CARMARTHENSHIRE BAT ATLAS 1970 to 2023

by

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Photo Credits: Denise Plume, David Lee, Bat Conservation Trust and Daniel Whitby

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Introduction

Carmarthenshire is located in south-west Wales and is bordered by Powys to the east, Ceredigion to the north, Swansea and Neath Port-Talbot to the south east, and Pembrokeshire to the west. The Black Mountain range in the Brecon Beacons National Park dominates the east of the county with the lower foothills of the Cambrian Mountains to the north of the county. Carmarthenshire is predominantly agricultural but there are other industries such as forestry, fishing and tourism. The county has a population of approximately 190,000 which is 6% of Wales' total. The main urban conurbations are Carmarthen, Llanelli and Ammanford.

The river network and its long coastline are important habitats for wildlife, particularly bats and birds as they are used for navigating, foraging, roosting and nesting. There are 10 major river systems in the county (Afon Aman, Cothi, Cych, Cywyn, Gwendraeths, Gwili, Llwchwr, Taf, Teifi, and Twyi). The Afon Tywi (River Towy) is the longest flowing river within Wales, and starts at the Cambrian Mountains and flows southwards through Carmarthenshire and ends at Carmarthen Bay, where is flows into the Bristol Channel. The Afon Teifi (River Teifi) is 73 miles long and starts at the Cambrian Mountains and forms much of the border between Carmarthenshire and Ceredigion.

Carmarthenshire's geology has been well described but of its importance for bats, the limestone ridge that extends from Kidwelly in the west, north eastwards in an arc up to Mynydd Du is especially important for hibernating bats. Elsewhere the workings of the old coal measures that were once a crucial part of the industrial era also provide locations for bats to hibernate.

Carmarthenshire has a number of sites that are considered to be of international importance for nature conservation designated as Special Areas of Conservation (SAC) and Special Protection Areas (SPA). There are 81 Sites of Special Scientific Interest (SSSI), excluding the area within the Brecon Beacons National Park, and covers approximately 7.2% of the county. SSSI sites are important sites for wildlife; their habitats include ancient woodland, flower-rich meadows, wetlands as well as disused quarries.

There are also six Local Nature Reserves (LNR) which support a rich variety of wildlife; Morfa Berwig, Pembrey Burrows and Saltings, Ashpits Pond and Pwll Lagoon, North Dock Dunes (Llanelli coastal area), Carreg Cennen and Glan-yr-Afon Kidwelly.

In the UK, 17 species of bats are known to breed, 15 have been recorded in Wales, 14 in Carmarthenshire. Bechstein's bat (*Myotis bechsteinii*) has not been recorded in Carmarthenshire, but has previously been recorded in Brecon and in Pembrokeshire. The grey long-eared bat (*Plecotus austriacus*) is very rare and at the very limit of its European range in the southern counties of England, so is unlikely to be present in Carmarthenshire despite DNA evidence from bat droppings collected in south west of the county some years ago. The Alcathoe bat (*Myotis alcathoe*), new to science and discovered only in 2001, was confirmed in the British Isles in 2010 and is one of three cryptic species. It has yet to be recorded in Wales.

There are limited numbers of records for some bat species in Carmarthenshire, particularly those species that are difficult to determine using bat detectors alone (personal review of records 2021). The most difficult species to identify are those in the genus *Myotis.* A total of 4 out of 6 *Myotis* species known to breed nationally have been recorded in Carmarthenshire. A 7th *Myotis* species - the greater mouse-eared bat (*Myotis myotis)* was discovered in the UK in 1958 but was officially declared locally extinct in 1990. However, since 2002, one single male has been recorded hibernating in a disused railway tunnel in West Sussex most years, but in January 2023, two greater mouse-eared bats were discovered in two disused railway tunnels (BCT, 2023).

This first edition of the Carmarthenshire Bat Atlas was produced in January 2022, using 10,772 records received from West Wales Biodiversity Information Centre (WWBIC) covering 51 years of recording (1970 to 2021).

The second edition of the Carmarthenshire Bat Atlas was produced following a two year project run by the authors to boost the biological records for bats. The number of records used in this edition has virtually doubled from 10,772 to 19,108; an overall increase of 8,336 records in two years. Included in the second edition are 511 records of "unidentified bat" which were not included in the first edition of the Carmarthenshire Bat Atlas. Also the number of records generated from garden surveys, swarming surveys, driven and walking transects and trapping surveys carried out under the Carmarthenshire Bat Project generated 3,888 new records between May and September, 2022 and 2023.

The biological records received from WWBIC are generally considered good quality with a widespread coverage of "all bats". A total of 1,153 × 1km^2 grid squares now contain bat records. Since the total area of Carmarthenshire is 2440km^2 this represents coverage of 47% of the county; an increase in coverage of 15% in two years.

Table 1: The number of records for each bat species recorded in Carmarthenshire in 2021 and 2023.

Scientific Name	Common name	Number of Records 1970 to 2021 Baseline Atlas (1st Edition)	Number of Records 1970 to 2023 This Atlas (2nd Edition)
Chiroptera	Unidentified bat	Not included	511
Pipistrellus sp.	Pipistrelle bat	933	1026
Pipistrellus pipistrellus	Common pipistrelle	1901	4512
Pipistrellus pygmaeus	Soprano pipistrelle	1960	4051
Pipistrellus nathusii	Nathusius' pipistrelle	21	23
Plecotus auritus	Brown long-eared bat	904	1507
Myotis species.	*Myotis* species	893	1262
Myotis sp. (small)	Whiskered/Brandt's	441	811
Myotis mystacinus	Whiskered bat	158	174
Myotis brandtii	Brandt's bat	47	47
Myotis nattereri	Natterer's bat	920	1575
Myotis daubentonii	Daubenton's bat	694	1207

Scientific Name	Common name	Number of Records 1970 to 2021 Baseline Atlas (1st Edition)	Number of Records 1970 to 2023 This Atlas (2nd Edition)
Nyctalus species	Nyctalus species	96	110
Nyctalus noctula	Noctule bat	546	835
Nyctalus leisleri	Leisler's bat	29	29
Eptesicus serotinus	Serotine bat	32	35
Barbastella barbastellus	Barbastelle bat	132	138
Rhinolophus sp.	Horseshoe bat	2	2
Rhinolophus ferrumequinum	Greater horseshoe bat	844	998
Rhinolophus hipposideros	Lesser horseshoe bat	219	255
Total Records		**10772**	**19108**

The distribution of records from each species is mapped at a 1km square resolution, based on Ordnance Survey grid squares (monads). The current recording period for this Atlas is considered to be 2000 to 2023 and distributions of records, which amount to 17,586, from this period, are shown as blue circles. The distributions of earlier records obtained from 1970 to 1999 inclusive, which amount to 1,522, are indicated by underlying red squares.

Pipistrelle bats (*Pipistrellus species)* have the highest number of available records at 50% and the *Myotis* group are the second most recorded group at 27%. The most recorded *Myotis* species is the Natterer's bat (*Myotis Nattereri*) and then Daubenton's bat (*Myotis daubentonii*), both have recognisable echolocation calls; the latter has hockey like social calls as well as being easily identified visually as it trawls just above the water's surface to forage.

Some species are not so easily identified, either by bat detector or in the hand, and are more likely to occur in woodlands, around water bodies or historic buildings such as churches. It is not clear whether small numbers of records imply that such species are rare or merely under recorded, particularly species difficult to identify by bat detector. In particular from 2000-2023, 41% of *Myotis* records and 11% of records from the *Nyctalus* group were only identified to genus level.

The majority of recorders and determiners listed in WWBIC's database are deemed competent bat workers and known to the authors. Records covering all verification categories have been accepted for the purposes of this document so their accuracy, particularly those species difficult to identify using bat detectors alone, should to be viewed with some degree of caution.

Explanatory notes about the records and the species have been included in this document in addition to distribution maps and photographs. The conservation status of each bat species according to International Union for the Conservation of Nature (IUCN) listing is also included, as published on the Mammal Society's website under the IUCN Red List criteria (June 2021), each species is allocated to one of the following categories, relating to

imminent risk of extinction: Critically Endangered (CR), Endangered (EN), Vulnerable (VU), Near Threatened (NT), Least Concern (LC), Data Deficient (DD) (2023, Mammal Society).

Disclaimer:
The Atlas distribution maps indicate bat presence only – they do not imply bat abundance, habitat type, the time of year or years bats were present or recorded, where and what the bat was doing at the time (roosting, in flight, dead, hibernating, swarming or breeding) or the number of records per monad square.

If bats are not shown as present in a monad square then it is likely they have not been recorded, as opposed to being absent. There are some areas where bats are recorded more than others; these areas are often heavily influenced by where a bat worker/recorder lives. Information contained in this Atlas cannot be used to support a planning application or can it be used to prove bats are absent from a site.

“All Bat Species” Distribution

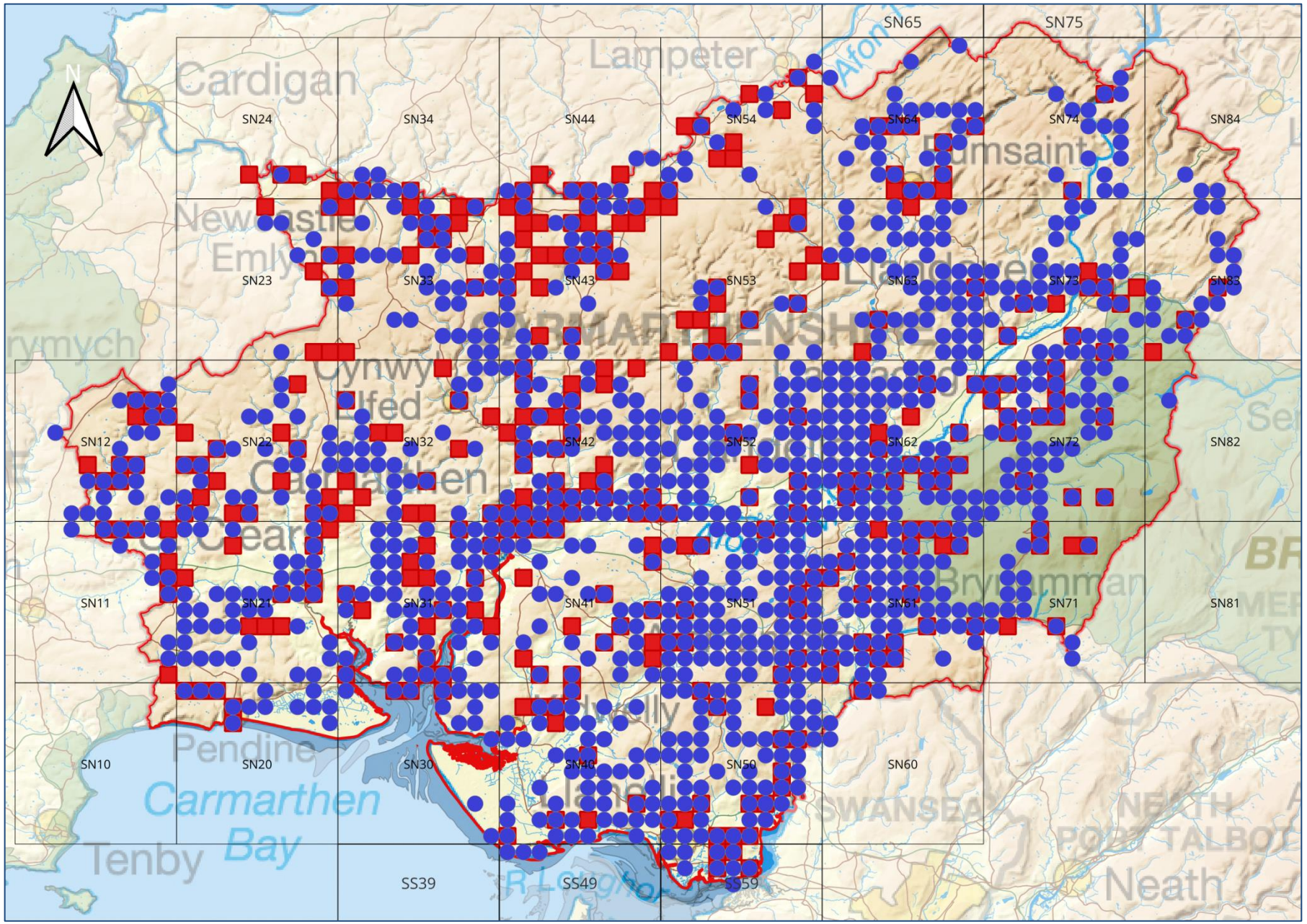


Figure 1: Distribution of all bat species using 19,108 records from 1970 to 2023 (pre-2000 records are shown as red squares)

Pipistrelles (*Pipistrellus species*) (common and soprano pipistrelles)

Photo credit: Soprano pipistrelle by Denise Plume and David Lee

In 1999, the soprano pipistrelle (*Pipistrellus pygmaeus*) was formally separated from the common pipistrelle (*Pipistrellus pipistrellus*) on the basis of mitochondrial DNA analysis. Previously the "common pipistrelle" was considered to be a single species, although there was increasing suspicion that this may not be true when it was discovered that there appeared to be two discrete "phonic types" echolocating at different frequencies. We now know that the common pipistrelle echolocates at around 45kHz and the soprano at around 55kHz. However, their echolocation frequencies can vary considerably if the bat is foraging in clutter or in areas where there are large numbers of bats. There are also subtle differences in their appearance, habitat preference and prey selection.

Pipistrelle bats (common and soprano pipistrelles) recorded between 1970 and 1999 are shown in the records as one species i.e. Pipistrelle species. However, since 1999 they have been recorded as separate species, as well as just pipistrelle bats.

Distribution: The pipistrelle is found in most of Europe and it is the most common and widespread bat in the British Isles. In Carmarthenshire, it is also widely distributed and considered to be common.

Identification: This small bat emerges approximately 20 minutes after sunset flying fast and erratically pursuing small insects, which it catches and eats on the wing. Pipistrelles are relatively easy to identify using a bat detector and it is the bat the public are most likely to see.

Roosts: Summer roosts are usually found in crevices around the outside of buildings such as behind hanging tiles, soffits, barge or eaves boarding, between roofing felt and roof tiles or in cavity walls. This species also roosts in bat boxes, tree holes and crevices. In winter it is found in crevices of buildings and trees, and also in bat boxes. It is rarely encountered underground.

