

Mammal Review

North Kent Woods and Downs Candidate NNR

Date: August 2024

Revision: Original

1 Summary

Site	North Kent Woods and Downs Candidate NNR
Central OS Grid Reference	TQ 68490 67051
Report Commissioned by	Kent County Council
Report Purpose	High-level assessment of existing and potential importance of the proposed NNR for terrestrial mammals (excluding bats).
Date of KMBRC data download	June 2024
Date of KMG data download	July 2024
Dates of ground truthing surveys	9 th to 15th August 2024
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Version	Original: 30.08.2024

Considerations	Species	Comments
Most important species	Hazel dormouse <i>Muscardinus avellanarius</i>	These species are listed as Priority Species under Section 41 of the NERC Act (2006), some are legally protected, and all have been confirmed as present in the proposed NNR.
	Harvest mouse <i>Micromys minutus</i>	
	Brown hare <i>Lepus europaeus</i>	Water vole and water shrew were initially considered in this list, but a lack of suitable habitat opportunities and limited records meant removing them as focal species for future considerations relating to the proposed NNR.
	Hedgehog <i>Erinaceus europaeus</i>	
Key areas for mammals (existing)	Hazel dormouse	Ranscombe Farm, Shorne Woods Country Park, Shorne Rough Common, Crabbles Bottom and Jeskyns Community Woodlands
	Harvest mouse	Ranscombe Farm and Jeskyns Community Woodlands
	Brown hare	“Unreliable” old records only, so currently unknown
	Hedgehog	Crabbles Bottom, Cobham Hall School and Silverhand Estate
	Water vole	No suitable habitat
	Water shrew	Very limited suitable habitat
Key areas for mammals (potential) and / or further survey effort needed to determine	Hazel dormouse	Great Crabbles Wood, The Leisure Plots, Camer Park (Henley Woods), Ashenbank Wood, South Ashenbank Wood, Cobham Hall School, Holborough Woods and Silverhand Estate
	Harvest mouse	Crabbles Bottom, West Park, Cobham Hall School and Holborough Woodlands

Considerations	Species	Comments
presence / likely absence	Brown hare	Cobham Hall School, West Park and Cobham Woods
	Hedgehog	Ranscombe Farm, Silverhand Estate and Jeskyns Community Woodlands
Key areas for new or continued long-term monitoring	Hazel dormouse	Ranscombe Farm, Shorne Woods Country Park, Shorne Rough Common, Crabbles Bottom and Jeskyns Community Woodlands
Habitat management / creation options	Habitat creation and enhancement	To be informed by baseline surveys, but most likely to be dominated by creation and enhancement of hedgerows and field margins. Also, creation of dead hedging, log piles, brash piles and ensuring exit ramps or gradual slopes are present within water-bodies.
	Connectivity	Improve connectivity between and within sites, including connectivity across Halfpence Lane.
	Land management / farming	Adopt suitable land management and farming practices and carry out works at an appropriate time of year to minimise impacts to wildlife.
	Engagement	Seek out partnerships with conservation and local community groups and actively seek volunteer engagement where surveys and monitoring do not need to be carried out by professional ecologists.

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2 Introduction

2.1 Background

The Kent Mammal Group and David Archer Associates were commissioned by Kent County Council (KCC) to undertake a high-level assessment of existing and potential importance of the proposed North Kent Woods and Downs Candidate NNR for terrestrial mammals (excluding bats). This report will be combined with those produced for other taxa to inform the application by KCC to Natural England to create a new 'Super' NNR in north-west Kent.

2.2 Site Location and Description

The proposed new NNR core, affiliate and possible affiliate sites shown in **Appendix 2** have all been included in this assessment. The proposed NNR covers a total of 2,087.29ha, which stretches c. 8.3km north-south from Shorne Woods Country Park to the southern tip of Holborough Woodland and c. 6.9km west-east from Camer Park to Ranscombe Farm. This includes 1,236.07ha of core sites, 607.37ha of affiliate sites and 243.85ha of possible affiliate sites. The approximate centre of the proposed NNR is at grid reference TQ 68490 67051.

The existing designations for the proposed NNR can be found at **Appendix 3**, the overlay of Priority Habitats based on MAGIC mapping can be found at **Appendix 5**, and the habitats recorded during the 2012 Kent Habitat Survey are shown in **Appendix 6**. Broadly speaking, the proposed NNR covers areas of woodland, parkland, arable (including viticulture) and pastoral land. The A2/M2 motorway dissects the site east-west, with only four sites lying north of this: Shorne Woods Country Park, Shorne Rough Common, Crabbles Bottom and Great Crabbles Wood. All other sites lie south of the A2/M2, with the high-speed railway line dissecting the northern part of the Silverhand Estate. Otherwise, the sites south of the A2/M2 are largely connected, with the exception of Camer Park.

2.3 Scope and Objectives of Mammal Review

The scope and objectives of this mammal assessment (excluding bats) are focussed around four key questions:

1. What are the most important species in the study area?
2. Which are the key areas for mammals?
3. Where is more survey work required?
4. What are the main habitat management / creation options?

Our brief included advice to limit the extent of detail to that which could be achieved within approximately 10 days of work. Accordingly, a desk study involving the use of existing biological records and habitat mapping data has formed the bulk of the evidence base for this high-level assessment, with some ground truthing surveys carried out where possible to support the conclusions.

3 Methodology

3.1 Personnel

This assessment was jointly carried out by Claire Munn (member of the Kent Mammal Group and Associate Director of Ecology at David Archer Associates) and Ian Gray (chairperson of the Kent Mammal Group). Both Claire and Ian are actively involved in mammal conservation efforts within Kent and have been for several years.

Claire is licensed to survey for bats and hazel dormice and has been a dormouse monitor and licence trainer for the Kent Mammal Group (KMG) for ten years. Claire also sits on the KMG dormouse subcommittee, was previously vice-chairperson of the KMG and was also actively involved in the early stages of the Kent Harvest Mouse Survey. Claire holds Natural England Class Licences for badger (CL35) and beaver (CL51) and has been the named ecologist on hazel dormouse and bat mitigation and badger development licences. Claire has been a practising ecologist in Kent since 2008 and is also a Full member of the Chartered Institute of Ecology and Environmental Management (CIEEM) and therefore subject to the CIEEM Professional Code of Conduct. In addition to heading up the ecology team at DAA, Claire is also the technical lead for terrestrial mammals.

After attending a Dormouse Conservation Course at Wildwood, Ian has spent 18 years as a licensed surveyor of hazel dormice in several Kent woodlands and is also the hedgehog rehabilitator for the Kent Wildlife Rescue Service. Whilst continuing his career, initially as an industrial chemist then as the Senior Chief Medical Laboratory Scientific Officer at Guys Hospital Medical School, he became a leader with the British Trust for Conservation Volunteers (now The Conservation Volunteers). The skills, training and experience gained were then transferred to his local Cuxton Countryside Group, of which he is chair, and he is also a trustee of the West Kent Downs Countryside Group together with his role as chair of the KMG.

The mapping was carried out by DAA Ecologist Zenobia Hatch, who has been using GIS software (specifically ArcGIS during 2016-2019, and QGIS since 2019). Zenobia undertook a Landscape Ecology and Geographical Information Systems (GIS) course whilst studying for a Wildlife Ecology and Conservation BSc (Hons) degree in 2017. Zenobia has since undertaken extensive research on the use of QGIS, and continues to do so, to continuously develop and enhance her skillset.

Botanist Dr Lesley Mason, kindly provided confirmation that the majority of Priority Habitats plotted on Defra's Magic maps are accurate, based on extensive ground truthing that she has carried out for the botanical assessment for the proposed NNR. Lesley also provided us with records for incidental sightings of mammal evidence that she encountered during her survey work for the botanical assessment.

Dr Lee Brady also kindly provided us with details of pond locations across the proposed NNR, based on a combination of existing data and extensive ground truthing that he has carried out for the herpetofauna assessment for the proposed NNR.

3.2 Desk Study

In June 2024 the Kent and Medway Biological Records Centre (KMBRC) provided the following information for the proposed NNR sites and immediately adjacent areas to Kent County Council:

- All mammal species, including those that are legally protected, such as the hazel dormouse and water vole, those which are notable/Priority species (S.41 NERC Act, 2006), such as the hedgehog, harvest mouse and brown hare, and those afforded no conservation designation or legal protection.

It was noted that the KMBRC records were dated up to 2021 only, which is likely due to the time lag taken for record submissions to be added to the database. Therefore, the Kent Mammal Group's own records from 2021 to 2024 for the proposed NNR area were downloaded and added to those provided by KMBRC to provide the most up-to-date records base for this assessment.

Kent County Council also provided us with a map of the Local Wildlife Sites and statutory designated sites within the proposed NNR (see **Appendix 3**). Full citations for the LWSs were not provided, but citations for the statutory designated sites were obtained using Natural England's Multi-Agency Geographic Information for the Countryside (MAGIC) database. Kent County Council also provided us with QGIS mapping layers for Priority Habitats and habitats recorded as part of the 2012 Kent Habitat Survey (**Appendices 5 & 6**).

Based on the initial results of the desk study, a list of six mammal species was derived to form the focus of the assessment. Factors influencing the decision of which mammals to focus on for the NNR review included:

- Availability of existing biological records;
- Priority habitats likely to be present;
- Knowledge of ecology of the species in relation to the existing and potential habitat availability within the proposed NNR; and
- Current conservation status, legal protection and designation as 'notable' species under Section 41 of the NERC Act (2006).

3.3 Ground Truthing Survey

Walkover surveys by Claire Munn and Ian Gray were carried out for the following sites and on the following dates in dry conditions. These were high level walkover surveys to confirm broad habitat types in relation to their suitability to support the six key mammals and to identify potential areas for habitat enhancement / creation for the benefit of the six key mammal species.

- Crabbles Bottom Wood, 8th August 2024
- Great Crabbles Wood, 8th August 2024
- Ashenbank Wood, 9th August 2024
- South Ashenbank Wood, 9th August 2024
- West Park, 9th August 2024
- Cobham Hall School, 9th August 2024
- Camer Park, 12th August 2024
- Shorne Rough Common, 12th August 2024
- Shorne Woods Country Park, 13th August 2024
- The Leisure Plots, 15th August 2024
- Cobham Woods, no ground truthing survey, but discussion with site ranger, August 2024.

Where incidental observations were made of mammals or field signs left by mammals during the ground-truthing surveys, the locations of these were noted and added to the records database and

maps in **Appendix 4**. The maps, evaluation and recommendations therefore incorporate both the desk study records and those made during the ground truthing surveys carried out in August 2024.

Jeskyns Community Woodland and Ranscombe Farm are both sites that are already well known to the authors, hence they were excluded from ground truthing surveys. Views from public roads were used to carry out a very high-level assessment of the Silverhand Estate and Holborough Woodlands only on 9th August 2024, as the scope did not allow for sufficient time to survey these vast sites in our ground truthing surveys.

3.4 Mapping

Records of 24 terrestrial mammal species (excluding bats) were combined in an Excel spreadsheet from KMBRC and the Kent Mammal Group, and were separated by date into three groups:

- Pre 1999
- 2000-2013
- 2014-2024

The records were then further divided into the following groups based upon their grid reference to determine their level of accuracy:

- 2-figure (10km by 10km)
- 4-figure (1km by 1km)
- 6-figure (100m by 100m)
- 8-figure (10m by 10m)
- 10-figure (1m by 1m)

For the purposes of producing useful maps to aid the objectives of this study, all records that fell within the 2-figure (10km by 10km) group were excluded from the maps. However, consideration has still been given to these records if applicable within the overall assessment of this report.

The Easting and Northing values were extracted from the grid references (where not already supplied), and the excel documents were converted into CSV (comma delimited) format to be imported into QGIS. Each record was depicted with a buffer relevant to its accuracy (e.g. a 4-figure grid reference was given a 1km circular buffer from the point to display the area in which it could have been recorded within). A random sample of grid references was then cross-referenced with GridReferenceFinder (2024), to ensure the points on the map were accurate and in the correct geographical location.

Once completed, the maps were overlaid with the proposed NNR sites to aid the analysis process. These were then exported as PDFs (provided in the Appendices of this report). The shapefiles for the maps can be provided for a more detailed look at the mapping outputs upon request.

3.5 Assumptions

The assessment has been carried out at a high-level to inform an initial overview of the likely value of the proposed NNR in relation to terrestrial mammals (excluding bats). This has been carried out through an analysis of existing biological records, existing habitat mapping, and limited ground-truthing surveys. A paucity of records does not necessarily reflect a paucity of presence of a particular species but may instead reflect surveyor effort in the recording area.

Further, due to the high-level brief of this assessment, ground truthing surveys were only carried out in some limited areas within the proposed NNR. As such, whilst every effort has been made to accurately map habitats, these may not be wholly correct for areas not included in the field-based ground truthing surveys. That said, the botanical specialist working on this same project (Dr Lesley Mason) has walked a much larger area of the proposed NNR and has been able to advise us that most Priority Habitats, as mapped on Magic Interactive Maps (Defra, 2024), are accurate. Dr Lee Brady, the taxa expert producing the herpetofauna review, has kindly provided us with a map of ponds across the proposed NNR, based on both desk study and ground truthing surveys that he has carried out, although some seasonally wet ponds may have been missed and it is possible that some ponds in Shorne Woods Country Park merge when at higher water levels.

For some species, biological records were very limited for the most recent 10-year period. As such, older records have been included in the assessment where helpful to do so. Additionally, the accuracy of the grid references provided with records was limited in many cases; records for grid references of only 10km accuracy levels have been excluded from this assessment. For all other records, a buffer showing the level of accuracy has been included in the mapping in **Appendix 4** to visually demonstrate the area the record may actually have come from.

4 Results

The following section presents the results of the desk study and ground truthing surveys for the proposed NNR sites.

4.1 Designated Sites

4.1.1 Statutory Sites

Statutory sites designated for nature conservation within and close to the proposed NNR sites are shown in **Appendix 3**, with details provided in **Table 4.1**. Prior to the UK's departure from the European Union, SACs formed part of a wider European network known as Natura 2000s protected sites; whilst the SACs are now reclassified under UK law as forming part of the National Site Network (NSN), the sites designated prior to Brexit are likely to remain of **European importance**. SSSIs are of **national importance**.

None of the statutory sites have been designated due to the presence of any mammals within them, with no mammal species mentioned in any of the site citations.

Table 4.1: Statutory designated sites within the proposed NNR sites.

Site Name	Distance & Direction from Proposed NNR	Area (ha)	Reasons for Designation
North Downs Woodlands SAC	0m within Holborough Woodlands	287.35	Annex I habitats that are a primary reason for designation: <ul style="list-style-type: none">9130 Asperulo-Fagetum beech forests91J0 Taxus baccata woods of the British Isles Annex I habitats present but not a primary reason for designation: <ul style="list-style-type: none">6210 semi-natural dry grassland and scrub facies on calcareous substrates (Festuco-Brometalia) (*important orchid sites).
Halling to Trottiscliffe Escarpment SSSI	0m within Holborough Woodlands and small north-eastern section of Silverhand Estate	600.58	The site is representative of chalk grassland in west Kent and beech woodland on the chalk. Outstanding assemblages of plants and invertebrates are present as well as a wide variety of birds. The herb-rich open downland is no longer grazed by stock and consequently only small areas remain. A full range of different types of scrub through to ash, yew and beech woodland is present. The woodland includes mature beech and yew on the steep slopes, oak standards and predominantly sweet chestnut coppice with some hornbeam on the more level higher ground; these two types of woodland support contrasting ground floras.
Cobham Woods SSSI	0m within Cobham Wood, The Leisure Plots and part of Ranscombe Farm	242.75	This woodland and old parkland is representative of woods in north Kent, which occur in part on acidic Thanet Sands and in part on chalk soils. One nationally rare plant species occurs in the arable land close to the wood. An outstanding assemblage of plants is present at this site, which is also of importance for its breeding birds.

Site Name	Distance & Direction from Proposed NNR	Area (ha)	Reasons for Designation
Shorne and Ashenbank Woods SSSI	0m within Shorne Woods Country Park and Ashenbank Wood	197.44	This site forms a complex of ancient and plantation woodland and includes a variety of stand-types associated with tertiary gravels, clays and sands. The site supports an important diverse invertebrate fauna, especially its Coleoptera (beetles), Hemiptera (true bugs) and Odonata (dragonflies). Within Shorne Country Park, an old series of clay-workings has been landscaped to provide wildlife habitats, including a network of shallow ponds, which are developing an increasingly interesting flora and fauna.
Great Crabbles Wood SSSI	0m within Great Crabbles Wood	32.98	This site is representative of woods on north-west Kent tertiary sediments; these comprise a succession of strata over upper chalk ranging from Blackheath gravels to Woolwich loams and Thanet sands, which give rise to a range of soil types. Most of the woodland is mixed coppice under oak standards, with sweet chestnut as the dominant species. A number of scarce plants occur.

4.1.2 Non-Statutory Sites and Priority Habitats

Non-statutory sites designated for nature conservation that are located within and immediately adjacent to the proposed NNR sites are shown in **Appendix 5**. No further information on the names of the LWSs nor the reason for their citations was provided. LWSs are of **local importance**.

Priority habitats within and immediately adjacent to the proposed NNR sites, as determined by the desk study, are shown in **Appendix 6**. Priority habitats are of at least **local importance**, with the following being present within the proposed super NNR:

- Lowland dry acid grassland:
 - Shorne Woods Country Park
- Lowland calcareous grassland:
 - The Leisure Plots
 - Silverhand Estate
 - Holborough Woodlands
- Traditional orchards:
 - Jeskyns Community Woodlands
- Lowland beech and yew woodland:
 - Holborough Woodlands
- Lowland mixed deciduous woodland and Ancient Woodland site:
 - Shorne Woods Country Park
 - Great Crabbles Wood
 - Ashenbank Wood
 - South Ashenbank Wood
 - The Leisure Plots
 - Ranscombe Farm
 - Silverhand Estate
 - Holborough Woodlands
- Yew dominated woodland:

- Holborough Woodlands
- Woodpasture and parkland:
 - Camer Park
 - West Park
 - Cobham Hall School
 - the northern-most fields of Silverhand Estate
 - Cobham Wood
 - The Leisure Plots
 - the north-western extent of Ranscombe Farm
- Priority hedgerow
 - Silverhand Estate
- Open mosaic habitats:
 - Holborough Woodlands

4.2 Habitats

Based on a combination of the various desk study data used and the ground truthing surveys, **Table 4.2** shows a list of habitats present within each proposed NNR site. This should not be taken as an exhaustive list, as some habitat types may not have been recorded due to the limited scope for ground truthing assessments.

The habitats chosen for inclusion in **Table 4.2** are based on the typical and key habitat requirements of the six priority mammal species identified:

- Brown hare *Lepus europaeus*
- Harvest mouse *Micromys minutus*
- Hazel dormouse *Muscardinus avellanarius*
- European hedgehog *Erinaceus europaeus*
- Water shrew *Neomys fodiens*
- Water vole *Arvicola amphibius*

A brief summary of these habitat requirements is detailed in the paragraphs below.

Table 4.2: Habitats present or likely present within the proposed NNR sites

NNR Site	Woodland	Scrub	Hedgerow	Scattered tree	Deadwood (standing)	Deadwood (fallen)	Rough grassland	Field margin	Large, flat field	Variety of crops	Road verge	Pond / lake	Ditch	Stream	Public access
Shorne Woods Country Park	Y	Y	Y	Y	Y	Y	Y	Y			Y	Y	Y		Y
Shorne Rough Common	Y	Y			Y	Y	Y				Y				Y
Great Crabbles Wood	Y	Y	Y	Y	Y	Y	Y	Y			Y				Y
Crabbles Bottom	Y	Y	Y	Y	Y	Y	Y	Y			Y				Y

Jeskyns Community Woodland	Y	Y	Y	Y			Y	Y	Y		Y	Y			Y
Ashenbank Wood	Y	Y			Y	Y					Y	Y			Y
South Ashenbank Wood	Y	Y			Y	Y									
West Park			Y	Y			Y	Y	Y		Y				
Cobham Hall School	Y	Y	Y	Y	Y	Y	Y	Y	Y		Y	Y			
Cobham Wood	Y	Y	Y	Y	Y	Y	Y	Y							Y
The Leisure Plots	Y	Y	Y	Y	Y	Y	Y	Y							Y
Ranscombe Farm	Y	Y	Y	Y	Y	Y	Y	Y							Y
Camer Park	Y	Y	Y	Y		Y	Y	Y			Y				Y
Silverhand Estate	Y	Y		Y	Y	Y	Y	Y			Y				
Holborough Woodlands	Y	Y		Y	Y	Y	Y								Y

4.2.1 Brown hare habitat requirements

Brown hares live predominantly on farmland and prefer open spaces, as this is better for sighting issues. They normally rest in a “form”, which is typically a small, scraped depression in the soil, often with overhanging foliage. Brown hares can be found sometimes in wooded areas with tracts of arable land nearby, but steeper hillsides are not a favourite habitat.

The diet of brown hares is varied between wheat, corn, rape, pea and bean foliage, wild herbs, set-aside land vegetation and autumn scavenging of fallen crop seeds. They will strip bark off of young trees and bushes and will also eat twigs and buds.

Brown hares rely on regenerative farming practices with non-herbicide crop choices and enjoy a variety of planted crops, rather than a monoculture.

4.2.2 Harvest mouse habitat requirements

Young woodlands, field edges, scrubby areas, road verges, wet grassland, reed beds, and emergent and riparian vegetation of ditches, streams, lake margins and marshes are favoured habitats of harvest mice, but they are also found in rough, tussocky and improved or semi-improved grassland. In winter, hedgerows are also useful for providing shelter at ground level. Changes in habitat management and agricultural methods are thought to be the main cause for the loss of harvest mouse populations.

Harvest mice eat a mixture of seeds, berries and insects, although moss, roots and fungi may also be taken. Harvest mice sometimes take grain from cereal heads, leaving characteristic sickle-shaped remains. Noticeable damage to cereal crops is extremely rare. At least 27 different varieties of vegetation are known to be eaten by harvest mice (Coomber *et al.*, 2023).

