

Dormouse Survey of the Knepp Estate

September-November 2005

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Introduction

Dormice are an attractive nocturnal arboreal rodent species whose distributional range has declined significantly over the past century and they are considered a flagship species for nature conservation. They are fully protected under the Wildlife & Countryside Act furthermore. One previous record of dormice exists for the Knepp Estate from the late 1980s, hence two surveys using special dormice nest tubes and searching for opened hazel nuts were initiated late in their activity season in 2005 to seek to establish whether they were still present.

Methods

In selecting woods for survey it was decided to concentrate on larger stands within the estate (north of the A272 and close to Knepp castle) given the preference of dormice for woods over 20 ha in size. An initial investigation of those woods identified as potential dormouse habitat in the Phase 1 survey by Kate Ryland was made too during September 2005 to assess their suitability to install nest tubes as well as searching for opened nuts. The smaller woods examined in the south of the site, including Newbarn Wood and Northern Wood, were not pursued further, however, due to their general lack of suitable habitat and absence of any dormouse-opened hazel nuts detected in a brief search. The green lane Penbridge Lane was not further investigated either although appeared to be of potential interest.

Four woods were selected for detailed survey in the centre and north parts of the Knepp Estate which were considered potentially suitable for dormice based on their structure and composition including hazel shrubs and other potential food sources, one of which was the location of the old dormouse record. Dormice nest tubes were obtained from the Mammal Society consisting of a plastic surround and plywood tray insert, and set out in these woods largely following the guidelines of the People's Trust for Endangered Species who lead on dormouse work nationally. In each wood a grid of 16 (4 x 4) tubes were sited at approximately 20 m measured intervals and attached to the underside of horizontal branches at various heights using wire. In addition two linear strips of a reew and hedgerow were additionally sampled by placing nest tubes subjectively along their length. The characteristics of each site were noted, along with the location of the grid, as well as the height, orientation and tree/shrub species attachment of each tube being recorded. Two return visits were then made at approximately monthly intervals to check each tube for dormouse presence or evidence of use, recording any other wildlife usage whilst there, as well as cleaning them out and carrying out any maintenance necessary.

A secondary method used to detect dormouse presence was a search for characteristic opened hazel nuts in a range of woods including all of those with nest tube grids established. The search was undertaken on 4th November 2005 over half a day. It was both subjective and qualitative in nature, with no timed fixed-area search made as described in PTES' methods sheet since there were insufficient dense stands of fruiting hazel in the woods surveyed.

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Results & Discussion

The details of each nest tube grid are displayed in the tables at the end.

The results of the nut search are set out in the table below.

Site	Survey area	Hazel characteristics	Opened nuts by rodent species
Brickyard Wood	N half	Sparse, limited nuts	-
Knepp Castle wood	NW section	Stools mainly at boundaries	Grey squirrels
Merrik Wood (incl. Plot 4)	E half	Some nut patches	Grey squirrels
Matches Wood	Fenced & unfenced areas	Mostly young non-fruiting stands	Grey squirrels
Spring Wood (incl. Plot 3)	NW coup & wood bank	NW – dense hazel but little fruiting; bank – more mature fruiting shrubs	Grey squirrels
Horsham Common	S small block & wood bank	Mature fruiting shrubs on bank only	Grey squirrels
“”	SE quarter	Young coppice, few nuts	Grey squirrels
“”	NW quarter	Mature fruiting stools in N especially	Grey squirrels
“”	NE quarter (incl. Plot 1)	Some mature shrubs with nuts on ground	Grey squirrels
“”	Linear strip along stream	Few nuts	Grey squirrels
Constable's Furze	Inside & outside of fenced pheasant coup	Very little hazel, almost no nuts	-
Bar Furzefield	N section	Young hazel coppice under pine plantation, few nuts	Grey squirrels
“”	Central area (incl. Plot 2)	Hazel at N & W sides mainly, very few nuts	Grey squirrels + 1x Wood Mouse nut by footpath W of Tube 1
“”	S lateral strip W of conifer plantation	Some quite young hazel stools, few nuts	Grey squirrels

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Grey squirrels were ubiquitous in eating hazel nuts in all but two woods examined, with just one other mammal species identified from nut evidence, a wood mouse in Bar Furzefield near Plot 2. A few hazel nuts couldn't be definitively identified as to what animal had opened them, especially in Plot 3 Spring Wood, but they certainly hadn't been eaten by dormice. Hazel nut abundance was low overall in all areas surveyed that contained hazel, with most nuts apparently at least one year old and no green fallen nuts observed at all. Thus most of the hazel stands at Knepp have not produced many nuts this year at least, with some being too young in the coppice cycle to be mature whilst others may be too shaded by the tree canopy. A limited number of stools near to Knepp Castle have also been bark-stripped by deer furthermore, which may threaten their viability.