Pipistrelle bats (common and soprano), *Pipistrellus species*

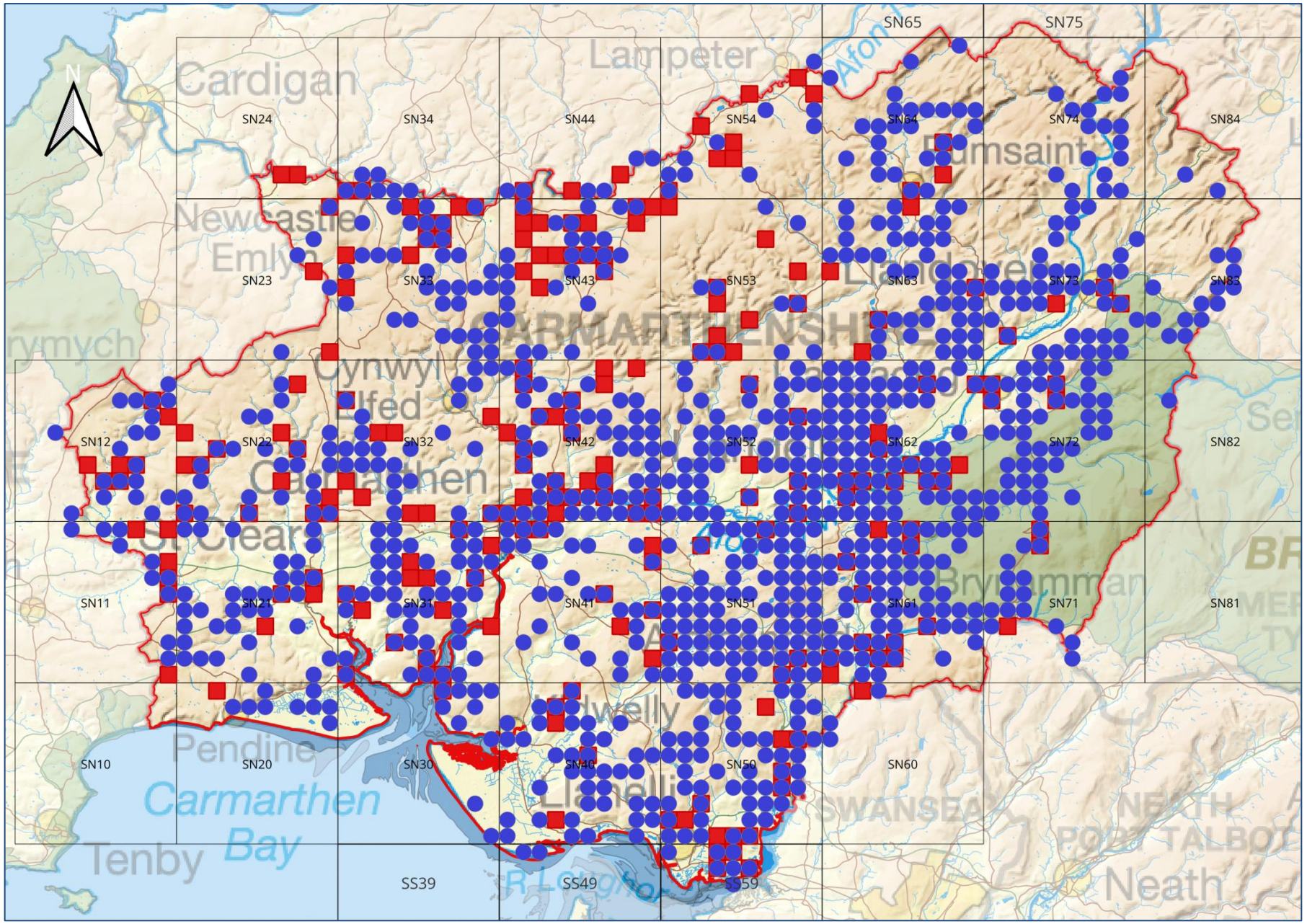


Figure 2: Distribution of *Pipistrellus species* from 1970 to 2023 using 9,612 records (pre-2000 records are shown as red squares)

Common pipistrelle (*Pipistrellus pipistrellus*)

Photo Credit: Denise Plume and David Lee

Distribution: The common pipistrelle bat is found in most of Europe and is common and widespread in most of the British Isles. In Carmarthenshire, it is also widespread and considered as common.

ICUN Conservation Status (Great Britain and Wales): IUCN Red list: GB: LC; Wales: [LC].

Identification: This small bat usually emerges from its roost about 20 minutes after sunset and can be seen flying fast and erratically pursuing their prey. The dorsal fur is dark to chestnut brown and the ventral fur is paler. It has a long snout and the face and ears are dark brown to black. Males have white buccal glands in the breeding season.

Feeding Habitat and Diet: It forages in a wide range of habitats comprising woodland, hedgerows, grassland and farmland and also in suburban and urban areas. It feeds on a wide range of small flies, aquatic midges and mosquitoes, which it catches and eats on the wing by 'aerial hawking'.

Roosts: Summer roosts are usually found in crevices around the outside of buildings, such as behind hanging tiles, soffits and barge boarding, between roofing felt and roof tiles, or in cavity walls. This species also roosts in bat boxes, tree holes and crevices. In winter it is found in crevices of buildings and trees, and also in bat boxes. It is rarely encountered underground.

Common pipistrelle (*Pipistrellus pipistrellus*)

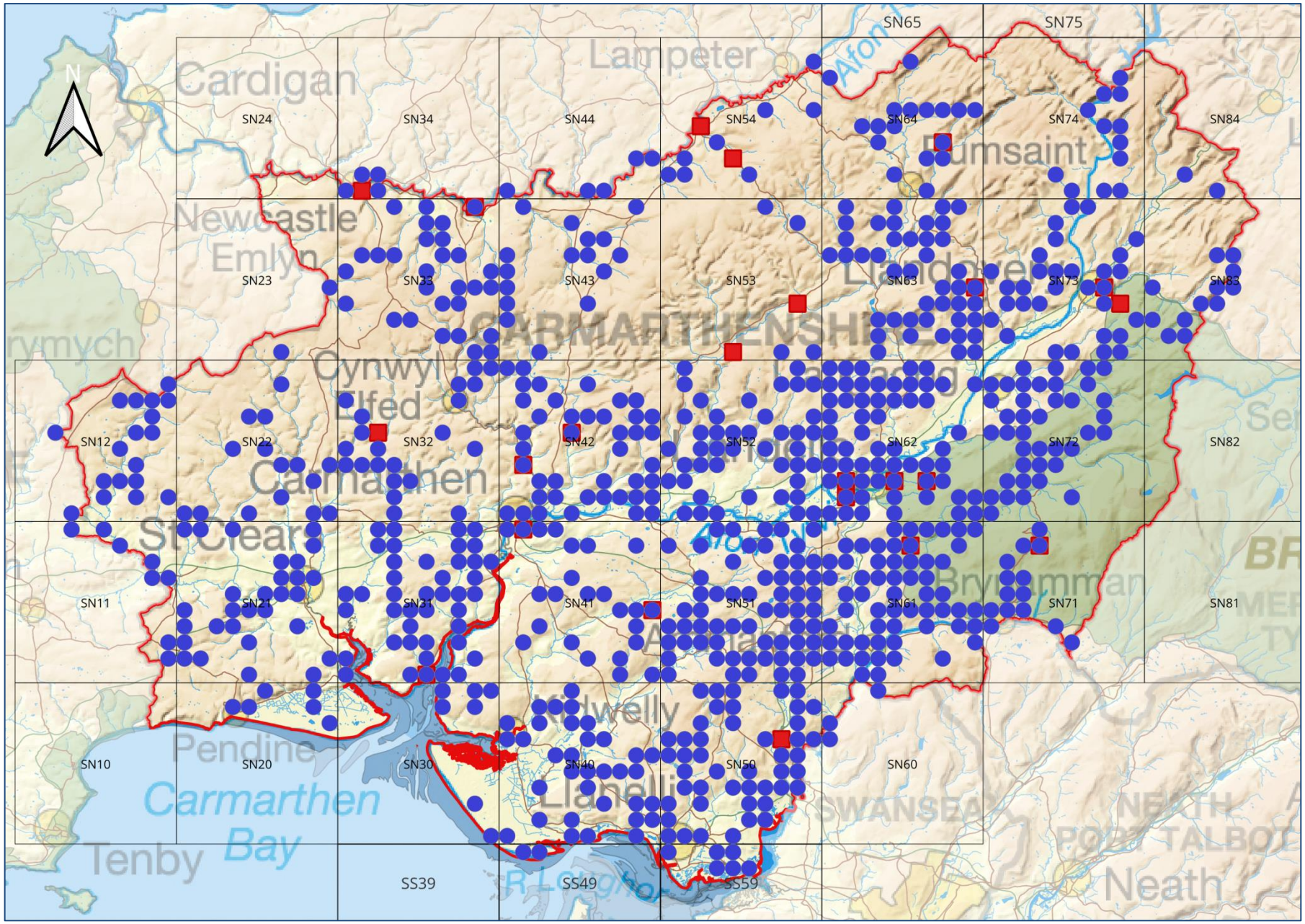


Figure 3: Distribution of *Pipistrellus pipistrellus* from 1970 to 2023 using 4,512 records (pre-2000 records may include *P.pygmaeus*)

Soprano pipistrelle (*Pipistrellus pygmaeus*)

Photo credit: David Lee

Distribution: The soprano pipistrelle bat is found in most of Europe and is common and widespread in the British Isles. In Carmarthenshire, it is widespread and considered common.

ICUN Conservation Status (Great Britain and Wales): IUCN Red list: GB: LC; Wales: [LC].

Identification: This small bat usually emerges from its roost about 20 minutes after sunset and can be seen flying fast and erratically pursuing their prey. The dorsal fur is chestnut brown and can sometimes have an olive tinge; the ventral fur is paler. It has a short pale snout, pale face and ears; there is a pale bald area around the ears and eyes. Males have yellow buccal glands in the breeding season.

Feeding Habitat and Diet: It usually forages over lakes and rivers, around woodland edges, tree lines, hedgerows, in gardens and parks. It feeds on a wide range of Hymenoptera, Diptera, mayflies and lacewings, as well as the aquatic midges which it catches and eats on the wing.

Roosts: Summer roosts are usually found in crevices around the outside of buildings, such as behind hanging tiles, soffits and barge boarding, between roofing felt and roof tiles or in cavity walls. This species also roosts in bat boxes, tree holes and crevices. In winter, it is found in crevices of buildings and trees, and also in bat boxes. It is rarely encountered underground.

Soprano pipistrelle (*Pipistrellus pygmaeus*)

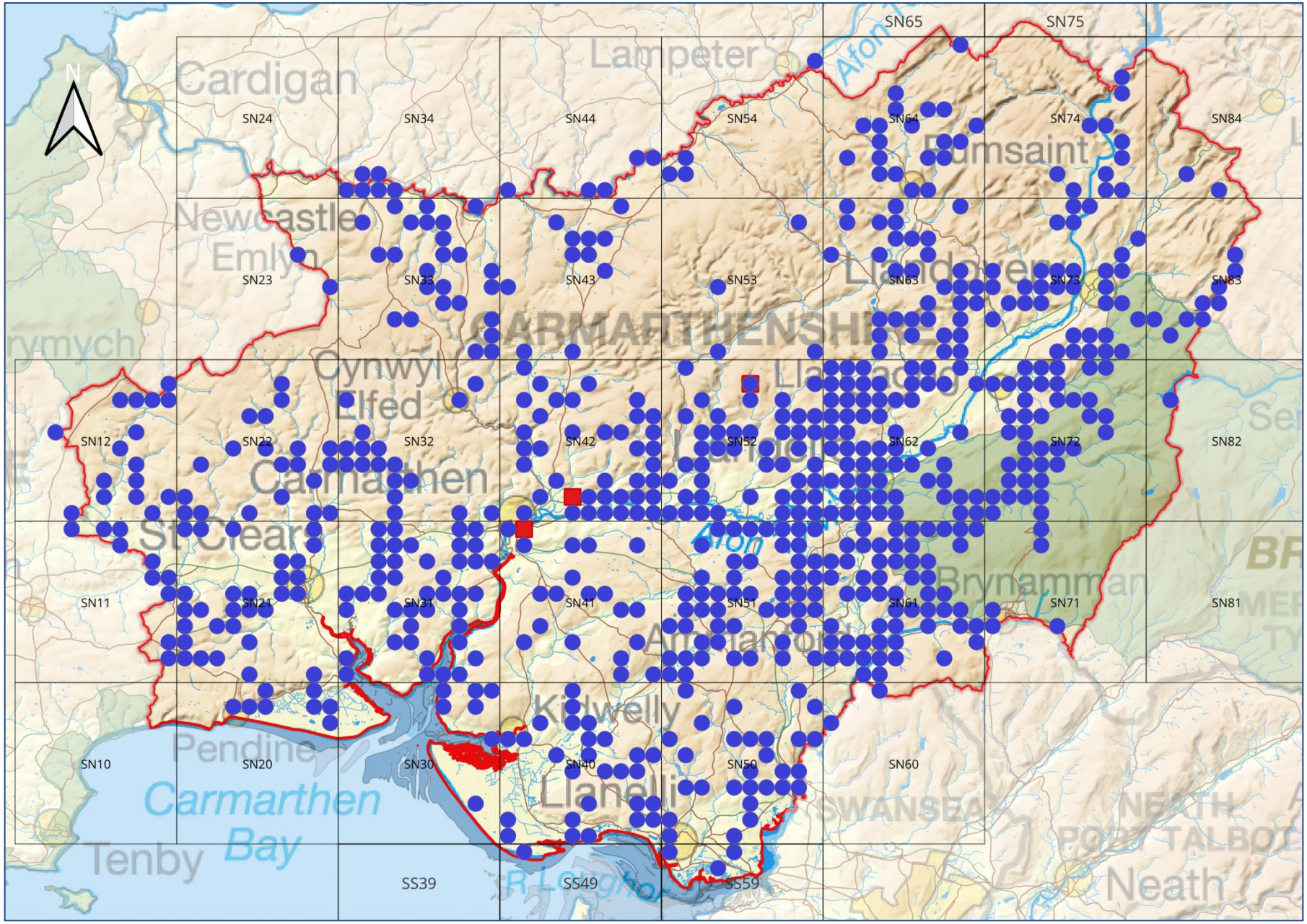


Figure 4: Distribution of *Pipistrellus pygmaeus* from 1970 to 2023 using 4051 records (pre-2000 records may include *P.pipistrellus*)

Nathusius' pipistrelle (*Pipistrellus nathusii*)

Photo credit: Denise Plume

Distribution: The Nathusius' pipistrelle is found from Western Europe to Asia Minor. It is a long-distance migrant often travelling along coastlines and mostly encountered in autumn, although some do remain all year and breed in the British Isles. In Carmarthenshire, it is considered to be extremely rare.

