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KRIEGERS FLAK II

TECHNICAL REPORT – BATS 2023-2024

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SUMMARY

INTRODUCTION

To support Denmark's political commitment to expanding offshore wind energy production, the Kriegers Flak II Offshore Wind Farm (OWF) is being planned in the Baltic Sea. The area comprises two sub-areas, North and South, located 25–50 km off the coast of South Zealand and Møn. In preparation for the environmental impact assessment, a bat monitoring program was conducted from spring 2023 to autumn 2024 to establish baseline data on bat migration and activity in the offshore and coastal zones.

EXISTING DATA AND KNOWLEDGE

Bats are primarily terrestrial and cannot rest on open water, making sea crossings risky. However, some species migrate seasonally across marine areas or forage over the sea when insect concentrations are high. Long-distance migratory bats are potentially vulnerable to offshore wind farms. Previous studies in the western Baltic Sea, especially in German waters, have documented bat migration patterns, with Nathusius's pipistrelle being the most frequently recorded offshore species. Migration typically occurs in spring (April–June) and autumn (August–October).

METHODOLOGY

Bat activity was monitored using detectors mounted on 16 offshore buoys and at selected coastal sites in Denmark, Germany, and Sweden. Offshore detectors were placed approximately 2.5 meters above sea level and recorded bat calls nightly. Coastal detectors were installed to identify migration timing and potential departure points. Data were analyzed using automated software and manually reviewed to ensure species-level identification, with some acoustically similar species grouped as "Nyctaloid bats."

DATA AND RESULTS

Offshore bat activity was generally lower than coastal activity but showed clear seasonal and spatial patterns. In total, 1,250 offshore detections were recorded, 1,010 in 2023 and 240 in 2024. Most detections were Nyctaloid bats, followed by Nathusius's pipistrelle and Soprano pipistrelle. Offshore activity peaked during autumn, particularly in September 2023, when warm temperatures and low wind speeds created ideal foraging conditions. This event led to a surge in Nyctaloid bat activity, highlighting the influence of weather on offshore behavior.

Buoys closest to the coast recorded the highest bat activity, suggesting that proximity to land is a key factor. Compared to other surveys carried out in areas for Danish offshore wind farm, Kriegers Flak II area showed higher offshore bat activity, though still lower than turbine-mounted detectors at Kriegers Flak I OWF, possibly due to insect attraction to turbines.

Bats were primarily active during the darkest hours of the night, minimizing predation risk. Offshore activity was strongly correlated with warm temperatures and low wind speeds, especially in autumn. Spring migrants tolerated cooler temperatures and higher wind speeds, likely due to the urgency of reaching breeding grounds. Wind direction also influenced activity, with most detections occurring during southeasterly or northwesterly winds.

Coastal data confirmed high bat activity during migration periods and supported the interpretation of offshore patterns. However, coastal results are not directly comparable due to differences in detection range and behavior of bats near land.

STATUS AND CONCLUSION

The survey confirms that Kriegers Flak II area is used by both migrating and foraging bats, with seasonal and weather-dependent variations. Larger species are more likely to forage offshore, while smaller species primarily pass-through during migration. The findings provide a valuable baseline for assessing potential impacts of offshore wind development on bat populations.

DATA AND KNOWLEDGE GAPS

Challenges in offshore monitoring include equipment malfunctions, limited detection range, and sparse data on flight altitude. Weather data from nearby stations may not fully represent offshore conditions. The origin of bats entering the offshore area is difficult to determine due to multiple potential coastal departure points. These limitations highlight the need for continued research to improve understanding of offshore bat ecology.

INTRODUCTION

In order to accelerate the expansion of Danish offshore wind production, it was politically decided with the agreement on the Finance Act for 2022 and the subsequent Climate Agreement on Green Power and Heat 2022 of 25 June 2022 to enable the expansion of a minimum of 9 GW offshore wind in Danish waters.

In order to enable the realization of the political agreements on significantly more energy production from offshore wind, the Danish Energy Agency has prepared a plan for the establishment of offshore wind farms in three areas in the North Sea, the Kattegat and the Baltic Sea respectively, and has initiated a large number of feasibility studies in the areas, some of which are reported in this report.
The area for Kriegers Flak II Offshore Wind Farm (OWF) consists of two sub-areas: North and South. The areas are located 25-50 km off the coast of South Zealand and Møn. Kriegers Flak II North is located approximately 15 km from the east coast of Møn, while Kriegers Flak II South is located approximately 30 km southeast of Møn (Figure 1). The area for the Kriegers Flak II OWF is approximately 175 km^2, divided into 99 km^2 for North and 76 km^2 for South. The Kriegers Flak II OWF will be connected to land via subsea cables making landfall close to Rødvig on South Zealand.

In the agreement on the tender framework, which the Danish Parliament adopted in May 2025, it was decided that the tender for Kriegers Flak II OWF will be included in the pool of development areas that will be tendered at a later, not yet decided, date.

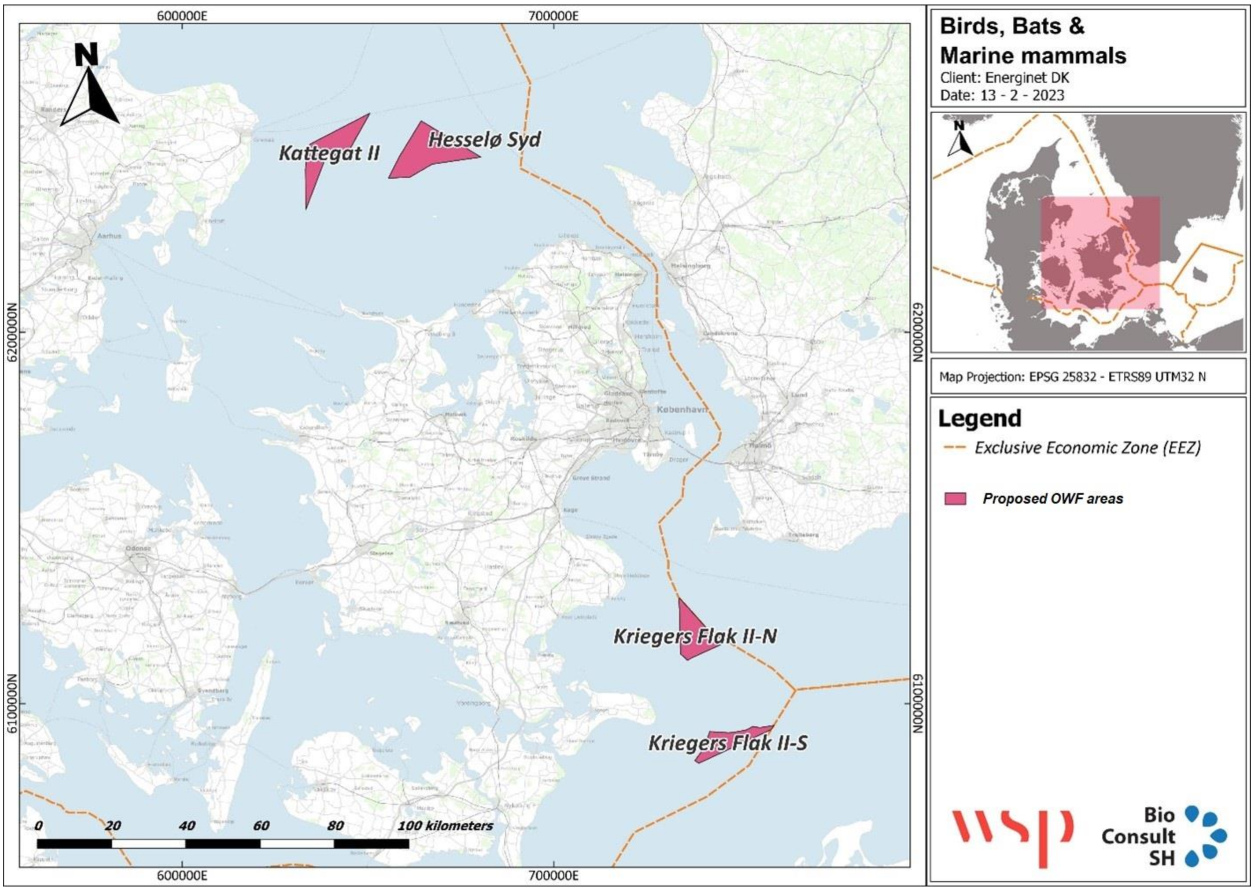

Figure 1 - Map showing the location of the investigated wind farm areas Kattegat, Hesselø and KF II OWF. The present report focuses on KF II OWF.

Bat migration across offshore areas of Denmark is poorly known and long series of observation offshore in Danish waters is almost absent. Due to the planning of several offshore wind farms in Denmark, there is a need for information on bat migration and behaviour in the area as baseline for the environmental impact and risk assessment.

To support the environmental impact assessment for the future Kriegers Flak II OWF project, a bat monitoring program was initiated by Energinet in spring 2023 and completed in autumn 2024. This technical report will include data and results collected during both survey years.

EXISTING DATA AND KNOWLEDGE

Bats are primarily associated with terrestrial environments, spending most of their lives in forests, open landscapes, or urban areas ((Baagøe, et al., 2007; Elmeros, et al., 2024). Unlike some bird species, bats are unable to rest on the sea surface, making overwater flight inherently riskier than flight over land (Troxell, et al., 2019)
Despite this, there are two main reasons why bats may be observed flying over the sea. First, several bat species undertake seasonal migrations between Northern Europe in summer and Central or Southern Europe in winter (Hutterer, et al., 2005). These migratory routes may partially cross marine areas. Second, bats may fly over the sea to forage. In late summer and early autumn, insect concentrations above the sea can be high, providing a valuable food source that may attract bats (Ahlén, et al., 2009).

BAT MIGRATION

Bat species can be broadly categorized into three groups based on their typical migration distances (Figure 2). The first group consists of long-distance migrants, which may travel several hundred to several thousand kilometres between seasonal habitats. The second group includes short-distance migrants, which typically move up to around 100 kilometres, often between breeding sites and winter roosts. Most bat species in Northern Europe fall into this category. The third group comprises sedentary species, which rarely move more than a few kilometres from their breeding and roosting sites.

Long-distance migratory bats are considered the most vulnerable to offshore wind farms due to their extensive flight paths and potential exposure to offshore infrastructure (Rydell, et al., 2010; Voigt, et al., 2012; Lehnert, et al., 2014; Arnett, et al., 2011; Kruszynski , et al., 2020).

It is generally assumed that most migratory bats avoid long sea crossings when possible. As a result, major migration routes are expected to follow coastlines and land corridors until a sea crossing becomes unavoidable. In Northern Europe, large numbers of bats are known to migrate from Finland, the Baltic States, and Sweden toward the Netherlands, Belgium, northern France, and even southern England.

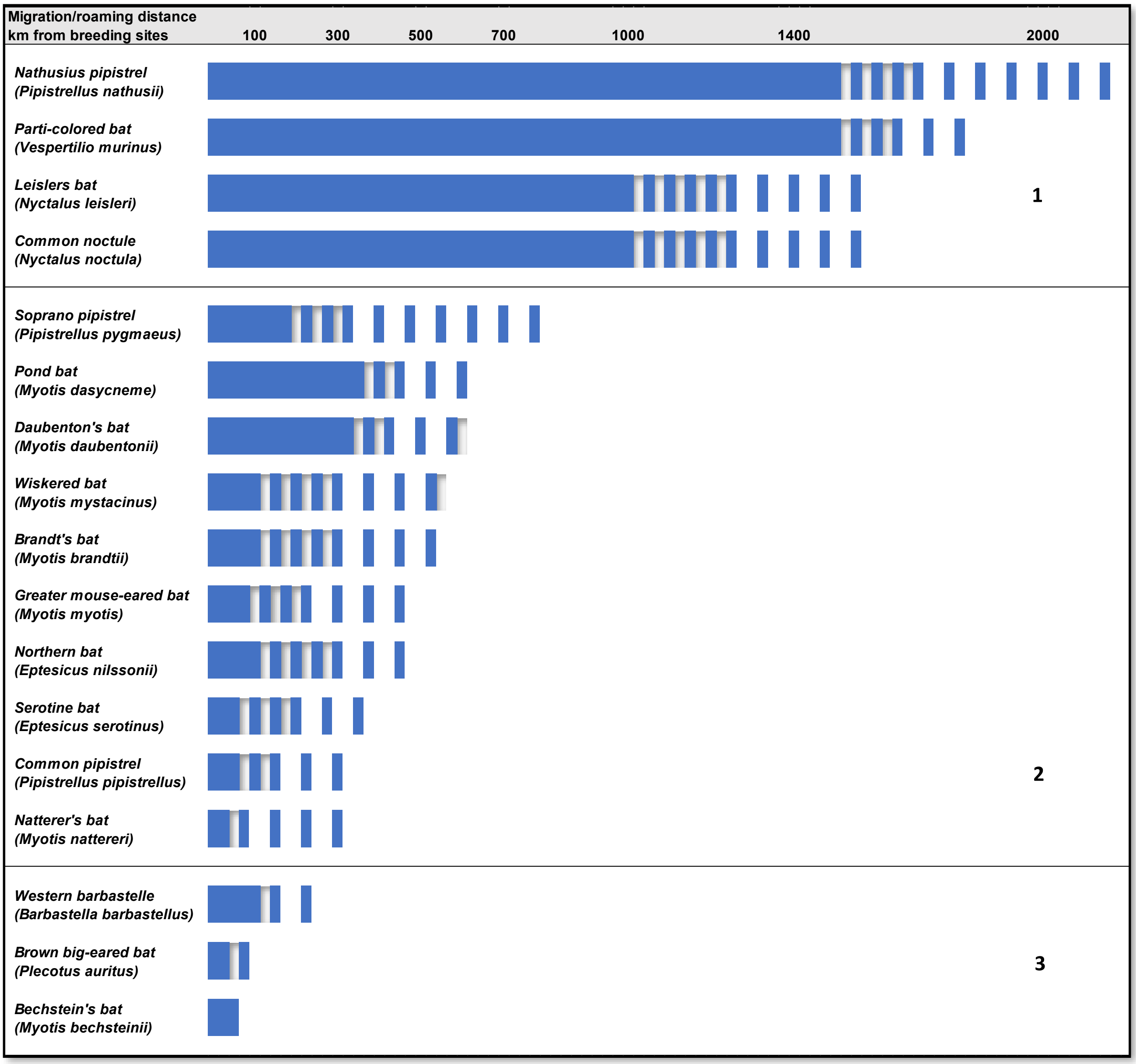

Figure 2 – General distance of migration and roaming for bat species found in Denmark. Figure from (Christensen, et al., 2023) (Translated from Danish). Based on sources: (Baagøe, 2001; Pētersons, 2004; Hutterer, et al., 2005; Dietz, et al., 2011; Baagøe, et al., 2007; Alcalde, et al., 2021) a.o.

BATS FEEDING IN MARINE AREAS

During the summer months, most bats remain at or near their breeding sites, where they forage on the abundant insect populations in the surrounding area. However, under suitable weather conditions, some species are known to forage in marine areas, occasionally at considerable distances from the coast. The extent and frequency of such offshore foraging behaviour remain poorly documented.

It is generally assumed that most of the bat activity over the sea occurs near the coastline, where insect densities are typically higher. Activity is expected to decline with increasing distance from shore, although further research is needed to quantify this pattern.

OFFSHORE BAT SURVEYS IN WESTERN BALTIC SEA

There are rather few scientific studies on bat migration over the pre-investigation area, and in the Baltic Sea in Sweden, Finland and the Baltic countries in general. The available studies show that bats in autumn head south from the southern Swedish coast towards the Baltic Sea and return to the coast in spring (Figure 3) ((Ahlén, 1997; Baagøe, 2001; Hutterer, et al., 2005; Ahlén, et al., 2007; Ahlén, et al., 2009; Bach, et al., 2015; Bach, et al., 2017). From the German Baltic coast studies of bat migration include studies on the island Greifswalder Oie, offshore Pomeranian Bay east of Rügen (Seebens, et al., 2013).

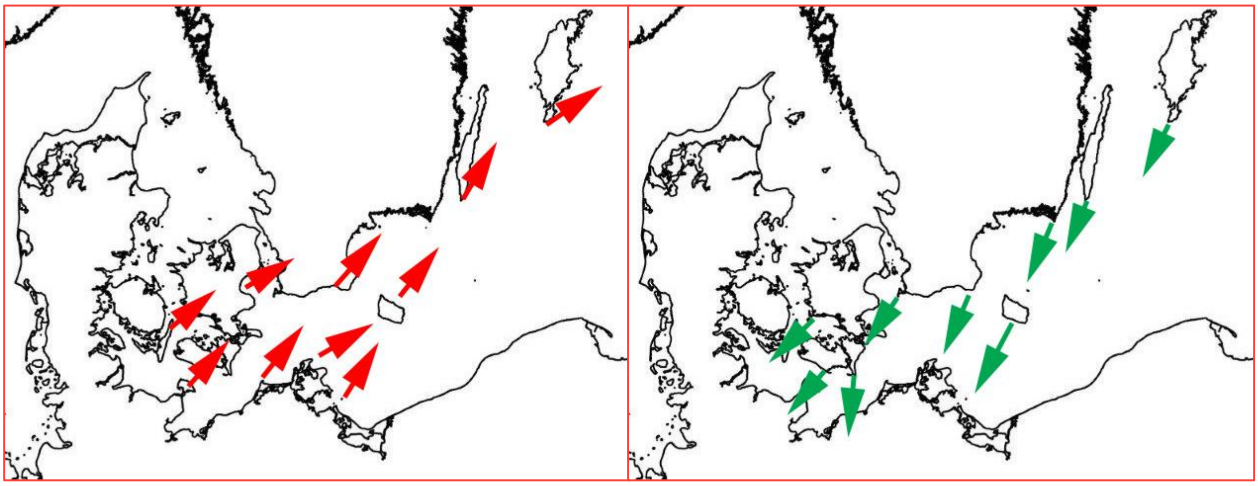

Figure 3 – Suggested patterns of bat spring (left) and autumn (right) migration in western Baltic Sea (based on (Walter et al. 2007; Ahlén et al 2009; Seebens et al. 2013 & Seebens-Hoyer et al. 2021).

OFFSHORE AND COASTAL BAT SURVEYS IN WESTERN BALTIC SEA

Few offshore surveys for bats have been carried out in the western Baltic Sea in the last decade (Figure 4 and Tabel 1). Most of the studies have been carried out in the German part of the Baltic Sea at two platforms and four marine buoys during the environmental impact assessment for various German offshore wind farms, as well as the Fehmarn tunnel connection between Denmark and Germany (Figure 4). Beside these offshore surveys, a few coastal surveys from southern Bornholm (Amphi Consult , 2015), Falsterbo in southern Sweden (Bach, et al., 2017) and Gedser (FEBI, 2013) are also relevant for the understanding of bat migration in the area. Coastal studies provide knowledge of how bats concentrate and most likely start migration from onshore locations that minimize migration distance or about potential feeding offshore at certain weather conditions.

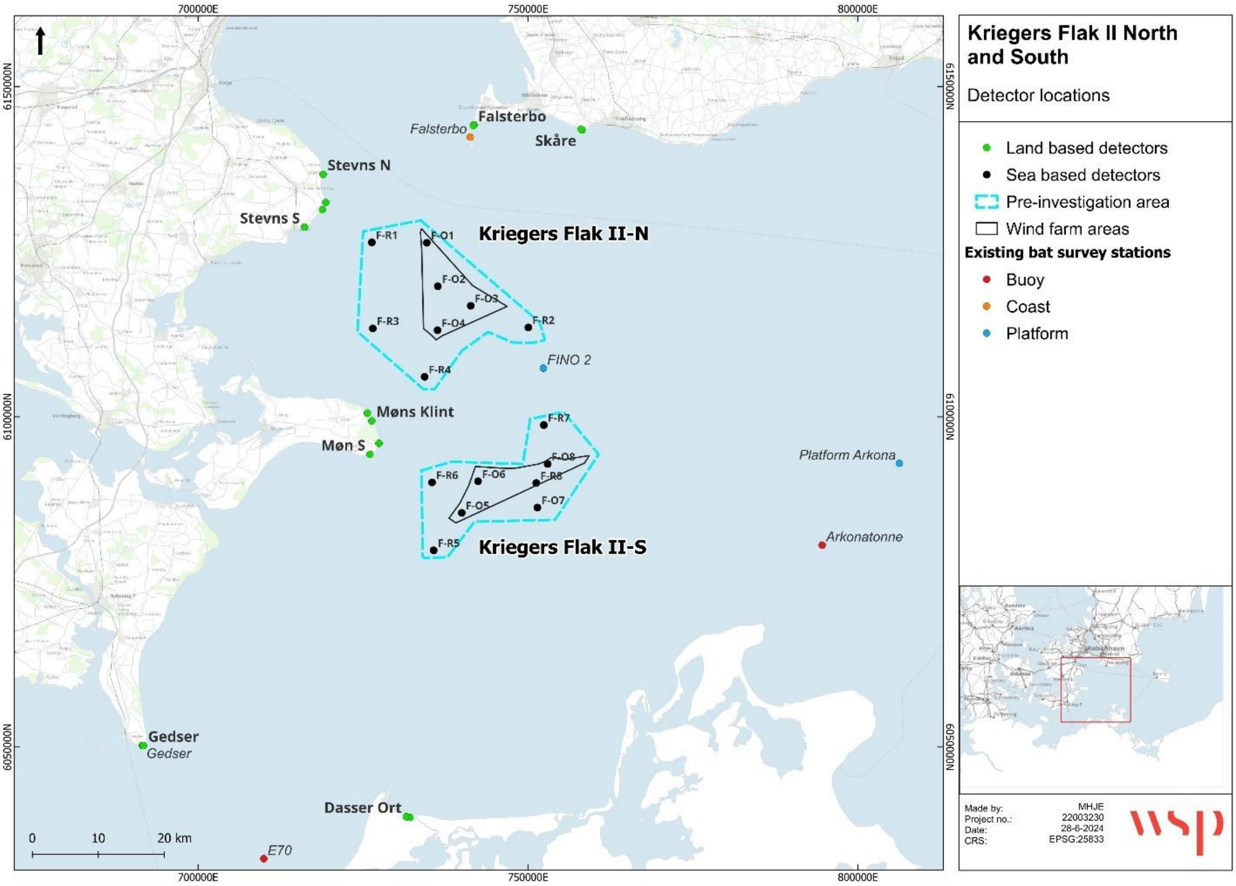

Figure 4 - Bat surveys in the western Baltic Sea. For offshore references please see Tabel 1.

At least eight species of bats have, prior to this study, been recorded offshore in western Baltic Sea (Tabel 1). In all studies Nathusius´s pipistrelle is the most frequent species with 70-90 % of all recordings. Common noctule, Common pipistrelle and Soprano pipistrelle are also recorded in most offshore surveys. Tabel 1 provide an overview of the recording of bat species in seven offshore surveys in the German part of the Baltic Sea.

Tabel 1 - Species recorded on platforms and buoys in the German part of the Baltic Sea (Seebens-Hoyer, et al., 2021).

	Common noctule	Leislers bat	Noctule or Leislers bat	Parti-colored bat	Common serotine	*Myotis sp.*	Common pipistrelle	Soprano pipistrelle	Nathusius pipistrelle	*Pipistrellus sp.*
Femmern Belt* (n=122)	8%		*6%*		1%	*1%*	1%	8%	75%	
Tonne E69 (2016-18)**** (n=231)	6%	<1%	*10%*	<1%	<1%		1%	11%	71%	
Tonne E70 (2018)**** (n=20)								5%	95%	
DS-W (2014)** (n=31)		3%						6%	90%	
FINO 2 (2013)*** (n=289)	4%		*4%*				16%	<1%	73%	*3%*
Arkonatonne (2017, 2018)**** (n=78)	5%	3%	*8%*	4%			3%	3%	76%	
Plattform Arkona (2017, 2018)**** (n=6)	17%								83%	

*) FEBI 2013
**) Wawra et al. 2016
***) Skov et al. 2015
****) Seebens-Hoyer et al. 2021

BAT SPECIES MIGRATING THROUGH WESTERN BALTIC SEA AREA IN LARGER NUMBERS

Three species of bats, Common noctule, Parti-coloured bat and Nathusius's pipistrelle, are most likely to migrate through the pre-investigation area in larger numbers, because all species are known to migrate long distance (Figure 2) and all species are present in large populations in Sweden (De Jong, 2020; Westling, et al., 2020), Finland (Tidenberg, et al., 2019), and the Baltic countries (EUROBATS, 2015).

COMMON NOCTULE (NYCTALUS NOCTULA)

Common noctule is widespread and common in Denmark (Møller, et al., 2013) and Sweden (De Jong, 2020; Westling, et al., 2020) (Figure 5). The Swedish population is estimated to 130,000 individuals (Westling, et al., 2020).
Common noctule is a typical migratory bat species. Populations from north-eastern Europe are known to migrate southwest in autumn and covering distances of several thousands of kilometres. Due to the weather conditions, western populations tend to be more sedentary (Lehnert, et al., 2018)..
It is expected that the Common noctule migrates through the pre-investigation area and it is likely that individuals from Møn and Stevns will use the area for feeding on days with low wind and high temperatures.

Figure 5 - Distribution of common noctule (Source: EUROBAT).

PARTI-COLOURED BAT (VESPERTILIO MURINUS)

Parti-coloured bat is common in the northern part of the island Zealand (Denmark) (Møller, et al., 2013) and has a scattered distribution in Sweden (De Jong, 2020; Westling, et al., 2020) (Figure 6). Parti-coloured bat is a long-distance migratory species, and the species might occur in the marine pre-investigation area both as a migratory species and as a part of their feeding behaviour.

Figure 6 - Distribution of parti-coloured bat (Source: EUROBAT).

NATHUSIUS'S PIPISTRELLE (PIPISTRELLUS NATHUSII)

Nathusius pipistrelle is widespread and common in Denmark (Møller, et al., 2013) and Sweden (De Jong, 2020; Westling, et al., 2020) and the distribution in the region also include the Baltic countries and southernmost Finland (

Figure 7). The Nathusius's pipistrelle undertakes a seasonal long-distance migration, usually from northeast to southwest Europe.

Existing data from offshore surveys in western Baltic Sea shows Nathusius's pipistrelle to be a frequent species.

Figure 7 - Distribution of Nathusius's pipistrelle (Source: EUROBAT).

BAT SPECIES MIGRATING THROUGH WESTERN BALTIC SEA AREA IN SMALL NUMBERS

LEISLER'S BAT (NYCTALUS LEISLERII)

Leisler's bat is only recorded a few times in Denmark (Møller, et al., 2013) and is very rare in Sweden (De Jong, 2020; Westling, et al., 2020). Large numbers of Leisler's bats are not expected in western Baltic Sea. However small number may occur accidentally.

NORTHERN BAT (EPTESICUS NILSSONII)

Northern bat is common in Sweden (De Jong, 2020; Westling, et al., 2020) but rare in Denmark (Møller, et al., 2013) . Although Northern bat appears to be a sedentary species, ring recoveries have shown that they occasionally fly longer distances. None of the previous offshore surveys in western Baltic Sea recorded Northern bats and it is therefore not expected that the species will occur in the pre-investigation area.

SEROTINE BAT (EPTERSICUS SEROTINUS)

Serotine bat is a common species in most part of Denmark (Møller, et al., 2013). In Sweden the species is rather rare and only found in the southernmost part of the country (De Jong, 2020; Westling, et al., 2020). Serotine bat is rather sedentary and the distance between summer and winter roosts tends to be small. It is therefore not expected that the species will occur in significant numbers in the pre-investigation area.

SOPRANO PIPISTRELLE (PIPISTRELLUS PYGMAEUS)

Soprano pipistrelle is widespread and common in Denmark (Møller, et al., 2013) and in southern Sweden (De Jong, 2020; Westling, et al., 2020). Due to its abundance and occurrence in Denmark and southern Sweden it is likely that a small number of Soprano pipistrelle may migrate through the pre-investigation area.

COMMON PIPISTRELLE (PIPISTRELLUS PIPISTRELLUS)

Common pipistrelle is widespread and common in southern parts of Denmark (Møller, et al., 2013) and found scattered in southern Sweden (De Jong, 2020; Westling, et al., 2020). Common pipistrelle is a rather sedentary species, with summer and winter roosts often less than 20 km apart. However, long distance migrations have also been recorded. It is possible that a small number of Common pipistrelle may migrate through the pre-investigation area.

POND BAT (MYOTIS DASYCNEME)

Pond bat is rather common in the northern parts of Jutland and scattered in southern Denmark (Møller, et al., 2013) but rare in Sweden (De Jong, 2020; Westling, et al., 2020). Large number of migrating Pond bats are not likely to occur in the pre-investigation area.

DAUBENTON'S BAT (MYOTIS DAUBENTONII)

Daubenton's bat is common in Denmark (Møller, et al., 2013) and in Sweden (De Jong, 2020; Westling, et al., 2020). Daubenton's bat is a migrant species and is known to fly up to 150 km between roosts. The migration seems however, primary to be over land along rivers and lakes. Daubenton’s bat is rarely observed offshore, and large number are not expected in the pre-investigation area.

BAT SPECIES UNLIKELY TO MIGRATE THROUGH WESTERN BALTIC SEA AREA

BRANDT’S BAT (MYOTIS BRANDTII)

Brandt’s bat is widespread and common in Sweden (De Jong, 2020; Westling, et al., 2020) but rare in Denmark (Møller, et al., 2013). Brandt’s bat is an occasional migrant, but the distances covered are usually no more than 40 km. Brandt’s bat in the pre-investigation area are considered unlikely.

WHISKERED BAT (MYOTIS MYSTACINUS)

Whiskered bat is common and widespread in Sweden (De Jong, 2020; Westling, et al., 2020) but not recorded in Denmark outside Bornholm in the Baltic Sea (Møller, et al., 2013). Whiskered bat is an occasional migrant, but the distances covered are usually small. Whiskered bat in the pre-investigation area is considered unlikely.

WESTERN BARBASTELLE (BARBASTELLA BARBASTELLUS)

Western barbastelle is only recorded in the southern part of Zealand and the islands in southern Denmark (Møller, et al., 2013) and is rare in Sweden (De Jong, 2020; Westling, et al., 2020). Western barbastelle is largely a sedentary species; the distance between summer and winter roosts are usually below 40 km. Occurrences in the offshore parts of Baltic Sea far away from the coast are therefore considered unlikely.

BROWN BIG-EARED BAT (PLECOTUS AURITUS)

Brown big-eared bat is common and widespread in Denmark (Møller, et al., 2013) and Sweden (De Jong, 2020; Westling, et al., 2020). Brown big-eared bat is a very sedentary species. Occurrences over the sea in the Baltic Sea far away from the coast is considered unlikely.

GREATER MOUSE-EARED BAT (MYOTIS MYOTIS)

Greater mouse-eared bat is a regional migrant, whose movements between traditional summer and winter roosts usually range from 50 to 100 km. It is only regularly breeding south of the Baltic Sea (Managementempfehlungen für Arten des Anhangs IV der FFH-Richtlinie (Internethandbuch) Umweltforschungsplan, 2008) and there are only very few recordings from Sweden (De Jong, 2020; Westling, et al., 2020). Because the Baltic Sea is situated outside the main distribution area of the speciess (Dietz, et al., 2011), it seems unlikely that the species will occur in the pre-investigation area.

NATTERER'S BAT (MYOTIS NATTERI)

Natterer's bat is common and widespread in Sweden (De Jong, 2020; Westling, et al., 2020) and scattered in Denmark (Møller, et al., 2013). Natterer's bat is generally considered a sedentary species; however, some individuals are known to have covered long distances. Occurrences of Natterer's bat in the pre-investigation area are considered unlikely.

TIMING OF BAT MIGRATION THROUGH THE WESTERN BALTIC SEA AREA

Systematic studies of bat migration in the Baltic Sea region are currently limited. As a result, the expected timing of migration is inferred from general knowledge and observations from Denmark and Sweden. Spring migration is expected to begin in April and continue until early June, while autumn migration typically starts in August and may extent into late October.

CLIMATE CHANGE AND THE TIMING OF BAT MIGRATION

The timing of bat migration is closely linked to the availability of specific insect species that serve as primary food sources. Changes in winter temperatures and shifts in the timing of spring and autumn can influence insect abundance and distribution, potentially affecting bat migration patterns. However, the extent to which these environmental changes impact migration timing and how quickly bats can adapt remains uncertain.

An eight-year dataset from Falsterbo in southern Sweden suggests a shift in the timing of autumn migration for Nathusius' pipistrelle, with the median migration date moving from late August in 2012 to late September in 2019 (Bach, 2021). This indicates that autumn migration may be particularly sensitive to temperature changes during August, September, and October. In general, bats are likely to remain longer in their breeding areas if insect availability remains high.
Spring migration is more difficult to predict, as bats cannot assess environmental conditions at their destination in advance. Instead, the timing of departure from wintering areas is believed to be influenced primarily by factors such as day length and internal physiological cues.

METHODOLOGY

The field survey programs for bat detection in offshore and -coastal areas are inspired by methods developed by BSH *(Bundesamt für Seeschifffahrt und Hydrographie, October 2013)* in StUK4 *(Standard Investigations of the impacts of Off-shore Wind Turbines in the Marine Environment),* and *technical requirements to the monitoring of bats (TA nr. A04, ver. 3, latest review 30.05.2018, DCE University of Aarhus)*. However, there are no standard survey methods developed for offshore bat surveys and therefore, different methods were applied during this survey programme. The method for the coastal onshore survey was selected mainly to support and supplement the results from the offshore survey. Therefore, the type of detectors and settings onshore are like offshore detectors, except for the box design and battery type.

The surveys mainly focused on the most likely migratory seasons; spring (from mid-March to mid-June) and autumn (from August to October), but due to the uncertainty of bat activity offshore and the possibility of foraging bats during the summer season, the offshore monitoring was conducted throughout the entire period from April to October. In both 2023 and 2024, no bats were recorded offshore before mid-April and consequently, all graphs below only show bat activity from 1st of April to 31st of October.

OFFSHORE BUOY BASED SURVEY

Bat detectors were attached to 16 buoys used for the marine mammal Passive Acoustic Monitoring (PAM) survey program conducted by WSP & BioConsult (Figure 8Figure 8). The initial mountings of the bat detectors to the PAM stations were carried out during a PAM-service expedition in March 2023. The bat detectors were mounted on the buoys by a bat detector technician. The detectors were placed near the top of the PAM-buoys, approximate 2.5 metres above sea level. The mounting position of the detectors ensured that the detectors were protected from direct contact with the saline seawater. However, rough weather conditions could cause the buoys to be submerged, thus exposing the detectors to seawater. To protect the microphone from intake of saline seawater, a special Gore-Tex membrane was applied to the detector casings. This membrane was specifically designed to prevent water intake and ensure non impaired sound recordings through the membrane. A preliminary test before the initiation of the project showed, that more than 95 % of all bats were recorded on detectors equipped with the Gore-Tex protected microphones.

The PAM-mounted bat detectors collected recordings of all bats passings at 16 positions (Figure 9) in the pre-investigation area during spring, summer, and autumn (1st of April to 31st of October) in 2023 and 2024.

The service of the bat detector was coordinated with the service of the marine mammals PAM- service expeditions. During these expeditions, the crew also replaced all the bat detectors.

Figure 8 - PAM bat detector mounted on a buoy used for the marine mammal survey.

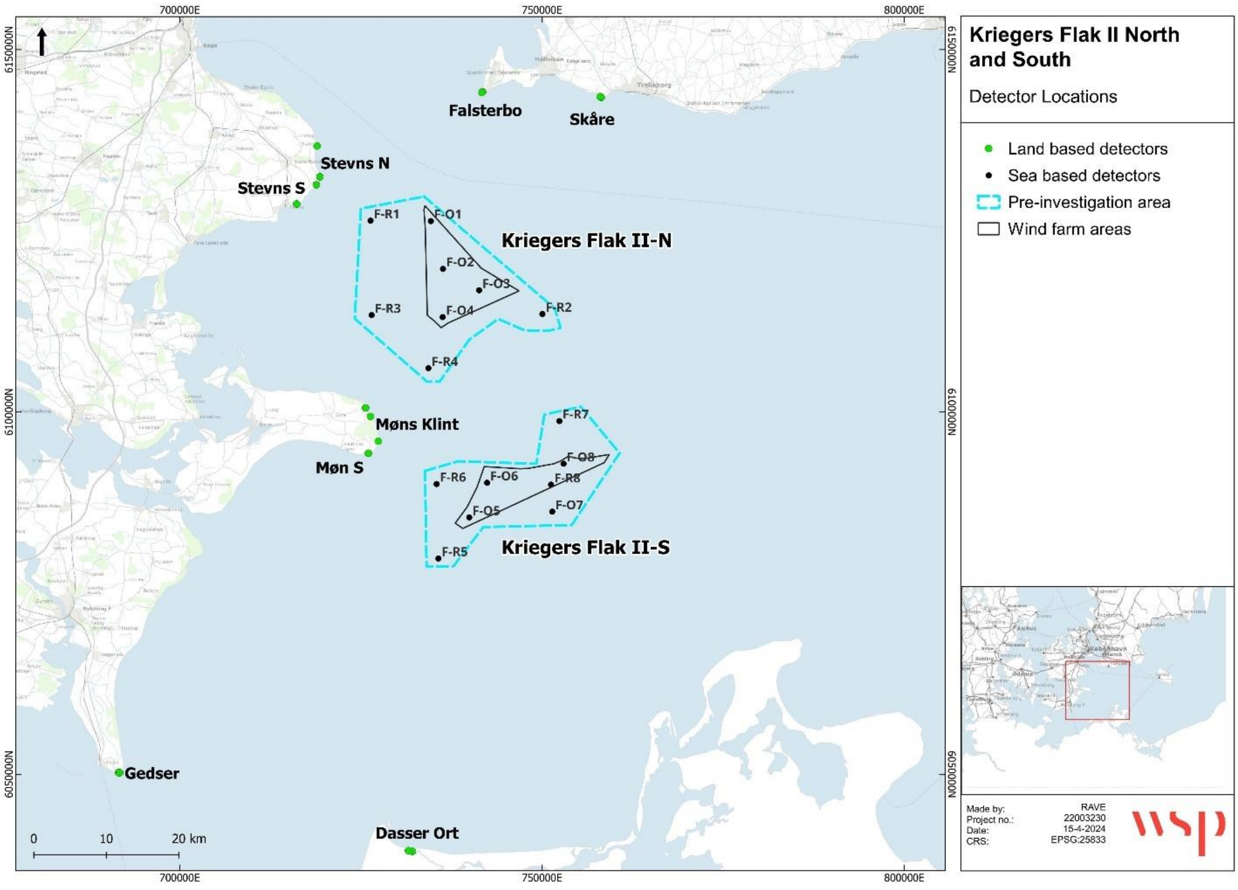

Figure 9 - Map showing the position of the buoys used for the survey. Bat detectors on coastal areas (green dots) and on sixteen buoys located within the pre-investigation area for the planned Kriegers Flak II (North and South) Offshore Wind Farm (black dots)

Error! Reference source not found. gives an overview of stations used in the buoy-based bat survey and which periods the detectors were deployed and recording.

