Woodlark Survey 2019

The Verderers of the New Forest
Higher Level Stewardship Agreement
AG00300016

This project has been funded under the Rural Development Programme for England

CONTENTS

1. EXECUTIVE SUMMARY

a. Hampshire Ornithological Society (HOS) was commissioned after tender in 2019 by the then Forestry Commission but now Forestry England to undertake a survey of breeding Woodlark (*Lullula arborea*) on land covered by the Verderers of New Forest and National Trust Higher Level Stewardship Schemes and New Forest Crown Lands Inclosures on behalf of its partners within the New Forest Higher Level Stewardship (HLS) scheme.

b. Volunteers with experience in the calls and identification of Woodlark were sought from within HOS's 2000 members and around 60 individuals agreed to participate in the survey. All 1km squares with the potential to support at least 1 Woodlark territory were surveyed using the standard BTO guidelines used in previous surveys. Once the programme of fieldwork had been completed, data were analysed to determine the number of individual territories present.

c. The analysis produced a breeding population estimate of 169 Woodlark territories within the survey area in 2019.

d. Comparisons with previous surveys would indicate that the breeding population of Woodlark within the New Forest has increased since the 2014 survey and is comparable with surveys prior to 2014. However, we feel that the downward trend indicated in the 2014 survey needed a more robust analysis and explanation than was given at the time but are confident that the current population is at the least stable and at best increasing.

e. The data within this report provides an accurate assessment of the current breeding population of Woodlark in the New Forest and discusses how to improve and analyse the data for future surveys of Woodlark within the New Forest.

f. It also explores the basis upon which to analyse factors influencing the breeding population and distribution of Woodlark within the New Forest.

2. INTRODUCTION

a. A ten year Higher Level Stewardship Scheme (HLS) was awarded to the Verderers of the New Forest in 2010 in partnership with Forestry England and the New Forest National Park Authority. The scheme is granted by the Department for Environment, Food and Rural Affairs (Defra) from the EU's Rural Development Fund for England and administered by Natural England. In the case of the New Forest, whilst the Crown Lands are managed by Forestry England (FE), the Verderers have statutory rights conferred under the New Forest Acts to administer the grazing and commoning rights and are legally and financially responsible for the delivery of the scheme. The delivery of works funded under HLS is overseen by a Board from the chief executives of the Partners and representatives from key stakeholders.

b. As part of the Verderers HLS agreement there is a requirement to undertake surveys for bird species for which the New Forest Special Protected Area (SPA) is designated. The HLS Board agreed the requirement for delivery of a survey of breeding Woodlarks (*Lullula arborea*) in 2019 in line with the methodology used in previous Woodlark surveys within the New Forest.

c. Hampshire Ornithological Society (HOS) was commissioned by Forestry England following successful tender, on behalf of its partners within the New Forest HLS scheme, to undertake a survey of breeding Woodlarks on land covered by the Verderers and National Trust schemes and suitable habitat outside the HLS area but forming part of the Crown Lands managed by Forestry England.

d. This report describes the methods used to determine the range and density of breeding Woodlark within the New Forest and evaluates the findings of the survey. Accordingly, this report also provides an analysis of the survey information including the status of the population compared to previous local and national studies.

e. It also explores the potential factors which may be affecting the distribution and density of Woodlark within the study area and looks at whether a more robust survey methodology could be applied to future surveys that might reflect a more accurate figure for the New Forests Woodlark population than that produced by the standard methodology.

New Forest Designations

a. The New Forest has long been considered one of England's most important and extensive semi-natural landscapes having received protection through its designation as a royal hunting forest since the 11th Century. It comprises internationally important wet and dry heathlands, valley mires, grasslands, ancient pasture and woodland and boasts both national and international wildlife site designations. It is classified as a Special Protection Area (SPA)

for its breeding and overwintering bird species of European importance, in accordance with the European Birds Directive (Directive 2009/147/EC on the conservation of wild birds [codified version]).

b. In 2005 it was also designated a Special Area of Conservation (SAC) for thirteen Annexe 1 habitats and three non-avian species of European importance, the Stag beetle (*lucana cervus*), Southern damselfly (*coenagrion mercuriale*) and Great crested Newt (triturus cristatus) in accordance with the European Habitats Directive (Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora). The European Directive requirements, ensuring the protecting of European wildlife sites, are transposed into UK law by the Conservation of Habitats and Species Regulations 2017 as amended.

c. The New Forest Site of Special Scientific Interest (SSSI) covers nearly 29,000 hectares following a revision of boundaries in 1996 and is the national designation that recognises the biodiversity value of the New Forest.

d. The New Forest is also listed as a Ramsar site, under the Ramsar Convention, as a wetland of international importance.

Woodlark feeding young in the nest

3. WOODLARK DISTRIBUTION AND ECOLOGY

a. The Woodlark has a restricted global range that mostly lies in Europe. It breeds from southern Fennoscandia (south of 60 degrees N), south to the Mediterranean and North Africa, and from Iberia east to the Urals and Iran (Cramp 1998; Tucker & Heath 1994). It is polytypic with two sub-species described. The nominate race *Lullula arborea arborea* occurs across most of Europe, south to Portugal, northern Spain, northern Italy and Ukraine. *Lullula arborea pallida* occurs further south of this range in North Africa, as well as further east, as far as Iran and Turkmenistan (Cramp 1988).

b. Woodlarks are widely distributed across Europe from Iberia to the Russian steppes, but have a generally southern distribution, occurring only in the southernmost parts of Scandinavia and Britain. This reflects its preference for Mediterranean and temperate climatic conditions with warm summers and mild winters. Western populations are sedentary, but further east birds migrate west and south from summer breeding areas to avoid severe continental winters (Hagemeijer & Blair 1997).

c. Numbers have fluctuated widely during the 20th century in north-west and central Europe, with several countries experiencing long-term declines. Up to two-thirds of the known European population is currently experiencing a reduction in range, particularly in Spain and France. Similarly in the UK and Finland, the northern limit of the range has moved south with the species being lost from Ireland around 100 years ago. These declines have been attributed to the loss of dry grassland, fallow land and pasture to intensive agriculture, abandonment and afforestation, and the loss, or degradation of lowland heathland to agriculture, scrub invasion and development.