No dormice were found using the nest tubes in the four grids and two strips established. A range of other wildlife was found to frequently utilise the nest tubes, however, principally woodland birds (tit species apparently) and various invertebrates particularly earwigs and woodlice as well as spiders, centipedes and millipedes. Presumably if a tube is occupied by birds then it is less suitable for dormice to utilise, particularly given the prevalence of maggots in their tubes, whilst it is unlikely that use by different invertebrates deters dormice.

It cannot be said from this limited survey that dormice are definitively absent from the surveyed parts of the Knepp estate, since the sampling period has been relatively short and the number of tubes set out was also limited (just 74 in total). The English Nature research report no. 524 by Channin and Woods (2003) sets out an index of probability of finding dormice present in nest tubes (in SW England) for each month, finding September to be the most likely month to detect them, although they have been recorded generally rather late in the year across England during 2005 (PTES *pers. comm.*). Furthermore, their research recommends that a search effort score of at least 20 is obtained in order to assume that dormice are absent from a locality, with a score of less than 15 suggesting that negative results may not be very meaningful. The search effort score of this survey for the **whole** estate was 16.5, not sufficient to assume absence, with individual woods having a much reduced score of just 3.66 for each one! Hence it is recommended to continue monitoring during 2006 (April-November inclusive) to arrive at a score of 37.5 for the whole site, but this would still be just 8.33 per wood because of the relatively small number of tubes set out according to this research.

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Site name: Knepp Estate

Plot number: 1

Date established: 31/08/2005

Location: Horsham Common (previous dormouse record from 1987-90), NE block from ride crossroads.

Description: Oak standards c. 15 m height over old hazel coppice understorey c. 4-5 m height, some tree underplanting; hornbeam dominates at east fringe.
Little ground flora in places with patches of Carex pendula and bramble elsewhere.

<u>Tube no.</u>	<u>GPS co-ords</u>	<u>Height</u>	<u>Orientation</u>	<u>Tree/shrub</u>	<u>Notes</u>	<u>29-9-05 survey</u>	<u>Notes</u>	<u>1-11-05 survey</u>	<u>Notes</u>
1 (SW corner)	15781 23978	160	NNE	Hazel		0		0	
2		190	NE	Hazel		0	Bird use	0	Bird use
3		130	W	Hazel	Squirrel-eaten hazel nuts	0	Bird use	0	Old bird use
4 (NW corner)		130	E	Hazel	Squirrel-eaten hazel nuts	0		0	Centipede & old bird use
5		160	S	Hazel		0		0	Bird use
6		175	N	Sycamore		0	Bird use	0	Woodlouse & old bird use
7		210	NW	Hazel	Dead branch	0	Earwigs & bird use	0	Bird use
8		150	ENE	Hawthorn		0	Bird use	0	Bird use
9		95	WNW	Hazel		0		0	Earwig use
10		150	NNE	Hazel	Squirrel-eaten hazel nuts	0	Earwig use	0	Spider & earwig use
11		90	WNW	Field maple		0		0	
12		145	N	Crab apple	Planted tree in tube	0	Earwig use	0	Spider
13 (NE corner)	15848 23929	150	E	Hazel	Squirrel-eaten hazel nuts	0		0	Old bird use
14		140	NNW	Hazel	Squirrel-eaten hazel nuts	0	Earwigs & bird use	0	Woodlouse & bird use
15		160	SE	Hornbeam		0	Earwig use	0	Earwig use
16 (SE corner)	15833 23914	160	NE	Oak	Squirrel-eaten hazel nuts	0	Earwig use	0	

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Site name: Knepp Estate

Plot number: 2

Date established: 31/08/2005

Location: Bar Furzefield, just N of pylon line & E of footpath by field corner

Description: Oak/ash woodland to c. 15 m height, with hazel coppice understorey to 5-6 m height (dense stools at W end), plus sporadic honeysuckle.
Very sparse ground flora, evidence of wild roe deer grazing here.