Table 1. Deployment periods for buoy-based bat detectors

	2023		2024	
Stations	**Spring**	**Autumn**	**Spring**	**Autumn**
F-O1	-	25. Aug. – 31. Oct.	1. Apr. – 24. Aug.	25. Aug. – 31. Oct.
F-O2	1. Apr. – 24. Aug.	25. Aug. – 31. Oct.	1. Apr. – 24. Aug.	25. Aug. – 31. Oct.
F-03	1. Apr. – 24. Aug.	25. Aug. – 31. Oct.	1. Apr. – 24. Aug.	25. Aug. – 31. Oct.
F-04	1. Apr. – 24. Aug.	25. Aug. – 31. Oct.	1. Apr. – 24. Aug.	25. Aug. – 31. Oct.
F-05	-	25. Aug. – 31. Oct.	1. Apr. – 24. Aug.	25. Aug. – 31. Oct.
F-O6	-	25. Aug. – 31. Oct.	1. Apr. – 24. Aug.	25. Aug. – 31. Oct.
F-O7	1. Apr. – 24. Aug.	25. Aug. – 31. Oct.	1. Apr. – 24. Aug.	25. Aug. – 31. Oct.
F-O8	1. Apr. – 24. Aug.	25. Aug. – 31. Oct.	1. Apr. – 24. Aug.	25. Aug. – 31. Oct.
F-R1	1. Apr. – 24. Aug.	25. Aug. – 31. Oct.	1. Apr. – 24. Aug.	25. Aug. – 31. Oct.
F-R2	1. Apr. – 24. Aug.	25. Aug. – 31. Oct.	1. Apr. – 10. Jun.	13. Sep. – 31. Oct.
F-R3	-	25. Aug. – 31. Oct.	1. Apr. – 24. Aug.	25. Aug. – 31. Oct.
F-R4	1. Apr. – 24. Aug.	25. Aug. – 31. Oct.	1. Apr. – 24. Aug.	25. Aug. – 9. Oct.
F-R5	1. Apr. – 24. Aug.	25. Aug. – 31. Oct.	1. Apr. – 24. Aug.	25. Aug. – 31. Oct.
F-R6	16. Mar. – 20. Jun.	20. Jul. – 6. Oct.	1. Apr. – 18. Aug.	13. Sep. – 31. Oct.
F-R7	-	25. Aug. – 31. Oct.	1. Apr. – 1. Jul.	13. Sep. – 16. Sep.
F-R8	1. Apr. – 24. Aug.	25. Aug. – 31. Oct.	1. Apr. – 24. Aug.	25. Aug. – 31. Oct.

OFFSHORE VESSEL BASED SURVEY

The survey vessel Skoven has been visiting the survey areas for different purposes throughout the survey period in 2023. A bat detector has been installed on the vessel (Figure 10). The bat detector was programmed to record completely independently with no assistance from the staff onboard the vessel. The bat detector recorded the ultrasound from bats around the vessel and saved the recording for later analysis. The bat detector also recorded the position of the vessel and the time. Weather conditions (wind direction, wind speed and temperature were taken from the vessels logbook). The vessel-based bat surveys included data collection from March 2023 to October 2023. From March to mid-August 10 detectors were deployed for the full period and from August 16 detectors were deployed (**Error! Reference source not found.**)

Figure 10 - Automatic bat detector (in front) mounted on the survey vessel Skoven.

COASTAL (ONSHORE) SURVEY

Concentration and activity of bats onshore, in the coastal regions, may be a strong indicator for migration trends.

During spring (April-June) and autumn (August-October), the migrating bat species may concentrate along the coast, waiting for the right weather conditions for crossing the sea. Therefore, the level of activity measured along the coast can help to understand when a migration through the pre-investigation area occurs. Hence, a land-based survey was set up, and the survey included data collection from April to October in 2023 and 2024.

The main migration of bats through the pre-investigation area is expected to occur from southwest to northeast in spring and from northeast to southwest in autumn (Figure 3). Therefore, eight sites on the coast of Møn, Stevns and Gedser in Denmark, Darsser Ort in Germany as well as the Southern coast of Skåne in Sweden were selected because of high probabilities for acting as exit or entry points for migrating bats

Coastal studies provide knowledge of how bats concentrate and most likely start migration from landsites that minimize migration distance over open water, as well as provide knowledge about potential feeding activities offshore during certain weather conditions in the pre-investigation area. Therefore, the survey stations include not only Danish sites but also include sites of adjacent countries.

A total of 16 detectors (Figure 9) in eight different areas along the coast of Stevns, Gedser and Møn in Denmark as well as Darsser Ort in Germany and Skåne in Sweden (**Error! Reference source not found.**), were installed during the survey periods monitored for bat activity throughout the migration seasons in order to describe and quantify the number of bats waiting near the coast for ideal weather conditions to migrate. Most sites had two detectors with one detector functioning as a backup in case of technical failure (Table 2). At the coast of Stevns and Møn, four single detectors were places with 2-7 km distance to cover the potential variation along the coast. In the later analysis, the results are grouped for these locations based on similarities in the observed recording patterns.

Table 2. Deployment periods for coastal bat detectors

	2023		2024	
Stations	**Spring**	**Autumn**	**Spring**	**Autumn**
Skåre (2 detectors)	1. Apr. – 15. Aug.	16. Aug. – 31. Oct.	1. Apr. – 15. Aug.	16. Aug. – 6. Oct.
Falsterbo (2 detectors)	1. Apr. – 31. Jul.	17. Aug. – 23. Oct.	1. Apr. – 26. Jul.	16. Aug. – 8. Oct.
Stevns N (2 detectors, 1 on each subsite)	1. Apr. – 15. Aug.	16. Aug. – 28. Oct.	1. Apr. – 15. Aug.	16. Aug. – 2. Oct.
Stevns S (2 detectors. 1 on each sub site)	1. Apr. – 3. Aug.	10. Aug. – 29. Oct.	1. Apr. – 4. Aug	10. Aug. – 1. Oct.
Møns Klint (3 detectors, 1 on each subsite)	1. Apr. – 15. Aug.	16. Aug. – 14. Sep.	1. Apr. – 16. Aug.	17. Aug. – 24. Oct.
Møn S (1 detector)	1. Apr. – 15. Aug.	16. Aug. – 21. Oct.	1. Apr. – 16. Aug.	17. Aug. – 21. Oct.
Gedser (2 detectors)	1. Apr. – 24. Jul.	27. Jul. – 31. Oct.	1. Apr. – 16. Aug.	17. Aug. – 21. Oct.
Darsser Ort (2 detectors)	1. Apr. – 15. Aug.	16. Aug. – 31. Oct.	2. Apr. – 16. Aug.	17. Aug. – 9. Oct.

All detectors were mounted in trees or other structures in approximate three meters height. The specific mounting locations were selected close to open space, in areas where bat activity was expected (Figure 11).

Figure 11 – PAM bat detector mounted on a tree on the coast of Møn.

DATA ANALYSIS

MEASUREMENT CONFIGURATIONS

Data collection for both the buoy-based, the vessel-based and the coastal (onshore) bat surveys were conducted using detectors, which all were based on AudioMoth technology but enhanced with an external microphone and a large battery pack (Figure 9, Figure 8 & Figure 11). All detectors were configured to record all bat activity from half an hour before sunset to half an hour after sunrise. Recordings were segmented into 5-second intervals, separated by 10-second pauses. The configurations used on this project are similar to the ones used on bat survey on Energy Island Bornholm (WSP, 2024b), Kattegat OWF (WSP in press) and Kriegers Flak II OWF (WSP in press). The detector configurations are presented in Table 3.

Before deployment all detectors are calibrated to ensure comparability. Detectors with a microphone that performed less than 90 percent of the standard microphone performance were not used.

Table 3 - Configuration of the detectors.

Parameter	Unit	Setting
SD card	GB	256
Sample rate	kHz	192
Gain	-	Medium
Cyclic recording	s	Recording 5 – pause 10
Trigger type		Amplitude
Minimum trigger frequency	kHz	15
Max duration	s	5
Compression	-	WAW

POST PROCESSING

The initial analysis of all collected onshore, offshore buoy-based and vessel-based bat detection data was performed using Wildlife Acoustics Kaleidoscope Pro software with the automatic identification algorithm enabled. Kaleidoscope analyzes all files for the presence of bat calls based on the signal parameters summarized in Table 4. Files that do not meet these parameters are labeled as noise and deleted by the software. The remaining output files are then analyzed by the Auto-ID function using a classifier library (Bats of Europe 5.4.0) containing calls of relevant bat species. The output files and their contents from Kaleidoscope are summarized in Table 5.

Table 4 - Signal parameters.

Parameter	Unit	Settings
Minimum frequency	kHz	8
Maximum frequency	kHz	120
Minimum pulse length	ms	2
Maximum pulse length	ms	500
Maximum inter-syllable gap	ms	500
Minimum number of pulses	ms	2
CF (cutoff frequency) noise filter maximum frequency	kHz	0
CF (cutoff frequency) noise filter maximum bandwidth	kHz	0

Table 5 - Output files of the Auto-ID process.

Output file	Description
meta.csv	The meta.csv file is a catalog of the input recording files which were processed in the batch.
id.csv	The id.csv file contains a list of all input files and their Auto-ID analysis results. The file also contains extensive statistical information regarding the content of the input files including these main parameters: - AUTO-ID – This field shows the automatic classification result - MATCHING - Number of pulses matching the auto classification result - MATCH RATIO - The ratio of MATCHING over PULSES - MANUEL ID – Manuel identification
idsummary.csv	The idsummary.csv file provides a summary of which species were detected in the Auto-id analysis.
settings.ini	This file is a snapshot of every setting in Kaleidoscope Pro at the time of the Auto-ID for Bats batch process. The settings.ini file is additionally useful because it provides a record of any custom Button Labels in the Viewer
db-batch.wdb	This file contains no actual database records but defines the structure of the database.

MANUAL ANALYSIS

Due to the varying success rates of the Auto-ID function in Kaleidoscope Pro, a manual review of files was conducted by personnel with bat identification expertise. Experience with Kaleidoscope Pro's Auto-ID indicates that the software achieves nearly 100 % accuracy with certain species, such as the Soprano pipistrelle, which performs acoustic output at levels of approximately 50 kHz. However, it has less than 20 % accuracy with other species, such as the Common noctule, which performs acoustics at levels of approximately 20 kHz and are often misclassified due to background noise. Consequently, some Auto-ID suggestions are thoroughly checked, while others are reviewed only if the match ratios are low. Additionally, random samples were taken throughout the collected data as an additional quality assurance measurement.

All recordings from the buoy-based passive acoustic monitoring (PAM) bat detectors were processed and identified to species level. For the land-based detectors, the identification process focused specifically on migratory bat species. As a result, the species detected on the buoys—confirmed migratory species—were also the primary focus for analysis on land. Recordings of bat species which were not recorded on the buoys and therefore not relevant to this survey were either not identified or excluded from the analysis.

Species-level identification was performed when possible. In cases where confident identification could not be achieved, recordings were classified into species-group. Due to the difficulty in reliably distinguishing between Common noctule, Leisler's bat, and Parti-coloured bat based on acoustic data, these species were grouped under the category "Nyctaloid bats" for the purposes of analysis.

DATA AND RESULTS

GENERAL COASTAL PATTERNS

The patterns of the bat activity measured on the coastal detectors are shown in detail in Appendix 2. To better fit the format of this report and to get able to compare the two survey years the below graphs are collated in 10-days segments. Often patterns found on coastal locations are a mixture of local and migrating bats. However, some patterns are visible, and these are described for each location below.

STEVNS

Four bat detectors were deployed along the coast of Stevns (Figure 9), and the combined data from these monitoring sites are presented in Figure 12. The results indicate that the coastal areas of Stevns provide important habitat for bats. Data from the two survey years show broadly consistent patterns, with the most notable difference being a generally higher number of bat recordings in 2023 compared to 2024.

Bat activity was especially high during the spring and autumn migration periods, while the summer months showed little to no activity, depending on the species. Nathusius's pipistrelle exhibited a clear migratory pattern, with pronounced peaks in both spring and autumn and very few detections during summer. Stevns appears to be particularly significant for this species during spring migration, with peak activity levels approximately ten times higher than those observed in autumn across both years.
Nyctaloid bats also showed migratory tendencies. However, the pattern was less distinct due to the presence of local, breeding individuals. Migration patterns differed between the two years: in 2023, most activity occurred during the autumn migration, while in 2024, the seasonal difference was less pronounced. Notably, in September 2023, favourable weather conditions—characterized by low wind and warm night temperatures—created ideal conditions for insect migration, particularly moths. This led to a surge in bat activity, especially among Nyctaloid species feeding along the coast and offshore, resulting in approximately 2,500 more detections compared to the same period in 2024.
Soprano pipistrelle was also commonly recorded in Stevns and displayed clear migratory behaviour, with activity peaks during both spring and autumn migration periods.

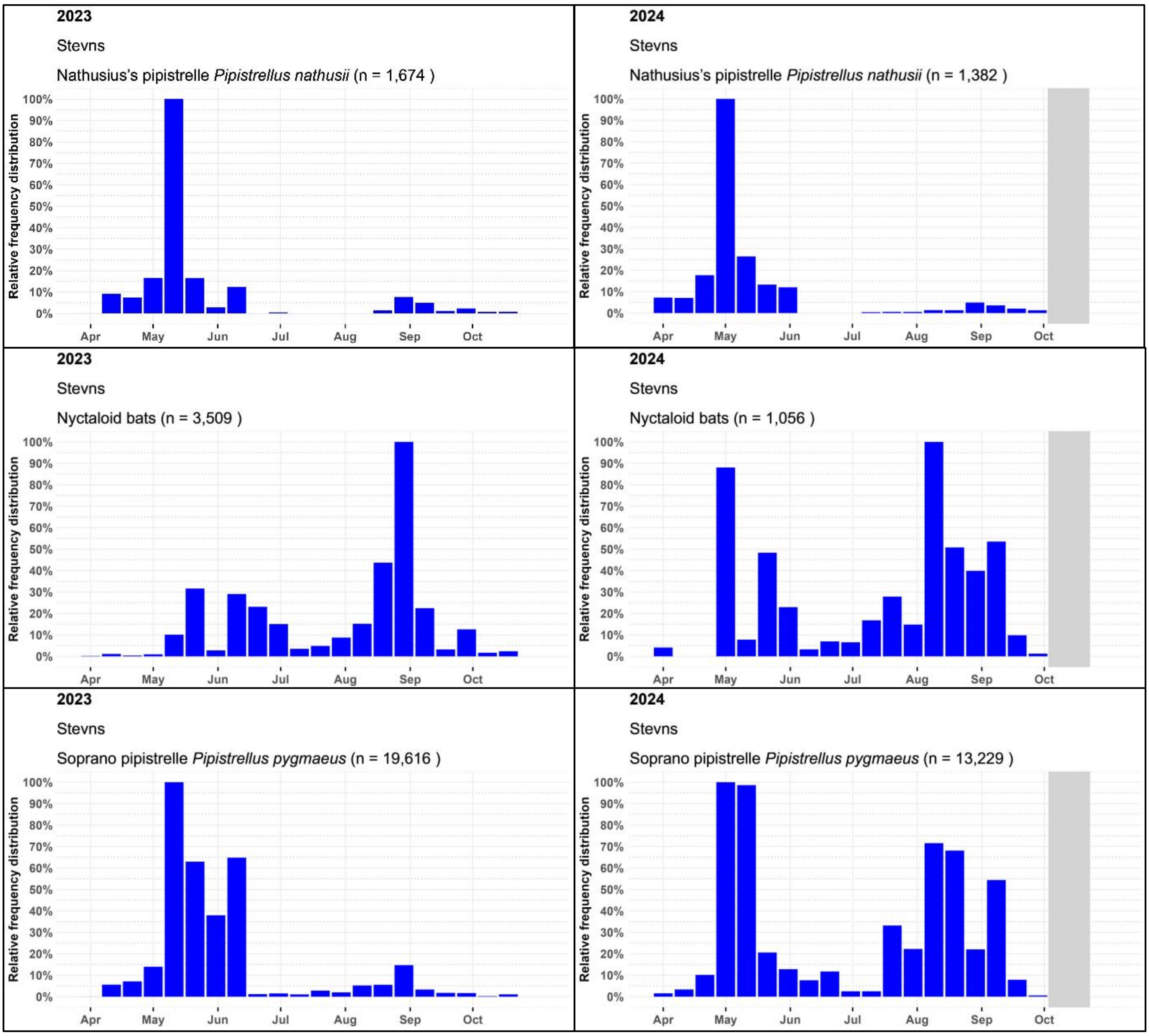

Figure 12 – Relative frequency of bat recordings summarised in 10 days intervals for 2023 and 2024. Grey areas indicate periods without monitoring.

MØNS KLINT

This dataset is based on recordings from three bat detectors positioned along the coast of Møns Klint (Figure 9), with the graphs representing the average activity across these sites. Unfortunately, equipment failures affected some of the detectors during the summer and autumn of 2024, making the data from that period less reliable and more difficult to interpret.

Overall, the data from Møns Klint indicate both migratory and resident behaviour among the observed bats (Figure 13). All three species or species groups exhibited migratory patterns, with activity peaking during spring and autumn. However, both Nyctaloid bats and Soprano pipistrelle also showed signs of local breeding populations, as evidenced by their continued presence during the summer months.

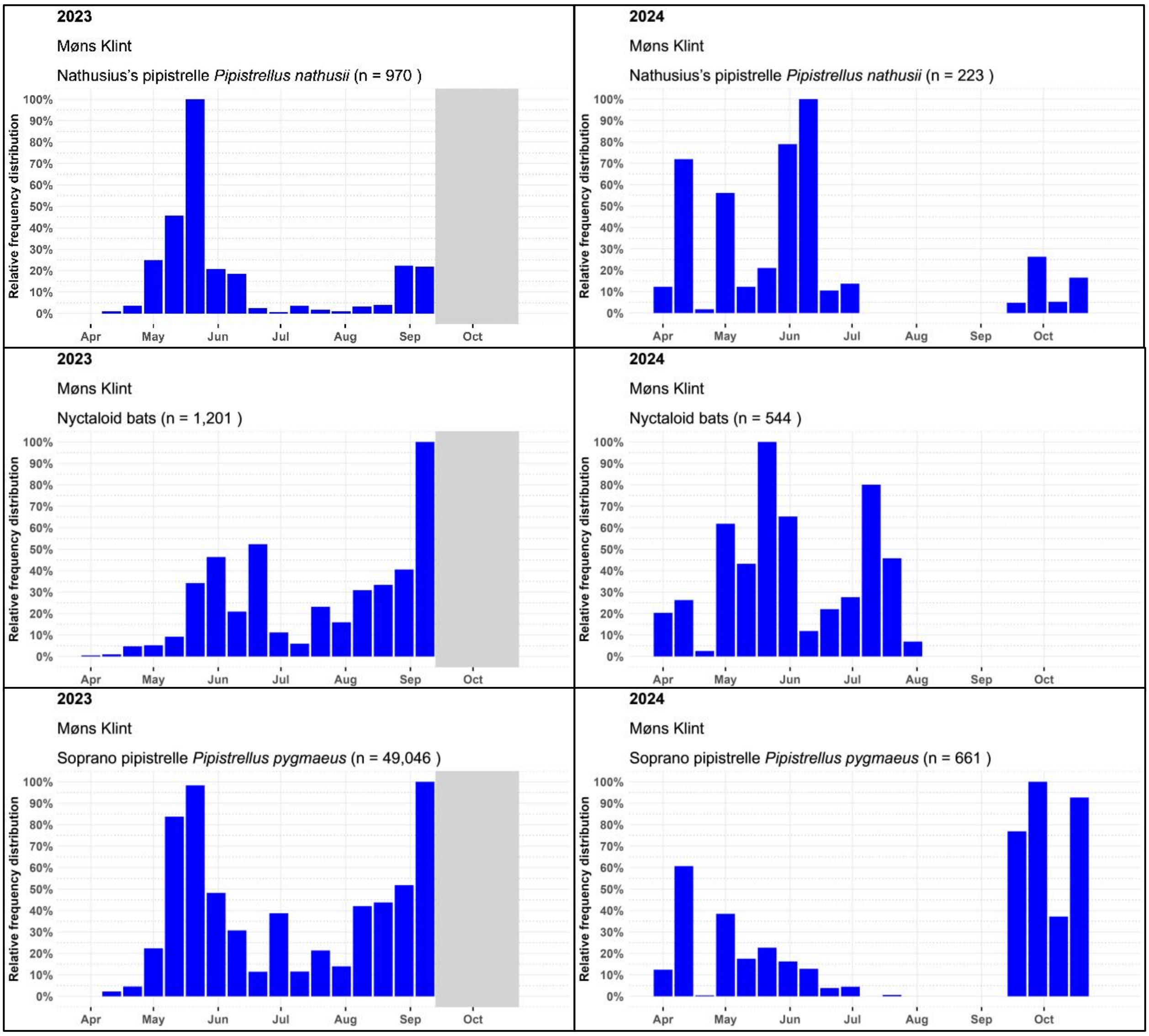

Figure 13 – Relative frequency of bat recordings summarised in 10 days intervals for 2023 and 2024. Grey areas indicate periods without monitoring.

MØN SOUTH

One bat detector was deployed on the south-east coast of Møn (Figure 9), and the data from this monitoring site is presented in Figure 14. The results indicate that the coastal areas of Stevns provide important habitat for bats. Data from the two survey years show broadly consistent patterns, with the most notable difference being a generally higher number of bat recordings in 2023 compared to 2024.

Bat activity at Møn South was particularly high during the spring and autumn migration periods, while the summer months showed little to no activity, depending on the species. Nathusius' s pipistrelle showed no evidence of local breeding, as indicated by the absence of activity during summer. However, the distinct peaks in spring and autumn confirm a strong migratory pattern. Like the observations from Stevns, Møn South recorded a significantly higher number of Nathusius' s pipistrelle detections during autumn 2023 compared to 2024, when very few individuals were observed.
Nyctaloid bats and Soprano pipistrelle followed the same general pattern, with activity peaks during spring and autumn migrations. However, both groups also showed clear signs of local presence during the summer months, suggesting the presence of resident breeding populations.

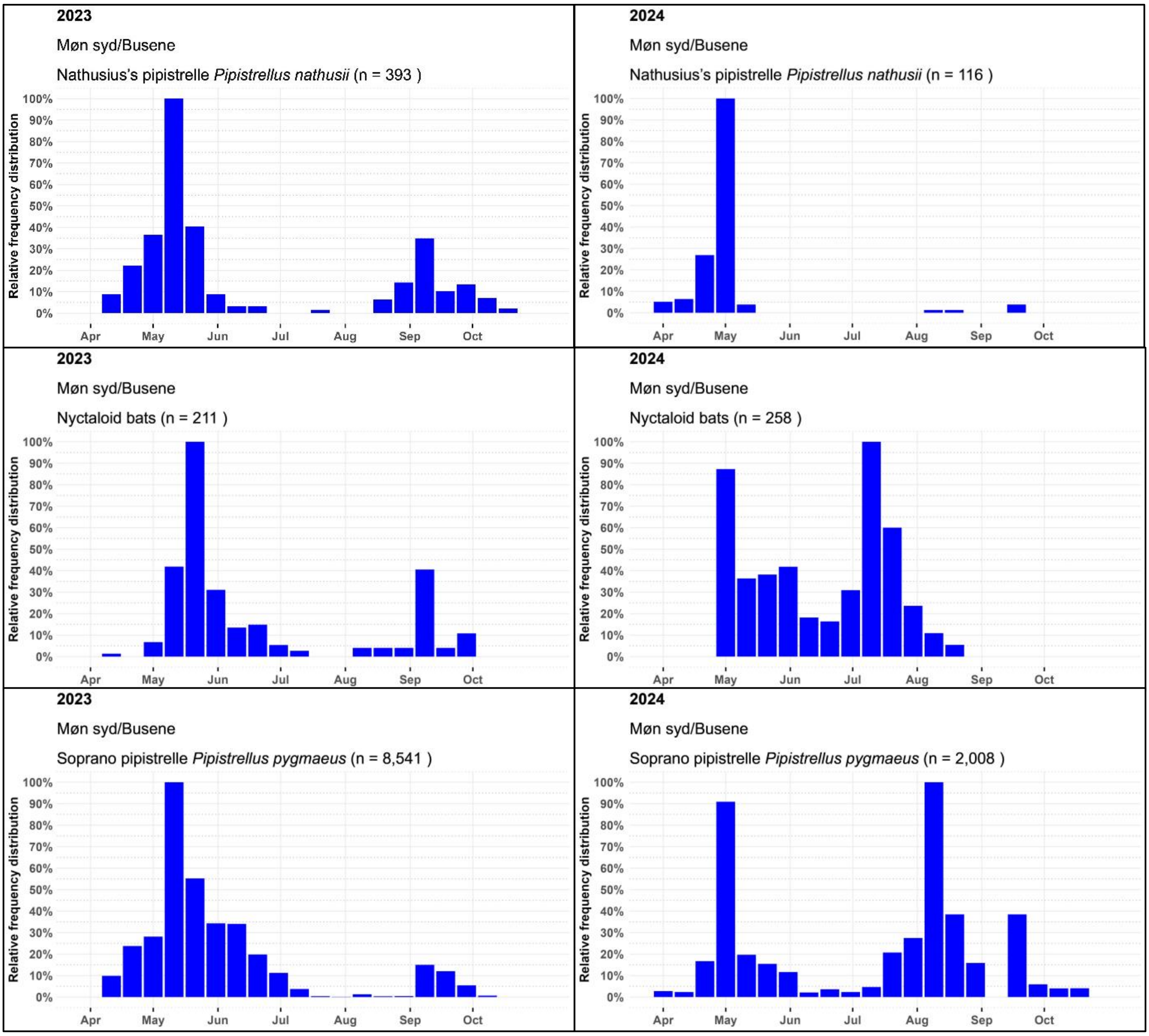

Figure 14 – Relative frequency of bat recordings summarised in 10 days intervals for 2023 and 2024. Grey areas indicate periods without monitoring.

GEDSER

Two bat detectors were deployed on the southernmost tip of Falster (Figure 9), and the combined data from these monitoring sites are presented in Figure 15.

Gedser, located at the southern tip of Falster and the southernmost point of Denmark, is well known for its importance to migrating birds. Data from the two survey years suggest that it also plays a significant role for migrating bats.
Nathusius' pipistrelle was recorded in high numbers—particularly in 2024—and showed clear migratory behaviour, with distinct peaks during both spring and autumn migration periods. Nyctaloid bats also exhibited migratory tendencies, though the spring peak was less pronounced. A similar pattern was observed for the soprano pipistrelle, which showed stronger activity during autumn migration and a more modest presence in spring.
The consistent presence of all three species or species groups throughout the summer months indicates that breeding populations are present in the surrounding area.

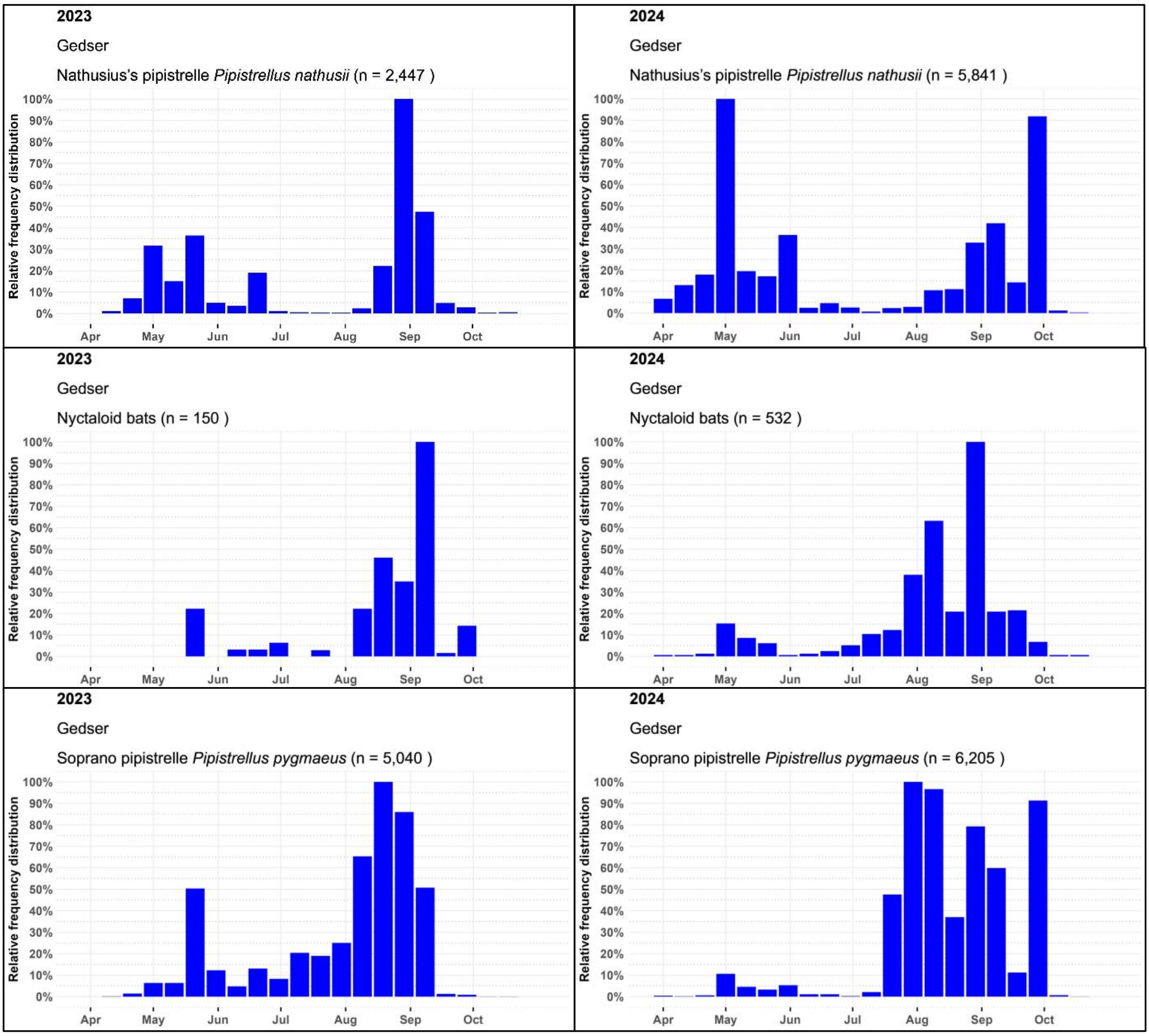

Figure 15 – Relative frequency of bat recordings summarised in 10 days intervals for 2023 and 2024. Grey areas indicate periods without monitoring.

DARSSER ORT (GERMANY)

This dataset is based on recordings from two bat detectors placed in Zingst, along the coast of the Darsser Ort peninsula (Figure 9), with the graphs in Figure 16 representing the average activity across both sites. Unfortunately, equipment failures affected both detectors during the autumn of 2023, making the data from that period less reliable and more difficult to interpret.

Despite these limitations, the available data clearly indicates that Darsser Ort is an important area for bats, with activity recorded throughout the season. Nathusius' pipistrelle showed a distinct migratory pattern during spring, but no corresponding peak in autumn (2024), suggesting that this species may follow alternative routes during its southward migration. Nyctaloid bats were present throughout the season, with a noticeable increase in activity during the autumn migration period (2024). Soprano pipistrelle displayed a pattern like that of Nathusius' s pipistrelle, with a spring migration peak and no autumn peak, but with a much stronger presence of resident individuals during the summer months.

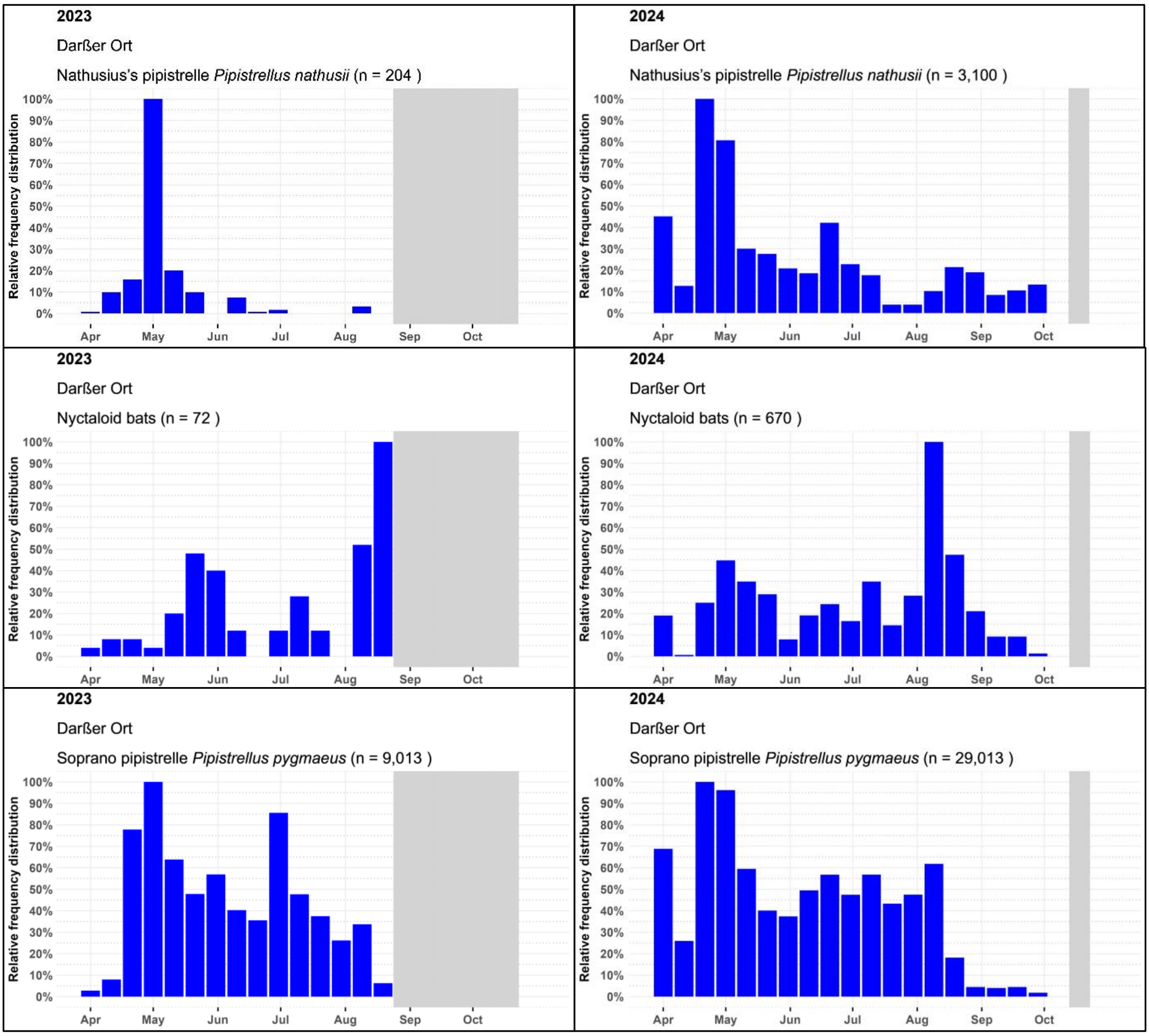

Figure 16 – Relative frequency of bat recordings summarised in 10 days intervals for 2023 and 2024. Grey areas indicate periods without monitoring.

SKÅRE (SWEDEN)

Two bat detectors were deployed on the south coast of Skåne (Figure 9), and the combined data from these monitoring sites are presented in Figure 17.

Overall, the Skåre site appears to be an important location for bats, particularly during migration periods. Nathusius's pipistrelle showed a clear migratory pattern, with peaks in activity during both spring and autumn. Migration was evident in both survey years, though spring migration was notably more pronounced in 2024 compared to 2023. The data also suggest the presence of a nearby breeding population of Nathusius's pipistrelle, which regularly visits the area for foraging, albeit in modest numbers. Nyctaloid bats demonstrated migratory tendencies as well, though the timing of peak activity varied between years. In 2023 with the dominant peak during spring, whereas the main peak in 2024 occurred in autumn. The soprano pipistrelle also showed signs of migration, most clearly in 2024. Interestingly, data from 2023 indicate a relatively stable summer presence of soprano pipistrelle, suggesting a local breeding population that was absent in 2024. This absence may indicate that the breeding population either failed to establish successfully or relocated.

