Survey & Assessment of Nightjar *Caprimulgus europaeus* Status in the New Forest

Higher Level Stewardship Agreement
The Verderers of the New Forest
AG00300016

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Executive Summary

Arcadian Ecology & Consulting Ltd were contracted by Leanne Sargeant, Forestry England, on behalf of the New Forest Higher Level Stewardship (HLS) scheme partners to undertake the survey and assessment of nightjar *Caprimulgus europaeus* status in the New Forest, as a requirement of the agreement to monitor the Special Protection Area (SPA) bird species.

The project aimed to provide an update to the surveys undertaken in 2013 and 2018, but also a comparison to the national nightjar survey completed in 2004, with supplementary survey of the New Forest conducted in 2005.

Surveys were conducted from the end of May to mid-July 2023 by a team of Arcadian Ecology and Hampshire & Isle of Wight Wildlife Trust staff and volunteers, Forestry England staff and volunteers and New Forest National Park rangers. Surveys were completed on 154 transects, following the same routes as completed during previous surveys in 2013 and 2018.

A total of 1,379 nightjar observations were recorded, of which 1033 were males. This included churring males, calling birds, wing clapping displays, flying and foraging birds.

Surveys identified 353 territorial males (318 within the open forest/HLS area), a decline on the results of 2018, which recorded 435 territorial males (382 within the open forest/HLS area). This is equivalent to 7.7% of the UK population, based on the 2004 national survey identifying 4,606 territorial males. However, the number of territorial males (as a representation of breeding pairs) still exceeds the SPA target of 300 breeding pairs in Great Britain.

Results suggest a decline in territorial males in the New Forest when compared to previous local and national surveys. There have been slight changes in density and range, with nightjar territories becoming more densely clustered where they are present, but being lost elsewhere. Further investigation is required into the possible causes for this change in distribution, which include alterations to management practices and localised changes to habitat types.

One explanation for the decline may be the unsettled and extreme weather events during 2023, potentially resulting in fewer birds returning to the Forest. Unpredictability of the weather, and extremes of temperature and rainfall, are likely to have had an impact on plants and consequently the invertebrates that nightjar prey upon. It is therefore recommended that further surveys are carried out at regular intervals to establish if this is a declining trend or the consequence of other factors such as weather events. Further survey work and additional assessment of localised factors such as habitat management, changes to habitat type, grazing density and recreational use of areas will also help to establish whether there is a correlation between the decline and other factors. These additional surveys may also enable identification of local mitigation measures that might help to reverse the decline, or habitat creation and management opportunities to increase numbers.

Other potential factors include loss of habitat (from development, for example), forestry works and changes in habitat management practices, such as overgrazing or lack of management. In addition, there is high recreational pressure in the New Forest which has increased significantly in recent years. Extensive areas of new residential development are being constructed throughout Hampshire, likely resulting in increased impacts from new occupiers, including dog walkers, to protected sites such as the New Forest. More detailed survey work should be focused on areas where the most significant declines in nightjar territories have occurred, enabling causal factors to be determined. Specifically, efforts should be made to identify if these declines are linked to changes in habitat management on breeding habitats, or are likely to result from external factors, such as adverse conditions during the birds' migration or while over-wintering in Africa.

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1. INTRODUCTION

Arcadian Ecology & Consulting Ltd (Arcadian Ecology) were appointed by Forestry England on behalf of the Verderers in the New Forest National Park to deliver a survey and assessment of nightjar *Caprimulgus europaeus* status in the New Forest, as a requirement of the Higher Level Stewardship (HLS) agreement to monitor the Special Protection Area (SPA) bird species. It will provide an update to the surveys undertaken by Arcadian Ecology in 2018 and follow the same survey methodology and structure.

The output will include an assessment of the breeding population based on territorial males and location and extent of each site and/or breeding population. This will provide an assessment of the current status of nightjar in the New Forest (across New Forest common land, including land under management of National Trust, Hampshire County Council and Wellow Parish Council) and how this compares with historic trends in distribution and population size.

1.1. Background

As part of the Verderers of the New Forest HLS agreement, there is a requirement to monitor the SPA bird species, for which the area is designated.

The first surveys funded through the HLS were undertaken in 2013, which recorded the breeding population of nightjar as 544; 441 within the open forest/HLS scheme area, 49 territories within forestry enclosures, and a further 54 territories on land outside of this area but within the New Forest National Park boundary. The next surveys funded through the HLS were undertaken five years later in 2018. Surveys recorded a decline on the results of 2013 with 435 territorial males identified, 303 of which within the open forest/HLS area.

An update to these surveys is required to assess the current status of the New Forest population.

1.2. New Forest SPA

The New Forest SPA in south-west Hampshire and south-east Wiltshire covers an area of over 28,000 hectares comprising a mosaic of habitats including wet and dry heaths, bogs, valley mires, grasslands, pasture, woodlands, rivers and streams, and ponds, which are able to support a range of species. This diverse habitat has led to multiple designations across the New Forest. In addition to being an SPA, it is also a Special Area of Conservation (SAC), Ramsar and Site of Special Scientific Interest (SSSI).

The SPA is designated due to its importance for breeding and over-wintering birds, qualifying under Article 4.1 of the European Birds Directive (2009/147/EC), supporting populations of European importance for five species listed on Annex II of the Directive.

Breeding populations of:

- Dartford warbler *Sylvia undata*
- Honey buzzard *Pernis apivorus*
- Hobby *Falco subbuteo*
- Nightjar *Caprimulgus europaeus*
- Woodlark *Lullula arborea*
- Wood warbler *Phylloscopus sibilatrix*

Over-wintering population of:

- Hen harrier *Circus cyaneus*

During the breeding season, the New Forest SPA should support 300 pairs of nightjar, representing at least 6.5% of the breeding population in Great Britain (JNCC 2019 SPA Designation).

1.3. Remit and Scope of the Report

This report provides an assessment of the current status of the nightjar population in the New Forest, based on territorial males. This will be compared against historic trends from previous surveys in 2013 and 2018 by assessing potential change in distribution and population size within the New Forest and nationally.

2. ECOLOGY AND LEGISLATION

2.1. Ecology

Nightjars are a summer migrant, arriving from late April to mid-May to breed and leaving during August, to return to their over-wintering grounds in sub-Saharan Africa. Clutches usually comprise two eggs, with one or both birds fledging. Young are independent from a month after hatching.

They are associated with heathlands, moorlands, woodland edges and clearings, in young and recently felled conifer plantations as well as coppiced woodland. Suitable habitat needs 10-20% bare ground patches of greater than $2m^2$ for nesting. Areas which support rich densities of invertebrate prey, namely woodland and heathland interfaces and the adjoining habitat, are important for foraging.

Nightjars are most active at dusk and dawn, when they are hawking their insect prey (moths and beetles), with larger Lepidoptera forming an important part of their diet. Males can also be heard making their distinctive “churring” song at this time, often whilst perched on top of a tree, and wing clapping in flight whilst displaying to females. Churring can last several minutes and varies in pitch and volume. Soft “coo-ick” contact calls can also be heard and are made by both males and females whilst in flight.

Males have distinctive white markings on their wings and tail, distinguishing them from the females in their silent flight. During the daytime they nest on the ground, their cryptic grey-brown patterned plumage providing excellent camouflage.

2.2. Status

2.2.1. National

Nightjars are most numerous in southern England, found on the heathlands of the New Forest, Dorset and Surrey, reflecting the availability of good breeding habitat.

Nightjars declined across the UK throughout most of the 20th century, but since the 1981 national survey, numbers of breeding nightjar have steadily increased, with the most recent national survey conducted in 2004 estimating the national population to be 4,606 territorial males.

2.2.2. New Forest

The New Forest was included within the national survey in 2004, however surveys were incomplete so additional surveys, commissioned by English Nature (now Natural England), were undertaken in 2005 to provide supplementary information. The 2004 surveys recorded 552 territorial males, with a further 161 records contributed in 2005, resulting in 713 territories identified for the New Forest. Of these, 51 were outside of the SPA (Gates & Bull 2013).

National declines have been attributed to loss, fragmentation and degradation of heathland sites, combined with the increased use of pesticides leading to a decline in invertebrate prey, changes in forestry practice and disturbance through recreation activities, particularly by walkers and dogs during the incubation period (Langston *et al.* 2008).

2.3. Legislation

In England, nightjar, their nests and their eggs are protected under the Wildlife and Countryside Act 1981, as amended by the Countryside and Rights of Way Act 2000. Under this legislation, it is an offence to:

- intentionally kill, injure or take any wild bird;
- intentionally take, damage or destroy the nest of any wild bird whilst it is in use or being built;
- intentionally take or destroy the egg of any wild bird;
- have in one's possession or control any wild bird, dead or alive, or any part of a wild bird, which has been taken in contravention of the Act or the Protection of Birds Act 1954;
- have in one's possession or control any egg or part of an egg which has been taken in contravention of the Act or the Protection of Birds Act 1954;
- use traps or similar items to kill, injure or take wild birds.

(Taken from the RSPB website: Wildlife & Countryside Act 1981 - The RSPB)

UK birds are also split into categories (red, amber and green) based on their conservation importance. Nightjar are amber listed, the details for this criteria are as follows:

- They are classed as threatened with extinction from Europe;
- There has been a moderate (25-50%) decline in breeding in the UK during the last 25 years or longer;
- Their UK breeding range has contracted between 25% and 50% over last 25 years or longer;
- There has been a moderate (25-50%) decline in the non-breeding population in the UK during the last 25 years or longer;
- There was a severe decline in their numbers during 1800–1995, but they are now recovering - their population size has more than doubled over last 25 years;
- They are a rare breeder – only 1 to 300 breeding pairs in UK;
- They are rare non-breeders - less than 900 individuals;
- They only live in a few localised places – the definition is that more than half of the UK breeding or non-breeding population lives in 10 or fewer sites;
- Their UK population is internationally important - at least 20% of the European breeding or non-breeding population is in UK.

(Taken from the RSPB website:
https://www.rspb.org.uk/birds-and-wildlife/wildlife-guides/uk-conservation-status-explained/)

In addition, nightjar are a Priority Species under the UK Post-2010 Biodiversity Framework.

3. METHODOLOGY

3.1. Field Survey

Surveys followed an adaptation of the BTO standard methodology, which was used for the 2013 and 2018 surveys undertaken by RPS and Arcadian Ecology (Gates & Bull 2013; Jackson 2018). This comprised the use of transects rather than 1km squares, to survey the 80 hectare survey areas.

The surveys comprised two visits to each transect. Visits were conducted between 9pm and 11pm, or 2am and 4.30am, in calm, dry weather; as nightjars churr most predictably and consistently just after sunset and just before dawn. Surveys were not conducted if the wind speed exceeded force 4 (moderate breeze raises dust and loose paper, small branches move i.e. >17mph).

During the survey, surveyors recorded all calling (churring) males onto maps, in addition to noting other behaviours including the 'coo-ick' call, wing clapping and flying. Only males churr, but the 'coo-ick' call given by both sexes can be used as evidence of an occupied territory.

Surveyors were advised to walk the site at a steady pace along the pre-determined route, stopping and listening for birds every few minutes. On hearing a nightjar, surveyors marked its position as accurately as possible on the map provided, using codes A1, A2, A3 etc for each individual found on visit one, and B1, B2, B3 etc for each found on visit two. The positions of simultaneously churring males were noted and marked on the map by a dashed line (A1-----A2). Any other behaviour and observed flights were recorded by an arrowed line (--A3-->). The position of distant individuals, particularly outside the survey area, were noted as accurately as possible with a time. No tapes were used.

In addition to recording activity on the map, surveyors completed a standard survey form, detailing the survey dates, times, weather conditions and the total number of males they encountered. This also included a row for the estimated number of males on site following the two visits, based on the surveyor's encounters whilst in the field.

Surveys were largely conducted on ArcGIS Survey123 software (data was received from 196 surveys on Survey123 compared to 106 on paper forms). The survey form comprised the standard survey fields, as well as options to add points and flight paths to the map showing the locations of all nightjars heard and seen. Surveyors were able to pinpoint their exact locations by GPS, with transect routes overlaid on the map to enable them to more accurately follow the correct path.

3.1.1. Survey Period

Surveys were conducted between the last week of May (22nd May 2023) and the end of the second week of July (21st July 2023), with at least one visit in June and visits at least three weeks apart. The first visit was completed between 22nd May and 17th June (ideally within the first two weeks of June), and the second visit between 18th June and 21st July (ideally within the second two weeks of June).

3.1.2. Survey Area

Surveys were conducted within the New Forest National Park boundary (Map 1), covering the whole of the New Forest common land, which includes land under management of Forestry England, the National Trust, Hampshire County Council and Wellow Parish Council. This followed the same structure used in the 2013 and 2018 surveys (Gates & Bull 2013; Jackson 2018). To allow comparison of results between this survey and the previous surveys, the same transect routes were also followed; 154 transects were identified. The transect routes were designed to pass within 200 metres of all suitable habitat types (Map 2). These passed through a mix of habitats including lowland heathland, young coniferous woodland and coniferous plantation of unplanted blocks, bare ground and clear-fell areas.

3.1.3. Surveyors

A total of 65 surveyors conducted surveys for nightjar in 2023. The majority of transects were surveyed by Arcadian Ecology/Hampshire & Isle of Wight Wildlife Trust staff and volunteers with support from Forestry England staff and volunteers, New Forest National Park rangers, and both existing Trust volunteers and new recruits. A breakdown of transect coverage and split across surveyors is provided in Table 1.

Table 1. Survey team

Surveyor Type	Number of Surveyors	Number of Transects
Arcadian Ecology/Hampshire & Isle of Wight Wildlife Trust	34	106
Hampshire & Isle of Wight Wildlife Trust – experienced bird surveyor	7	13
Forestry England – staff and volunteers	5	8
New Forest National Park ranger	2	3
Volunteer – new recruit*	19	24

* A number of new recruits accompanied volunteers and staff on surveys rather than completing their own transects

3.2. Data Analysis

Maps were submitted either electronically using ArcGIS Survey 123 software or in paper format for entry into MapInfo GIS software.

The locations of all observed activity were entered as points into GIS software. Visits 1 and 2 were colour coded differently, with only churring males mapped on the table. A second GIS table was created to show interactions between males. This enabled identification of concurrently churring males, allowing them to be recorded as separate individuals during territory mapping, and other observed or heard activity such as flying, wing clapping and 'coo-ick' calls.

Individual territories were identified using the analysis employed by Conway *et al.* (2007) and RPS (Gates & Bull 2013). A buffer of 350 metres was created around the points of "churring" males, except where known topographical or structural features were present and likely to form a 'barrier', and clusters of registrations (churring males) indicative of territories were mapped using polygons. These polygons were then converted into central points, representing the centre of territory. Grid references were extracted from these points.

Territories were mapped conservatively; therefore, the number identified is likely to be underestimated as it will give the lowest possible number of territories.

Maps showing the locations of nightjars were divided into three main compartments within the New Forest; north, east and west. Boundaries were formed by the main A31 and A337 roads, as shown in Map 3.

The transect data was overlaid with a 1km square grid, to allow comparison of the data with both previous surveys on a local and national scale.

3.3. Constraints to survey

Practical issues identified during the surveys included road/traffic noise affecting the surveyor's ability to hear clearly, disturbance from other forest users (human and animal) and sound orientation when lots of trees were present. These factors can also influence the surveyor's ability to determine an accurate estimate of the number of nightjars on each transect.

Despite transects being walked at an almost continuous steady pace, there is always the risk of double-counting birds, especially when they are flying from one perch to another. Low light levels and features obstructing the surveyor's view exacerbate this issue, creating difficulty in determining if two separate birds have been observed, or a single, mobile individual. This can also reduce the surveyor's ability to accurately estimate the total number of distinct individuals on each transect. Consequently, as territories were mapped conservatively, some valid records are likely to have been omitted through caution, resulting in underestimates of nightjar populations and total territories.

The weather is likely to have had an impact of nightjar presence this year, affecting the period when they are migrating to the UK. April was quite unsettled and unseasonably cool, following a very dry February, then a wet March. The weather started to improve during May, becoming sunny and warm

following a cool and unsettled start to the month. This trend continued throughout the remaining survey period.

As multiple surveyors were utilised, there was the risk of inconsistency between them. However, all were provided with a standardised methodology, training and survey forms, reducing the likelihood of errors. To further strengthen the method, visits were conducted by experienced bird surveyors, the majority of whom have surveyed for Arcadian Ecology or other conservation organisation previously. In addition, due to volunteer availability, some transects were visited by a different surveyor on each occasion. Linked to these constraints, some transects were not surveyed three weeks apart as specified in the survey methodology; for example, two transects (51 and 52) were visited by two different surveyors only nine days apart. However, as both visits were undertaken in June, it is hoped that the number of nightjar territories has still been accurately recorded.

There were some issues with commitment of volunteers, with some surveys not being completed, despite surveyors agreeing to complete them. Although numerous attempts were made to contact the volunteers to confirm they had been done, of the 308 scheduled visits (two visits to 154 transects), six were not carried out. Unfortunately, this included transects 101 and 102, for which no data was collected in 2018. However, all remaining transects had two visits completed and at least a single visit has been made to all transects. This may potentially have caused some males to be missed and a slight underestimation of the number of territories.

Although the survey timings for dusk surveys were between 9pm and 11pm, as per previous years' methodologies, it was found that the start of this survey window was still very light, particularly in the middle of June when sunset was 9:30-10pm. Therefore, there is potential that some nightjars were missed during the earlier part of the survey window. However, to reduce the risk of this occurring, surveyors were asked to alternate their routes, walking transects in opposite directions each time.

Due to difficulties in access and health and safety, such as absence of a former path, boggy ground and mires, and areas known to have unexploded ordinance, a number of transect routes were altered by surveyors. These were walked on both visits and followed previous transect routes as closely as possible. Therefore, it is not considered likely that any fewer territories in areas of suitable habitat were recorded as a result. The new transect routes will be mapped so that these can be followed in future survey years.

4. RESULTS

4.1. 2023 Survey

Surveys were completed on 154 transects. A total of 1,379 nightjar observations were recorded, of which 1033 were males. This included churring males, calling birds, wing clapping displays, flying and foraging birds. All records of nightjar are shown on Map 4, with Maps 5, 6 and 7 displaying more detailed results along the transects, split by the three main compartments within the New Forest, Map 8 provides a heat map, showing the approximate densities of recorded churring males across the areas surveyed in the New Forest.

All surveyors observed nightjar in the New Forest, and birds were recorded on 141 of the 154 transects, with only 13 transects having no nightjar (transects 30 in Pig Bush, 50 at Bolton's Bench in Lyndhurst, 53 at Balmers Lawn, 59, 61, 64 and 69 in Setley, 84 in Burley, 117 in Fritham, 142 and 144 in Stoney Cross, 146 in North Gorley and 155 in Ringwood). Of the transects with nightjar observations, 113 transects had nightjar recorded on both visits, while 28 transects only had nightjar on one of the two visits.

The mean number of territorial male nightjars present per transect was 2.5, while the mode number was three territorial males per transect (43 transects had a total of three territorial males). Transects having two territorial males was the next most commonly encountered, with 34 transects in this category. The total number of territorial male nightjars ranged from no nightjars being present, to one site with seven males on a single transect (transect 123 in Godshill).

The breeding population of nightjar in the New Forest in 2023 is 353, based on territorial males. This is equivalent to 7.7% of the UK population, based on the 2004 national survey identifying 4,606 territorial males. Of these, 318 were within the open forest/HLS area.

Table 2 provides a breakdown of the number of territories by landownership area. A summary of nightjar survey results are detailed in Appendix 1.

Table 2. Breakdown of number of territories by area

Landownership area	Number of nightjar territories
Forestry England	318
Wellow Parish Council	1
National Trust	20
Hampshire County Council	2
Other (private land)	13

Territories are shown on Map 9, with territory centres on Map 10, and coordinates for territory centres are provided in Appendix 2. More detailed maps of territories and territory centres are provided in Appendices 3 and 4, respectively.

Transposing the territory centres onto a 1km square grid, 187 squares have territory occupancy (of 661 1km squares at least partially within NFNPA boundary). This is equivalent to 28% of squares being occupied. Based on the 2023 figures, there are approximately 1-2 individuals per occupied square kilometre. Across the monitoring in 2013, 2018 and 2023, a total of 267 squares have been occupied. Of these, 68 squares have held nightjar territories in a single year of monitoring, 55 have held nightjar territories across two survey years and 144 have held nightjar territories across all three survey years. Full data on territory occupancy over the monitoring years is detailed in Appendix 5.

4.2. Comparison with previous data

4.2.1. Population size

A comparison of the number of territorial males from previous studies, both national and within the New Forest, suggest that there has been a decline in numbers, with approximately 19% fewer territories identified than in 2018 (reduction from 435 to 353 in 2023). This includes a similar decline in numbers within the open forest/HLS area from 382 to 318, equating to approximately 17% fewer territories. This

repeats the decline found in the previous surveys; approximately 20% fewer territories were identified in 2018 than in 2013 (reduction from 544 to 435). Overall, there has been a steady decline in numbers since surveys began in 2004 (Figure 1).

When comparing the number of territorial males on transects, a total of 55 transects observed more nightjar in 2023 than in 2018, while 44 recorded the same number of territorial males. However, there was a decrease in the number of territorial males on 52 transects. The largest decrease was five nightjars on transect 30 in Pig Bush, with a total of five territorial males recorded in 2018 and none in 2023. Transects 83 in Burley and 123 in Godshill showed the greatest increases in territorial males, rising from two to six males and three to seven males, respectively. Estimates were not available for six of the transects and therefore no comparable data could be gathered for these.

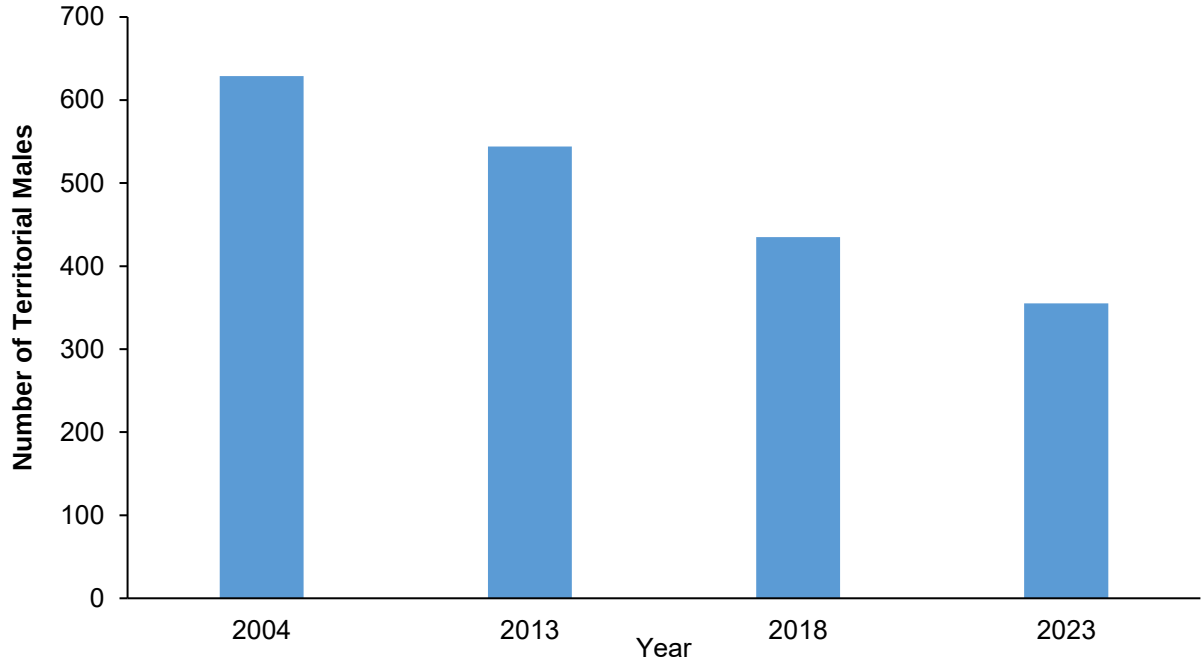

Figure 1. Number of territorial males recorded in the New Forest over time

A comparison of the territory centres for 2013, 2018 and 2023 shows an overall reduction in range and density of territories, as illustrated by Map 11. However, additional areas were surveyed in 2018 which were not resurveyed in 2023. This includes territories recorded in Barton on Sea, Keyhaven, Roydon Woods Hampshire & Isle of Wight Wildlife Trust Reserve, and a number of woodlands and inclosures at the centre of the New Forest.