The harvest mouse is seasonally omnivorous, adapting its diet according to the availability of high-energy food; in the spring many shoots are consumed, invertebrates are taken in the summer, and fruits and small seeds in autumn and winter (Harris, 1979b, Dickman, 1986, Okutsu *et al.*, 2012, Yamao *et al.*, 2016).

4.2.3 Hazel dormouse habitat requirements

Hazel dormice are most commonly found in biodiverse woodlands and ancient semi-natural woodland, scrub and native hedgerows. Whilst considered sub-optimal habitat, dormice have also been found in pine woodlands and sometimes garden and coastal scrub habitats. Various aged coppice wood and tracts within wooded areas are of particular importance, with hedgerows and reed beds often being useful corridors. If a suitable woodland is isolated, hazel dormice typically need this to be of at least 20 hectares in size for the population to be sustainable.

Connectivity between optimal habitats is a key feature for successful dormouse conservation; whilst dormice will come to ground and cross open habitats, this puts them at greater risk of predation and thus they will generally opt to avoid crossing open habitat if possible to do so. As such, gaps in hedgerows and other woody vegetation can prevent or reduce movement of dormice through the landscape and thus affect future genetic diversity and long-term population viability.

Where natural connectivity has been severed, previous research has shown that dormice will use green bridges, with dormice even being found to breed on the A21 Scotney Castle Green Bridge six years after completion of its construction (PTES, 2012). They have also been found to use Animex arboreal type bridges (White & Hughes, 2019) or rough cabling runs over footpaths and busy roads, where there is no canopy overlap.

Dormice utilise a variety of food sources across their active season. Hazel, hawthorn, willow, honeysuckle and bramble provide good examples of both nectar and fruit sources, with oak and sycamore being useful as insect suppliers. Even gorse and willowherb are good edible sources of food. Dormice will feed on pollen and nectar from flowers in spring, insects in summer and fruits and nuts in autumn. Occasionally they may be seen on garden bird nut feeders.

4.2.4 Hedgehog habitat requirements

Hedgehogs are found in most types of countryside, including wetlands, but they do not like heavy rainfall areas. Optimally, they prefer hedgerows and grassy and scrubby areas and, increasingly, urban fringes and gardens. Small tussocky grassed areas are suitable, as are mowed recreational type grassland and interconnecting wooded copses.

For shelter, log piles, decaying wood, sheds, thick bramble and nettle areas are ideal, as are abandoned leaf piles and compost heap mounds. The main hedgehog sources of natural food are earthworms, insects, caterpillars, some small slugs and snails and carrion.

4.2.5 Water shrew habitat requirements

Habitats such as unpolluted clear streams, small rivers, ponds, lakes, ditches, reedbeds and marshes provide the typical nesting and food resources for water shrews. Additionally, they can be found in rough grassland, scrub, hedgerows, gardens and wooded areas; the latter often when young are dispersing.

Water shrews will travel up to 3km for food. Their main food sources are aquatic invertebrates, together with terrestrial invertebrates such as earthworms, snails, beetles and millipedes.

4.2.6 Water vole habitat requirements

Water voles are normally found in low-lying farmland, where they are close to narrow, slow-moving watercourses, ditches (sometimes brackish) or lakes, but can be found in reed beds close to clear, fresh water and even saline lagoons. Water voles create an underground network of burrows.

Water voles prefer lush riparian vegetation, especially for cover, and as an important food-source. Submerged, emergent and bankside vegetation including grasses, sedges, reeds, tree roots and berries form the water vole diet, with some 227 different food plants having been identified (Strachan and Jefferies, 1993). Occasionally, animal material is also eaten by water voles.

4.3 Mammal Records

4.3.1 Protected / Priority Mammals

For maps showing the locations and date ranges for all mammals recorded, please see **Appendix 4**. **Table 4.3** below shows which of the six priority mammals have been recorded within the proposed NNR sites. This may also include records from nearby off-site areas where the grid references provided have not been precise.

Table 4.3: Confirmed presence in the last 10 years (2014-2024) and historic records (pre-2014) of the six priority mammals within each of the proposed NNR sites

	Brown hare		Harvest mouse		Hazel dormouse		Hedgehog		Water shrew		Water vole	
NNR Site	2014-24	Pre-2014	2014-24	Pre-2014	2014-24	Pre-2014	2014-24	Pre-2014	2014-24	Pre-2014	2014-24	Pre-2014
Shorne Woods Country Park		Y			Y	Y						
Shorne Rough Common					Y							
Great Crabbles Wood					Record adjacent S							
Crabbles Bottom					Y		Y					
Jeskyns Community Woodland			Y		Y							
Ashenbank Wood					Records adjacent NW	Records adjacent NW						
South Ashenbank Wood												
West Park												
Cobham Hall School						Record adjacent N	Y					
Cobham Wood										Y		
The Leisure Plots						Y						
Ranscombe Farm			Y		Y	Y		Y				

Camer Park		Y										
Silverhand Estate						Records adjacent SW	Y					
Holborough Woodlands		Y		Y		Y		Y				

4.3.1.1 Brown hare

The only record of brown hare since 1999 is a single record north-west of Jeskyns Community Woodland in 2004. Whilst the proposed NNR sites are not all optimal for brown hare, it is expected that their presence is likely in other parts of the NNR (based on habitats present) and thus the lack of records is likely to reflect a lack of survey and recording effort.

4.3.1.2 Harvest mouse

Other than records from Ranscombe Farm, the only other harvest mouse records from the last ten years are from a recent single sighting by the ranger at Jeskyns Community Woodland and another single sighting just north-west of Jeskyns Community Woodland in an arable field margin, spotted by Claire Munn during a systematic search for the species of that arable field margin. Additionally, a recent record was mentioned to us after the completion of the mapping for land adjacent to Camer Park. Suitable habitat for harvest mice exists across the proposed NNR and therefore a lack of survey and recording effort is expected to be the main reason for the low number of records. However, the lack of wet ditches and streams does reduce the potential for the species to be present in good numbers in many of the proposed NNR sites.

4.3.1.3 Hazel dormouse

All of the recent dormouse records are from National Dormouse Monitoring Programme (NDMP) sites. These have been subject to regular surveying of nest boxes by licensed monitors over a period of years. Ranscombe Farm and Jeskyns Community Woodland are both known to support good numbers of dormice, with high numbers of individuals, including litters, regularly encountered. Ian Gray is the monitor for Ranscombe Farm and Claire Munn previously monitored and extended the areas of monitoring at Jeskyns Community Woodland. The current dormouse monitor at Jeskyns, Victoria Harrison, was contacted and kindly confirmed that the dormouse numbers are still high in the monitoring areas of ideal habitat within Jeskyns Community Woodland.

The records from Jeskyns Community Woodland provide a helpful insight into the potential for habitat creation in the wider NNR to potentially benefit dormice; the site was originally farmland, which, following purchase by the Forestry Commission, was transformed into a mosaic of woodland, parkland, grassland (some grazed), ponds, orchards and hedgerow habitats. The site was initially planted between 2005 and 2007 with a focus on mixed broadleaved woodland, areas of hazel and orchards.

At some point prior to 2017, nest tubes were installed in hedgerows in the east of the site, which connected a new (roughly 10- 12-year-old at that point) hazel copse to Ashenbank Woods. Dormice were confirmed as present and 15 nest boxes were set up in the hazel copse. Unfortunately, the licensed member of staff who set these up, left the area and the boxes were not then monitored until Claire Munn took on the monitoring of the site in 2017, when dormice were confirmed to be breeding

in the hazel copse. It was noted that the hazel nut abundance was optimal at this 10-12 year age range but that there was a lack of diversity of food sources and winter sheltering opportunities; as such, native honeysuckle was planted and bramble scrub allowed to develop along the woodland margins, with brash piles also to be installed following works in other areas of the site, thus using local arisings.

In the winter of 2017-2018, a further 20 dormouse nest boxes were installed, 10 each in different woodland types in the centre (predominantly walnut) and west (mixed native deciduous woodland and scrub) of the site. By this point, these woodland areas were all suitably connected by hedgerows and the aim was to ascertain if hazel dormice had expanded their range into these newly created woodland areas. Dormice have since been recorded in all three woodland zones, with steady and good numbers in the original hazel plantation in the east of the site, including more dormice now recorded in the later part of the season (possibly in part due to the improved habitat management). Numbers have been steadily increasing in the central walnut block, although numbers are still significantly lower in the western block of woodland near the car park.

Jeskyns Community Woodland is therefore a fine example of how, with suitable planting, landscape connectivity to existing dormouse populations (assumed to be in the ancient Ashenbank Wood), and land management, dormice can colonise further areas within just 10-12 years.

4.3.1.4 Hedgehog

Recent records for hedgehog were returned for Crabbles Bottom, the north-eastern extent of Silverhand Estate and the south-eastern edge of Ranscombe Farm. Hedgehog droppings were also noted in a mown field during the ground truthing survey of Cobham Hall School. Several historic records with 1km level accuracy were returned from the wider landscape in all directions around the proposed NNR, thus suggesting the potential for hedgehogs to be more widely distributed across suitable habitat within the proposed NNR sites.

4.3.1.5 Water shrew & water vole

The paucity of water shrew and water vole records within the proposed NNR is likely a reflection of the lack of suitable habitats across the majority of the sites, particularly for water vole. Assessing these mammals is complicated by the fact that their density on the ground is known to be low, thus complicating accurate interpretation of survey results.

4.3.2 All Mammals

For maps showing the locations and date ranges for all mammals recorded, please see **Appendix 4**. **Table 4.4** below shows which mammals, other than the six identified initially as priorities, have been recorded within the proposed NNR sites.

Table 4.4: Confirmed presence (1981-2024) of all other mammals within each of the proposed NNR sites

NNR Site	Badger	Bank vole	Brown rat	Common shrew	Fallow deer	Field vole	Fox	Grey squirrel	House mouse	Mole	Polecat-ferret	Pygmy shrew	Rabbit	Roe deer	Stoat	Weasel	Wood mouse	Yellow necked mouse
Shorne Woods Country Park	Y	Y	Y	Y		Y	Y	Y		Y		Y	Y				Y	Y

Shorne Rough Common													Y					
Great Crabbles Wood	Y			Y			Y	Y					Y					
Crabbles Bottom	Y						Y	Y					Y					
Jeskyns Community Woodland	Y			Y			Y	Y		Y			Y				Y	
Ashenbank Wood	Y		Y				Y	Y		Y			Y			Y	Y	
South Ashenbank Wood	Y							Y					Y					
West Park			Y					Y								Y		
Cobham Hall School	Y				Y			Y		Y			Y					Y
Cobham Wood	Y				Y		Y	Y		Y			Y		Y	Y	Y	
The Leisure Plots	Y	Y			Y		Y	Y					Y	Y			Y	Y
Ranscombe Farm	Y	Y		Y	Y	Y	Y	Y		Y		Y	Y	Y		Y	Y	Y
Camer Park																	Y	
Silverhand Estate	Y	Y	Y				Y	Y					Y			Y	Y	Y
Holborough Woodlands		Y	Y	Y			Y	Y		Y			Y		Y	Y	Y	Y

4.3.3 Potential Negative Mammal Impacts

Badgers have been recorded extensively across the proposed NNR with a far greater number of records returned than that of hedgehog. However, the low number of hedgehog records is most likely due to under-recording of that species. Both are native mammals that have co-existed for a great many years. When the badgers' main food source, earthworms (which also forms a good part of the hedgehog diet), is in low supply, badgers will turn to other food sources, which can include hedgehogs. Based on the vast extent of suitable habitat already present and the scope to improve this further for hedgehogs, no significant conflicts are expected across the proposed NNR between these two species. Nonetheless, further surveys for hedgehogs in areas known to already support badgers would be helpful to paint a more accurate picture of how well the two species are co-existing across the proposed NNR. It may be that high numbers of badgers without natural predators have reduced the food availability in the area for hedgehogs.

During the ground truthing surveys, the presence of grey squirrels and deer was evident across several of the sites, which matches the picture painted by the biological records. That said, whilst deer damage was noted in the Leisure Plots and Ranscombe Farm, this did not appear extensive. No significant issues with deer damage were apparent at Cobham Hall School despite good numbers of fallow deer being present; upon discussion with staff at Cobham Hall School, it was clear that a deer management plan is already in place to cull deer within that site before numbers become problematic, with infrequent action required. Establishing whether or not existing deer and grey squirrel management plans exist from across the proposed NNR sites would be a helpful addition to the existing knowledge base when considering conservation priorities.

5 Evaluation

The following four questions are answered in turn in this section, utilising the results collected from the desk study and ground truthing surveys.

1. What are the most important species in the study area?
2. Which are the key areas for mammals?
3. Where is more survey work required?
4. What are the main habitat management / creation options?

5.1 Most important species

The most important mammal species (excluding bats) that we have identified within the proposed NNR are:

- Brown hare
- Harvest mouse
- Hazel dormouse
- Hedgehog

These species have been selected due to confirmed presence within at least some parts of the proposed NNR (**Section 4**), the fact that they are all subject to declines and/or vulnerability in their populations, all are Priority Species (S.41, NERC Act, 2006) (see **Appendix 1** for details), and opportunities exist to reduce existing threats/pressures and enhance the proposed NNR at a landscape-scale for these species.

5.1.1 Current threats / pressures

In deciding on the most important mammal species to focus on for the proposed NNR, identifying existing threats, and thus establishing priorities for mammal conservation that could realistically address some of these threats within the proposed NNR, is important. Whilst the potential for mammal conflicts between species have been considered in **Section 4.3.3**, by far the biggest threat to mammals within the proposed NNR is man, with some of the main existing threats identified as follows:

- Use of herbicides and pesticides for crops
- Large fields of monocrops
- Changes in habitat management (tree felling etc.) and removal of woodlands
- Climate change
- Drainage of field systems
- Loss of connectivity and hedgerows, with these often being replaced with fencing
- Streams and water pollution
- Housing developments on green field sites
- Predation by non-native species
- Road and rail constructions
- Mechanical harvesting of crops
- Persecution
- Smaller fields (for hares)

-
- Over-grazing / over-management of bankside vegetation
 - Recreational impacts, including disturbance, trampling, littering and dog fouling

5.2 Key mammal areas

Based on existing records and habitats present within the proposed NNR sites, the following key areas have been identified for each of the four most important mammal species:

5.2.1 Brown hare

Since only older, unreliable records were returned, the current extent of important areas for brown hares within the proposed NNR is unknown.

5.2.2 Harvest mouse

Ranscombe Farm and Jeskyns Community Woodland are the only sites which have had recent harvest mouse records confirmed. This, combined with the known habitats present at both sites, makes them likely to be of highest current importance to harvest mice within the proposed NNR.

5.2.3 Hazel dormouse

Ranscombe Farm, Jeskyns Community Woodland, Shorne Woods Country Park, Shorne Rough Common (a single record although we are not sure of its validity) and Crabbles Bottom have all been found to support dormice. A total of 648 records were returned for dormice, which is by far the highest number for any mammal species. This is due largely to the long-term and ongoing nest box monitoring at Ranscombe Farm and Jeskyns Community Woodland, plus historic monitoring at Shorne Woods Country Park. This monitoring data is submitted to the People's Trust for Endangered Species (PTES) via their National Dormouse Monitoring Programme (NDMP). The data could therefore be compared from these sites against the PTES national average and trends that they identify and publish in regular reports.

Ranscombe Farm, Shorne Woods Country Park and Jeskyns Community Woodland provide good examples of varied habitat types, managed in different ways and for different lengths of time, with woodland cover at Jeskyns being very young compared to other woodlands within the proposed NNR.

These sites all lie in the northern part of the proposed NNR and thus any existing connecting woody vegetation is likely to also form a key part of the existing dormouse habitat.

5.2.4 Hedgehog

Crabbles Bottom and the Silverhand Estate returned hedgehog records and hedgehog droppings were noted within a mown field at Cobham Hall School during the ground truthing surveys. The only recent record at the Silverhand Estate was in the very north-east corner of the site. However, older records for hedgehog are scattered around the wider general area, suggesting that based on the habitats present, the Silverhand Estate is likely of current importance to hedgehogs. The parkland and difference between field management across the Cobham Hall School site, plus the retention of fallen dead wood and scrubby areas makes the Cobham Hall School site particularly suitable for hedgehogs.

5.3 Further surveys

There was a limit to the amount of area we could cover in the ground-truthing surveys and as such, it would be advantageous to carry out additional ground truthing of the following sites, which we were unable to carry out thorough surveys of:

-
- Silverhand Estate
 - Holborough Woods
 - Crabbles Bottom
 - Great Crabbles Wood
 - The Leisure Plots
 - Cobham Wood (north-west edge to determine connectivity to the other NNR areas)
 - Camer Park (Henley Woods)

In terms of species-specific further surveys, confirming the presence or likely absence of the four focal species would be ideal. Ideas for such further surveys are listed below. For all four species, it is recommended that a baseline presence and, where possible, abundance assessment be carried out prior to implementing any enhancement measures. Ongoing monitoring should then be carried out to determine if, when and how the implemented enhancement measures are impacting the target species. This should then inform an iterative, long-term management plan.

Note that establishing a reliable baseline may take some years, particularly if limited by budgetary and other resource constraints, including the availability of suitably skilled surveyors. Therefore, whilst community and volunteer engagement is encouraged wherever possible, it may be necessary to commission scientifically robust and comparable surveys and reports produced by professional ecologists. This is particularly likely to be the case for the legally protected hazel dormouse.

5.3.1 Brown hare

Further presence / likely absence and then abundance surveys are recommended in areas of potential habitat suitability, in line with the most appropriate methods for the habitats present, as per Langbein *et al.*, (2002). This would most likely involve line transect counts to include agricultural and grassy fields, particularly those that are large and relatively flat.

Cobham Hall School, West Park and Cobham Woods appear likely to offer some of the best potential habitat for brown hares, therefore it is recommended that initial survey efforts target these areas.

5.3.2 Harvest mouse

Further presence / likely absence surveys are recommended in suitable habitats, which exist in most sites across the proposed NNR. However, Crabbles Bottom, West Park, Cobham Hall School and Holborough Woodlands have been identified as particularly suitable or in need of updated records, therefore surveys may be best started in these locations.

Harvest mouse presence / likely absence surveys should be carried out in line with The National Harvest Mouse Survey Protocol (The Mammal Society, 2022). This means that the data could also be fed into a national project to determine wider trends and how data collected in the proposed NNR compare to that being collected across other parts of England.

5.3.3 Hazel dormouse

In addition to a continuation of the long-term monitoring at Ranscombe Farm and Jeskyns Community Woodland, new and up-to-date presence / likely absence data should be sought in other woody vegetation across the rest of the proposed NNR. This could be carried out using a combination of nest tubes, nut searches and footprint tunnels, in line with the methods in The Dormouse Conservation Handbook (Bright *et al.*, 2006) and the latest version of the footprint tunnel survey guidance (PTES, 2022). This guidance is due to be updated very soon, and therefore the latest iteration of the survey

guidelines should be used when commencing surveys. Of critical importance is the need to research the importance of existing connecting corridors between woodland blocks, including hedgerows and scrub. The surveys would also enable us to establish areas of likely absence due to a lack of suitable connectivity or land management, and thus inform specific locations for appropriate habitat enhancements.

5.3.4 Hedgehog

There is a paucity of recent hedgehog records across the whole of the proposed NNR site, which would therefore benefit from an extensive presence / likely absence survey of this species. Suitable methodologies would need to factor in the resources required, particularly in terms of number of surveyors. One potentially suitable method would be to employ footprint tracking tunnels, in line with the PTES and British Hedgehog Society guidance (2019). Ranscombe Farm, Silverhand Estate and Jeskyns Community Woodlands would be particularly suited to hedgehog surveys. It would also be helpful to survey for hedgehog presence / likely absence in close proximity to recently recorded badgers.

5.4 Opportunities

The proposed super NNR will cover a vast area of the landscape and will incorporate a variety of habitats well suited to our four focal mammal species. This presents a rare and exciting opportunity to further improve the proposed NNR sites in terms of their value to mammals at a landscape scale. Whilst very good habitats currently exist in places, habitat connectivity between and within sites could definitely be improved. It is recommended that this be the main focus of enhancements for mammals, mostly in the form of new, mixed, native-species hedgerows and infill planting of existing gaps in connectivity. Hedgerows should be bound, where possible, by wide field margins of tussocky grassland to offer further opportunities for our focal species. Measures to enhance the proposed NNR for these species will also likely lead to improvements for other mammals and indeed other taxa as well.

The precise details of where habitat improvements would be best placed and the exact nature of the measures to implement will need to be informed by further baseline surveys, as outlined in **Section 5.3**. However, some initial observations for potential habitat improvements were made during the ground truthing surveys as follows:

- Improve connectivity by strengthening hedging between Camer Park and the nearby Henley Wood (the latter being where dormice have been recorded). Also do this between Crabbles Bottom and Shorne Woods Country Park.
- Improve woody vegetation and field margin connectivity between the southern end of West Park, eastwards through the northern-most fields under the Silverhand Estate ownership, and then into Cobham Wood.
- Consider options for providing continuous canopy connectivity between Ashenbank Wood and the hedgerow in West Park, across Halfpence Lane.
- Alter the land management of the southern scrub edge within The Leisure Plots to benefit dormice and hedgehogs.
- Manage the southern edge of Cobham Woods to act as a suitable corridor for dormice and hedgehog linkage to the southern scrub of The Leisure Plots.
- Dead hedging of arisings (brashings) will benefit many of the woodlands, particularly towards the field margins.

-
- Provide sloped edges and escape options for hedgehogs in water-bodies.
 - Carry out site maintenance, harvesting, forestry operations etc. at a suitable time of year and in a suitable manner to minimise negative impacts on mammals. Specific guidance exists for active forestry sites where bats and / or dormice have been recorded (see **Appendix 1** for details).
 - Carry out coppicing on a careful coup rotation to maximise the age range of coppice regrowth within and across sites.
 - Where possible, provide min. 3m-wide buffer zones at field edges with suitable vegetation and management to support harvest mice and hedgehogs.
 - The issue of fragmentation of plot ownership in The Leisure Plots is causing issues with overall land management practices. Resolution is likely to benefit mammals and other taxa.

In terms of implementation of the habitat enhancement measures, a collaborative approach between all NNR landowners will likely yield the best results; all site -specific management plans should stem from and feed into an overall NNR Management Plan. This should seek to hold all landowners to the same common objectives and ensure that all taxa requirements and opportunities can be maximised across the site as a whole.