ICUN Conservation Status (Great Britain and Wales): IUCN Red list: GB: NT; Wales: [VU].

Identification: This medium-sized bat has dark-reddish dorsal fur which extends considerably on the tail membrane; the ventral fur is paler. The tail projects <6mm beyond the tail membrane and has a post-calcarial lobe with a visible T-piece. The penis is egg-shaped and is robust with long hairs and a medial groove.

Feeding Habitat and Diet: Nathusius' pipistrelle forages near coastal waters, estuaries, rivers, canals, lakes and water-logged areas, as well as along woodland rides and edges. It feeds on medium-sized flying insects such as aquatic flies, midges, mosquitoes and caddis flies which are caught on the wing by "aerial hawking".

Roosts: In summer, maternity roosts are located in cavity walls or under slate in brick buildings. In both summer and winter, individuals are found in cracks in brickwork, under soffit boards, fissures in rocks and sometimes in bat boxes.

Nathusius' pipistrelle (*Pipistrellus nathusii*)

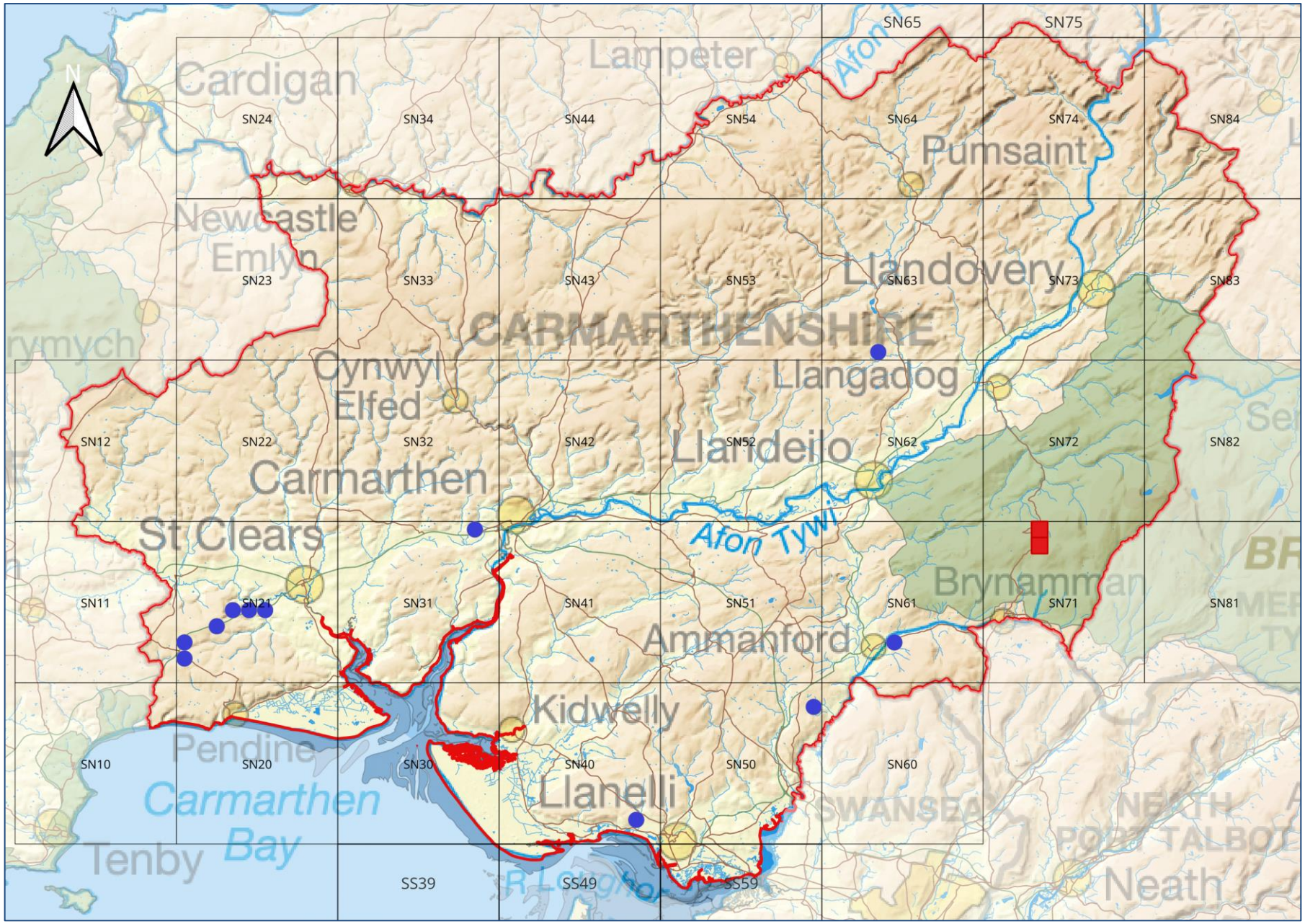


Figure 5: Distribution of *Pipistrellus nathusii* 1970 to 2023 using 23 records (there are only two records pre 2000)

Brown long-eared Bat (*Plecotus auritus*)

Photo credit: Denise Plume

Distribution: The brown long-eared bat is found in the whole of Europe, but is rare or absent in the Mediterranean region. It is found throughout Britain and is widespread and common in Carmarthenshire. The distribution maps include records submitted as "*Plecotus species"* as well as "*Plecotus auritus"* since it assumes that the grey long-eared bat (*P.austriacus)* is not present in Carmarthenshire.

ICUN Conservation Status (Great Britain and Wales): IUCN Red list: GB: LC; Wales: [LC].

Identification: This medium-sized bat has long, delicate ears (>28mm) which join at the base. The long and fluffy dorsal fur is brown with a reddish tinge; the ventral fur is yellowish grey. It has large sometimes bulging eyes and a short muzzle, compared to the grey long-eared bat. The ears are curled and tucked under the wings when at rest; the tragus (inner ear lobe) can be confused as being ears when the bat is torpid.

Feeding Habitat and Diet: It forages in coniferous and deciduous woodlands, orchards, parks, and gardens. It is known as the "whispering bat" due to its quiet echolocation calls. It hunts slowly amongst foliage searching for prey and will often glean insects from the surface of foliage. It feeds on Diptera, grasshoppers, moths, spiders, earwigs and caterpillars.

Roosts: In summer, it is found in older buildings, barns, churches, trees and bat boxes. In winter, it is found hibernating in caves, tunnels, mines, icehouses, and occasionally in trees and buildings.

Brown long-eared Bat (*Plecotus auritus*)

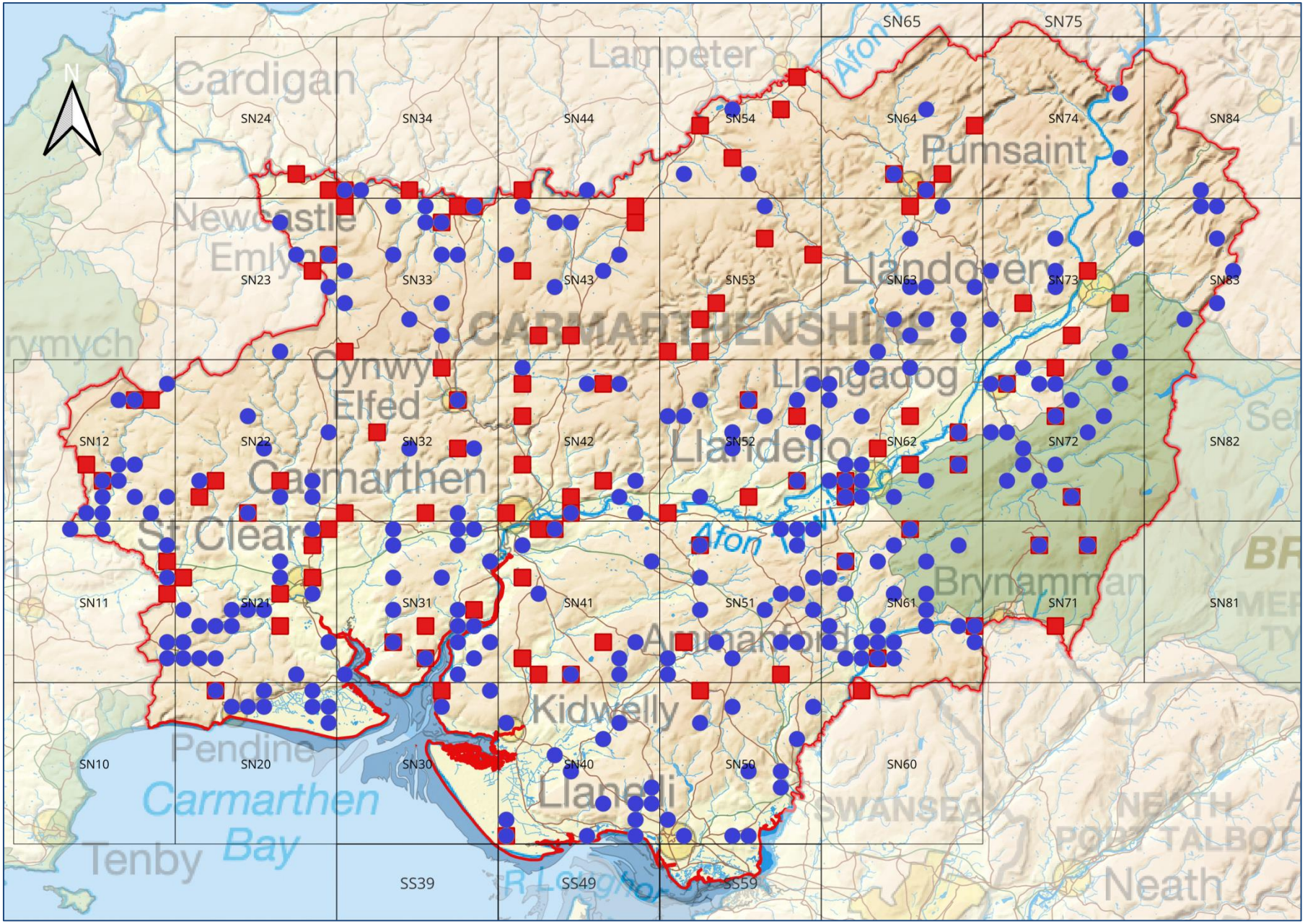


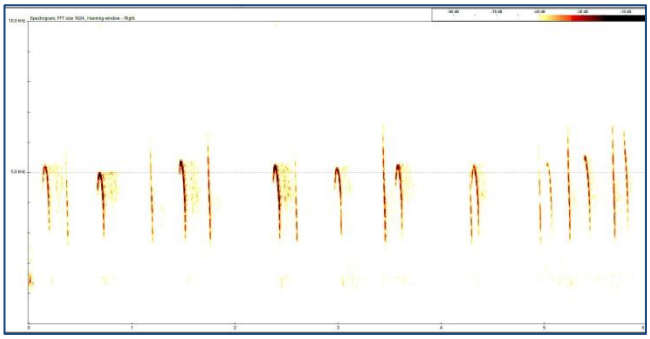
Figure 6: Distribution of *Plecotus species*/*Plecotus auritus* using 1507 records from 1970 to 2023 (pre-2000 records are shown as red squares)

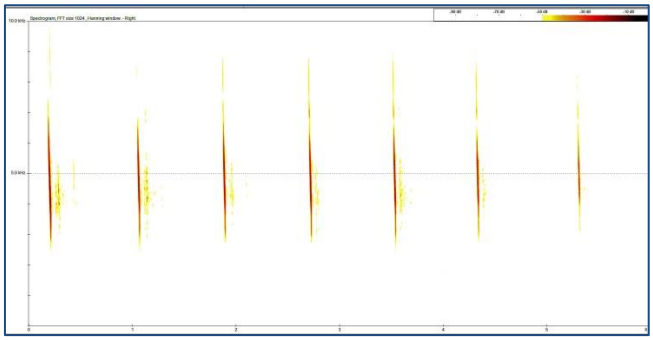
The *Myotis* Genus

In the British Isles, there are six species of *Myotis* bats; Natterer's (*Myotis nattereri*), Daubenton's, (*M. daubentonii*) Bechstein's, (*M. bechsteinii*) Brandt's (*M. brandti*), whiskered (*M. mystacinus*) and Alcathoe (*M. alcathoe*). Four out of the UK's six *Myotis* species have been recorded in Carmarthenshire with the exception of the Alcathoe and Bechstein's bat.

Myotis bats are similar in both appearance and echolocation calls. They all have distinct dark dorsal fur with pale/white ventral fur and have similar preferences for roosting, especially in winter where they use underground sites such as cave systems, disused mines and railway tunnels for hibernating. They will often gather at these sites during the autumn for swarming activities and can also be found in cracks and crevices in stonework.

All *Myotis* species echolocate using short, frequency modulated calls with slight tonal differences. However, it is difficult to determine individual species from these broadband sweeps in the field. Identification cannot always be relied upon even when calls are analysed using sophisticated sound analysis software. Surveyors frequently group all 6 species under the genus *Myotis* when carrying out bat activity surveys to avoid ambiguity. However, observation of flight patterns and foraging habitat can assist in the identification of some *Myotis bats to* species. Daubenton's bats, for example, are fairly easy to identify when they trawl across lakes and ponds just above the water's surface. Natterer's bats can be recognised as they will normally fly strongly and higher from the water's surface; they can also echolocate at frequencies ranging from around 120kHz to 20kHz, where most other *Myotis* species echolocate over a much narrower range of frequencies. However, this latter observation cannot always be relied upon.





Images 1 & 2: Examples of simple echolocation calls for 2 *Myotis* species; 1) Daubenton's echolocation calls with missing frequencies due to it foraging behaviour over water and its distinctive hockey stick social calls. 2) Natterer's echolocation calls can be long and straight. However, not all calls from these 2 species are typical as illustrated in these images.

Where it is possible to separate some Natterer's and Daubenton's echolocation calls, it is extremely difficult to separate the small *Myotis* species which are normally grouped as whiskered/Alcathoe/Brandt's, whiskered/Brandt's or "WABS" for short.

Whiskered, Brandt's and Alcathoe are known as "cryptic species" because they are difficult to identify even in the hand. Whiskered and Brandt's bats were separated in 1970 and separated using a combination of various features such as biometrics, tragus shape, claw length and differences in dentition and penis shape. Little information is known about the Alcathoe, a new species for the British Isles since 2010 and new to science being first identified in Greece in 2001. Distinguishing features of this species compared to whiskered and Brandt's bats is in pelage colour, size and shape of the tragus, forearm length and its overall size. However, the use of DNA from bat droppings is being used more frequently to identify bats, especially the cryptic species.