During the 2013 surveys, there were particularly dense clusters of records, compared to 2018, around the north-west of the survey area (Millersford Bottom and Stoney Quarry Bottom; Latchmore Bottom and Long Bottom), central west Forest (Harvest Slade Bottom), south-west Forest (Wilverley Plain) and south-east Forest (Stockhill Inclosure and Hawkley Inclosure). When comparing the 2023 data with the two previous survey years, the reduction in territories appears to be widespread across the Forest, rather than concentrated in any one area. The data suggests there are more individual territories in the south-east between Dibden, Beaulieu and Blackfield, and between South Baddesley and Beaulieu Heath, but a slight contraction in range. However, there is a large contraction in range to the south-west of the New Forest between Sway and Holmsley.

As several of the nightjar territories recorded in previous years were not associated with a transect route, it may potentially be misleading to make direct comparisons between the overall territory figures. In 2023, data was only collected from surveys along the transect routes and no additional records were gathered. Therefore, to allow for a better comparison and understanding of long-term trends, the data from 2013 and 2018 was filtered by its proximity to a transect route. A buffer of 600m was applied to each transect and only territories within that were considered (Table 3). A buffer of 600m was used as it covered all the 2023 territories and therefore shows the area that could reasonably be seen by surveyors along the transects. This removes any additional datasets that were sent in separately in

previous years, which are likely to have contributed to the higher territory totals. Despite this, there is still an apparent decline in the population size. However, this shows a decline of just 10% when looking solely at territories associated with the transect routes, as opposed to a decline of 19% when taking into account all datasets.

Table 3. Comparison of number of territories associated with transect routes over time

Year	No. of Territories	No. of Territories within 600m of the 2023 Transect Routes
2013	544	500
2018	435	393
2023	353	353

4.2.2. Distribution

Analysis of distribution by 1km squares indicates that nightjar occupancy has reduced slightly (by 13%) from 2018 to 2023, from 214 squares to 187 squares.

However, there has been a change in distribution. In 2013, distribution was more compact with territories focused on adjoining squares. In 2018, the distribution of territories was sparser, but reflected a slight range expansion into previously unoccupied 1km squares. This can be seen to the north of the Forest in the Godshill area and in the centre of the Forest around Lyndhurst, as shown on Map 12. The nightjar territory range has continued to expand to the north of the Forest in Godshill in 2023, as well some new territories in the south-west towards Bransgore, Brockenhurst and east of Lyndhurst. Comparisons of 1km square occupancy in 2013, 2018 and 2023 are shown in Map 13.

Comparing to the previous years, there appear to be significantly fewer territories in the centre of the New Forest between Bolderwood and Fritham, between Brockenhurst and Beaulieu, and in the south between Brockenhurst and Burley.

4.2.3. Comparison to sites outside the New Forest

Data for trends in nightjar populations on the Dorset Heaths and Thames Basin Heaths was investigated.

Analysis of data for nightjar on the Dorset Heaths suggests an average decline in numbers per year of 0.43% from 1991 to 2013. Effectively, numbers have remained stable during this period (Fearnley & Liley 2014).

Additional data on the urban Dorset Heaths has been collected by the RSPB between 2009 and 2022 (Dieck, 2022). This has shown that the total number of nightjar records on these sites has increased from 267 recorded individuals to 494. However, most of these sites were not surveyed every year within this period. Therefore, to take this into account, the total nightjars observed per survey was calculated. The general trend is that nightjar numbers within urban heaths have increased slightly over these years of monitoring (Figure 2). The total number of nightjars recorded each year ranges between nine and 16. Sites do fluctuate in total nightjar abundance over the years, but generally show a stable or slightly increasing trend. However, it should be taken into consideration that survey effort has increased over the years, with a lot of sites not surveyed until 2014/15, which could contribute to these increased numbers.

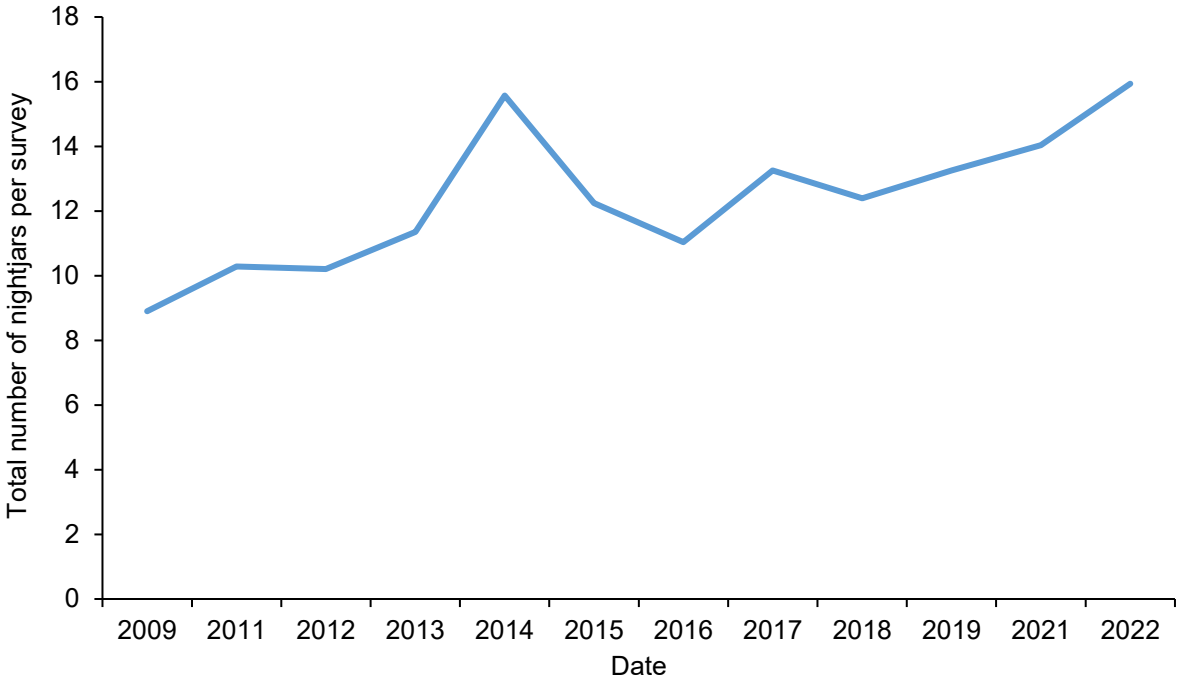

Figure 2. Total number of nightjars recorded in urban Dorset Heaths between 2009 and 2022

Results for Thames Basin Heaths indicate the numbers, although fluctuating from 306 at its lowest to 355 at its highest, have remained relatively stable during monitoring from 2010 to 2016 (2Js Ecology 2016).

No other new datasets have become available in recent years and therefore it is not possible to draw any additional conclusions or comparisons with data published anymore recent than 2013 for Dorset Heaths and 2016 for the Thames Basin Heaths.

4.3. Additional Wildlife Sightings

During the nightjar surveys in 2023, a number of other species were also recorded along the transects in the New Forest. These included birds such as cuckoo *Cuculus canorus*, Dartford warbler, meadow pipit *Anthus pratensis*, snipe *Gallinago gallinago*, stonechat *Saxicola rubicola*, tawny owl *Strix aluco*, woodcock *Scolopax rusticola* and woodlark, as well as glow worm *Lampyris noctiluca*.

5. ASSESSMENT OF CURRENT STATUS

The 2023 surveys suggest that the New Forest nightjar population has suffered a significant decline since the previous national and targeted surveys of the Forest.

In addition, comparison with data from neighbouring nightjar sites of the Dorset and Thames Basin heaths indicates these populations are relatively stable compared with the New Forest population. Although it must be noted that this data is collected on an annual basis and does not contain recent data, covering the periods 1991 to 2013 and 2010 to 2016 respectively. Although there is more recent data on the Dorset Heaths between 2009 and 2022, this is in relation to urban heaths, and not directly comparable. The collation of regular annual data enables more accurate assessment in population trends, as it allows for anomalies in the data to be identified and explained, such as extreme weather events.

This year may not have provided an accurate representation of nightjar numbers for comparison to the baseline data as the unsettled and extreme weather events of 2023 may have affected nightjar migration, and consequently reduced the number of breeding nightjar this year. However, given the effects of global warming and more frequent extreme weather events, this is likely to continue to affect nightjar populations and any future survey results. The assessment that the population has declined also makes the assumption that the 2004 and 2013 surveys carried out within the New Forest produced an accurate assessment of the New Forest nightjar population. There is currently no other data available for other sites for 2023, or in recent years, to assess if there has been a similar trend elsewhere.

6. CONCLUSION

The survey suggests that nightjar numbers are declining in the Forest when compared to the 2004/05, 2013 and 2018 survey data. Additionally, there have been slight changes in density and range, with nightjar territories becoming more densely clustered where they are present, but being lost elsewhere. However, the number of territorial males (as a representation of breeding pairs) still exceeds the SPA target of 300 breeding pairs (6.5%) of the breeding population in Great Britain (JNCC 2019).

Additional areas were surveyed in 2018, which were not resurveyed in 2023, which may have contributed to the apparently lower number of territories. However, when making direct comparisons, accounting solely for nightjars observed from transect routes, a decline (of 10%) is still evident. In addition, data is missing for six surveys, which will also have contributed to the lower numbers of nightjar records.

The purpose of this study was to assess the current trend in the New Forest nightjar population compared to previous local and national surveys, and not the possible cause and effect of the population trend. However, some potential causes have been suggested below, both localised and national/international, as to why the population may have declined from the previous surveys, in order to identify areas for further investigation and highlight the requirement for additional surveys. The list of possible causes is not considered exhaustive, there may be other factors influencing the number of nightjars that have not been identified or considered.

The decline may be due to the unsettled and extreme weather events during 2023, potentially resulting in fewer birds returning to the Forest. Unpredictability of the weather, and extremes of temperature and rainfall, are likely to have had an impact on plants and consequently the invertebrates that nightjar prey upon. Anecdotally, males have still been heard churring late into the summer in August, which may be an indication of disruptions to their breeding cycle and suggests the presence of unpaired males. It is therefore recommended that further surveys are carried out at regular intervals to establish if this is a declining trend or the consequence of other factors such as weather events. Further survey work and additional assessment of localised factors such as habitat management, changes to habitat type, grazing density and recreational use of areas will also help to establish whether there is a correlation between the decline and other factors. These additional surveys may also enable identification of local mitigation measures that might help to reverse the decline, or habitat creation and management opportunities to increase numbers.

Other potential factors include loss of habitat, such as through development, forestry works or changes in habitat management practices, such as overgrazing or lack of management, among others. In addition, there is high recreational pressure in the New Forest which has increased significantly in recent years. Extensive areas of new residential development are being constructed throughout Hampshire, likely resulting in increased impacts from new occupiers, including dog walkers, to protected sites such as the New Forest (Lily *et al*, 2020). More detailed survey work should be focused on areas where the most significant declines in nightjar territories have occurred, enabling causal factors to be determined. Specifically, efforts should be made to identify if these declines are linked to changes in habitat management on breeding habitats, or are likely to result from external factors, such as adverse conditions during the birds' migration or while over-wintering in Africa.

The changes in 1km square occupancy also require further investigation to identify potential causes. A change in distribution may suggest that those areas previously occupied have become "saturated", having reached carrying capacity, and are no longer able to support any more individuals. Where nightjars are present, they appear to be at high densities, which may be due to improved management increasing the carrying capacity of the site. However, as the numbers have declined overall since the previous survey, other factors may be influencing this change. Possible areas to consider are:

- localised changes to habitat type e.g. recently felled conifer plantations and heathland restoration which may have created new areas of suitable habitat for nightjars to extend into, whilst others through a process of succession have started to become less favourable;
- localised changes to management practices, such as grazing intensity, to identify if there is a link between the previous and current square occupancy, and management practices, and whether these have had a positive, negative or no impact; and
- recreational pressure and disturbance, to identify if there has been a change in potential levels of disturbance.

When available, a comparative desk assessment of 2023 nightjar survey data from sites outside of the New Forest should also be carried out, to establish if declines are widespread across the country. This may help determine whether factors outside of habitat management, such as weather and migration, are the likely cause of the decrease in territorial males, or if the decline is confined to the New Forest, with the cause more likely to be attributable to local factors.

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- **RSPB** Wildlife and Countryside Act Wildlife & Countryside Act 1981 - The RSPB [accessed 21st September 2023].

MAPS

Location within county:

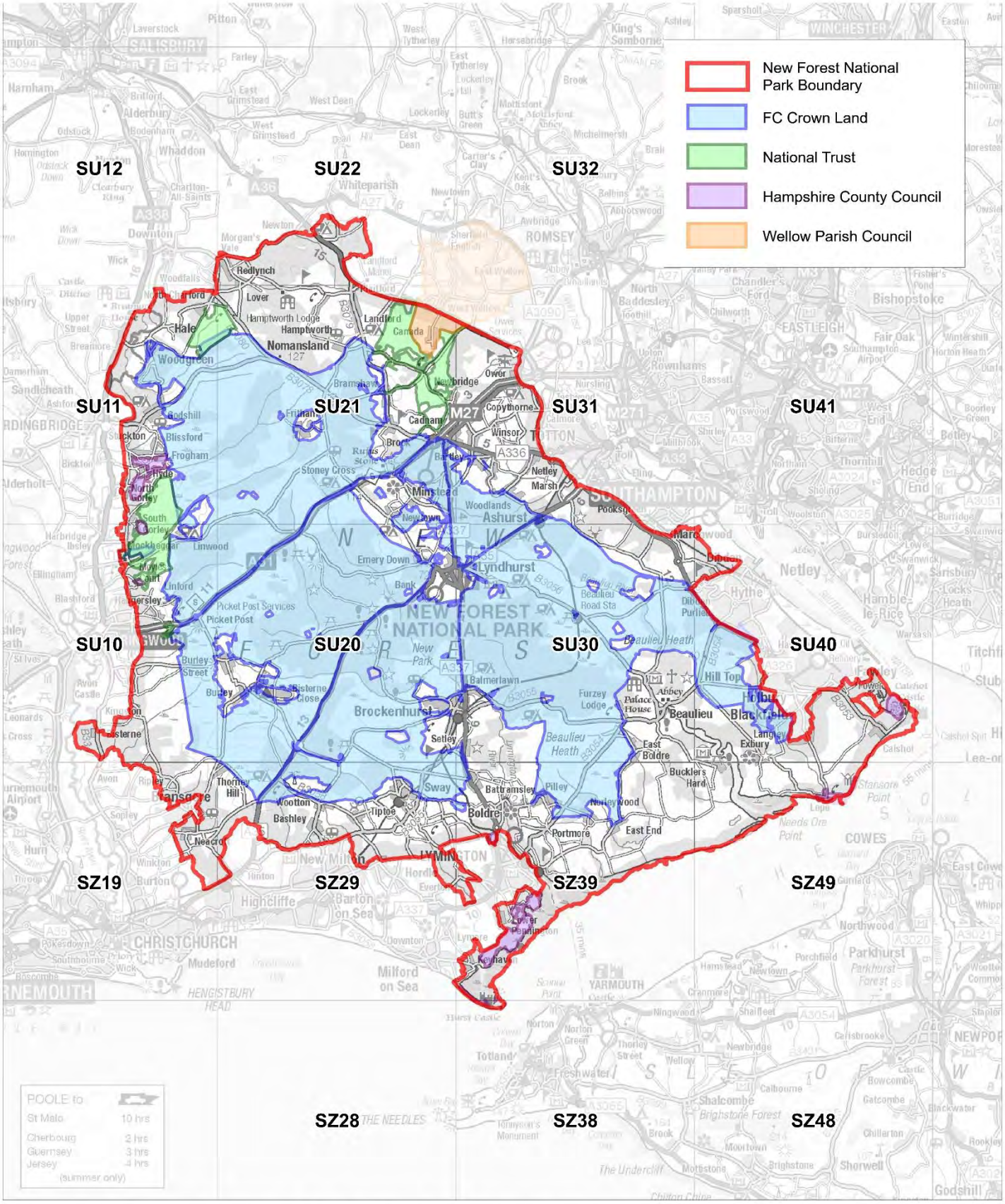
Map 1 - Survey Area

Ordnance Survey basemap (1:250,000)

Scale - 1:200,000

Arcadian

Hampshire & Isle of Wight Wildlife Trust



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Location within county:

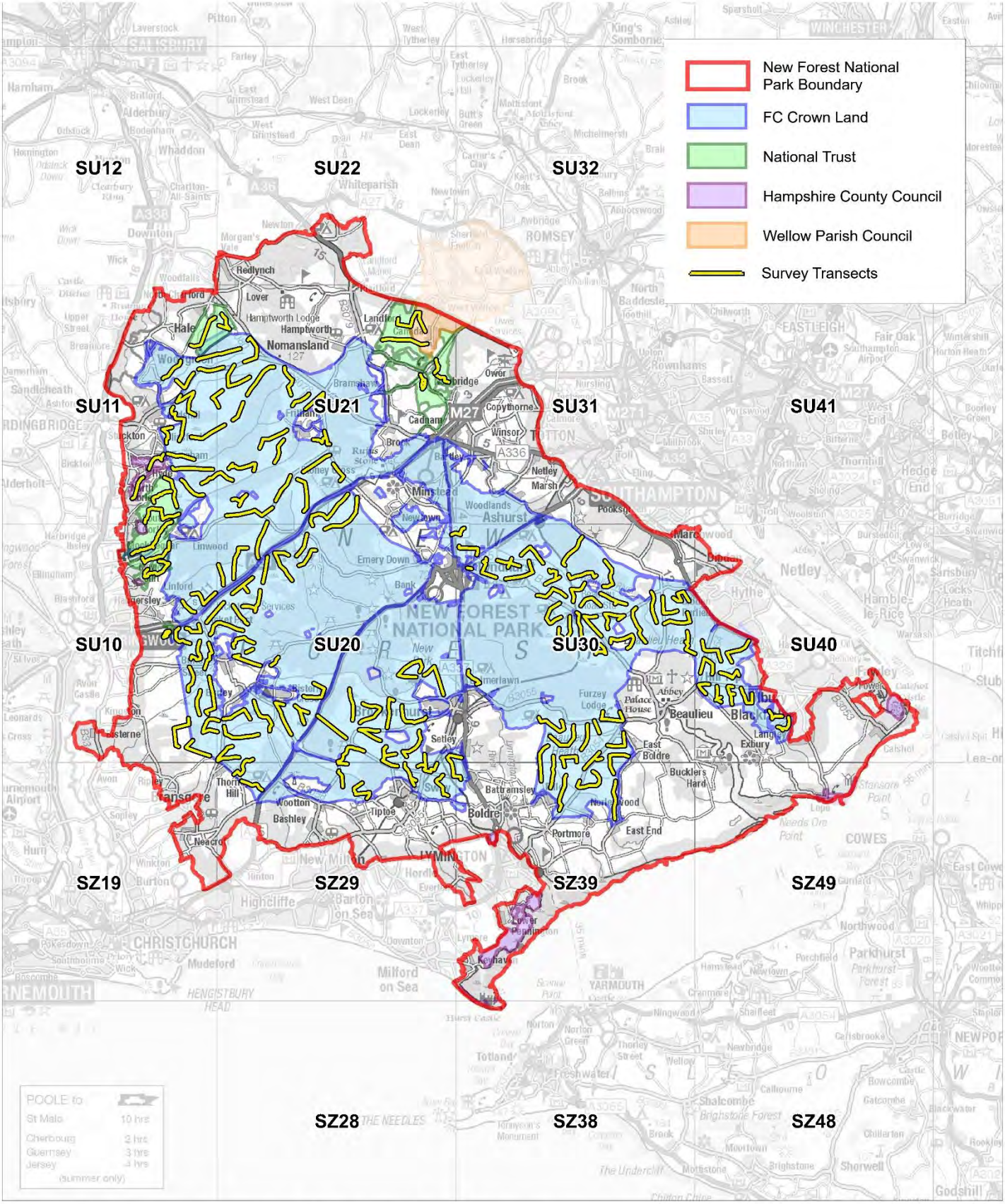
Map 2 - Transect Routes

Ordnance Survey basemap (1:250,000)

Scale - 1:200,000

Arcadian

Hampshire & Isle of Wight Wildlife Trust



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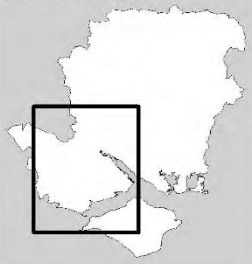


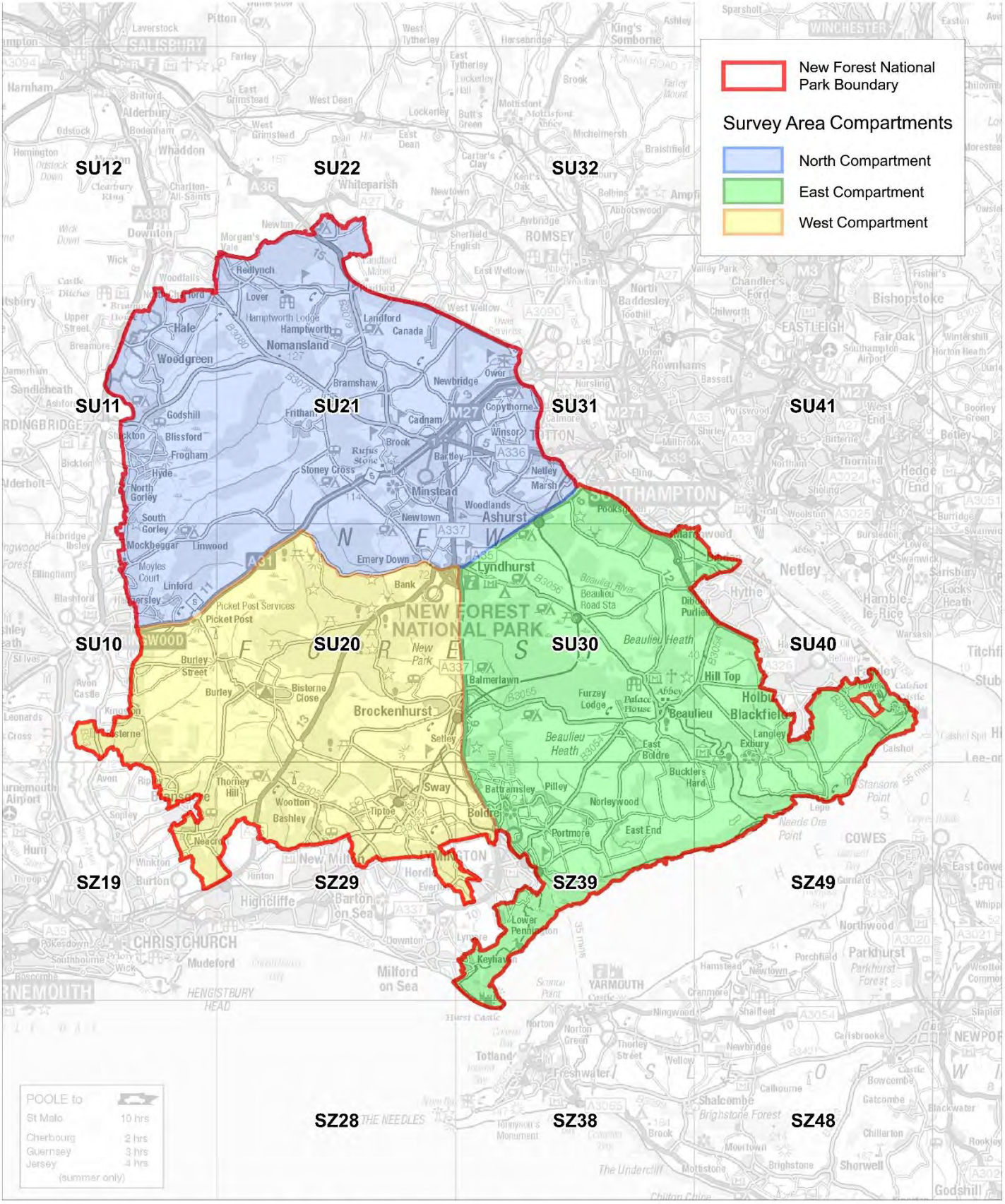
Map 3 - Survey Area Compartments

Ordnance Survey basemap (1:250,000)

Scale - 1:200,000

Arcadian

Hampshire & Isle of Wight Wildlife Trust



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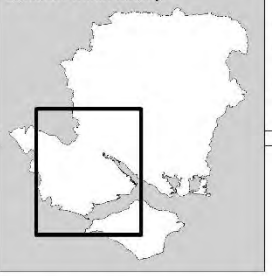