Whilst some survey, monitoring and reporting work will likely need to be carried out by suitably skilled, professional ecologists, many opportunities exist to engage the local community and other volunteers. Where possible, partnerships and volunteer engagement opportunities should be pursued, for example with:

- Kent Mammal Group
- The Mammal Society
- People's Trust for Endangered Species
- Vincent Wildlife Trust
- Hare Preservation Trust
- British Hedgehog Preservation Society
- Natural England Species Recovery Programmes where funding avenues may be available
- Local parish and council conservation groups
- Training course providers for volunteers
- Sponsored business volunteer practical work outings

6 Conclusion

The proposed NNR hosts a fine mix of habitats capable of already supporting a good mammal population formed of numerous species. Indeed, the biological records, mapping data and ground truthing surveys have highlighted the existing suitability of the site for four key and priority mammal species: brown hare, harvest mouse, hazel dormouse and hedgehog. Much of the woodland within the proposed NNR is already of at least county-level importance to dormice.

Further, through implementation of appropriate enhancement measures informed by robust baseline surveys, the proposed NNR presents an excellent opportunity to think bigger, better and more joined up in terms of mammal and wildlife conservation in general. The key to successful improvements to existing mammal populations is highly likely to be the enhancement and creation of key connecting habitats, predominantly in the form of hedgerows and suitable field margins.

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Appendix 1 Legislation

Legislation

Conservation of Habitat and Species (Amendment) (EU Exit) Regulations (CHSR) 2019

The *CHSR 2019* transpose Council Directive 92/43/EEC on the Conservation of Natural Habitats and Wild Flora and Fauna (Habitats Directive) into English law, making it an offence to deliberately capture, kill or disturb wild animals listed under Schedule 2 of the Regulations. It is also an offence to damage or destroy a breeding site or resting place of such an animal (even if the animal is not present at the time). Of the four most important species identified in this mammal review, this protection is afforded only to the hazel dormouse.

The purpose of the 2019 amendments applied to the legislation were to ensure the continued functionality of the Regulations once the UK has left the European Union, with no policy changes included.

Wildlife & Countryside Act (WCA) 1981

The *WCA 1981*, as amended by the *Countryside and Rights of Way Act (CROW) 2000* and the *Natural Environment and Rural Communities Act (NERC) 2006*, consolidates and amends existing national legislation to implement the Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention), making it an offence to:

- Intentionally kill, injure or take any wild animal listed under Schedule 5 to the Act; intentionally or recklessly damage, destroy or obstruct any place used for shelter or protection by any wild animal listed under Schedule 5 to the Act; intentionally or recklessly disturb certain Schedule 5 animal species while they occupy a place used for shelter or protection;

Of the four most important species identified in this mammal review, this full protection under Schedule 5 of the Act is afforded only to the hazel dormouse.

Natural Environment & Rural Communities (NERC) Act 2006

The *NERC Act 2006* amends the *CROW Act*, by further extending the requirement to have regard for biodiversity to all public authorities, which includes local authorities and local planning authorities and requires that the Secretary of State consults Natural England (NE) in the publication of the list of living organisms and habitat types deemed to be of principal importance in conserving biodiversity. Species and Habitats of Principal Importance are listed under Section 41 of the NERC Act; listed habitats and species are those deemed to be of the greatest importance for biodiversity conservation in England and are to be a material consideration in all planning application decisions.

All four important species identified in this mammal review (brown hare, harvest mouse, hazel dormouse and hedgehog), are listed under Section 41 of the NERC Act (2006).

Relevant Protected Species Legislation

Species	Relevant Legislation	Level of Protection
Badger	<i>Protection of Badgers Act, 1992.</i> Protection under <i>Schedule 6 and 6ZA of the Wildlife and Countryside Act, 1981 (as amended).</i>	It is an offence to: <ul style="list-style-type: none"> wilfully kill, injure, take, possess, or cruelly ill-treat a badger, or to attempt to do so. intentionally or recklessly interfere with a sett. Kill or take a badger by trapping or snaring.
Hazel Dormouse	European protected species under the <i>Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019.</i> Full protection under <i>Schedule 5 and Schedule 6 of the Wildlife and Countryside Act, 1981 (as amended).</i>	It is an offence to: <ul style="list-style-type: none"> deliberately capture, injure or kill hazel dormice. damage or destroy a dormouse resting place or breeding site. deliberately or recklessly disturb a hazel dormouse while it's in a structure or place of shelter or protection. block access to structures or places of shelter or protection. possess, sell, control or transport live or dead hazel dormice, or parts of hazel dormice.
Water Vole	Full protection under <i>Schedule 5 of the Wildlife and Countryside Act, 1981 (as amended).</i> <i>The Wild Mammals (Protection) Act 1996.</i>	It is an offence to: <ul style="list-style-type: none"> take, kill, or injure water voles. damage or destroy a breeding or resting place. disturb water voles in a place used for shelter or protection. obstruct access to their resting or sheltering places.
Hedgehog	Protection under <i>Schedule 6 of the Wildlife and Countryside Act, 1981 (as amended).</i>	It is an offence to: <ul style="list-style-type: none"> kill or capture wild hedgehogs, with certain methods listed.
Shrews (incl. water shrew)	Protection under <i>Schedule 6 of the Wildlife and Countryside Act, 1981 (as amended).</i>	It is an offence to: <ul style="list-style-type: none"> kill or capture wild shrews, with certain methods listed.
Brown hare	Protection under <i>Schedule 6A of the Wildlife and Countryside Act, 1981 (as amended).</i>	It is an offence to: <ul style="list-style-type: none"> poach hares.
Wild Mammals	<i>The Wild Mammals (Protection) Act 1996.</i>	This makes it an offence to: <ul style="list-style-type: none"> crush or asphyxiate any wild mammal with intent to inflict unnecessary suffering. <p>This may apply during works involving the use of heavy machinery, particularly where burrowing animals such as foxes and rabbits are present, since such animals could be crushed or asphyxiated in their burrows if the weight above ground causes burrows to collapse.</p>

In order to enable the above legislation to be complied with in actively managed woodlands, the Forestry Commission and Natural England have together compiled and published documents specifically relating to best practice for woodlands where bats and dormice are present. These documents also provide advice as to what type of management activities are covered by this guidance and when further measures may be required to ensure legislative compliance of woodland activities. It is strongly advised that as any part of ongoing management of the sites where bats and/or dormice may be or are confirmed as present, that these management practices are adhered to. They should also form a fundamental part of any future management in relation to the proposed NNR designation.

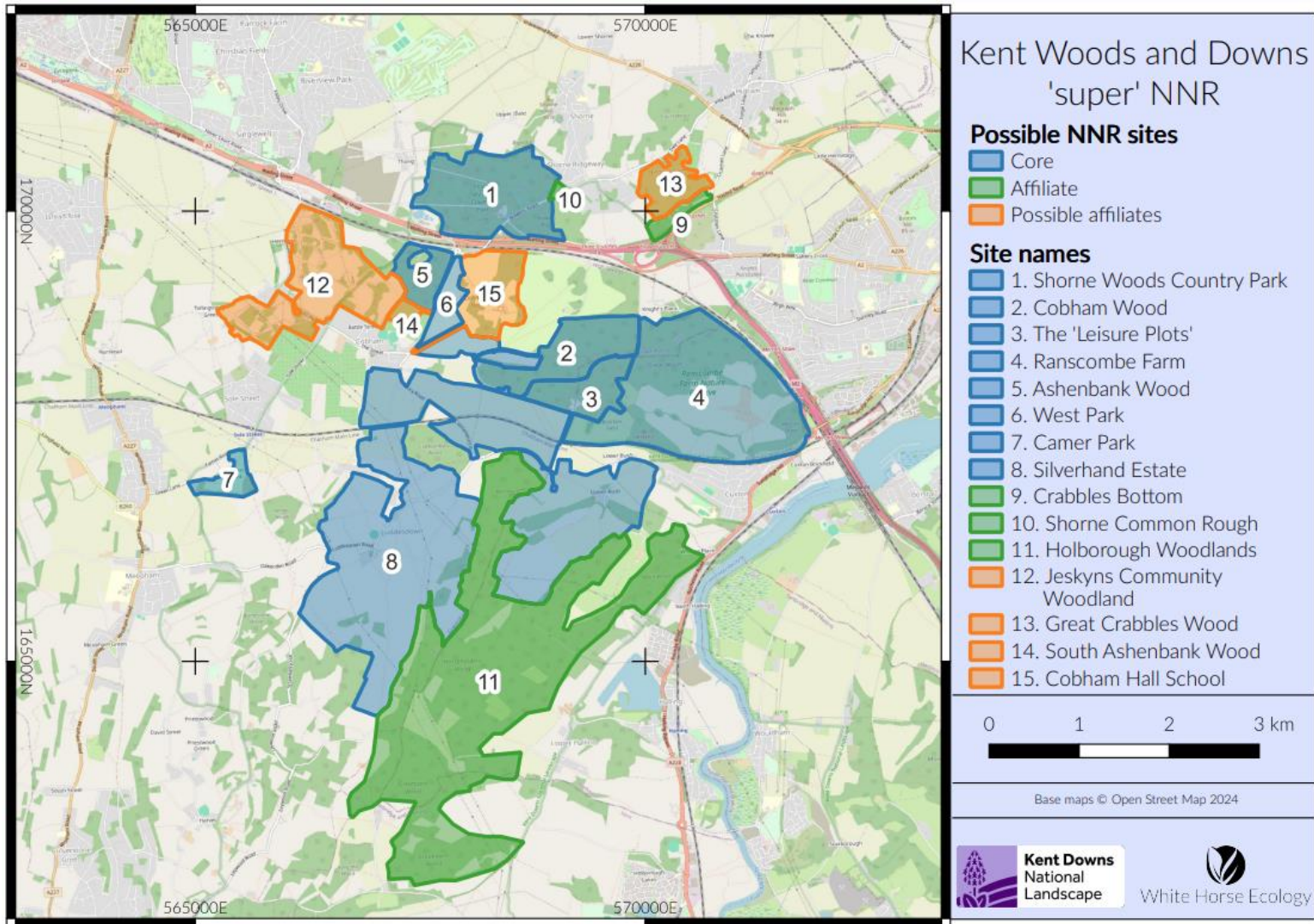
- Guidance on managing woodlands with bats in England, Version 3 (October 2013), can be accessed here:

<https://assets.publishing.service.gov.uk/media/5ac62d27ed915d76a04b2c2c/England-protected-species-bats.pdf>

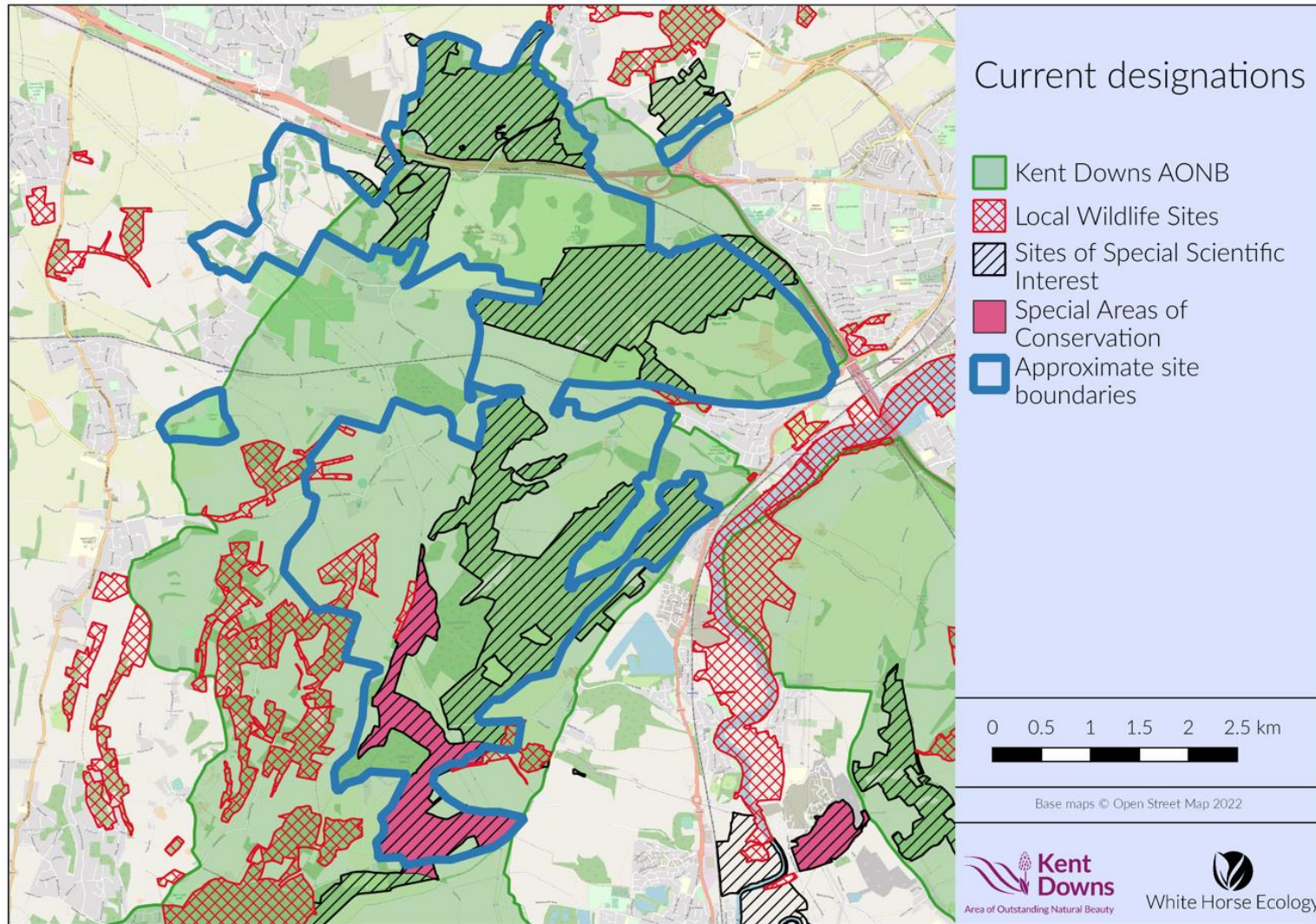
- A protocol for undertaking woodland management in England where dormice are present, Version 4 (May 2019), can be accessed here:

https://assets.publishing.service.gov.uk/media/5cf8ed17e5274a5f183f819c/PROTOCOL_Dormouse_May_2019_v4.0_FINAL.pdf

Appendix 2 Proposed Kent Wood and Downs Super NNR Sites



Appendix 3 Designated Sites within the Proposed NNR



Appendix 4 Mammal Records Maps

The name of the proposed NNR was changed following completion of these maps; the Project Name in the maps is synonymous with the "North Kent Woods and Downs Candidate NNR".

Figure A4.1: Records for brown hare *Lepus europaeus* with grid reference accuracy buffers laid over proposed NNR sites

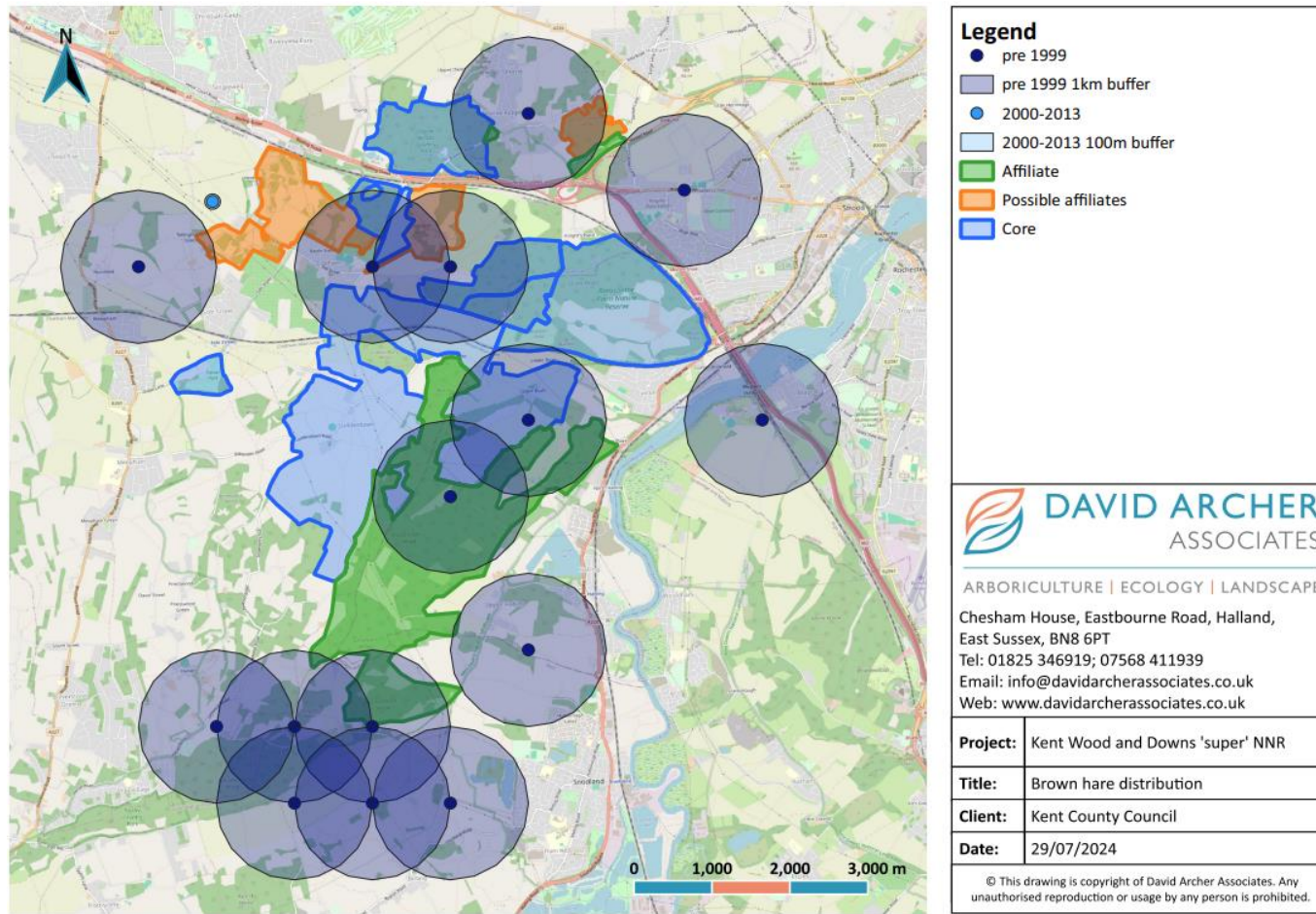


Figure A4.2: Records for harvest mouse *Micromys minutus* with grid reference accuracy buffers laid over proposed NNR sites

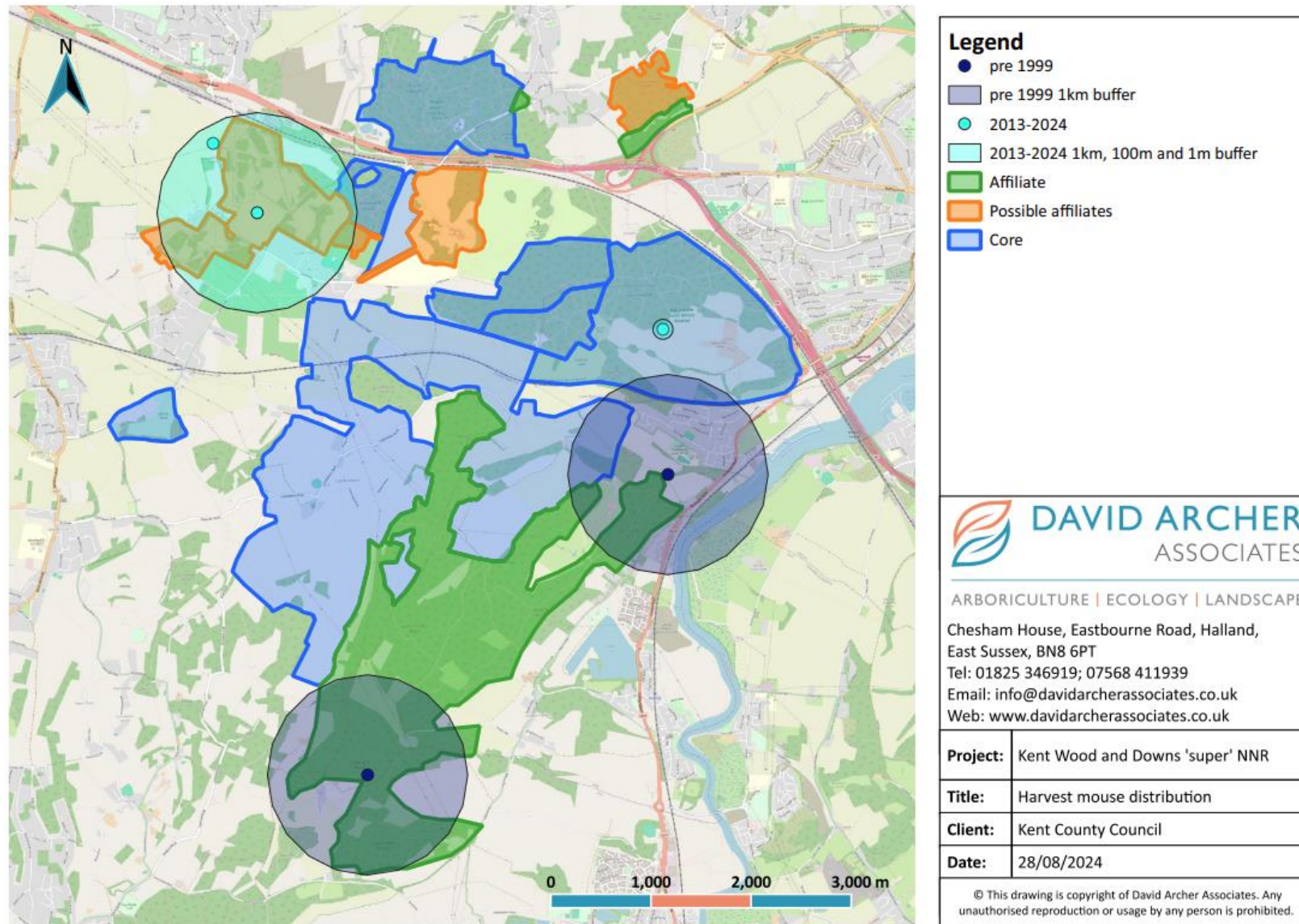


Figure A4.3: Records for hazel dormouse *Muscardinus avellanarius* with grid reference accuracy buffers laid over proposed NNR sites