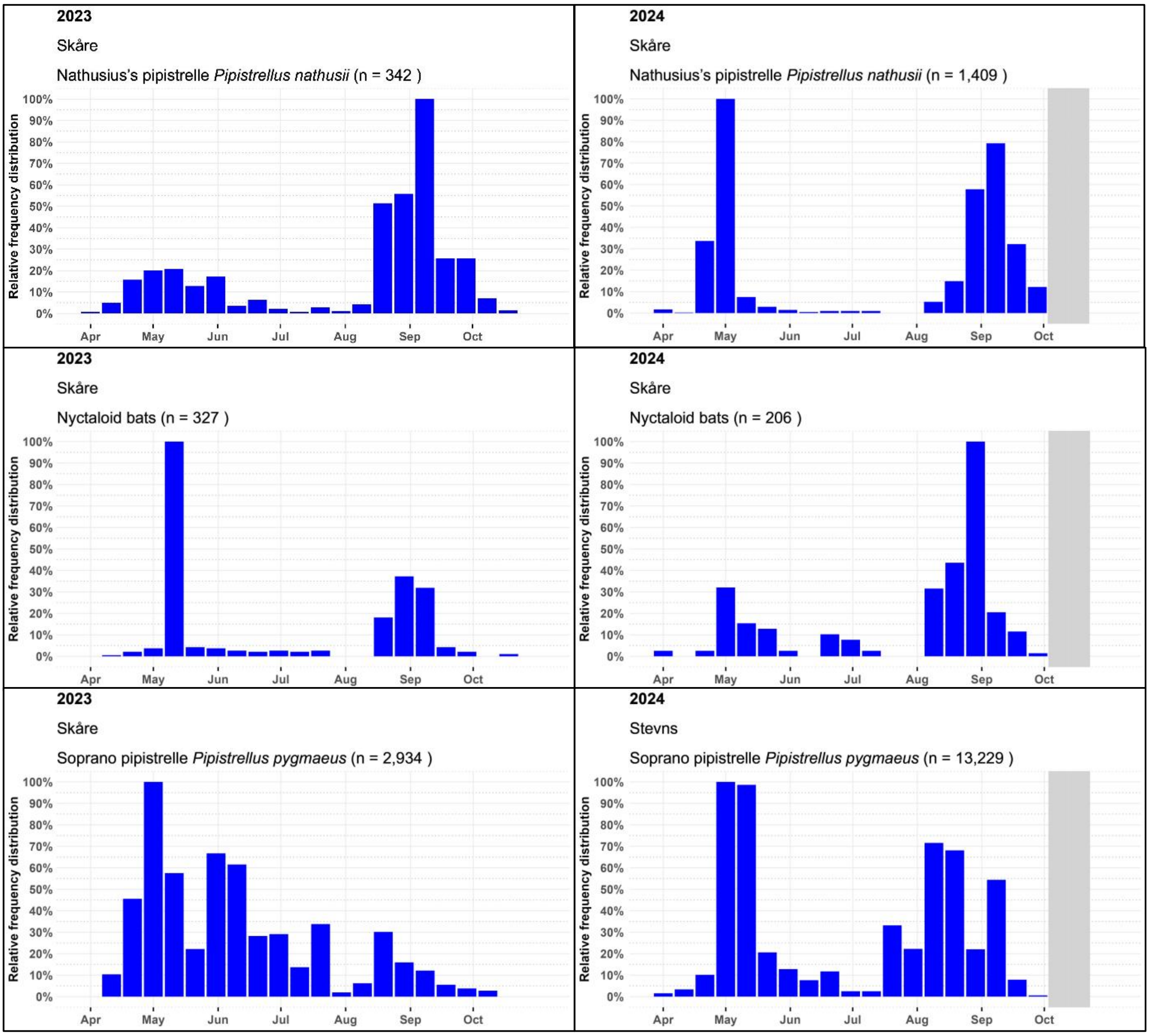

Figure 17 – Relative frequency of bat recordings summarised in 10 days intervals for 2023 and 2024. Grey areas indicate periods without monitoring.

FALSTERBO (SWEDEN)

Two bat detectors were deployed in Falsterbo (Figure 9), and the combined data from these monitoring sites are presented in Figure 18.

Falsterbo, located at the southwestern tip of Sweden, is well known for its importance to migrating birds. Data from the two survey years indicate that it also plays a significant role for migrating bats.

Nathusius' pipistrelle was recorded in high numbers in both years and exhibited a strong migratory pattern, with clear peaks in activity during both spring and autumn migrations—autumn being the more dominant period. Nyctaloid bats were observed in lower numbers, but their activity also followed a migratory pattern, again with autumn showing the highest levels. Soprano pipistrelle was recorded at activity levels like Nathusius' pipistrelle and also displayed a clear migratory tendency.

All three species or species groups were present in small numbers during the summer months, suggesting the presence of nearby breeding populations that regularly visit the area for foraging.

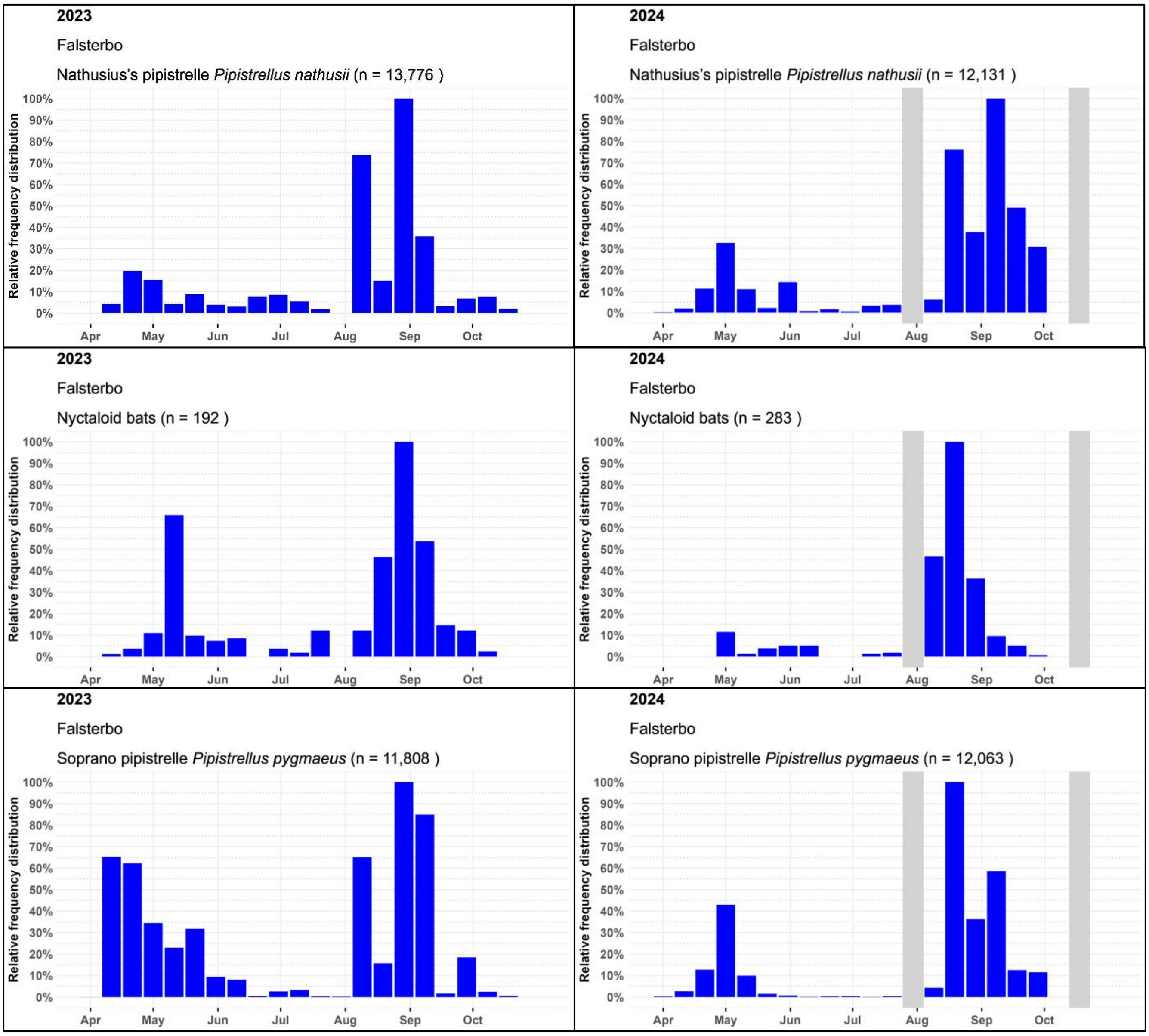

Figure 18 – Relative frequency of bat recordings summarised in 10 days intervals for 2023 and 2024. Grey areas indicate periods without monitoring.

GENERAL OFFSHORE PATTERNS

Foraging and migrating activity of bats in marine areas differs between locations dependent on proximity to land and position in relation to migration corridors. For migrating birds some marine areas are more important than others as these are preferred migration corridors. The same is assumed to be applicable for migrating bats. Also, some marine areas are used by foraging bats – especially during late summer. Data on bat activity in marine areas are not widely available, but some data exists collected from other bat monitoring surveys for Offshore Wind Farms. In Table 6 number of recordings per buoy in the area north of Kriegers Flak II can be seen in relation to data collected from other OWF project in Denmark.
At Kriegers Flak, the number of bat recordings per buoy ranged from 25 to 116 in 2023, and from 2 to 36 in 2024 (Figure 13). After correcting for equipment malfunctions, the average number of recordings per buoy was 63.9 in 2023 and 17.2 in 2024. These results highlight a marked difference in bat activity between the two survey years.
This variation is primarily attributed to an isolated event in September 2023, when unusually warm temperatures and low wind speeds created favourable conditions for insect activity, possibly including insect migration. These conditions led to a significant increase in bat foraging activity, particularly Nyctaloid species. Such extreme weather events are considered rare and are unlikely to occur frequently.
Despite the year-to-year differences, the average number of recordings per buoy at Kriegers Flak remained substantially higher than those observed in comparable surveys conducted south of Bornholm for the Energy Island project in 2022 (WSP, 2024b) and 2023 (WSP, 2024) as well as in the Kattegat region in 2023 and 2024 (WSP, in press).
In contrast, surveys conducted on wind turbines within the established Kriegers Flak I Offshore Wind Farm - located between the two sections of Kriegers Flak II - recorded significantly higher bat activity. In 2023, which included the exceptional September event, the average number of recordings per turbine was 184.3, nearly three times higher than the buoy average. The Kriegers Flak I wind farm is situated closer to the coast of Møn, which may partly explain the increased activity. However, it is also possible that the turbines themselves attract insects, thereby drawing in foraging bats.

Table 6 Average number of recordings per bat detectors at Kriegers Flak II, Hesselø, Kattegat, Energy Island Bornholm and turbines of the existing Kriegers Flak I OWF.

	Kriegers Flak II		Kattegat		Hesselø		Kriegers Flak I OWF			Energy Island Bornholm
Year	2023	2024	2023	2024	2023	2024	2022	2023	2024	2022
Average bat obs per buoy/WT	63.9	17.2	14.8	5.2	3.9	5.9	26.3	184.3	28.8	5.3

Bat activity recorded by detectors mounted on offshore buoys was generally lower than that recorded by the land-based detector (see Appendix 2).

Geographically the buoys nearest the coast of Møn and Stevns shows the highest number of bat recording (Figure 19).

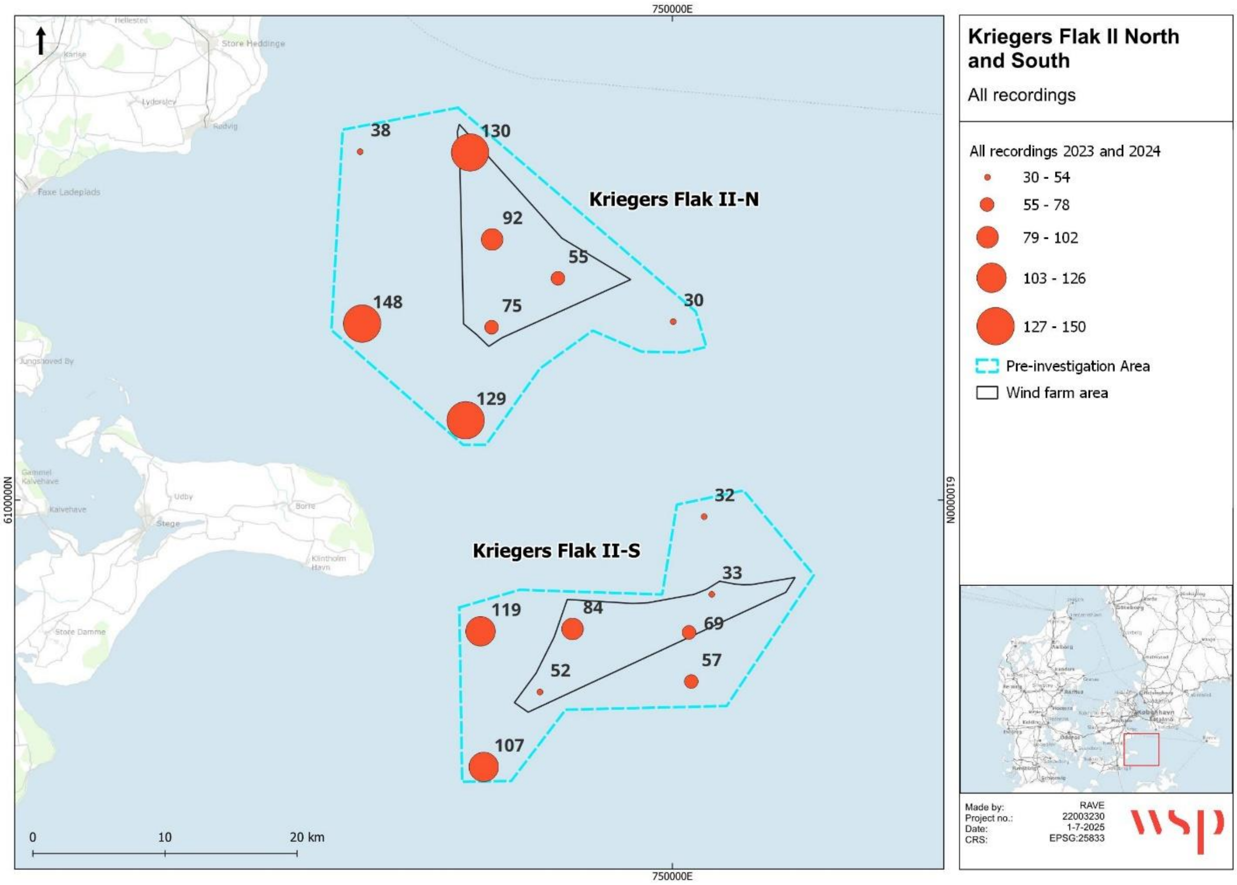

Figure 19 - *Number of bat recordings per buoy during both survey years (2023 and 2024).*

SEASONAL VARIATION IN OBSERVATIONS

OFFSHORE OBSERVATIONS

Over the two survey years, passive acoustic monitoring (PAM) bat detectors were deployed on 16 buoys, resulting in a total of 1,250 bat detections—1,010 in 2023 and 240 in 2024 (Figures 20–24). Most detections (1,073) were attributed to Nyctaloid bats, followed by 127 detections of Nathusius's pipistrelle, 44 of Soprano pipistrelle, and three each of Pond bat and Daubenton's bat.

The data suggest that Nathusius's pipistrelle migrates through the study area during both spring and autumn. While the total number of detections for this species was similar across the two years, the seasonal distribution varied. In 2023, most detections occurred during the autumn migration period, whereas in 2024, recordings were more evenly distributed between spring and autumn (Figure 20).

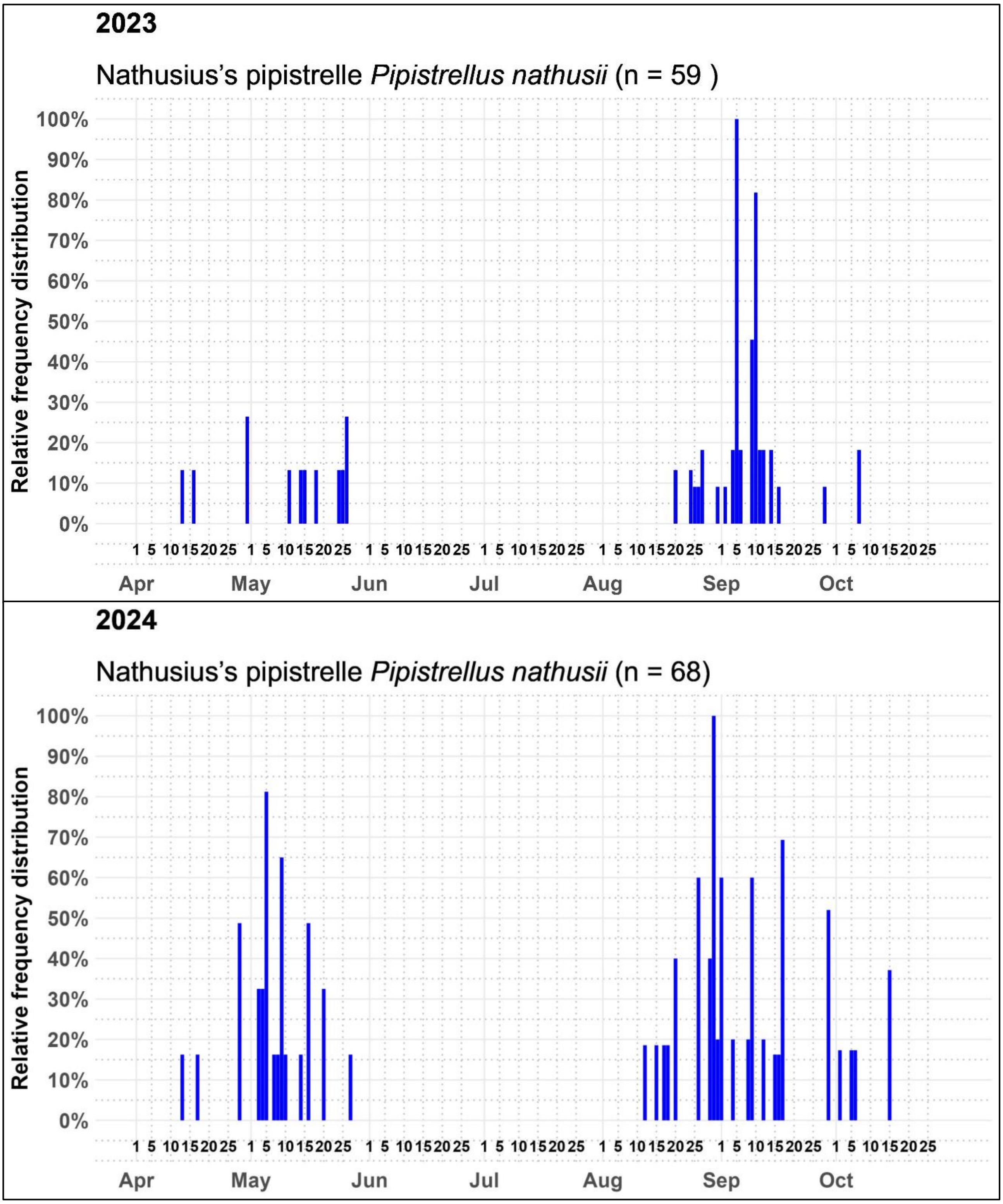

Figure 20 – Relative frequency of bat recordings per night for 2023 and 2024. Grey areas indicate periods without monitoring.

As described above, the significant variation in bat activity between the two survey years can largely be attributed to a single event in September 2023, during which a high number of Nyctaloid bats were recorded. This is clearly illustrated in Figure 21, where the exceptionally high peaks during autumn overshadow the rest of the seasonal pattern.

When this isolated event is accounted for, the data suggests that the pre-investigation area holds particular importance for Nyctaloid bats during the autumn season, serving both as a foraging ground and a migratory corridor.

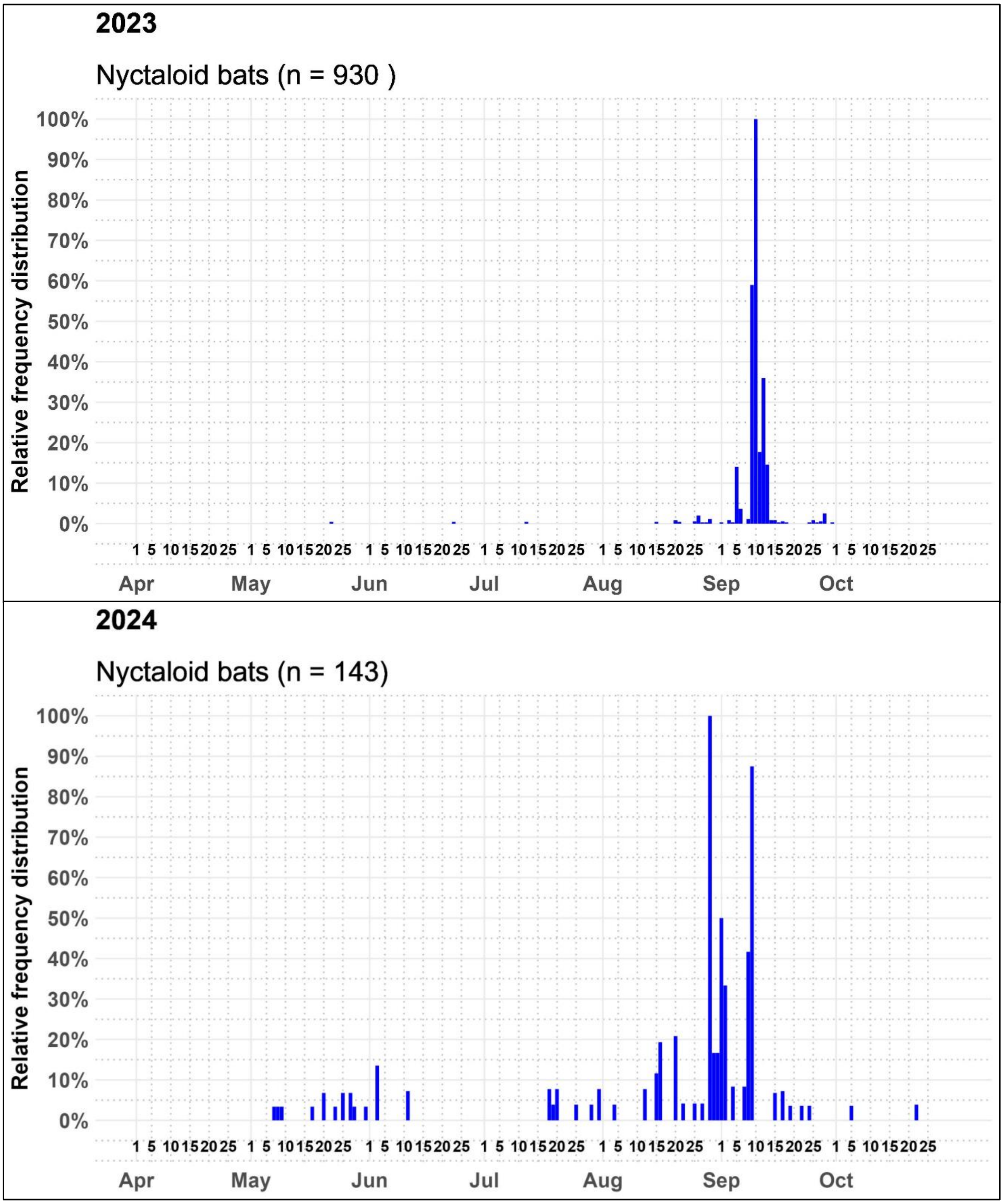

Figure 21 – Relative frequency of bat recordings per night for 2023 and 2024. Grey areas indicate periods without monitoring.

Soprano pipistrelles were recorded in low numbers within the pre-investigation area (Figure 22). A few individuals were detected during the spring, but most observations occurred in the autumn, likely associated with migratory activity and/or foraging behaviour.

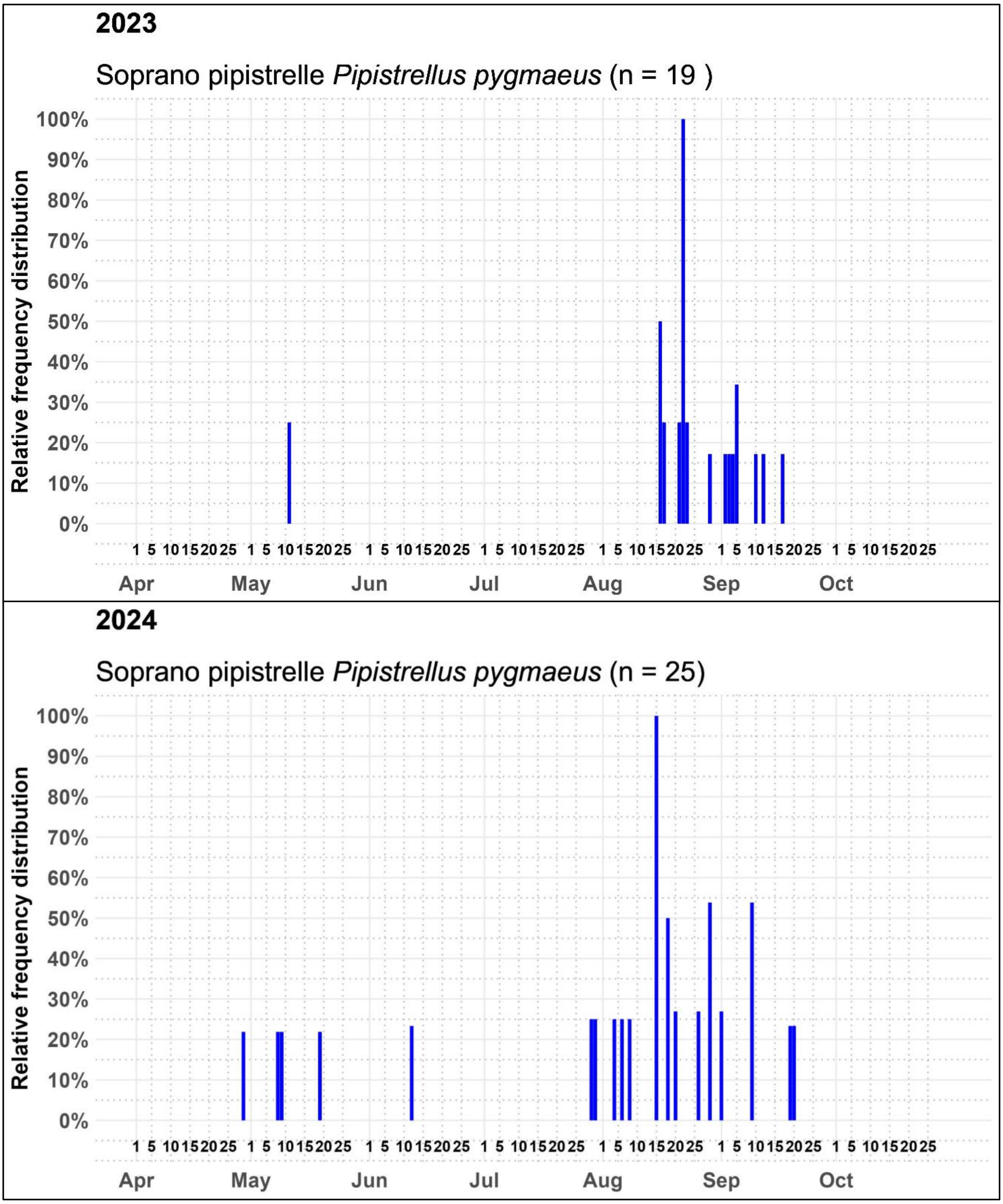

Figure 22 – Relative frequency of bat recordings per night for 2023 and 2024. Grey areas indicate periods without monitoring.

Only a few recordings of Daubenton’s bat and Pond bat were made within the pre-investigation area (Figure 23 & Figure 24). These species appear to be rare visitors of the coast, and due to the limited number of detections, drawing firm conclusions from the data is challenging.

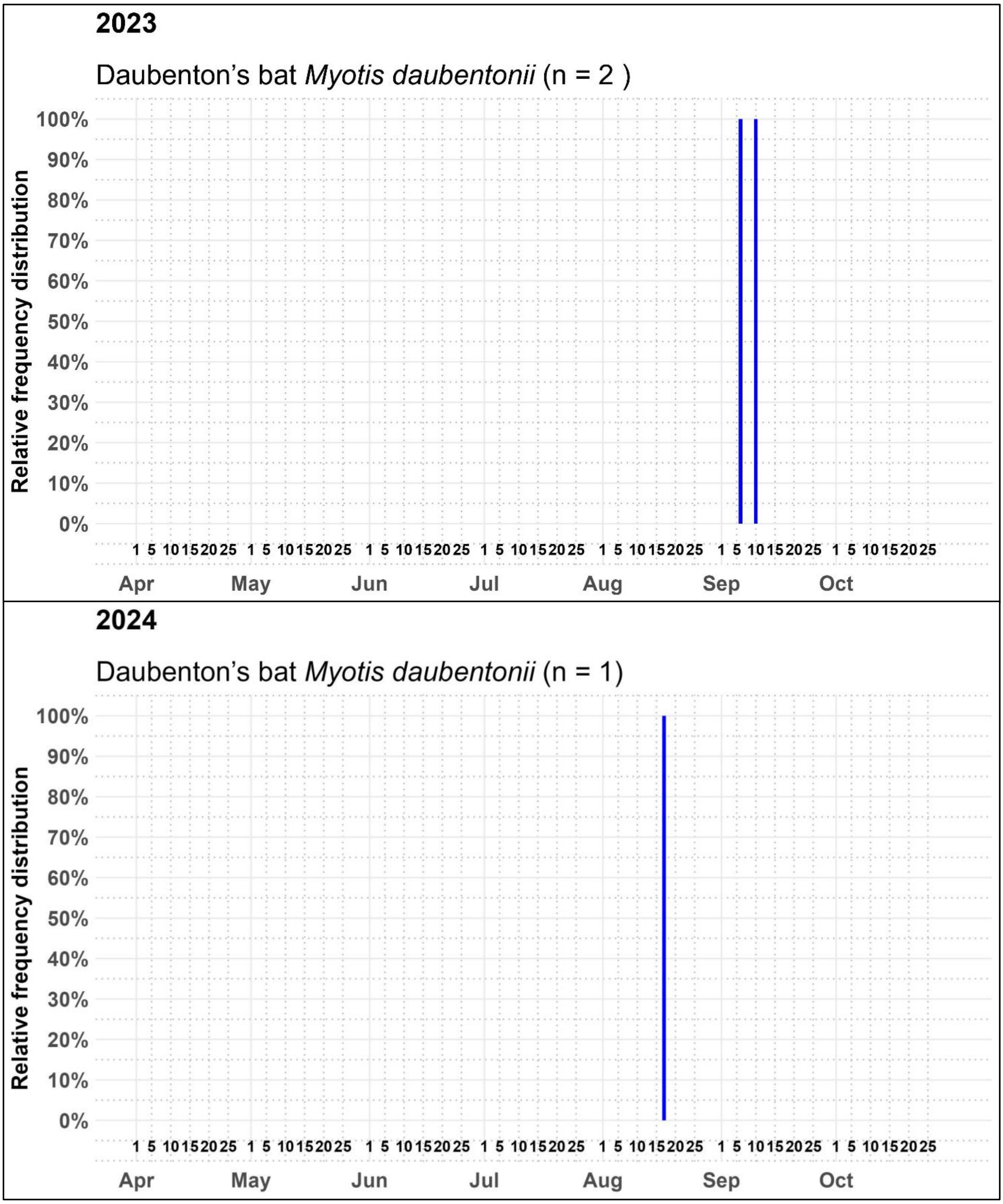

Figure 23 – Relative frequency of bat recordings per night for 2023 and 2024. Grey areas indicate periods without monitoring.

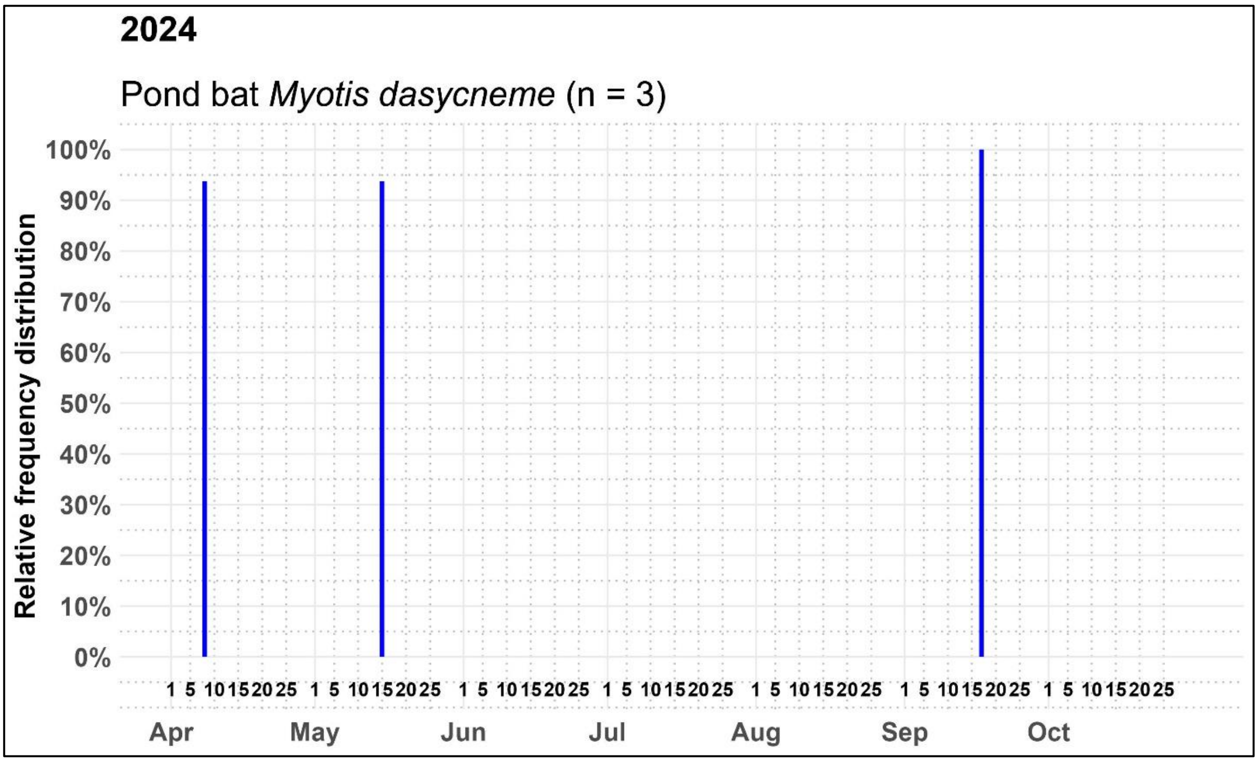

Figure 24 – Relative frequency of bat recordings per night for 2023 and 2024. Grey areas indicate periods without monitoring.

TIME OF OFFSHORE OBSERVATIONS

The timing of bat recordings during the night is a key factor in understanding the sea-crossing strategies of different bat species. Data presented in Figure 25 and Figure 26 clearly show a preference for crossing the open sea during the darkest hours of the night. This pattern suggests that bats may have already travelled a considerable distance before reaching the survey area. Crossing open sea during dawn, daylight, or dusk increases the risk of predation, particularly from gulls and other diurnal predators. This behaviour underscores the vulnerability of bats during daylight crossings and highlights the importance of timing and proximity to land in shaping their movement patterns.

Only a small number of bats were recorded outside peak nocturnal hours, specifically before dusk or after dawn. Two individuals were detected before dusk in spring 2024. Depending on the buoys distance from the coast, these may represent early migrators or bats that had taken shelter on offshore structures such as wind turbines before continuing their journey. Three individuals were recorded after dawn—two in 2023 and one in 2024—with two occurring in spring and one in autumn. The spring recordings likely reflect bats that misjudged the time required to cross the sea and were unexpectedly exposed to daylight and increased predation risk. Notably, a Soprano pipistrelle recorded approximately 2.5 hours after dawn in early May 2023 appears to deviate from the general behavioural pattern. The single Nyctaloid bat recorded after dawn in September 2023 was detected on a night characterized by a clear foraging event, indicated by an almost continuous series of detections throughout the dark hours. This is likely a straggler returning to shore.