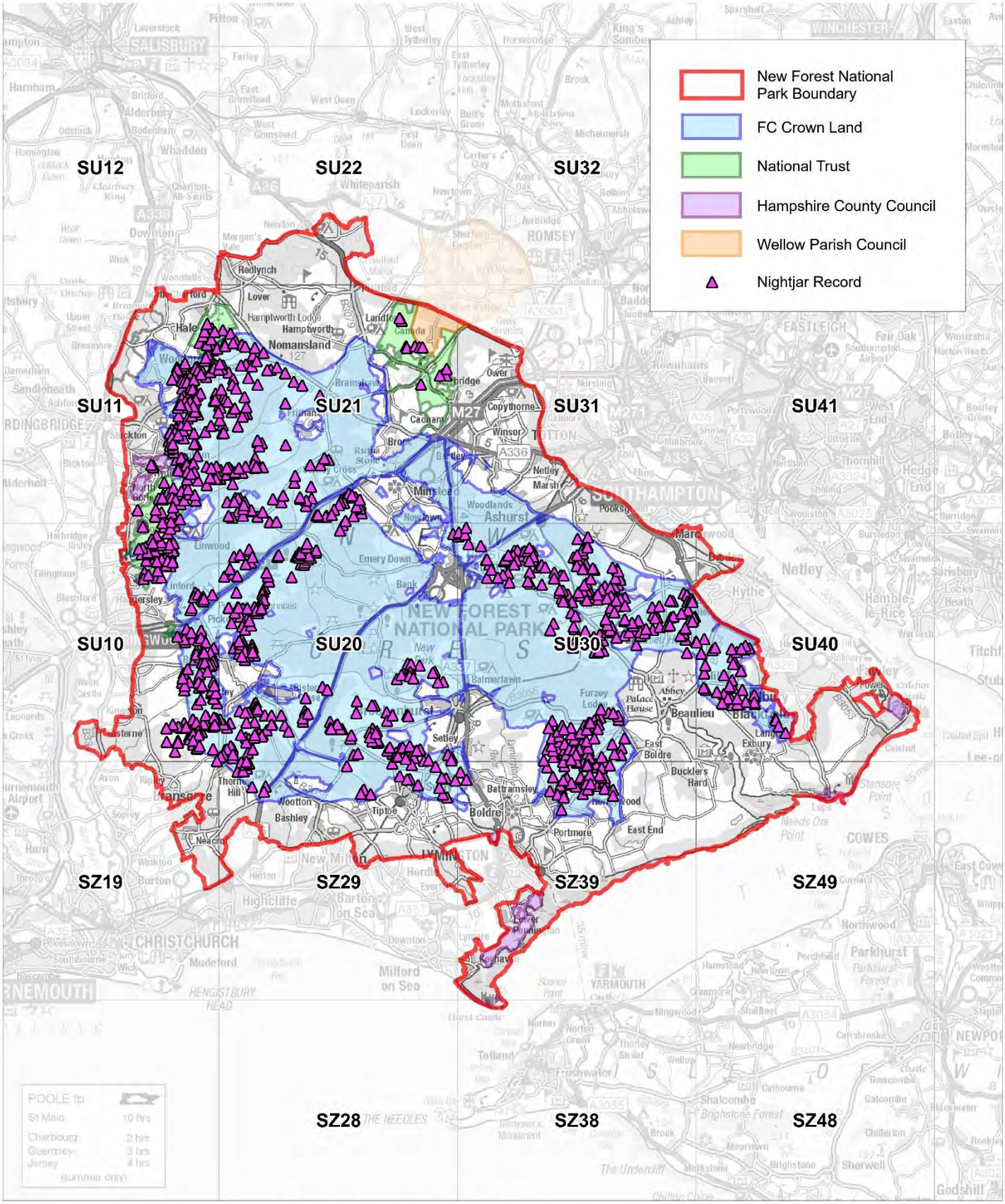
Map 4 - All Nightjar Records

Ordnance Survey basemap (1:250,000)

Scale - 1:200,000

Arcadian

Hampshire & Isle of Wight Wildlife Trust



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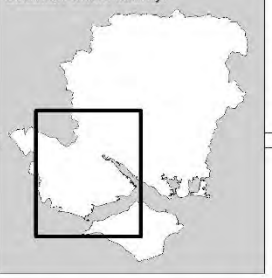
BAP Priority habitat, notable species and SINC data supplied by the Hampshire Biodiversity Information Centre on behalf of the HBIC Partnership.
Aerial photography courtesy of GetMapping plc. Produced on 25 September 2023 by Alex Glossop

Location within county:



Map 5 - All Nightjar Records (North Compartment)

Ordnance Survey basemap (1:50,000)

Scale - 1:100,000

Arcadian

Hampshire & Isle of Wight Wildlife Trust

North Compartment Boundary

Survey Transects

Nightjar Record (Flight)

Nightjar Record (Point)

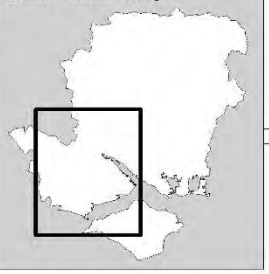
SU12 SU22 SU32

SU11 SU21 SU31

SU10 SU20 SU30

N

Location within county:



Map 6 - All Nightjar Records (East Compartment)

Ordnance Survey basemap (1:50,000)

Scale - 1:100,000

Arcadian

Hampshire & Isle of Wight Wildlife Trust

East Compartment Boundary

Survey Transects

Nightjar Record (Flight)

Nightjar Record (Point)

SU30

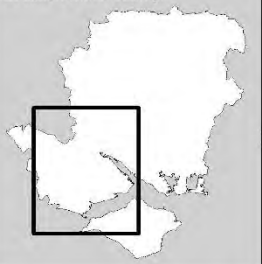
SU40

SZ39

SZ49

N

Location within county:



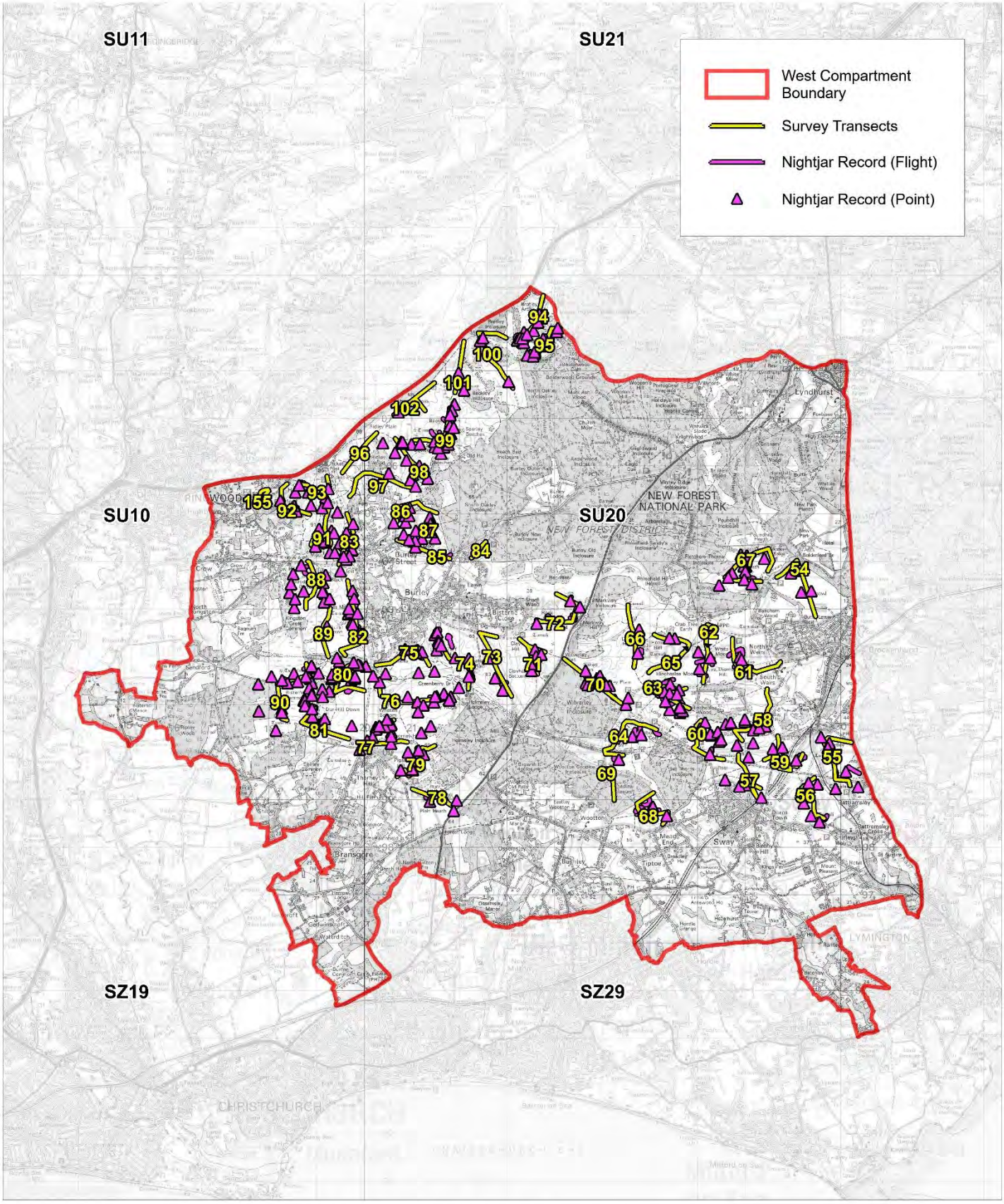
Map 7 - All Nightjar Records (West Compartment)

Ordnance Survey basemap (1:50,000)

Scale - 1:100,000

Arcadian

Hampshire & Isle of Wight Wildlife Trust



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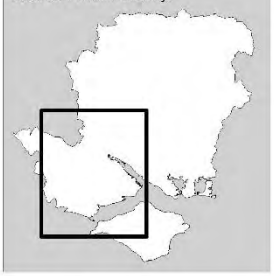


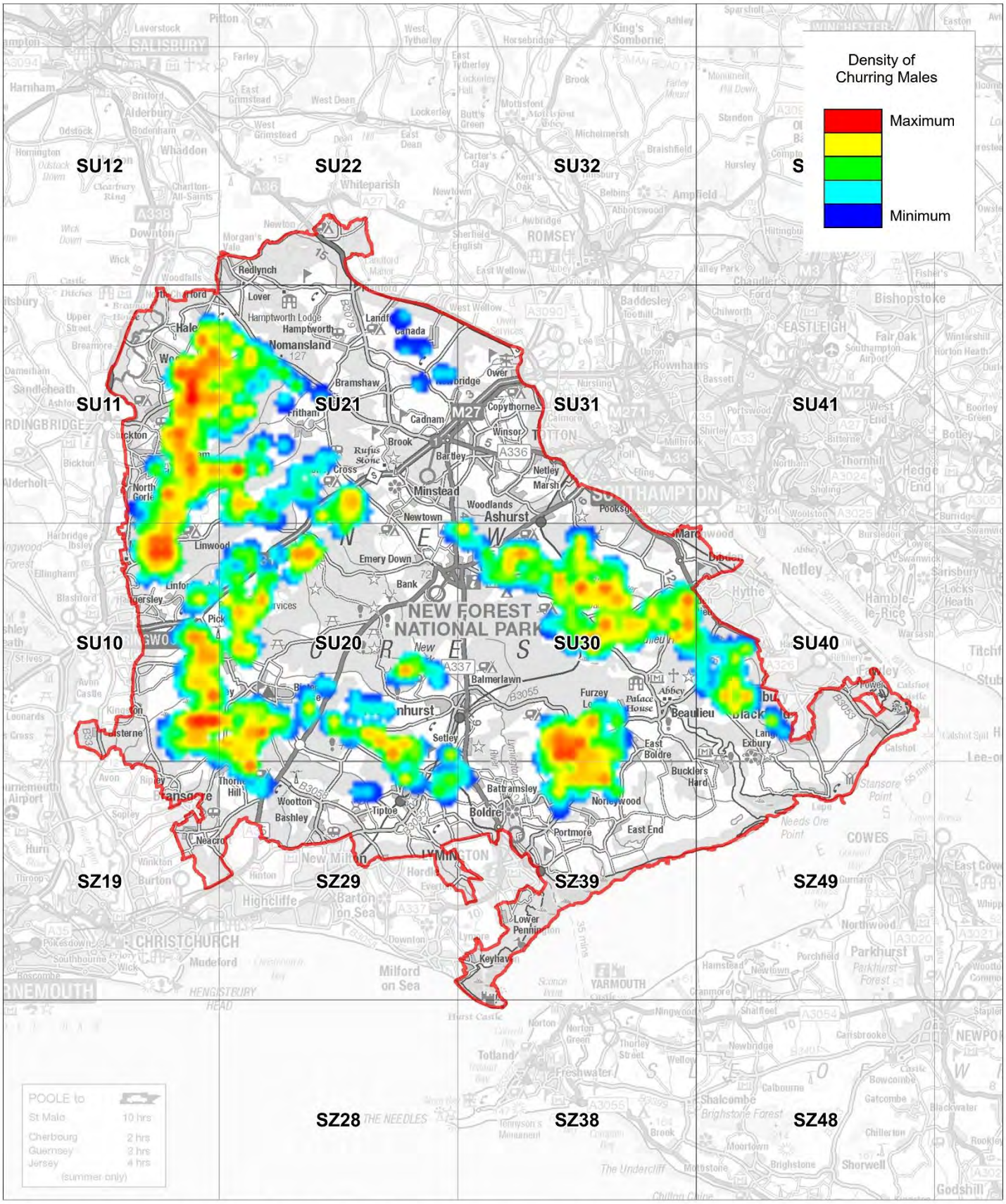
Map 8 - Heat Map of Churring Males

Ordnance Survey basemap (1:250,000)

Scale - 1:200,000

Arcadian

Hampshire & Isle of Wight Wildlife Trust



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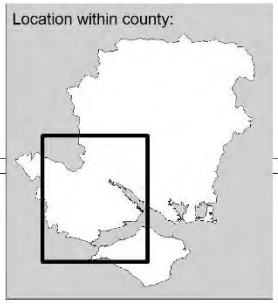


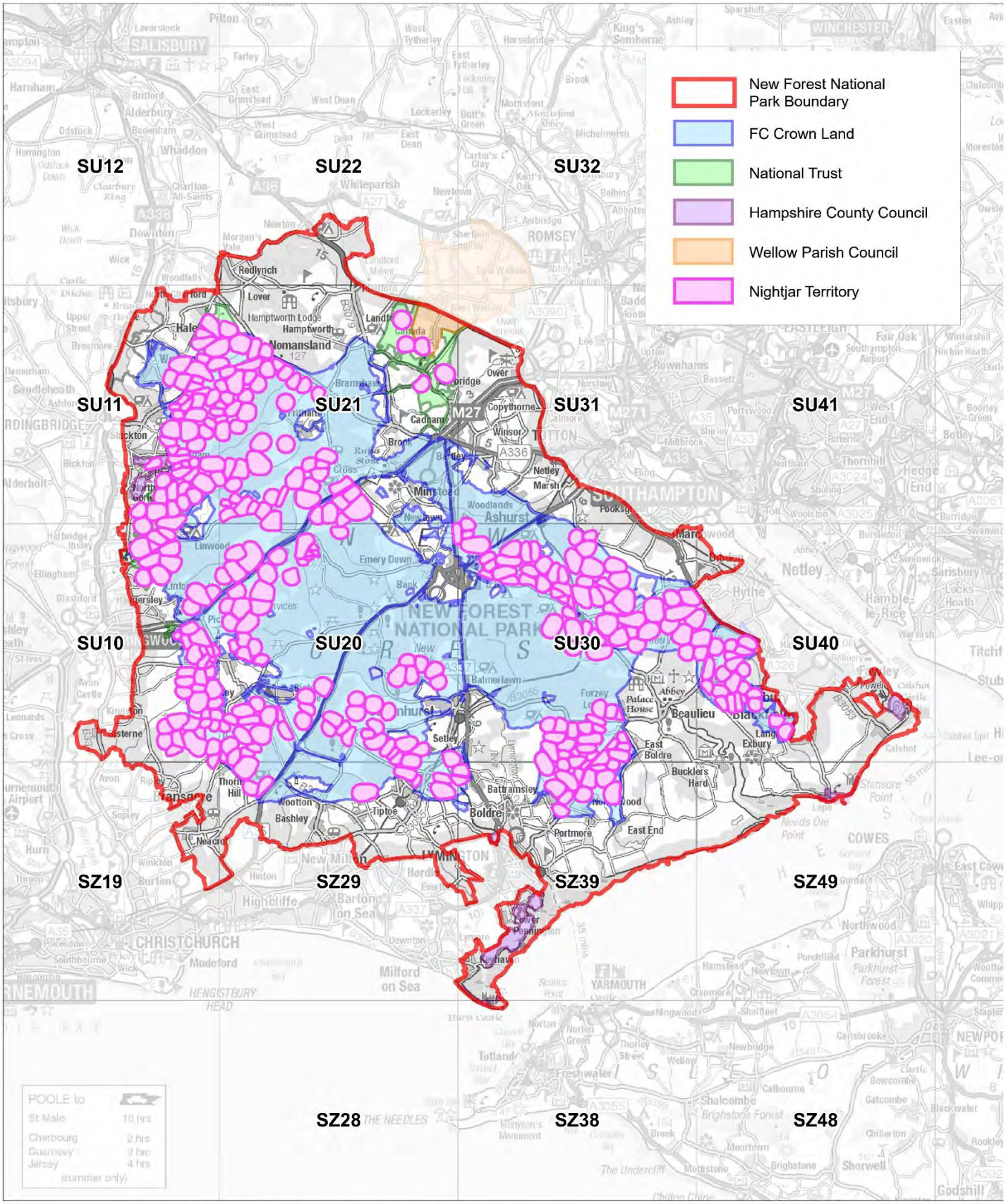
Map 9 - Nightjar Territories

Ordnance Survey basemap (1:250,000)

Scale - 1:200,000

Arcadian

Hampshire & Isle of Wight Wildlife Trust



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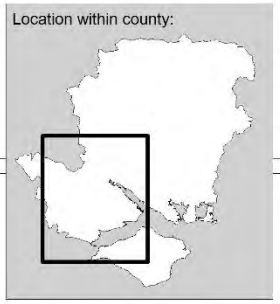


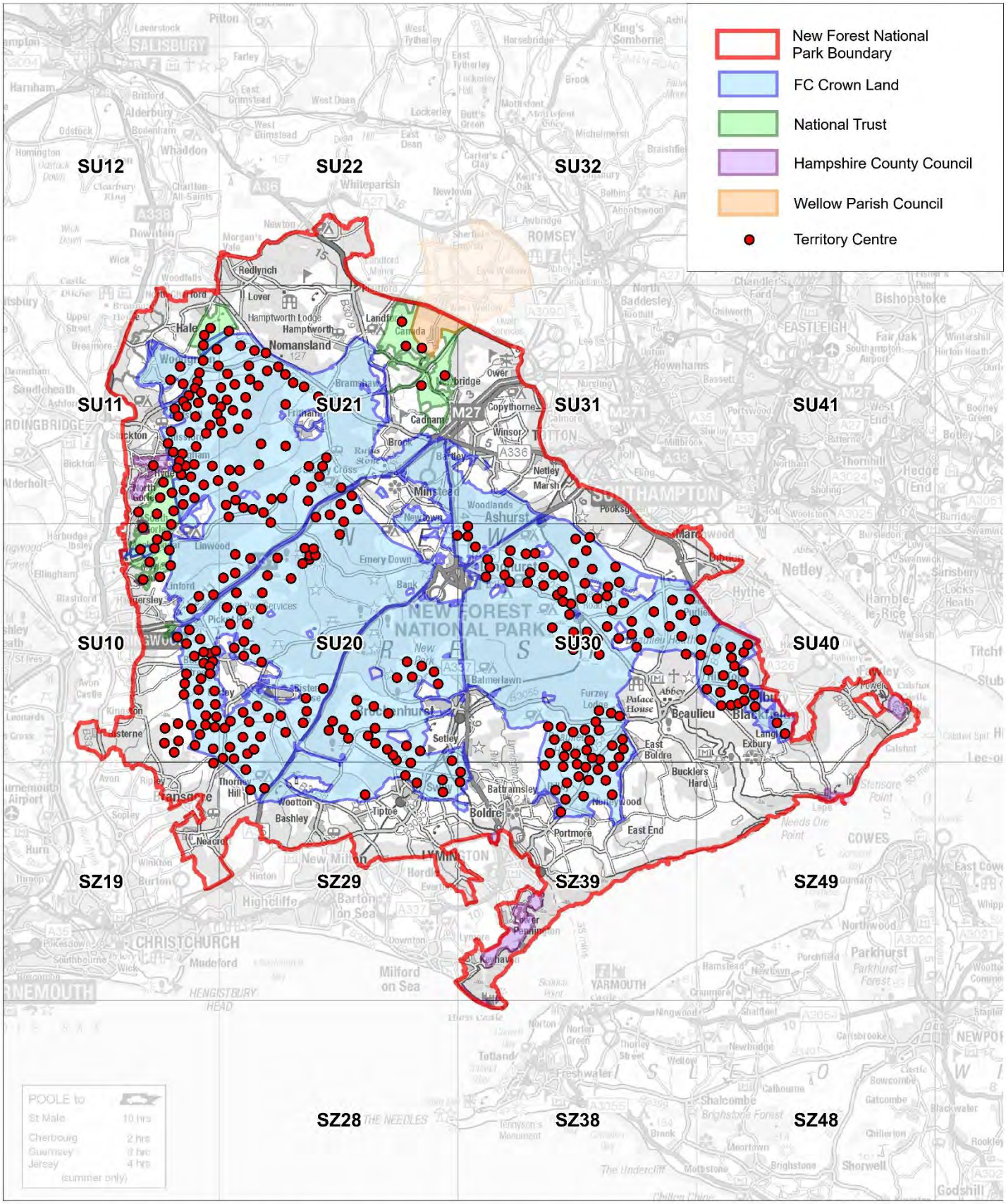
Map 10 - Territory Centres

Ordnance Survey basemap (1:250,000)

Scale - 1:200,000

Arcadian

Hampshire & Isle of Wight Wildlife Trust



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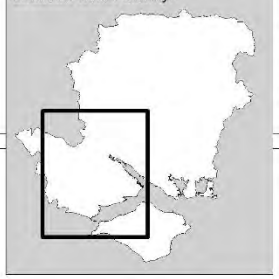
Location within county:



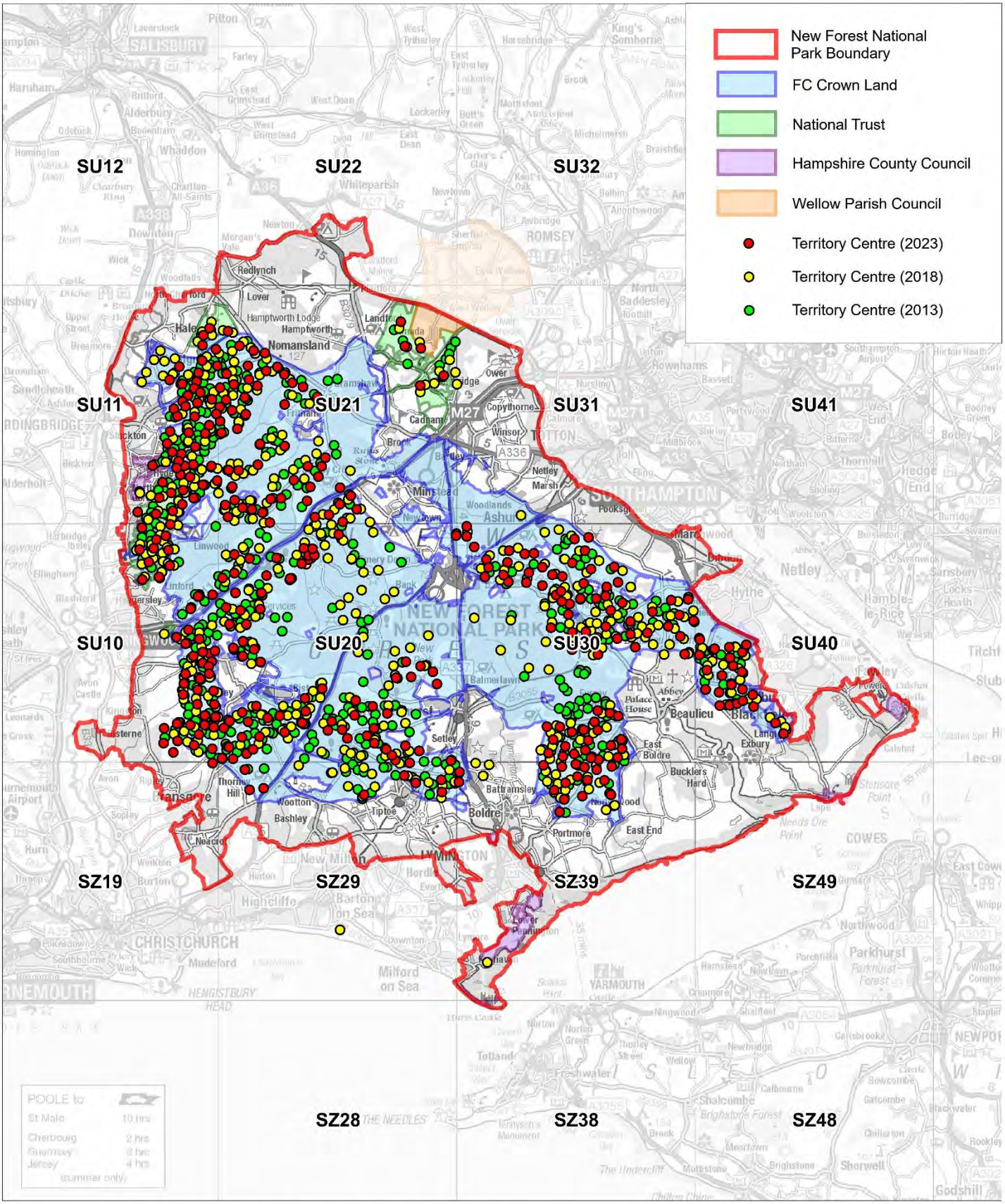
Map 11 - Territory Centres (2023, 2018 & 2013)