The *Myotis* Genus

Figure 7: *Myotis* species: top row from left to right; Daubenton's bat, Natterer's bat and Bechstein's bat.
Bottom row left to right; whiskered, Brandt's and Alcathoe bat
Photo credit: Denise Plume and David Lee

Myotis species

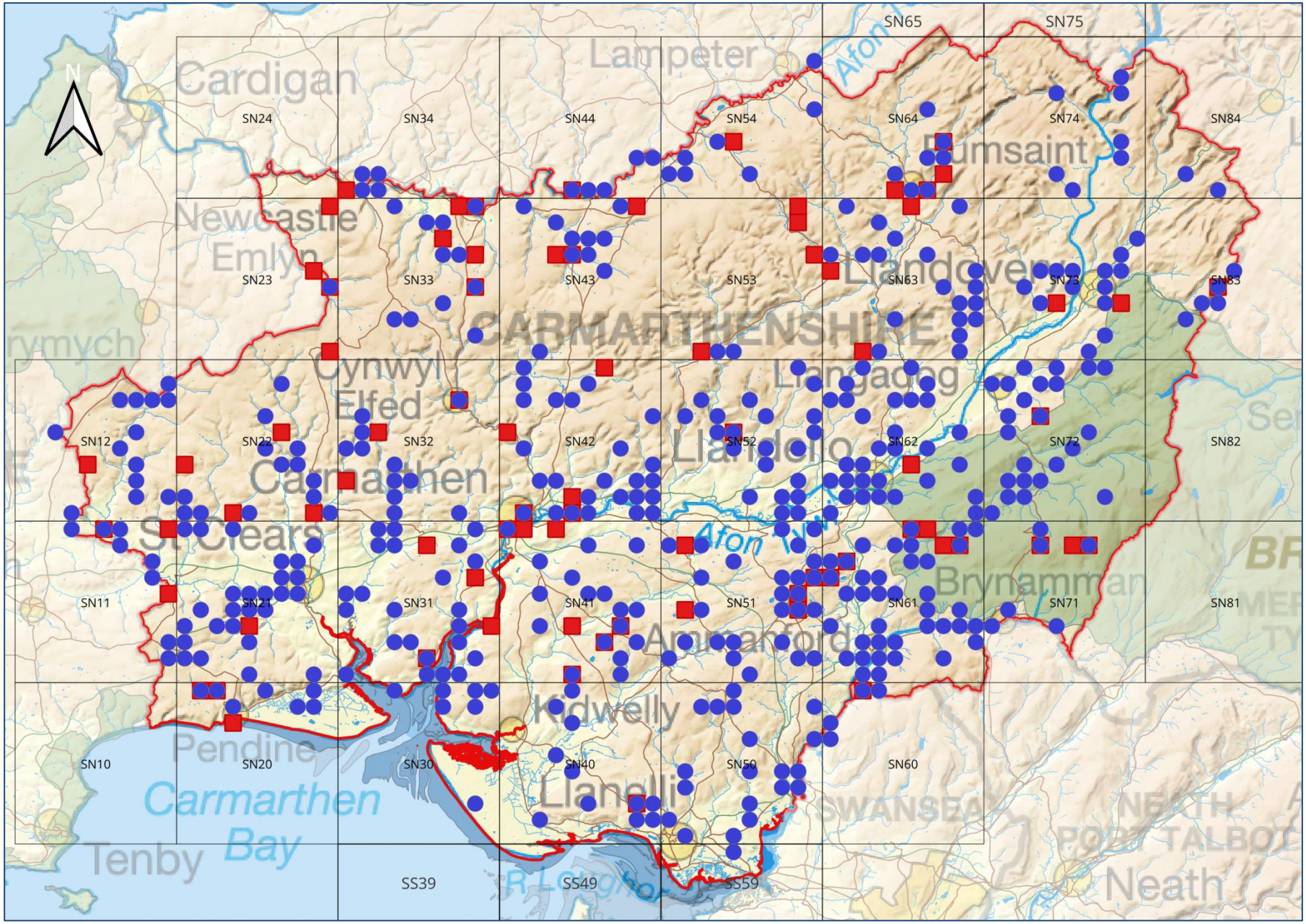


Figure 8: Distribution of all *Myotis* species using 5076 records from 1970 to 2023 (Pre-2000 records are shown as red squares)

Whiskered/Brandt's Aggregate

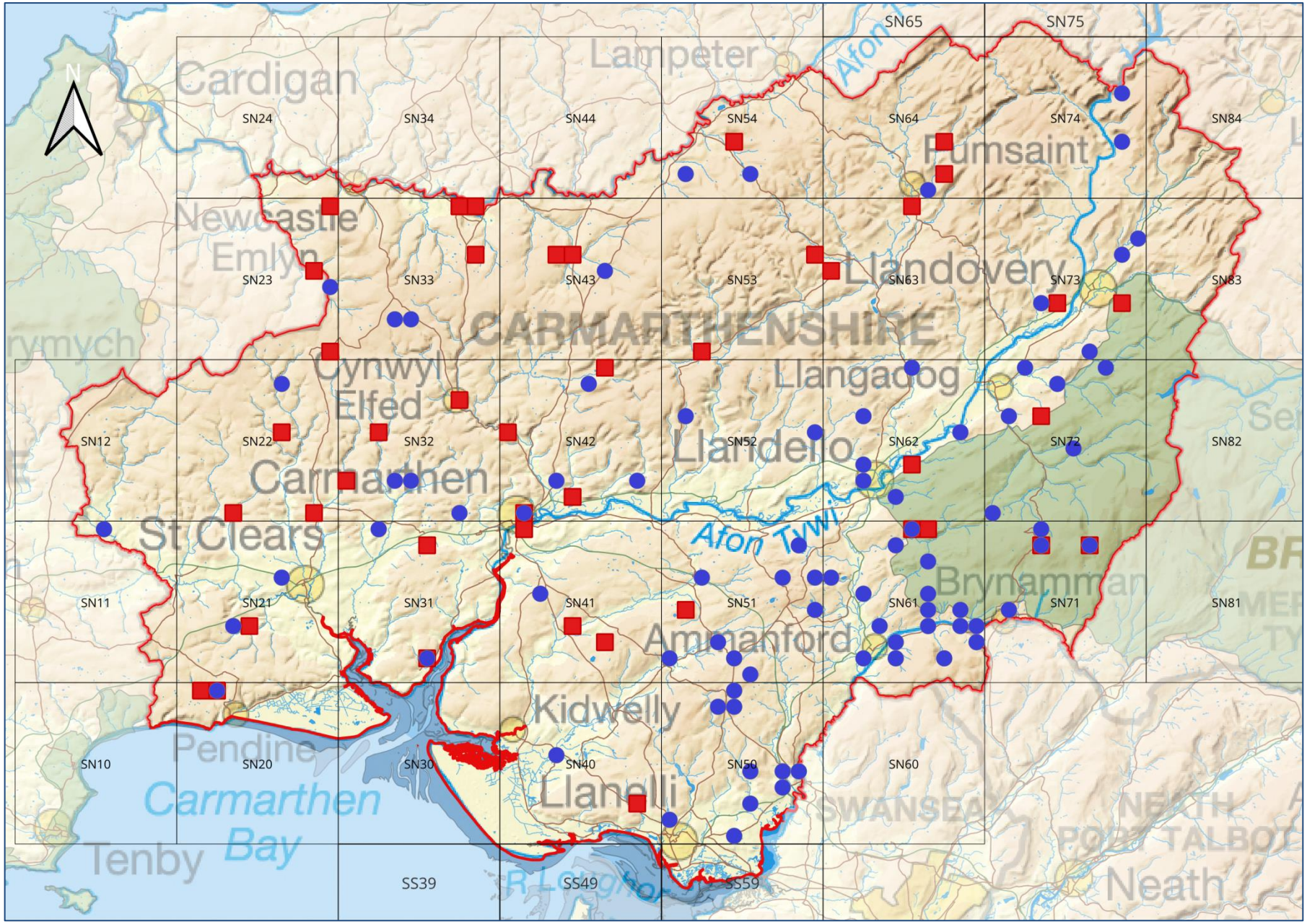


Figure 9: Distribution of Whiskered/Brandt's aggregate using 1032 records from 1970 to 2023 (pre-2000 records are shown as red squares)

Whiskered Bat (*Myotis mystacinus*)

Photo credit: David Lee

Distribution: The whiskered bat is found throughout Europe, England, Wales, Ireland and southern Scotland. In Carmarthenshire, it is considered widespread and fairly rare.

ICUN Conservation Status (Great Britain and Wales): IUCN Red list: GB: DD; Wales: [DD].

Identification: The dorsal fur of this small bat is grey-brown with pale highlights; the ventral fur is whitish. It has a shaggy coat particularly around the neck which forms a ruff. The ears are dark blackish-brown without colour inside and the muzzle is dark black-brown. The tragus is pointed with a concave or straight posterior edge. It is similar to the Brandt's bat but differences lie in the shape of tragus, penis and dentition (the shape of the 3rd upper pre-molar). Brandt's bat has a large cusp at the base on the inside of this tooth. The cusp is bigger than the tiny tooth next to it where the whiskered bat has a small or no cusp. The penis shape of the whiskered bat is narrow compared to Brandt's bats which is club shaped. The calcar extends ½ of the length from foot to tail with a narrow edging of skin.

Feeding Habitat and Diet: It usually forages in semi-open landscapes, woodland edges, water courses, woodlands, villages and along hedgerows. It feeds on flying insects such as Diptera, moths, lacewings and spiders.

Roosts: In summer, it is found in cavities of houses and trees. In winter, it is found hibernating in caves, mines, or any underground shelter.

Whiskered Bat (*Myotis mystacinus*)

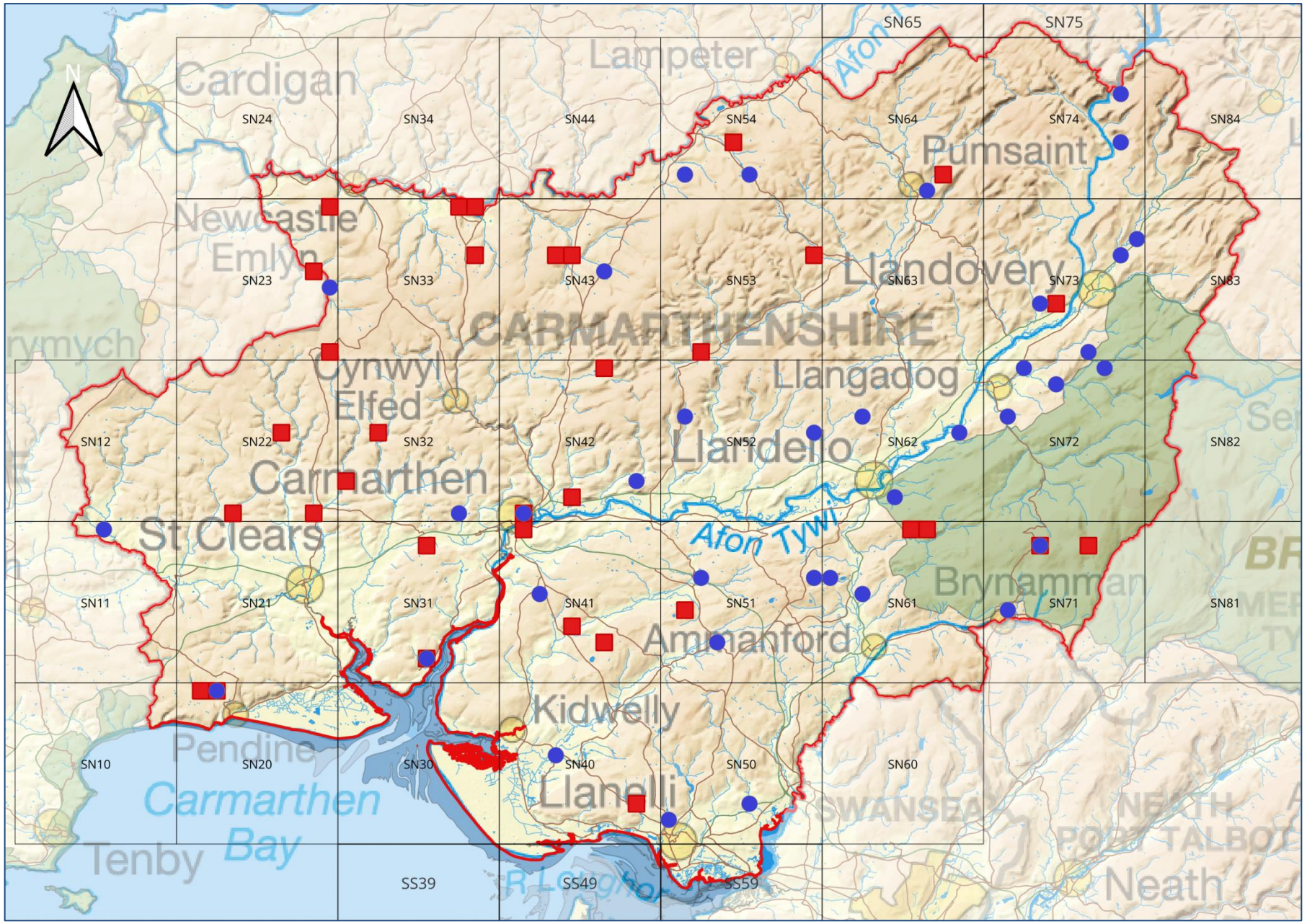


Figure 10: Distribution of *Myotis mystacinus* using 174 records from 1970 to 2023 (pre-2000 records are shown as red squares)

Brandt's Bat (*Myotis brandtii*)

Photo credit: Denise Plume and David Lee

Distribution: Brandt's bat is found in central and northern Europe, England, Wales and more recently Ireland. In Carmarthenshire, it is considered very rare.

ICUN Conservation Status (Great Britain and Wales): IUCN Red list: GB: DD; Wales: [DD].

Identification: The dorsal fur of this small bat is grey-brown with a reddish tinge; the ventral fur is whitish or pale grey. The ears are long with an indentation on the posterior margin of the ear; the tragus is pointed with a convex posterior edge which projects above the indentation. It is similar to the whiskered bat but differences lie in the shape of tragus, penis and dentition (the shape of the 3rd upper pre-molar). Brandt's bat has a large cusp at the base on the inside of this tooth; the cusp is bigger than the tiny tooth next to it whereas the whiskered bat has a small cusp or none at all. The penis is club shaped compared to the whiskered bat which is narrow. Its calcar extends ½ of the length from foot to tail.