<u>Tube no.</u>	<u>GPS co-ords</u>	<u>Height</u>	<u>Orientation</u>	<u>Tree/shrub</u>	<u>Notes</u>	<u>29-9-05 survey</u>	<u>Notes</u>	<u>1-11-05</u>	<u>Notes</u>
1 (SW corner)	16438 23572	100	NW	Hazel	Squirrel-eaten hazel nuts	0	Earwig use	0	Spider use
2		190	SSW	Field maple		0		0	Woodlice & old bird use
3		180	W	Hazel	Dead branch	0	Earwigs & slugs use	0	Earwigs and bird use
4 (NW corner)	16464 23669	210	W	Hazel	Dead branch at end	0	Earwig use	0	Old bird use
5		160	NE	Hazel		0		0	Woodlouse use
6		110	SE	Hornbeam	Dead branch at end	0		0	
7A		120	S	Hazel	Dead branch & squirrel-eaten hazel nuts	0	Acorn eaten in tube - squirrel?	0	BRANCH BROKEN - thus tube relocated
7B		c. 150	NW	Hazel		NA		NA	
8		185	NNW	Hazel		0		0	
9		190	S	Silver birch	Tube just S of rabbit fence in planted thicket along pylon route	0		0	Slug & old bird use
10		190	S	Hornbeam		0		0	Bird use
11		160	WNW	Hazel		0	Bird use	0	Spider & bird use
12		160	WSW	Sweet chestnut	Dead honeysuckle on branch	0	Bird & earwig use	0	Old bird use
13 (NE corner)	16510 23667	110	NE	Hornbeam	Small sapling at deer fenceline, with scrambling honeysuckle	0	Hair fragment - sticky tape placed on roof	0	Tape gone! Beetle present eating wood tray!
14		170	W	Hornbeam		0		0	
15		155	NW	Hornbeam		0	Bird use	0	Woodlouse & old bird use
16 (SE corner)	16532 23615	140	WNW	Hazel	12 m S of tube 15 only, as reached wood edge	0		0	Earwig use

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Site name: Knepp
Estate
Plot number: 3

Date established: 09/09/2005

Location: Spring Wood, NW fenced section with pheasant hopper

Description: Mixed-age oak and ash standards plus hornbeam, to 16 m height, plus some pine and even-age oak plantation in NE
 Shrub understorey to 5-6 m height including much hornbeam, hazel mainly in NW of variable age, little bramble in SE only, rhododendron patches; ground flora sparse to dense

<u>Tube no.</u>	<u>GPS co-ords</u>	<u>Height</u>	<u>Orientation</u>	<u>Tree/shrub</u>	<u>Notes</u>	<u>29-9-05 survey</u>	<u>Notes</u>	<u>1-11-05 survey</u>	<u>Notes</u>
1 (SW corner)	14960 22355	180	WNW	Ulmus glabra (English elm)	Squirrel-eaten acorns below	0		0	Millipede use
2		160	W	Hornbeam		0		0	
3		180	ESE	Oak (pedunculate)	Tube on dead lower twig of oak standard	0		0	
4 (NW corner)	14966 22408	130	NNW	Hazel	In hazel coup to N of wood bank	0	Spider use	0	Woodlouse & spider use
5		80	S	Hawthorn	Hazel nut opened below, too rough for dormouse, uncertain species.	0	Earwig use	0	
6		180	N	Hazel		0		0	
7		160	SW	Hornbeam	Hazel nut with gnaw marks and split, uncertain species (bank vole?)	0		0	Woodlice & snail use
8		160	NNE	Hornbeam		0		0	Woodlice, millipede & bird use
9		110	N	Hornbeam	(Deer damage to bark of near tree)	0	Earwig use	0	
10		160	SSE	Hawthorn	Tape at loose tube end as at angle	0		0	Bird use
11		105	E	Hazel	Hazel nuts below eaten by squirrels	0		0	
12		160	ESE	Blackthorn	Shrub part-prostrate with much dead wood	0		0	
13 (NE corner)	15025 22385	160	SW	Oak	Dead semi-prostrate oak within plantation	0		0	Earwig use
14		200	SSE	Ulmus glabra		0	Bird use	0	Bird use
15		110	S	Hornbeam		0	Woodlice & bird use	0	Woodlice & bird use
16 (SE corner)		150	E	Ulmus glabra		0	Bird use	0	Bird use