Ordnance Survey basemap (1:250,000)

Scale - 1:200,000

Arcadian

Hampshire & Isle of Wight Wildlife Trust



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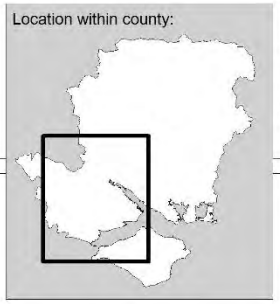
Location within county:



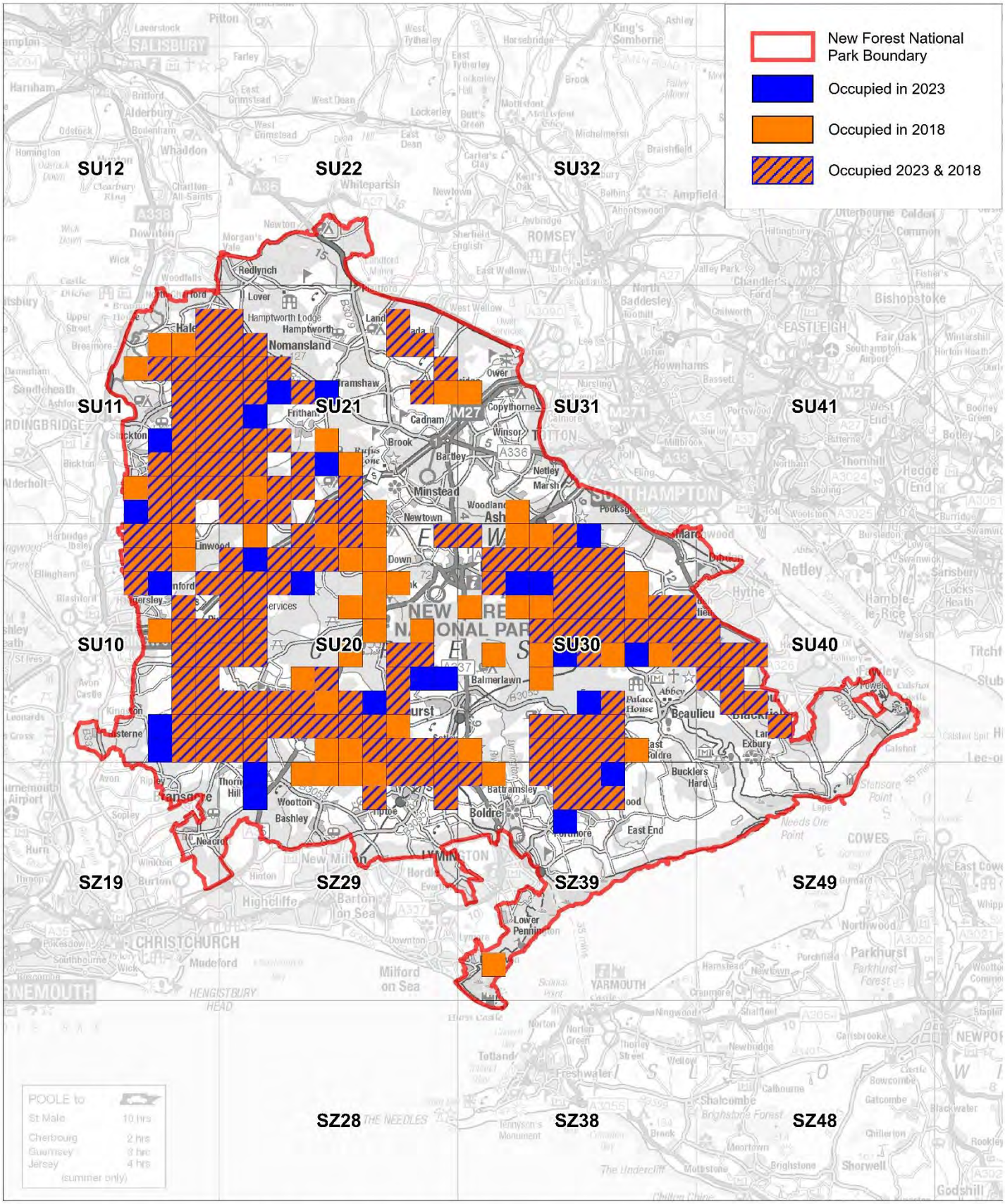
Map 12 - 1km Square Occupancy (2023 & 2018)

Ordnance Survey basemap (1:250,000)

Scale - 1:200,000

Arcadian

Hampshire & Isle of Wight Wildlife Trust



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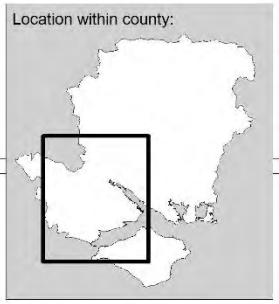
Location within county:



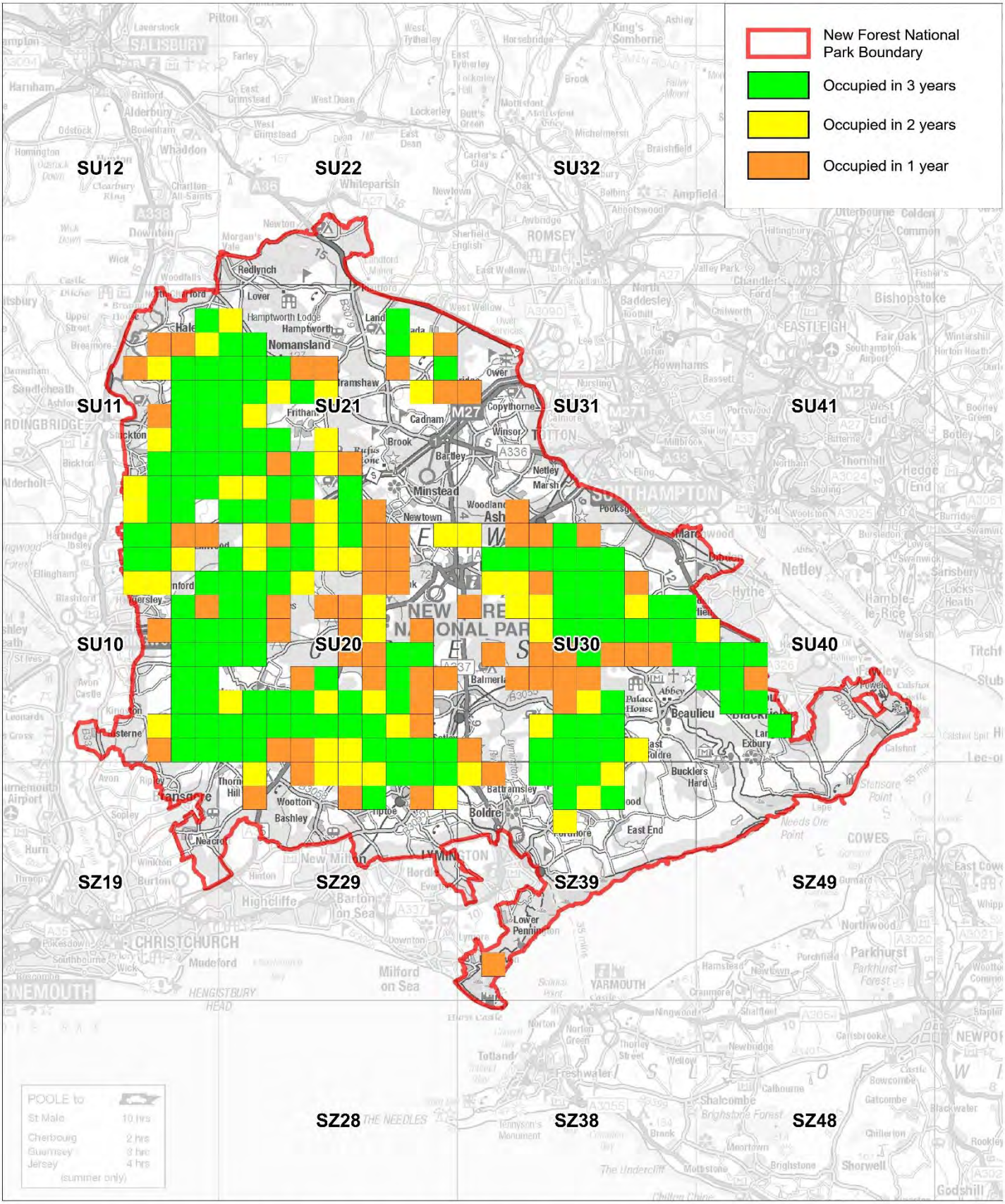
Map 13 - 1km Square Occupancy (2023, 2018 & 2013)

Ordnance Survey basemap (1:250,000)

Scale - 1:200,000

Arcadian

Hampshire & Isle of Wight Wildlife Trust



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BAP Priority habitat, notable species and SINC data supplied by the Hampshire Biodiversity Information Centre on behalf of the HBIC Partnership.
Aerial photography courtesy of GetMapping plc. Produced on 25 October 2023 by Alex Glossop

APPENDICES

APPENDIX 1:

Summary of raw nightjar data collected during the 2023 surveys

Appendix 1. Raw nightjar data during the 2023 surveys

Transect Location	Transect Number	Survey	Date	Start Time	Finish Time	Average Temp. (°C)	Average Wind Speed	Wind Direction	Cloud Cover (1 - 8)	Moon Phase	Notes	Estimated Number of Males	Maximum Number of Males per Transect	Submission Method	Organisation
East Boldre	1	A	14/06/2023	21:35	22:07	18	0	N/A	0	Half moon		0	1	Survey123	Arcadian/HIWWT
East Boldre	1	B	02/07/2023	22:25	22:47	14	0	N/A	4	Full moon		1		Survey123	Arcadian/HIWWT
East Boldre	2	A	14/06/2023	21:09	21:33	18	0	N/A	0	Half moon		0	2	Survey123	Arcadian/HIWWT
East Boldre	2	B	02/07/2023	21:41	22:13	14	0	N/A	4	Full moon		2		Survey123	Arcadian/HIWWT
East Boldre	3	A	14/06/2023	22:27	23:00	18	0	N/A	0	Half moon		3	3	Survey123	Arcadian/HIWWT
East Boldre	3	B	02/07/2023	21:10	21:40	14	0	N/A	4	Full moon		0		Survey123	Arcadian/HIWWT
East Boldre	4	A	31/05/2023	22:04	22:57	14	3	NE	0	Waning gibbous		3	4	Survey123	Arcadian/HIWWT
East Boldre	4	B	06/07/2023	21:50	22:45	13	4	N	1	Waning gibbous		4		Survey123	Arcadian/HIWWT
East Boldre	5	A	31/05/2023	21:04	21:56	17	3	NE	0	Waning gibbous		2	5	Survey123	Arcadian/HIWWT
East Boldre	5	B	07/07/2023	02:10	03:10	13	3	NW	0	Waning gibbous		5		Survey123	Arcadian/HIWWT
Pilley	6	A	29/05/2023	21:05	21:43	12	2	NE	1	Half moon	A5 and A6 were likely the same bird and both flying despite appearing to come from a different direction. Fairly close by	3	3	Survey123	Arcadian/HIWWT
Pilley	6	B	12/07/2023	21:46	22:21	18	1	SW	1	Not visible		3		Survey123	Arcadian/HIWWT
Pilley	7	A	29/05/2023	21:06	21:50	13	4	NE	1	Waxing gibbous	Cuckoo calling. A1 assumed perching as call static but not seen	1	1	Survey123	Arcadian/HIWWT
Pilley	7	B	06/07/2023	22:40	23:15	16	0	N/A	1	Waning gibbous		1		Survey123	Arcadian/HIWWT
Pilley	8	A	29/05/2023	22:05	22:52	13	4	NE	1	Waxing gibbous		0	3	Survey123	Arcadian/HIWWT
Pilley	8	B	06/07/2023	21:30	22:30	16	0	N/A	1	Waning gibbous	Lots of birds on second half of transect in areas of older gorse. Multiple birds all around near end of transect near old airfield.	3		Survey123	Arcadian/HIWWT
Hatchet Moor	9	A	14/06/2023	21:34	22:26	18	0	N/A	3	Not recorded		2	3	Survey123	Arcadian/HIWWT
Hatchet Moor	9	B	17/07/2023	21:40	22:35	15	1	SW	2	Not visible		3		Survey123	Arcadian/HIWWT
Hatchet Moor	10	A	15/06/2023	22:17	23:09	15	0	N/A	1	Not recorded		3	3	Survey123	Arcadian/HIWWT
Hatchet Moor	10	B	18/07/2023	02:31	03:14	12	1	W	3	New moon		3		Survey123	Arcadian/HIWWT
Hatchet Moor	11	A	15/06/2023	21:39	22:14	17	0	N/A		Not recorded		3	4	Survey123	Arcadian/HIWWT
Hatchet Moor	11	B	17/07/2023	21:34	22:30	17	3	E	3	New moon		4		Survey123	Arcadian/HIWWT
Langley	12	A	08/06/2023	22:02	22:22	18	1	-	0	Not recorded		1	1	Survey123	Volunteer - new recruit
Langley	12	B	28/06/2023	21:26	22:00	19	1	-	7	Not recorded		1		Survey123	Volunteer - new recruit
Langley	13	A	08/06/2023	21:45	22:00	20	0	N/A	0	Not recorded	Nightjars recorded on walk back after completion of transect	1	1	Survey123	Volunteer - new recruit
Langley	13	B	26/06/2023	21:31	22:13	18	0	N/A	3	Not recorded		0		Survey123	Volunteer - new recruit
Hill Top	14	A	04/06/2023	21:30	22:00	18	0	N/A	1	Full moon		3	3	Paper Form	Arcadian/HIWWT
Hill Top	14	B	06/07/2023	22:05	22:35	16	2	-	3	Waning gibbous		2		Paper Form	Arcadian/HIWWT
Hill Top	15	A	04/06/2023	21:30	22:00	18	0	N/A	1	Full moon		2	2	Paper Form	Arcadian/HIWWT

Transect Location	Transect Number	Survey	Date	Start Time	Finish Time	Average Temp. (°C)	Average Wind Speed	Wind Direction	Cloud Cover (1 - 8)	Moon Phase	Notes	Estimated Number of Males	Maximum Number of Males per Transect	Submission Method	Organisation
Hill Top	15	B	06/07/2023	22:05	22:35	16	2	-	3	Waning gibbous		2		Paper Form	Arcadian/HIWWT
Hill Top	16	A	13/06/2023	22:05	22:25	20	3	NE	1	Waxing crescent		2	2	Paper Form	Arcadian/HIWWT
Hill Top	16	B	13/07/2023	22:05	22:30	16	1	-	2	Waxing crescent		2		Paper Form	Arcadian/HIWWT
Hill Top	17	A	13/06/2023	22:05	22:25	20	3	NE	1	Waxing crescent		1	1	Paper Form	Arcadian/HIWWT
Hill Top	17	B	13/07/2023	22:05	22:30	16	1	-	2	Waxing crescent		0		Paper Form	Arcadian/HIWWT
Hardley/Dibden	18	A	06/06/2023	21:30	21:50	16	4	N	0	Full moon		1	1	Paper Form	Arcadian/HIWWT
Hardley/Dibden	18	B	17/07/2023	22:15	22:42	15	0	N/A	4	New moon		1		Paper Form	Arcadian/HIWWT
Hardley/Dibden	19	A	06/06/2023	21:55	22:20	15	4	N	0	Full moon		2	2	Paper Form	Arcadian/HIWWT
Hardley/Dibden	19	B	17/07/2023	21:50	22:10	15	0	N/A	4	New moon		1		Paper Form	Arcadian/HIWWT
Hardley/Dibden	20	A	03/06/2023	21:36	21:55	17	3	NE	0	Full moon		4	4	Paper Form	Arcadian/HIWWT
Hardley/Dibden	20	B	07/07/2023	21:40	22:10	22	3	ESE	0	Waning gibbous		2		Paper Form	Arcadian/HIWWT
Hardley/Dibden	21	A	03/06/2023	22:05	22:36	17	3	NE	0	Full moon		0	2	Paper Form	Arcadian/HIWWT
Hardley/Dibden	21	B	07/07/2023	22:17	22:40	22	3	ESE	0	Waning gibbous		2		Paper Form	Arcadian/HIWWT
Dibden	22	A	10/06/2023	21:00	22:00	16	0	N/A	0	Third quarter		3	3	Paper Form	Volunteer – experienced bird surveyor with Trust
Dibden	22	B	07/07/2023	21:30	23:10	24	0	N/A	0	Waning gibbous		3		Paper Form	Volunteer – experienced bird surveyor with Trust
Dibden Bottom	23	A	07/06/2023	21:10	22:30	15	0	N/A	0	Waning gibbous		3	3	Paper Form	Volunteer – experienced bird surveyor with Trust
Dibden Bottom	23	B	01/07/2023	21:30	22:40	15	0	N/A	0	Waxing gibbous		2		Paper Form	Volunteer – experienced bird surveyor with Trust
Dibden Bottom	24	A	28/05/2023	21:16	21:55	16	2	E	0	Half moon		3	3	Survey123	Volunteer - new recruit
Dibden Bottom	24	B	24/06/2023	21:40	22:15	18	0	N/A	0	Half moon		3		Survey123	Volunteer - new recruit
Dibden Bottom	25	A	27/05/2023	21:00	21:50	13	0	N/A	0	Half moon		2	2	Survey123	Volunteer - new recruit
Dibden Bottom	25	B	07/07/2023	21:35	22:21	22	1	E	0	Waning gibbous		2		Survey123	Volunteer - new recruit
Dibden Bottom	26	A	28/05/2023	21:00	22:00	-	1	-	0	First quarter		2	2	Paper Form	Volunteer – experienced bird surveyor with Trust
Dibden Bottom	26	B	02/07/2023	21:30	22:00	15	-	W	2	Waxing gibbous		2		Paper Form	Volunteer – experienced bird surveyor with Trust
Dibden Bottom	27	A	15/06/2023	20:58	22:59	19	0	N/A	3	Waxing crescent		3	3	Paper Form	Volunteer - new recruit
Dibden Bottom	27	B	18/07/2023	21:10	22:37	17	1	SW	8	Waxing crescent		2		Paper Form	Volunteer - new recruit
Ferny Crofts	28	A	12/06/2023	21:17	22:27	18	3	S/SW	0	Waning Crescent		3	3	Survey123	Arcadian/HIWWT
Ferny Crofts	28	B	18/07/2023	21:15	22:21	17	1	SW	8	New moon		3		Survey123	Arcadian/HIWWT
Ferny Crofts	29	A	10/06/2023	21:50	22:14	21	0	N/A	3	Third quarter		4	4	Paper Form	Arcadian/HIWWT

Transect Location	Transect Number	Survey	Date	Start Time	Finish Time	Average Temp. (°C)	Average Wind Speed	Wind Direction	Cloud Cover (1 - 8)	Moon Phase	Notes	Estimated Number of Males	Maximum Number of Males per Transect	Submission Method	Organisation
Ferny Crofts	29	B	25/06/2023	22:00	22:24	23	0	N/A	0	First quarter		3		Paper Form	Arcadian/HIWWT
Pig Bush area	30	A	10/06/2023	21:05	21:35	22	0	N/A	3	Third quarter		0	0	Paper Form	Arcadian/HIWWT
Pig Bush area	30	B	25/06/2023	21:15	21:45	24	0	N/A	0	First quarter		0		Paper Form	Arcadian/HIWWT
Pig Bush area	31	A	04/06/2023	21:24	22:15	22	0	N/A	0	Full moon		3	3	Survey123	Arcadian/HIWWT
Pig Bush area	31	B	27/06/2023	21:18	21:53	18	1	-	8	Waxing gibbous		1		Survey123	Arcadian/HIWWT
Pig Bush area	32	A	14/06/2023	21:35	22:56	17	1	W	3	Waning Crescent	A1 - Think this was west of the railway line A3 - Simultaneous churring with A5 A4 - Flew circles around me on raised bank in mire A5 - Simultaneous churring with A3	3	3	Survey123	Arcadian/HIWWT
Pig Bush area	32	B	06/07/2023	21:32	22:24	14	0	N/A	0	Waning Gibbous	B1 - Quite distant. Possibly to west of railway line B2 and B3 simultaneous churring B4 - Flew circles around surveyor on path B5 - Quite distant	3		Survey123	Arcadian/HIWWT
Pig Bush area	33	A	13/06/2023	21:35	22:05	20	2	NE	0	Waning Crescent	A1 - Flew around edge of canopy of stand of trees. Flew from high perch. A2 and A3 churring simultaneously A3 simultaneously churring with A2 & A4 at separate times A4 -possibly on edge of small woodland between Transect 33 and Decoy Pond Farm	3	3	Survey123	Arcadian/HIWWT
Pig Bush area	33	B	05/07/2023	22:28	22:50	12	2	W	1	Waning Gibbous	B1 and B5 simultaneously churring B4 - Quite distant	3		Survey123	Arcadian/HIWWT
Longdown	34	A	13/06/2023	22:20	22:55	16	0	N/A	0	Waning Crescent	A1 - Calling and wing clapping. Flew across transect from south to north A2 - Flew across transect from south to north A3 simultaneously churring with A4 & A5 at separate times A6 - Flew across transect from north to south A7 - Flew across transect from south to north A8 - Initially churring while perched, then took flight	3	3	Survey123	Arcadian/HIWWT

Transect Location	Transect Number	Survey	Date	Start Time	Finish Time	Average Temp. (°C)	Average Wind Speed	Wind Direction	Cloud Cover (1 - 8)	Moon Phase	Notes	Estimated Number of Males	Maximum Number of Males per Transect	Submission Method	Organisation
											(S) and wing clapped A9 simultaneous churring with A10. Initially churring while perched, then flew south-east				
Longdown	34	B	05/07/2023	21:35	22:09	12	1	N	1	Waning Gibbous	B1 and B2 simultaneously churring B3 - 1 x male churring. 3 x individuals seen flying/foraging in this area B4 - Initially 1 individual churring. Then 2 x flying around surveyors and across transect with wing clapping	3		Survey123	Arcadian/HIWWT
Longdown	35	A	15/06/2023	21:30	22:05	17	2	E	1	Waning Crescent	A1 - Very distant and faint churring heard to the east A2 and A4 churrings simultaneously	3	4	Survey123	Arcadian/HIWWT
Longdown	35	B	07/07/2023	21:44	22:15	19	1	W	2	Waning Gibbous	B1 - In or behind tree-line B2 - Not seen. On or behind tree-line B3 and B4 simultaneously churring B4 - Initially churring while perched, then flew N while calling B5 - Churring beyond mound to west of transect	4		Survey123	Arcadian/HIWWT
Longdown	36	A	06/06/2023	21:20	22:10	16	3	NE	0	Waning gibbous		4	4	Paper Form	Arcadian/HIWWT
Longdown	36	B	06/07/2023	21:32	22:20	15	2	SSE	1	Waning gibbous		2		Paper Form	Arcadian/HIWWT
Longdown	37	A	02/06/2023	21:05	22:15	16	3	ENE	0	Waxing gibbous		2	3	Paper Form	Arcadian/HIWWT
Longdown	37	B	23/06/2023	21:32	22:33	18	3	SW	0	Waxing crescent		3		Paper Form	Arcadian/HIWWT
Longdown	38	A	08/06/2023	21:10	22:05	19	3	NE	0	Waning gibbous		3	3	Paper Form	Arcadian/HIWWT
Longdown	38	B	07/07/2023	21:21	22:23	15	2	SSE	1	Waning gibbous		3		Paper Form	Arcadian/HIWWT
Beaulieu Road Station	39	A	12/06/2023	21:01	22:09	17	0	N/A	1	Not visible	High density of nightjar along the railway line	4	4	Survey123	Volunteer – experienced bird surveyor with Trust