d. Severe winters in north-west Europe may also cause local extinctions where numbers have already been reduced by habitat loss (Tucker & Heath 1994). Woodlark populations have also fluctuated widely in the UK. Between the 1920s and early 1950s the population expanded and the species became widely distributed in England and Wales as far north as Yorkshire (Parslow 1973). This was followed by a rapid decline and contraction of range. From the late 1960s to the early 1980s, the population is thought to have fluctuated between 100–400 pairs (Sitters et al. 1996).

e. The number of 10x10 km squares occupied in the breeding season in the UK decreased by 62% between 1968–1972 and 1988–1991. However, the population has since increased from an estimated 250 pairs in 1986 to around 1,500 pairs in 1997 (Wotton & Gillings 2000). The recent increase is thought to be largely because of a recent increase in the availability of breeding habitat in forestry plantations due to storm damage and clear felling.

f. The Woodlark is a small to medium sized bird 6 inches in length and of drab appearance that spends much of its time on the ground. It is relatively short lived with the oldest known bird reaching just over 7 years of age. In Britain, Woodlark principally breed on lowland heathland where there is sufficient grazing or management regimes to promote the short sward and bare ground essential for Woodlarks to feed upon and within young conifer plantations where suitable habitat is generated as a consequence of the rotational clear-felling of trees. They have a distinct relationship with woodland edge and in particular where this is characterised by scattered low scrub, small trees and bushes. They are not found in large open areas of heathland where this edge effect is not present, hence large apparently suitable heathland areas will not have Woodlarks. In more recent years Woodlarks have been increasingly found on farmland sites in Hampshire (Keith Betton HOS records). New Forest studies (A. Page unpublished) have shown that nesting generally occurs in small often sparse clumps of vegetation, especially grass and heather, but also bracken and where the very short vegetation enables birds to easily walk into the nest. Birds generally return to territory in February and nest building and egg laying commence in March. The normal clutch size is 3-4 eggs but occasionally 5-6 eggs are laid. Incubation lasts around 14 days and young can leave the nest after a further 12 days. Most pairs are incubating by early April. If predation occurs, multiple repeat clutches can be laid within 10 -14 days. Successful pairs are often double brooded.

g. In the breeding season Woodlarks forage almost exclusively on the ground picking invertebrate prey from the ground or from vegetation a few centimetres tall.

h. Very few young Woodlarks return to their natal area to breed but adults can remain faithful to a site for several years. However within that site they can move territory over different seasons and even within season with different partners (Eyre, Baldwin 2014).

Woodlark populations nationally and in the New Forest.

a. In the UK, breeding is largely confined to southern England with most birds occurring in Dorset, Hampshire (especially the New Forest), Surrey, Sussex, Berkshire, Breckland and the Suffolk Coast. Small populations have also recently become established in north Norfolk and the east Midlands. The preferred breeding habitat in England varies with location. Birds in the southwest use agricultural habitats, whilst those in southern England are largely found on heathland, and those in East Anglia depend on recently cleared or restocked forestry plantations (Gibbons et al. 1993). The Breckland region supports 25–30% of the UK breeding Woodlark population, largely within Thetford Forest. This forest comprises pine-dominated plantations managed by rotational clear-felling and replanting of even-aged stands, creating a mosaic of growth stages. Woodlarks breed in clear-felled and re-planted stands with trees up to 9 years old, but most (98% of all Woodlarks across all years) are found on stands less than 6 years old or areas of permanent open space.

b. We know very little of where Woodlarks spend the winter but the accepted thinking is that they winter locally on farmland. During prolonged cold weather they move to the coast and may even cross to the continent giving them partial migrant status. In the south of England some birds may remain on their breeding grounds all year round.

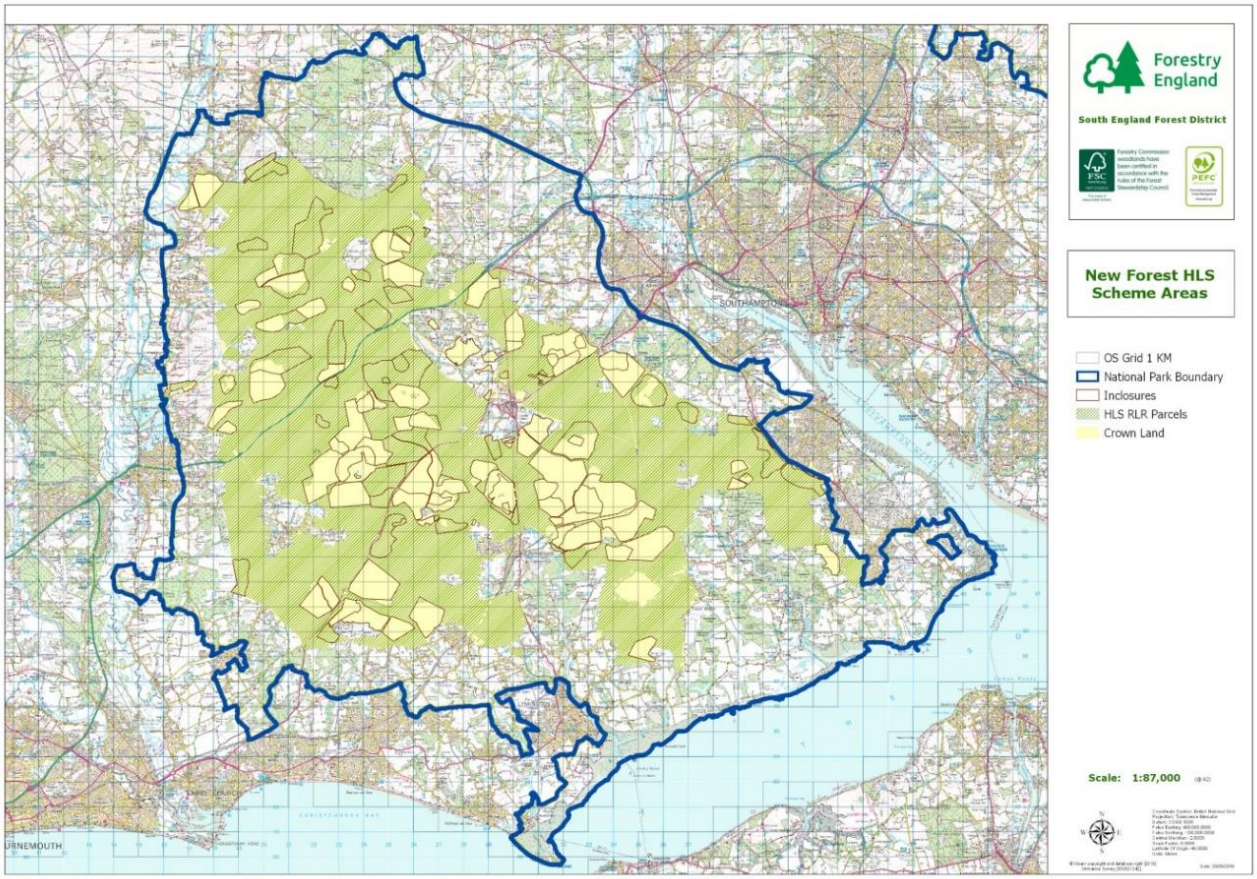
c. Following a dramatic decline in breeding numbers and contraction of range nationally during the latter half of the 20th century, the numbers of breeding Woodlark steadily increased post the 1986 national survey. National surveys of the British breeding population of Woodlark were undertaken in 1986, 1997 and 2006 but not subsequently so the latest national dataset is now 13 years old. The 2006 national survey showed an overall increase in the population size and range for the whole of Britain, and a total population estimate of 3,064 territorial males. However small differences in the sampling methodology meant that some New Forest areas surveyed in 1997 were not covered in the 2006 survey.