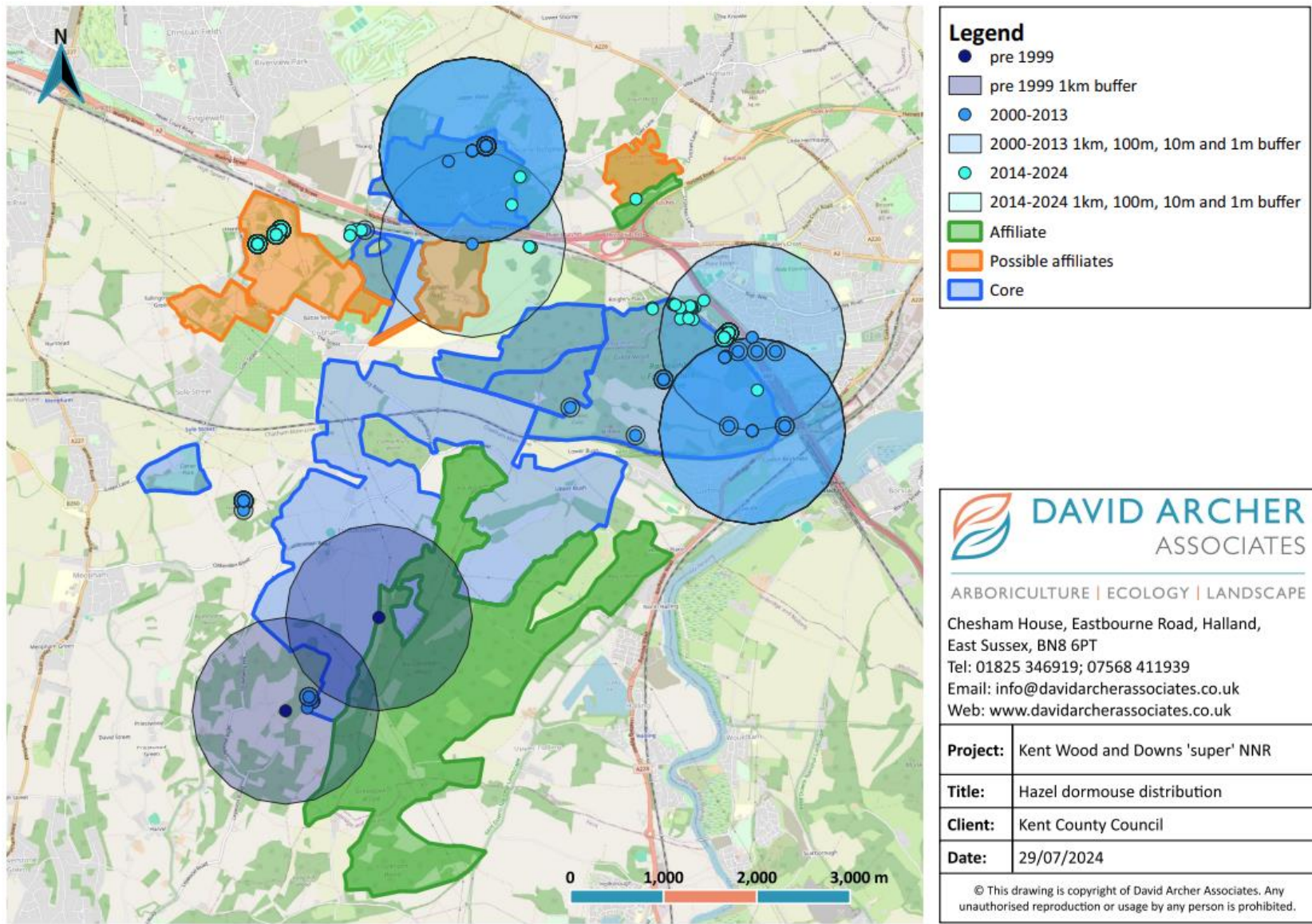


Figure A4.4: Records for hedgehog *Erinaceus europaeus* with grid reference accuracy buffers laid over proposed NNR sites

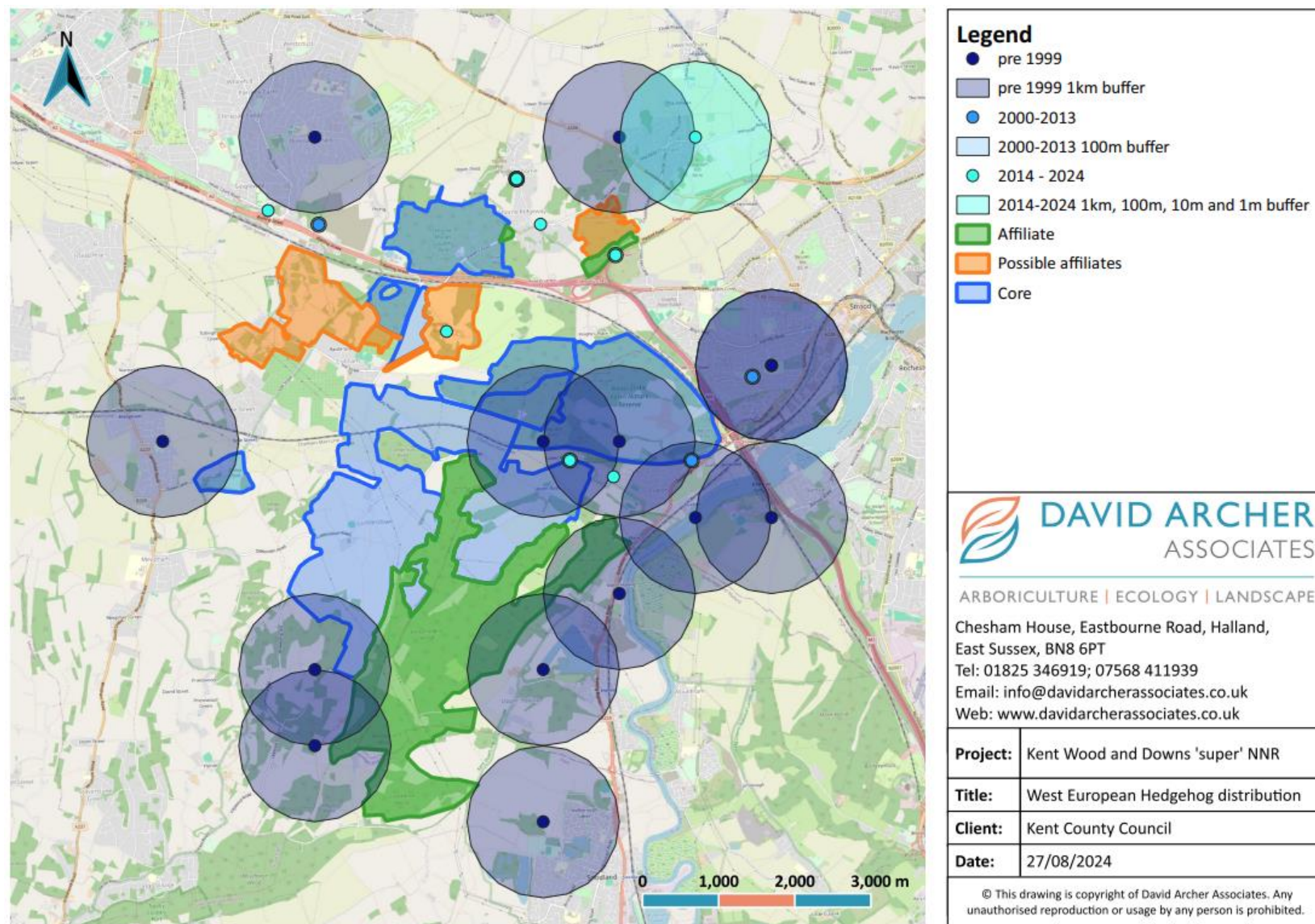


Figure A4.5: Records for water shrew *Neomys fodiens* with grid reference accuracy buffers laid over proposed NNR sites

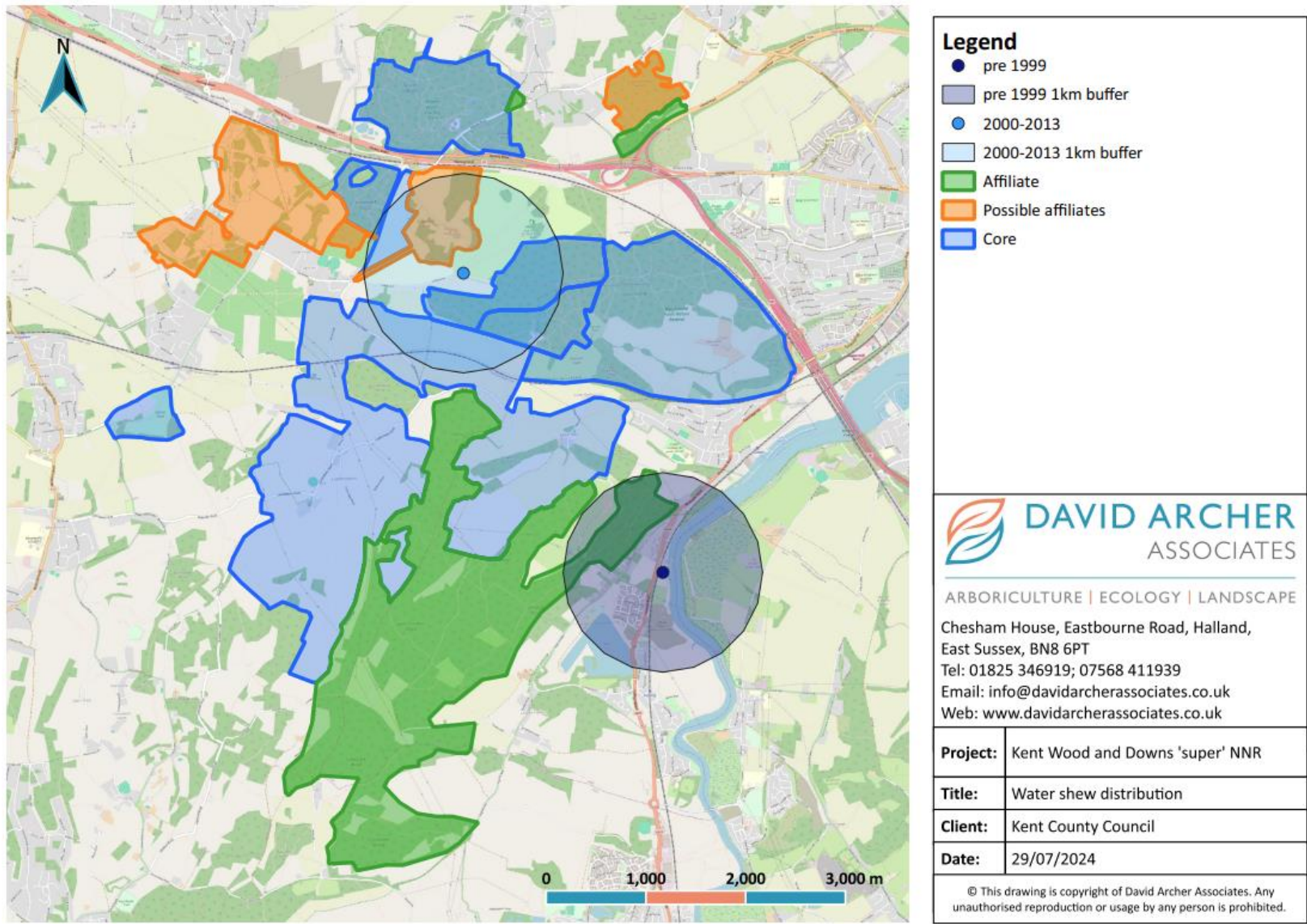


Figure A4.6: Records for water vole *Arvicola amphibius* with grid reference accuracy buffers laid over proposed NNR sites

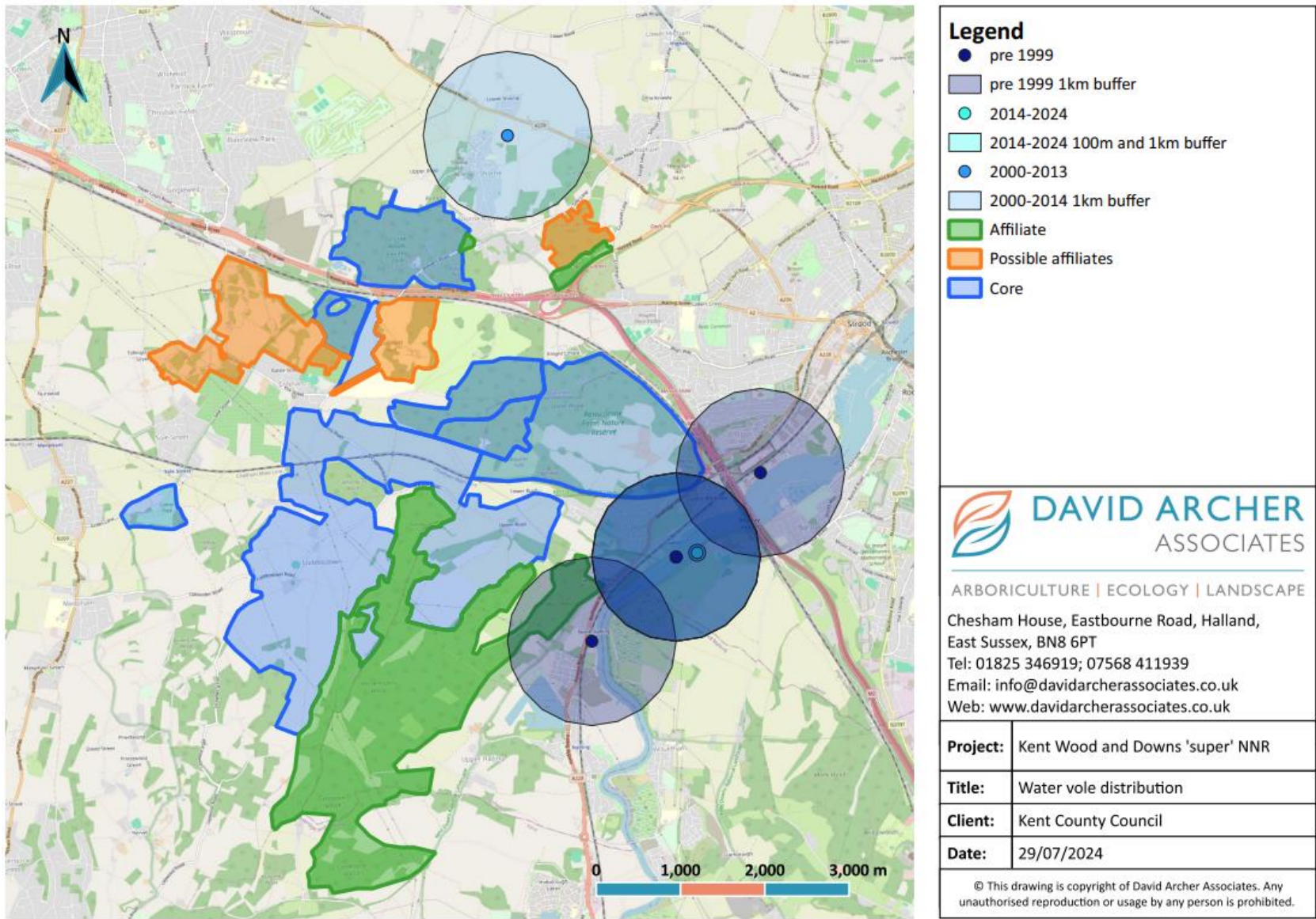


Figure A4.7: Records for badger *Meles meles* with grid reference accuracy buffers laid over proposed NNR sites

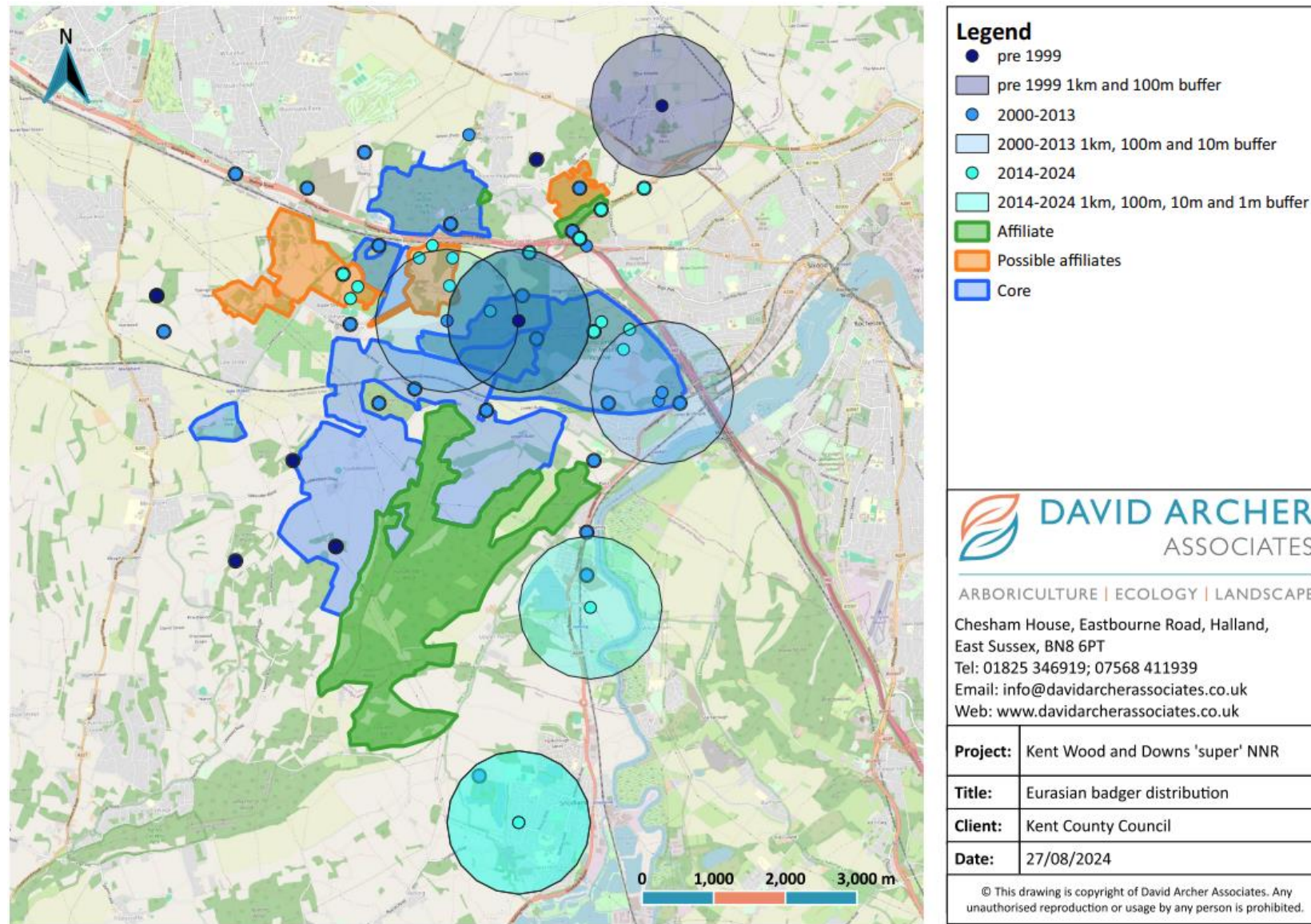


Figure A4.8: Records for bank vole *Myodes glareolus* with grid reference accuracy buffers laid over proposed NNR sites

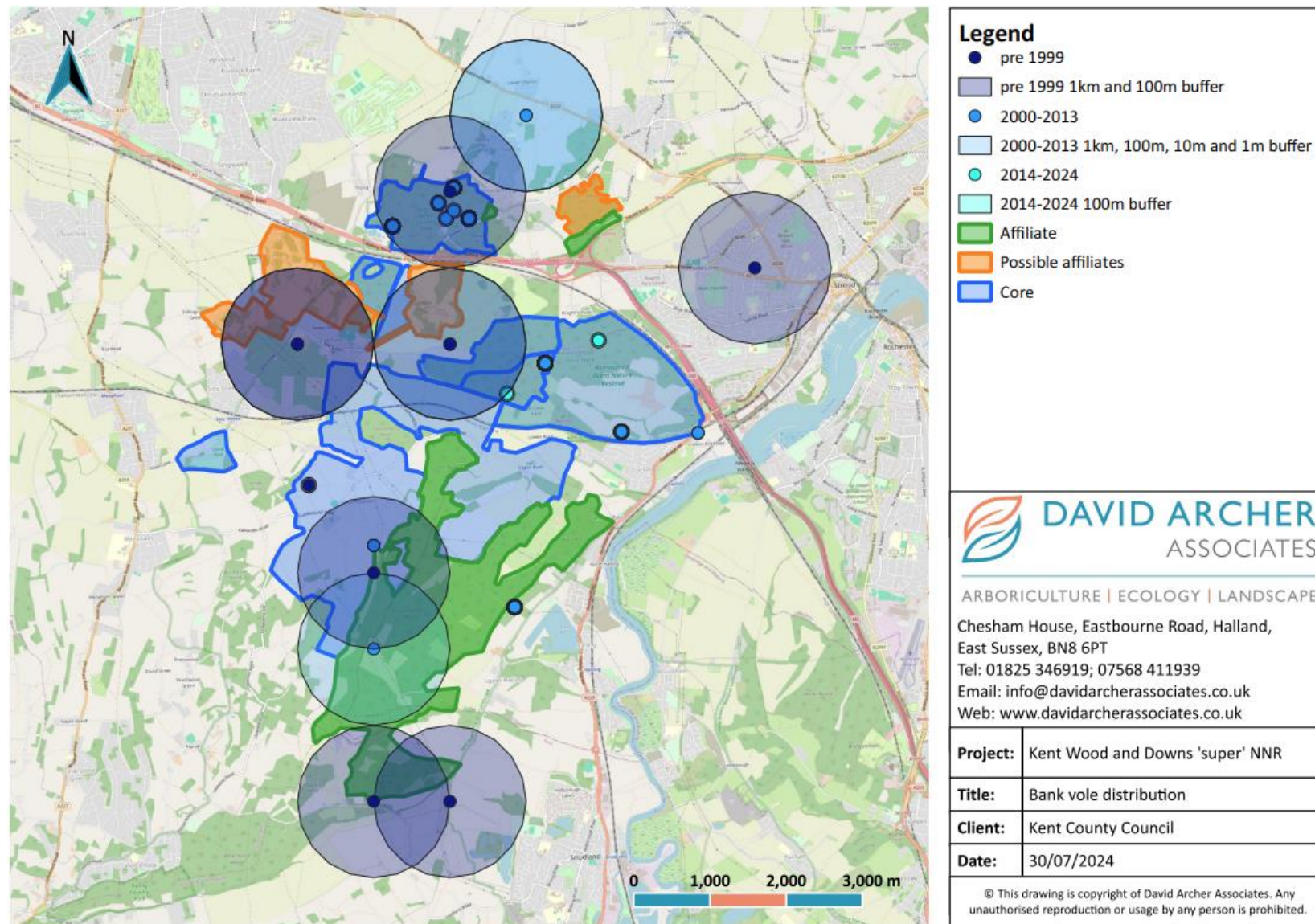


Figure A4.9: Records for brown rat *Rattus norvegicus* with grid reference accuracy buffers laid over proposed NNR sites

