest aggregation (Gara Rock East) did occur in steep slope of short maritime grassland with less than 5% bare ground.

Nest sites in Cornwall usually are vertical cliffs often with loess type deposits superficially similar to Prawle. Loess soil types in Devon and Cornwall typically have high clay and silt content (Catt & Staines 1982). The bee does nest in flat compacted bare-ground in Cornwall, such as a well walked area on SW coast-path on one site. On one site nesting was found in an almost flat garden lawn with almost no bare ground. In Cornwall they also use finer more friable areas of clay or silt, on several sites mining spoil-heaps are used and one site china clay waste.

Nests (with larvae) are very vulnerable to destruction by storm surges as they are usually situated in tight aggregations in soft material. This has been observed in Cornwall and is an issue with some sites where the bees are mainly restricted to one area at the high water mark. At Prawle there was no observation of recent damage. At the Cornish sites the most damaging storm events are not annual. Climate change induced increased frequency and severity of storm events needs further monitoring this site.

The nest requirements of ground nesting bees is a field with little published research. More research is needed. Soil samples were taken and some future reporting is planned on soil types and nest classification.

Appendix 2. Six-banded Nomad Bee records.

Table 5.

Location		Recorder	Comment
Coastpath above Willow Cove SX777354	2019	A.Whitehouse & C.Mitson	6/6/2019 One male. Det. S.Falk
Sharpers Cove	2017	C.Mitson	14.06.2017 A fresh individual carrying Meloe proscarabeus triungulins John Walters 17.06.2017 Brief individual sighting around a nest entrance Philip Strange 21.06.2017 Two individuals spotted Lee Dingain and Rachel Ward 23.06.2017 Four sightings, unsure if four different individuals Philip Strange 13.07.2017 One individual at main nest site around midday John Walters
Sharpers Cove	2014	P.Saunders	7/7/14, At least one female shown to me by S.Falk, at dense Eucera aggregation
Prawle Cliffs	1993	A.Stubbs	20/6-24/6/93 3 Sharpers head, one Willow cove (Wollow) SX778354, 3 cliff west of Malcombe sand (Maelcombe) to stinking cove (Maelcombe) SX792363 SX793364 SX794365, (1989 16 females mainly near Sharpers cove)
Sharpers point	1985	G.M. Spooner	20/7/85 several females, esp near sharpers point around eucera burrows,
Prawle cliffs to Langerstone	1984	G.M. Spooner	p.104 3/7/84 almost a glut of females at cliff exposures, outnumbering eucera, some males at ger.sang with host, worn male at Langerstone point.
Prawle Cliffs	1981	G.M. Spooner	14/7/81 eastern part 2 females at earth exps with eucera burrows. West cliff, skirt of 3 females at eucera burrows.
Prawle Cliffs	1979	G.M. Spooner	6/7/79 At least 6 females exploring eucera burrows undercliff, seen also by Alan stubbs and L. Packer.
Lannacombe	1979	A.Stubbs	A female at eucera aggregation SX801371

Appendix 3. Table 6. Species recorded on the Prawle survey by PS and JW

Vernacular	Taxon	Status	
Red Banded Sand Wasp	*Ammophila sabulosa*		
a mason wasp	*Ancistrocerus gazella*		
a potter wasp	*Ancistrocerus oviventris*		2024
Small Gorse Mining Bee	*Andrena afzeliella*	(recent taxon split)	
Water-dropwort Mining Bee	*Andrena ampla*	Prdb	2024
Sandpit Mining Bee	*Andrena barbilabris*		2024
Ashy Mining Bee	*Andrena cineraria*		2024
Yellow-legged Mining Bee	*Andrena flavipes*		
Hawk's-beard Mining Bee	*Andrena fulvago*	Na	2024
Orange-tailed Mining Bee	*Andrena haemorrhoa*		2024
Grey-patched Mining Bee	*Andrena nitida*		2024
Black Mining Bee	*Andrena pilipes sens. str.*	Nb	2024
Cliff Mining Bee	*Andrena thoracica*		
Trimmer's Mining Bee	*Andrena trimmerana*	Nb	
Wool Carder Bee	*Anthidium manicatum*		2024
Green-eyed Flower Bee	*Anthophora bimaculata*		
a digger wasp	*Astata boops*		
Six-belted Clearwing	*Bembecia ichneumoniformis*	Nb	
Red-tailed Bumblebee	*Bombus lapidarius*		2024
Common Carder Bee	*Bombus pascuorum*		2024
Buff-tailed Bumblebee	*Bombus terrestris*		2024
Sand Tailed Digger Wasp	*Cerceris arenaria*		
a digger wasp	*Cerceris ruficornis*		
Ornate Tailed Digger Wasp	*Cerceris rybyensis*		2024
Large Sharp-tail Bee	*Coelioxys conoidea*		2024
Shiny-vented Sharp-tail Bee	*Coelioxys inermis*		
Davies' Colletes	*Colletes daviesanus*		
Slender Digger Wasp	*Crossocerus elongatulus*		2024
4-spotted Digger Wasp	*Crossocerus quadrimaculatus*		
a spider-hunter wasp	*Cryptocheilus notatus*	RDB2	
a long palped cranefly	*Ctenophora pectinicornis*	Scarce	2024
A cranefly	*Dicranomyia goritiensis*	RDB3	
a short-palped cranefly	*Dicranomyia morio*		2024
A cranefly	*Dicranomyia ornata*	Scarce	
a spider-hunter wasp	*Dipogon variegatus*		
a spider-hunter wasp	*Dipogon variegatus*		2024
Black-thighed Epeolus	*Epeolus variegatus*		
Red Legged Spider Wasp	*Episyron rufipes*		2024
Long-horned Bee	*Eucera longicornis*	Na	2024
A cranefly	*Geranomyia unicolor*		
a cuckoo wasp	*Hedychridium ardens*		
Hairy Yellow-face Bee	*Hylaeus hyalinatus*		
Green Furrow Bee	*Lasioglossum morio*		2024

Long-faced Furrow Bee	***Lasioglossum punctatissimum***		
Smeathman's Furrow Bee	***Lasioglossum smeathmanellum***		
a digger wasp	***Lindenius albilabris***		
Humming-bird Hawk-moth	***Macroglossum stellatarum***	**Migrant**	
Coast Leafcutter Bee	***Megachile maritima***	**Local**	**2024**
Painted Nomad Bee	***Nomada fucata***	**Na**	**2024**
Orange-horned Nomad Bee	***Nomada fulvicornis sens. str.***	**RDB3**	**2024**
Gooden's Nomad Bee	***Nomada goodeniana***		
Blunt-jawed Nomad Bee	***Nomada striata***		**2024**
Spiny Mason Wasp	***Odynerus spinipes***		**2024**
Bee Wolf	***Philanthus triangulum***	**RDB2**	
Thrift Clearwing	***Pyropteron muscaeformis***	**Nationally Scarce**	
Rosechafer	***Rose chafer***		
Dark Green Fritillary	***Speyeria aglaja***		
Bare-saddled Blood Bee	***Sphecodes ephippius***		**2024**
Dark-winged Blood Bee	***Sphecodes gibbus***		**2024**
Box-headed Blood Bee	***Sphecodes monilicornis***		
Sickle-jawed Blood Bee	***Sphecodes puncticeps***		
a cuckoo wasp	***Trichrysis cyanea***		