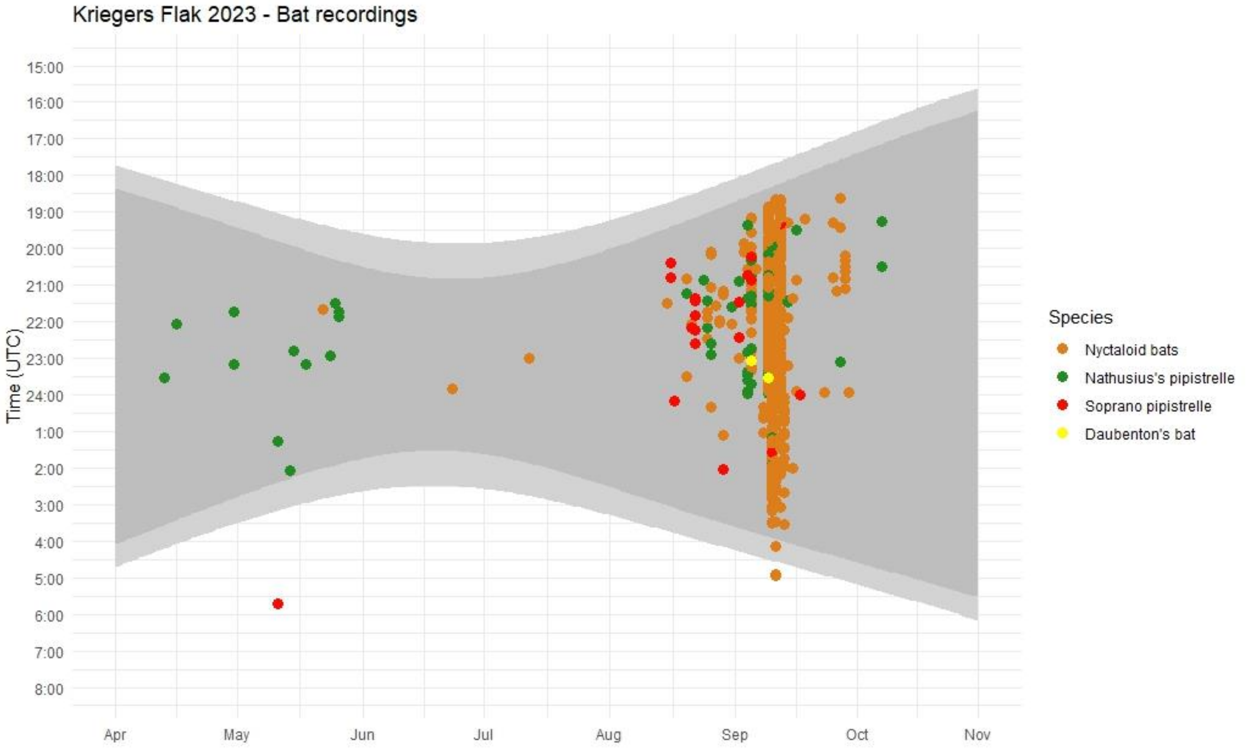

Figure 25 - Time of the bat recordings on the buoy-based detectors in autumn 2023 (9th August to 31st October). Shaded areas indicate the nights. Pale shading indicates the dusk from sun set to the sun is more than 6 degrees under the horizon and similar in the morning until sunrise (see suninfo.dk for more information)

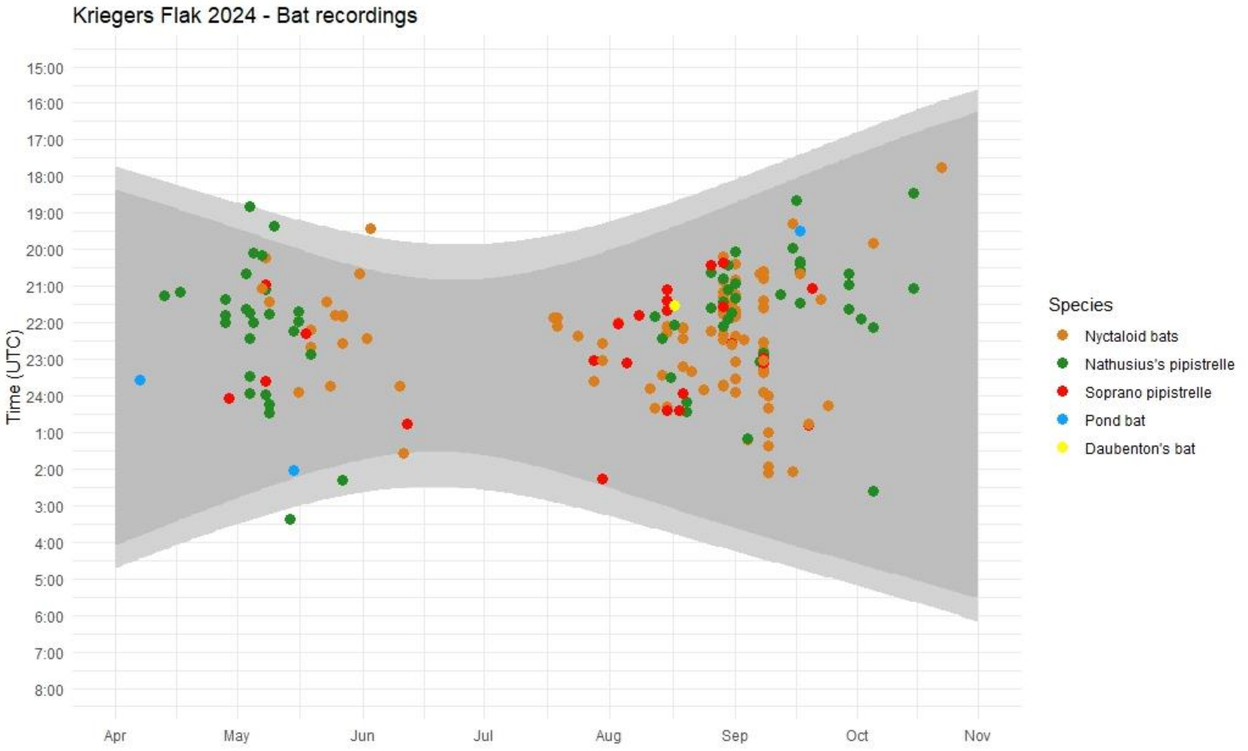

Figure 26 - Time of the bat recordings on the buoy-based detectors in autumn 2023 (9th August to 31st October). Shaded areas indicate the nights. Pale shading indicates the dusk from sun set to the sun is more than 6 degrees under the horizon and similar in the morning until sunrise (see suninfo.dk for more information)

OFFSHORE OBSERVATIONS AND WEATHER CONDITIONS

Weather data for the pre-investigation area was collected using a MetOcean buoy positioned at the center of the area. Unfortunately, this method only covered part of the survey period (3rd September 2023 to 3rd April 2024), resulting in an incomplete dataset that could not be used for comprehensive data presentation and analysis of bat preferences.

Subsequently, modelled data from Copernicus was evaluated.

Significant discrepancies between the Copernicus data and the collected MetOcean data were identified, particularly with respect to temperature and wind speed measurements, which greatly limited its suitability for the present baseline assessment. These differences appear to stem from the Copernicus model's reliance on land-based condition inputs, which typically result in higher daytime temperatures, lower nighttime temperatures, and lower wind speeds than those observed in marine environments, thereby skewing the results.

For the Kriegers Flak II area the most reliable weather data available was from Drogden Lighthouse, a marine-based weather station located off the east coast of Amager. The weather station s is operated by the Danish Meteorological Institute (DMI) and the data is collected 10 meters above sea level. Although geographically distant from the pre-investigation area, its marine setting makes it more comparable to the MetOcean buoy data. During autumn 2024, minor gaps occurred in the temperature data series from Drogden Lighthouse. These gaps were supplemented with data from a weather station at Falsterbo on the Swedish coast, allowing the inclusion of 24 bat recordings from that period. Falsterbo data shows strong correlation with Drogden Lighthouse measurements, although its temporal resolution is lower (hourly vs. 10-minute intervals). Therefore, Drogden Lighthouse data is used in the subsequent data presentations. The Falsterbo weather station is operated by the Swedish Meteorological Institute (SMHI) and data is collected 10 meters above sea level.

As Drogden Lighthouse is located relatively far from the pre-investigation area and closer to land, some differences in weather conditions between the two locations are to be expected. However, the correlation between the measured MetOcean data and data from Drogden Lighthouse is strong and is therefore considered the most reliable source of weather data used for analysis of bat data from 2024. That said, the following presentation should be interpreted with an awareness of potential discrepancies between the two locations.

TEMPERATURE

Figure 27and Figure 28 illustrate the relationship between temperature and bat recordings, with data presented by season (spring and autumn). The survey years are shown separately due to significant differences in the number of recordings between them.

In spring 2023, bat activity was notably low compared to the same period in 2024. The limited number of recordings is partly attributed to equipment failure, as five of the sixteen PAM bat detectors were non-functional during the survey. With only 15 recordings available, discernible patterns are limited. However, bats were recorded flying on nights with temperatures as low as 5 °C.

During autumn 2023, a substantial number of bat recordings were made in the pre-investigation area. The majority of these were Nyctaloid bats, captured during an intense foraging event during a few nights in the first part of September 2023, as shown in Figure 21. Whether these Nyctaloid recordings are included or excluded, the data consistently show a strong preference for warm nights, with nearly all recordings occurring at temperatures above 15 °C.

In spring 2024, the number of recordings increased compared to 2023, allowing for clearer pattern recognition. Few bats were recorded during colder nights, with most activity occurring when temperatures ranged between 10 and 14 °C.

In autumn 2024, no comparable intense foraging event occurred, which is reflected in the lower number of recordings. Despite this, the general trend remains consistent: bats showed a clear preference for flying on warmer nights, with most recordings made at temperatures above 15 °C. A notable difference from 2023 is the presence of recordings on nights with very low temperatures, down to 5–6 °C. Overall, when comparing spring and autumn, bats appear to tolerate lower temperatures in spring. This likely reflects the cooler marine conditions typical of the season. Moreover, due to minimal insect activity over the sea in spring, all recordings are of migrating bats rather than foraging individuals, making temperature a less influential factor. In contrast, autumn recordings show a strong preference for higher temperatures, with most activity occurring above 15 °C. A small number of bats, primarily Nathusius's pipistrelle, were recorded on colder nights in late autumn, likely representing migrating individuals.

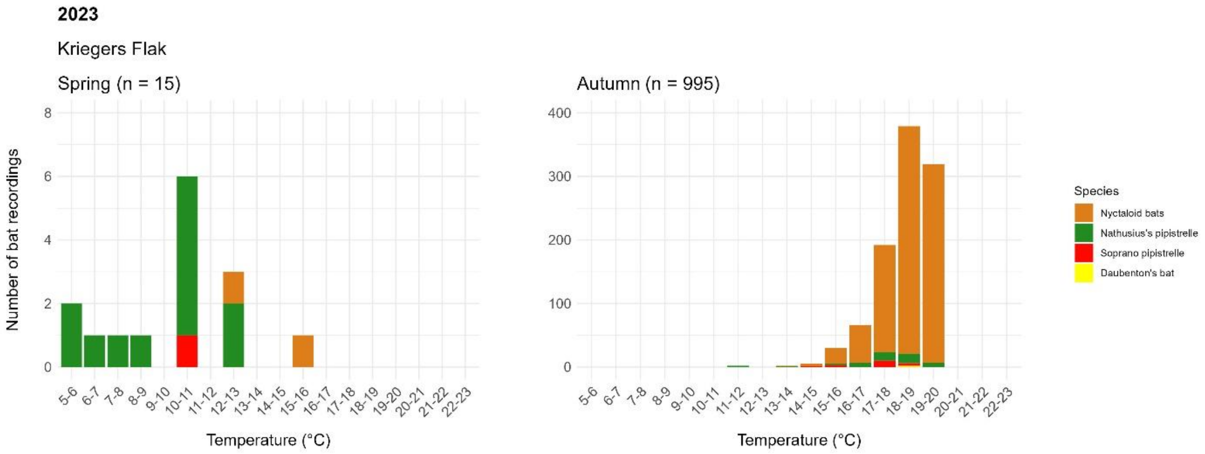

Figure 27 - Relations between temperature and recordings of bats on the buoy-based detectors 2023. Information on temperature are from Drogden light house (DMI) and Falsterbo (SMHI).

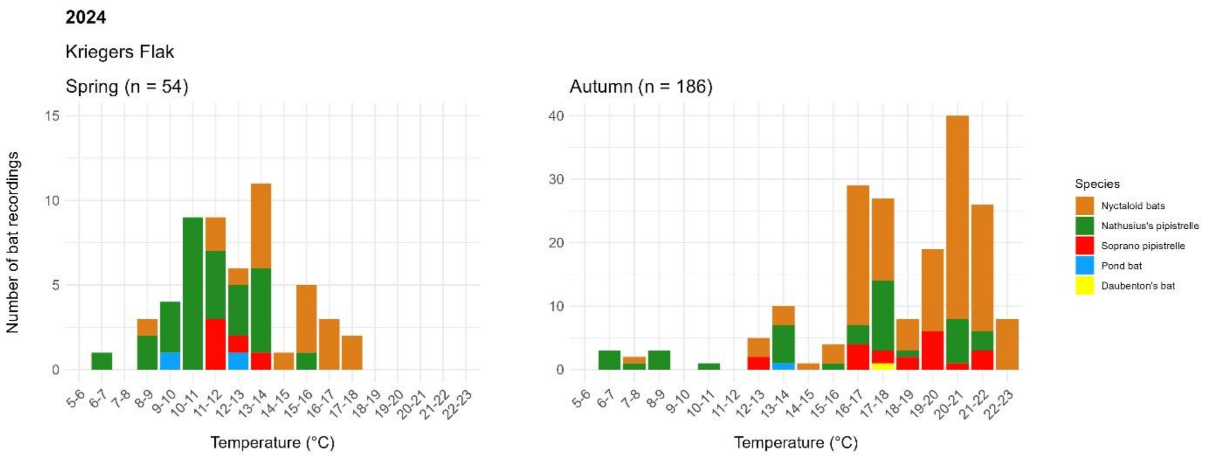

Figure 28 - Relations between temperature and recordings of bats on the buoy-based detectors 2024. Information on temperature are from Drogden light house (DMI) and Falsterbo (SMHI).

WIND SPEED

Figure 29 demonstrates that bats generally prefer flying over marine areas during low wind conditions, with 75–90% of all recordings occurring at wind speeds below 5 m/s.

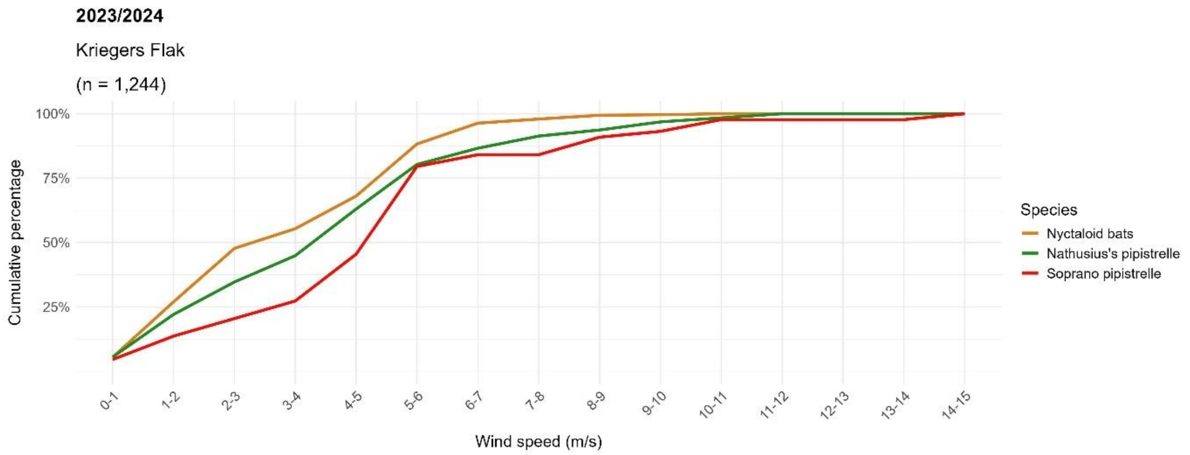

Figure 29 - Cumulative frequency of bat recordings related to wind speed. Information on wind speeds are from Drogden light house (DMI) and Falsterbo (SMHI).

As outlined above, only 15 bat recordings were obtained during spring 2023, which limits the ability to identify clear trends. Nevertheless, the available data indicate that bats were active across a broad range of wind speeds, including conditions with wind speeds reaching up to 10 m/s.
In contrast, the autumn 2023 data reveal a distinct preference for low wind speeds, with the majority of bat recordings occurring at wind speeds below 7 m/s. While the intense foraging activity of Nyctaloid bats during this period somewhat overshadows other species, the overall tendency toward lower wind speeds remains evident even when accounting for this event. Notably, there was a single record of a Soprano pipistrelle during exceptionally strong winds of 14 m/s. This individual was detected early in the evening and likely misjudged its timing the previous night, necessitating shelter on a wind turbine or platform within the nearby offshore wind farms. As conditions worsened and wind speeds increased by dawn, the bat was likely compelled to attempt flight in these challenging conditions.

During spring 2024, the same pattern as observed in spring 2023 is evident, with no clear preference regarding wind speed, and bats were recorded during all wind speeds up to 12 m/s.
Autumn 2024 corresponds to the tendency seen in 2023, with a clear preference for low wind speeds.

There appears to be a reduced preference for very low wind speeds in spring. This may be attributed to the limited presence of insects over the sea in spring, resulting in fewer foraging opportunities. Consequently, bat activity over marine areas during spring is primarily related to migration rather than foraging. An additional factor could be the urgency for bats to reach their breeding grounds, potentially leading to a greater tolerance for suboptimal wind conditions during spring migration.
In autumn, the preference for low wind speeds is much more pronounced. This trend is evident both among foraging individuals—such as the many Nyctaloid bats recorded during the September 2023 foraging event—and among migrating Nathusius's pipistrelles (Figure 28). The latter may suggest that autumn migration involves less urgency, as bats are not under pressure to reach breeding sites, allowing them to be more selective with weather conditions.

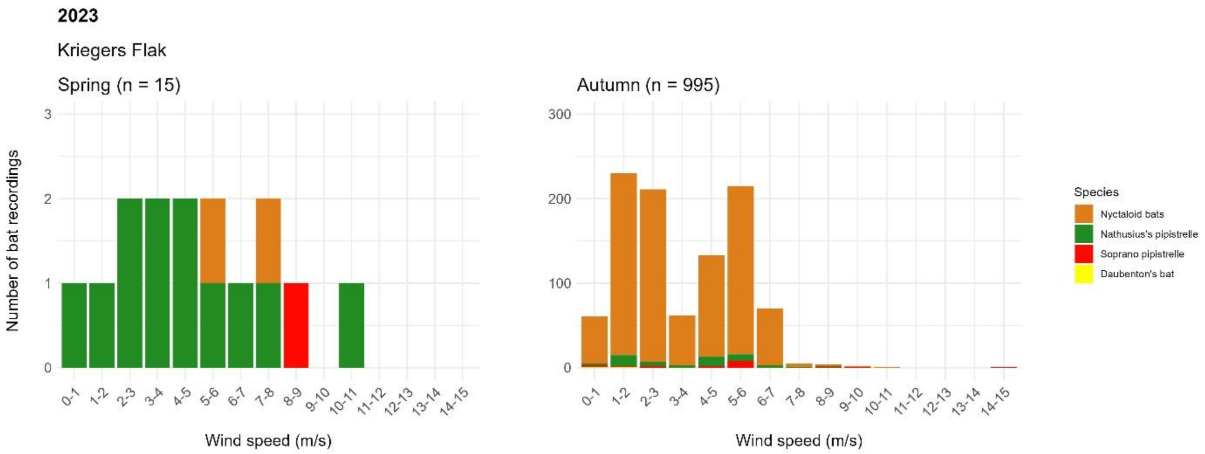

Figure 30 - Relation between wind speed and recordings of bats on the buoy-based detectors 2023. Information on wind speeds are from Drogden light house (DMI) and Falsterbo (SMHI).

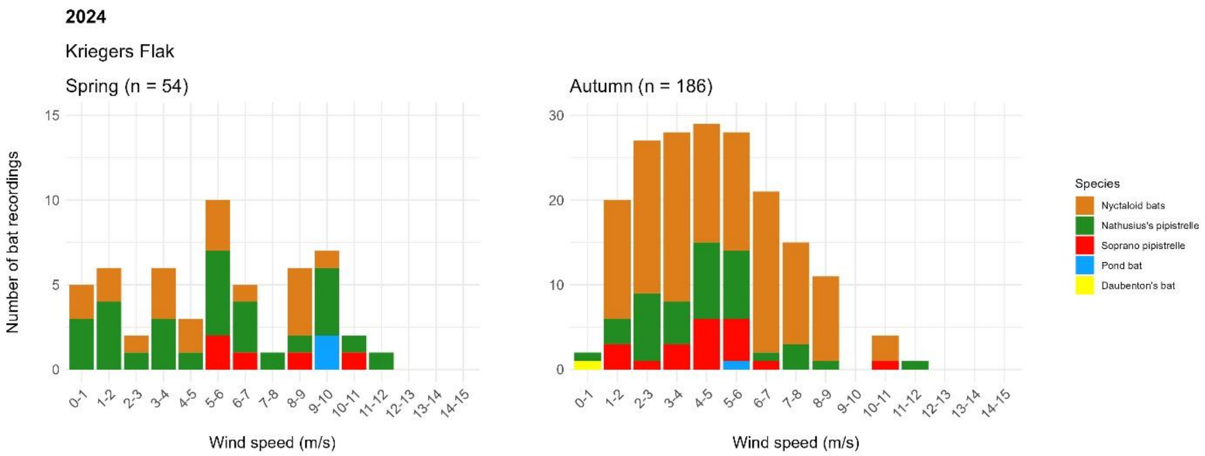

Figure 31 - Relation between wind speed and recordings of bats on the buoy-based detectors 2024. Information on wind speeds are from Drogden light house (DMI) and Falsterbo (SMHI).

WIND DIRECTION

Figure 32 and Figure 33 illustrate the relationship between wind directions and bat recordings. In spring 2023, the limited number of recordings prevents identification of any clear trends related to wind direction. Although some bats were recorded during periods of strong southeasterly winds, it can only be speculated, without supporting data on individual flight paths, that these individuals may have originated from Germany, as bats are unlikely to cross marine areas in strong headwinds.

During autumn 2023, more distinct patterns emerge. The majority of bat recordings occurred on nights characterized by south to southeasterly winds; however, these recordings were predominantly made during periods of very low wind speed, suggesting that wind direction may have been less influential under these conditions. Recordings during stronger winds in this period were associated with southeasterly and northerly wind directions.

In spring 2024, the number of recordings increased compared to the previous spring, and the wind directions associated with bat activity were somewhat less variable. Nonetheless, it remains challenging to discern definitive patterns between wind direction and bat recordings. Notably, very few recordings were made during northerly winds. Observations of bat activity during the strongest wind speeds were linked to southerly winds, which may indicate that these bats originated from the north coast of Germany, as crossing marine areas in strong headwinds is considered unlikely.

In autumn 2024, most recordings were made during southeasterly or northwesterly winds. Recordings during relatively strong southeasterly winds could potentially represent bats originating from the German coast and Rügen, though this remains speculative due to the absence of data on individual flight directions. Additionally, recordings made during southerly winds in autumn raise the possibility that bats foraging or present in the pre-investigation area may originate not only from nearby land west of the pre-investigation area, but also from areas south-southeast of the area. Finally, recordings made during nights with strong northerly winds are likely to represent migrating individuals taking advantage of favourable tailwinds for their southward migration.

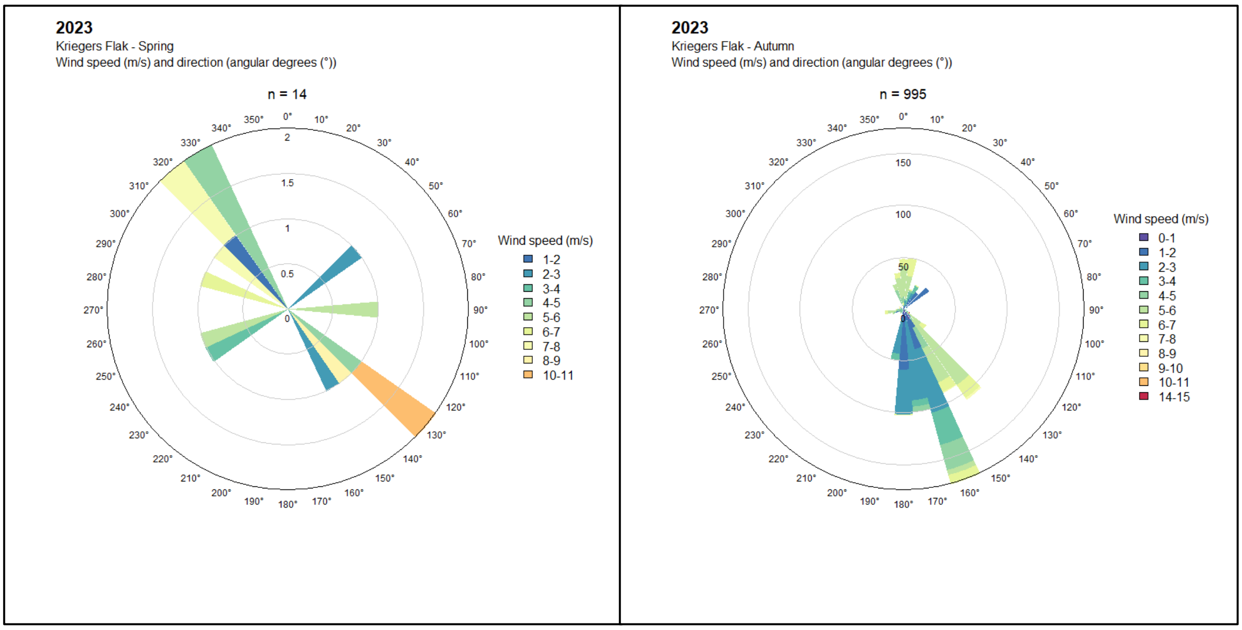

Figure 32 - Relation between wind direction and wind speed and recordings of bats. Information on wind directions and wind speeds are from Drogden light house (DMI) and Falsterbo (SMHI). The figure is based on 14 recordings in spring and 995 recordings in autumn. Data on wind direction for the single remaining record in spring was not available.

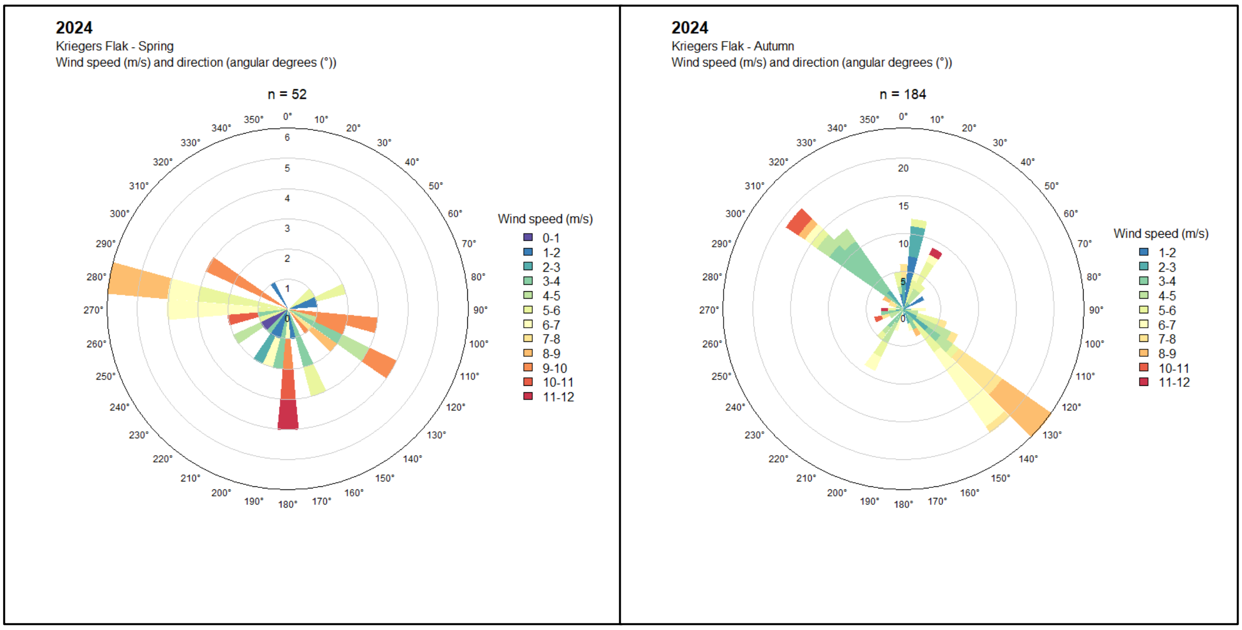

Figure 33 - Relation between wind direction and wind speed and recordings of bats. Information on wind directions and wind speeds are from Drogden light house (DMI) and Falsterbo (SMHI). The figure is based on 52 recordings in spring and 184 recordings in autumn. Data on wind direction for the remaining records were not available.

STATUS AND CONCLUSION

The present baseline provides extensive information on bat presence in the pre-investigation area and the surrounding coastal areas. However, significant gaps remain in our general understanding of offshore bat activity and migration. At Kriegers Flak, bat presence comprises both migratory individuals traversing between their wintering sites in central and western Europe and their breeding grounds in Scandinavia, as well as bats actively foraging within the area.

In spring, migrating bats appear to dominate, whereas in early autumn both migrating and foraging groups are present simultaneously and may occur in the pre-investigation area during the same nights. Owing to the considerable distance from land, only larger species, such as Common noctule and Parti-coloured bat, are likely to use the area for feeding. In contrast, species such as Nathusius's pipistrelle, Soprano pipistrelle, and members of the genus *Myotis* are expected to occur in the pre-investigation area only during migration periods in spring and autumn.

Weather conditions undoubtedly influence the presence of bats offshore. High wind speeds and low temperatures are generally avoided by most species. However, migrating bats exhibit different preferences for wind speed and temperature compared to bats that forage in offshore areas. Migrating individuals may tolerate lower temperatures and slightly stronger winds, whereas foraging bats are recorded almost exclusively during nights with high temperatures and low wind speeds.

DATA AND KNOWLEDGE GAPS

Monitoring bat activity in the open sea presents considerable challenges, primarily due to adverse weather conditions and the potential for damage arising from fishing and shipping operations. As such, occasional detector malfunctions are to be expected. During the spring and early summer 2023 survey period, several detectors experienced failures, resulting in this phase of the survey relying on data from a reduced number of operational detectors.

When interpreting the results, it is crucial to avoid direct comparison between the number of recordings from offshore buoy-based detectors and those from land-based detectors. The buoys are deployed in the open sea, where bats are generally only passing through. Because of the relatively short detection range for smaller species (approximately 20–50 meters) and the limited number of buoys covering a large area, the probability of registering bats offshore is inherently low.

By contrast, land-based detectors are positioned in locations with expected high bat activity. Consequently, they produce a much larger number of recordings, which may even include repeated detections of the same individuals.

Similarly, our knowledge of the flight height of migrating and foraging bats remains very limited. The present survey only covers altitudes of approximately 20–50 meters above the sea surface, depending on the species. It is therefore likely that some bats, both during migration and while feeding, may fly outside the detection range due to their flight altitude.

Information on offshore meteorological conditions remains limited, and direct measurements at sea are both challenging and costly. Consequently, the relationship between bat activity and weather conditions is primarily inferred from data collected at meteorological stations located outside the pre-investigation area.

It is important to note that the decision of bats to move offshore is, in most cases, made during the evening hours in coastal areas. At Kriegers Flak, bats may depart from several different coastal regions. The nearest land areas are Møn and Stevns, but the Swedish south coast and the German north coast are also in close proximity to parts of the pre-investigation area. For this reason, it is difficult to establish a straightforward analysis of the relationship between onshore and offshore temperatures, as bats may originate from multiple coastal environments with differing local conditions.

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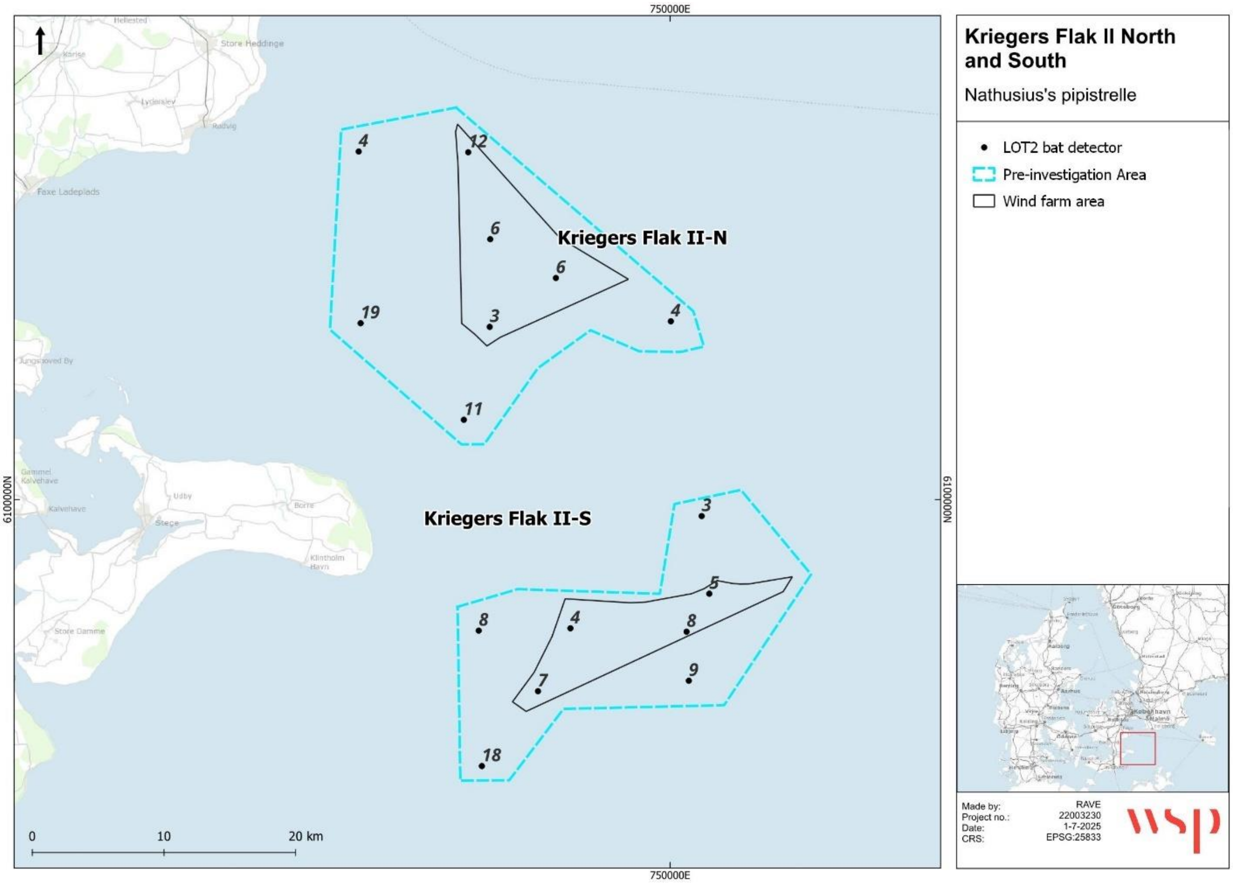
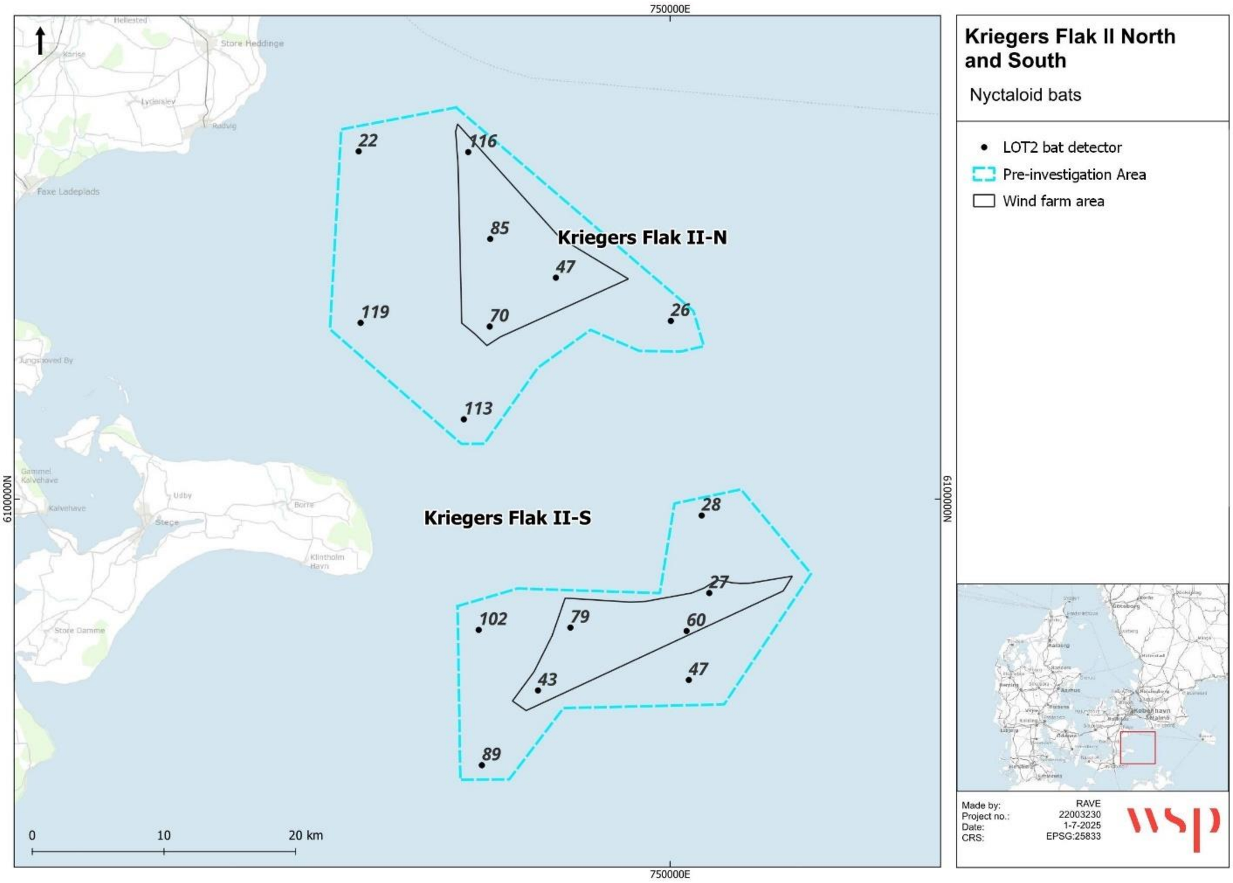
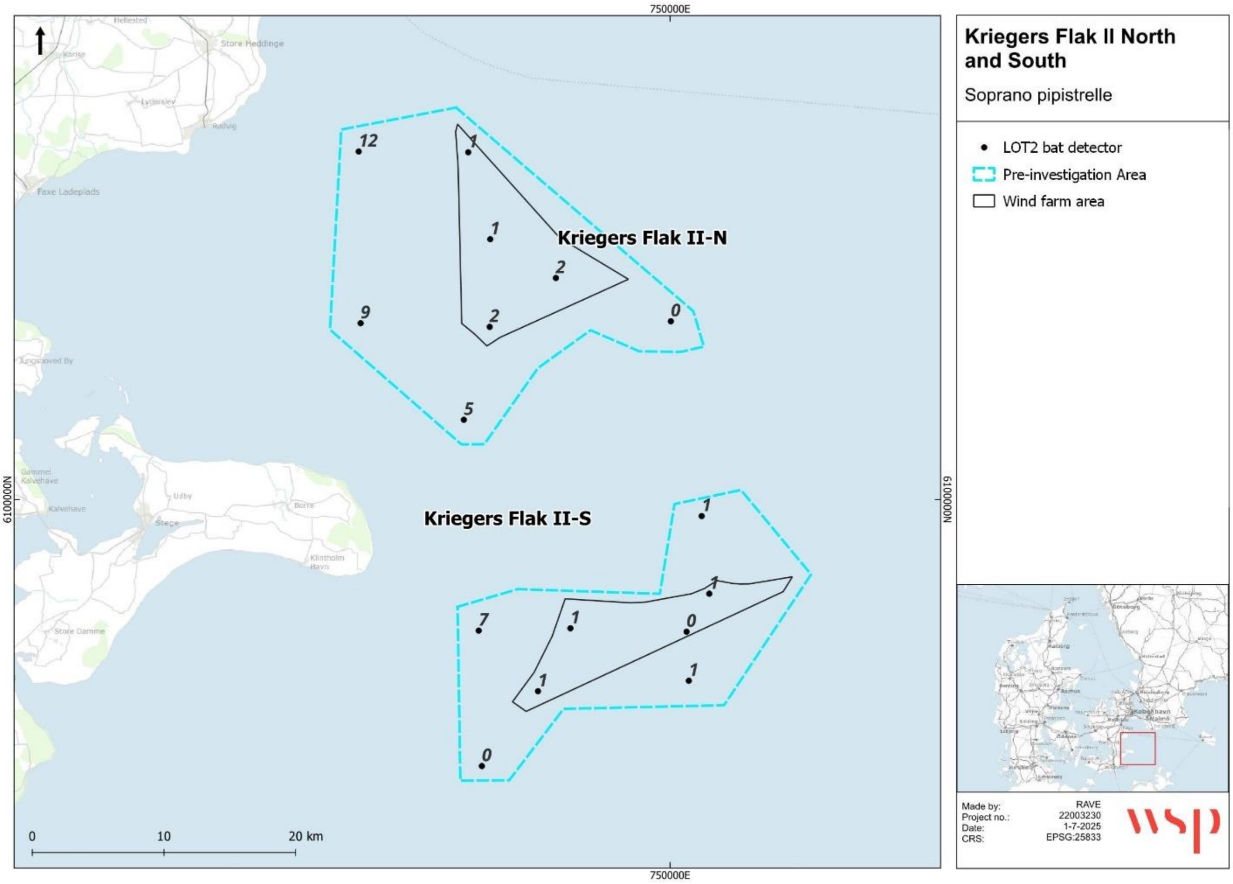
APPENDIX 1 – SPECIES DISTRIBUTION