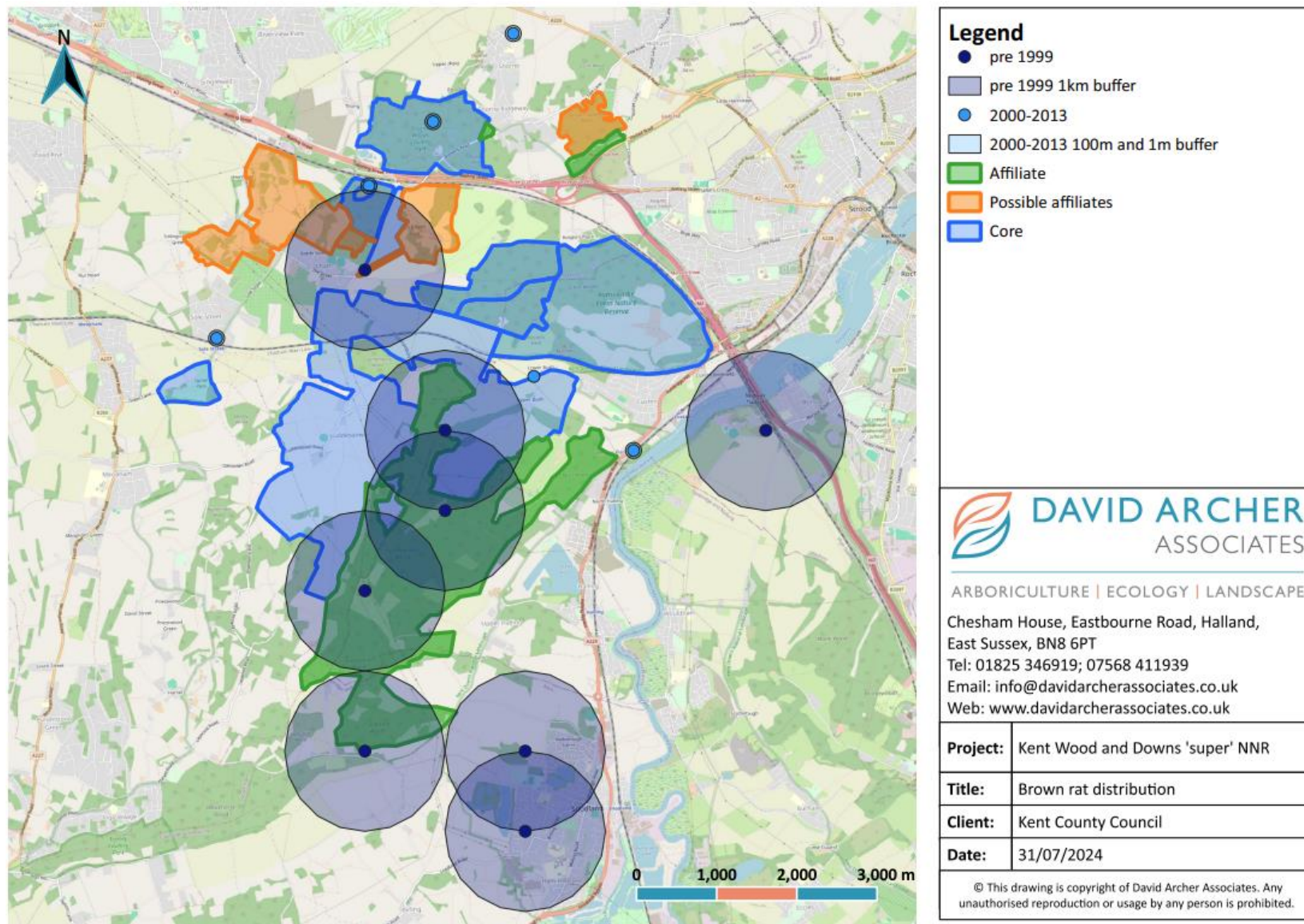


Figure A4.10: Records for common shrew *Sorex araneus* with grid reference accuracy buffers laid over proposed NNR sites

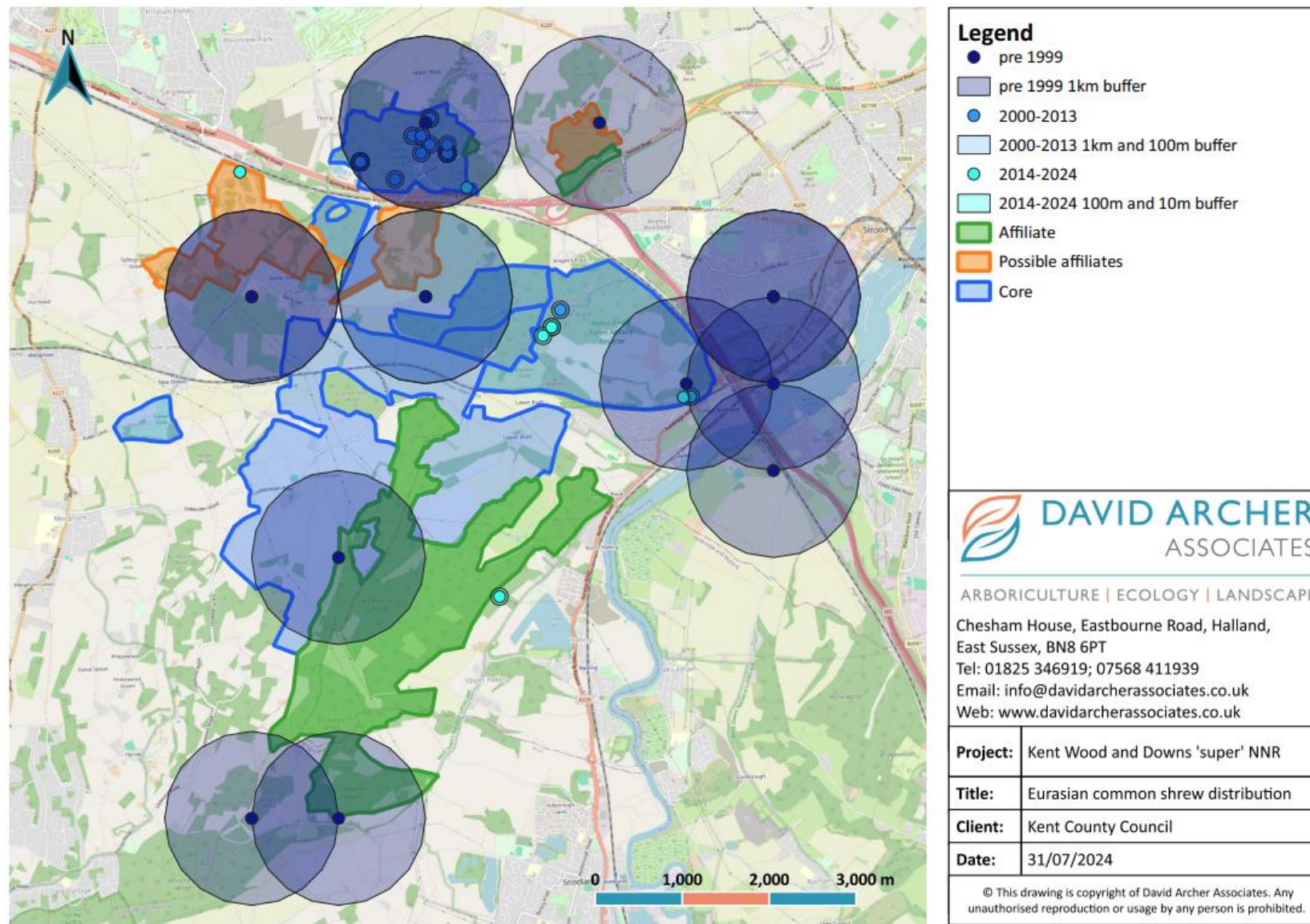


Figure A4.11: Records for fallow deer *Dama dama* with grid reference accuracy buffers laid over proposed NNR sites

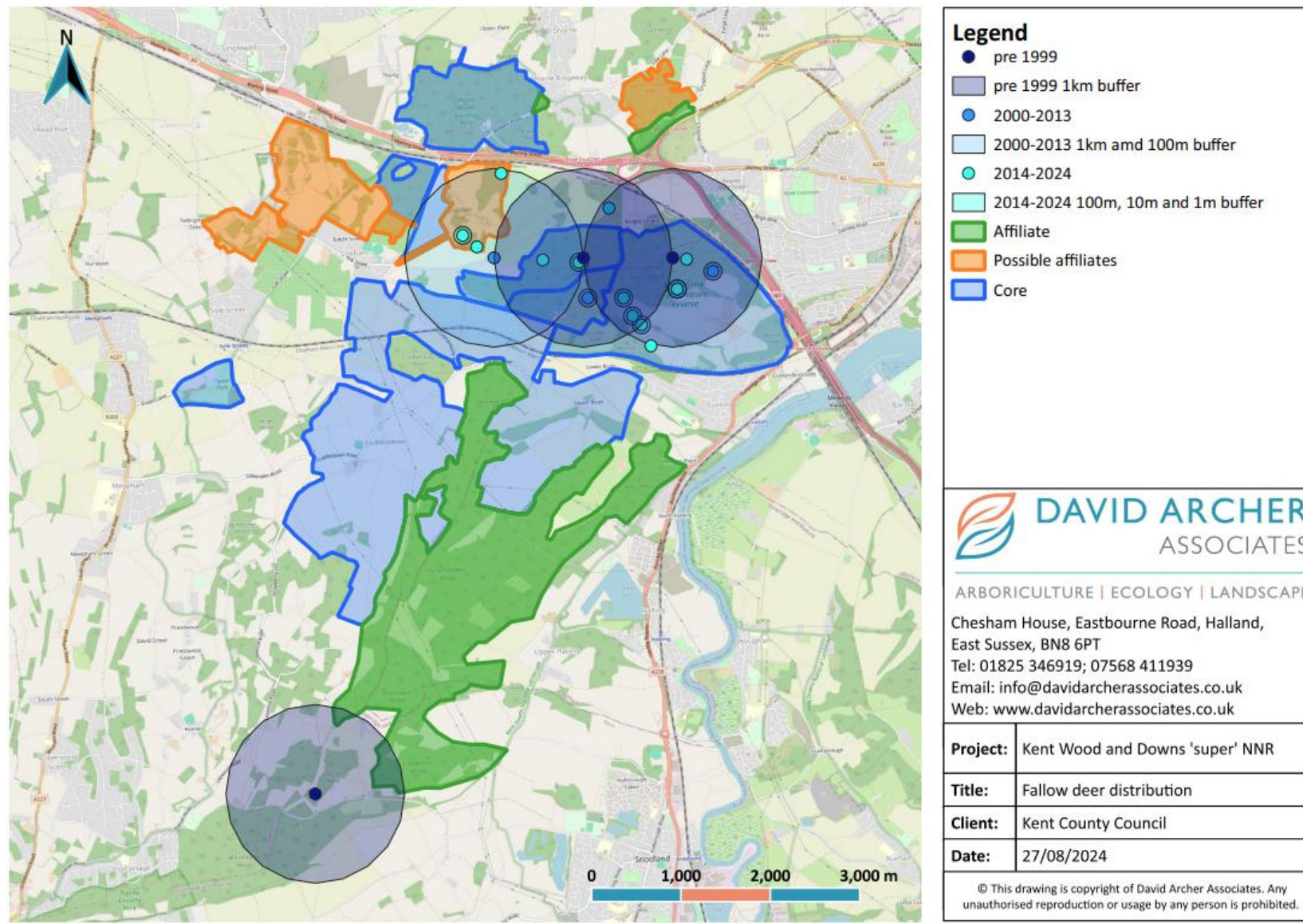


Figure A4.12: Records for field vole *Microtus agrestis* with grid reference accuracy buffers laid over proposed NNR sites

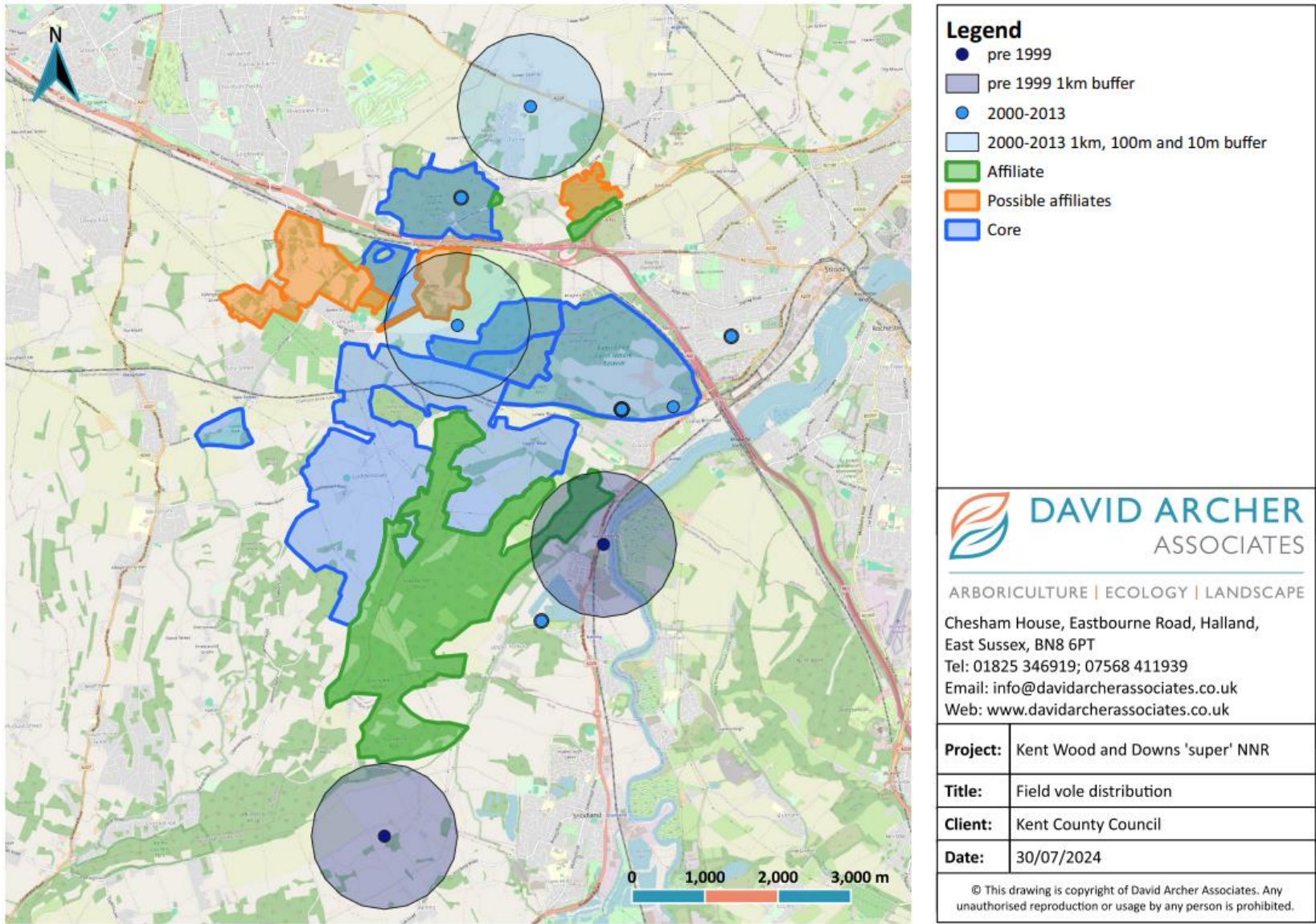


Figure A4.13: Records for fox *Vulpes vulpes* with grid reference accuracy buffers laid over proposed NNR sites

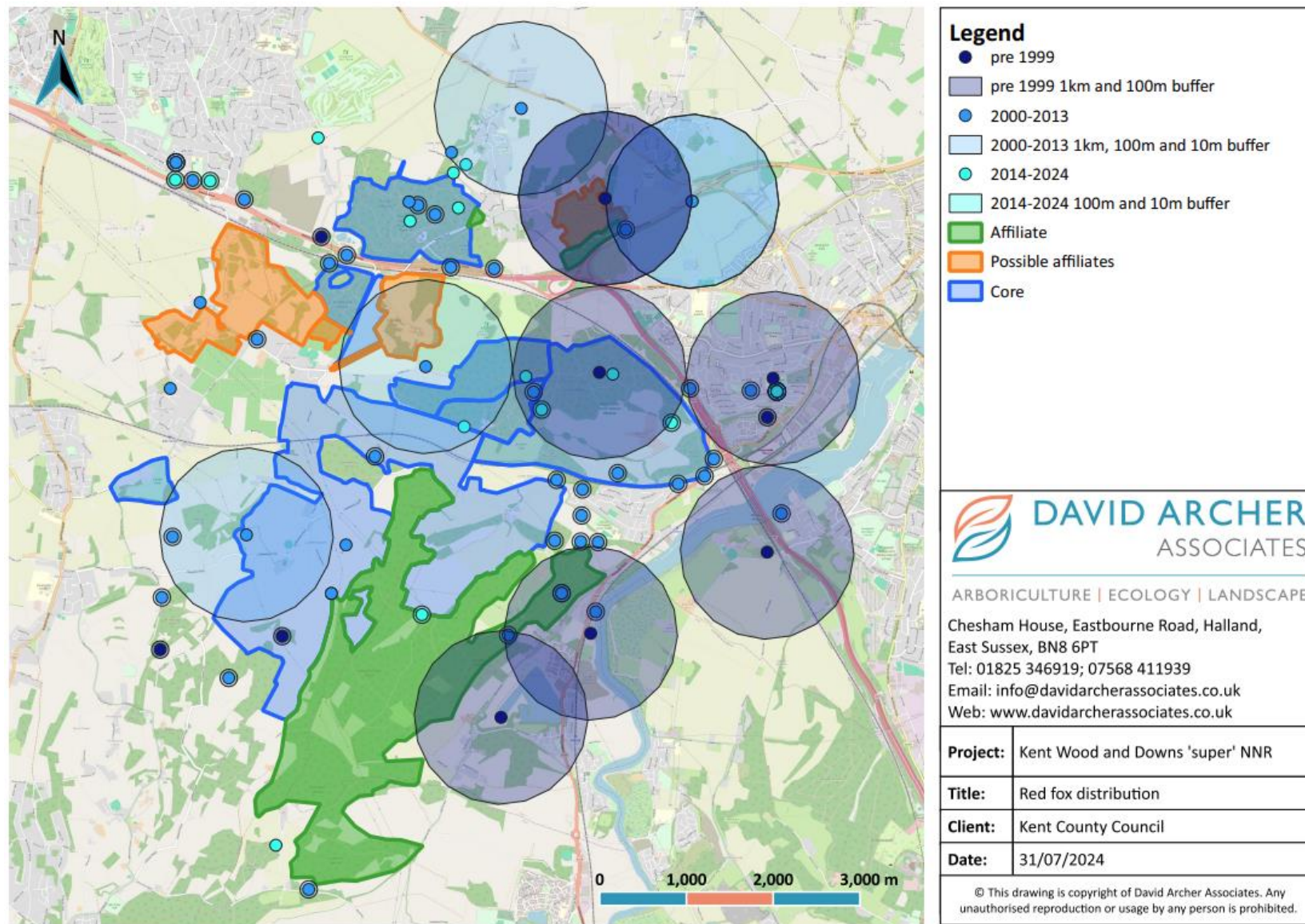


Figure A4.14: Records for grey squirrel *Sciurus carolinensis* with grid reference accuracy buffers laid over proposed NNR sites