d. In Hampshire the main centres for Woodlark populations are the Thames Basin Heaths the Wealden Heaths and New Forest. The Thames Basin heaths were designated a Special Protected Area (SPA) in 2005 with its strong Woodlark population cited in its designation. However, prior to 2005 a lot of clearance work had been undertaken which was thought to be responsible for the healthy population of Woodlarks at that time. Overall there has recently been a downward trend in numbers to well below the level at which the SPA was designated. However detailed studies of Bourley and Long Valley SSSI, one of the Thames Basin Heath component sites over the last 17 years (J.Eyre pers comm) show a fluctuating population but currently very close it what it was in 2003.

e. Following the documented declines of the 1970's and 1980's the RSPB conducted a Woodlark survey of the New Forest in 1990. 51-54 pairs were found with its author D.Burges stating the population was unlikely to exceed 60 pairs. However just seven years later a BTO coordinated survey revealed the New Forest as holding 183 territories. Notwithstanding the small differences in sampling methodology, the 2006 national Woodlark survey recorded 143 breeding pairs which represented a decrease on the 183 pairs from the previous national survey in 1997. This went against the national trend for the same period which saw an increase in the Woodlark population.

f. This downward trend continued with the results of the 2014 New Forest HLS survey finding 134 territories.

New Forest HLS area (green) within the larger New Forest National Park boundary (blue)



4. METHODS

a. Volunteer observers were allocated all 1km squares within the survey area with instruction to survey each square on a minimum of two occasions. All areas of the square with the potential to hold breeding Woodlarks were searched. The first visit was to be undertaken during the period 15th February -31st March and the second visit between the 1st April and 31st May.

b. Recording sheets showing the appropriate 1km square were distributed to each surveyor with attached instruction of how and what to record including start/finish times and weather conditions during the surveying period. Singing Woodlarks were mapped as accurately as possible on the recording sheets with a different colour annotated to each visit.

c. Pairs or singles flushed or seen but not singing were also mapped in the same way but using different symbology.

d. A very small sample of squares received 4-5 visits within the survey period to try and gauge a statistical model for the level of possible under recording using the standard methodology but this was subsequently not possible to determine conclusively enough to form part of this report.

e. All sightings and returned survey forms were then collated and the point data was transferred to a GIS layer in Forester Web the Forestry England mapping system.

f. An assessment was then made by Keith Betton and Andy Page as to the probable number of territories based on the following criteria.

g. Plots more than three hundred metres apart were automatically assumed to relate to different birds/pairs. Those closer were generally assumed to be the same pair and an arbitrary territory boundary was drawn around each plot or number of plots based on the average territory size of a well-studied area of maximum woodlark density where the average territory size is approximately 18 hectares. This enabled better evaluation of cluster sightings.

h. Plots were generally allocated to the square holding the largest proportion of the assumed territory, irrespective of where the sighting was actually made.

i. Territory maps were then produced for the whole of the survey area and are to be found on pages 13 and 14 of this document.

Woodlark nest and eggs

Woodlark nest site in sparse bracken

Woodlark nest site in sparse bracken

Incubating Woodlark

5. RESULTS

Survey coverage and delivery

a. Nearly 60 volunteer surveyors co-ordinated by Keith Betton, chairman of Hampshire Ornithological Society completed survey visits to each of the 1km squares within the survey area that had the potential habitat to support Woodlarks. Surveys were undertaken twice within the required timeframes and in appropriate weather conditions. All sightings were plotted for each survey visit and these were then analysed to determine the probable number of territories involved ensuring confidence in the completeness and accuracy of the results presented here.

b. Average territory size was determined by GIS mapping of Woodlark territories in an area under long term study and consisting of prime habitat. The Longcross and Stoney Cross areas have some of the highest densities of Woodlark and have been studied on and off for 30 years (A.Page unpublished). Virtually no burning has been carried out over many decades with small scale tractor mounted flailing accounting for any required habitat management. The heavy grazing pressure negates the need for more regular management and results in prime Woodlark habitat and a very stable population. Here, where all the key Woodlark habitat criteria are met and pairs are evenly spaced then Woodlark territory size averages 18 hectares equating to a density of 0.05 per hectare of suitable habitat. It was assumed that no other site would exceed the density here and therefore this was used as the baseline to determine territories across the whole survey area from the raw data.