Kriegers Flak II North and South
Soprano pipistrelle
LOT2 bat detector
Pre-investigation Area
Wind farm area
Kriegers Flak II-N
Kriegers Flak II-S
12
1
1
2
9
2
0
5
1
1
7
1
0
1
1
0
750000E
6100000N
0
10
20 km
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Date: 1-7-2025
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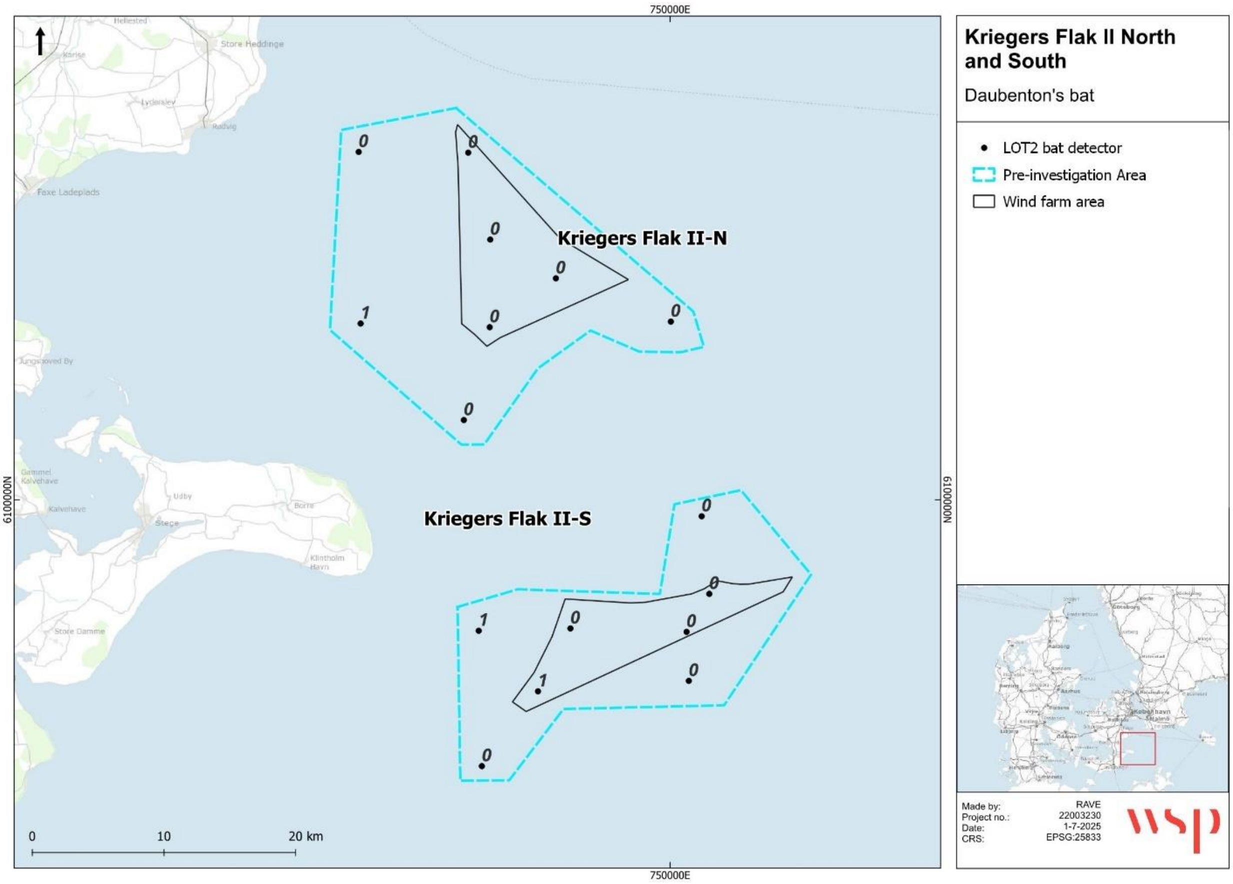
Kriegers Flak II North and South
Daubenton's bat
LOT2 bat detector
Pre-investigation Area
Wind farm area
Kriegers Flak II-N
Kriegers Flak II-S
0
0
0
0
1
0
0
0
0
0
1
0
0
1
0
0
750000E
6100000N
0
10
20 km
Made by: RAVE
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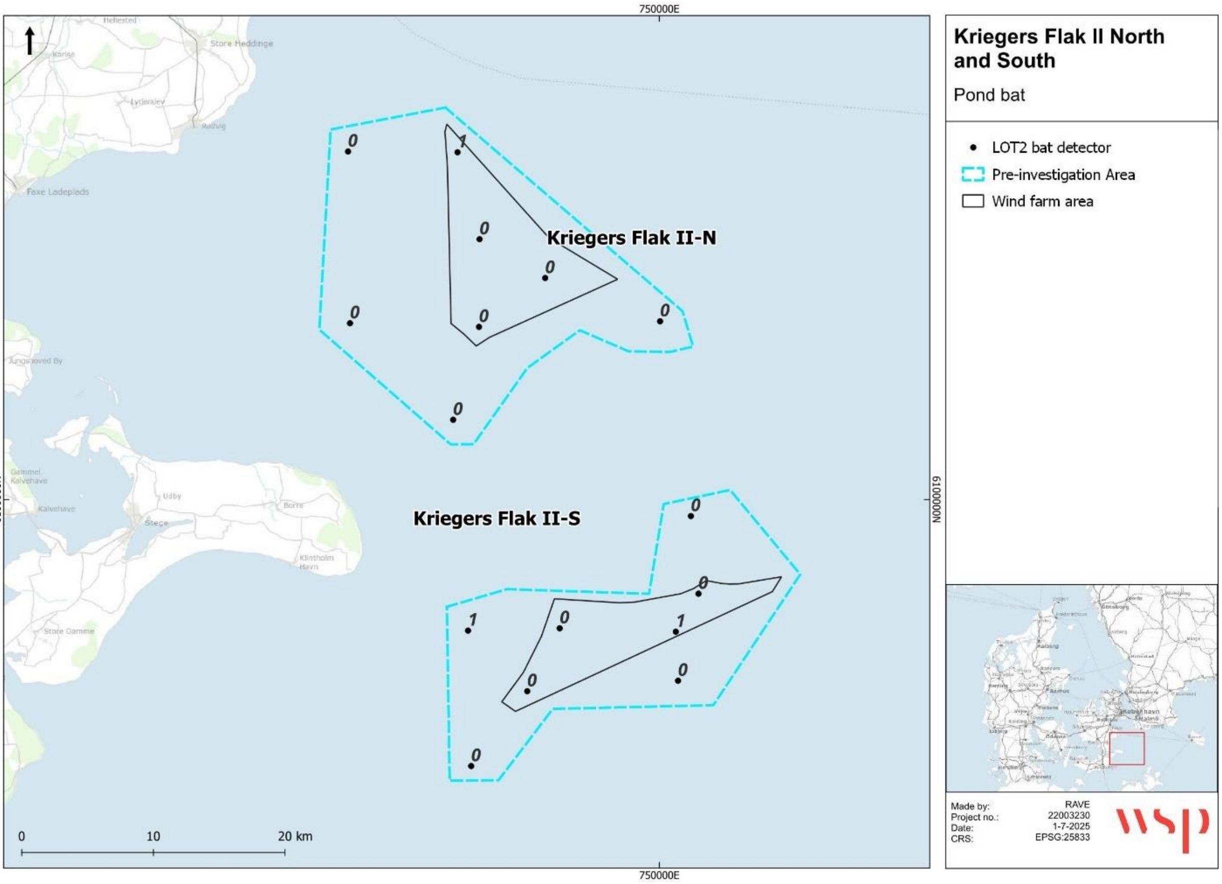
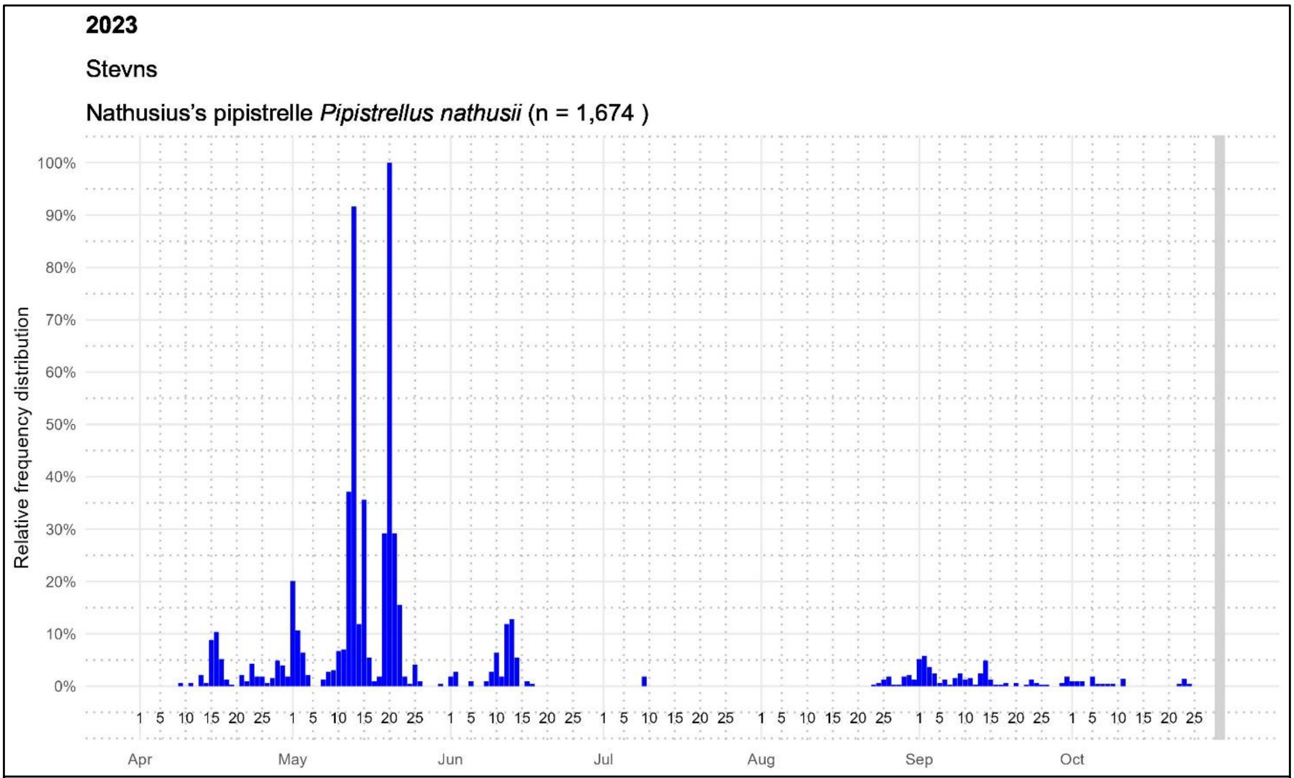
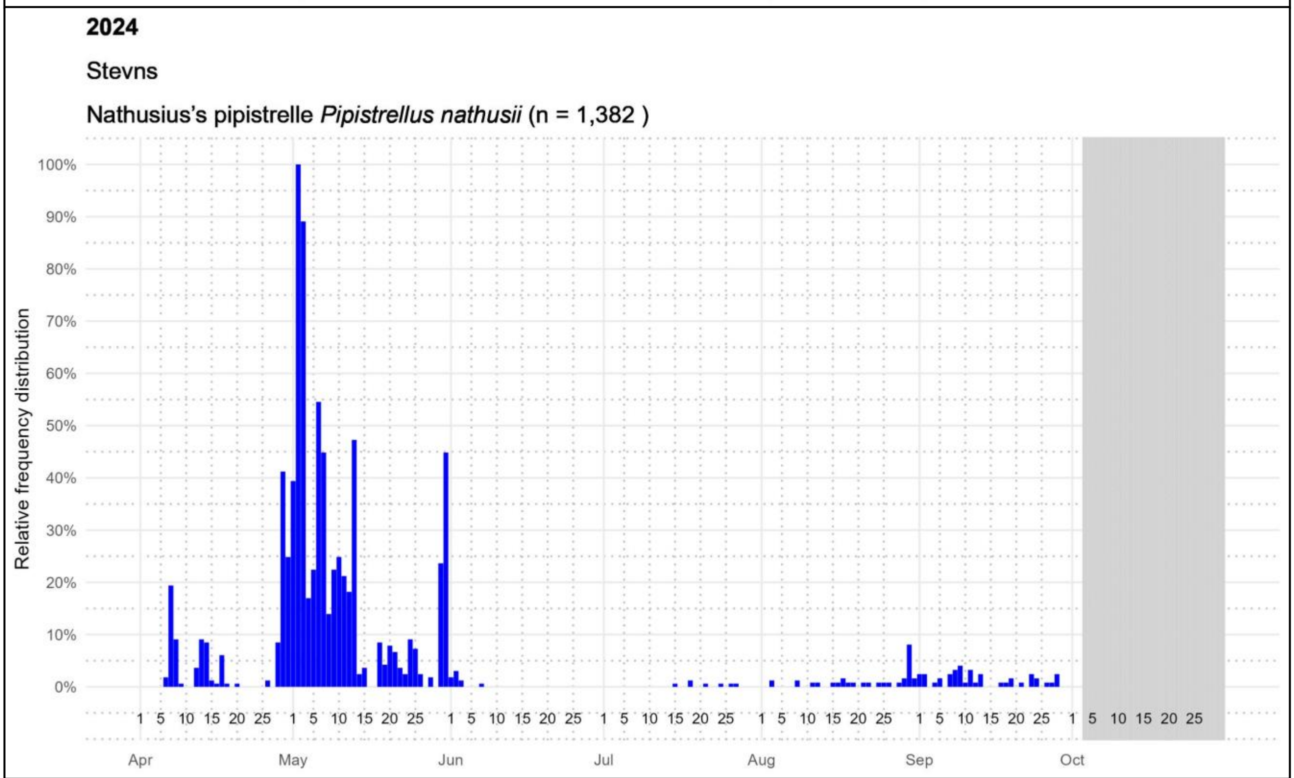
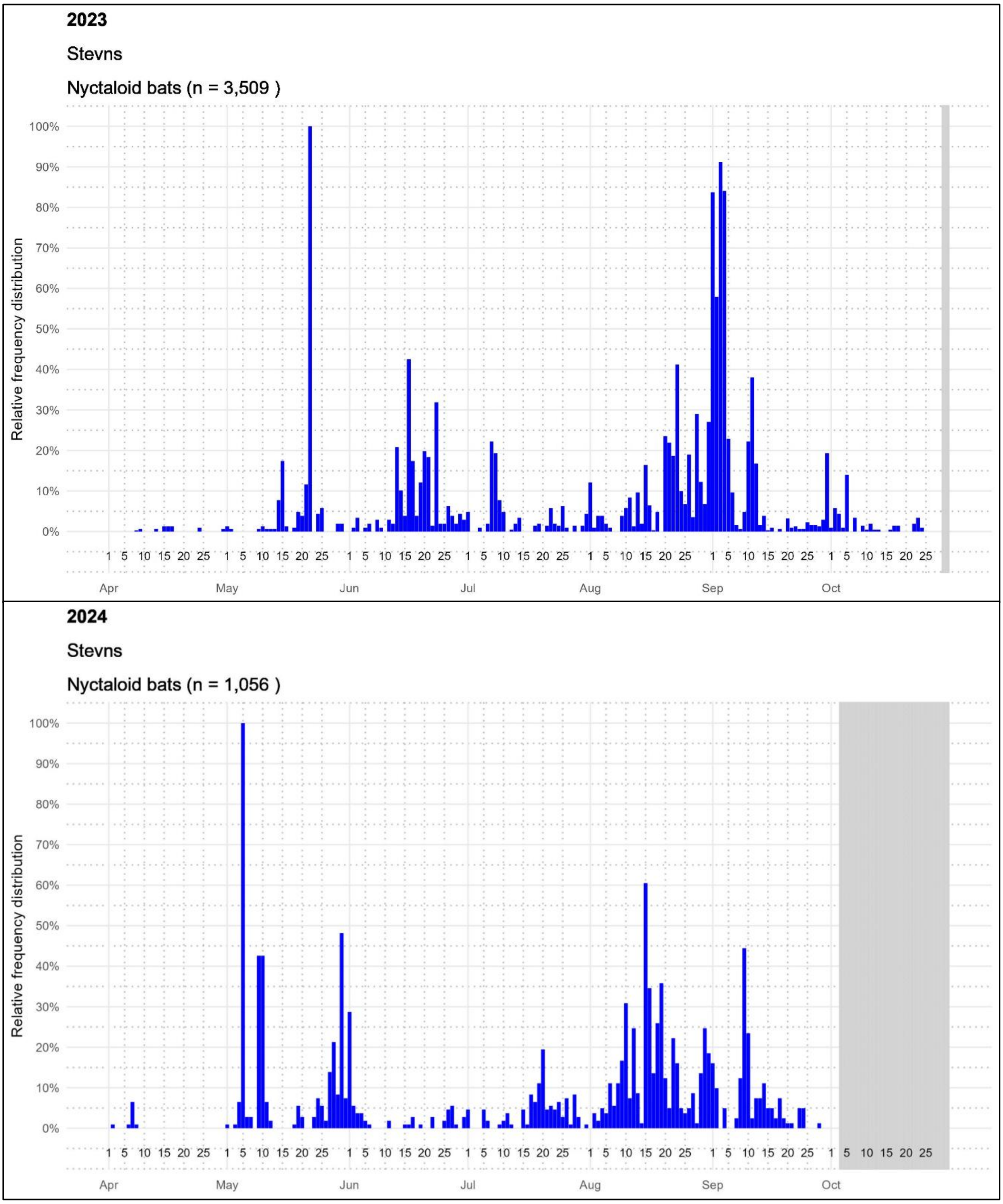
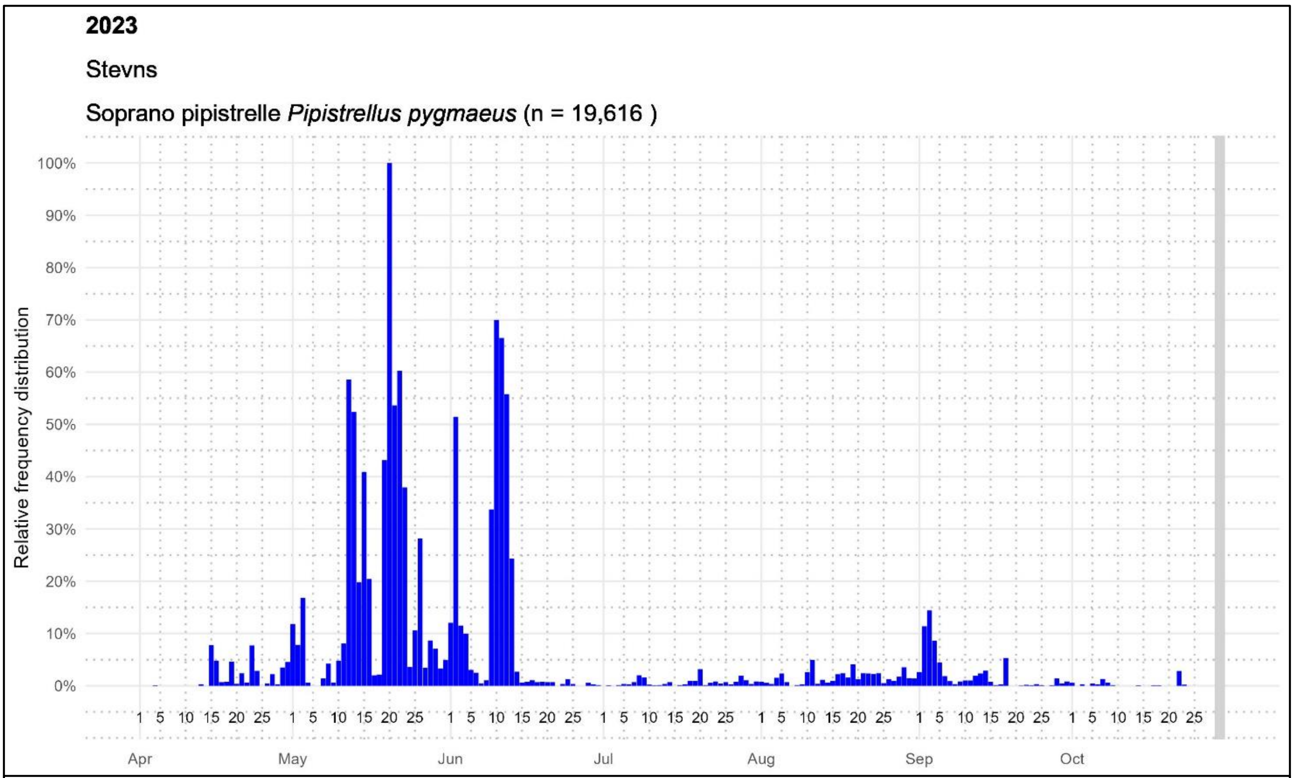

Kriegers Flak II North and South
Pond bat
LOT2 bat detector
Pre-investigation Area
Wind farm area
Kriegers Flak II-N
Kriegers Flak II-S
750000E
6100000N
0
10
20 km
Made by: RAVE
Project no.: 22003230
Date: 1-7-2025
CRS: EPSG:25833

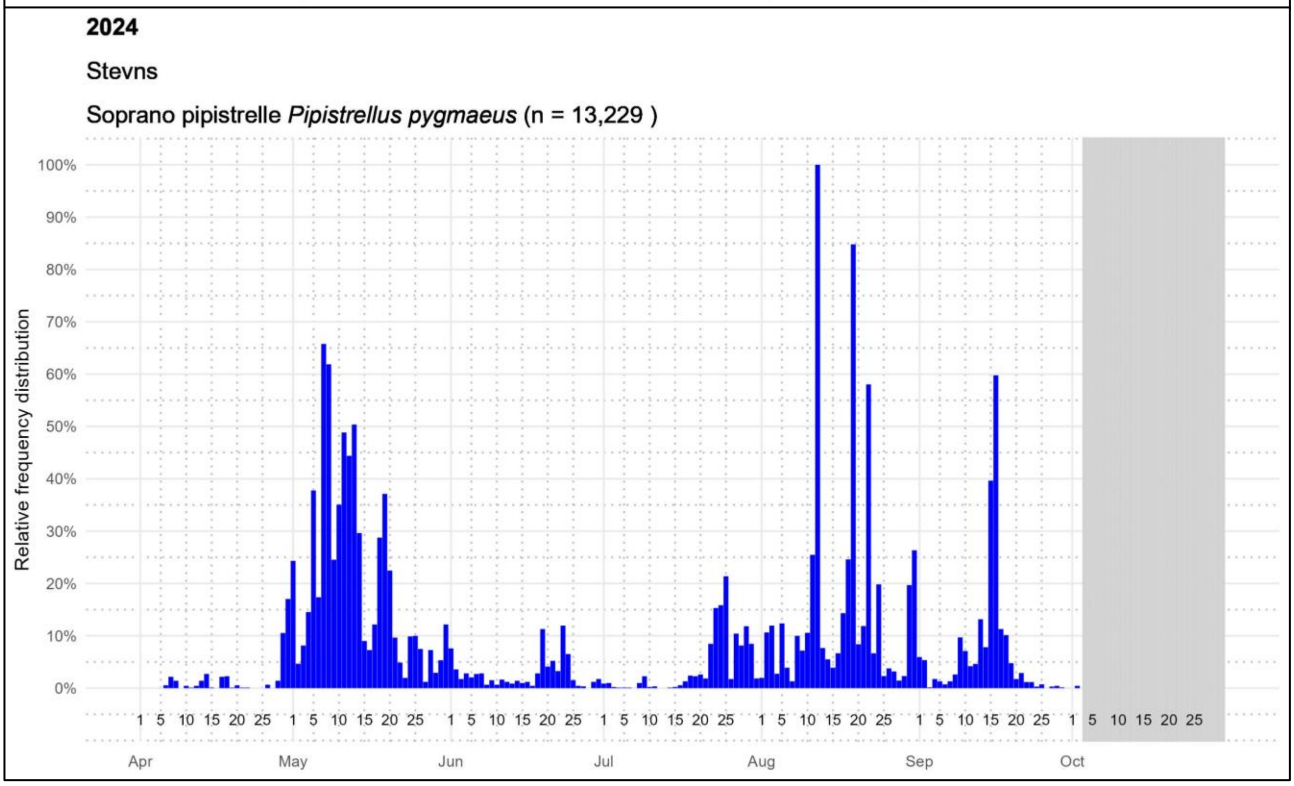
APPENDIX 2 – OBSERVATIONS BY BAT DETECTORS PER NIGHT

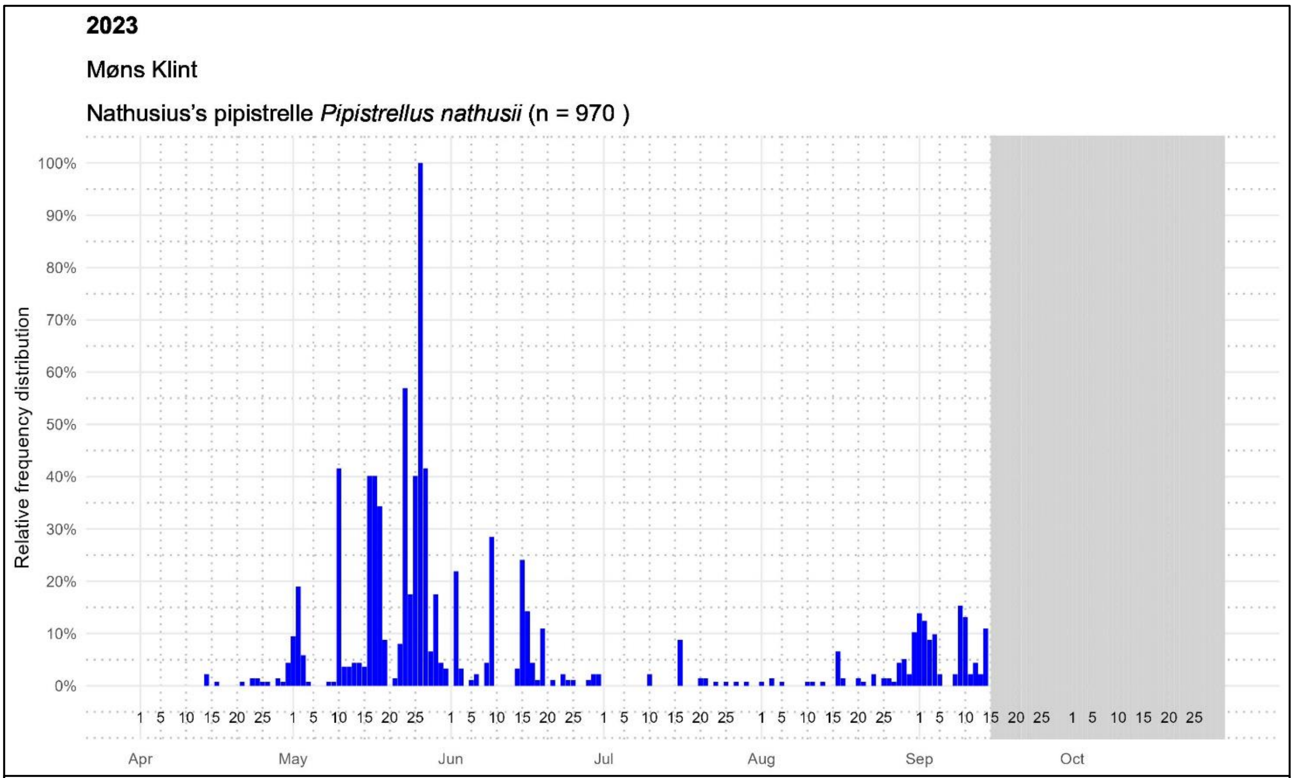




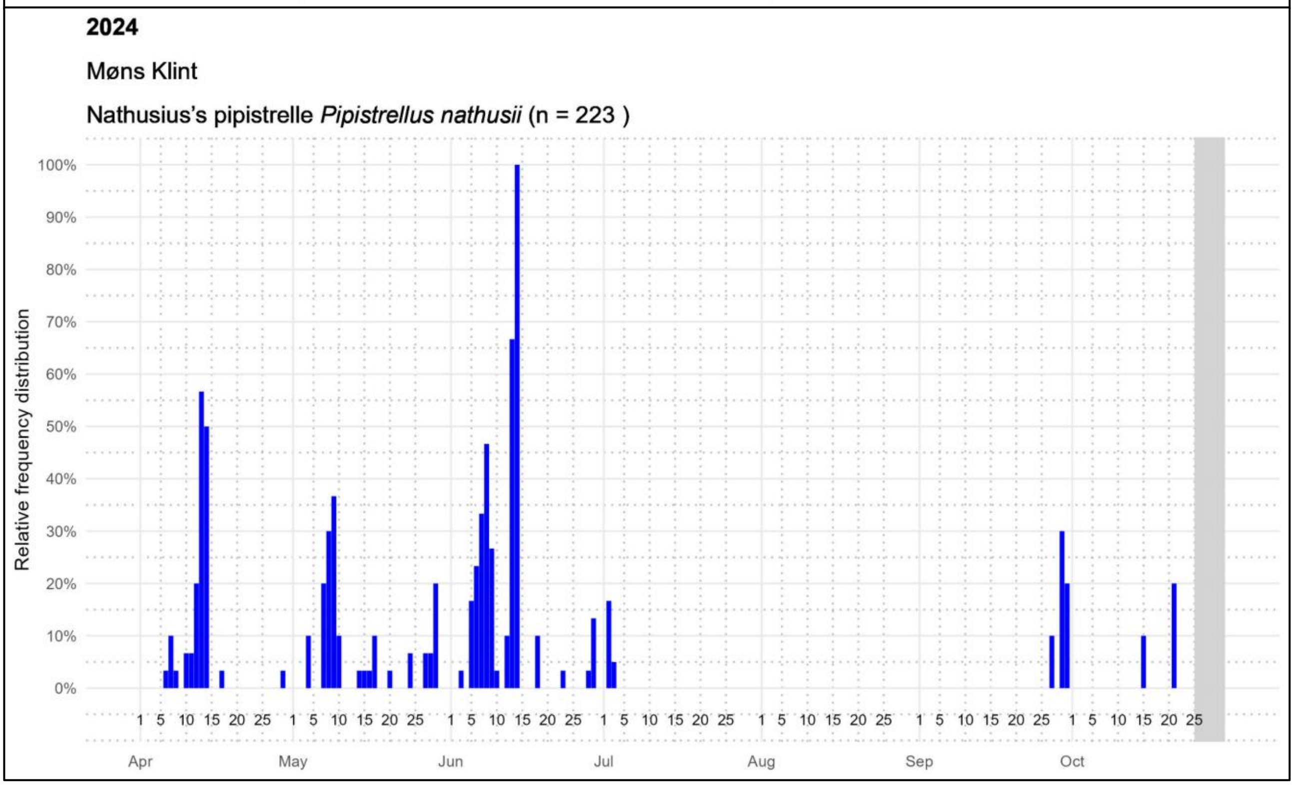

2023
Stevns
Nyctaloid bats (n = 3,509)
Relative frequency distribution
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
1 5 10 15 20 25 1 5 10 15 20 25 1 5 10 15 20 25 1 5 10 15 20 25 1 5 10 15 20 25 1 5 10 15 20 25 1 5 10 15 20 25
Apr
May
Jun
Jul
Aug
Sep
Oct
2024
Stevns
Nyctaloid bats (n = 1,056)
Relative frequency distribution
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
1 5 10 15 20 25 1 5 10 15 20 25 1 5 10 15 20 25 1 5 10 15 20 25 1 5 10 15 20 25 1 5 10 15 20 25 1 5 10 15 20 25
Apr
May
Jun
Jul
Aug
Sep
Oct


2023
Stevns
Soprano pipistrelle *Pipistrellus pygmaeus* (n = 19,616)
Relative frequency distribution
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Apr
May
Jun
Jul
Aug
Sep
Oct