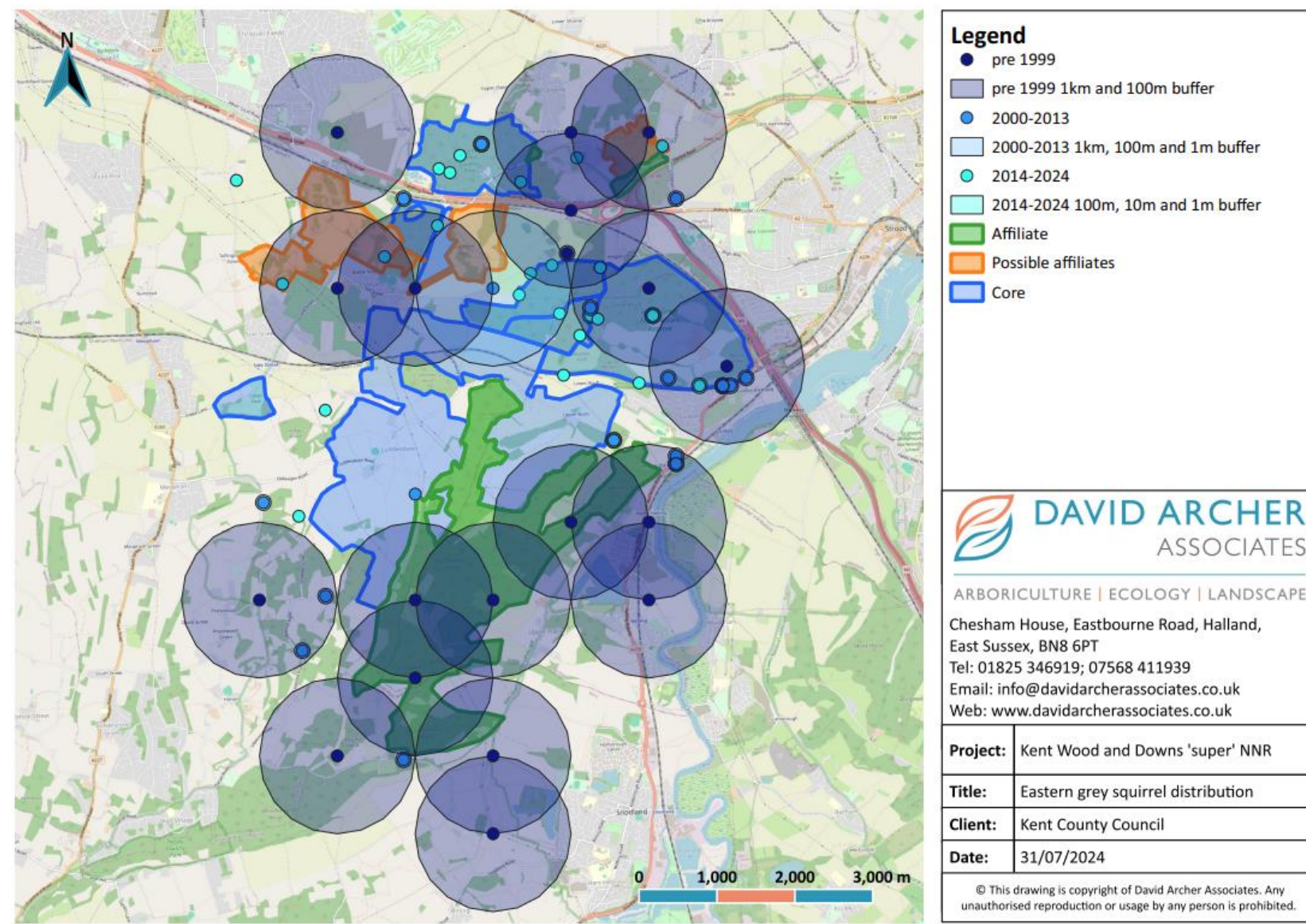


Figure A4.15: Records for house mouse *Mus musculus* with grid reference accuracy buffers laid over proposed NNR sites

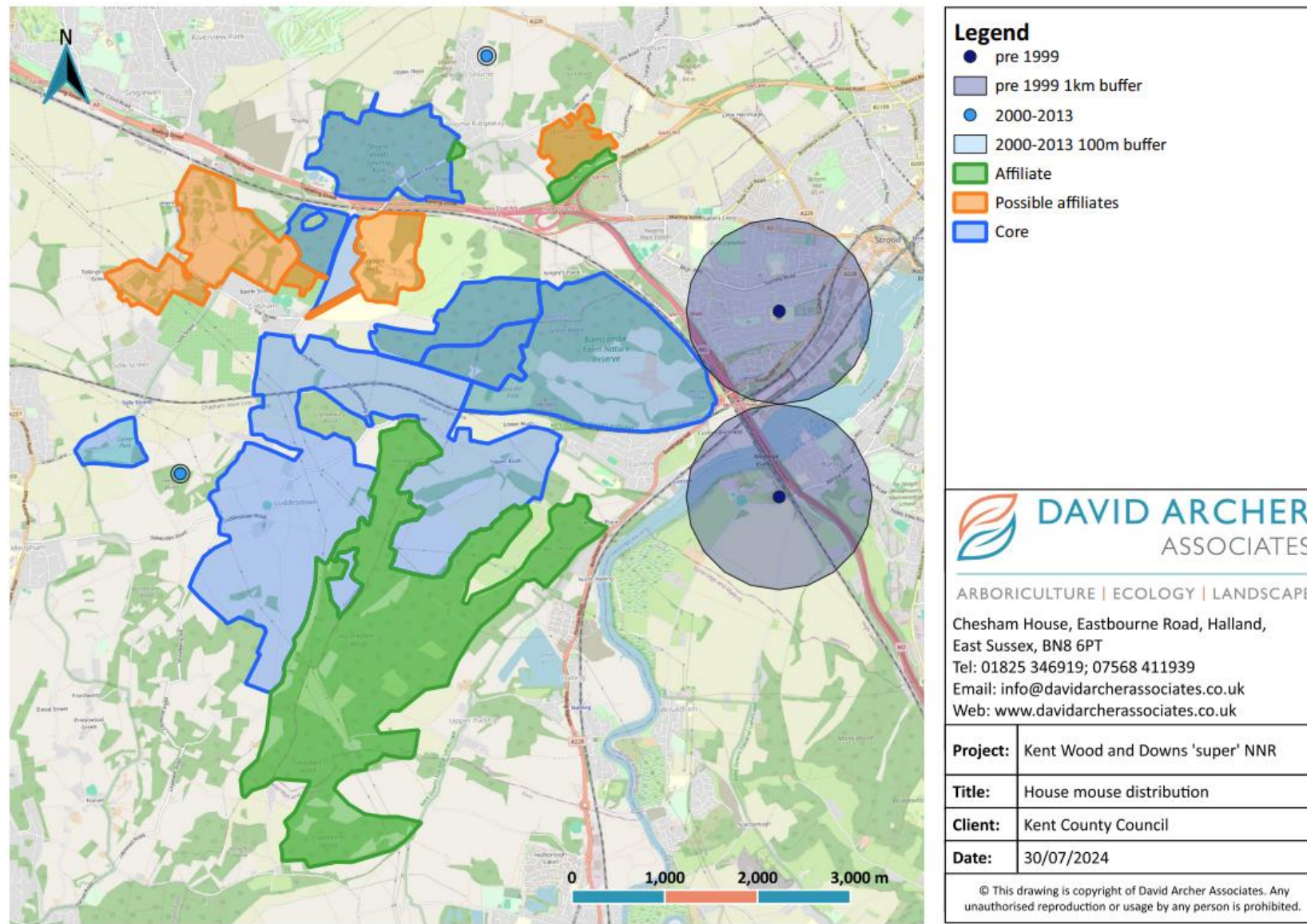


Figure A4.16: Records for mole *Talpa europaea* with grid reference accuracy buffers laid over proposed NNR sites

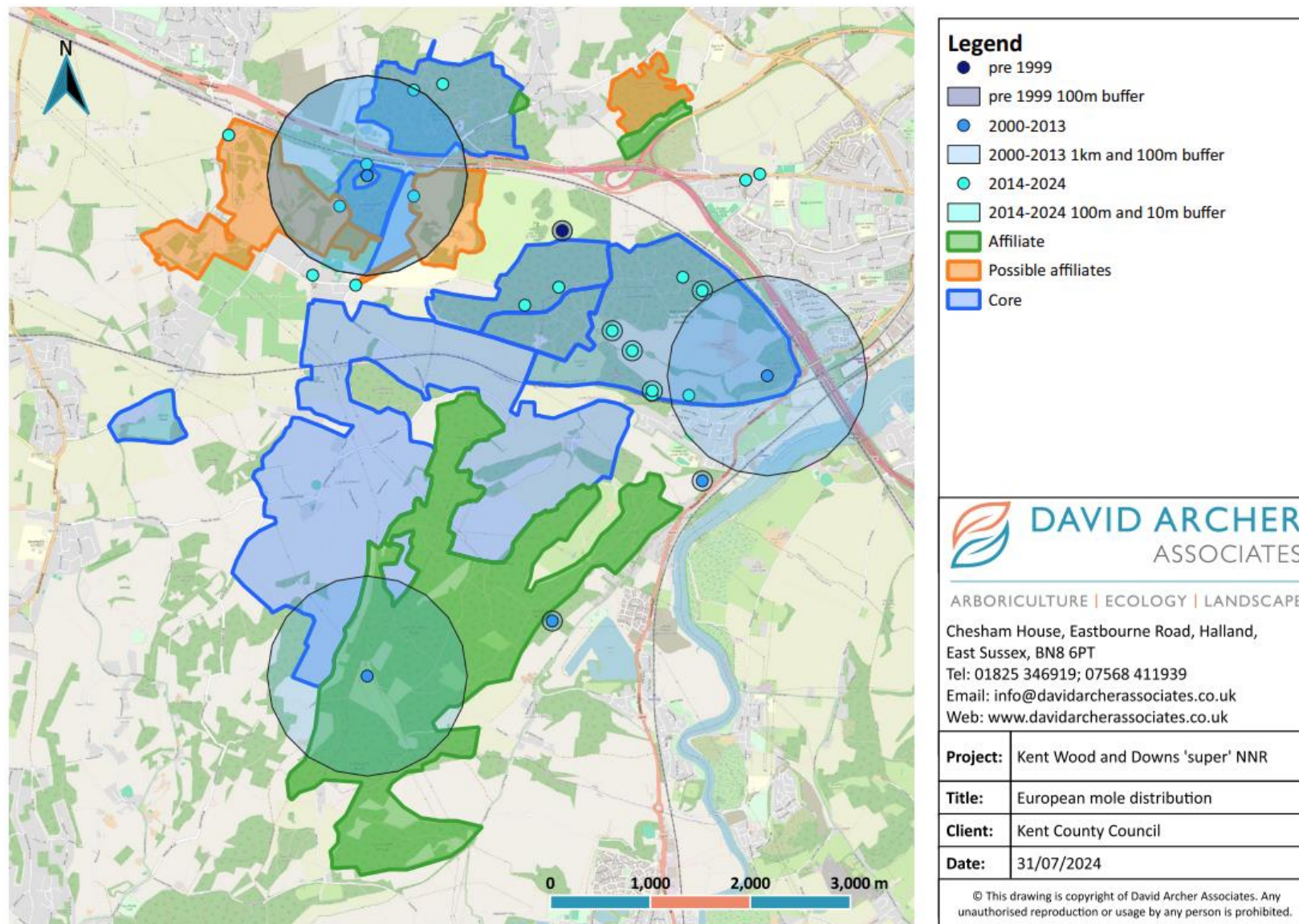


Figure A4.17: Records for polecat-ferret *Mustela putorius x furo* with grid reference accuracy buffers laid over proposed NNR sites

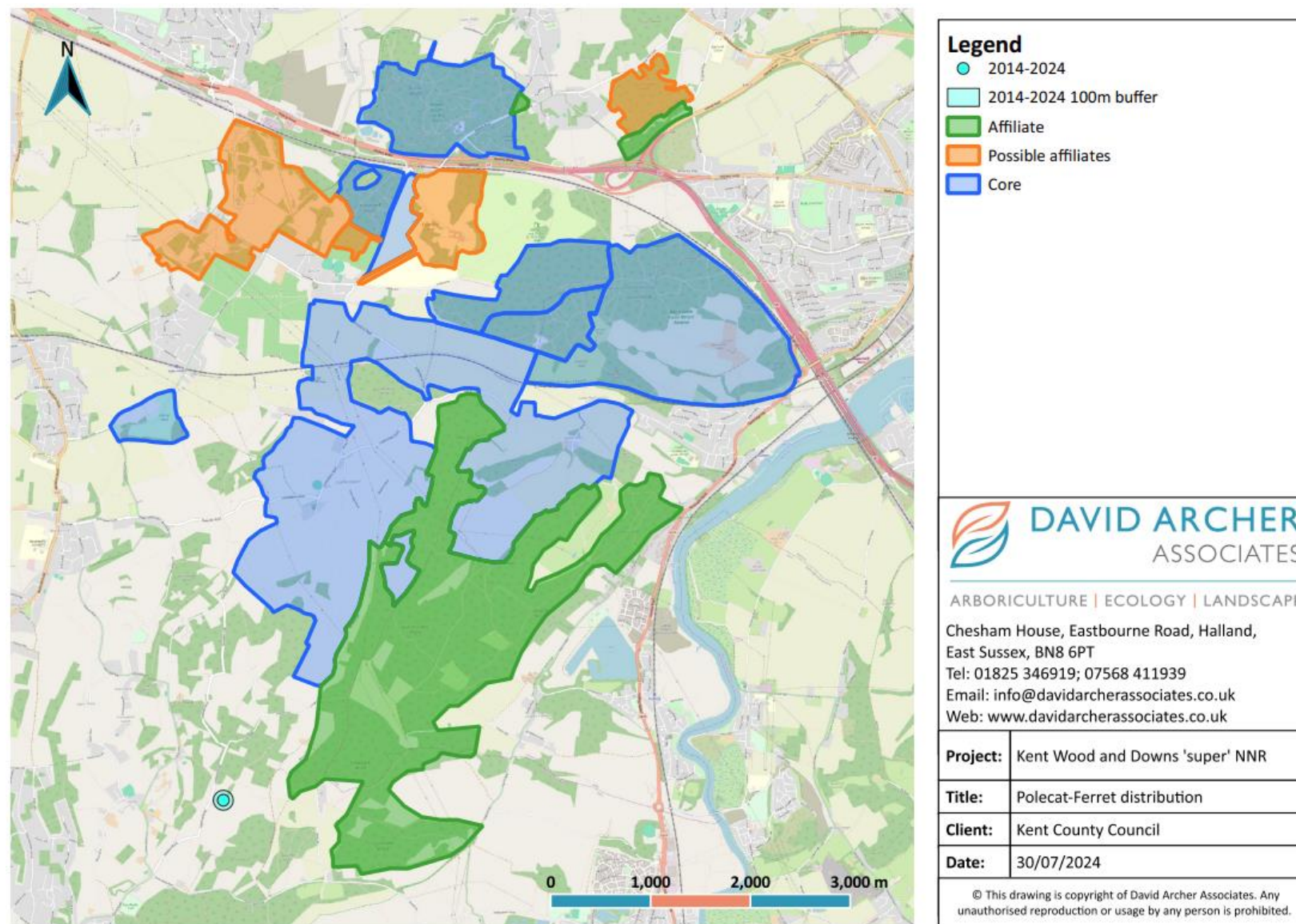


Figure A4.18: Records for pygmy shrew *Sorex minutus* with grid reference accuracy buffers laid over proposed NNR sites

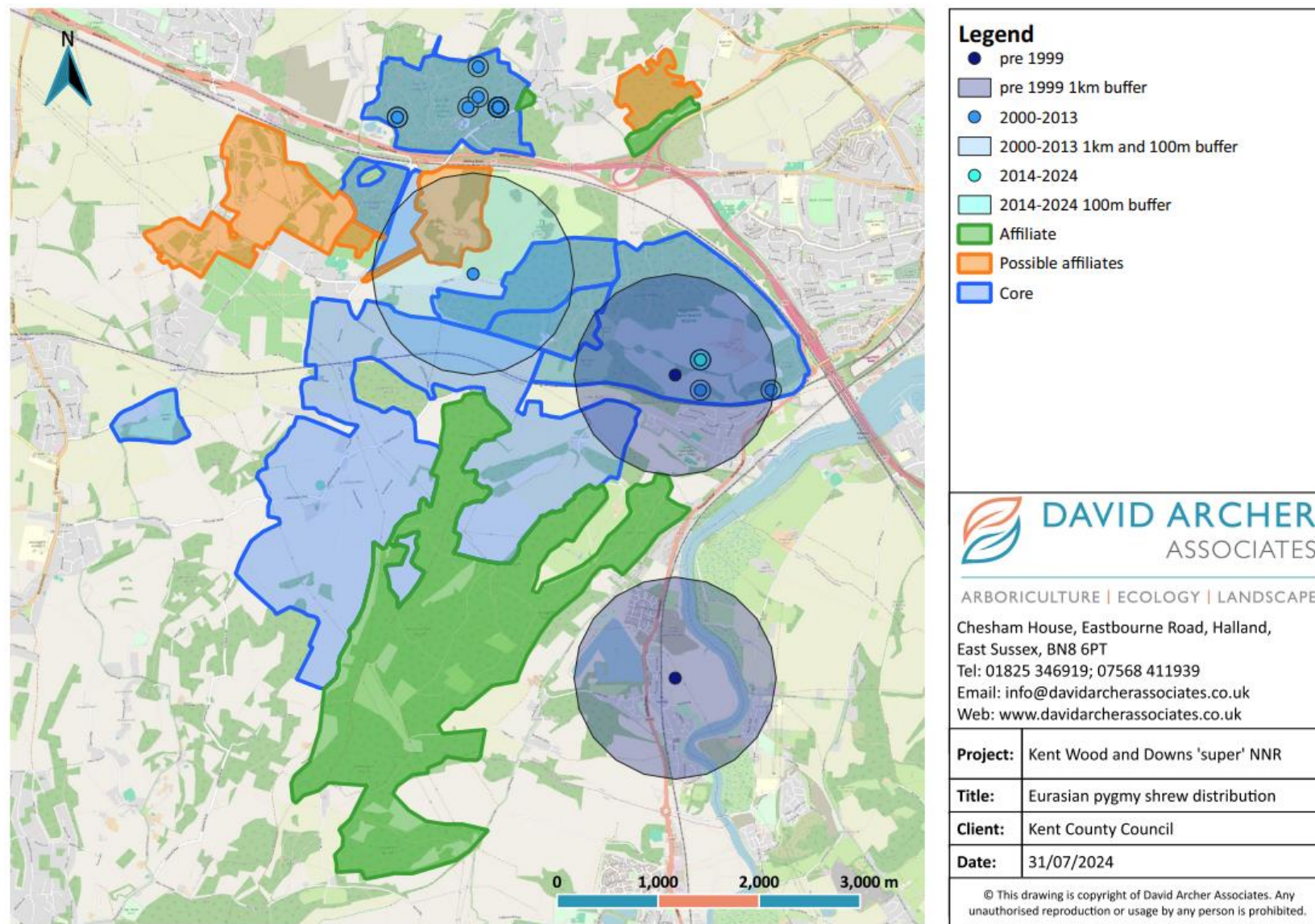


Figure A4.19: Records for rabbit *Oryctolagus cuniculus* with grid reference accuracy buffers laid over proposed NNR sites

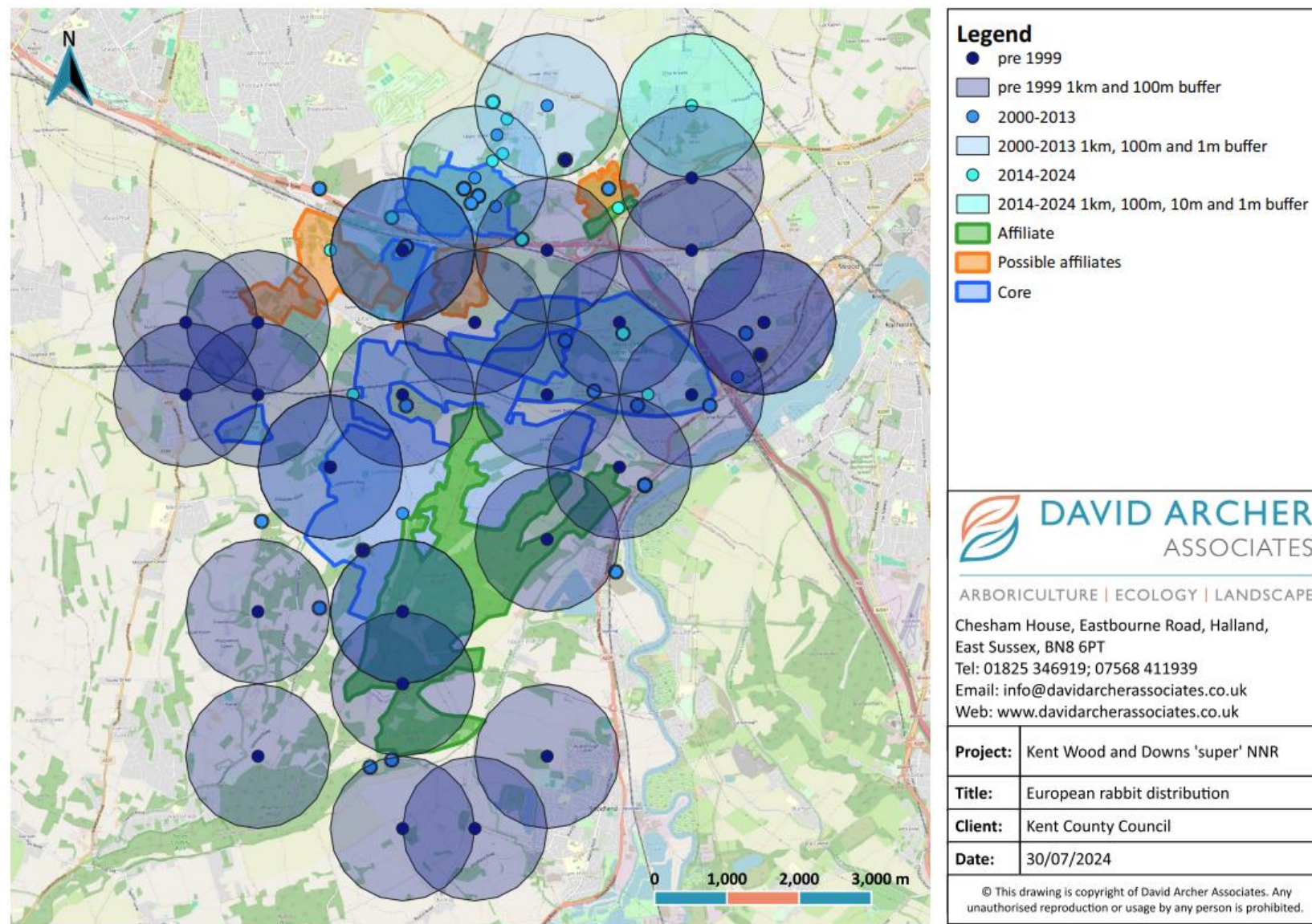


Figure A4.20: Records for roe deer *Capreolus capreolus* with grid reference accuracy buffers laid over proposed NNR sites