Transect Location	Transect Number	Survey	Date	Start Time	Finish Time	Average Temp. (°C)	Average Wind Speed	Wind Direction	Cloud Cover (1 - 8)	Moon Phase	Notes	Estimated Number of Males	Maximum Number of Males per Transect	Submission Method	Organisation
Beaulieu Road Station	39	B	20/07/2023	21:52	22:33	16	0	N/A	5	Not visible		2		Survey123	Volunteer – experienced bird surveyor with Trust
Beaulieu Road Station	40	A	12/06/2023	22:20	22:57	17	0	N/A	3	Not visible		1	1	Survey123	Volunteer – experienced bird surveyor with Trust
Beaulieu Road Station	40	B	20/07/2023	21:00	21:40	17	0	N/A	5	Not visible		1		Survey123	Volunteer – experienced bird surveyor with Trust
Matley Passage	41	A	30/05/2023	21:10	21:48	15	3	SW	8	Waxing gibbous	Snipe observed	1	3	Survey123	Arcadian/HIWWT
Matley Passage	41	B	06/07/2023	22:29	23:15	14	0	N/A	1	Waning gibbous	B1 and B3 simultaneously churring B2 calling then flying by	3		Survey123	Arcadian/HIWWT
Matley Passage	42	A	30/05/2023	22:05	22:44	15	3	SW	8	Waxing gibbous		2	3	Survey123	Arcadian/HIWWT
Matley Passage	42	B	06/07/2023	21:35	22:20	15	0	N/A	1	Waning gibbous		3		Survey123	Arcadian/HIWWT
Lyndhurst	43	A	02/06/2023	21:35	22:15	14	1	NE	0	Waxing gibbous		2	4	Paper Form	Volunteer - new recruit
Lyndhurst	43	B	23/06/2023	21:10	22:58	19	0	N/A	0	Waxing crescent		4		Paper Form	Volunteer - new recruit
Lyndhurst	44	A	02/06/2023	21:00	21:25	14	1	NE	0	Waxing gibbous		1	3	Paper Form	Volunteer - new recruit
Lyndhurst	44	B	23/06/2023	23:10	23:37	19	0	N/A	0	Waxing crescent		3		Paper Form	Volunteer - new recruit
Lyndhurst	45	A	02/06/2023	22:20	22:55	14	1	NE	0	Waxing gibbous		3	3	Paper Form	Volunteer - new recruit
Lyndhurst	45	B	23/06/2023	21:30	22:10	19	0	N/A	0	Waxing crescent		3		Paper Form	Volunteer - new recruit
Lyndhurst	46	A	07/06/2023	21:55	22:38	16	1	-	0	Waning gibbous		3	3	Survey123	Arcadian/HIWWT
Lyndhurst	46	B	11/07/2023	22:00	22:32	16	2	E	5	Waning crescent		2		Survey123	Arcadian/HIWWT
Hatchet Pond	47	A	09/06/2023	21:20	21:57	20	3	NW	1	Half moon		3	3	Survey123	Arcadian/HIWWT
Hatchet Pond	47	B	06/07/2023	22:15	22:47	14	0	N/A	0	Not visible		2		Survey123	Arcadian/HIWWT
Hatchet Pond	48	A	09/06/2023	22:01	22:23	20	2	NE	1	Half moon		2	2	Survey123	Arcadian/HIWWT
Hatchet Pond	48	B	06/07/2023	21:41	22:05	15	0	N/A	0	Not visible		2		Survey123	Arcadian/HIWWT
Hatchet Pond	49	A	16/06/2023	21:59	22:45	18	0	N/A	0	Half moon		3	3	Survey123	Arcadian/HIWWT
Hatchet Pond	49	B	06/07/2023	21:47	22:30	15	0	N/A	5	Full moon		2		Survey123	Arcadian/HIWWT
Lyndhurst	50	A	07/06/2023	21:40	21:47	16	1	-	0	Waning gibbous		0	0	Survey123	Arcadian/HIWWT
Lyndhurst	50	B	11/07/2023	22:46	22:51	16	2	E	5	Waning crescent		0		Survey123	Arcadian/HIWWT
Lyndhurst	51	A	14/06/2023	22:31	22:58	16	2	SE	3	Waning crescent		1	1	Paper Form	Arcadian/HIWWT
Lyndhurst	51	B	23/06/2023	21:45	23:00	20	2	NE	0	Not recorded		1		Paper Form	Arcadian/HIWWT
Lyndhurst	52	A	14/06/2023	21:34	22:14	17	1	S	1	Waning crescent		3	3	Survey123	Arcadian/HIWWT
Lyndhurst	52	B	24/06/2023	21:45	22:45	22	1	NW	0	Not recorded		1		Paper Form	Arcadian/HIWWT
Balmers Lawn	53	A	14/06/2023	22:34	22:58	19	1	-	3	Waning crescent		0	0	Survey123	Arcadian/HIWWT

Transect Location	Transect Number	Survey	Date	Start Time	Finish Time	Average Temp. (°C)	Average Wind Speed	Wind Direction	Cloud Cover (1 - 8)	Moon Phase	Notes	Estimated Number of Males	Maximum Number of Males per Transect	Submission Method	Organisation
Balmers Lawn	53	B	20/07/2023	21:35	21:51	17	1	-	4	Waxing crescent	Very open and heavily grazed, little scrub or heather	0		Survey123	Arcadian/HIWWT
Balmers Lawn	54	A	12/06/2023	21:16	22:00	20	0	-	1	Not recorded		2	2	Survey123	Forestry England volunteer ranger
Balmers Lawn	54	B	08/07/2023	22:05	22:52	16	0	N/A	6	Not recorded		0		Survey123	Forestry England volunteer ranger
Sway/Setley	55	A	31/05/2023	21:07	22:15	17	4	NE	0	Waxing gibbous	Cuckoo calling	-	3	Survey123	Arcadian/HIWWT
Sway/Setley	55	B	12/07/2023	21:30	22:30	16	3	SW	2	Waning crescent		3		Survey123	Arcadian/HIWWT
Sway/Setley	56	A	31/05/2023	22:16	22:50	17	4	NE	0	Waxing gibbous	Very faint call	1	2	Survey123	Arcadian/HIWWT
Sway/Setley	56	B	17/07/2023	21:30	22:15	16	1	W	3	New moon		2		Survey123	Arcadian/HIWWT
Sway/Setley	57	A	05/06/2023	22:10	22:40	10		NE	0	Full moon		3	3	Survey123	Arcadian/HIWWT
Sway/Setley	57	B	19/07/2023	22:17	22:43	15	1	SW	0	Waning crescent		1		Survey123	Arcadian/HIWWT
Sway/Setley	58	A	05/06/2023	21:27	22:09	11	2	NE	0	Full moon		4	4	Survey123	Arcadian/HIWWT
Sway/Setley	58	B	19/07/2023	21:30	22:16	16	1	SW	0	Not recorded		3		Survey123	Arcadian/HIWWT
Setley	59	A	14/06/2023	21:15	22:50	14	5	ENE	8	Waning crescent		0	0	Survey123	Volunteer – experienced bird surveyor with Trust
Setley	59	B	17/07/2023	21:30	22:50	16	4	W	5	New moon		0		Survey123	Volunteer – experienced bird surveyor with Trust
Setley	60	A	13/06/2023	21:05	21:46	19	0	N/A	0	Not recorded		1	3	Survey123	Forestry England volunteer ranger
Setley	60	B	09/07/2023	21:35	22:18	19	0	N/A	1	Not recorded		3		Survey123	Forestry England volunteer ranger
Setley/Brockenhurst	61	A	13/06/2023	21:00	22:45	24	6	ENE	4	Waning crescent		0	0	Survey123	Volunteer – experienced bird surveyor with Trust
Setley/Brockenhurst	61	B	19/07/2023	21:25	22:25	18	4	NW	1	Waxing crescent		0		Survey123	Volunteer – experienced bird surveyor with Trust
Setley/Brockenhurst	62	A	13/06/2023	21:00	22:45	21	6	ENE	0	Waning crescent		1	1	Survey123	Volunteer – experienced bird surveyor with Trust
Setley/Brockenhurst	62	B	20/07/2023	21:30	22:30	16	2	NW	3	Waxing crescent		0		Survey123	Volunteer – experienced bird surveyor with Trust
Setley/Brockenhurst	63	A	14/06/2023	21:16	22:09	17	2	SE	1	Not recorded	Very busy and noisy road at the start but then nightjars everywhere! After finishing the transect, there were a couple more pairs in flight which then perched and called	3	3	Survey123	Forestry England volunteer ranger
Setley/Brockenhurst	63	B	09/07/2023	22:10	22:47	17	0	N/A	1	Not recorded		3		Survey123	Forestry England volunteer ranger

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Setley/Brockenhurst	64	A	15/06/2023	21:00	22:50	17	2	WNW	1	Waning crescent		0	0	Survey123	Volunteer – experienced bird surveyor with Trust
Setley/Brockenhurst	64	B	18/07/2023	21:25	22:10	18	4	WSW	7	Waxing crescent		0		Survey123	Volunteer – experienced bird surveyor with Trust
Brockenhurst	65	A	12/06/2023	21:00	22:00	15	1	SW	1	Waning crescent		1	1	Paper Form	Forestry England staff
Brockenhurst	65	B	13/07/2023	21:15	22:15	14	2	SW	3	Waning crescent		1		Paper Form	Forestry England staff
Brockenhurst	66	A	12/06/2023	22:00	23:00	15	1	SW	1	Waning crescent		2	2	Paper Form	Forestry England staff
Brockenhurst	66	B	13/07/2023	22:15	23:15	14	2	SW	3	Waning crescent		1		Paper Form	Forestry England staff
Brockenhurst	67	A	15/06/2023	21:04	22:17	16	0	N/A	0	Not recorded	The first sector due west from the campsite is directly across the heath with no defined paths and perfect habitat for ground nesting birds.	3	3	Survey123	Forestry England volunteer ranger
Brockenhurst	67	B	16/07/2023	21:25	22:40	16	2	W	1	Waning crescent	Aldridge Hill campsite adjacent to the transect is now open	3		Survey123	Forestry England volunteer ranger
Sway/Setley	68	A	16/06/2023	21:00	22:45	17	1	ESE	7	Waning crescent		2	2	Survey123	Volunteer – experienced bird surveyor with Trust
Sway/Setley	68	B	18/07/2023	22:20	22:55	16	6	WSW	7	Waxing crescent		1		Survey123	Volunteer – experienced bird surveyor with Trust
Sway/Setley	69	A	13/06/2023	22:00	23:00	16	1	SW	1	Waxing crescent		0	0	Paper Form	Forestry England volunteer ranger
Sway/Setley	69	B	14/07/2023	22:15	23:15	15	2	SW	2	Waxing crescent		0		Paper Form	Forestry England volunteer ranger
Sway/Setley	70	A	14/06/2023	21:39	22:23	18	1	-	3	Waning crescent	A1 and A2 simultaneously churring. Woodcock observed	4	4	Survey123	Arcadian/HIWWT
Sway/Setley	70	B	20/07/2023	22:03	22:38	17	2	SW	4	Waxing crescent		4		Survey123	Arcadian/HIWWT
Burley	71	A	05/06/2023	21:52	22:20	13	2	NE	0	Waning gibbous	A1 and A2 churring simultaneously	2	2	Survey123	Arcadian/HIWWT
Burley	71	B	05/07/2023	21:30	22:05	15	0	N/A	2	Waning gibbous	B2 and B4 churring simultaneously	2		Survey123	Arcadian/HIWWT
Burley	72	A	06/06/2023	21:14	22:09	15	2	W	0	Waning gibbous		1	2	Survey123	Arcadian/HIWWT
Burley	72	B	07/07/2023	21:34	22:33	20	1	S	1	Waning gibbous		2		Survey123	Arcadian/HIWWT
Burley	73	A	05/06/2023	21:12	21:43	15	2	S	0	Waning gibbous		0	2	Survey123	Arcadian/HIWWT
Burley	73	B	05/07/2023	22:18	22:52	13	0	N/A	4	Waning gibbous	B1 and B2 churring simultaneously	2		Survey123	Arcadian/HIWWT
Burley	74	A	09/06/2023	21:03	21:47	22	1	NE	2	Waxing gibbous		3	3	Survey123	Arcadian/HIWWT
Burley	74	B	03/07/2023	21:41	22:44	16	2	W	2	Full moon	Buck moon (orange supermoon)	2		Survey123	Arcadian/HIWWT

Transect Location	Transect Number	Survey	Date	Start Time	Finish Time	Average Temp. (°C)	Average Wind Speed	Wind Direction	Cloud Cover (1 - 8)	Moon Phase	Notes	Estimated Number of Males	Maximum Number of Males per Transect	Submission Method	Organisation
Burley	75	A	13/06/2023	21:02	21:53	23	1	-	0	Not recorded		2	2	Survey123	Arcadian/HIWWT
Burley	75	B	05/07/2023	21:39	22:03	15	-	-	2	Waning gibbous		2		Survey123	Arcadian/HIWWT
Burley	76	A	09/06/2023	21:58	22:45	21	2	NE	2	Waxing gibbous	Many calling and churring at same time	2	5	Survey123	Arcadian/HIWWT
Burley	76	B	05/07/2023	22:22	22:54	14	0	N/A	3	Waning gibbous		5		Survey123	Arcadian/HIWWT
Burley	77	A	07/06/2023	21:19	21:54	19	1	W	0	Waxing gibbous	A nightjar flew in front of surveyor while calling a couple of minutes after the survey ended	4	4	Survey123	Arcadian/HIWWT
Burley	77	B	11/07/2023	21:38	22:24	17	2	-	5	Waning crescent		4		Survey123	Arcadian/HIWWT
Thorney Hill	78	A	13/06/2023	22:20	22:43	21	0	N/A	0	Not recorded		2	2	Survey123	Arcadian/HIWWT
Thorney Hill	78	B	29/06/2023	21:42	21:57	18	2	NW	1	Waxing gibbous	Campsite much busier than before	0		Survey123	Arcadian/HIWWT
Thorney Hill	79	A	07/06/2023	22:09	22:40	15	2	W	0	Waxing gibbous		2	2	Survey123	Arcadian/HIWWT
Thorney Hill	79	B	29/06/2023	22:04	22:36	16	2	NW	1	Waxing gibbous	One male and female pair	1		Survey123	Arcadian/HIWWT
Burley	80	A	07/06/2023	21:30	22:50	18	1	-	0	Not recorded		6	6	Survey123	Arcadian/HIWWT
Burley	80	B	12/07/2023	21:30	23:05	18	2	W	1	Waning crescent	At very minimum there was 3 distinct territories as at one point there was three churring simultaneously. Various other churring locations throughout brought the estimate of males up to around 6	4		Survey123	Arcadian/HIWWT
Burley	81	A	14/06/2023	22:52	00:00	20	2	SE	3	Waxing crescent		2	3	Survey123	Arcadian/HIWWT
Burley	81	B	07/07/2023	22:22	23:16	22	3	-	0	Waning gibbous		3		Survey123	Arcadian/HIWWT
Burley	82	A	06/06/2023	21:12	21:54	14	1	NE	0	Waning		2	2	Paper Form	Arcadian/HIWWT
Burley	82	B	12/07/2023	21:22	22:18	16	1	WSW	1	Waning crescent	Both flying birds circling surveyor	2		Survey123	Arcadian/HIWWT
Burley	83	A	17/06/2023	21:20	22:07	17	-	-	6	New moon		4	6	Paper Form	Arcadian/HIWWT
Burley	83	B	16/07/2023	22:09	22:50	15	2	WNW	3	Waning crescent		6		Paper Form	Arcadian/HIWWT
Burley	84	A	01/06/2023	21:16	21:33	17	1	NE	0	Waxing gibbous		0	0	Paper Form	Arcadian/HIWWT
Burley	84	B	06/07/2023	21:20	21:35	15	0	N/A	0	Waning gibbous	Transact mainly woodland. Heath section doesn't have much ground cover (mainly short grass with occasional crossed leaf heath and tormentil) so wouldn't expect them to be nesting here	0		Survey123	Arcadian/HIWWT
Burley	85	A	01/06/2023	21:47	22:43	17	2	NE	0	Not recorded		2	2	Paper Form	Arcadian/HIWWT

Transect Location	Transect Number	Survey	Date	Start Time	Finish Time	Average Temp. (°C)	Average Wind Speed	Wind Direction	Cloud Cover (1 - 8)	Moon Phase	Notes	Estimated Number of Males	Maximum Number of Males per Transect	Submission Method	Organisation
Burley	85	B	06/07/2023	21:47	22:43	15	0	N/A	0	Waning gibbous	Temp dropped to 9C in middle section of transect. Mist forming in ditches.	1		Survey123	Arcadian/HIWWT
Burley	86	A	20/06/2023	22:10	22:40	17	2	SW	1	Waxing crescent		2	2	Paper Form	New Forest Ranger
Burley	86	B	14/07/2023	22:28	22:51	16	2	SW	0	Waning crescent		1		Paper Form	New Forest Ranger
Burley	87	A	20/06/2023	22:45	23:00	17	1	SW	1	Waxing crescent		2	2	Paper Form	New Forest Ranger
Burley	87	B	14/07/2023	22:01	22:25	16	2	SW	0	Waning crescent		1		Paper Form	New Forest Ranger
Burley	88	A	15/06/2023	21:07	22:25	18	0	N/A	0	Waning crescent		4	4	Paper Form	Arcadian/HIWWT
Burley	88	B	18/07/2023	21:15	22:04	16		W	7	New moon		4		Paper Form	Arcadian/HIWWT
Burley	89	A	06/06/2023	22:16	22:45	14	1	NE	0	Waning		1	1	Paper Form	Arcadian/HIWWT
Burley	89	B	12/07/2023	22:19	23:01	15	1	WSW	0	Waning crescent	North end of the transect treacherous and should be avoided.	0		Survey123	Arcadian/HIWWT
Burley	90	A	14/06/2023	21:45	22:52	20	2	SE	3	Waxing crescent	Cuckoo at start of transect 90	6	6	Survey123	Arcadian/HIWWT
Burley	90	B	07/07/2023	21:28	22:22	22	3	-	0	Waning gibbous		3		Survey123	Arcadian/HIWWT
Burley	91	A	16/06/2023	21:24	22:31	17	-	-	4	Waning crescent		4	4	Paper Form	Arcadian/HIWWT
Burley	91	B	16/07/2023	21:21	22:04	15	2	WNW	3	Waning crescent		3		Paper Form	Arcadian/HIWWT
Burley	92	A	05/06/2023	22:06	22:54	13	2	NNE	0	Not recorded	A2 and A3 churring immediately after each so confident they are two individuals	3	3	Survey123	Arcadian/HIWWT
Burley	92	B	29/06/2023	21:30	22:16	15	3	W	1	Not recorded	B2 heard churring prior to and after B3 observed B4 seen immediately after B2 flew	2		Survey123	Arcadian/HIWWT
Burley	93	A	05/06/2023	21:07	21:48	15	2	NNE	0	Waning gibbous	A2 interacting with A1 and A3	0	2	Survey123	Arcadian/HIWWT
Burley	93	B	29/06/2023	22:22	22:57	14	2	W	1	Not recorded	B5 distant	2		Survey123	Arcadian/HIWWT
Bolderwood	94	A	12/06/2023	21:01	21:47	19	0	N/A	3	Last quarter	A3 very active and churring, foraging and wing clapping	1	1	Survey123	Arcadian/HIWWT
Bolderwood	94	B	06/07/2023	22:10	22:51	15	0	N/A	1	Waning gibbous		1		Survey123	Arcadian/HIWWT
Bolderwood	95	A	12/06/2023	22:00	22:26	19	0	N/A	0	Last quarter	A3 and A4 churring simultaneously, approximately 200m apart A5 and A6 churring simultaneously, approximately 200m apart. Then A5 began flying, wing clapping and calling	5	5	Survey123	Arcadian/HIWWT

Transect Location	Transect Number	Survey	Date	Start Time	Finish Time	Average Temp. (°C)	Average Wind Speed	Wind Direction	Cloud Cover (1 - 8)	Moon Phase	Notes	Estimated Number of Males	Maximum Number of Males per Transect	Submission Method	Organisation
											A7 and A8 churring simultaneously from both sides of the transect route, approximately 150m apart.				
Bolderwood	95	B	06/07/2023	21:11	21:52	19	1	S	1	Waning gibbous	Temp dropped quickly to 14°c	2		Survey123	Arcadian/HIWWT
Picket Post	96	A	15/06/2023	21:13	21:46	18	1	SE	0	Waning crescent		1	1	Survey123	Arcadian/HIWWT
Picket Post	96	B	21/07/2023	22:31	22:50	14	1	WNW	1	Waxing crescent		0		Survey123	Arcadian/HIWWT
Picket Post	97	A	15/06/2023	22:26	22:55	17	1	SE	0	Waning crescent		1	1	Survey123	Arcadian/HIWWT
Picket Post	97	B	21/07/2023	21:18	22:04	15	0	N/A	1	Waxing Crescent		1		Survey123	Arcadian/HIWWT
Picket Post	98	A	15/06/2023	21:58	22:22	17	1	SE	0	Waning crescent		2	2	Survey123	Arcadian/HIWWT
Picket Post	98	B	21/07/2023	22:08	22:26	14	1	WNW	1	Waxing Crescent		2		Survey123	Arcadian/HIWWT
Picket Post	99	A	09/06/2023	22:22	23:00	21	2	NE	2	Not recorded		3	3	Paper Form	Volunteer - new recruit
Picket Post	99	B	21/07/2023	21:30	22:11	16	1	WNW	1	Not recorded		3		Paper Form	Volunteer - new recruit
Bratley	100	A	17/06/2023	22:00	22:20	26	0	N/A	0	New moon		2	2	Survey123	Arcadian/HIWWT
Bratley	100	B	No survey undertaken												
Bratley	101	A	17/06/2023	21:34	21:51	25	0	N/A	0	New moon		1	1	Survey123	Arcadian/HIWWT
Bratley	101	B	No survey undertaken												
Bratley	102	A	17/06/2023	22:30	22:57	25	0	N/A	0	New moon		1	1	Survey123	Arcadian/HIWWT
Bratley	102	B	No survey undertaken												
Bolderwood	103	A	14/06/2023	21:04	21:49	22	0	N/A	0	Last quarter	A1 noticed first, then A2 began churring 20 seconds after the first male	2	4	Survey123	Arcadian/HIWWT
Bolderwood	103	B	07/07/2023	22:00	22:50	21	3	ESE	4	Waning gibbous	B12, B13, B14 circled around surveyor at the point for B12 on the map. Flight paths drawn for B13 & B14	4		Survey123	Arcadian/HIWWT
Bolderwood	104	A	14/06/2023	21:54	22:44	20	0	N/A	3	Last quarter	A3, A4, A5 were flying and calling around surveyor and then landed on the path 20m ahead and proceeded to almost fight. Appeared to be two males fighting with a female watching. Then took off and flew in circles wing clapping and calling	4	4	Survey123	Arcadian/HIWWT