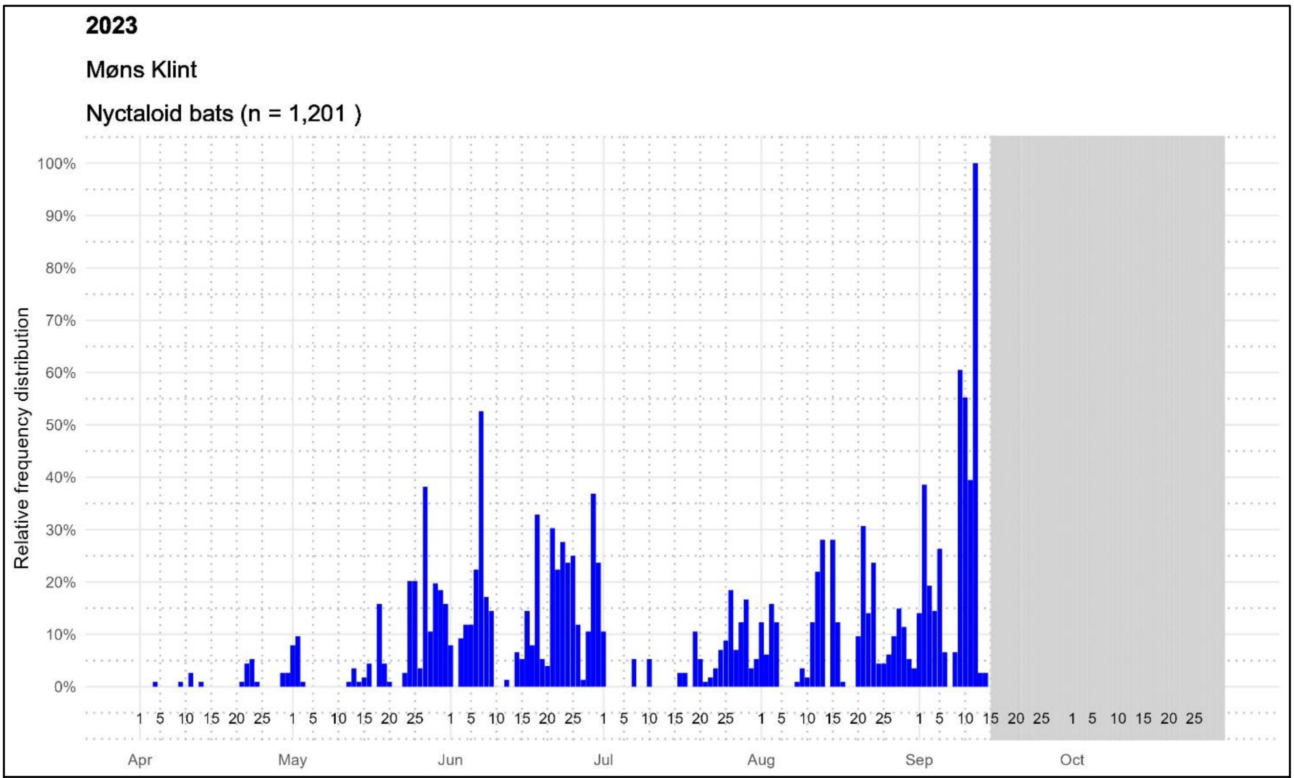

2024
Stevns
Soprano pipistrelle *Pipistrellus pygmaeus* (n = 13,229)
Relative frequency distribution
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Apr
May
Jun
Jul
Aug
Sep
Oct

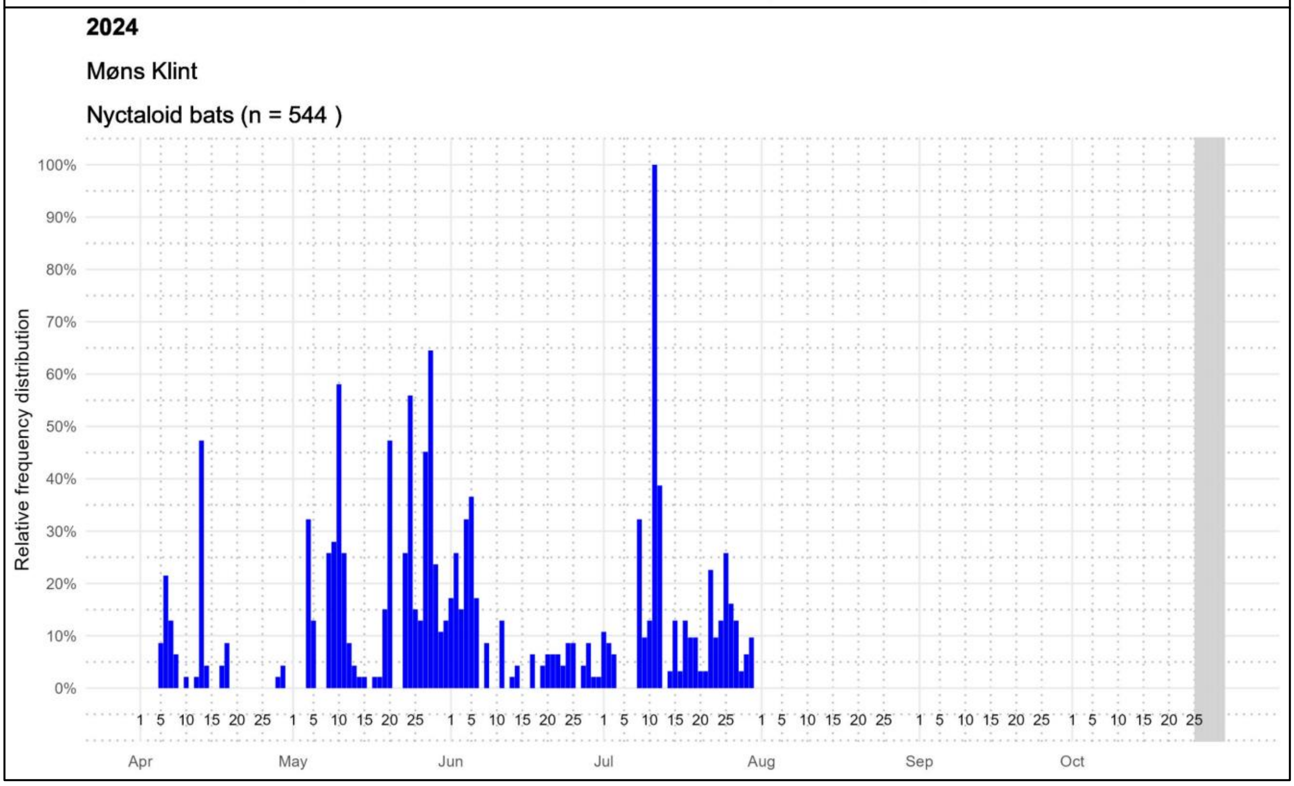


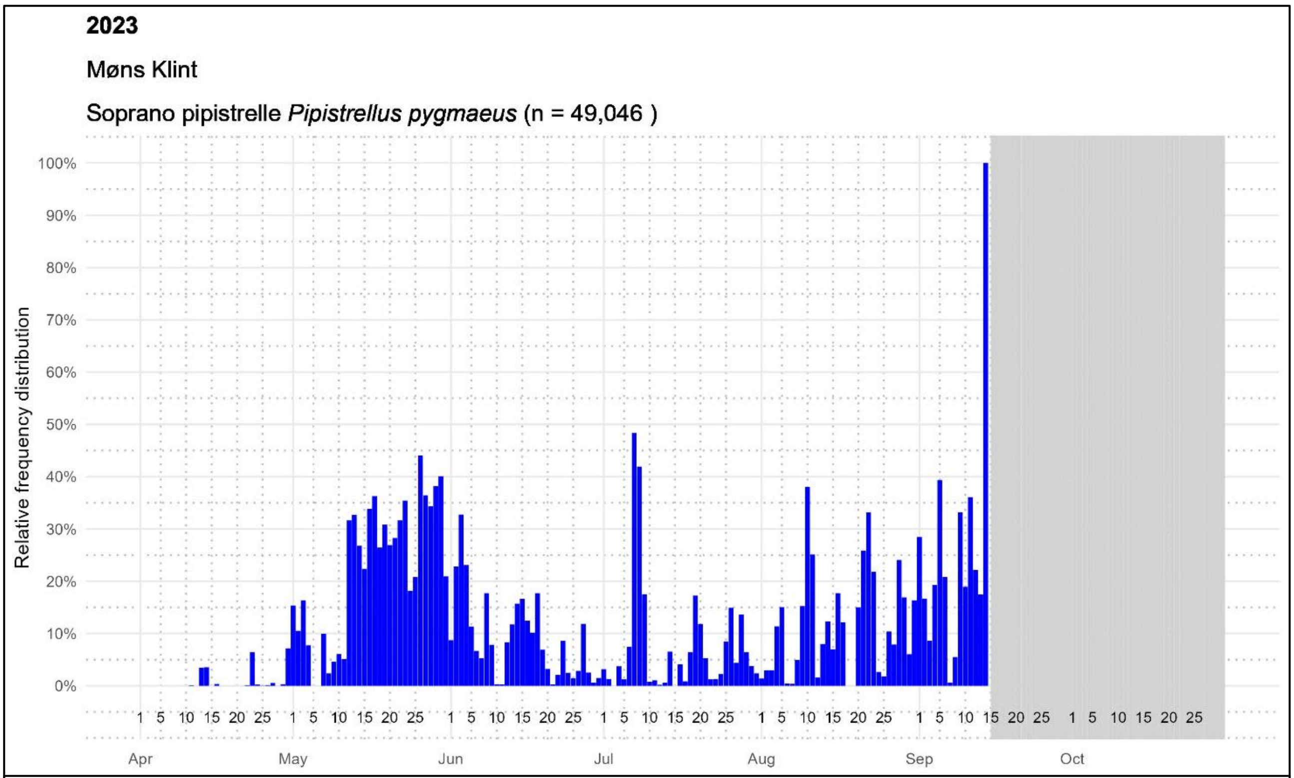
2023
Møns Klint
Nathusius's pipistrelle Pipistrellus nathusii (n = 970)
Relative frequency distribution
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
1 5 10 15 20 25 1 5 10 15 20 25 1 5 10 15 20 25 1 5 10 15 20 25 1 5 10 15 20 25 1 5 10 15 20 25 1 5 10 15 20 25
Apr May Jun Jul Aug Sep Oct

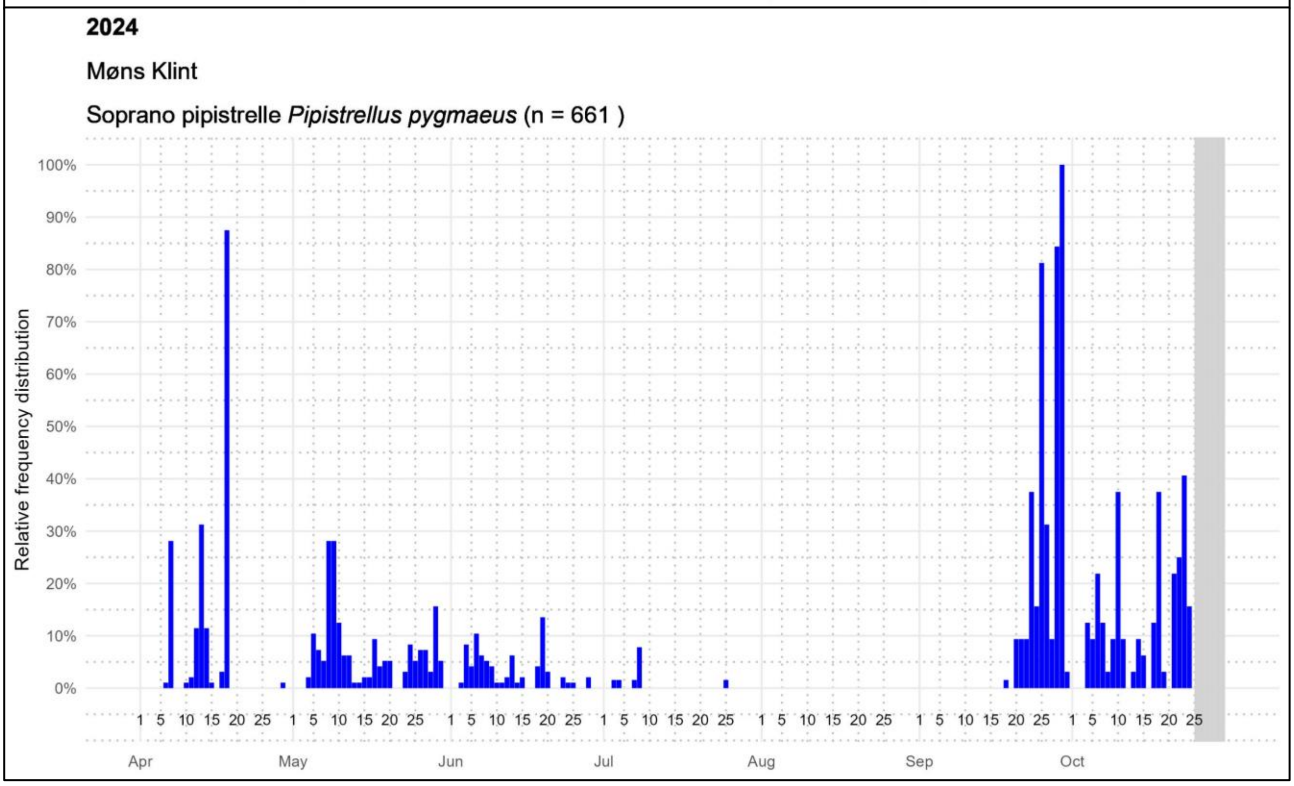


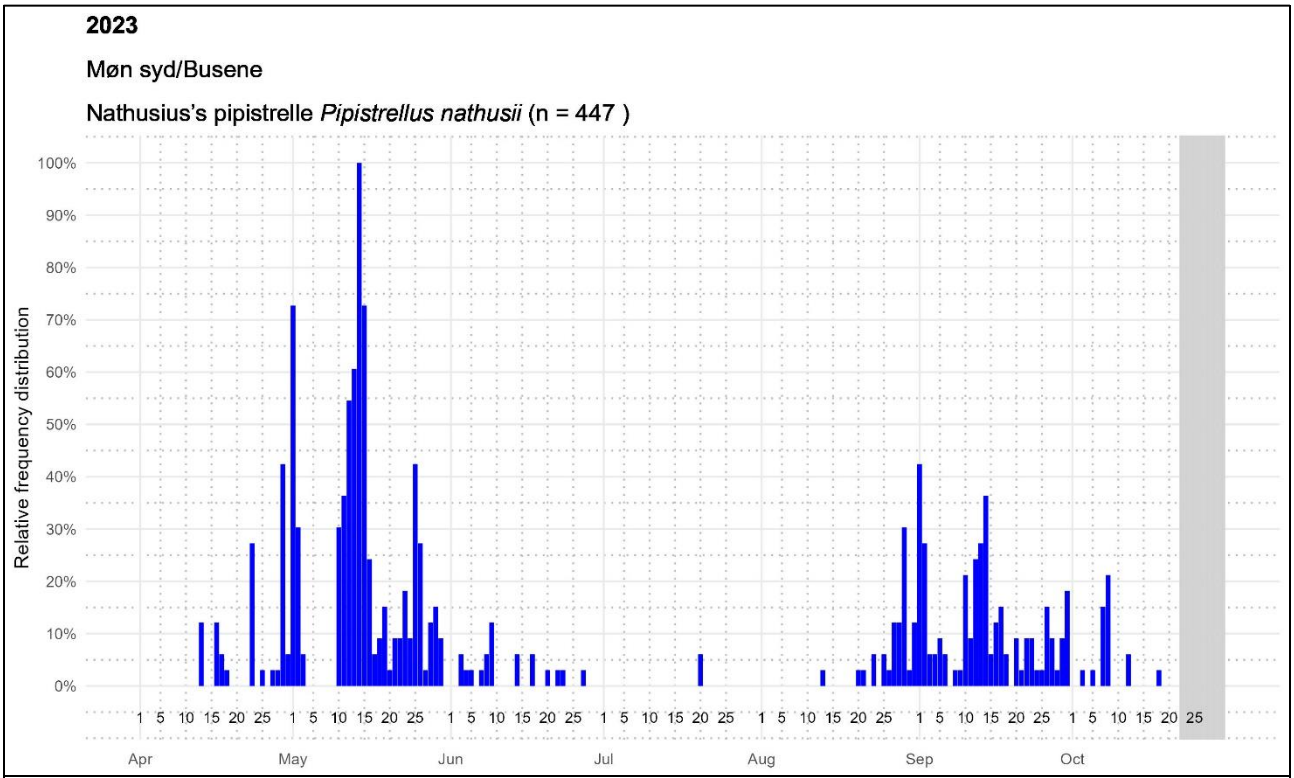
2024
Møns Klint
Nathusius's pipistrelle Pipistrellus nathusii (n = 223)
Relative frequency distribution
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
1 5 10 15 20 25 1 5 10 15 20 25 1 5 10 15 20 25 1 5 10 15 20 25 1 5 10 15 20 25 1 5 10 15 20 25 1 5 10 15 20 25
Apr May Jun Jul Aug Sep Oct


2023
Møns Klint
Nyctaloid bats (n = 1,201)
Relative frequency distribution
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Apr
May
Jun
Jul
Aug
Sep
Oct


2024
Møns Klint
Nyctaloid bats (n = 544)
Relative frequency distribution
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Apr
May
Jun
Jul
Aug
Sep
Oct


2023
Møns Klint
Soprano pipistrelle Pipistrellus pygmaeus (n = 49,046)
Relative frequency distribution
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Apr
May
Jun
Jul
Aug
Sep
Oct


2024
Møns Klint
Soprano pipistrelle Pipistrellus pygmaeus (n = 661)
Relative frequency distribution
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Apr
May
Jun
Jul
Aug
Sep
Oct


2023
Møn syd/Busene
Nathusius's pipistrelle *Pipistrellus nathusii* (n = 447)
Relative frequency distribution
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Apr
May
Jun
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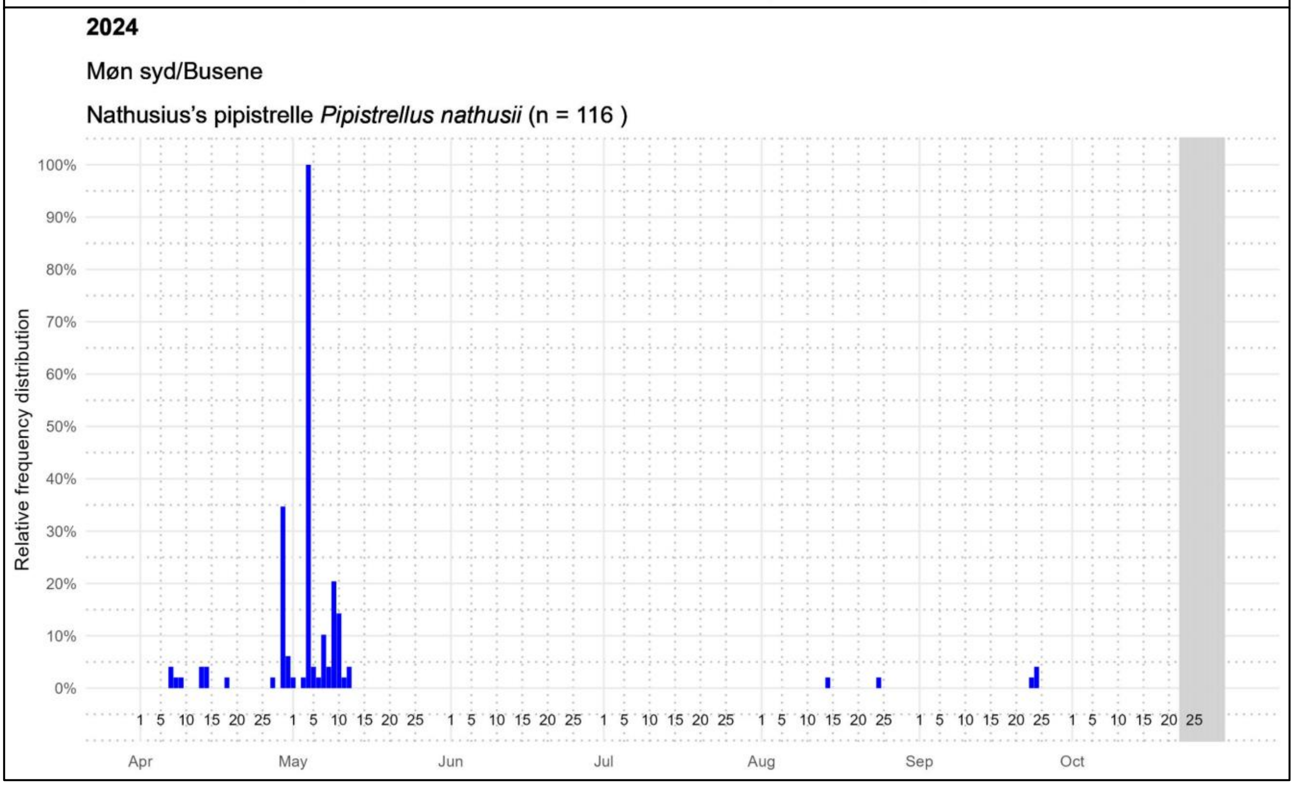
Aug
Sep
Oct


2024
Møn syd/Busene
Nathusius's pipistrelle *Pipistrellus nathusii* (n = 116)
Relative frequency distribution
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Apr
May
Jun
Jul
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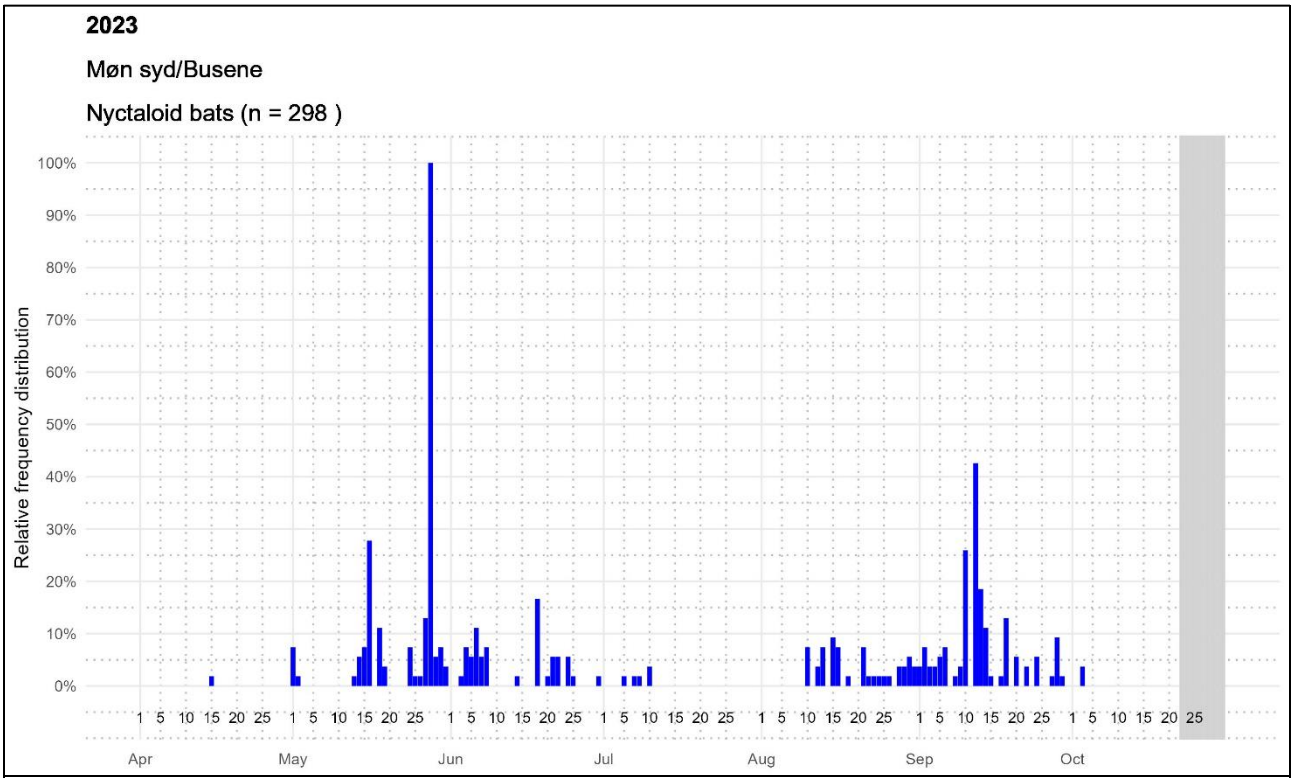
Sep
Oct


2023
Møn syd/Busene
Nyctaloid bats (n = 298)
Relative frequency distribution
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Apr
May
Jun
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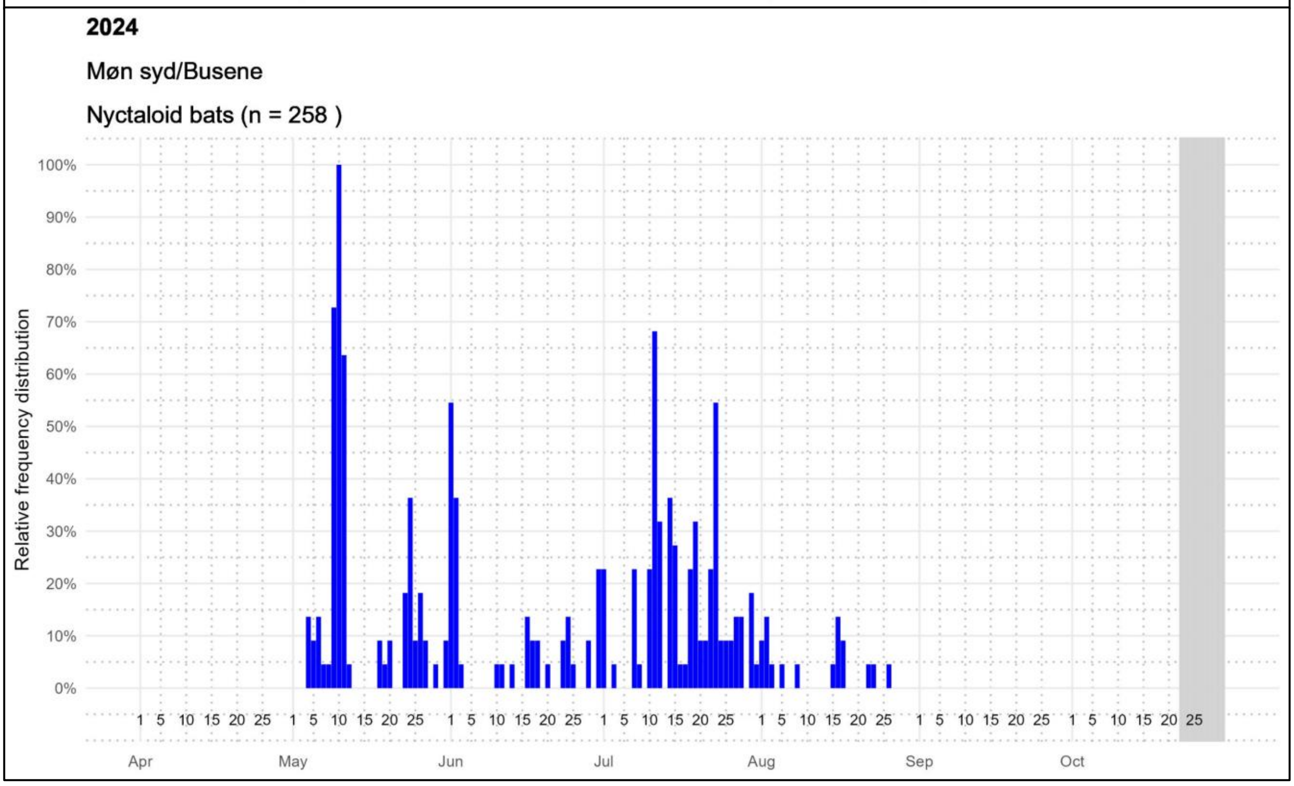
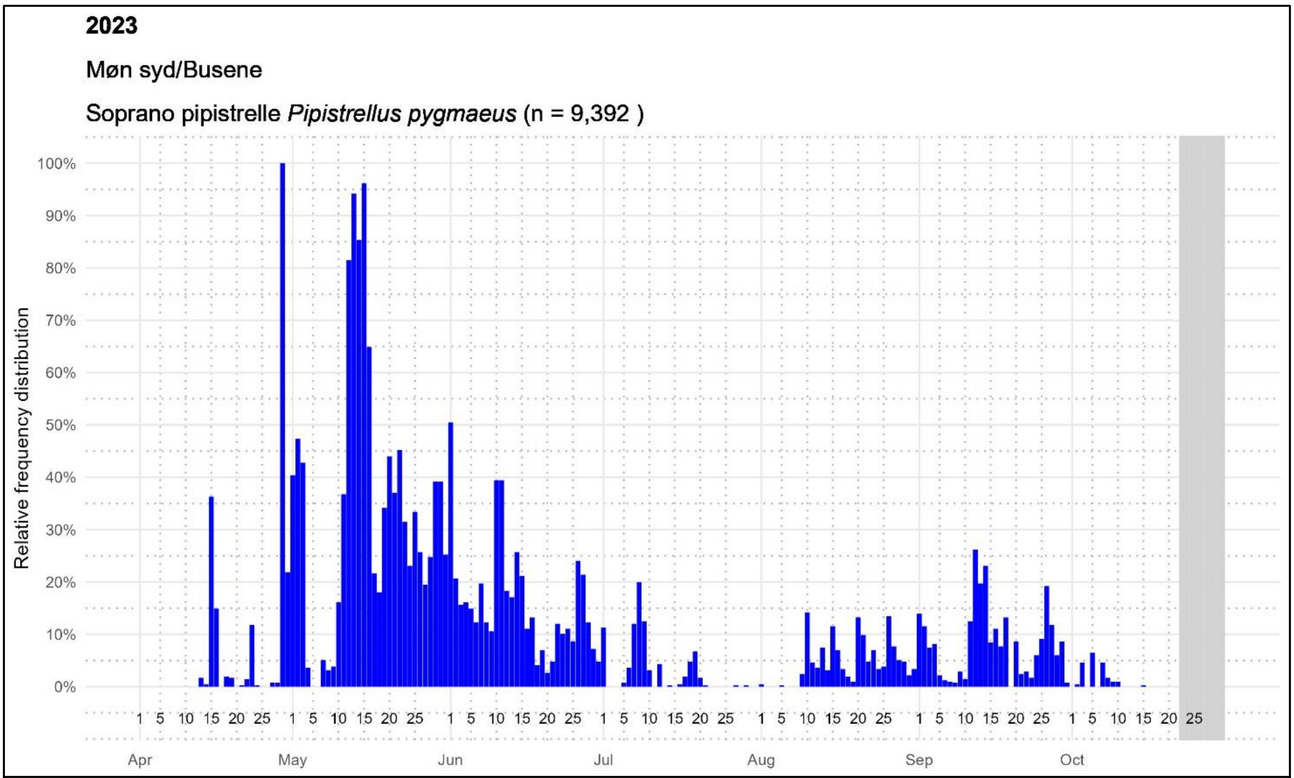
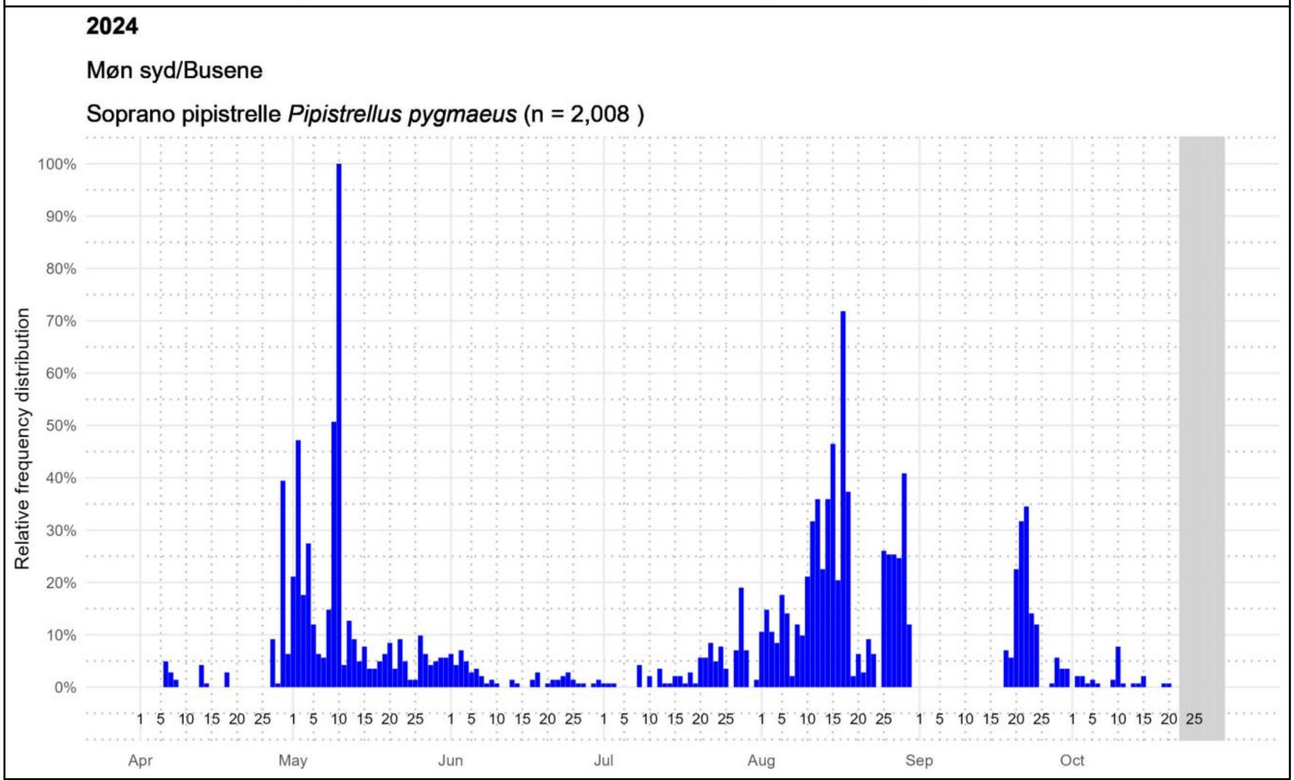
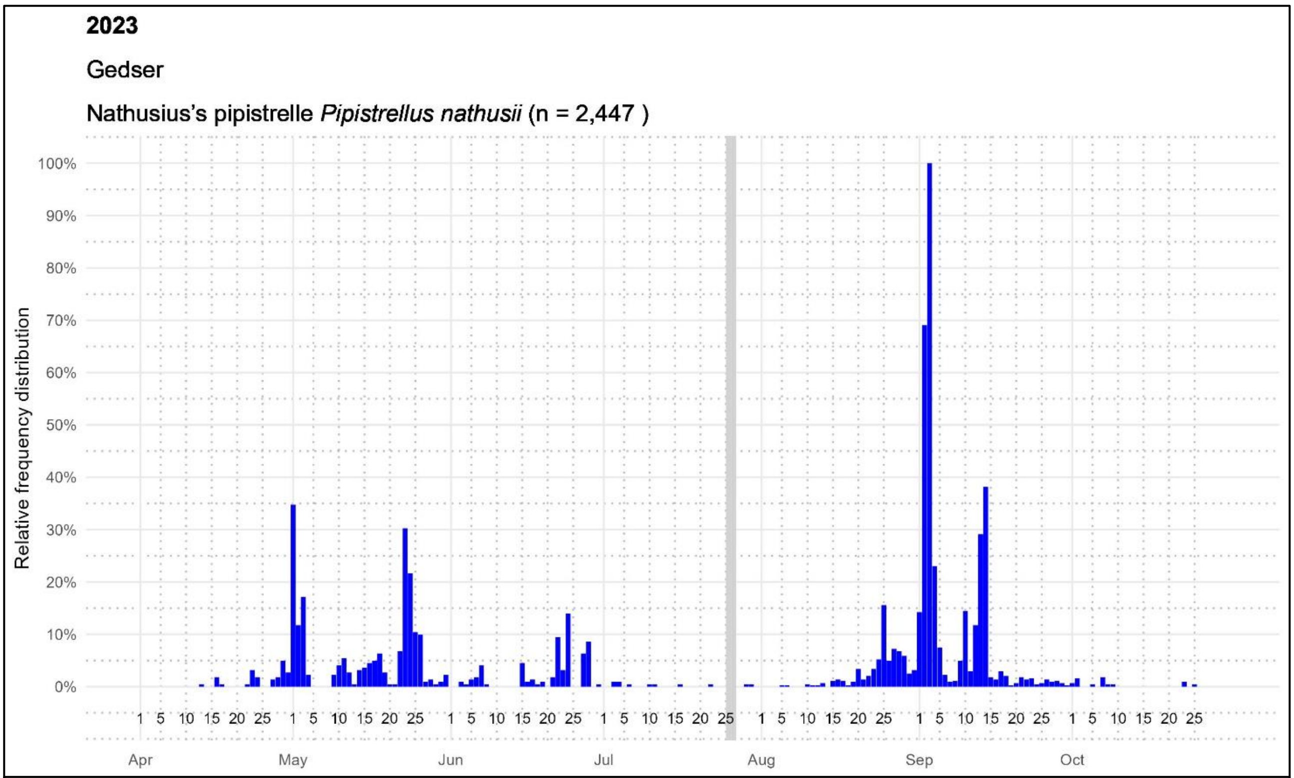
Sep
Oct


2024
Møn syd/Busene
Nyctaloid bats (n = 258)
Relative frequency distribution
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Apr
May
Jun
Jul
Aug
Sep
Oct


2023
Møn syd/Busene
Soprano pipistrelle *Pipistrellus pygmaeus* (n = 9,392)
Relative frequency distribution
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
Apr
May
Jun
Jul
Aug
Sep
Oct


2024
Møn syd/Busene
Soprano pipistrelle *Pipistrellus pygmaeus* (n = 2,008)
Relative frequency distribution
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
Apr
May
Jun
Jul
Aug
Sep
Oct