Breeding population in 2019

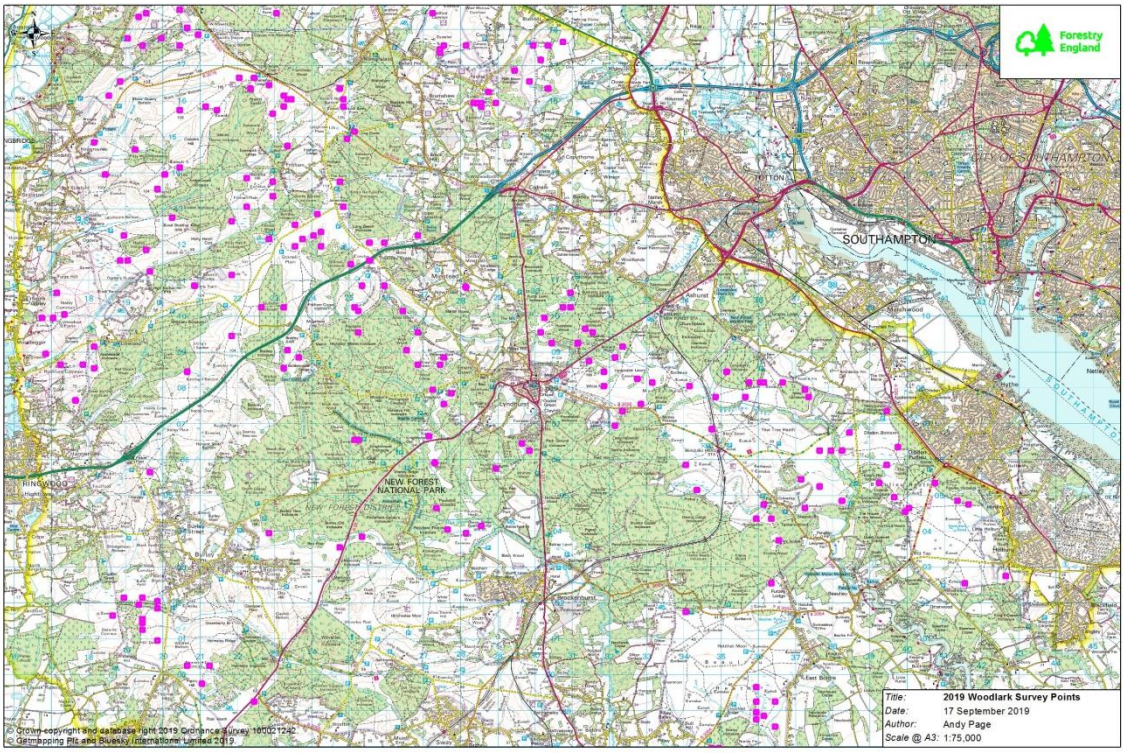
a. The breeding population of Woodlark recorded from the entire survey area within the New Forest National Park area surveyed in 2019 was 169 territories/pairs derived from 214 separate registrations of Woodlark.

b. The survey recorded 148 territories on Crown Land open to grazing with none being found within fenced Inclosures which were included in the survey. A further 21 territories were recorded on National Trust owned land.

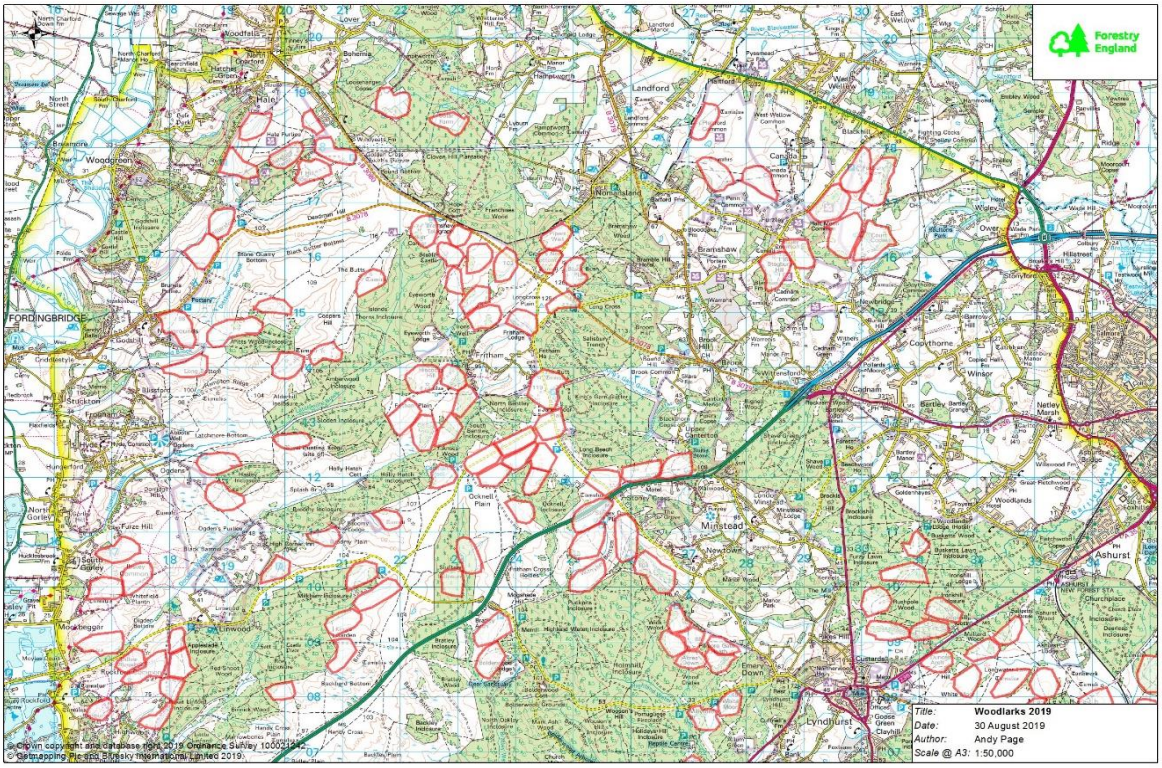
c. The location of all territories recorded during the survey of breeding Woodlark in 2019 are provided at Section 6. The number of territories per 1km square surveyed in 2019, are provided in Appendix A alongside the 2014 figures for comparison.