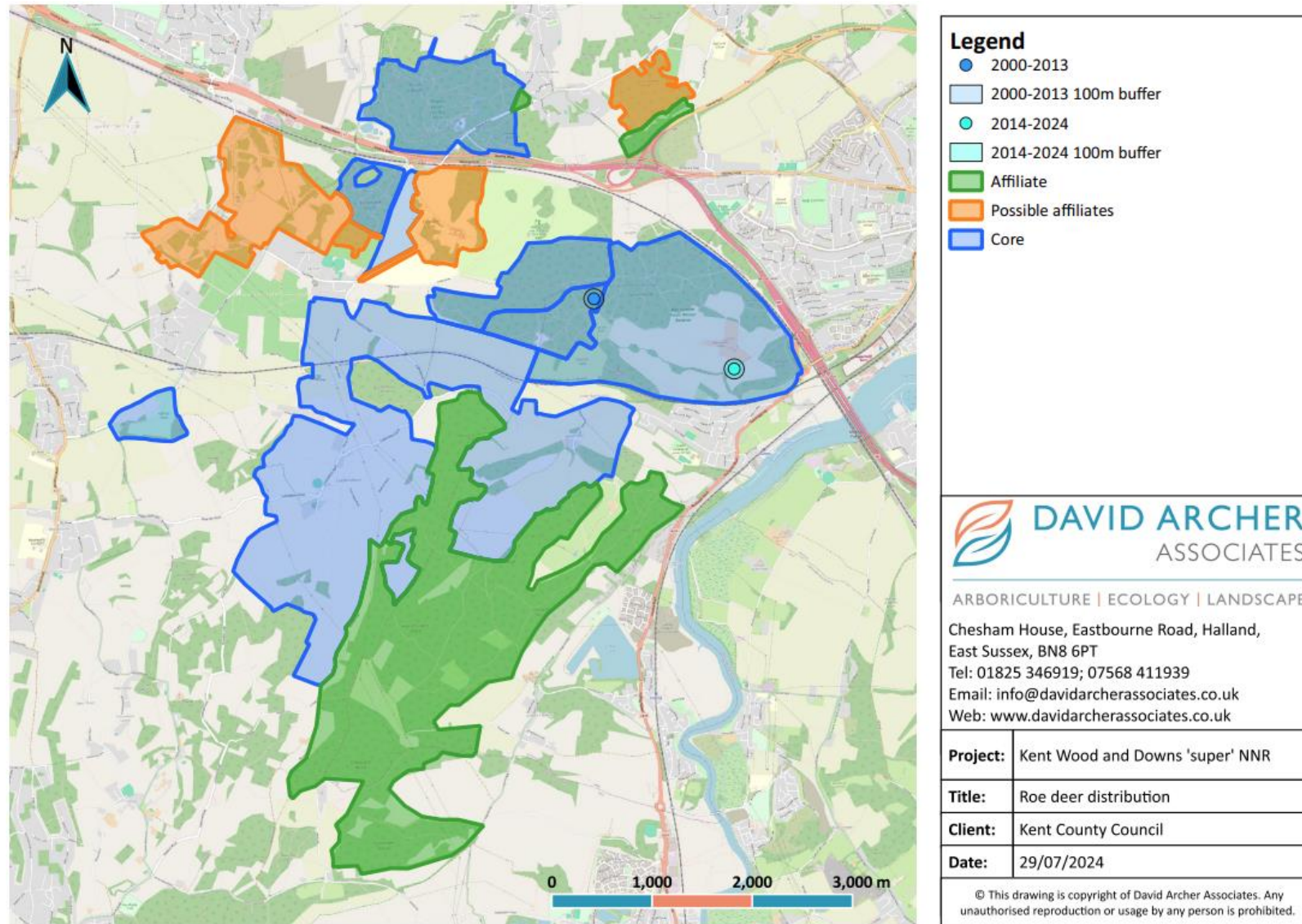


Figure A4.21: Records for stoat *Mustela erminea* with grid reference accuracy buffers laid over proposed NNR sites

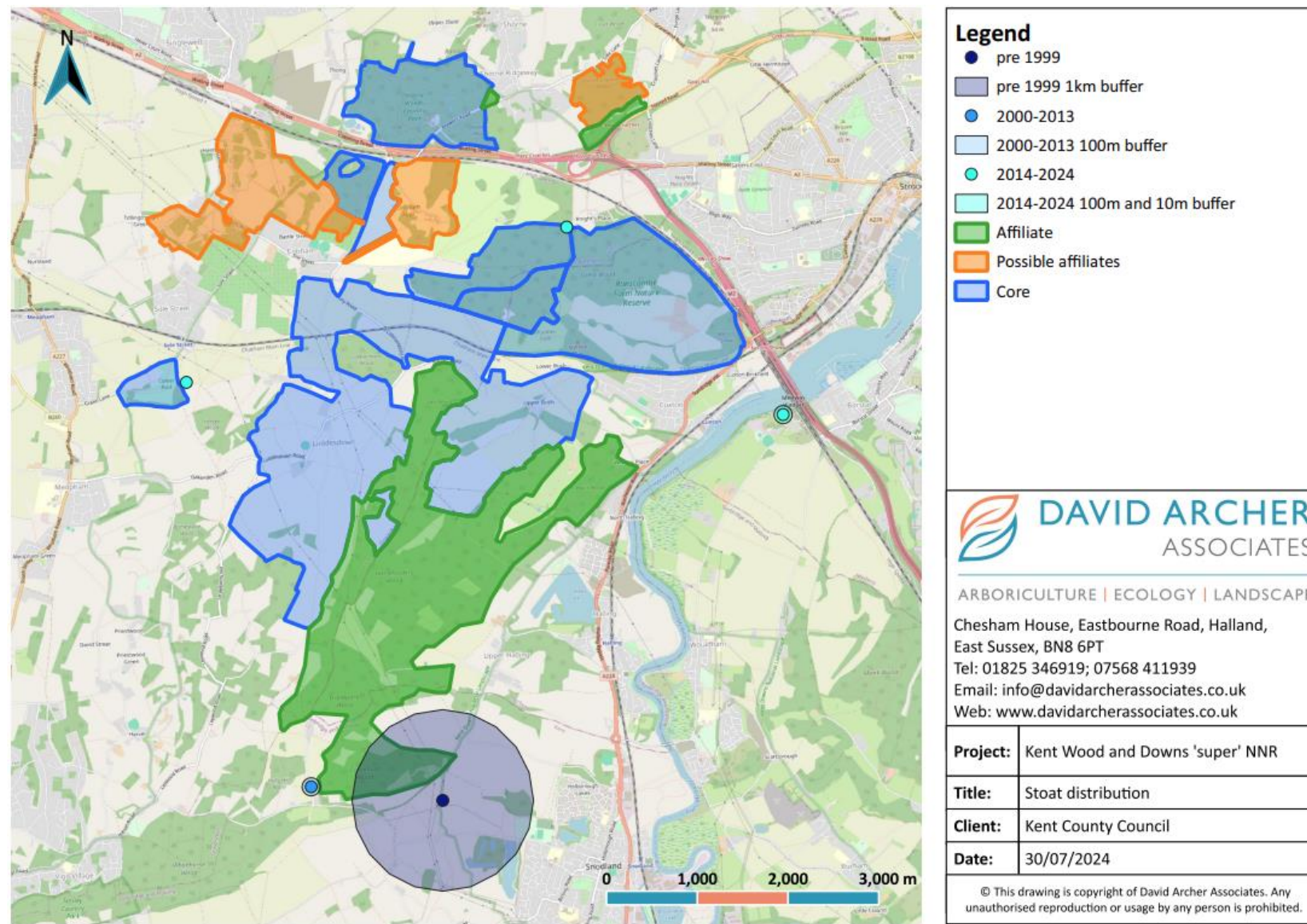


Figure A4.22: Records for weasel *Mustela nivalis* with grid reference accuracy buffers laid over proposed NNR sites

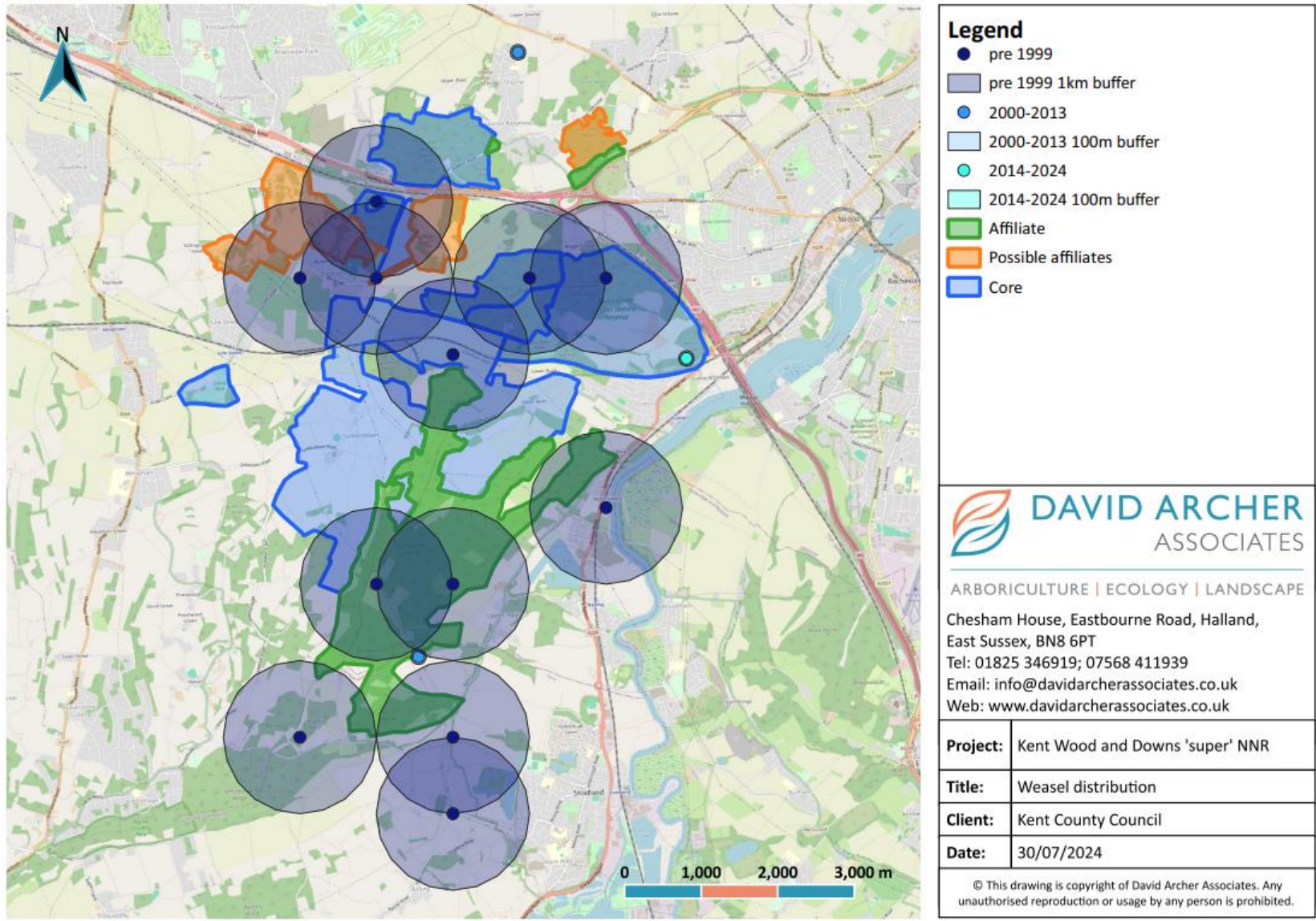


Figure A4.23: Records for wood mouse *Apodemus sylvaticus* with grid reference accuracy buffers laid over proposed NNR sites

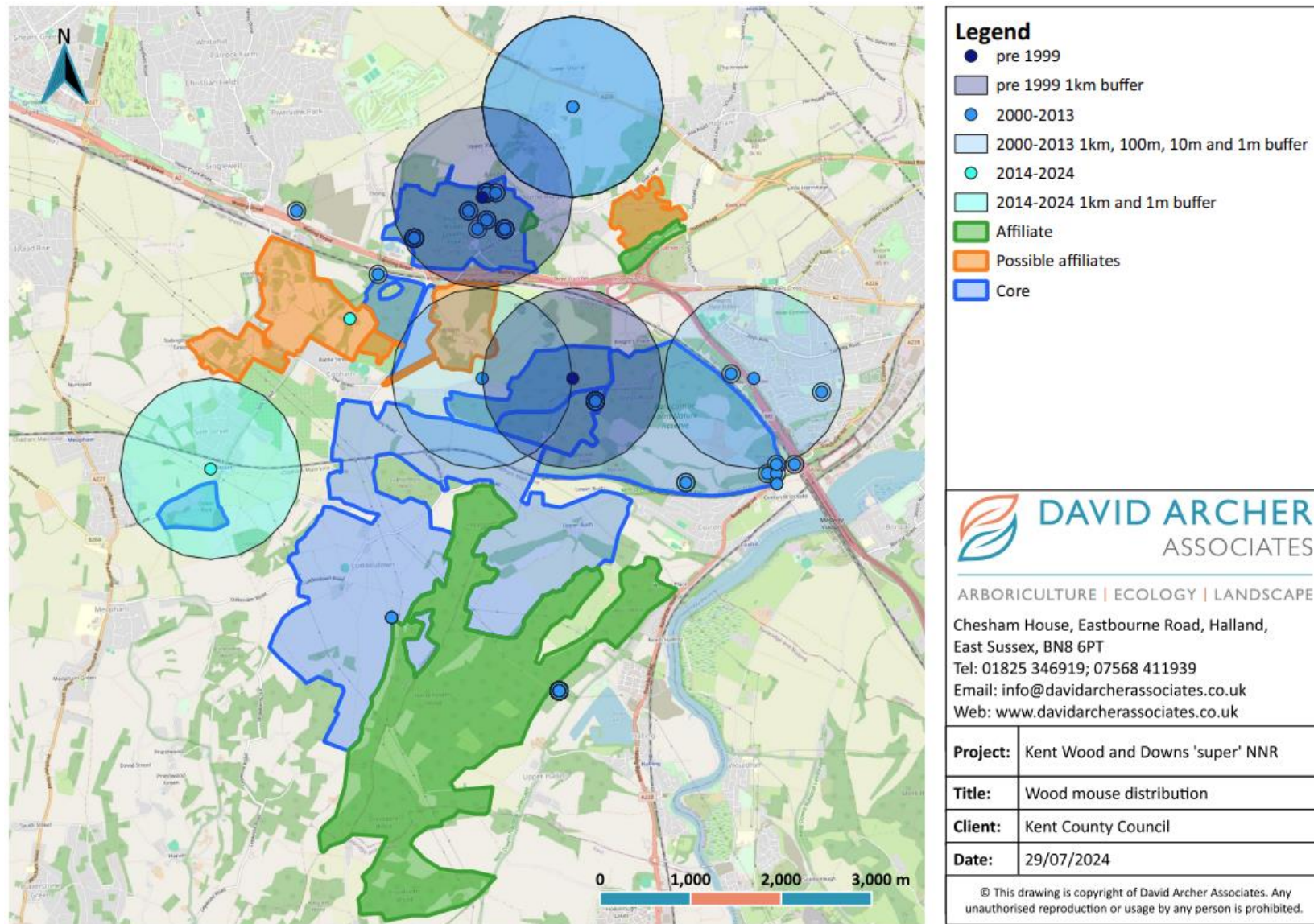
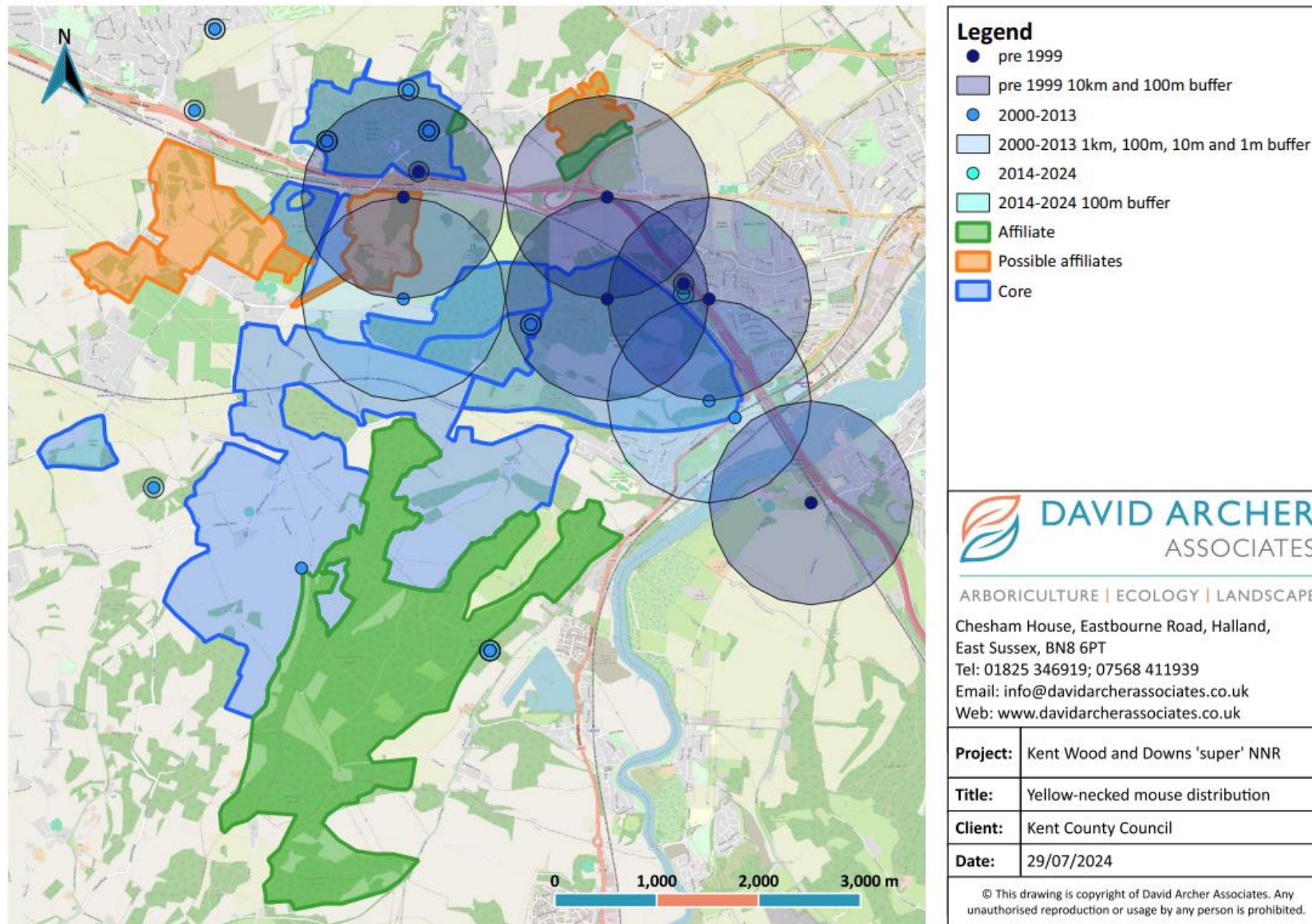
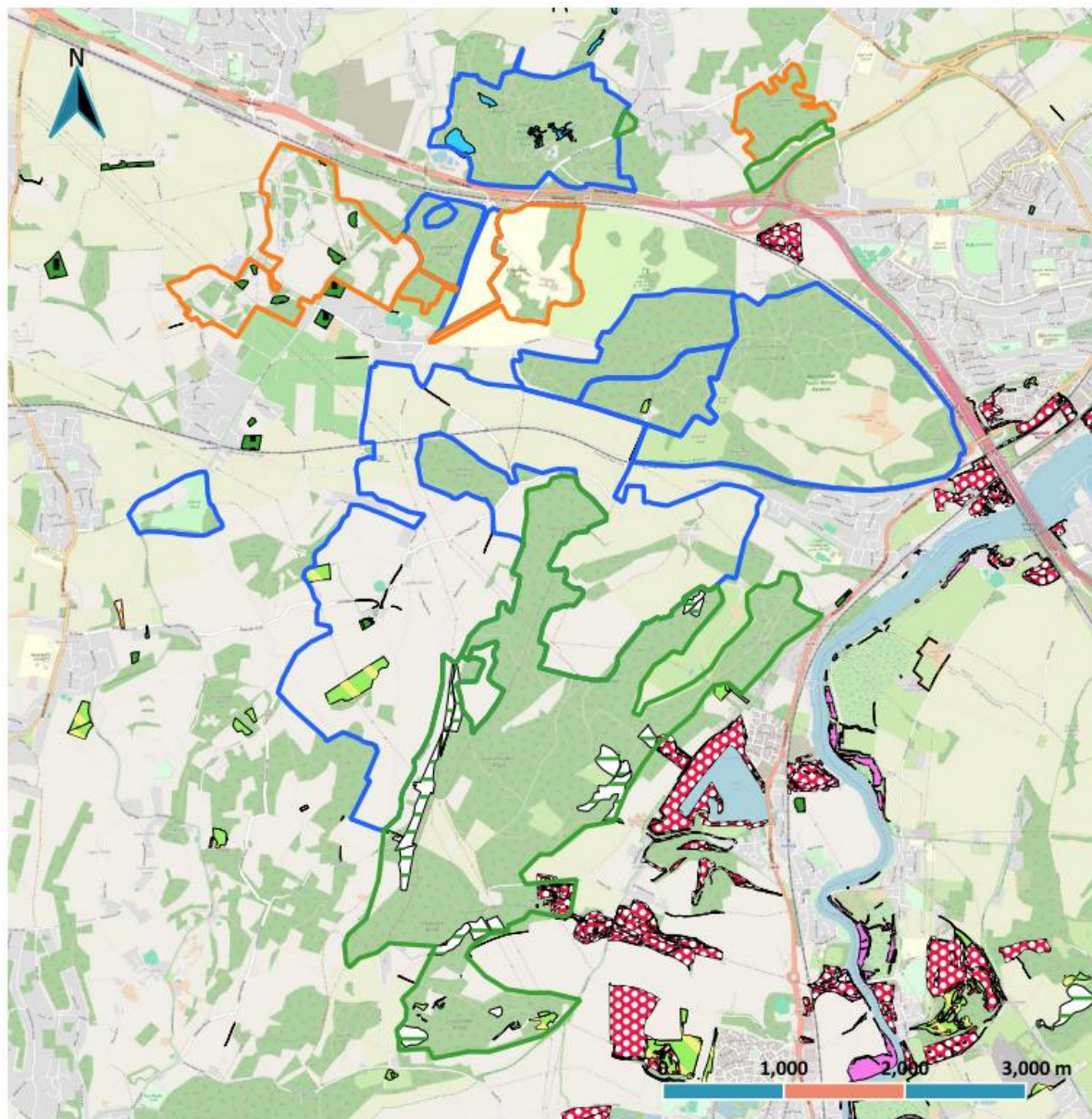


Figure A4.24: Records for yellow-necked mouse *Apodemus flavicollis* with grid reference accuracy buffers laid over proposed NNR sites



Appendix 5 Priority Habitats Maps

See next pages, with Priority Habitats added over three separate maps to ensure visibility of all layers. Data source: Kent County Council.