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Site name: Knepp Estate

Plot number: 4

Date established: 9&12/09/2005

Location: Merrik Wood, with ride in centre dividing two main wood types
W plantation eith rows of poplar trees, plus turkey oak and few conifers, to 14 m height; dense understorey incl. honeysuckle & bramble between more

Description: open linear strips
E hazel coppice with oak standards (7 and 18 m height respectively), less dense understorey, sparse ground flora

<u>Tube no.</u>	<u>GPS co-ords</u>	<u>Height</u>	<u>Orientation</u>	<u>Tree/shrub</u>	<u>Notes</u>	<u>29-9-05 survey</u>	<u>Notes</u>	<u>4-11-05 survey</u>	<u>Notes</u>
1 (SW corner)	15708 22362	165	SSW	Ash	Squirrel-eaten acorn	0	Earwig use	0	Woodlouse use
2		150	NW	Hawthorn	Young tree	0	Earwig use	0	
3		150	ESE	Hawthorn	Young tree, many squirrel-eaten acorns, nearby honeysuckle	0		0	
4 (NW corner)	15710 22430	180	NW	Spruce (?)	Much honeysuckle in near tree	0		0	Bird use
5		150	N	Hawthorn	Young tree	0		0	Bird use
6		90	NW	Hawthorn	Semi-prone	0		0	
7		120	W	Blackthorn		0	Earwig use	0	Bird use
8		170	ENE	Sycamore		0		0	Earwig/woodlouse use
9		180	S	Hazel	Large dead stem, squirrel-eaten hazel nuts below	0		0	Spider use
10		130	N	Field maple	Squirrel-eaten hazel nuts below	0		0	
11		205	WSW	Hazel		0		0	Bird use
12		200	S	Hawthorn	Tube at steep angle	0	Earwig use	0	Bird use
13 (NE corner)	15784 22400	185	SSW	Hawthorn		0	Bird use	0	Bird use
14		180	NNW	Hazel	Dead branch, squirrel-eaten hazel nuts below	0	Earwig use	0	Bird use
15		140	E	Hazel	Squirrel-eaten acorns	0		0	
16 (SE corner)	15774 22338	180	N	Hazel	Squirrel-eaten hazel nuts below	0		0	

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Site name: Knepp Estate

Plot number: Link 1

Date established: 31/08/2005

Location: Wood rew between Horsham Common & Coates Furzefield woodland blocks; stream meandering at N & W edges, footpath at E end

Description: Oak/ash wood to 12 m + height, hazel & hawthorn sparse understorey to 4-5 m height
Tubes set out subjectively without 20 m spacing!

<u>Tube no.</u>	<u>Location</u>	<u>Height</u>	<u>Orientation</u>	<u>Tree/shrub</u>	<u>Notes</u>	<u>29-9-05 survey</u>	<u>Notes</u>	<u>1-11-05 survey</u>	<u>Notes</u>
1	W of footpath beyond ditch	70	W	Hazel	Low branch, squirrel-eaten hazelnut	0		0	Moth use
2	Near to above	110	S	Holly		0		0	
3	W of tube 2	130	SSW	Ash	On live semi-prone tree underside, squirrel-eaten hazel nuts	0		0	
4	NW of tube 3	140	SE	Hawthorn	Squirrel-eaten hazelnut	0	Earwig use	0	Bird use (much)
5	Over stream, near bend	180	SSE	Hazel		0	Earwig use	0	Old bird use
6	S of tube 5	170	SSW	Hazel		0	Earwig use	0	Bird use

Site name: Knepp Estate

Plot number: Hedge 1

Date established: 31/08/2005

Location: Hedge between Constable's & Pollardshill Furzes, fenced both sides, c. 3-5 m wide (wider to E)

Description: Thorn scrub dominated, mostly continuous except for gate at W end and gap under oak standards (branches overhang both)
Tubes subjectively sited along part of length!

<u>Tube no.</u>	<u>Location</u>	<u>Height</u>	<u>Orientation</u>	<u>Tree/shrub</u>	<u>Notes</u>	<u>29-9-05 survey</u>	<u>Notes</u>	<u>1-11-05 survey</u>	<u>Notes</u>
1	10 m from wood E end, just N of large oak tree	130	W	Hawthorn		0	Earwig use	0	Bird use
2	E of second large oak tree from wood	140	S	Hawthorn		0	Earwig use	0	Bird use
3	E of oak pair gap	140	E	Blackthorn		0	Earwig use	0	Bird use
4	Just W of oak pair	120	W	Hawthorn		0	Earwig use	0	Earwig use