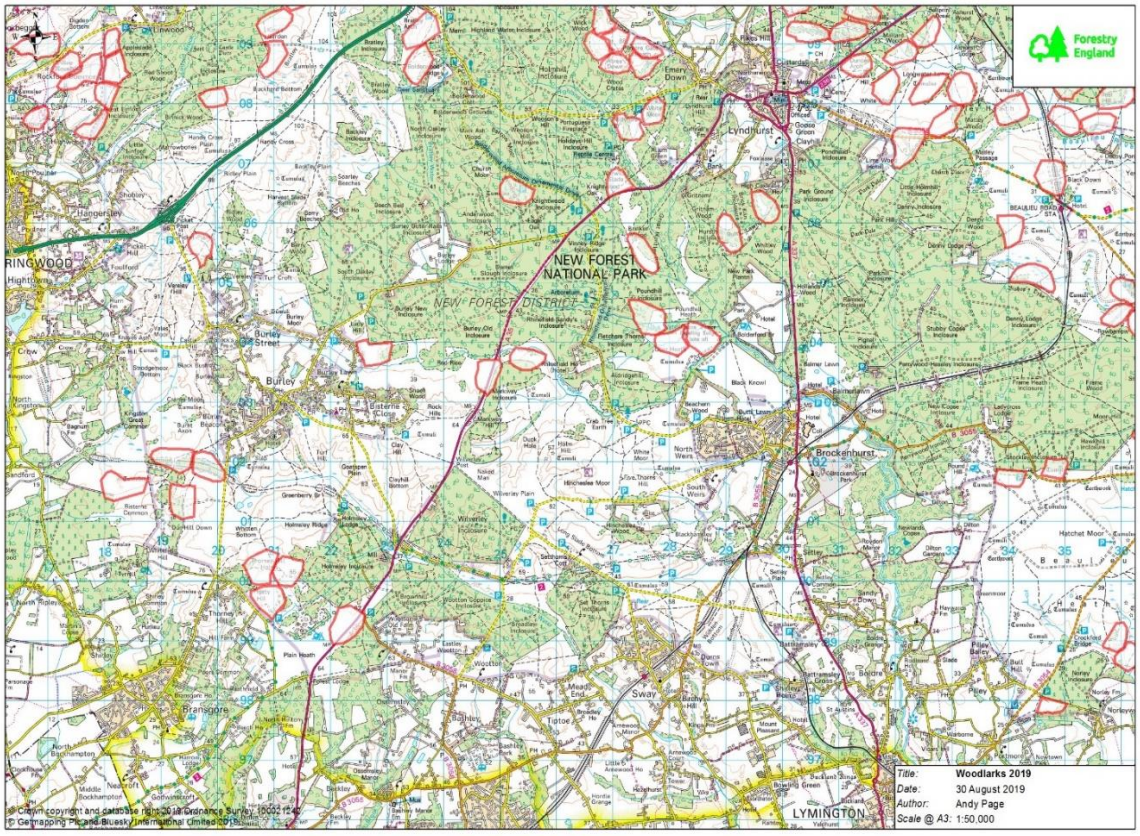
d. There were 63 squares holding Woodlarks in 2019 that were vacant in 2014 and 20 squares holding Woodlark in 2014 that were vacant in 2019 but we feel no meaningful conclusions can or should be drawn from this information.

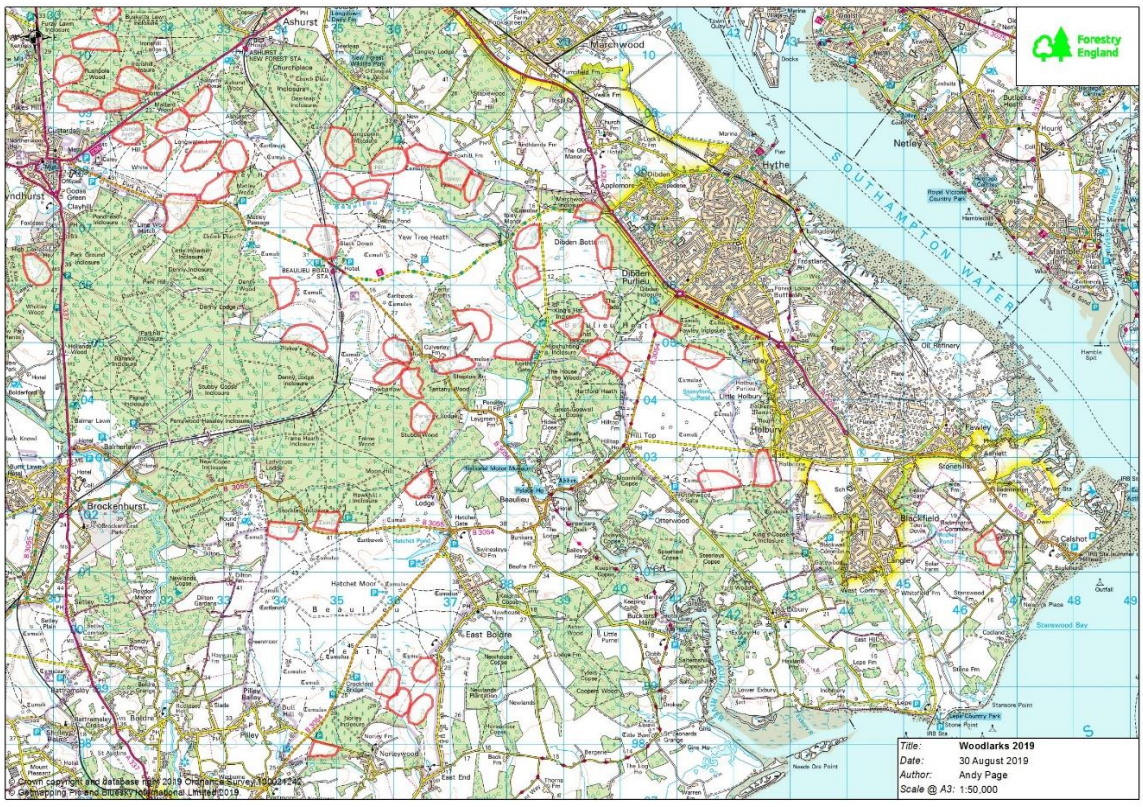
6. WOODLARK TERRITORY PLOTS 2019



Analysis of the 2019 survey point data transposed into territories.