Legend

-  Arable field margins
-  Hedgerow (Priority)
-  Lowland calcareous grassland
-  Lowland dry acid grassland
-  Reedbed
-  Traditional orchards
-  Wet woodland
-  Open mosaic habitats
-  Lowland beech and yew woodland
-  Affiliate
-  Possible affiliates
-  Core



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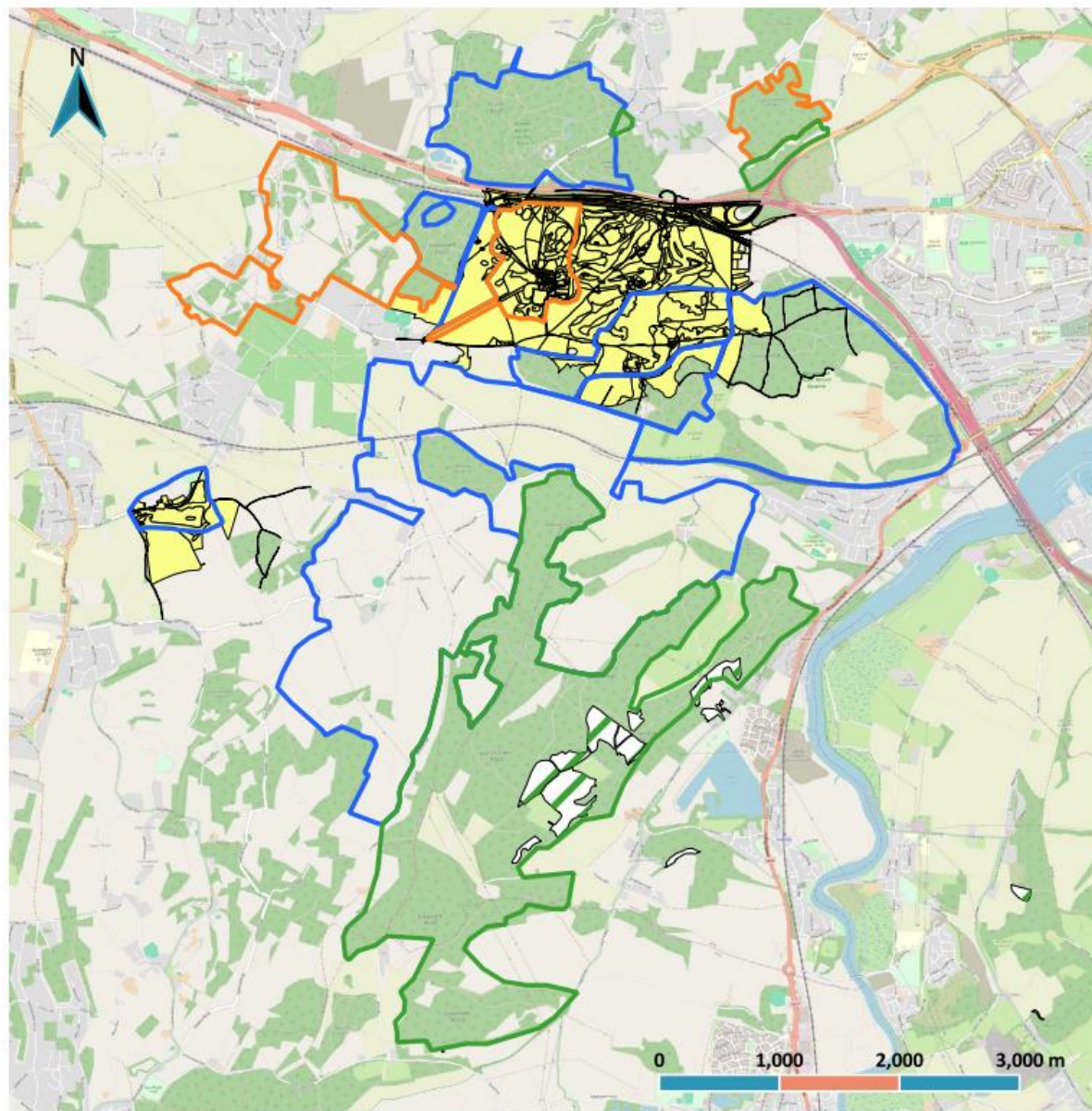
Project: Kent Wood and Downs 'super' NNR

Title: Priority Habitat overlay map 1 of 3

Client: Kent County Council

Date: 08/08/2024

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Legend

- Woodpasture and parkland
- Yew dominated woodland
- Affiliate
- Possible affiliates
- Core



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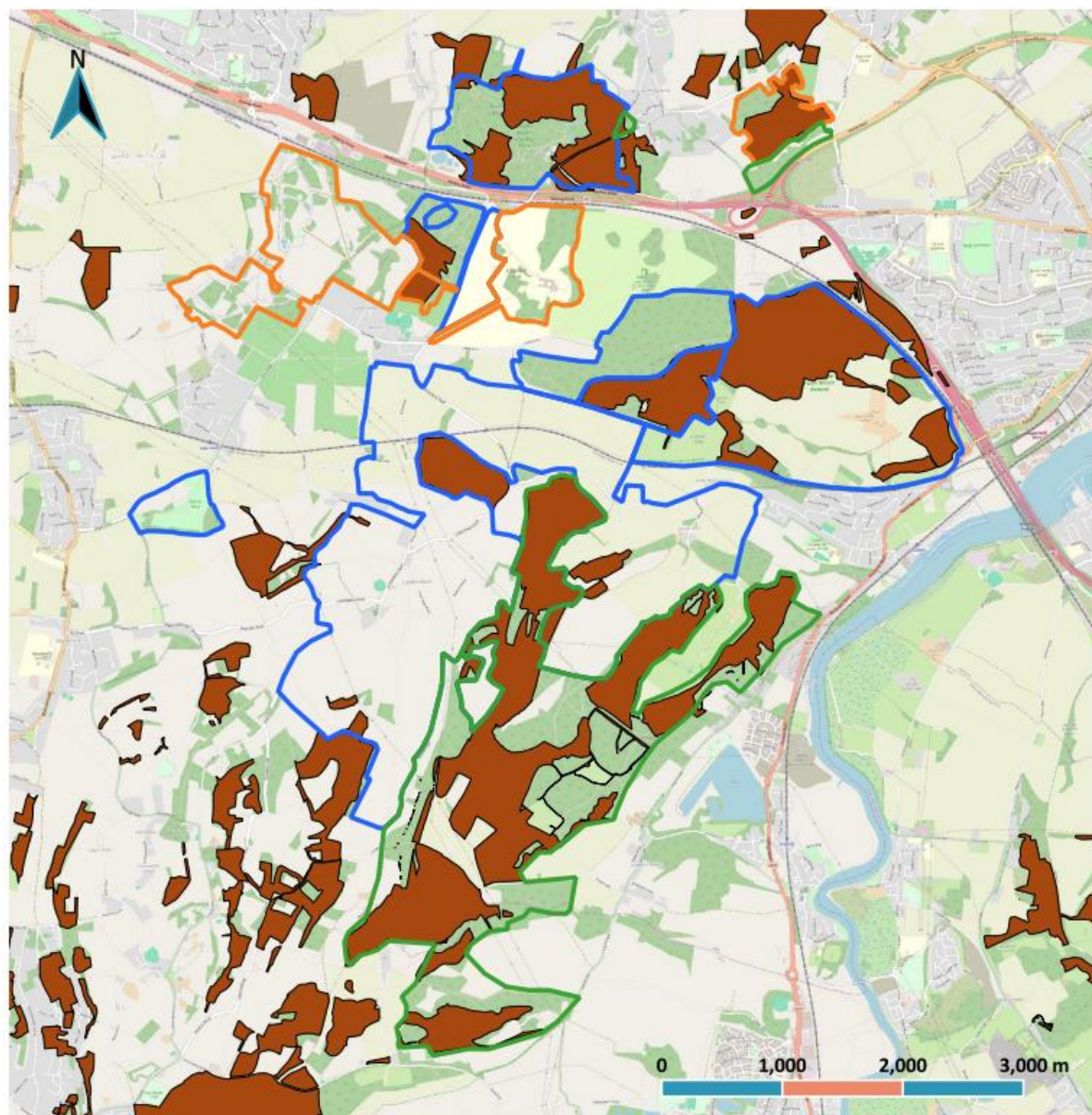
Project: Kent Wood and Downs 'super' NNR

Title: Priority Habitat overlay map 2 of 3

Client: Kent County Council

Date: 08/08/2024

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Legend

- Lowland mixed deciduous woodland and Ancient woodland site
- Affiliate
- Possible affiliates
- Core



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Title: Priority Habitat overlay map 3 of 3

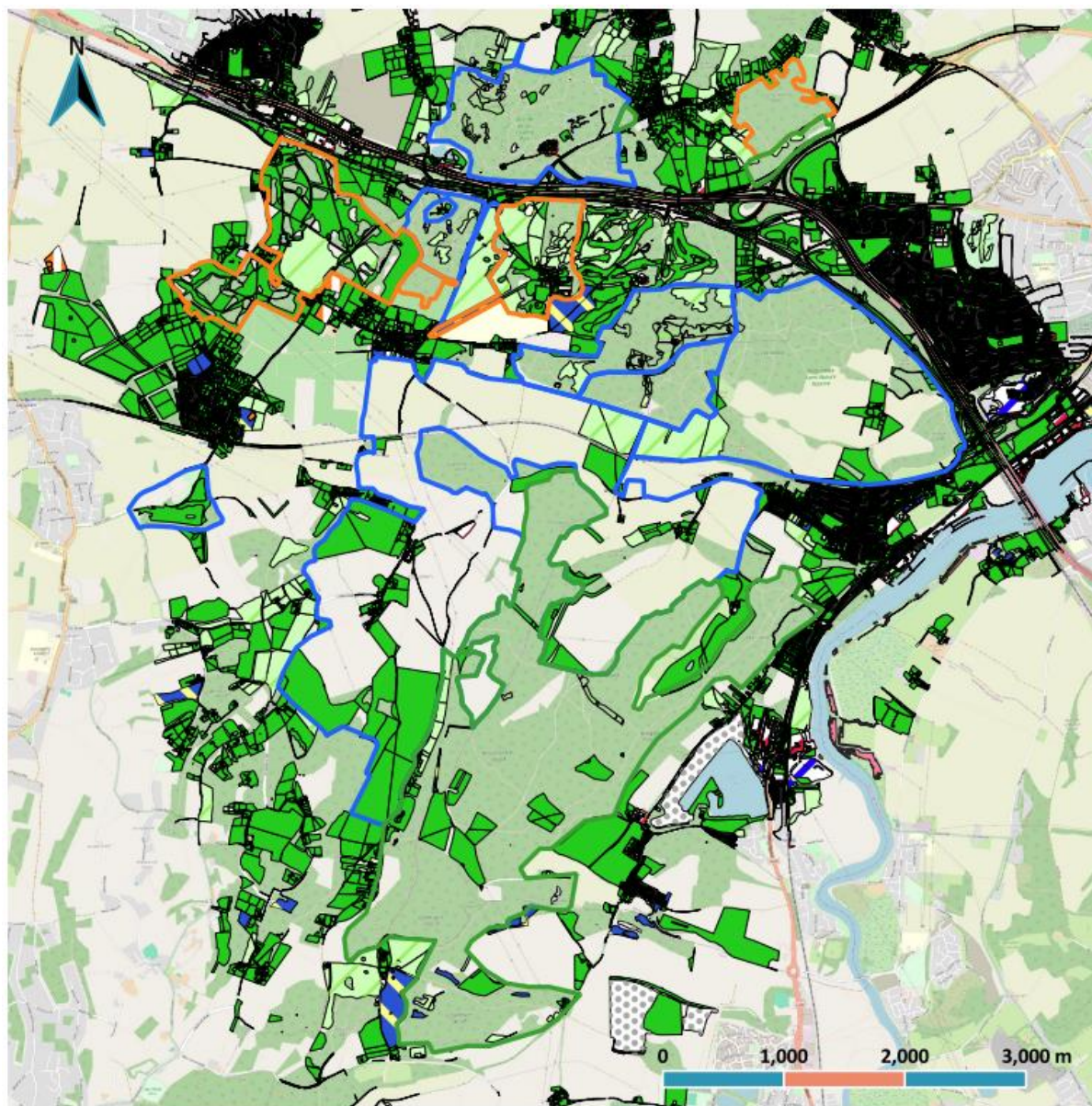
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Appendix 6 Kent Habitat Survey (2012) Maps

See next pages, with habitats added over three separate maps to ensure visibility of all layers. Data source: Kent County Council.



Legend

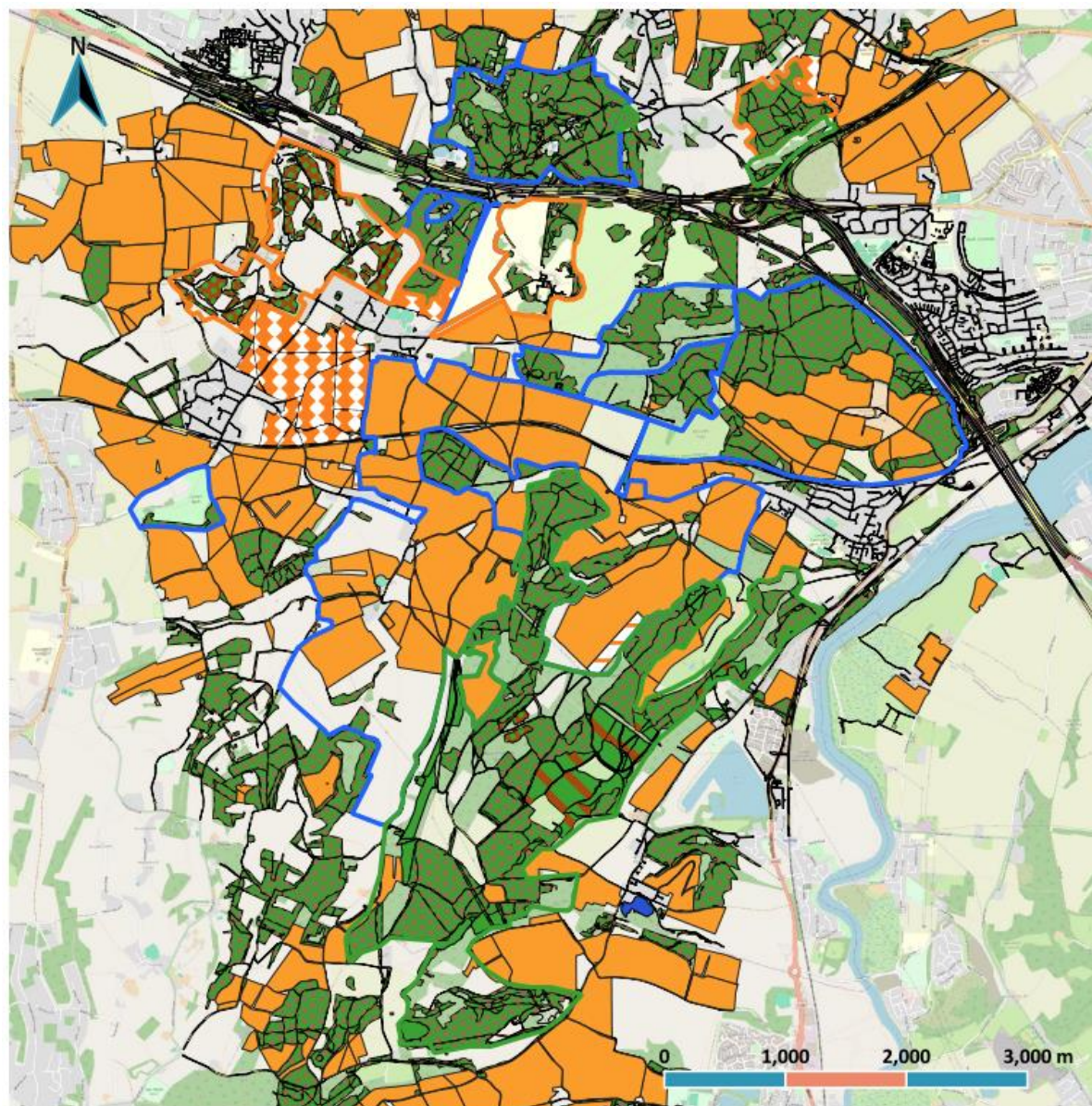
- Hedgerows
- Line of trees (not originally intended to be stock proof)
- Other artificial rock exposure and waste
- Other continuous bracken
- Traditional cherry orchard
- Reedbeds
- Transport corridor associated verges only
- Rank neutral grassland
- Quarry
- Rank calcareous grassland
- Other neutral grassland
- Improved grassland
- Built-up areas and gardens
- Affiliate
- Possible affiliates
- Core



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Legend

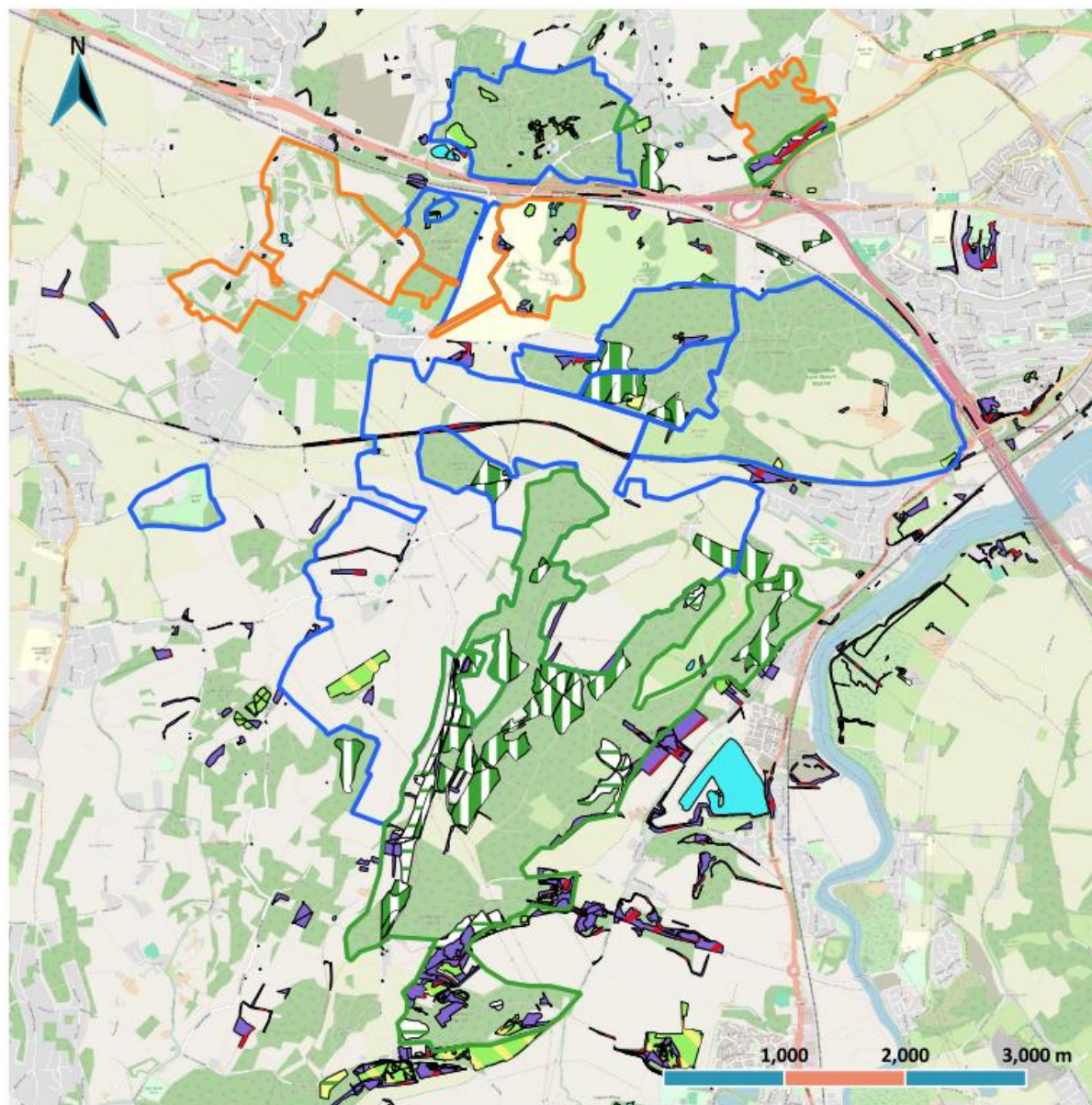
- Intensively managed orchards
- Arable and horticulture
- Broadleaved woodland
- Brownfield grassland
- Open calcareous grassland of slopes and ledges
- Arable headland or uncultivated strip
- Undetermined young woodland
- Arable field margins
- Willow carr
- Transport corridor without associated verges
- Transport corridor with natural land surface
- Taxus baccata woods of British Isles
- Lowland beech and yew woodland
- Affiliate
- Possible affiliates
- Core



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Legend

- Lowland calcareous grassland
- Lowland dry grassland
- Lowland dry acid grassland
- Mixed woodland
- Other coniferous woodland
- Other lowland beech and yew woodland
- Other lowland calcareous grassland
- Standing open water and canals
- Other lowland dry acid grassland
- Other lowland meadows
- Scrub woodland
- Scrub woodland on calcareous soils
- Affiliate
- Possible affiliates
- Core



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