Transect Location	Transect Number	Survey	Date	Start Time	Finish Time	Average Temp. (°C)	Average Wind Speed	Wind Direction	Cloud Cover (1 - 8)	Moon Phase	Notes	Estimated Number of Males	Maximum Number of Males per Transect	Submission Method	Organisation
											A9 and A10 churring simultaneously				
Bolderwood	104	B	07/07/2023	21:03	21:52	22	0	N/A	2	Waning gibbous		1		Survey123	Arcadian/HIWWT
Shobley	105	A	15/06/2023	21:54	22:32	14	0	N/A	0	Not recorded		2	2	Survey123	Arcadian/HIWWT
Shobley	105	B	No survey undertaken												
Shobley	106	A	15/06/2023	21:22	21:43	23	0	N/A	0	Not recorded		1	1	Survey123	Arcadian/HIWWT
Shobley	106	B	No survey undertaken												
Linwood	107	A	05/06/2023	21:00	21:33	16	2	-	0	Not recorded	No nightjars but stonechat and meadow pipit observed	0	2	Survey123	Arcadian/HIWWT
Linwood	107	B	29/06/2023	23:01	23:39	16	2	W	0	Waxing gibbous		2		Survey123	Arcadian/HIWWT
Linwood	108	A	05/06/2023	21:34	22:11	16	2	-	0	Not recorded	Woodcock near south of transect A2 and A3 churring simultaneously	3	3	Survey123	Arcadian/HIWWT
Linwood	108	B	29/06/2023	22:07	22:52	17	2	W	0	Waxing gibbous		3		Survey123	Arcadian/HIWWT
Linwood	109	A	05/06/2023	22:19	22:40	14	1	-	0	Not recorded		1	1	Survey123	Arcadian/HIWWT
Linwood	109	B	29/06/2023	20:21	21:39	18	1	W	0	Waxing gibbous	5 woodlark and 1 Dartford warbler observed	0		Survey123	Arcadian/HIWWT
Linwood	110	A	06/06/2023	21:15	22:30	18	0	N/A	0	Waning gibbous	A9 landed on the ground in front of surveyor about 2ft away	4	4	Survey123	Arcadian/HIWWT
Linwood	110	B	13/07/2023	21:17	22:20	17	2	SW	4	Waning Crescent		3		Survey123	Arcadian/HIWWT
Ocknell Plain	111	A	03/06/2023	22:17	22:50	15	2	NE	0	Full moon		3	3	Paper Form	Volunteer - new recruit
Ocknell Plain	111	B	07/07/2023	21:30	22:01	20	1	ESE	2	Waning gibbous		1		Paper Form	Volunteer - new recruit
Linwood	112	A	03/06/2023	21:09	21:49	15	1	NE	0	Full moon		3	3	Paper Form	Volunteer - new recruit
Linwood	112	B	07/07/2023	22:20	23:03	20	1	ESE	1	Waning gibbous		2		Paper Form	Volunteer - new recruit
Ocknell Plain	113	A	09/06/2023	21:02	21:51	21	3	NE	4	Not recorded		1	2	Paper Form	Volunteer - new recruit
Ocknell Plain	113	B	21/07/2023	22:50	23:30	16	2	WNW		Not recorded		2		Paper Form	Volunteer - new recruit
Janes Moor/Stoney Cross	114	A	16/06/2023	22:00	23:00	-	-	-	0	Waning crescent		3	3	Paper Form	Arcadian/HIWWT
Janes Moor/Stoney Cross	114	B	20/07/2023	21:30	22:00	-	-	-	1	Waxing crescent		1		Paper Form	Arcadian/HIWWT
Fritham	115	A	15/06/2023	21:02	09:42	21	0	N/A	1	Not visible	No nightjars heard or seen	0	1	Survey123	Volunteer – experienced bird surveyor with Trust

Transect Location	Transect Number	Survey	Date	Start Time	Finish Time	Average Temp. (°C)	Average Wind Speed	Wind Direction	Cloud Cover (1 - 8)	Moon Phase	Notes	Estimated Number of Males	Maximum Number of Males per Transect	Submission Method	Organisation
Fritham	115	B	11/07/2023	21:37	22:04	17	3	SW	7	Not visible		1		Survey123	Volunteer – experienced bird surveyor with Trust
Fritham	116	A	13/06/2023	21:21	21:52	19	1	E	0	Not visible	A1 and A2 churring simultaneously. A4 was probably same individual as A2.	2	2	Survey123	Volunteer – experienced bird surveyor with Trust
Fritham	116	B	02/07/2023	21:26	22:22	18	3	SE	3	Not visible	B1 & B2 same as previous transect, likely foraging female but not possible to see clearly due to light. The other two males flew over the path and around surveyor, both calling, one wing-clapping, and perched in different trees, churring; at one point one chasing the other. B3 and B7 probably same individual.	2		Survey123	Volunteer – experienced bird surveyor with Trust
Fritham	117	A	15/06/2023	21:54	22:23	20	0	N/A	1	Not visible		0	0	Survey123	Volunteer – experienced bird surveyor with Trust
Fritham	117	B	12/07/2023	21:38	21:56	16	1	SW	2	Not visible	No nightjars seen. Brief churring in distance - couldn't locate and not on transect.	0		Survey123	Volunteer – experienced bird surveyor with Trust
Black Gutter Bottom	118	A	06/06/2023	21:50	22:20	13	3	NE	0	Not visible	Likely two pairs. Seen very soon after each other and approaching from different directions. Coming together and going to ground.	2	2	Survey123	Volunteer - new recruit
Black Gutter Bottom	118	B	21/06/2023	22:32	23:00	14	1	SW	2	Waxing crescent	Only recorded two birds close together heard/saw them at the same time	2		Survey123	Volunteer - new recruit
Black Gutter Bottom	119	A	06/06/2023	22:30	23:15	10	4	NE	0	Not visible		2	2	Survey123	Volunteer - new recruit
Black Gutter Bottom	119	B	21/06/2023	21:46	22:20	16	2	SW	1	Waxing crescent		2		Survey123	Volunteer - new recruit
Black Gutter Bottom	120	A	14/06/2023	21:41	22:15	21	0	N/A	2	Not visible	A1 and A2 churring simultaneously, A1 and A3 churring simultaneously	3	4	Survey123	Arcadian/HIWWT
Black Gutter Bottom	120	B	06/07/2023	21:42	22:37	14	0	N/A	0	Not visible	B3 (confirmed male) and B4 (assumed female) flying together.	4		Survey123	Arcadian/HIWWT
Rodger Penny Way	121	A	16/06/2023	22:18	22:56	17	1	SE	4	Waning crescent		2	2	Survey123	Arcadian/HIWWT
Rodger Penny Way	121	B	11/07/2023	21:40	22:03	17	4	SE	5	Not recorded		2		Survey123	Arcadian/HIWWT
Rodger Penny Way	122	A	05/06/2023	21:14	21:55	14	2	NW	4	Not visible	Traffic noise at start of transect was loud	1	4	Survey123	Arcadian/HIWWT
Rodger Penny Way	122	B	05/07/2023	21:53	22:51	14	0	N/A	0	Not visible		4		Survey123	Arcadian/HIWWT

Transect Location	Transect Number	Survey	Date	Start Time	Finish Time	Average Temp. (°C)	Average Wind Speed	Wind Direction	Cloud Cover (1 - 8)	Moon Phase	Notes	Estimated Number of Males	Maximum Number of Males per Transect	Submission Method	Organisation
Godshill	123	A	05/06/2023	21:30	22:10	14	1	NE	0	Waxing gibbous		7	7	Paper Form	Volunteer - new recruit
Godshill	123	B	26/06/2023	21:45	22:30	16	1	WNW	1	Half moon		7		Paper Form	Volunteer - new recruit
Godshill	124	A	06/06/2023	21:45	22:25	14	1	NE	0	Waxing gibbous		2	4	Paper Form	Volunteer - new recruit
Godshill	124	B	27/07/2023	21:45	22:30	18	2	SW	1	Half moon		4		Paper Form	Volunteer - new recruit
Blissford	125	A	14/06/2023	22:10	22:45	17	1	SSW	0	Waning crescent		3	4	Survey123	Volunteer - new recruit
Blissford	125	B	06/07/2023	22:06	22:30	14	2	SSE	0	Waning gibbous	B7 churring to B8	4		Survey123	Volunteer - new recruit
Blissford	126	A	08/06/2023	21:40	22:25	18	1	E	0	Waxing gibbous		3	3	Paper Form	Volunteer - new recruit
Blissford	126	B	01/07/2023	21:45	22:20	16	1	W	0	Waxing gibbous		3		Paper Form	Volunteer - new recruit
Hampton Ridge	127	A	08/06/2023	21:31	22:19	17	3	ENE	0	Waning gibbous	A4 wing clapping. Heard minimum 3 males churring at once. Wind picked up later.	5	5	Survey123	Arcadian/HIWWT
Hampton Ridge	127	B	03/07/2023	21:16	21:45	14	2	W	6	Waning gibbous	Rainy day with stormy interludes. Cool breeze.	2		Survey123	Arcadian/HIWWT
Hampton Ridge	128	A	08/06/2023	22:25	22:40	17	4	ENE	0	Waning gibbous	Saw a male nightjar before the survey period	1	5	Survey123	Arcadian/HIWWT
Hampton Ridge	128	B	03/07/2023	21:46	22:15	13	2	W	3	Waning gibbous	Minimum of 5 males on site (3 to east of transect in northern half, 2 simultaneous in southern half). Several more seen wing clapping on walk back.	5		Survey123	Arcadian/HIWWT
Plaitford	129	A	13/06/2023	22:15	23:30	17	1	-	4	Not recorded		1	1	Paper Form	Arcadian/HIWWT
Plaitford	129	B	17/07/2023	22:15	23:30	12	1	-	4	Not recorded		1		Paper Form	Arcadian/HIWWT
Plaitford	130	A	13/06/2023	21:00	22:15	17	1	-	0	Not recorded		1	1	Paper Form	Arcadian/HIWWT
Plaitford	130	B	17/07/2023	21:00	22:00	15	-	-		Not recorded		0		Paper Form	Arcadian/HIWWT
Turf Hill	131	A	16/06/2023	21:32	22:11	17	1	SE	2	Waning crescent		4	4	Survey123	Arcadian/HIWWT
Turf Hill	131	B	11/07/2023	22:12	22:39	16	3	SE	6	Not recorded		2		Survey123	Arcadian/HIWWT
Turf Hill	132	A	25/05/2023	21:25	22:03	16	1	NE	0	Waxing crescent		4	4	Survey123	Arcadian/HIWWT
Turf Hill	132	B	26/06/2023	21:03	22:38	16	2	NE	3	Half moon		4		Survey123	Arcadian/HIWWT
Turf Hill	133	A	25/05/2023	22:20	22:50	16	1	NE	2	Waxing crescent		1	1	Survey123	Arcadian/HIWWT
Turf Hill	133	B	26/06/2023	21:32	21:57	18	2	NE	2	Half moon		1		Survey123	Arcadian/HIWWT
Turf Hill	134	A	06/06/2023	21:10	21:52	13	3	NW	0	Not visible		2	2	Survey123	Arcadian/HIWWT
Turf Hill	134	B	12/07/2023	21:37	22:16	14	1	SW	1	Not visible		2		Survey123	Arcadian/HIWWT
Hyde	135	A	17/06/2023	21:00	21:30	19	0	N/A	7	Waning crescent		3	3	Paper Form	Arcadian/HIWWT
Hyde	135	B	11/07/2023	21:17	21:39	17	2	NE	4	Waning crescent		3		Paper Form	Arcadian/HIWWT
Fordingbridge	136	A	No survey undertaken										3		
Fordingbridge	136	B	17/07/2023	21:45	22:48	14	3	N	1	New moon		3		Paper Form	New Forest Ranger
Hyde	137	A	14/06/2023	21:37	22:01	17	1	S	0	Waning crescent		3	3	Survey123	Arcadian/HIWWT

Transect Location	Transect Number	Survey	Date	Start Time	Finish Time	Average Temp. (°C)	Average Wind Speed	Wind Direction	Cloud Cover (1 - 8)	Moon Phase	Notes	Estimated Number of Males	Maximum Number of Males per Transect	Submission Method	Organisation
Hyde	137	B	06/07/2023	22:30	22:53	14	1	S	0	Waning gibbous	A1 not on transect but thought worth noting seen at 22:20. Definitely two males, maybe three, churring in the vicinity of 137 as I was finishing 138, but too far away to place. Gone by the time surveyor reached the survey. A2 & A3 maybe same individual	2		Survey123	Arcadian/HIWWT
Hyde	138	A	14/06/2023	22:15	10:46	17	2	SSW	1	Waning crescent	A8 seen between transects 137 and 138	4	4	Survey123	Arcadian/HIWWT
Hyde	138	B	06/07/2023	21:27	22:13	15	1	S	0	Waning gibbous	A5 & A6 & A7 possibly same individual. A3 also calling and wing clapping. Maximum 3 males churring at once with a 4th individual calling.	3		Survey123	Arcadian/HIWWT
Hyde	139	A	16/06/2023	21:43	23:30	21	1	SE	2	Waning crescent	Estimate 4 male territories. Limited simultaneous churring but some churring considerable distances away from each other. Three nightjars were seen flying together in the heath south of the transect route. Cuckoo also recorded.	4	4	Survey123	Arcadian/HIWWT
Hyde	139	B	11/07/2023	21:25	23:00	17	4	W	4	Waxing crescent	A1&2 likely a pair as they were churring, calling, feeding in close proximity and foraging in and around oak trees by the path. Glow worms recorded and locations/numbers sent to the relevant ranger. Only can be confident on 2-3 males	3		Survey123	Arcadian/HIWWT
Fritham	140	A	02/06/2023	21:00	21:40	15	2, 3	E	0	Waxing		1	1	Paper Form	Volunteer - new recruit
Fritham	140	B	07/07/2023	22:05	22:35	14	1, 2	W	0	Waning gibbous		1		Paper Form	Volunteer - new recruit
Fritham	141	A	02/06/2023	22:07	22:30	18	2, 3	E	0	Waxing		1	1	Paper Form	Volunteer - new recruit
Fritham	141	B	07/07/2023	21:20	21:45	22	1, 2	W	0	Waning gibbous		0		Paper Form	Volunteer - new recruit
Janes Moor/Stoney Cross	142	A	16/06/2023	21:00	21:45	-	-	-	0	Waning crescent	No heathland habitat	0	0	Paper Form	Arcadian/HIWWT
Janes Moor/Stoney Cross	142	B	19/07/2023	22:00	22:30	-	-	-	0	Waxing crescent		0		Paper Form	Arcadian/HIWWT

Transect Location	Transect Number	Survey	Date	Start Time	Finish Time	Average Temp. (°C)	Average Wind Speed	Wind Direction	Cloud Cover (1 - 8)	Moon Phase	Notes	Estimated Number of Males	Maximum Number of Males per Transect	Submission Method	Organisation
Janes Moor/Stoney Cross	143	A	16/06/2023	21:40	22:20	-	-	-	1	Waning crescent		0	0	Paper Form	Arcadian/HIWWT
Janes Moor/Stoney Cross	143	B	20/07/2023	22:15	23:00	-	-	-	1	Waxing crescent		0		Paper Form	Arcadian/HIWWT
Turf Hill	144	A	31/05/2023	21:07	22:32	12	3	NNE	0	Waxing gibbous		4	4	Survey123	Arcadian/HIWWT
Turf Hill	144	B	18/07/2023	21:30	22:20	16	2	SW	5	Not visible		3		Survey123	Arcadian/HIWWT
North Gorley	146	A	15/06/2023	21:34	22:15	18	2	SSE	1	Waning crescent		0	0	Survey123	Volunteer - new recruit
North Gorley	146	B	13/07/2023	21:38	22:15	17	2	SW	4	Waning crescent	No nightjar seen or heard	0		Survey123	Volunteer - new recruit
Frogham	147	A	14/06/2023	21:30	22:02	17	1	S	0	Waning crescent	No nightjar seen or heard	0	1	Survey123	Volunteer - new recruit
Frogham	147	B	06/07/2023	21:41	22:03	14	2	SSE	0	Waning gibbous		1		Survey123	Volunteer - new recruit
Rockford	148	A	15/06/2023	22:30	23:15	18	0	N/A	2	Waning crescent		2	3	Paper Form	Arcadian/HIWWT
Rockford	148	B	10/07/2023	21:49	22:45	15	1	NNE	8	Full moon		3		Paper Form	Arcadian/HIWWT
Rockford	149	A	15/06/2023	21:30	22:15	20	0	N/A	2	Waning crescent		4	4	Paper Form	Arcadian/HIWWT
Rockford	149	B	10/07/2023	21:06	21:47	18	2	NNE	8	Full moon		2		Paper Form	Arcadian/HIWWT
Rockford	150	A	16/06/2023	21:30	22:25	18	1	N	4	Waning crescent		5	5	Paper Form	Arcadian/HIWWT
Rockford	150	B	11/07/2023	21:34	22:30	15	1	NNE	6	Full moon		4		Paper Form	Arcadian/HIWWT
South Gorley	151	A	12/06/2023	21:28	22:12	19	0	N/A	1	Not visible		2	2	Survey123	Arcadian/HIWWT
South Gorley	151	B	03/07/2023	21:49	22:30	14	0	N/A	2	Not visible		2		Survey123	Arcadian/HIWWT
South Gorley	154	A	12/06/2023	21:56	22:42	19	0	N/A	4	Not visible		3	5	Survey123	Arcadian/HIWWT
South Gorley	154	B	03/07/2023	21:39	22:23	16	3	SW	3	Not visible	A1 and A2 heard simultaneously. A4 and A5 heard simultaneously. A6 and A7 heard chirring close but simultaneously.	5		Survey123	Arcadian/HIWWT
Ringwood	155	A	20/06/2023	21:20	21:40	18	1	SW	1	Waxing crescent		0	0	Paper Form	New Forest Ranger
Ringwood	155	B	14/07/2023	21:15	21:35	16	2	SW	0	Waning crescent		0		Paper Form	New Forest Ranger
Bramshaw	156	A	05/06/2023	21:05	22:05	16	2	NE	0	Waning		1	1	Paper Form	Volunteer - new recruit
Bramshaw	156	B	13/07/2023	21:05	22:05	15	1	SE	3	Waning		1		Paper Form	Volunteer - new recruit
Bramshaw	157	A	03/06/2023	21:05	22:00	18	1	ENE	0	Waning		1	1	Paper Form	Volunteer - new recruit
Bramshaw	157	B	18/07/2023	21:00	21:40	17	1	SW	8	New moon		0		Paper Form	Volunteer - new recruit

APPENDIX 2:
Location data for nightjar territories 2023

Appendix 2. Location data for nightjar territories 2023

Below details the co-ordinates of all recorded nightjar territories during the 2023 surveys

Forestry Commission Land/Open Forest

OS Easting	OS Northing
417845	113440
417967	113943
418055	113078
418832	106502
417958	108312
419138	107020
418820	101622
418754	113892
418615	114988
417945	116102
418130	114888
418721	115446
418472	115938
418490	115202
418279	114570
418355	116659
418515	111480
418949	111144
418576	112500
418241	112404
418802	112039
418483	110873
418444	112997
418317	112693
418945	112553
419611	104626
418946	104523
418239	105307
418611	105036
418744	105620
419718	104288
419847	104733
419193	105230
419339	104692
418546	103359
419123	103104
418614	103775
419221	103565
419609	103776
419338	104224
419584	104091
419788	103059
419829	102486
419117	102505
419433	102024
418971	100774

OS Easting	OS Northing
420149	100229
419732	100633
419418	101624
419802	101533
419178	101228
419876	101966
419937	111879
419447	113854
419018	113305
419699	112492
419341	111695
420071	114374
420049	114968
419083	116022
419000	114562
418971	115749
419904	114670
419727	115282
419157	116393
419243	115567
419109	115143
419611	114203
420341	116352
420065	115769
419897	117385
419949	116697
419319	116904
420391	118147
421489	104802
421026	105128
420618	104863
421761	104268
421022	104517
420459	105854
421160	105859
421655	112544
420432	112315
420849	112303
420392	110361
421402	110670
420674	111054
420277	110856
421008	110737
420574	111622
420223	101497
421588	102422

OS Easting	OS Northing
421249	101760
422057	101917
420465	101786
420985	101120
420991	102156
420438	100702
421719	101142
421181	100420
420609	100209
421893	98971
421448	100601
421106	99761
421749	106493
419745	107096
420668	108777
420168	107796
420313	106558
420715	107168
422011	107900
420910	106439
421796	107175
421300	108607
420660	107993
422430	108631
423001	107772
420876	117526
421096	115364
420314	115261
421628	115852
421274	116120
420648	115914
421945	117231
421468	117327
421231	116689
422473	116650
422009	116481
420566	114826
421140	114664
420791	114049
420122	113882
421738	113413
422777	113328
422153	110117
421840	110537
422632	111140
422180	111107

OS Easting	OS Northing
423162	111898
424747	101789
422566	102008
422772	101318
424585	101401
423508	101721
425186	101433
424346	103153
423662	102210
423626	102752
423766	108570
423579	109042
423784	108731
423494	108394
424639	110444
424021	108741
423947	109021
424046	110342
425041	109614
425212	110156
425084	110893
423721	111030
423855	111616
423752	112471
424324	112481
424484	112834
425549	111241
425101	111584
425797	110674
424196	112048
425714	102033
425751	102662
425409	101075
426103	98700
426532	101489
426466	102406
426536	100866
426229	101173
423544	115804
422767	116326
423094	115976
424145	115393
422775	115074
427077	102118
427446	103611
428083	103646
427867	104280
428999	103856
429173	103349
428475	104100
429744	100130

OS Easting	OS Northing
427798	99510
427845	100749
427420	100154
428026	100045
428271	99204
428416	100533
427273	100354
427041	100607
430112	99655
430082	99232
429353	99321
429368	98815
431243	108565
431177	107843
431335	108237
430728	109093
430411	109964
430410	109545
429970	109573
433022	108016
432165	107640
432194	108944
431954	107921
432124	108446
432854	108798
433240	108830
434003	107933
433593	107480
432919	107601
433590	108251
433957	105705
434553	100735
433845	100448
433629	99939
434046	101019
434450	100312
434321	101544
433777	101559
434409	99885
434167	107079
434845	105511
434832	104791
435189	106928
434738	106702
434674	106259
434406	106812
435413	105539
435481	99310
434567	99207
434084	98893
434313	97971

OS Easting	OS Northing
434508	98507
435063	99459
435264	98643
436467	98701
436192	99303
434929	100417
434822	101330
434994	99988
435634	100244
435363	99864
435388	100571
435325	101428
435516	100986
435782	101763
435873	99757
434430	107859
434371	107239
435377	108935
435325	107563
436600	108264
434944	109426
434848	108427
436763	107618
435632	108173
436281	107420
436748	100268
436427	102120
436780	102006
435910	102226
435917	101409
436901	101028
436504	99892
436937	100630
436467	100763
435950	100176
437284	105437
436942	106756
435919	104588
436245	107037
436459	106434
436251	105753
435839	105234
436742	105257
435844	106936
437281	105975
437493	104888
438877	105765
438003	105491
438211	106373
439342	106243
440194	105211

OS Easting	OS Northing
439386	105347
438994	106861
439940	106004
439710	106901
440435	103123
440489	103925
439562	104596
440180	104558
440826	104829

OS Easting	OS Northing
441001	102998
441444	102452
441132	103699
441038	102449
441529	103321
441592	104109
441432	104888
441464	104454
441980	104678

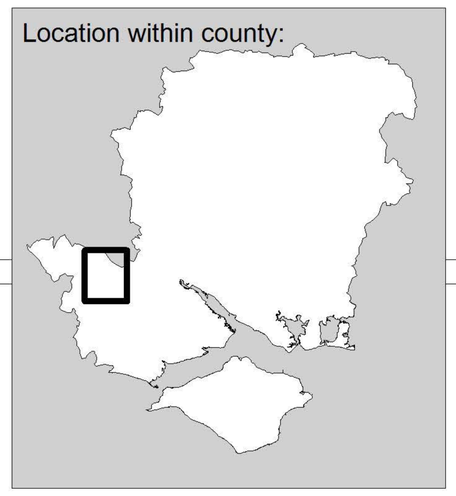
OS Easting	OS Northing
442149	104997
441970	103863
441985	103121
441760	102518
442422	102891
442456	102396
442000	102646
443372	101721
443715	101262

Territories outside FC Crown Land Boundary

Area	OS Easting	OS Northing
National Trust	416689	108979
National Trust	417385	109406
National Trust	417271	109036
National Trust	417378	110482
National Trust	418017	111363
National Trust	417652	111802
National Trust	417519	111155
National Trust	418085	110605
National Trust	417790	109560
National Trust	417898	108963
National Trust	417985	110044
National Trust	416806	107723
National Trust	419362	117976
National Trust	419330	117559
National Trust	419623	118271
National Trust	420391	118147
National Trust	427819	117520
National Trust	427654	118538
National Trust	428465	115865
National Trust	429450	116285
Hampshire County Council	416792	109897
Hampshire County Council	417229	112512
Wellow Parish Council	428488	117432
Other (Private Land)	435528	109499
Other (Private Land)	421306	98907
Other (Private Land)	419753	100033
Other (Private Land)	418514	102904
Other (Private Land)	418401	112123
Other (Private Land)	418281	100961
Other (Private Land)	418258	101689
Other (Private Land)	418103	100479
Other (Private Land)	417714	101494
Other (Private Land)	417698	100863
Other (Private Land)	417505	107843
Other (Private Land)	417069	108465
Other (Private Land)	416606	110557

APPENDIX 3:
Detailed territory mapping

Location within county:



Appendix 3 - Detailed Territories - Map 1

Ordnance Survey basemap (1:50,000)

Scale - 1:50,000

Arcadian

Hampshire & Isle of Wight Wildlife Trust

New Forest National Park Boundary

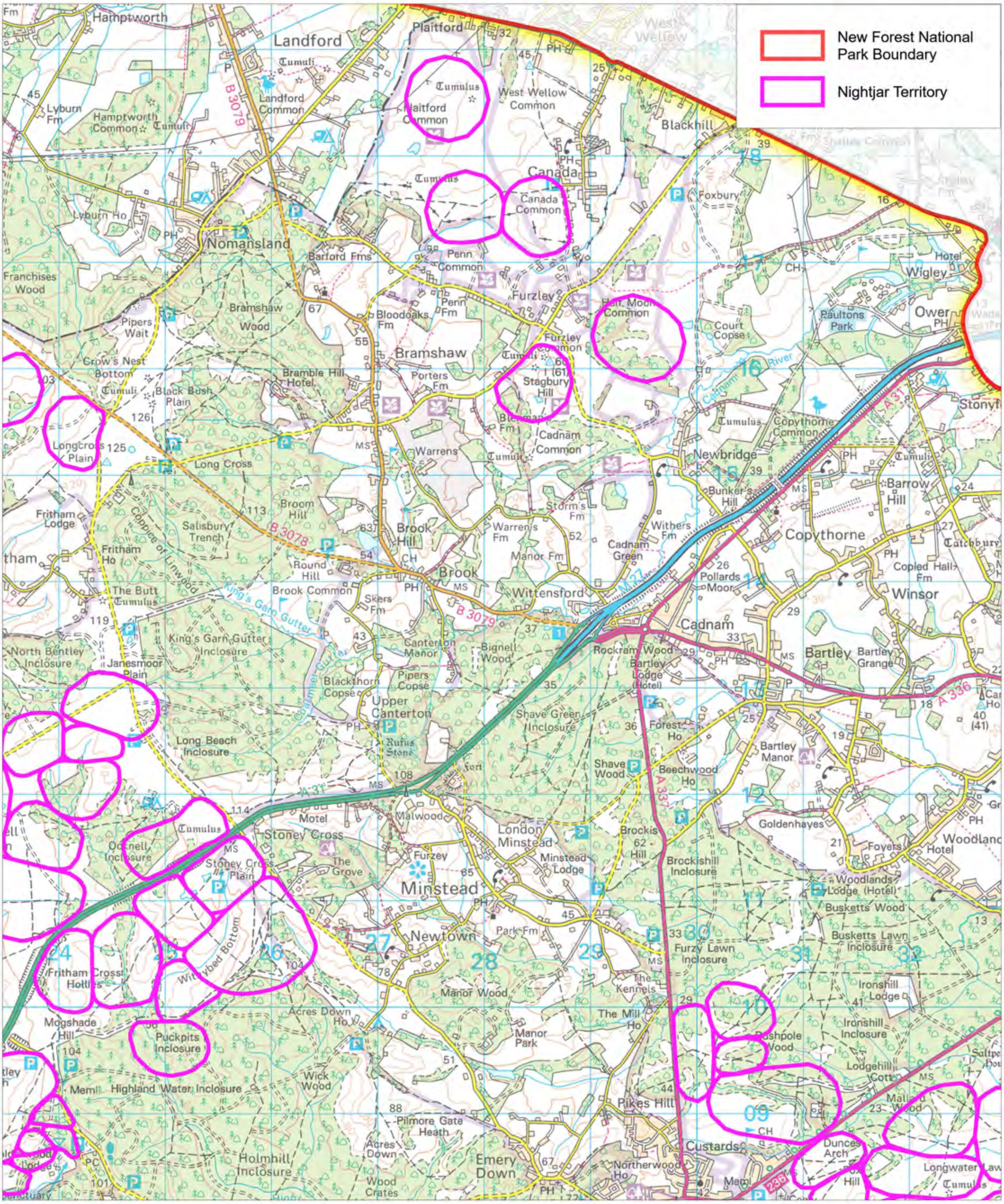
Nightjar Territory

N

Appendix 3 - Detailed Territories - Map 2

Ordnance Survey basemap (1:50,000)

Scale - 1:50,000



BAP Priority habitat, notable species and SINC data supplied by the Hampshire Biodiversity Information Centre on behalf of the HBIC Partnership.
Aerial photography courtesy of GetMapping plc. Produced on 25 October 2023 by Alex Glossop

Location within county:

Appendix 3 - Detailed Territories - Map 3

Ordnance Survey basemap (1:50,000)

Scale - 1:50,000

Arcadian

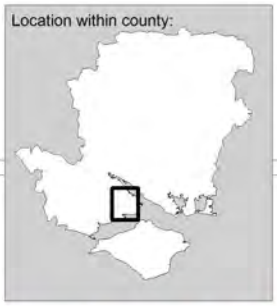
Hampshire & Isle of Wight Wildlife Trust

New Forest National Park Boundary

Nightjar Territory

N

Location within county:



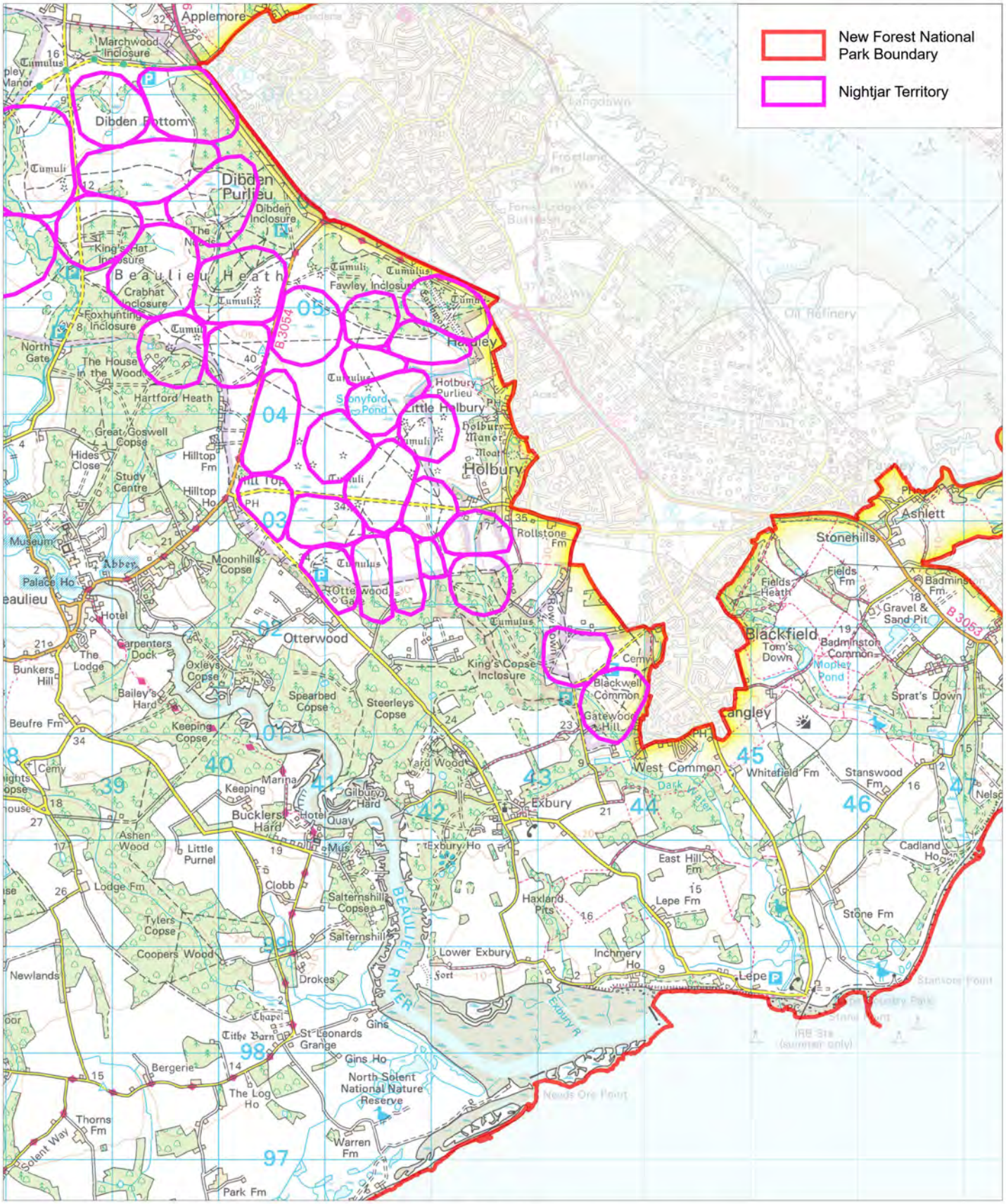
Appendix 3 - Detailed Territories - Map 4

Ordnance Survey basemap (1:50,000)

Scale - 1:50,000

Arcadian

Hampshire & Isle of Wight Wildlife Trust



N

Location within county:

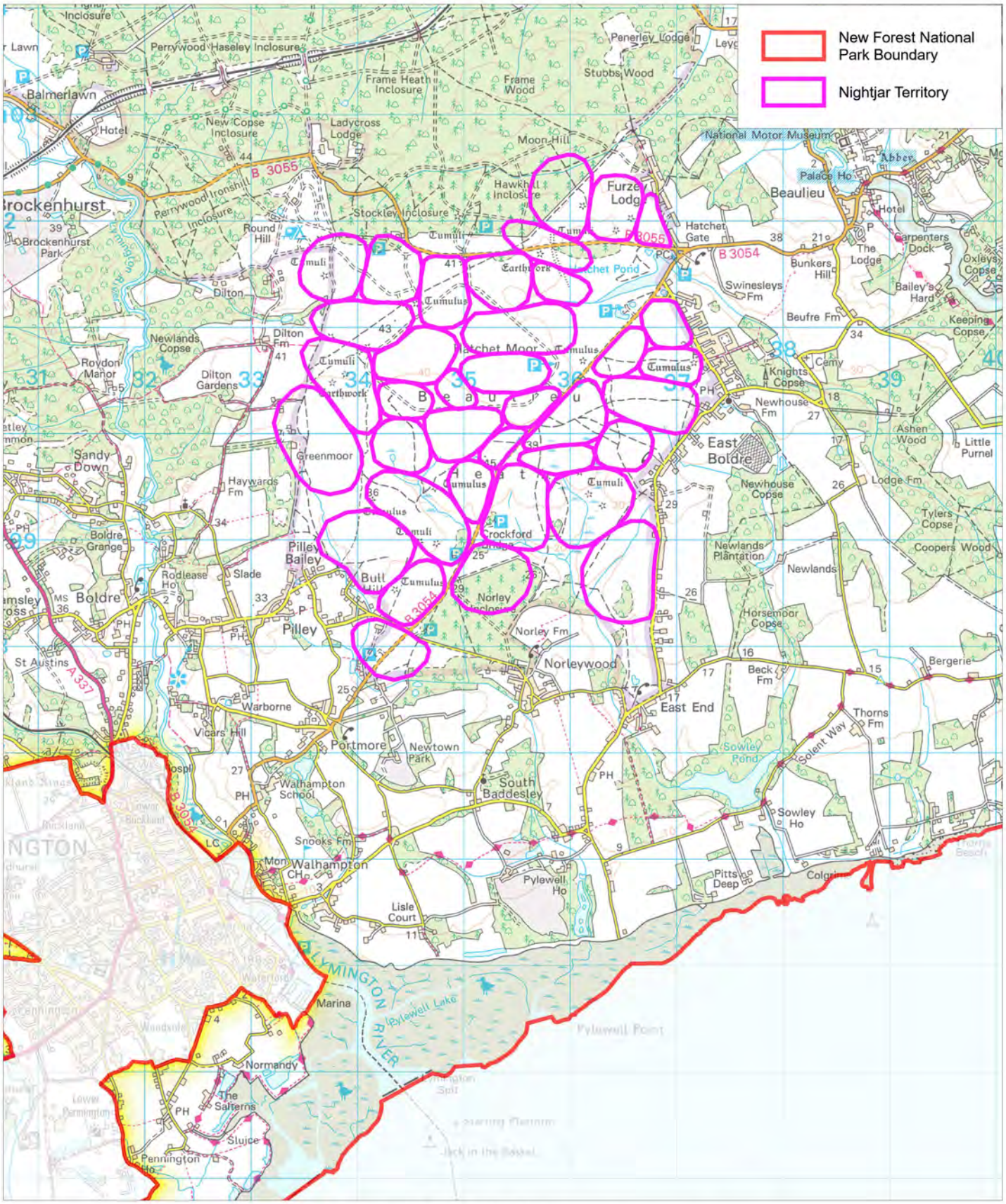
Appendix 3 - Detailed Territories - Map 5

Ordnance Survey basemap (1:50,000)

Scale - 1:50,000

Arcadian

Hampshire & Isle of Wight Wildlife Trust



N

Location within county:

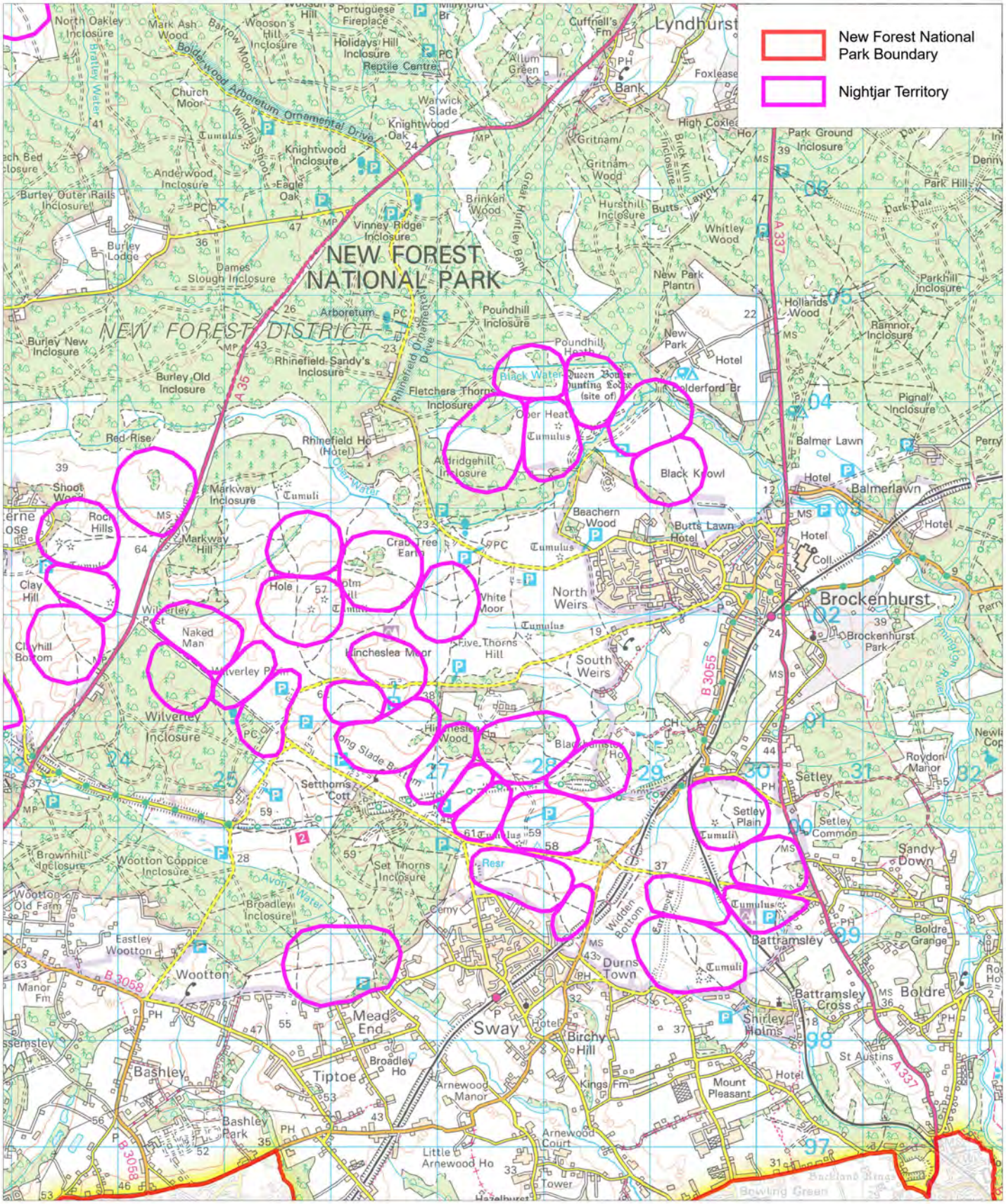
Appendix 3 - Detailed Territories - Map 6

Ordnance Survey basemap (1:50,000)

Scale - 1:50,000

Arcadian

Hampshire & Isle of Wight Wildlife Trust



N

Location within county:

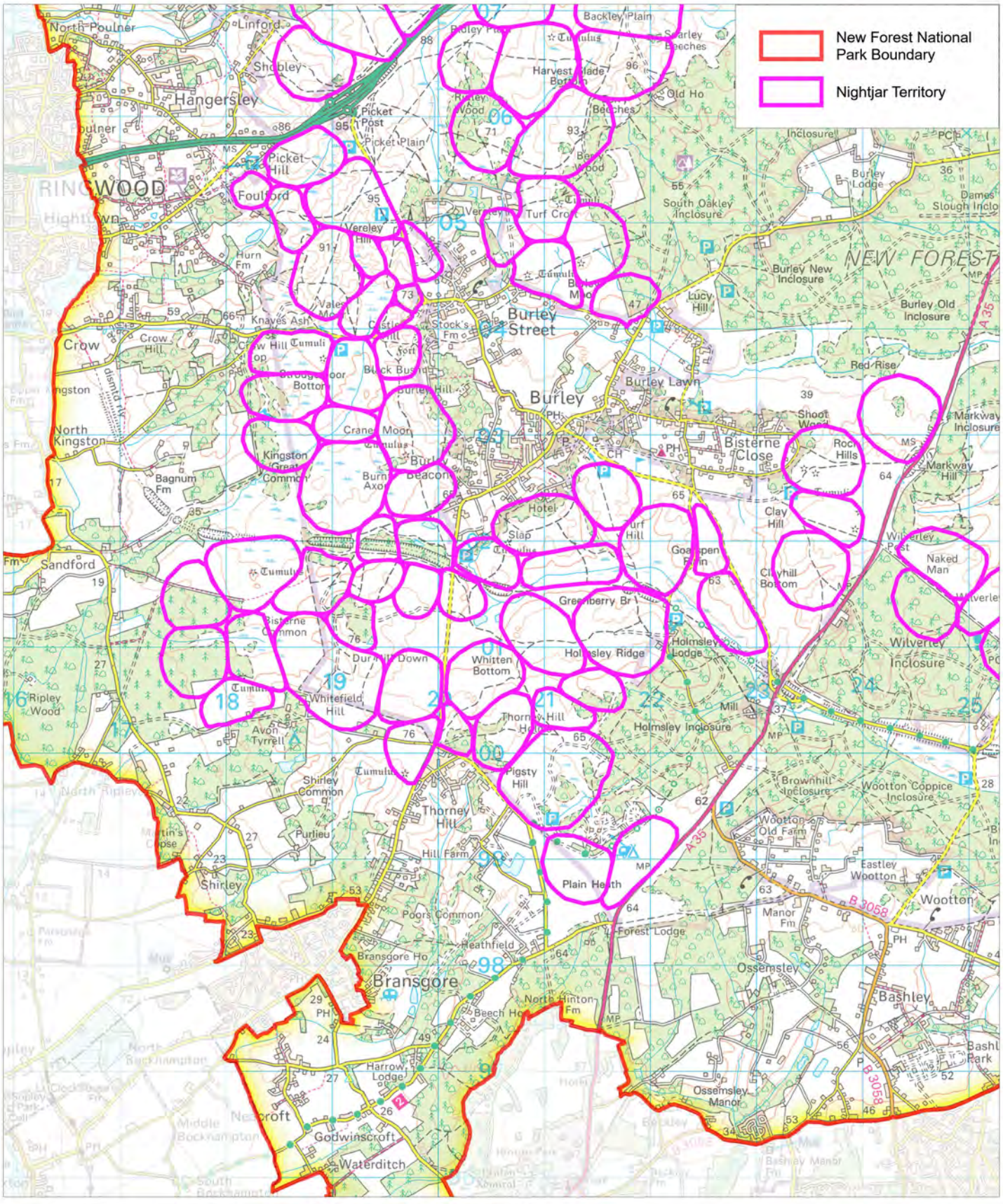
Appendix 3 - Detailed Territories - Map 7

Ordnance Survey basemap (1:50,000)

Scale - 1:50,000

Arcadian

Hampshire & Isle of Wight Wildlife Trust



N

Location within county:

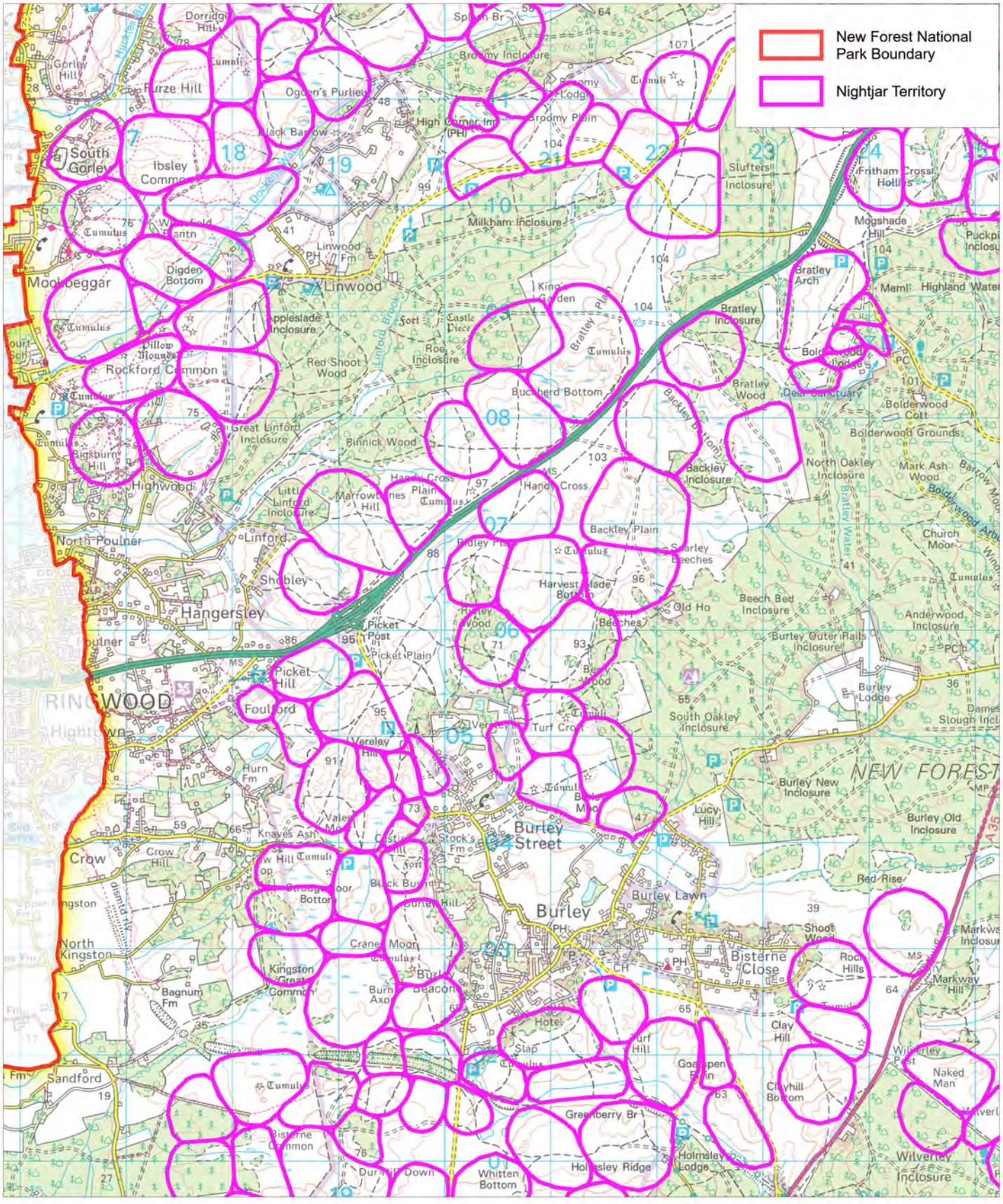
Appendix 3 - Detailed Territories - Map 8

Ordnance Survey basemap (1:50,000)