Forestry England
NEW FOREST NATIONAL PARK
NEW FOREST DISTRICT
RINGWOOD
Lyndhurst
Burley
Brockenhurst
Sway
Brangore
LYMINGTON
Title: Woodlarks 2019
Date: 30 August 2019
Author: Andy Page
Scale @ A3: 1:50,000
© Crown copyright and database right 2019 Ordnance Survey 100021242
© Getmapping Plc and Bluesky International Limited 2019


Forestry England
Ashurst
Matchwood
Hythe
Netley
SOUTHAMPTON WATER
Dibden Purlieu
Holbury
Fawley
Oil Refinery
Brockenhurst
Beaulieu
East Boldre
Blackfield
Calshot
Stanswood Bay
Title: Woodlarks 2019
Date: 30 August 2019
Author: Andy Page
Scale @ A3: 1:50,000
© Crown copyright and database right 2019 Ordnance Survey 100021242
© Getmapping Plc and Bluesky International Limited 2019

7. DISCUSSION

a. National Standard survey methodologies by their very name are designed to ensure consistency and provide comparable data to assess wide-scale population trends irrespective of years and early or late seasons. The majority of species are best surveyed when on territory attracting a mate and in the early stages of nesting. Activity varies greatly across the period but drops off significantly after this.

b. Woodlarks are not easy to survey and our considered opinion is that the methodology should focus on early season visits and that by the end of April most Woodlark fieldwork should be completed. We are not advocating abandoning the standard methodology but rather fine tuning it to obtain the best possible results for the survey effort expended. Our suggestion is that future surveys cover the period 15th February - 31st March for the first visit with the second visit in the period 1st April -30th April. This removes the month of May from the survey when Woodlarks are less obvious and confusion with fledged first brood young is much reduced thereby maximising chances for recording territorial birds. Obviously for a large and comprehensive survey of somewhere like the New Forest the ability to field many surveyors should provide more results than a smaller number of ecological consultants working full time but over a longer, albeit accepted, survey period. It enables better early season coverage across a bigger area and means fieldwork can be targeted at the most productive early season and early morning period. However the most important factor is undoubtedly experience with the species concerned.

c. Even highly experienced observers can miss breeding Woodlarks. A. Page (pers comm) states that on his long term study area he has never encountered all the known pairs on a single visit and multiple visits are required to build the full picture of overall pair density. To try and quantify this, additional visits to a very small sample of selected squares were undertaken to try and gauge a statistical analysis by which under recording could be measured. From our results it is quite clear that a number of pairs could be missed under the standard methodology but it was unfortunately not possible to put a statistic to this error factor. It is quite possible however that the declines noted in the previous three surveys of Woodlark are likely a combination of the methodology and different surveyors, rather than a true decline in numbers.

d. Previous attempts to evaluate New Forest breeding densities have concluded that density here in the New Forest is low compared to other heathland SPA's in southern England, but the mechanisms and reasons for this are poorly described. Within the New Forest, Woodlark habitat can be broadly defined as falling into two categories. Stable breeding sites where the habitat has been maintained in optimum condition by decades of very heavy grazing, and more transient sites created by clear-fell, restoration of plantation to heathland or early succession of habitat created by Forestry England's and National Trusts annual programmes

of cut and burn. The latter is probably largely though not wholly responsible for those squares where Woodlark may have been found in previous surveys but not this one and vice versa.

e. Woodlarks have a distinct relationship with woodland edge and in particular where this is characterised by scattered low scrub, small trees and bushes. They are not found in large open areas of heathland where this edge effect is not present, hence large apparently suitable heathland areas will not have Woodlarks. This is important in assessing true density. On prime habitat where all the key Woodlark habitat criteria are met and pairs are evenly spaced, then Woodlark territories generally range between 15 and 20 hectares in size.

f. Notwithstanding the potential pitfalls previously mentioned, with regard to comparisons with previous national surveys we accept it is probably necessary for a report such as this. The breeding population within the survey area at the time of the previous three surveys in 1997, 2006 and 2014 were 182, 143 and 134 respectively. It was considered that the breeding population of 134 territories recorded in 2014 indicated a decrease of 6% in the population since the previous survey in 2006. When compared with the change in population observed between 1997 (182 territories) and 2006 (143 territories) a decrease of 22%, the trend appeared to show a continued decline in the population of Woodlark in the New Forest, (RPS 2014) albeit a slowing decline. The 2019 figure of 169 territories would indicate a 20% increase in the population from the 2014 survey.

g. It seems pointless to compare density of Woodlark with other heathland areas in southern England irrespective of habitat suitability as has happened previously. Past surveys (Sharp *et al.,* 2008) and (Fearnley, et al 2012), have repeatedly referred to the New Forest as having apparent lower densities. Quite why you would try and assess different County areas irrespective of habitat suitability is uncertain. Although Woodlarks may be present in any unit area they will also be absent because of woods, scrub and unsuitable habitat vegetation. True density is only measurable across uniform areas of prime habitat of a known acreage where every Woodlark territory is known and can then be measured to give a density.

h. The 2014 survey also alludes to management practices and grazing greatly influencing structure and distribution of habitats but admits it is unclear which mechanisms are causing this and fails to explain how this relates to Woodlark density. It goes on to say, “The New Forest National Park is subject to various pressures and it is likely that a combination of these is responsible for these apparent low densities. The New Forest is unique in terms of its size and the extent of management practices which occur; the Forest also has a continuous history of grazing, which has greatly influenced the structure and distribution of certain habitats”(RPS 2014). The strong association with grazing has been largely dismissed in previous evaluations and current high stocking levels are likely to have had a positive effect on current Woodlark numbers.

i. Recent declines on the Thames Basin heaths are believed to be related to habitat quantity and quality with grazing levels too low to maintain the habitat suitable for Woodlarks. In the Thames Basin Heaths, Woodlark habitat is transient and, in the absence of burning, gorse, birch and pine regrowth has to be cleared manually and current stock numbers are insufficient to keep scrub regrowth at bay for long periods (J. Eyre pers comm).