Feeding Habitat and Diet: It usually forages within woodland, woodland edges, riparian habitats, wet woodlands, and water courses. It feeds on flying insects such as Diptera, moths, spiders and earwigs.

Roosts: In summer, it is found in trees holes, behind peeling bark and cracks in trunks. In winter, it is found hibernating in caves, mines, or any underground shelter.

Brandt's Bat (*Myotis brandtii*)

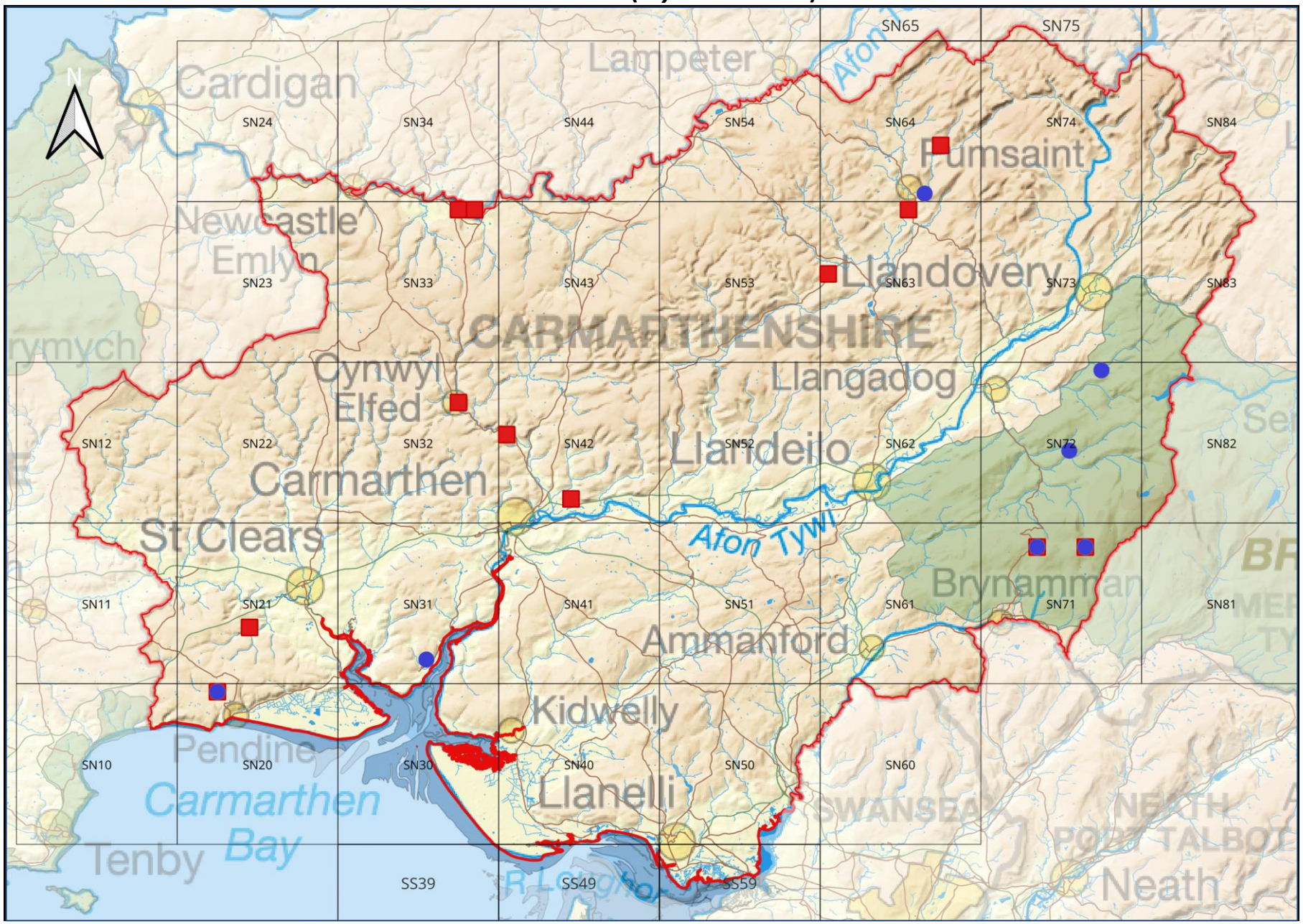


Figure 11: Distribution of *Myotis brandtii* using 47 records from 1970 to 2023 (pre-2000 records are shown as red squares)

Natterer's Bat (*Myotis nattereri*)

Photo credit: Denise Plume and David Lee

Distribution: Natterer's bat is found throughout most of the British Isles and is widespread in Europe. In Carmarthenshire, it is considered widespread, fairly rare and possibly under-recorded.

ICUN Conservation Status (Great Britain and Wales): IUCN Red list: GB: LC; Wales: [LC].

Identification: The dorsal fur of this medium-sized bat is light brown; the ventral fur can be dazzling white. The ears are less than 20mm long and when folded forward they extend the nose by a maximum of 5mm. The ears are light in colour, thin and translucent. They have a characteristic recurve at the ear tips and a spear-shaped tragus that is longer than half the ear. A characteristic feature of this species is a very long S-shaped calcar and a row of bristles between tail and end of the calcar.

Feeding Habitat and Diet: It usually forages around trees and other vegetation, gleaning insects from the surface of foliage. It often feeds in open woodland, parkland, hedgerows, along and around watercourses and will prey on Diptera, moths, spiders and other small insects.

Roosts: In summer, it is found in crevices in old timber beams, or gaps in beam joints in old buildings such as churches, castles and traditional barns. Although Natterer's bats are traditionally tree-roosting bats it will readily take to using bat boxes. In winter, it is found hibernating in caves, mines, or any underground shelter.

Natterer's Bat (*Myotis nattereri*)

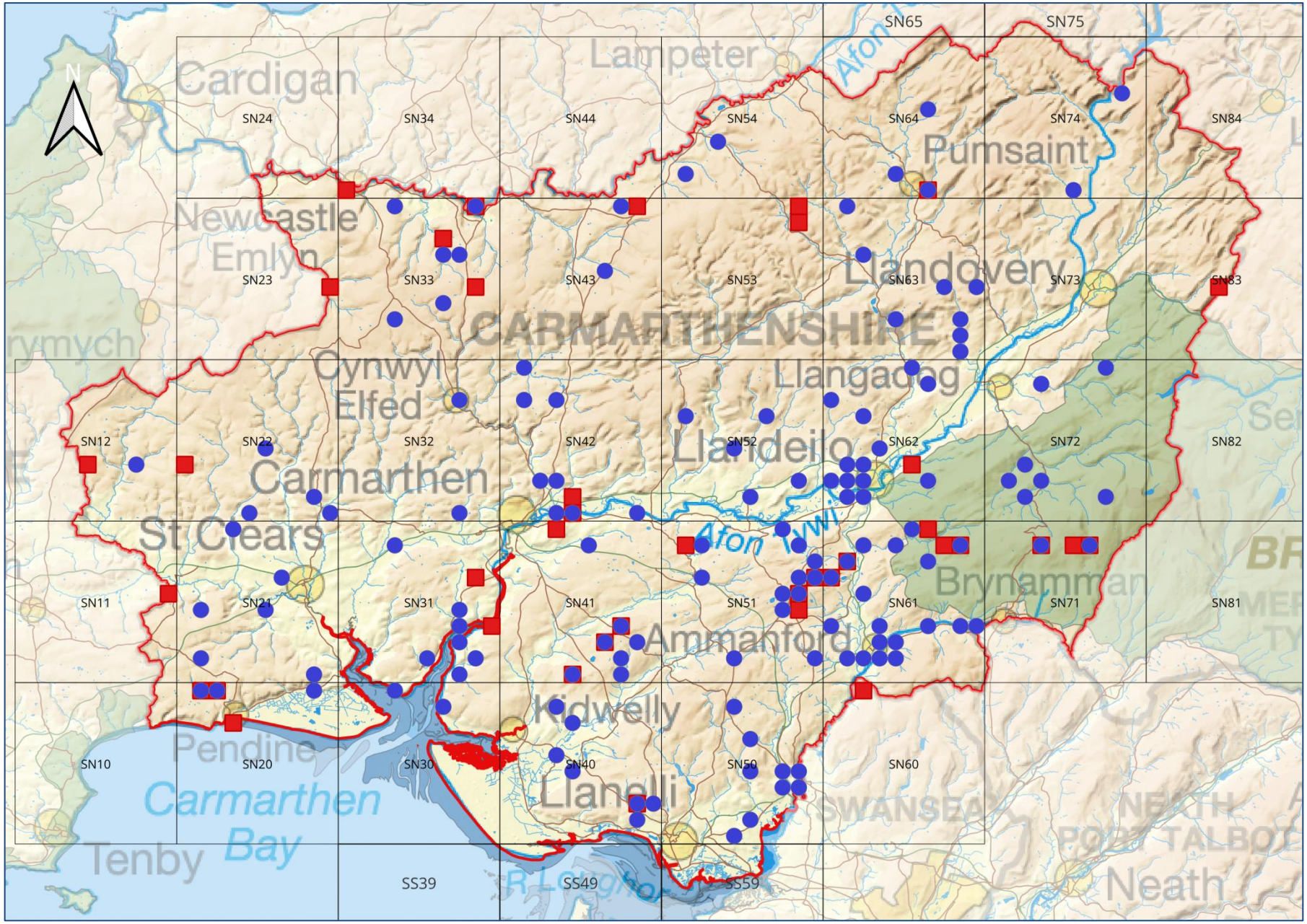


Figure 12: Distribution of *Myotis nattereri* using 1575 records 1970 to 2023 (pre-2000 records shown as red squares)

Daubenton's Bat (*Myotis daubentonii*)

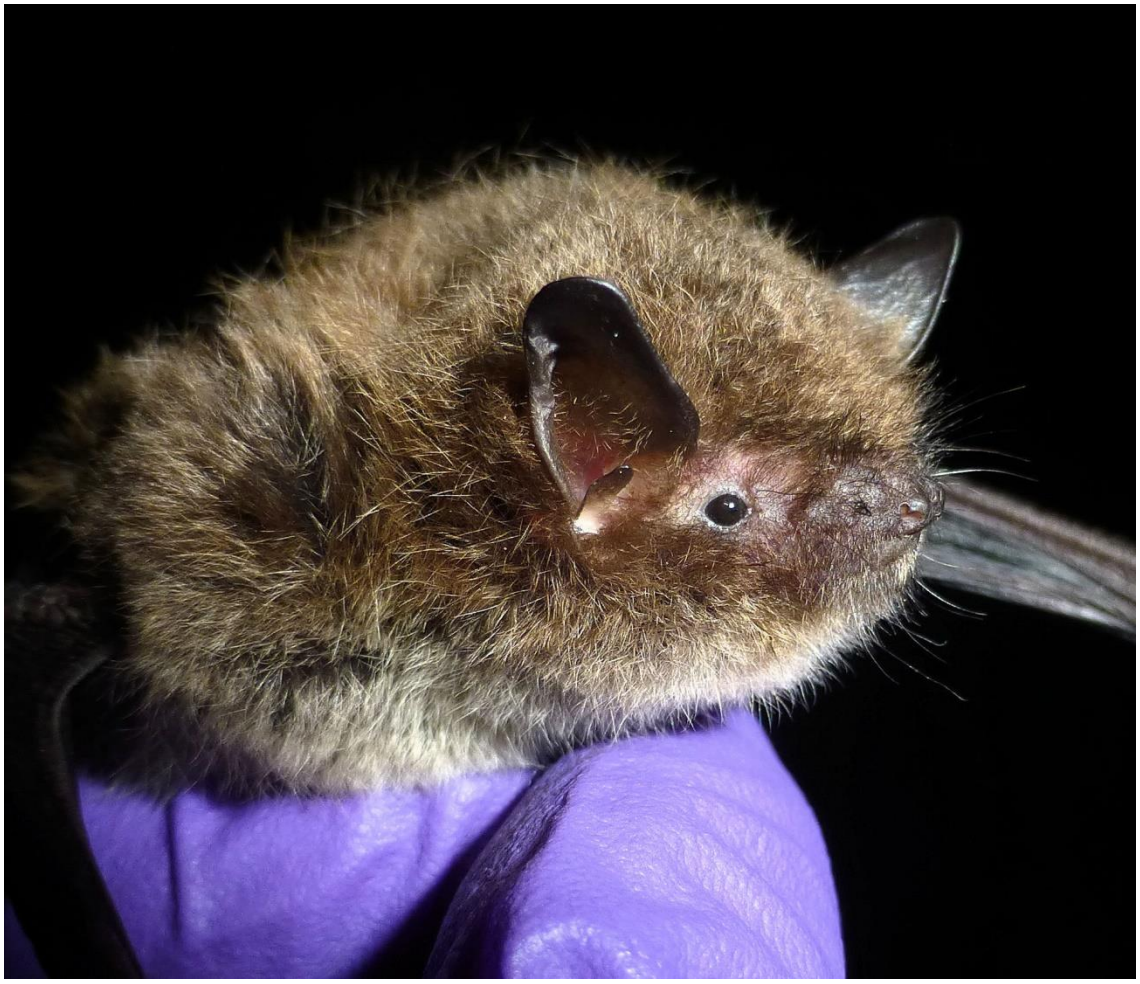


Photo credit: Denise Plume and David Lee

Distribution: Daubenton's bat is found throughout most of Europe and the British Isles. In Carmarthenshire, it is considered widespread and fairly rare or possibly under-recorded.

ICUN Conservation Status (Great Britain and Wales): IUCN Red list: GB: LC; Wales: [LC].

Identification: The dorsal fur of this medium-sized bat is uniform brown and shiny; the ventral fur is whitish or often a dirty-grey colour. Its face is reddish brown with an area of bare skin around the eyes, giving it a spectacled appearance. It has rubbery ears that do not project past the nose when bent forward. The tragus reaches half the ear length with a blunt tip. The feet are large and the wing membrane joins high up on the ankle. The calcar length is ¾ of the distance from the foot to the tail. There is a row of fine hairs, approx. 1mm long, on the trailing edge of the tail membrane and calcar.

Feeding Habitat and Diet: Daubenton's bats primarily forage over water but some will forage in woodland, parkland and traditional orchards. It forages within a few centimetres of the water's surface taking insects using its large feet as hooks or its tail membrane as a scoop. Females can forage about 6-10km from their roost site.