2023
Gedser
Nathusius's pipistrelle Pipistrellus nathusii (n = 2,447)
Relative frequency distribution
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
1 5 10 15 20 25 1 5 10 15 20 25 1 5 10 15 20 25 1 5 10 15 20 25 1 5 10 15 20 25 1 5 10 15 20 25 1 5 10 15 20 25
Apr
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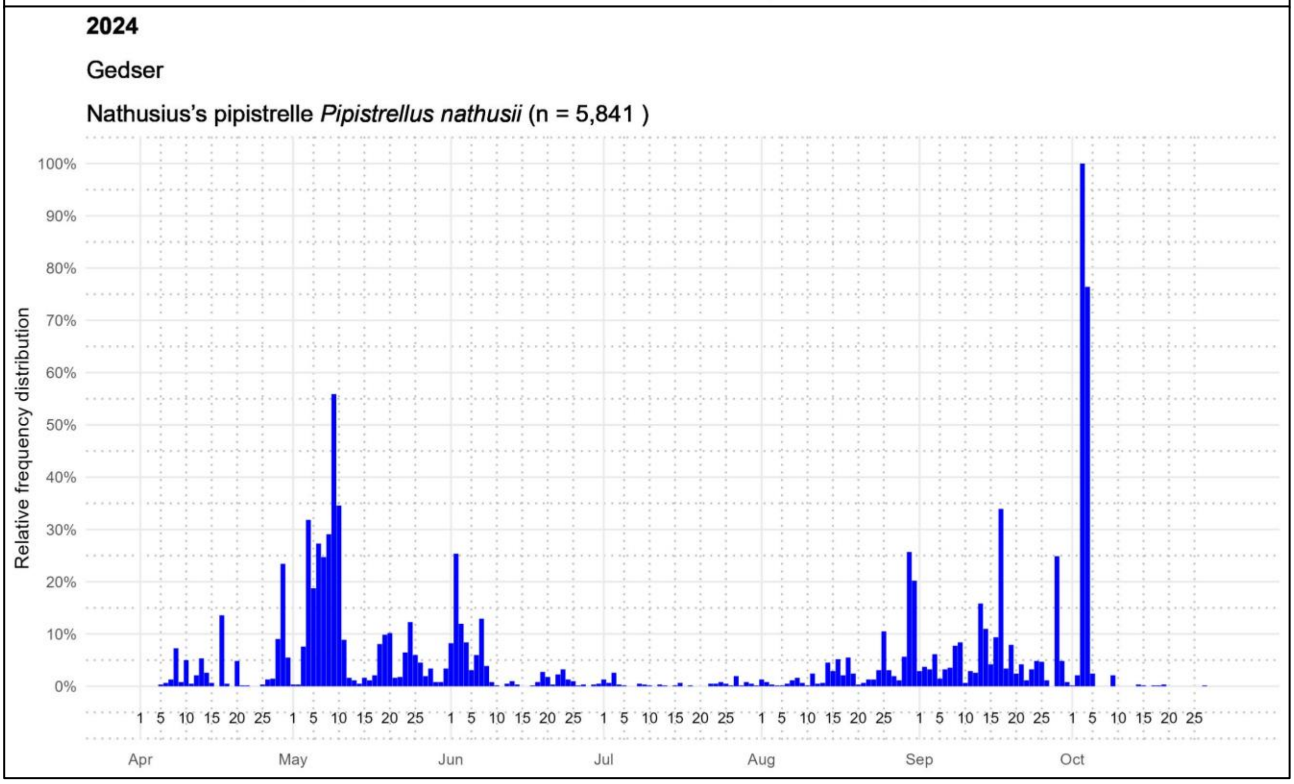
Sep
Oct


2024
Gedser
Nathusius's pipistrelle Pipistrellus nathusii (n = 5,841)
Relative frequency distribution
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
1 5 10 15 20 25 1 5 10 15 20 25 1 5 10 15 20 25 1 5 10 15 20 25 1 5 10 15 20 25 1 5 10 15 20 25 1 5 10 15 20 25
Apr
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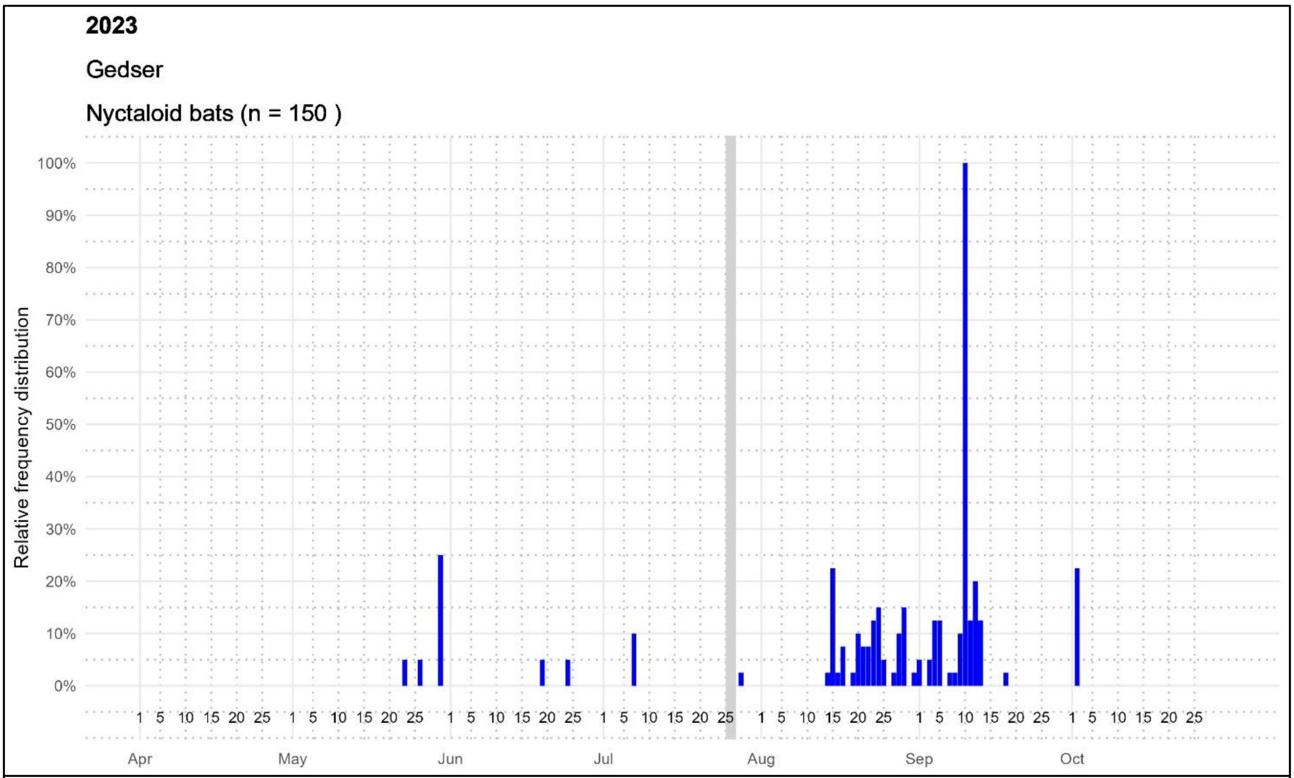
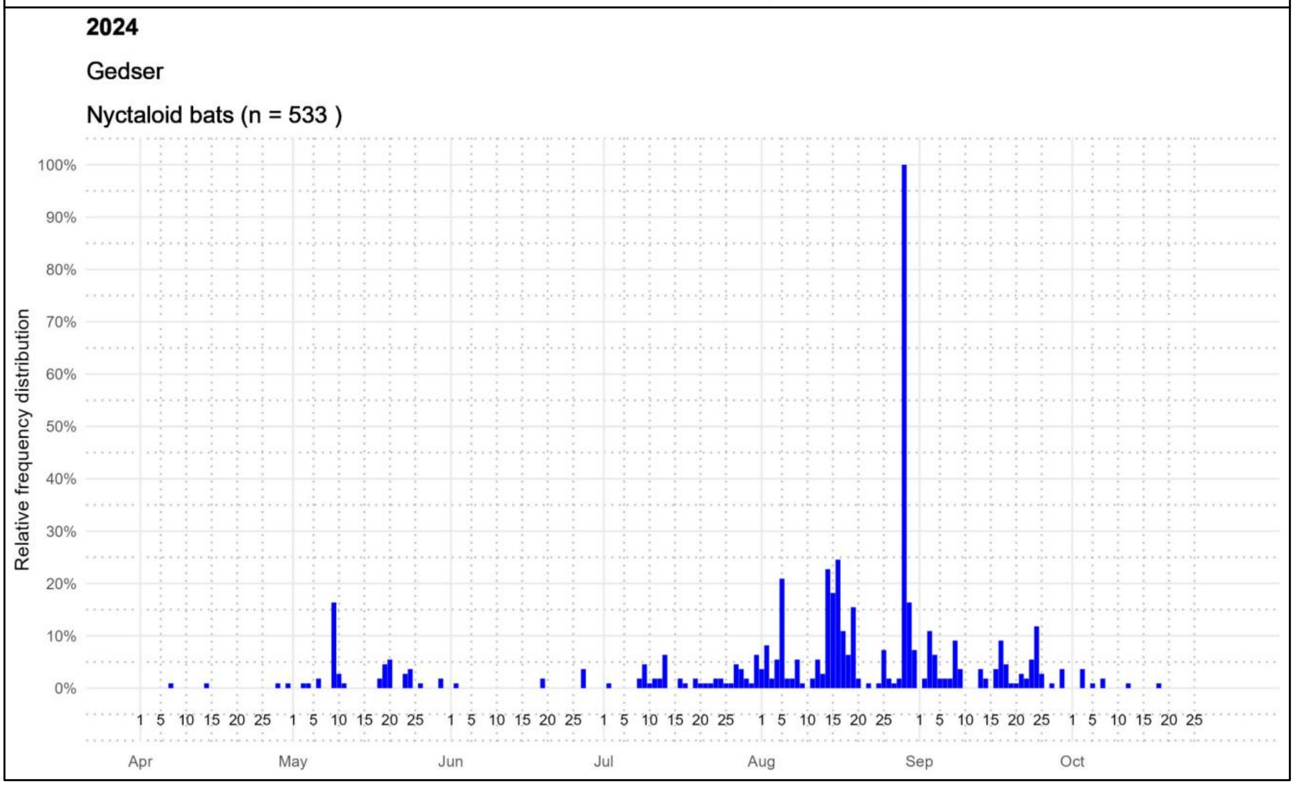
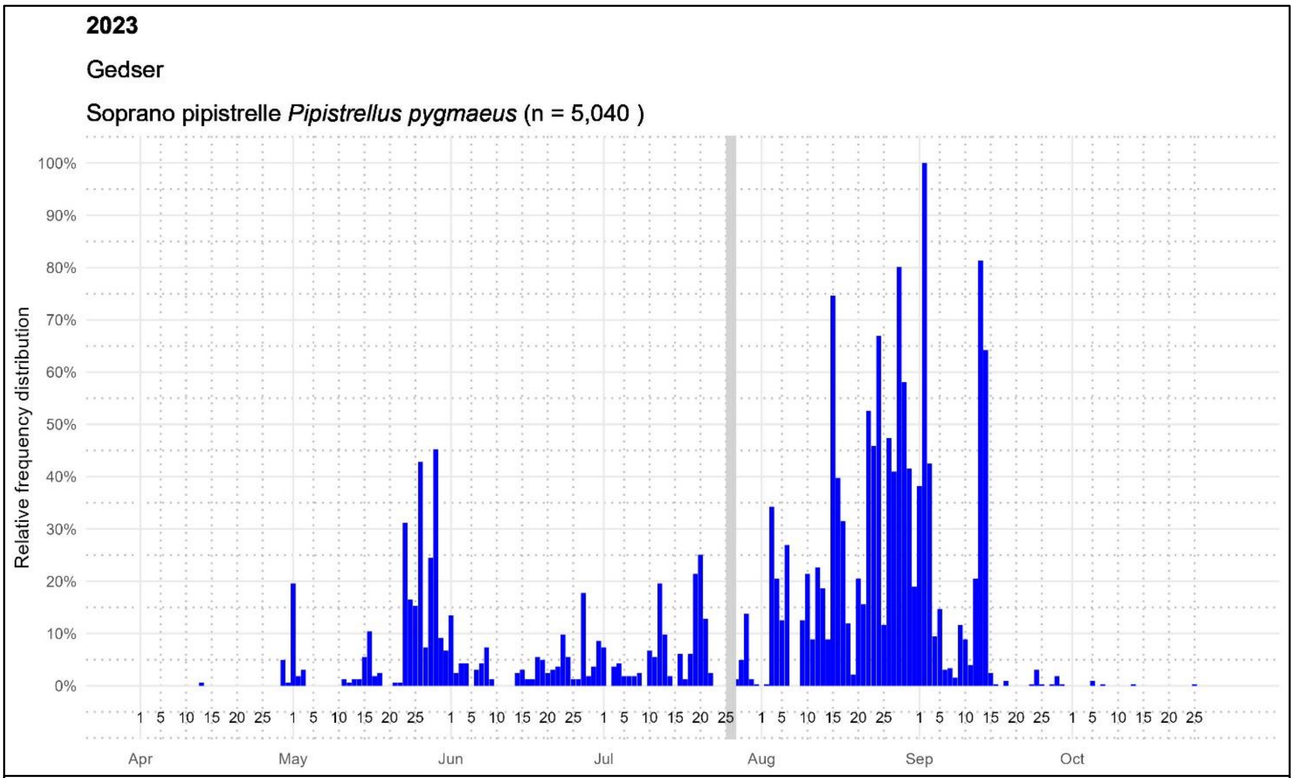
Sep
Oct



2023
Gedser
Nyctaloid bats (n = 150)
Relative frequency distribution
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Apr
May
Jun
Jul
Aug
Sep
Oct



2024
Gedser
Nyctaloid bats (n = 533)
Relative frequency distribution
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Apr
May
Jun
Jul
Aug
Sep
Oct


2023
Gedser
Soprano pipistrelle Pipistrellus pygmaeus (n = 5,040)
Relative frequency distribution
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
1 5 10 15 20 25 1 5 10 15 20 25 1 5 10 15 20 25 1 5 10 15 20 25 1 5 10 15 20 25 1 5 10 15 20 25 1 5 10 15 20 25
Apr
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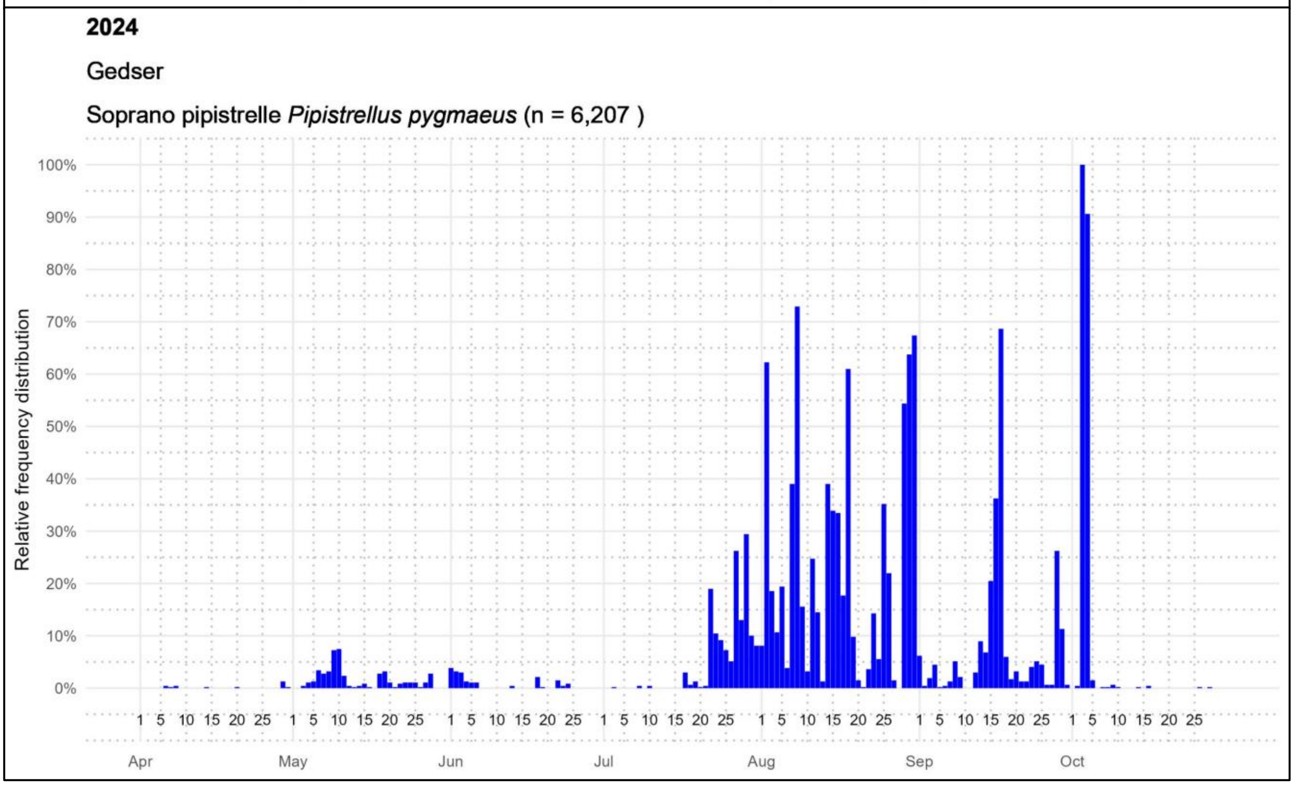
Oct


2024
Gedser
Soprano pipistrelle Pipistrellus pygmaeus (n = 6,207)
Relative frequency distribution
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
1 5 10 15 20 25 1 5 10 15 20 25 1 5 10 15 20 25 1 5 10 15 20 25 1 5 10 15 20 25 1 5 10 15 20 25 1 5 10 15 20 25
Apr
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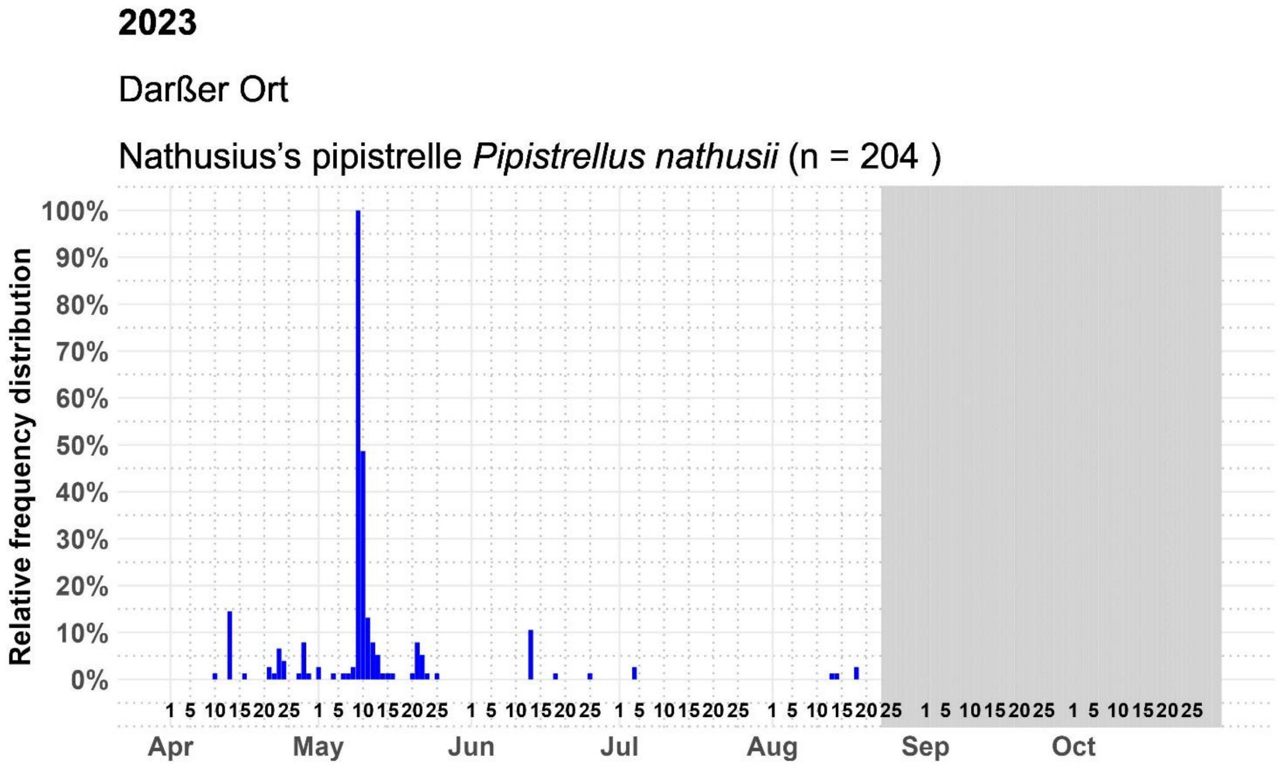
Oct


2023
Darßer Ort
Nathusius's pipistrelle *Pipistrellus nathusii* (n = 204)
Relative frequency distribution
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Apr
May
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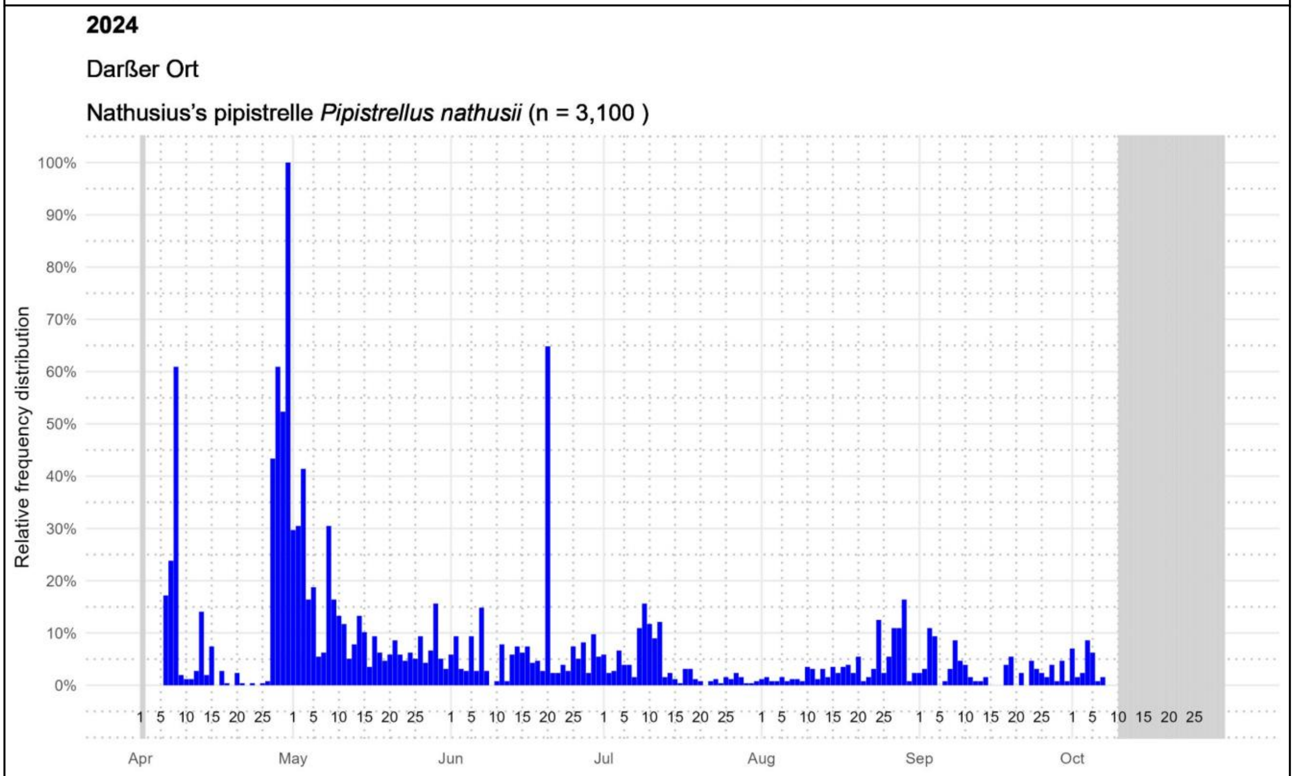
Sep
Oct


2024
Darßer Ort
Nathusius's pipistrelle *Pipistrellus nathusii* (n = 3,100)
Relative frequency distribution
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Apr
May
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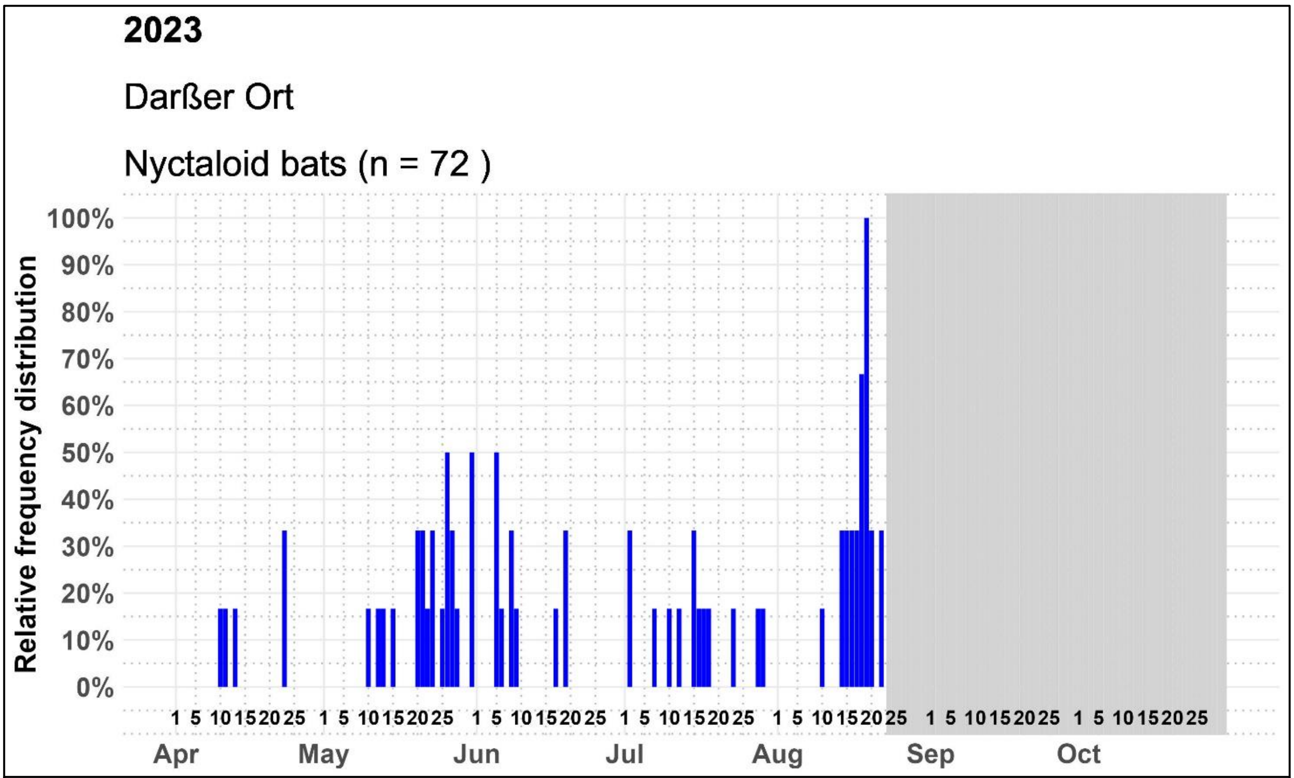
Sep
Oct


2023
Darßer Ort
Nyctaloid bats (n = 72)
Relative frequency distribution
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Apr
May
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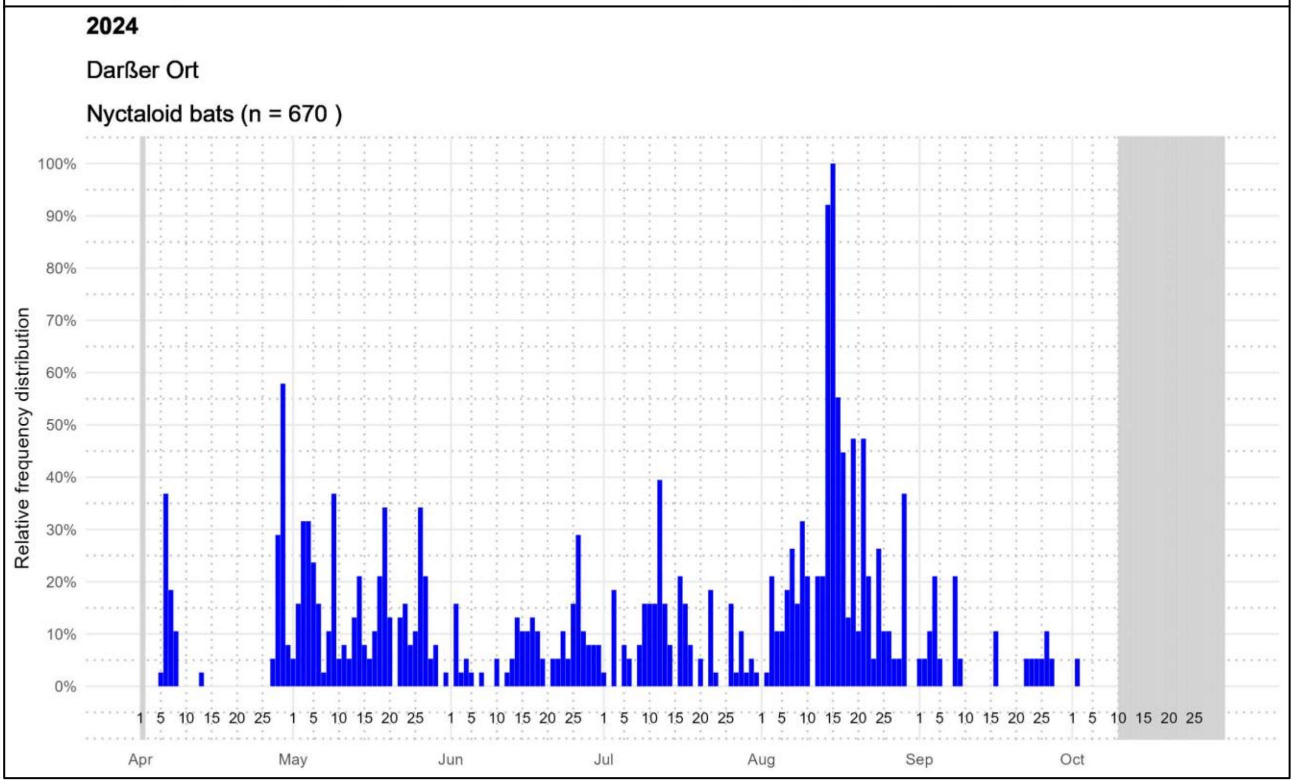
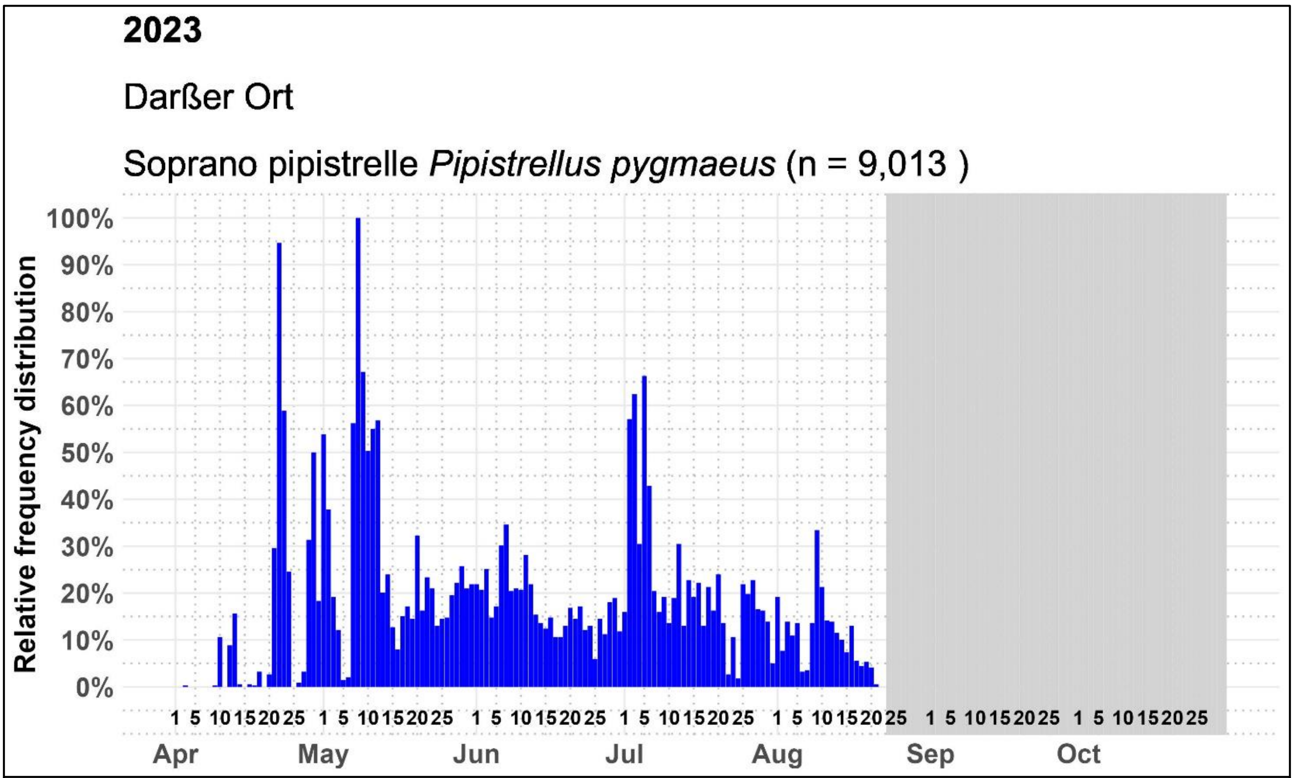
Oct


2024
Darßer Ort
Nyctaloid bats (n = 670)
Relative frequency distribution
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Apr
May
Jun
Jul
Aug
Sep
Oct


2023
Darßer Ort
Soprano pipistrelle *Pipistrellus pygmaeus* (n = 9,013)
Relative frequency distribution
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Apr
May
Jun
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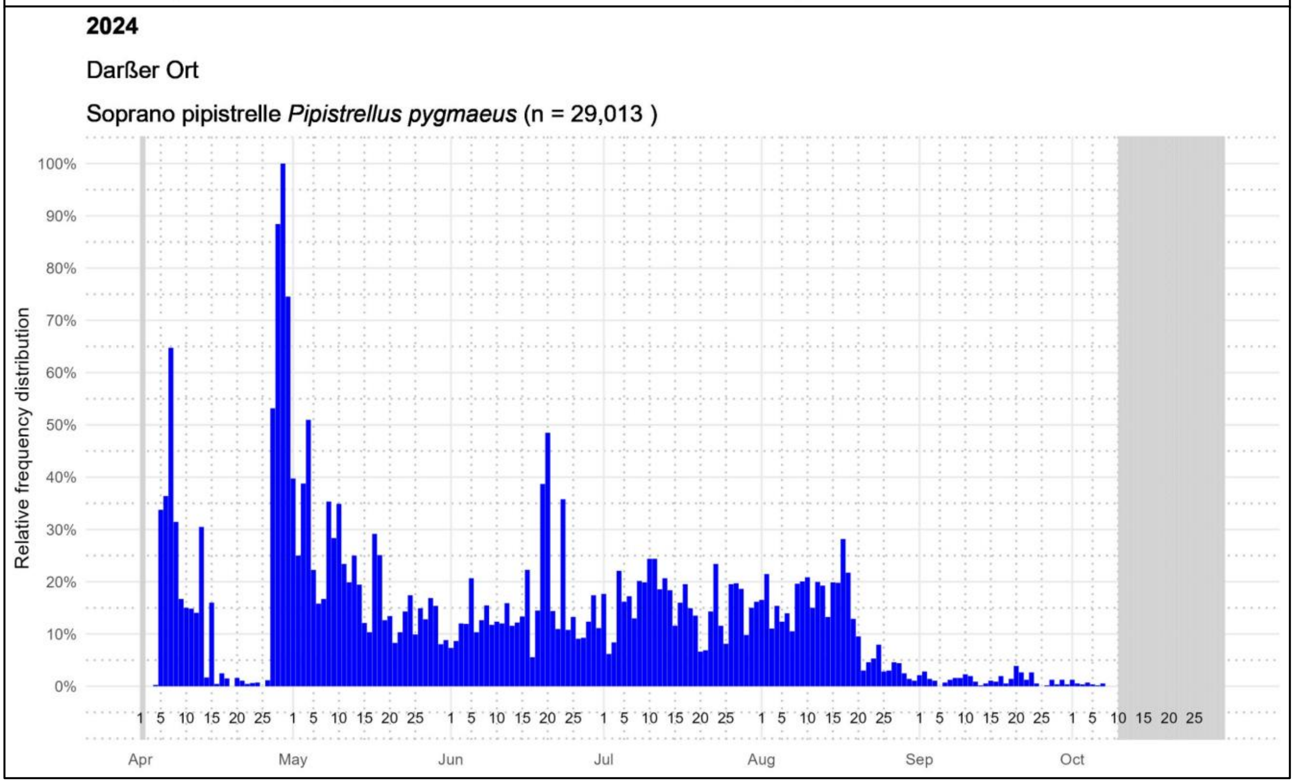
Aug
Sep
Oct