Factors thought to affect the species.

a. Factors affecting the variation in the species population densities are regularly stated to be a reduction in the area of lowland heathland due to habitat loss, changes in forestry practice, and disturbance by walkers and dogs. Predation levels vary but are not thought statistically relevant at population levels, but can be locally high in some areas. These perceived factors are explored below in the context of the survey area.

b. The New Forest is however atypical of much of the rest of the Woodlarks range in England. Large areas of commercial Forestry plantation within the New Forest National Park area and in particular on the Crown Lands and National Trust owned land, have and continue to be, felled for reversion to heathland so maximising available heathland habitat and particularly in the short term, providing viable habitat for Woodlarks to occupy and breed in.

c. As the vast majority of Woodlark territories are on the Open or grazed Forest then Forestry practices are less significant here than in other parts of their range. Within the fenced Inclosures current policy has moved to a more continuous cover forestry approach and the SSSI designation terms do not permit replanting with conifer species as has been the case in the past. Although clear fells do occur, they are generally small unless destined for heathland restoration. Ground prep for planting also differs in the New Forest to that practised in the Woodlarks eastern England strongholds. In the Brecks and Suffolk they are found on lighter sandy soils and are heavily reliant on the clear fell and ground preparation regime used in Forestry. Although sandy soils do occur in parts of the western Forest, the predominant soils where the species is most abundant in the New Forest are poor acidic gravels.

d. The grazing regime in the New Forest delivered predominantly by ponies and cattle is moderate at best and heavy at worst but delivers the closely cropped sward so beloved by Woodlarks for feeding. Rotational controlled burning and cutting, has the potential to create temporary Woodlark habitat and are indeed used by Woodlarks. However the prime sites with the most regular occupancy are those where a heavy grazing pressure maintains a stability of habitat over decades. Most of the remaining heathland sites in Hampshire and Dorset lack this intensity of grazing and therefore Woodlark numbers may be significantly lower but may conversely benefit other species that are less tolerant to heavy grazing. In the Thames basin Heaths, although trampling by livestock has been observed, at the low density

of grazing employed, it was not considered to be a significant cause of nest failure, but would likely increase with higher grazing density (Eyre and Baldwin 2014).

e. While disturbance by walkers and dogs is undoubtedly a factor that can negatively affect Woodlarks, it may also act as a deterrent to corvid presence. Long term monitoring in the New Forest by A.Page (pers comm) has not proven disturbance to be a significant threat. Mallord et al. (2007a) showed that "the density of Woodlarks Lullula arborea on heathlands in Dorset, southern England was reduced on sites with high levels of human disturbance, as a result of birds not nesting in the most heavily visited areas, although they continued to forage in such areas. In contrast, there was no direct effect of disturbance on breeding success or nest survival"

   Indeed the areas of greatest density of Woodlarks in the New forest occur in some of the most heavily recreated parts of the Forest.

f. The New Forest has a significant population of Crows and Jackdaws although Magpie numbers are relatively low, plus increasing numbers of Raven which are drawn to feed around the large numbers of depastured livestock. The short sward enables unhindered access and many nests fall foul of their keen vision. Fox and badger numbers are also very high and these also add to the local predation. Woodlarks however have a relatively long breeding season and will repeat lay after losses so increasing their chances of a successful fledging.

g. Studies of nest success for Woodlark on the Thames Basin Heaths suggest that Fox's and corvids are responsible for a significant proportion of nest losses. From 351 nests monitored in the Bourley and Long valley areas between 2006 and 2018 where the outcome was known 37.9 % failed (Eyre, Baldwin 2014).

h. New Forest studies, (A. Page unpublished) show that of 92 nests found between 1992 -1995, where the outcome was known 38 nests were successful and 31 failed with the outcome unknown for the remaining 23. 12 nests were predated, 3 were trodden on by livestock and 6 failed due to weather mainly heavy rain. For the remaining 10 failed nests the exact cause could not be determined.

8. CONCLUSIONS

a. Hampshire Ornithological Society volunteers completed a full survey of breeding Woodlark during the spring of 2019 on land within the Verderers of the New Forest HLS Scheme and Crown Lands outside of it. All habitat potentially suitable for breeding Woodlark was identified and visited twice during the periods defined in the national survey methodology.

b. An analysis of the survey data identified a total of 169 Woodlark territories within the area surveyed. However multiple visits to a number of sites proved that surveyor knowledge and effort can readily account for perceived fluctuations in the population not identified in previous surveys and could easily explain comments attributed to the New Forest population declining and bucking national trends.

c. We feel that with the declining status of many of our birds that future surveys should aim to acquire the most accurate population data for that species regardless of conforming to previous methodologies.

d. The UK breeding population of Woodlark based on the last national survey for the species in 2006 is considered to consist of 3,064 territories. If the UK population is assumed to have remained relatively stable over the last decade then the breeding population recorded in the surveyed area of the New Forest National Park in 2019, therefore, currently represents 6% of the UK breeding population.

e. Comparisons with previous surveys would indicate that the breeding population of Woodlark within the New Forest during 2019 appears to show an increase, which is against the trend recorded in the previous three national surveys in the New Forest in 2014, 2006 and 1997.

f. This survey of breeding Woodlark in 2019 fulfils the commitment of H.O.S. to the Verderers of the New Forest HLS Board, for providing accurate and current population information on Woodlark, a species for which the New Forest SPA is designated.

9. APPENDICES

Appendix A. Surveyed squares and number of Woodlark territories per 1km recorded in 2014 and 2019. Red text are pairs (4) outside of the HLS area.

1KM Square	2014	2019	1KM Square	2014	2019
SU1607	0	1	SU1907	0	0
SU1608	0	1	SU1909	0	0
SU1609	0	1	SU1910	0	1
SU1610	0	0	SU1911	0	0
SU1611	0	0	SU1912	1	0
SU1705	0	0	SU1913	0	0
SU1707	0	1	SU1914	1	1
SU1708	3	2	SU1915	1	1
SU1709	1	0	SU1916	0	0
SU1710	5	2	SU1917	0	2
SU1711	0	0	SU1918	1	1
SU1712	0	0	SU2000	1	1
SU1713	0	0	SU2001	0	0
SU1714	1	0	SU2002	0	0
SU1715	0	0	SU2003	0	0
SU1716	0	0	SU2005	0	0
SU1800	0	0	SU2006	0	0
SU1801	0	1	SU2007	0	0
SU1802	0	0	SU2008	1	2
SU1803	0	0	SU2009	0	1
SU1804	0	0	SU2010	2	1
SU1805	0	0	SU2011	0	0
SU1806	0	0	SU2012	0	1
SU1807	0	0	SU2013	1	0
SU1808	0	2	SU2014	0	2
SU1809	0	1	SU2015	0	0
SU1810	0	0	SU2016	0	0
SU1811	1	1	SU2017	5	2
SU1812	1	1	SU2018	2	1
SU1813	0	1	SU2100	0	1
SU1814	0	1	SU2101	0	0
SU1815	0	0	SU2102	1	0
SU1816	2	2	SU2103	0	0
SU1900	1	0	SU2104	0	0
SU1901	0	1	SU2105	0	0
SU1902	1	2	SU2106	0	0
SU1903	1	0	SU2107	0	0
SU1904	0	0	SU2108	0	0
SU1905	1	1	SU2109	0	1
SU1906	0	0	SU2110	1	1