Scale - 1:50,000

Arcadian

Hampshire & Isle of Wight Wildlife Trust



N

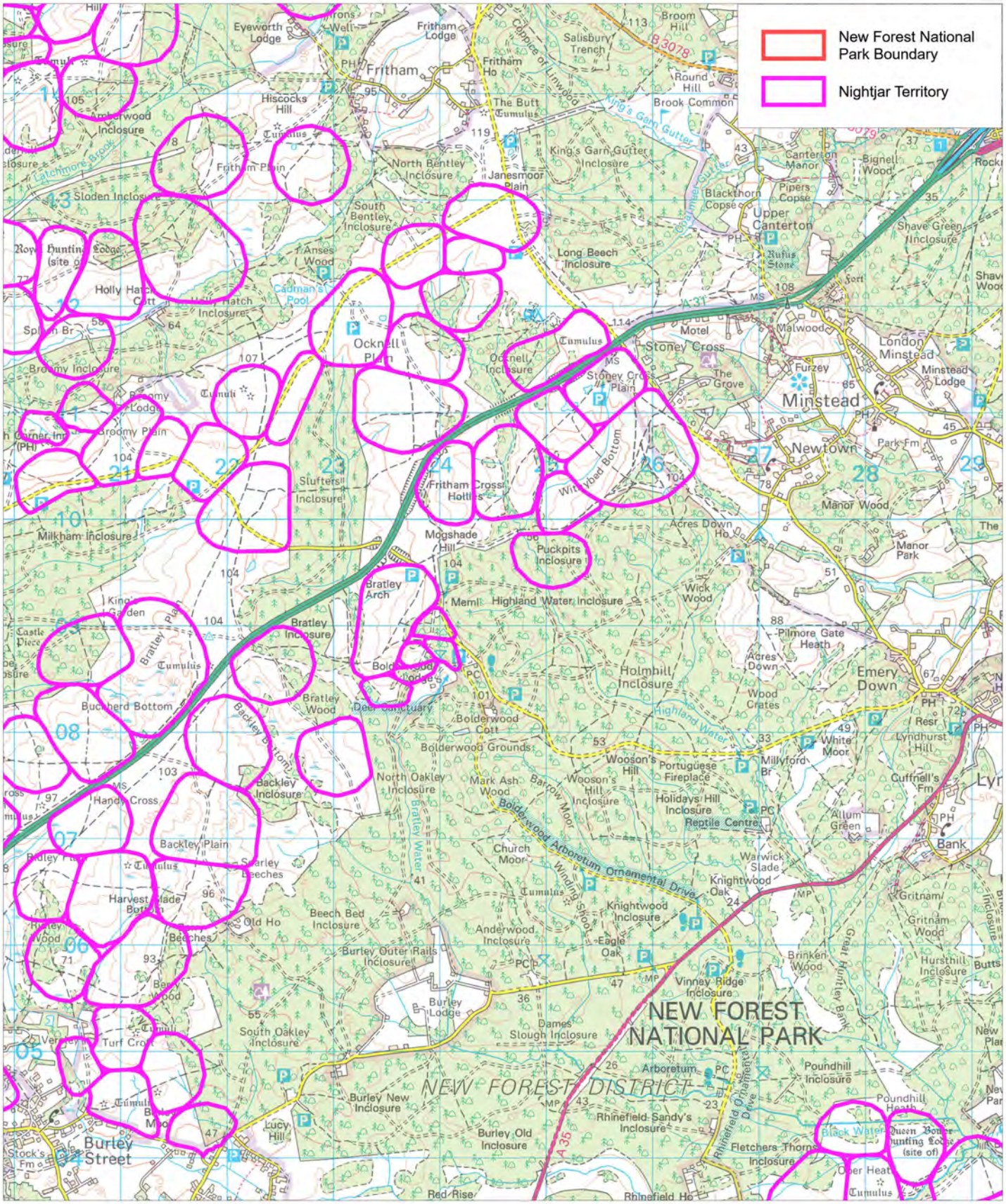
Appendix 3 - Detailed Territories - Map 9

Ordnance Survey basemap (1:50,000)

Scale - 1:50,000

Arcadian

Hampshire & Isle of Wight Wildlife Trust



N

APPENDIX 4:
Detailed territory centres mapping

Location within county:

Appendix 4 - Detailed Territory Centres (North Compartment)

Arcadian

Hampshire & Isle of Wight Wildlife Trust

Ordnance Survey basemap (1:50,000)

Scale - 1:100,000

North Compartment Boundary

Territory Centre

SU12 SU22 SU32

SU11 SU21 SU31

SU10 SU20 SU30

N

Produced by Hampshire and Isle of Wight Wildlife Trust on 25 October 2023 by Alex Glossop

Location within county:

Appendix 4 - Detailed Territory Centres (East Compartment)

Arcadian

Hampshire & Isle of Wight Wildlife Trust

Ordnance Survey basemap (1:50,000)

Scale - 1:100,000

East Compartment Boundary

Territory Centre

SU30

SU40

SZ39

SZ49

Produced by Hampshire and Isle of Wight Wildlife Trust on 25 October 2023 by Alex Glossop

Location within county:

Appendix 4 - Detailed Territory Centres (West Compartment)

Arcadian

Hampshire & Isle of Wight Wildlife Trust

Ordnance Survey basemap (1:50,000)

Scale - 1:100,000

West Compartment Boundary

Territory Centre

SU11 SU21 SU10 SU20 SZ19 SZ29

NEW FOREST NATIONAL PARK

NEW FOREST DISTRICT

Produced by Hampshire and Isle of Wight Wildlife Trust on 25 October 2023 by Alex Glossop

APPENDIX 5:
1km Grid Square Occupancy

Appendix 5. 1km Grid Square Occupancy

1km Grid Square	No. of Territory Centres		
	2023	2018	2013
SZ3089	0	0	0
SZ3189	0	0	0
SZ3289	0	0	0
SZ2990	0	0	0
SZ3090	0	0	0
SZ3190	0	0	0
SZ3091	0	0	0
SZ3191	0	1	0
SZ3291	0	0	0
SZ3092	0	0	0
SZ3192	0	0	0
SZ3292	0	0	0
SZ3392	0	0	0
SZ3193	0	0	0
SZ3293	0	0	0
SZ3393	0	0	0
SZ3493	0	0	0
SZ1994	0	0	0
SZ2094	0	0	0
SZ2994	0	0	0
SZ3094	0	0	0
SZ3194	0	0	0
SZ3294	0	0	0
SZ3394	0	0	0
SZ3494	0	0	0
SZ3594	0	0	0
SZ3694	0	0	0
SZ1895	0	0	0
SZ1995	0	0	0
SZ2095	0	0	0
SZ2595	0	0	0
SZ2695	0	0	0
SZ2795	0	0	0
SZ2895	0	0	0
SZ2995	0	0	0
SZ3095	0	0	0
SZ3195	0	0	0
SZ3295	0	0	0
SZ3395	0	0	0
SZ3495	0	0	0
SZ3595	0	0	0
SZ3695	0	0	0
SZ3795	0	0	0
SZ3895	0	0	0
SZ3995	0	0	0
SZ1896	0	0	0
SZ1996	0	0	0

1km Grid Square	No. of Territory Centres		
	2023	2018	2013
SZ2096	0	0	0
SZ2196	0	0	0
SZ2296	0	0	0
SZ2396	0	0	0
SZ2496	0	0	0
SZ2596	0	0	0
SZ2696	0	0	0
SZ2796	0	0	0
SZ2896	0	0	0
SZ2996	0	0	0
SZ3096	0	0	0
SZ3196	0	0	0
SZ3296	0	0	0
SZ3396	0	0	0
SZ3496	0	0	0
SZ3596	0	0	0
SZ3696	0	0	0
SZ3796	0	0	0
SZ3896	0	0	0
SZ3996	0	0	0
SZ4096	0	0	0
SZ4196	0	0	0
SZ4296	0	0	0
SZ1797	0	0	0
SZ1897	0	0	0
SZ1997	0	0	0
SZ2097	0	0	0
SZ2197	0	0	0
SZ2297	0	0	0
SZ2397	0	0	0
SZ2497	0	0	0
SZ2597	0	0	0
SZ2697	0	0	0
SZ2797	0	0	0
SZ2897	0	0	0
SZ2997	0	0	0
SZ3097	0	0	0
SZ3197	0	0	0
SZ3297	0	0	0
SZ3397	0	0	0
SZ3497	1	0	1
SZ3597	0	0	0
SZ3697	0	0	0
SZ3797	0	0	0
SZ3897	0	0	0
SZ3997	0	0	0
SZ4097	0	0	0

1km Grid Square	No. of Territory Centres		
	2023	2018	2013
SZ4197	0	0	0
SZ4297	0	0	0
SZ4397	0	0	0
SZ1798	0	0	0
SZ1898	0	0	0
SZ1998	0	0	0
SZ2098	0	0	0
SZ2198	2	0	0
SZ2298	0	0	0
SZ2398	0	0	0
SZ2498	0	0	0
SZ2598	0	0	1
SZ2698	1	1	2
SZ2798	0	0	0
SZ2898	0	0	1
SZ2998	1	1	0
SZ3098	0	0	0
SZ3198	0	0	0
SZ3298	0	0	0
SZ3398	0	0	0
SZ3498	2	3	2
SZ3598	1	1	0
SZ3698	1	3	1
SZ3798	0	0	0
SZ3898	0	0	0
SZ3998	0	0	0
SZ4098	0	0	0
SZ4198	0	0	0
SZ4298	0	0	0
SZ4398	0	0	0
SZ4498	0	0	0
SZ4598	0	0	0
SZ4698	0	0	0
SZ1699	0	0	0
SZ1799	0	0	0
SZ1899	0	0	0
SZ1999	0	0	0
SZ2099	0	0	0
SZ2199	1	0	2
SZ2299	0	0	0
SZ2399	0	1	0
SZ2499	0	1	1
SZ2599	0	2	3
SZ2699	0	3	2
SZ2799	1	1	2
SZ2899	1	2	3
SZ2999	1	3	5
SZ3099	2	1	0
SZ3199	0	2	0

1km Grid Square	No. of Territory Centres		
	2023	2018	2013
SZ3299	0	0	0
SZ3399	1	2	3
SZ3499	3	3	1
SZ3599	4	4	2
SZ3699	2	0	2
SZ3799	0	0	0
SZ3899	0	0	0
SZ3999	0	0	0
SZ4099	0	0	0
SZ4199	0	0	0
SZ4299	0	0	0
SZ4399	0	0	0
SZ4499	0	0	0
SZ4599	0	0	0
SZ4699	0	0	0
SZ4799	0	0	0
SU1400	0	0	0
SU1500	0	0	0
SU1600	0	0	0
SU1700	1	0	0
SU1800	3	1	1
SU1900	2	2	4
SU2000	3	3	5
SU2100	2	1	1
SU2200	0	0	1
SU2300	0	0	3
SU2400	0	1	1
SU2500	0	3	3
SU2600	1	1	5
SU2700	4	3	2
SU2800	2	1	1
SU2900	1	1	1
SU3000	0	1	0
SU3100	0	0	0
SU3200	0	0	0
SU3300	1	2	2
SU3400	3	2	2
SU3500	4	2	4
SU3600	3	3	3
SU3700	0	1	1
SU3800	0	0	0
SU3900	0	0	0
SU4000	0	0	0
SU4100	0	0	0
SU4200	0	0	0
SU4300	0	0	0
SU4400	0	0	0
SU4500	0	0	0
SU4600	0	0	0

1km Grid Square	No. of Territory Centres		
	2023	2018	2013
SU4700	0	0	0
SU4800	0	0	0
SU1301	0	0	0
SU1401	0	0	0
SU1501	0	0	0
SU1601	0	0	0
SU1701	1	0	1
SU1801	2	4	5
SU1901	4	4	8
SU2001	3	2	4
SU2101	2	1	5
SU2201	2	3	5
SU2301	1	2	5
SU2401	2	1	4
SU2501	2	1	3
SU2601	2	1	4
SU2701	0	1	1
SU2801	0	0	1
SU2901	0	0	0
SU3001	0	0	0
SU3101	0	0	0
SU3201	0	0	0
SU3301	1	1	0
SU3401	3	4	3
SU3501	3	4	1
SU3601	1	1	1
SU3701	0	0	0
SU3801	0	0	0
SU3901	0	0	0
SU4001	0	0	0
SU4101	0	0	0
SU4201	0	0	0
SU4301	2	3	1
SU4401	0	0	0
SU4501	0	0	0
SU4601	0	0	0
SU4701	0	0	0
SU4801	0	0	0
SU4901	0	0	0
SU1602	0	0	0
SU1702	0	0	0
SU1802	1	1	4
SU1902	3	5	4
SU2002	1	1	0
SU2102	1	2	4
SU2202	1	3	2
SU2302	2	5	4
SU2402	0	1	1
SU2502	2	2	4

1km Grid Square	No. of Territory Centres		
	2023	2018	2013
SU2602	1	0	5
SU2702	1	2	3
SU2802	0	0	1
SU2902	0	0	0
SU3002	0	0	0
SU3102	0	0	0
SU3202	0	0	0
SU3302	0	0	0
SU3402	0	0	6
SU3502	1	0	5
SU3602	2	3	4
SU3702	0	0	0
SU3802	0	0	0
SU3902	0	0	0
SU4002	0	0	0
SU4102	4	2	4
SU4202	3	2	1
SU4302	0	0	0
SU4402	0	0	0
SU4502	0	0	0
SU4602	0	0	0
SU4702	0	0	0
SU4802	0	0	0
SU4902	0	0	0
SU1603	0	0	0
SU1703	0	0	0
SU1803	2	5	4
SU1903	4	3	4
SU2003	0	0	0
SU2103	0	0	0
SU2203	0	0	0
SU2303	0	1	0
SU2403	1	1	2
SU2503	0	0	0
SU2603	0	0	1
SU2703	1	2	1
SU2803	2	0	0
SU2903	1	0	0
SU3003	0	0	0
SU3103	0	0	0
SU3203	0	0	1
SU3303	0	1	0
SU3403	0	0	3
SU3503	0	0	4
SU3603	0	0	0
SU3703	0	0	0
SU3803	0	0	0
SU3903	0	0	0
SU4003	2	1	3

1km Grid Square	No. of Territory Centres		
	2023	2018	2013
SU4103	4	1	2
SU4203	0	0	1
SU4303	0	0	0
SU4503	0	0	0
SU4603	0	0	0
SU4703	0	0	0
SU4803	0	0	0
SU1604	0	0	0
SU1704	0	0	0
SU1804	1	3	3
SU1904	6	5	4
SU2004	1	2	1
SU2104	3	1	3
SU2204	0	0	0
SU2304	0	0	0
SU2404	0	0	0
SU2504	0	1	0
SU2604	0	0	1
SU2704	1	2	1
SU2804	1	2	1
SU2904	0	0	0
SU3004	0	0	0
SU3104	0	1	0
SU3204	0	0	0
SU3304	0	1	0
SU3404	1	0	0
SU3504	1	2	2
SU3604	0	1	0
SU3704	1	0	0
SU3804	0	2	0
SU3904	1	1	1
SU4004	2	4	7
SU4104	4	4	6
SU4204	1	1	1
SU1605	0	0	0
SU1705	0	1	0
SU1805	3	2	2
SU1905	1	2	7
SU2005	1	3	2
SU2105	2	2	2
SU2205	0	0	1
SU2305	0	0	0
SU2405	0	0	0
SU2505	0	0	1
SU2605	0	1	1
SU2705	0	0	0
SU2805	0	1	0
SU2905	0	0	0
SU3005	0	0	0

1km Grid Square	No. of Territory Centres		
	2023	2018	2013
SU3105	0	0	0
SU3205	0	0	0
SU3305	1	2	0
SU3405	1	2	2
SU3505	2	6	1
SU3605	2	3	4
SU3705	2	5	4
SU3805	2	4	1
SU3905	1	3	1
SU4005	1	1	0
SU4105	0	0	0
SU4205	0	0	0
SU1606	0	0	0
SU1706	0	0	0
SU1806	1	1	1
SU1906	0	0	2
SU2006	2	1	5
SU2106	1	3	8
SU2206	0	0	2
SU2306	0	0	0
SU2406	0	0	1
SU2506	0	4	0
SU2606	0	1	1
SU2706	0	0	0
SU2806	0	0	0
SU2906	0	0	0
SU3006	0	1	0
SU3106	0	0	0
SU3206	0	1	1
SU3306	0	1	2
SU3406	3	2	2
SU3506	2	2	2
SU3606	2	2	5
SU3706	0	2	1
SU3806	2	2	4
SU3906	3	3	2
SU4006	0	0	0
SU1507	0	0	0
SU1607	1	1	0
SU1707	1	0	1
SU1807	0	0	0
SU1907	2	1	3
SU2007	3	1	3
SU2107	1	2	6
SU2207	1	2	1
SU2307	1	0	1
SU2407	0	0	0
SU2507	0	0	0
SU2607	0	1	0

1km Grid Square	No. of Territory Centres		
	2023	2018	2013
SU2707	0	1	0
SU2807	0	0	0
SU2907	0	0	0
SU3007	0	0	0
SU3107	2	1	0
SU3207	2	0	2
SU3307	1	0	0
SU3407	4	4	3
SU3507	1	1	2
SU3607	3	1	1
SU3707	0	1	0
SU3807	0	0	0
SU3907	0	0	0
SU4007	0	0	0
SU4107	0	0	0
SU1508	0	0	0
SU1608	1	3	2
SU1708	3	6	5
SU1808	0	2	1
SU1908	0	0	0
SU2008	1	3	2
SU2108	1	0	2
SU2208	1	1	2
SU2308	3	4	2
SU2408	1	1	0
SU2508	0	1	3
SU2608	0	2	0
SU2708	0	0	1
SU2808	0	0	0
SU2908	0	0	0
SU3008	0	0	0
SU3108	2	4	2
SU3208	3	1	1
SU3308	3	1	1
SU3408	1	1	2
SU3508	2	3	4
SU3608	1	1	1
SU3708	0	0	0
SU3808	0	0	0
SU3908	0	0	0
SU4008	0	0	0
SU4108	0	0	0
SU1509	0	0	0
SU1609	1	1	2
SU1709	3	5	5
SU1809	0	1	0
SU1909	0	0	1
SU2009	0	0	0
SU2109	0	2	2

1km Grid Square	No. of Territory Centres		
	2023	2018	2013
SU2209	0	0	1
SU2309	2	2	1
SU2409	0	3	2
SU2509	1	1	3
SU2609	0	1	0
SU2709	0	0	1
SU2809	0	0	0
SU2909	1	1	0
SU3009	3	1	0
SU3109	0	0	0
SU3209	0	1	0
SU3309	0	1	0
SU3409	1	2	3
SU3509	1	0	0
SU3609	0	0	0
SU3709	0	0	0
SU3809	0	0	0
SU3909	0	0	0
SU4009	0	0	0
SU1610	1	0	1
SU1710	2	2	6
SU1810	2	3	4
SU1910	0	0	0
SU2010	2	4	4
SU2110	3	3	5
SU2210	1	1	1
SU2310	0	0	1
SU2410	2	4	0
SU2510	3	2	3
SU2610	0	1	0
SU2710	0	0	0
SU2810	0	0	0
SU2910	0	0	0
SU3010	0	0	0
SU3110	0	0	0
SU3210	0	1	0
SU3310	0	0	0
SU3410	0	0	0
SU3510	0	0	0
SU3610	0	0	0
SU3710	0	0	0
SU1511	0	0	0
SU1611	0	1	1
SU1711	2	2	4
SU1811	3	5	3
SU1911	2	4	3
SU2011	2	1	0
SU2111	0	1	1
SU2211	2	2	3

1km Grid Square	No. of Territory Centres		
	2023	2018	2013
SU2311	3	1	2
SU2411	0	0	0
SU2511	2	1	1
SU2611	0	0	0
SU2711	0	0	0
SU2811	0	0	0
SU2911	0	0	0
SU3011	0	0	0
SU3111	0	0	0
SU3211	0	0	0
SU3311	0	0	0
SU3411	0	0	0
SU3511	0	0	0
SU3611	0	0	0
SU1612	0	0	0
SU1712	1	2	2
SU1812	7	3	5
SU1912	1	2	3
SU2012	2	4	2
SU2112	1	3	1
SU2212	0	0	1
SU2312	1	2	1
SU2412	3	0	3
SU2512	0	1	0
SU2612	0	0	0
SU2712	0	0	0
SU2812	0	0	0
SU2912	0	0	0
SU3012	0	0	0
SU3112	0	0	0
SU3212	0	0	0
SU3312	0	0	0
SU3412	0	0	0
SU1513	0	0	0
SU1613	0	0	0
SU1713	2	0	3
SU1813	2	2	8
SU1913	2	1	9
SU2013	1	1	1
SU2113	1	1	1
SU2213	1	3	7
SU2313	0	0	0
SU2413	0	2	1
SU2513	0	0	0
SU2613	0	0	0
SU2713	0	0	0
SU2813	0	0	0
SU2913	0	0	0
SU3013	0	0	0

1km Grid Square	No. of Territory Centres		
	2023	2018	2013
SU3113	0	0	0
SU3213	0	0	0
SU3313	0	0	0
SU1514	0	0	0
SU1614	0	0	0
SU1714	0	0	1
SU1814	3	3	4
SU1914	3	1	3
SU2014	4	3	3
SU2114	1	0	1
SU2214	0	0	0
SU2314	0	0	0
SU2414	0	0	0
SU2514	0	0	0
SU2614	0	0	0
SU2714	0	0	0
SU2814	0	0	0
SU2914	0	0	0
SU3014	0	0	0
SU3114	0	0	0
SU3214	0	0	0
SU3314	0	0	0
SU1515	0	0	0
SU1615	0	0	0
SU1715	0	0	0
SU1815	4	2	4
SU1915	3	3	7
SU2015	3	2	4
SU2115	2	3	3
SU2215	1	0	2
SU2315	2	2	2
SU2415	1	0	2
SU2515	0	0	0
SU2615	0	0	0
SU2715	0	0	0
SU2815	1	2	0
SU2915	0	1	0
SU3015	0	1	0
SU3115	0	0	0
SU3215	0	0	0
SU3315	0	0	0
SU1516	0	0	0
SU1616	0	2	0
SU1716	1	3	0
SU1816	1	3	3
SU1916	4	3	8
SU2016	1	3	6
SU2116	2	1	3
SU2216	3	3	2

1km Grid Square	No. of Territory Centres		
	2023	2018	2013
SU2316	0	0	1
SU2416	0	0	2
SU2516	0	0	0
SU2616	0	0	0
SU2716	0	0	1
SU2816	0	0	0
SU2916	1	3	3
SU3016	0	0	0
SU3116	0	0	0
SU3216	0	0	0
SU1517	0	0	0
SU1617	0	0	0
SU1717	0	1	0
SU1817	0	1	0
SU1917	3	3	0
SU2017	1	2	2
SU2117	2	3	1
SU2217	0	0	0
SU2317	0	0	0
SU2417	0	0	0
SU2517	0	0	0
SU2617	0	0	0
SU2717	1	1	1
SU2817	1	1	0
SU2917	0	0	3
SU3017	0	0	0
SU3117	0	0	0
SU3217	0	0	0
SU1618	0	0	0
SU1718	0	0	0
SU1818	0	0	0
SU1918	1	2	2
SU2018	1	2	0
SU2118	0	0	0
SU2218	0	0	0
SU2318	0	0	0
SU2418	0	0	0
SU2518	0	0	0
SU2618	0	0	0
SU2718	1	1	1
SU2818	0	0	0

1km Grid Square	No. of Territory Centres		
	2023	2018	2013
SU2918	0	0	0
SU3018	0	0	0
SU3118	0	0	0
SU1719	0	0	0
SU1819	0	0	0
SU1919	0	0	0
SU2019	0	0	0
SU2119	0	0	0
SU2219	0	0	0
SU2319	0	0	0
SU2419	0	0	0
SU2519	0	0	0
SU2619	0	0	0
SU2719	0	0	0
SU2819	0	0	0
SU2919	0	0	0
SU1920	0	0	0
SU2020	0	0	0
SU2120	0	0	0
SU2220	0	0	0
SU2320	0	0	0
SU2420	0	0	0
SU2520	0	0	0
SU1921	0	0	0
SU2021	0	0	0
SU2121	0	0	0
SU2221	0	0	0
SU2321	0	0	0
SU2421	0	0	0
SU2521	0	0	0
SU2621	0	0	0
SU2222	0	0	0
SU2322	0	0	0
SU2422	0	0	0
SU2522	0	0	0
SU2622	0	0	0
Total Territories	**353**	**437**	**544**
Total Occupied Squares	**187**	**214**	**209**