Roosts: Summer roosts are usually close to water and include tree holes, tunnels, bridges, bat boxes and occasionally buildings. Winter roosts include tree holes, caves, mines and other underground sites, which are entered in October.

Daubenton's Bat (*Myotis daubentonii)*

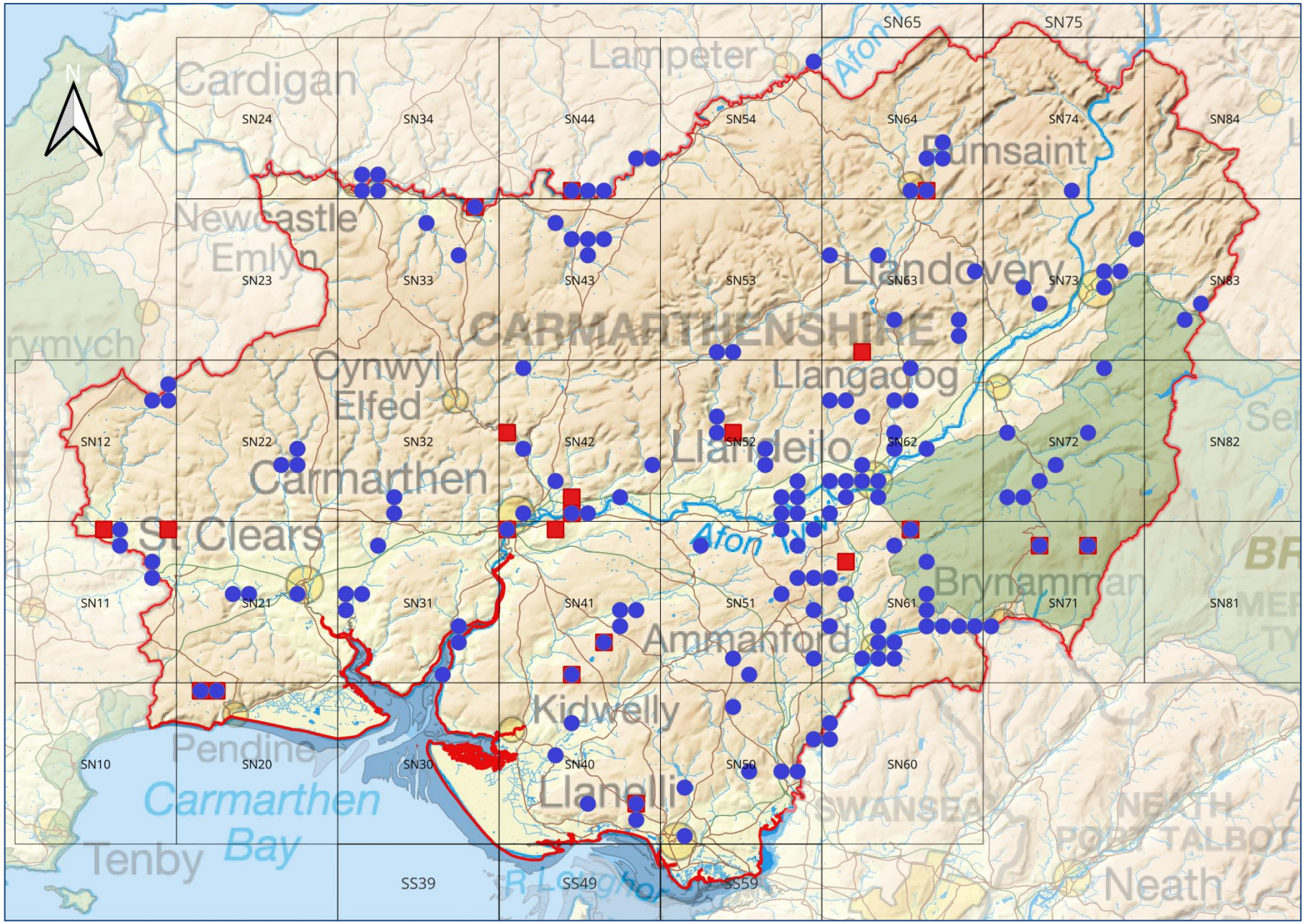


Figure 13: Distribution of *Myotis daubentonii* using 1,207 records from 1970 to 2023 (pre-2000 records shown as red squares)

Nyctalus species

Photo credit: Martin Celuch/www.bats.org.uk

Carmarthenshire is fortunate to have records for all three species of British "big bats"; noctule (*Nyctalus noctula*), Leisler's bat or lesser noctule (*Nyctalus leisleri*) and serotine bat (*Eptesicus serotinus)*. In Carmarthenshire the noctule is by far the most common of the three species whereas the serotine and Leisler's bat are generally considered as very rare. Leisler's records submitted using a bat detector alone should be viewed with caution!

To distinguish the three bats in the field using bat detectors alone can be challenging due to their overlapping echolocation call structures. Surveyors will often group the three "big bats" together as "*Nyctalus/Eptesicus* species" or just *Nyctalus species*. All three bat species echolocate at low frequencies ranging from 18 kHz (noctule) to 32 kHz (Serotine). Leisler's bats normally echo-locate at around 25-27 kHz but noctule bats can echolocate at higher frequencies when foraging in a cluttered environment such as woodland.

In Carmarthenshire, noctule bats are Carmarthenshire's most common "big bat" species, so it is likely that many of the records submitted as "Nyctalus species" will be the noctule.

Nyctalus species

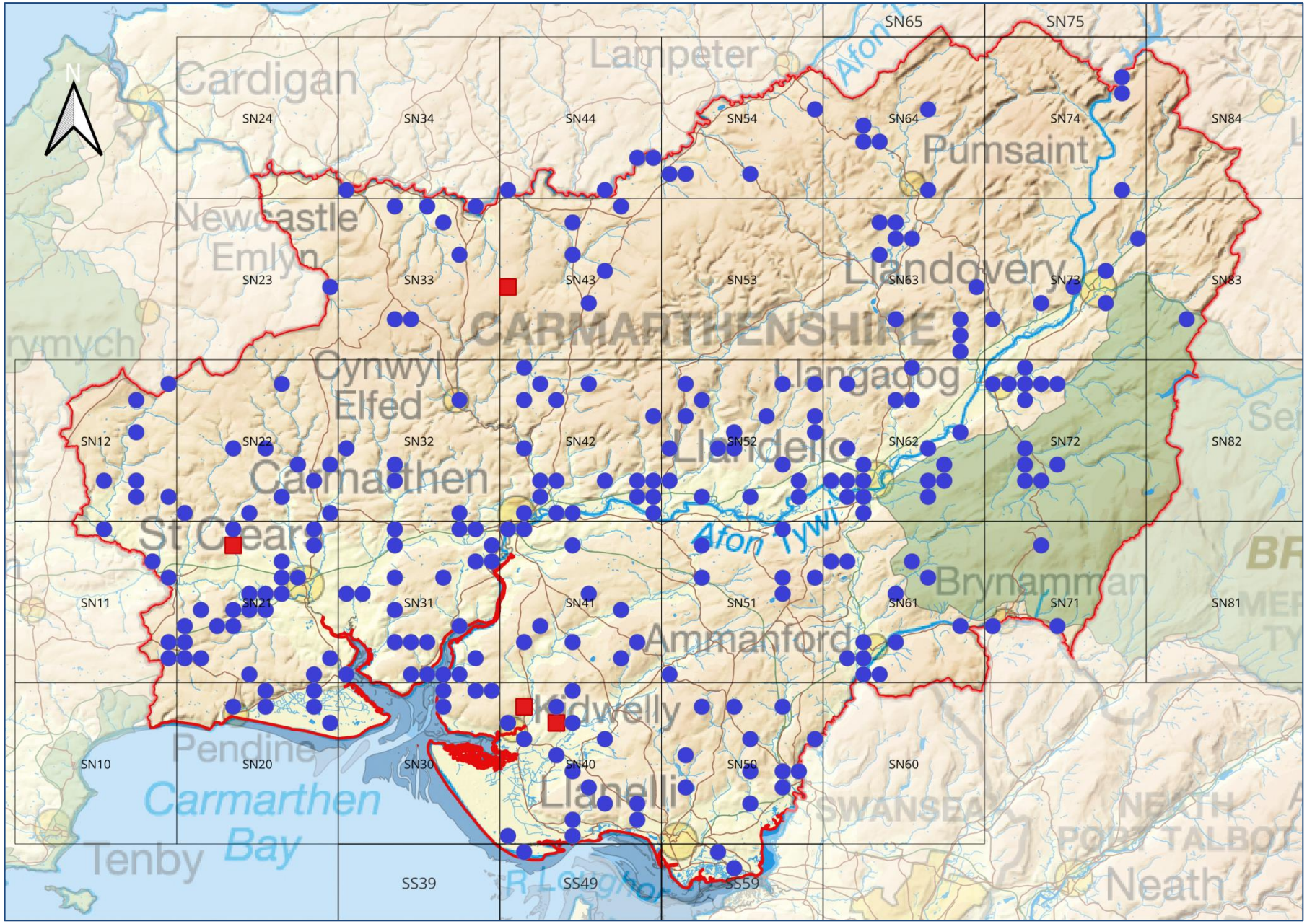


Figure 14: Distribution of *Nyctalus species* using 974 records from 1970 to 2023 (pre-2000 records shown as red squares)

Noctule (*Nyctalus noctula*)

Photo credit: Denise Plume and David Lee

Distribution: The noctule bat is found in most of Europe but absent from Ireland. It is relatively common in most of England, Wales and up to the south west of Scotland. In Carmarthenshire, it is considered widespread and fairly common.

ICUN Conservation Status (Great Britain and Wales): IUCN Red list: GB: LC; Wales: [LC].

Identification: The noctule bat is one of the UK's largest bats. It has golden or reddish brown dorsal fur which is short and lays flat; the ventral fur is slightly paler. The ears and nose are rounded and the tragus is mushroom shaped. The calcar has a post-calcarial lobe with a visible T-piece.

Feeding Habitat and Diet: It emerges early in the evening and has a fast direct flight. It forages at heights of 10-50m over water bodies, woodland edge, hedgerows and meadows. It feeds on Diptera, bugs, caddis flies, beetles, moths, cockchafers, shield bugs, winged ants and hoverflies.

Roosts: In summer, it is found high up in tree holes, particularly in mature/veteran trees, such as old woodpecker nest sites and rot holes. It is occasionally found in buildings and bat boxes. In winter, it is found in thick walled tree holes, rock crevices and crevices in buildings.

Noctule (*Nyctalus noctula*)

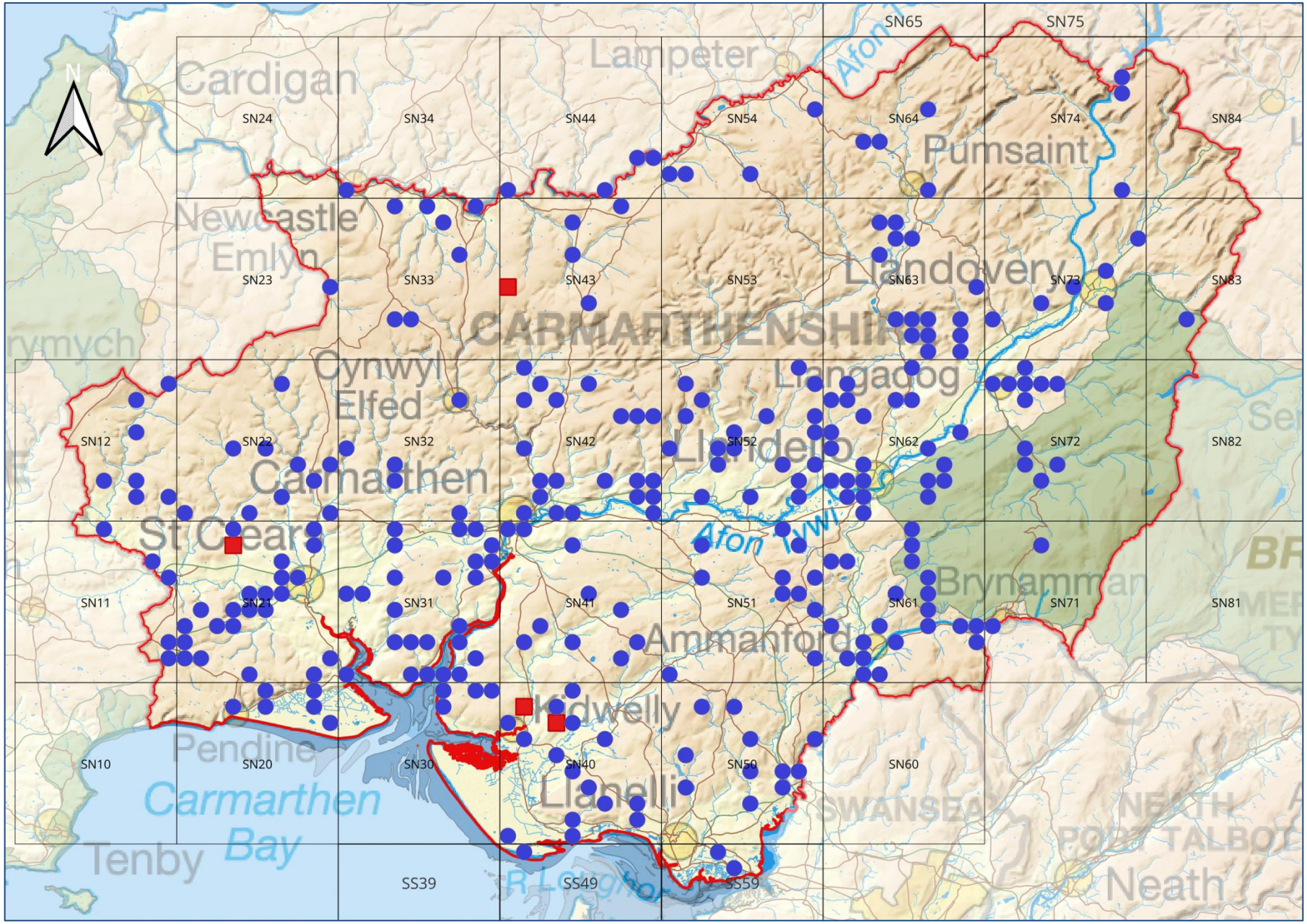


Figure 15: Distribution of *Nyctalus noctula* using 835 records from 1970 to 2023 (pre-2000 records shown as red squares)

Leisler's (*Nyctalus leisleri*)

Photo Credit: Daniel Whitby

Distribution: Leisler's bat is found throughout Europe and the British Isles, with the exception of northern Scotland. Ireland is a stronghold for this species but in England as a whole, it is considered to be rare. In Carmarthenshire, it is considered as extremely rare.