1KM Square	2014	2019	1KM Square	2014	2019
SU2111	0	1	SU2410	0	0
SU2112	1	0	SU2411	0	2
SU2113	1	0	SU2412	4	3
SU2114	0	0	SU2413	0	1
SU2115	0	1	SU2414	1	1
SU2116	0	0	SU2415	2	2
SU2117	0	0	SU2416	2	1
SU2118	0	1	SU2501	0	0
SU2200	0	0	SU2502	0	0
SU2201	1	0	SU2503	0	1
SU2202	0	0	SU2504	0	0
SU2203	0	1	SU2506	0	1
SU2204	1	0	SU2507	0	0
SU2206	0	0	SU2509	0	0
SU2207	0	0	SU2510	0	3
SU2208	0	1	SU2511	2	2
SU2209	0	0	SU2512	0	0
SU2210	2	1	SU2515	0	1
SU2211	0	0	SU2516	0	0
SU2212	4	3	SU2517	0	0
SU2213	5	3	SU2600	0	0
SU2214	0	0	SU2601	0	0
SU2215	1	1	SU2602	2	0
SU2216	1	2	SU2603	0	0
SU2301	0	0	SU2606	1	0
SU2302	0	0	SU2608	0	2
SU2303	0	0	SU2609	1	1
SU2304	0	0	SU2610	0	1
SU2306	0	0	SU2612	1	2
SU2307	0	0	SU2617	0	0
SU2308	0	1	SU2701	0	0
SU2309	2	1	SU2702	0	0
SU2310	2	1	SU2703	0	0
SU2311	0	1	SU2704	1	1
SU2312	0	2	SU2705	0	1
SU2313	1	1	SU2706	0	1
SU2314	1	1	SU2707	0	2
SU2315	2	2	SU2708	1	2
SU2316	0	2	SU2709	0	1
SU2318	0	1	SU2717	2	1
SU2401	0	0	SU2718	0	1
SU2402	0	0	SU2800	0	0
SU2403	0	1	SU2803	0	1
SU2404	0	0	SU2804	1	1
SU2407	0	0	SU2805	0	1
SU2408	0	0	SU2806	0	0
SU2409	2	0	SU2815	2	1

1KM Square	2014	2019	1KM Square	2014	2019
SU2816	0	1	SU3602	1	1
SU2817	0	1	SU3603	0	1
SU2818	1	0	SU3604	1	2
SU2900	0	0	SU3605	1	0
SU2903	0	0	SU3606	0	0
SU2905	0	0	SU3607	0	0
SU2906	0	1	SU3608	0	1
SU2915	0	0	SU3704	1	1
SU2916	3	2	SU3705	0	1
SU2917	2	1	SU3706	0	0
SU3003	0	0	SU3707	0	2
SU3006	0	0	SU3804	1	1
SU3008	0	0	SU3805	1	0
SU3009	0	2	SU3806	0	2
SU3010	0	2	SU3904	1	2
SU3015	0	0	SU3905	0	2
SU3016	1	1	SU3906	0	1
SU3017	2	1	SU3907	0	1
SU3108	0	2	SU4002	0	0
SU3109	0	2	SU4003	0	0
SU3206	0	0	SU4004	0	0
SU3207	1	2	SU4005	0	1
SU3208	0	2	SU4102	1	1
SU3209	0	1	SU4103	0	0
SU3300	1	0	SU4104	2	1
SU3301	0	0	SU4105	0	0
SU3305	0	0	SU4202	0	1
SU3306	0	0	SU4204	0	0
SU3307	0	0	SU4301	0	0
SU3308	2	1	SU4302	2	0
SU3400	0	0	SU4501	0	0
SU3401	1	2	SU4601	0	1
SU3404	0	0	SZ2099	0	0
SU3405	1	2	SZ2199	0	1
SU3406	0	1	SZ2298	0	0
SU3407	0	1	SZ2299	0	1
SU3408	2	1	SZ2599	0	0
SU3500	0	0	SZ2899	0	0
SU3501	0	0	SZ2999	0	0
SU3502	1	0	SZ3399	0	0
SU3504	3	1	SZ3497	2	1
SU3505	0	0	SZ3498	1	0
SU3506	0	0	SZ3499	0	0
SU3507	0	1	SZ3598	1	1
SU3508	2	2	SZ3599	2	1
SU3600	0	0	SZ3698	2	1
SU3601	0	0	SZ3699	0	1

Prime Woodlark habitat with limited suitable nesting sites

Fully grown Woodlark chicks

Woodlark nest on conifer clear fell site

Woodlark nest site on restored conifer Inclosure site

Limited breeding sites on prime Woodlark habitat

Incubating Woodlark

10. REFERENCES

Conway et al 2009

Betton K. HOS records (various years)

Fearnley et al 2012

Hagemeijer & Blair 1997

John Eyre & Jim Baldwin – Nest productivity of Woodlarks: a case study on the Thames Basin heaths - British Birds.

Mallord JW (2005) Predicting the consequences of human disturbance, urbanisation and fragmentation for a woodlark Lullula arborea population. PhD thesis, University of East Anglia, Norwich

Mallord JW, Dolman PM, Brown AF, Sutherland WJ (2007a) Linking recreational disturbance to population size in a ground-nesting passerine. J Appl Ecol 44:185–195

Quantifying density dependence in a bird population using human disturbance John W. Mallord, Paul M. Dolman, Andy Brown, William J. Sutherland. Oecologia (2007)

Parslow 1973

RPS Group Consultants 2014 - New Forest National Park Survey of Woodlark 2014

Sharp et al 2008

The status of breeding Woodlarks in Britain in 1997 - Wotton & Gillings 2000

Woodlarks in the New Forest, Their status, habitat management and monitoring – Dave Burges 1997

Woodlark and habitat selection in the New Forest, Hampshire in 1990 – Dave Burges