2024
Darßer Ort
Soprano pipistrelle *Pipistrellus pygmaeus* (n = 29,013)
Relative frequency distribution
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Apr
May
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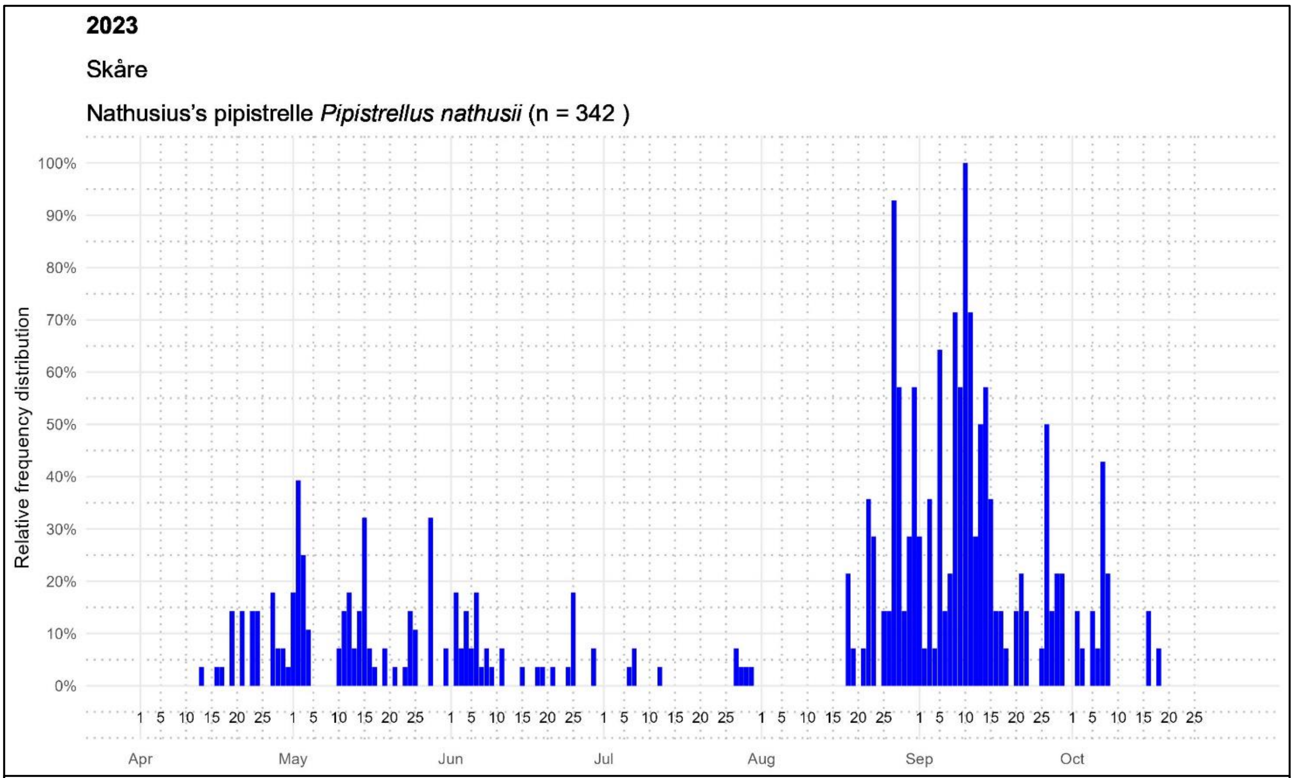
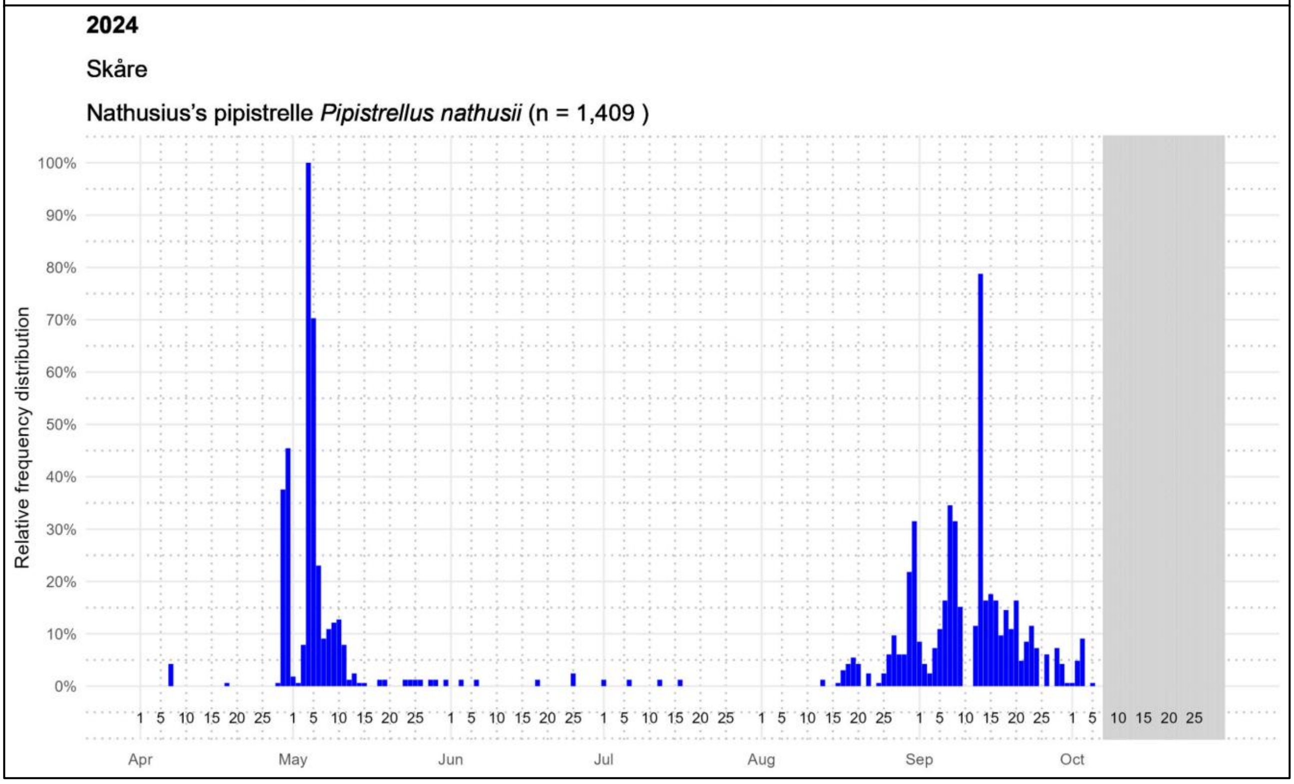
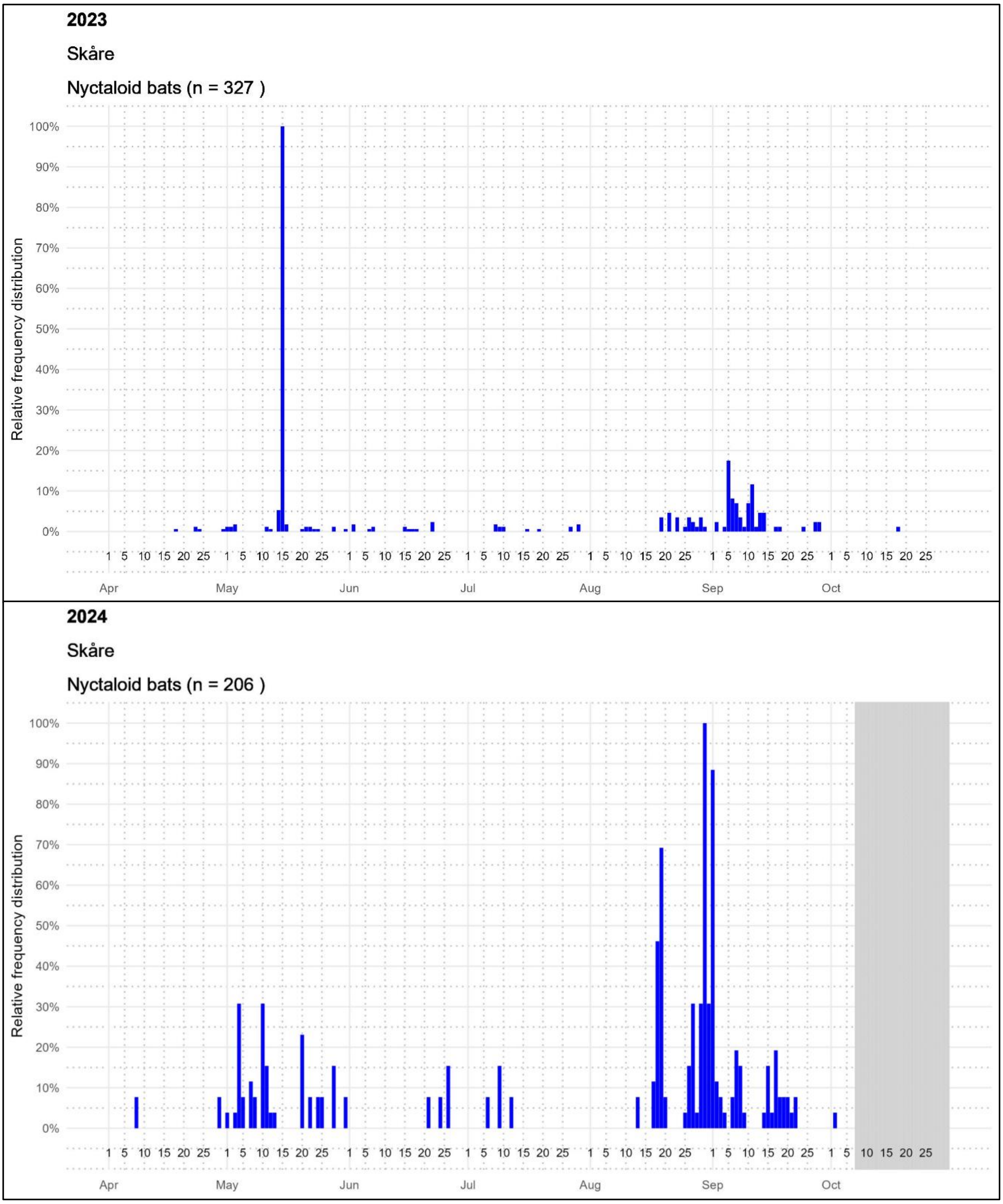
Oct



2023
Skåre
Nathusius's pipistrelle *Pipistrellus nathusii* (n = 342)
Relative frequency distribution
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
1 5 10 15 20 25 1 5 10 15 20 25 1 5 10 15 20 25 1 5 10 15 20 25 1 5 10 15 20 25 1 5 10 15 20 25 1 5 10 15 20 25
Apr May Jun Jul Aug Sep Oct



2024
Skåre
Nathusius's pipistrelle *Pipistrellus nathusii* (n = 1,409)
Relative frequency distribution
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
1 5 10 15 20 25 1 5 10 15 20 25 1 5 10 15 20 25 1 5 10 15 20 25 1 5 10 15 20 25 1 5 10 15 20 25 1 5 10 15 20 25
Apr May Jun Jul Aug Sep Oct


2023
Skåre
Nyctaloid bats (n = 327)
Relative frequency distribution
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Apr
May
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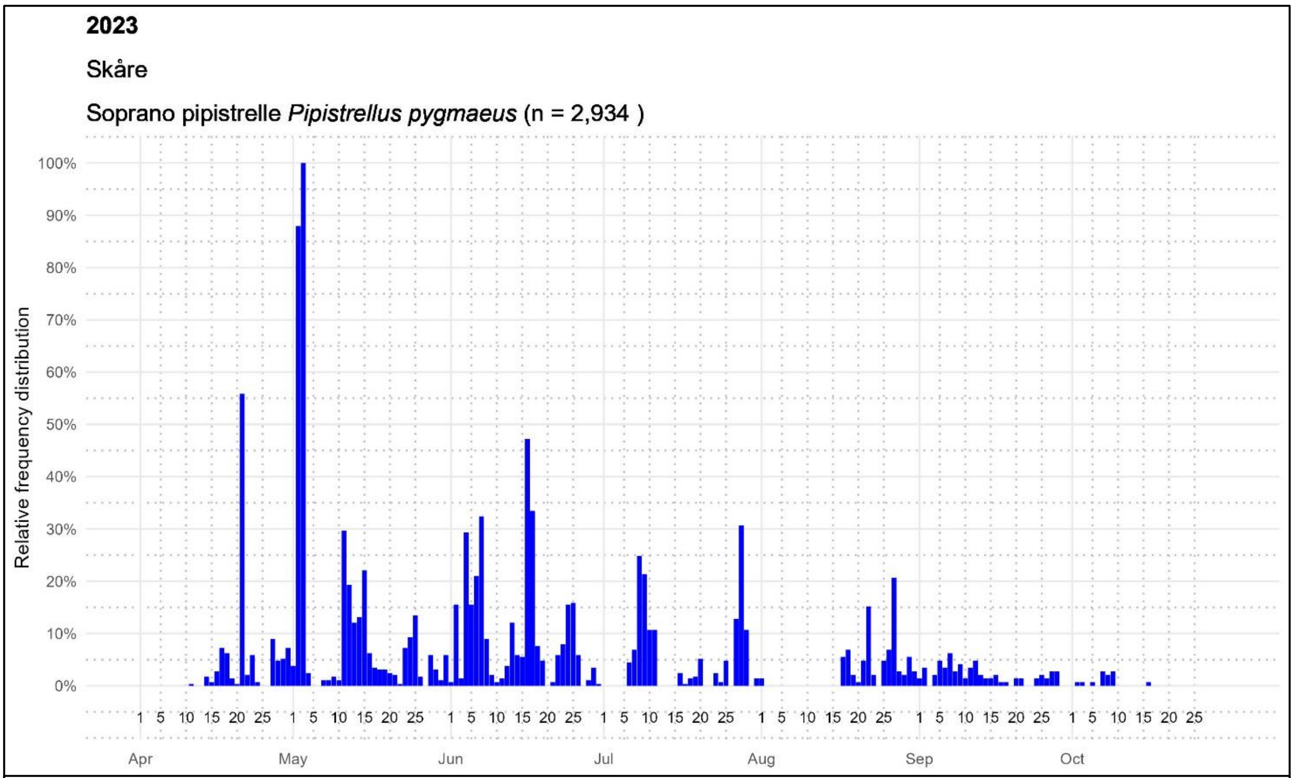
2024
Skåre
Nyctaloid bats (n = 206)


2023
Skåre
Soprano pipistrelle *Pipistrellus pygmaeus* (n = 2,934)
Relative frequency distribution
Apr
May
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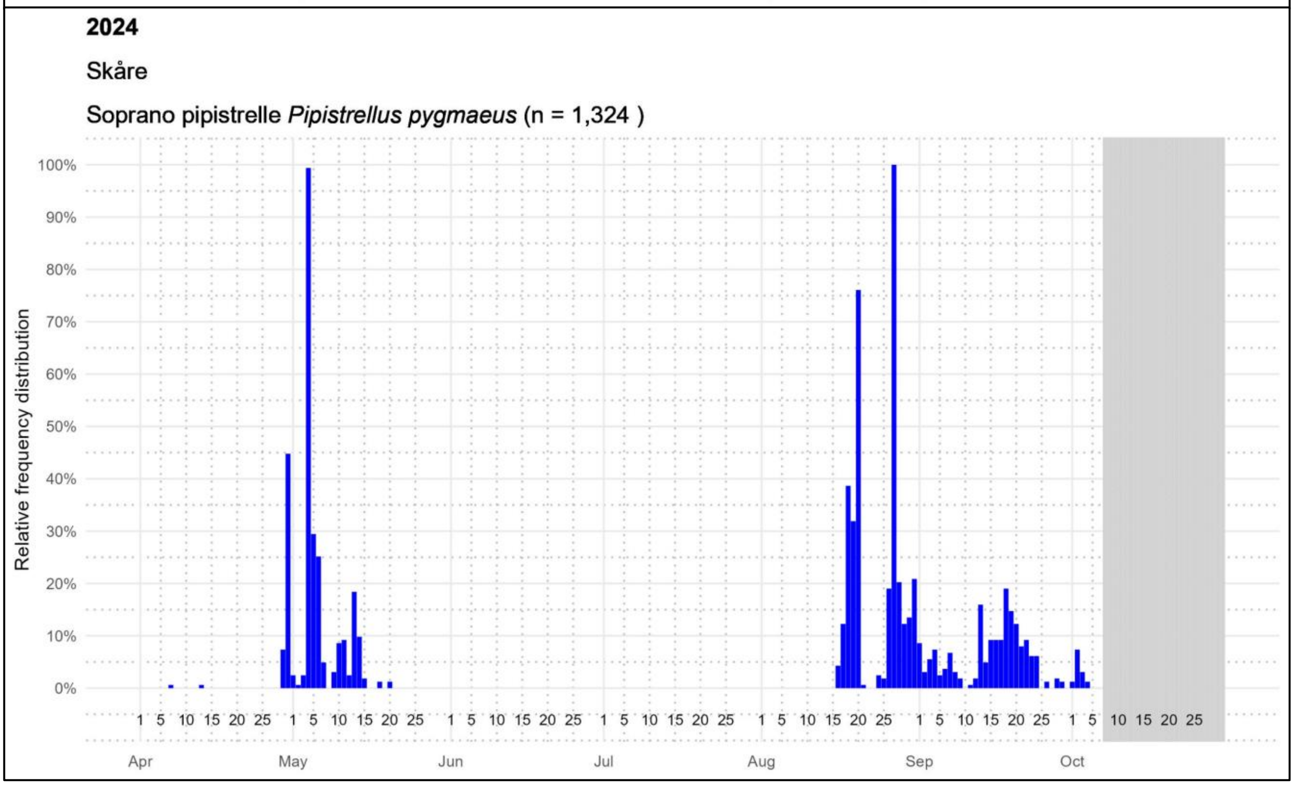
Sep
Oct


2024
Skåre
Soprano pipistrelle *Pipistrellus pygmaeus* (n = 1,324)
Relative frequency distribution
Apr
May
Jun
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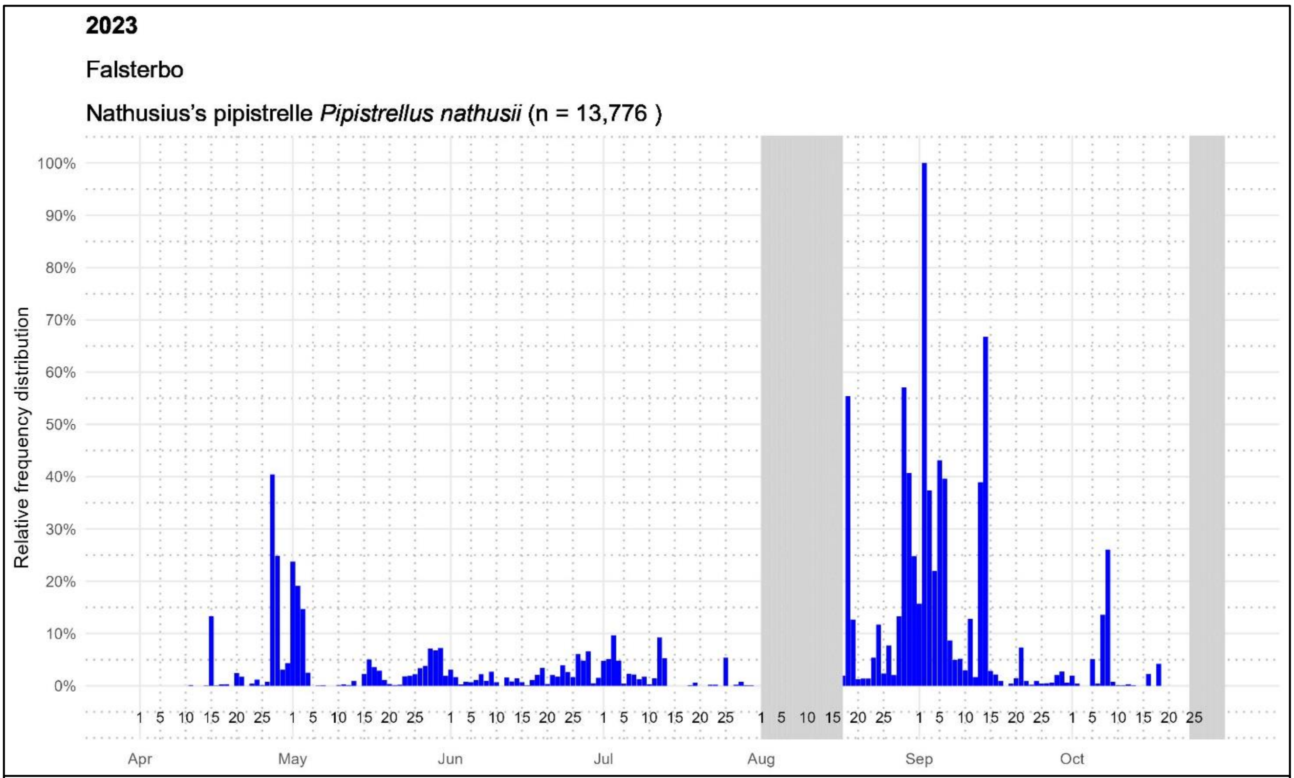
Aug
Sep
Oct


2023
Falsterbo
Nathusius's pipistrelle *Pipistrellus nathusii* (n = 13,776)
Relative frequency distribution
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Apr
May
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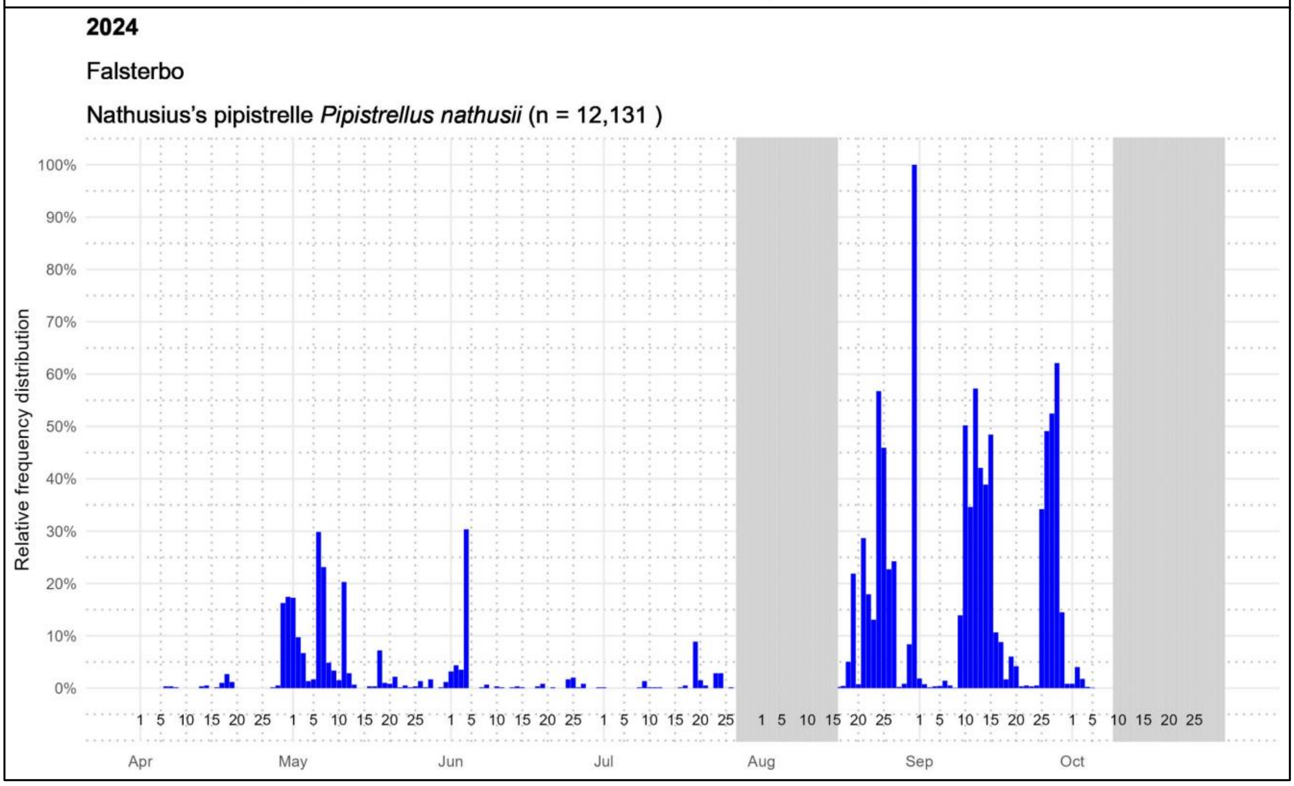
Oct


2024
Falsterbo
Nathusius's pipistrelle *Pipistrellus nathusii* (n = 12,131)
Relative frequency distribution
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Apr
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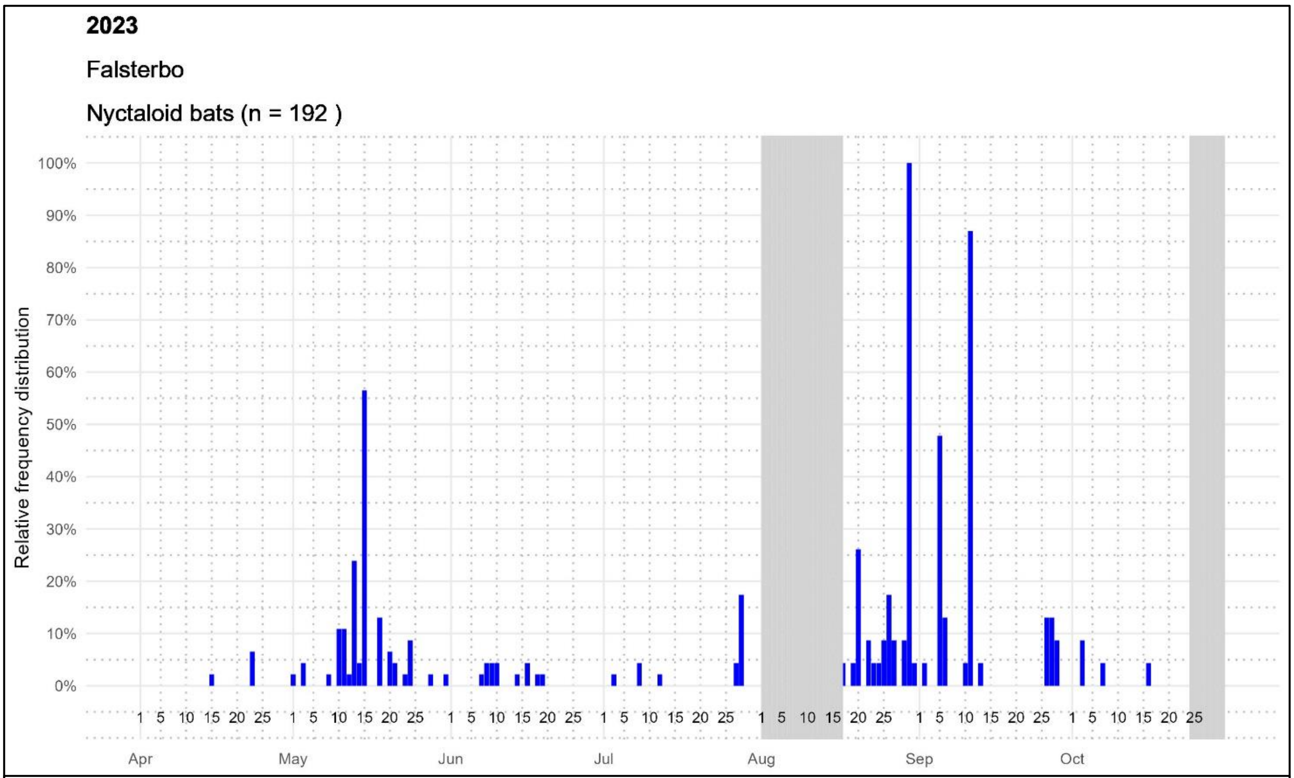
2023
Falsterbo
Nyctaloid bats (n = 192)
Relative frequency distribution
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Apr
May
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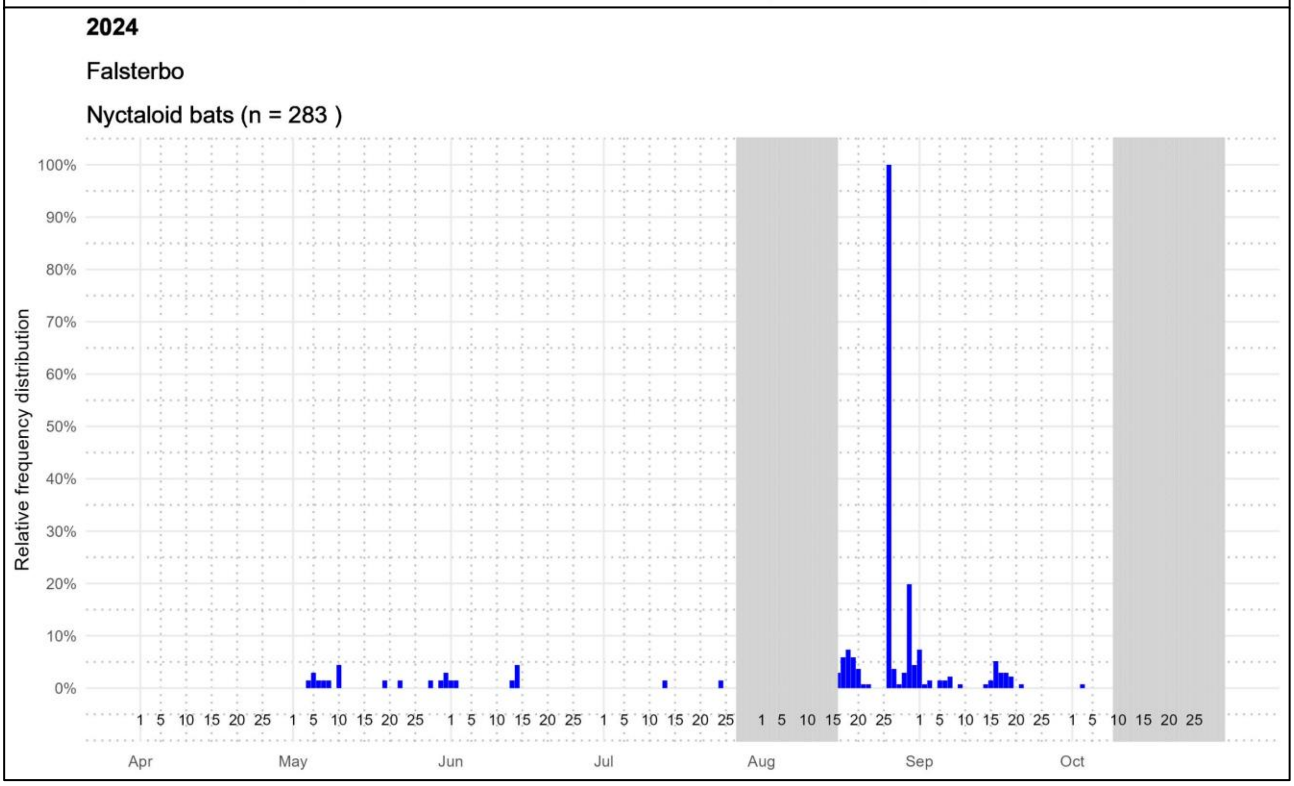
Oct


2024
Falsterbo
Nyctaloid bats (n = 283)
Relative frequency distribution
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Apr
May
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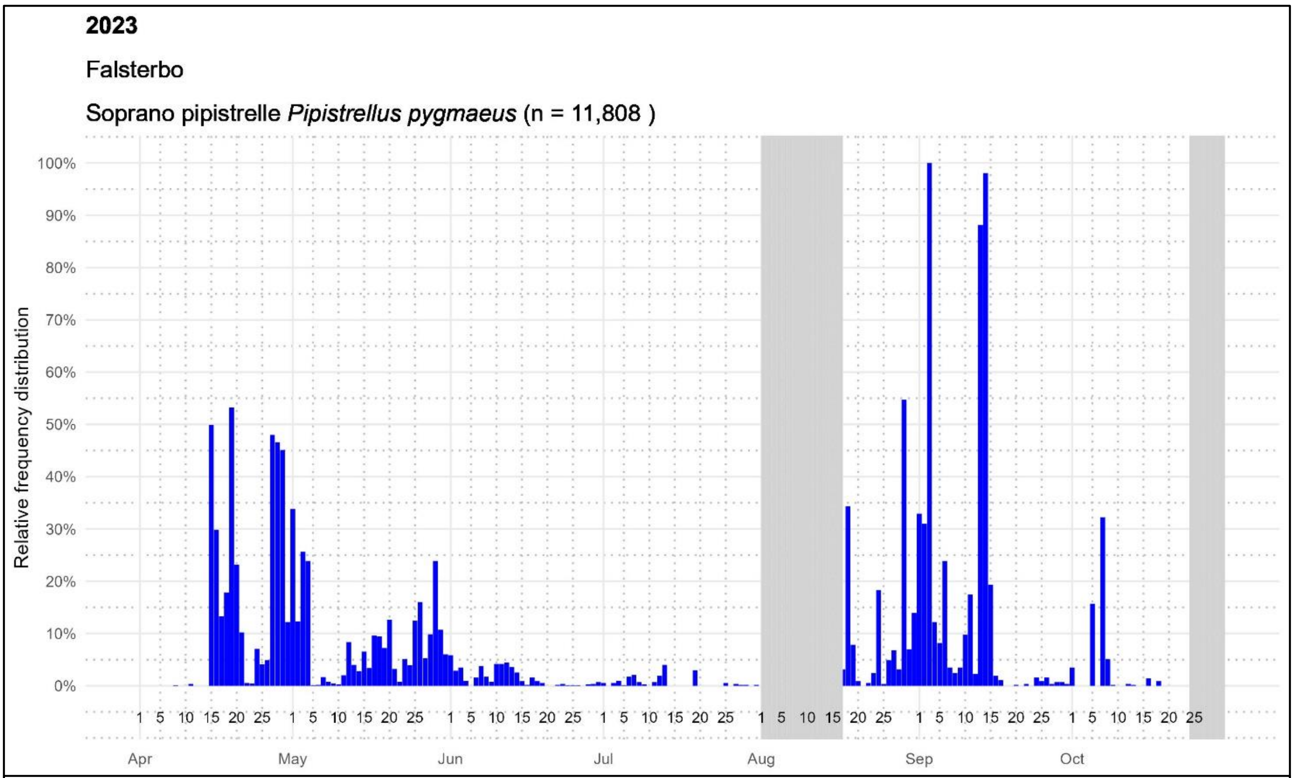
Sep
Oct


2023
Falsterbo
Soprano pipistrelle *Pipistrellus pygmaeus* (n = 11,808)
Relative frequency distribution
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Apr
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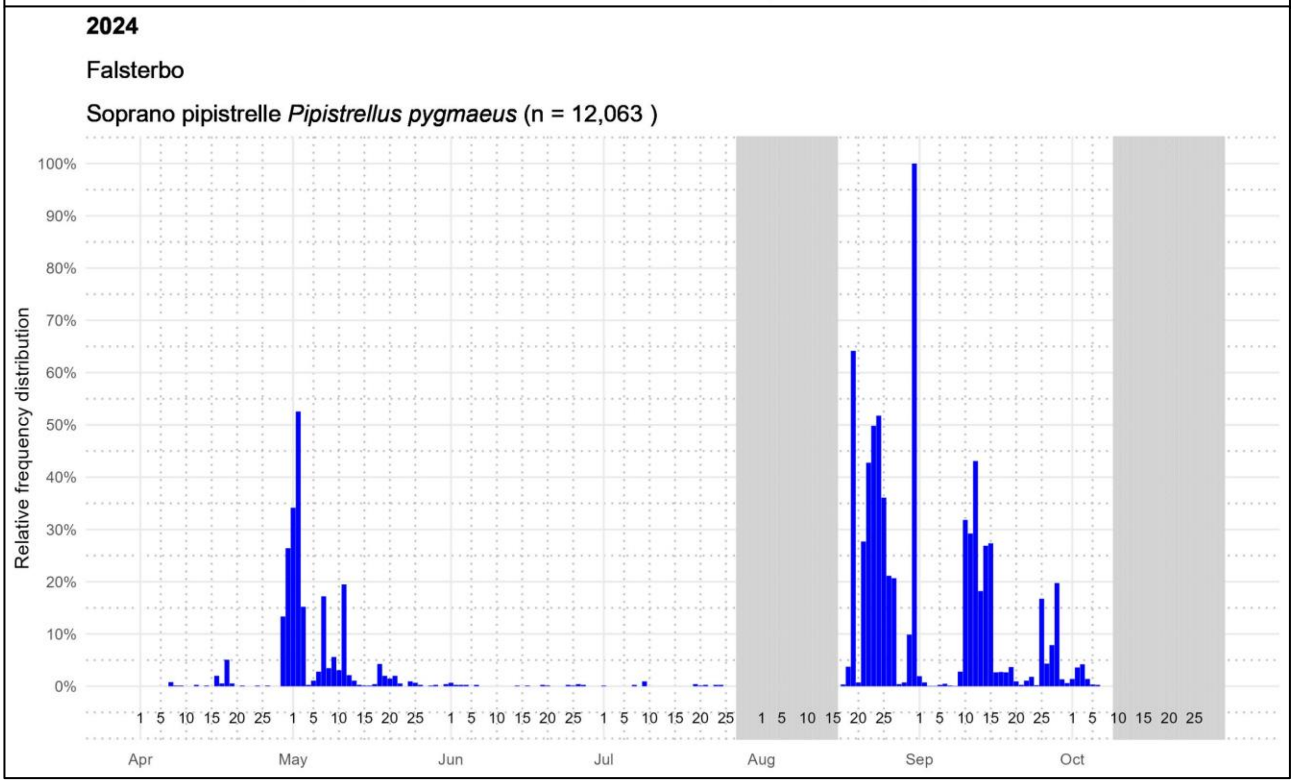
Sep
Oct


2024
Falsterbo
Soprano pipistrelle *Pipistrellus pygmaeus* (n = 12,063)
Relative frequency distribution
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Apr
May
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Sep
Oct