ICUN Conservation Status (Great Britain and Wales): IUCN Red list: GB: NT; Wales: [NT].

Identification: This large bat has golden-brown, two-tone effect dorsal fur with a darker base; the ventral fur is yellowish brown. The fur is short and lays flat but it is shaggier than the noctule, especially the mane over the shoulders in males. The fur extends over the wing membrane; this is the origin of one of its older names: "the hairy-armed bat". The ears and nose are rounded and the tragus is mushroom shaped. The calcar has a post-calcarial lobe with a visible T-piece.

Feeding Habitat and Diet: It has a fast direct flight and will forage in deciduous and coniferous woodland, parkland, suburban areas and around street lights. It feeds on Diptera, bugs, caddis flies, beetles, moths, cockchafers, shield bugs, winged ants and hoverflies.

Roosts: In summer, it roosts in tree holes and will occasionally take to bat boxes. It roosts in buildings particularly using the gable end, in lofts, between tiles and under felt and under ridge tiles. In winter, it hibernates in tree holes, in cracks and cavities of buildings and occasionally in caves and tunnels.

Leisler's (*Nyctalus leisleri*)

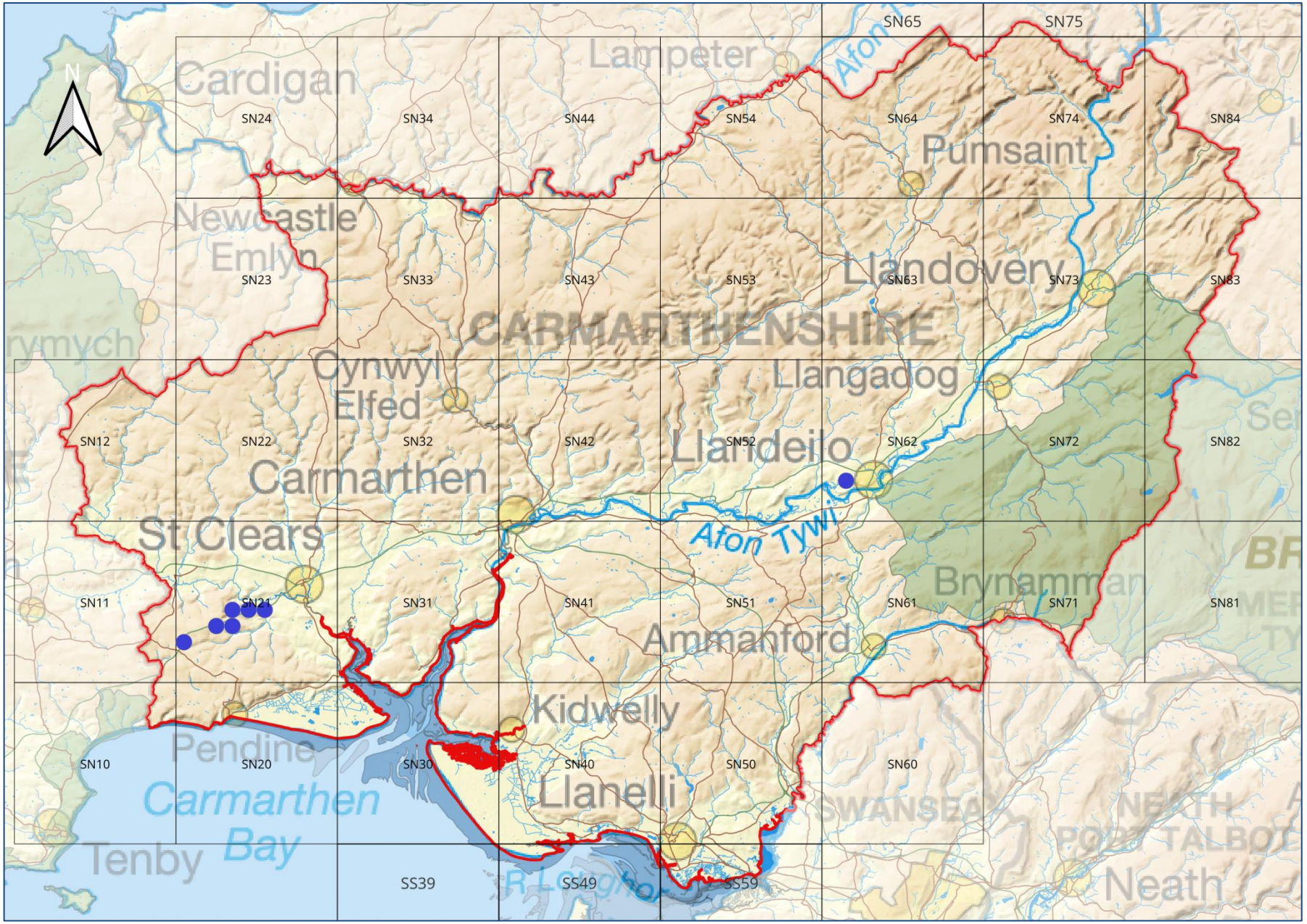


Figure 16: Distribution of *Nyctalus leisleri* using 29 records from 2000 to 2023 (no records exist pre-2000)

Serotine (*Eptesicus serotinus*)

Photo credit: Denise Plume and David Lee

Distribution: The serotine bat is found throughout Europe and southern England. In Carmarthenshire it is considered very rare.

ICUN Conservation Status (Great Britain and Wales): IUCN Red list: GB: VU; Wales: [VU].

Identification: The serotine is one of the Britain's largest bats. The dorsal and ventral fur is golden to dark brown; the ears are black and quite long and their muzzle is black. The tragus is long and broad not mushroom shaped like *Nyctalus* species. Some bat workers often say that in the hand it looks like a very large pipistrelle. Its tail projects >6mm beyond the tail membrane and has a post-calcarial lobe which is usually narrow. The penis widens towards the end.

Feeding Habitat and Diet: It forages at about tree-top height and often close to vegetation. It has broad wings, which makes it very maneuverable and it is able to drop on foliage with outstretched wings to catch large insects. The serotine will also feed around street lamps and even take prey from the ground. It feeds mainly on moths, Diptera, cockchafers and dung beetles.

Roosts: In summer, it roosts mainly in older buildings with high gables and cavity walls and it is rarely found in trees. In winter, it most likely hibernates in buildings.

Serotine (*Eptesicus serotinus*)

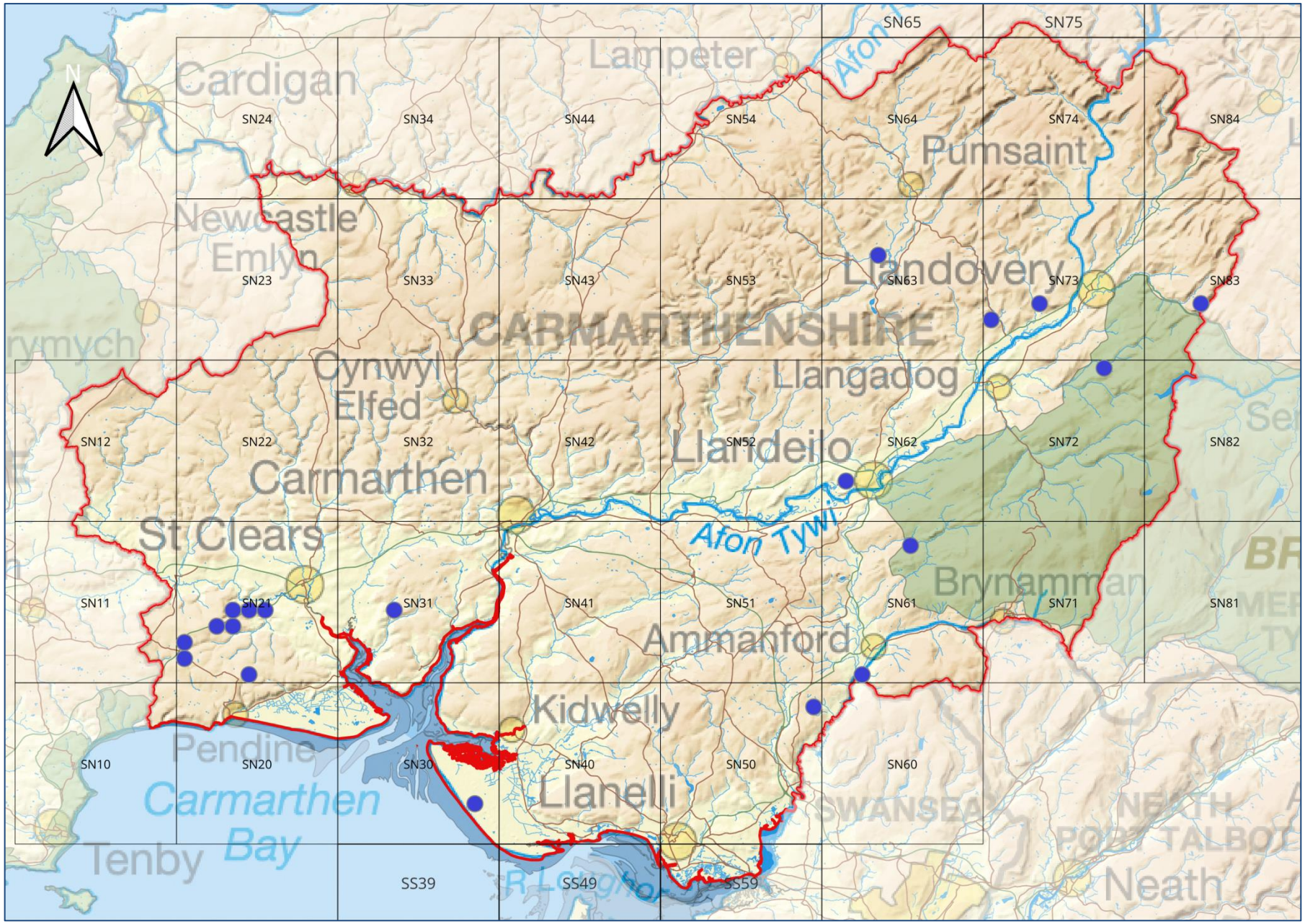


Figure 17: Distribution of *Eptesicus serotinus* from 2000 to 2023 using 35 records (no records exist pre-2000)

Barbastelle (*Barbastella barbastellus*)

Photo credit: Denise Plume and David Lee

Distribution: The barbastelle is found in large parts of Europe and central and southern England. A few isolated records exist for northern England where it is considered to be rare. In Carmarthenshire it is considered to be very rare.

ICUN Conservation Status (Great Britain and Wales): IUCN Red list: GB: VU: Wales: [VU].

Identification: The barbastelle is a medium-sized bat distinctive by its pug-shaped nose and its dorsal and ventral fur which is blackish with light frosted tips. The ears are quite large and joined over its head; the eyes are placed within the orbit of its ears. The tragus has a long rounded tip which tapers abruptly at half its length.

Feeding Habitat and Diet: It emerges at dusk and forages above the tree canopy and along vegetation edges. It is a fast flyer and can forage considerable distances from its roost during the night. It feeds mainly on moths but will also feed on Diptera, small beetles and other flying insects.

Roosts: In summer, it roosts behind loose bark, in tree crevices, buildings and will sometimes take to flat bat boxes; it is known to change roosts every few days. In winter, it is found hibernating in caves, mines, disused railway tunnels, rock crevices or any underground shelter.

Barbastelle (*Barbastella barbastellus*)

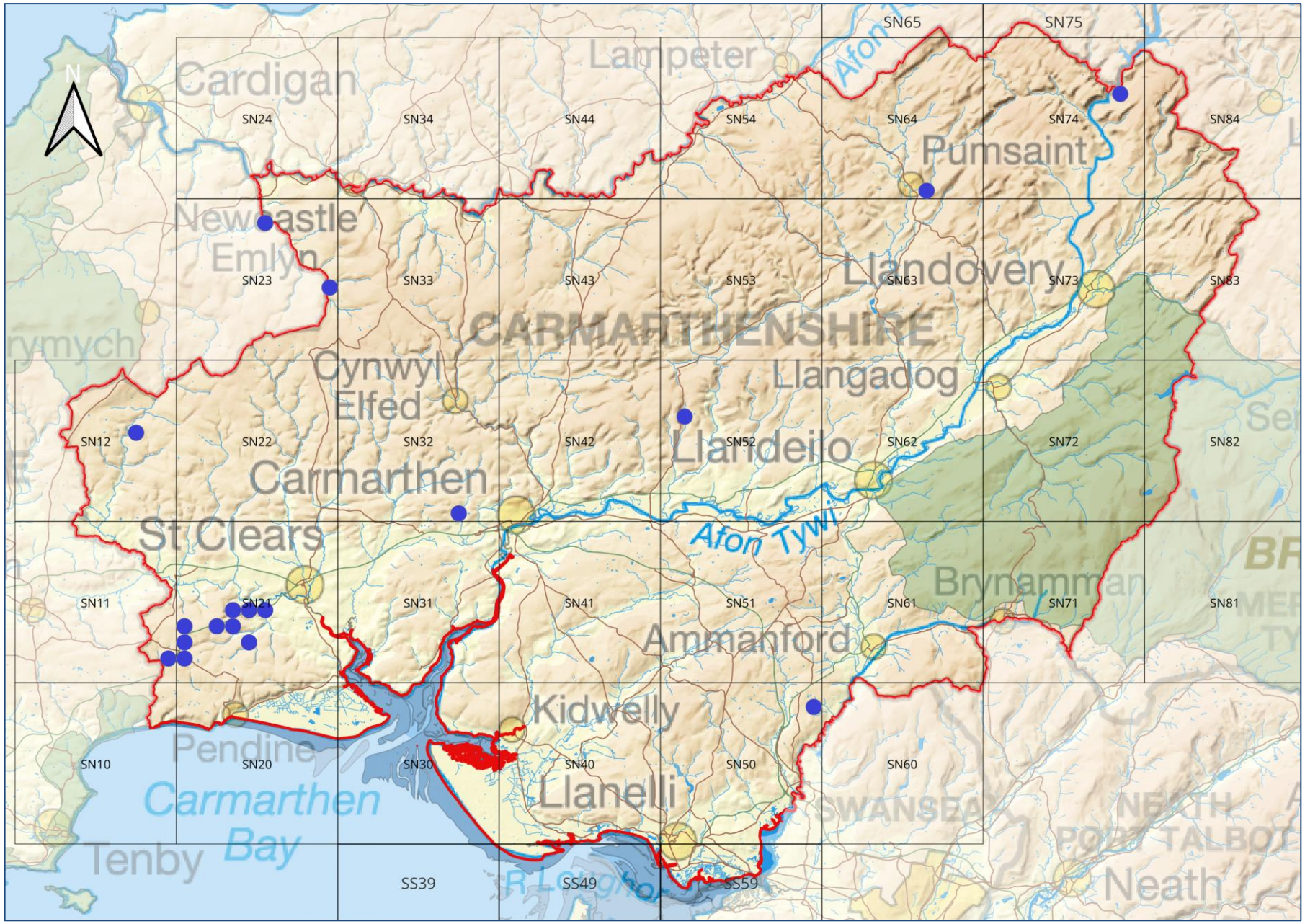


Figure 18: Distribution of *Barbastella barbastellus* using 138 records from 2000 to 2023 (no records exist pre-2000)

Greater horseshoe bat (*Rhinolophus ferrumequinum*)

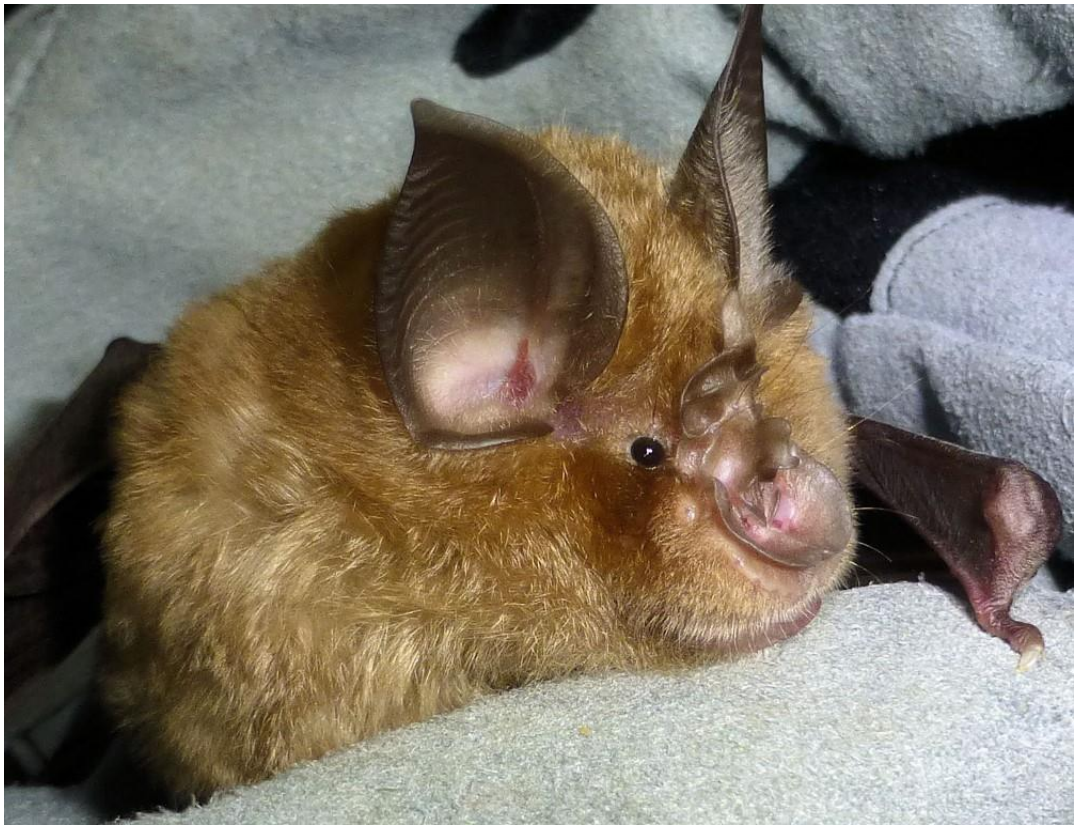


Photo credit: Denise Plume

Distribution: The greater horseshoe bat is distributed throughout the entire Mediterranean region and into central Europe. Overall, it is rare in Britain and confined to southwest England. In Carmarthenshire, it is mainly confined to the south and south-west of the county with a few records in the north.

ICUN Conservation Status (Great Britain and Wales): IUCN Red list: GB: LC; Wales: [NT].

Identification: The greater horseshoe bat is one of Britain's largest bat species and recognised at rest, hanging free where it enfolds its wings around its body when it resembles the size and shape of a pear. The dorsal fur is brown to grey-brown often with a yellowish/reddish tinge; the ventral fur is a paler grey-white to yellowish white. Horseshoe bats can be distinguished by their complex horseshoe-shaped nose-leaf.

Feeding Habitat and Diet: It emerges approximately 30 minutes after sunset and forages over meadows just above the ground or close to vegetation. It feeds on moths and particularly beetles such as cockchafers and dung beetles.

Roosts: In summer, females use buildings that have large entrance holes with access to open roof spaces. Roosts are found in large, older houses, churches and barns. Males will use caves and tunnels during the summer. In winter, it uses caves, disused mines, cellars and tunnels as hibernation sites. These sites can be up to 50km from the breeding roost.

Greater horseshoe bat (*Rhinolophus ferrumequinum*)

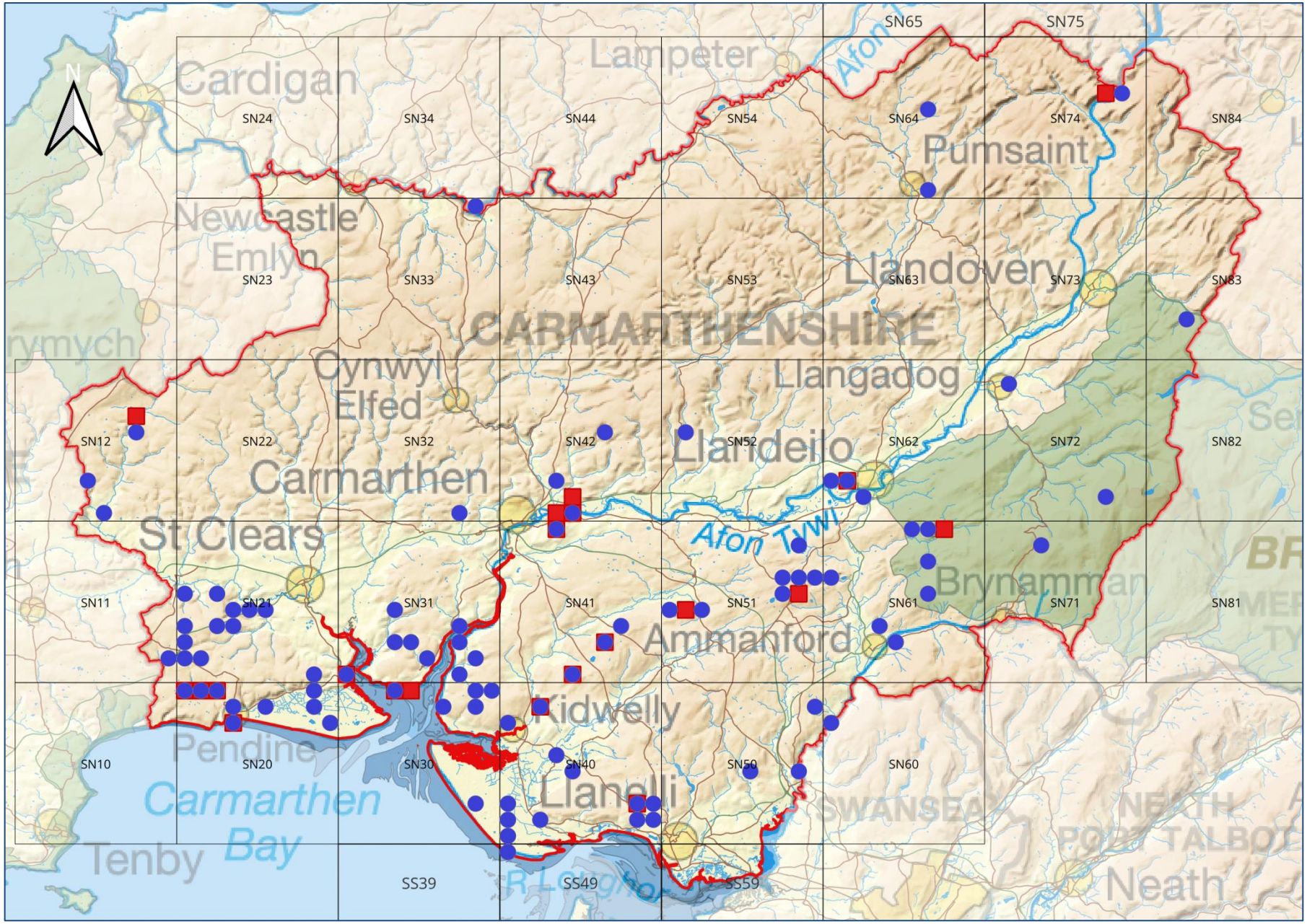


Figure 19: Distribution of *Rhinolophus ferrumequinum* using 998 records from 1970 to 2023 (pre-2000 records shown as red squares)

Lesser horseshoe bat (*Rhinolophus hipposideros*)

Photo credit: Denise Plume and David Lee

Distribution: The lesser horseshoe bat is found in Europe, Mediterranean, Asia and Africa. In Britain, it is confined to Wales, western England and western Ireland. In Carmarthenshire, it has been recorded in the south and south-west of the county with very few records in the north and considered rare.

ICUN Conservation Status (Great Britain and Wales): IUCN Red list: GB: LC; Wales: [LC].

Identification: The lesser horseshoe is one of Britain's smallest bats and is recognised at rest hanging free with its wings enfolding its body when it resembles the size and shape of a plum. The dorsal fur is brownish and the ventral fur is grey-white. It can be distinguished by its complex horseshoe-shaped nose-leaf.

Feeding Habitat and Diet: It emerges approximately 30 minutes after sunset and will follow linear structures such as hedgerows when commuting to foraging grounds, which tend to be within woodland. It is a very agile flyer and forages over vegetation and in dense foliage looking for Diptera, Hymenoptera, lacewings and small moths.

Roosts: In summer, females use roof spaces of castles, churches and other large buildings where they can enter with uninterrupted flight to the roof apex. However, they are capable of using more discreet gaps. Night roosts are used for consuming large prey and these can be porches, cellars, or open sheds. Males will use caves and tunnels during the summer. In winter, caves and old disused railway tunnels are used as hibernation sites.

Lesser horseshoe bat (*Rhinolophus hipposideros*)

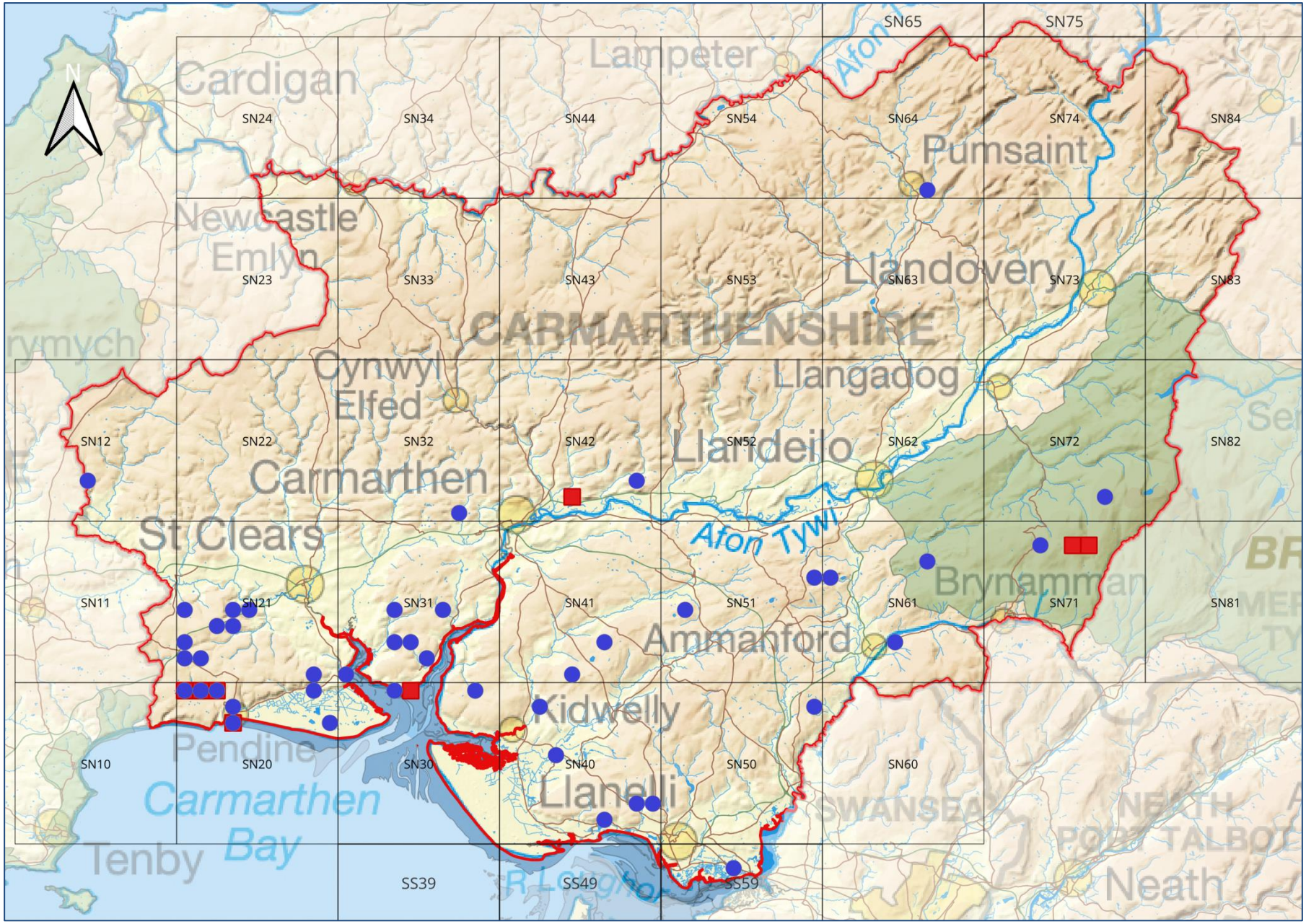


Figure 20: Distribution of *Rhinolophus hipposideros* using 255 records from 1970 to 2023 (pre-2000 records shown as red squares)

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Acknowledgements

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