

## Timed Butterfly Transect Survey of the Knepp Estate 2009

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### ***Introduction***

Butterflies have been the subject of annual monitoring surveys in July on the Knepp Estate by the Sussex Wildlife Trust, as part of the overall monitoring programme to assess the effects of the naturalistic grazing regime that is being instituted there. The five surveys run to date, in conjunction with fixed point photo monitoring, have detected a total of 24 different species, whereas previous recording by Butterfly Conservation (BC) Sussex branch lepidopterists during 1995-2004 had registered 26 species (mostly the same ones).

### ***Methods***

We have consistently used BC's standard methodology for 'Butterfly Site Recording' as the basis for our simple fixed-route timed transect surveys of the main areas of the estate subject to 're-wilding', enabling relative population densities to be calculated. The rapid walking route, covered in a single day, was divided into 26 discrete parcels (according to vegetation, habitat and management) and the length of time spent in each and the individual numbers seen of each butterfly species were recorded. The walking route taken and transect section locations are given in English Nature Research Report 693 (Map 6). The weather conditions apparent at the time of survey of each parcel were also recorded, and a summary of maximum temperature, wind speed and direction and amount of sunshine was noted furthermore.

### ***Results & Discussion***

(For detailed results, see individual data tables and summary results for the period in the accompanying Excel file "[Knepp butterfly surveys 2005-9](#)", covering the entire survey dataset)

#### **2009 Survey - Summary**

The weather was not good on the day of survey, being very breezy and turning to rain by late afternoon, with scattered sun and cloud before that. Indeed, much of the preceding month of July was very wet, which would also have had an impact on numbers of butterflies evident on the wing. Despite this, 15 species were recorded on the transect, with an average of 4.4 species per parcel which ranged from no butterflies in one single parcel (No. 24) up to 9 species in grassland Parcel 4 (N/E of Merrick Wood). A reasonable abundance of 825 individual butterflies was recorded in total, equating to 2.52 individuals per minute survey (relative density), although this would have been much lower had it not been for the invasion of Painted Lady butterflies in 2009. 2009 was distinguished by the dominance of Painted Ladies, the 313 recorded individuals making up 38% of the total and considerably outnumbering the usual Meadow Browns (233 individuals) and Gatekeepers (131 individuals). Painted Ladies significantly contributed to the transect section with the highest recorded density of butterflies this year as well, grassland Parcel 5 (N/E of Great Cockshill Wood) with 6.63 butterflies recorded per minute survey. This was followed by Parcel 7, the long grassland along the stream to the south-west of Horsham Common, which also had a relatively high density of butterflies (4.75 per minute in 2009).

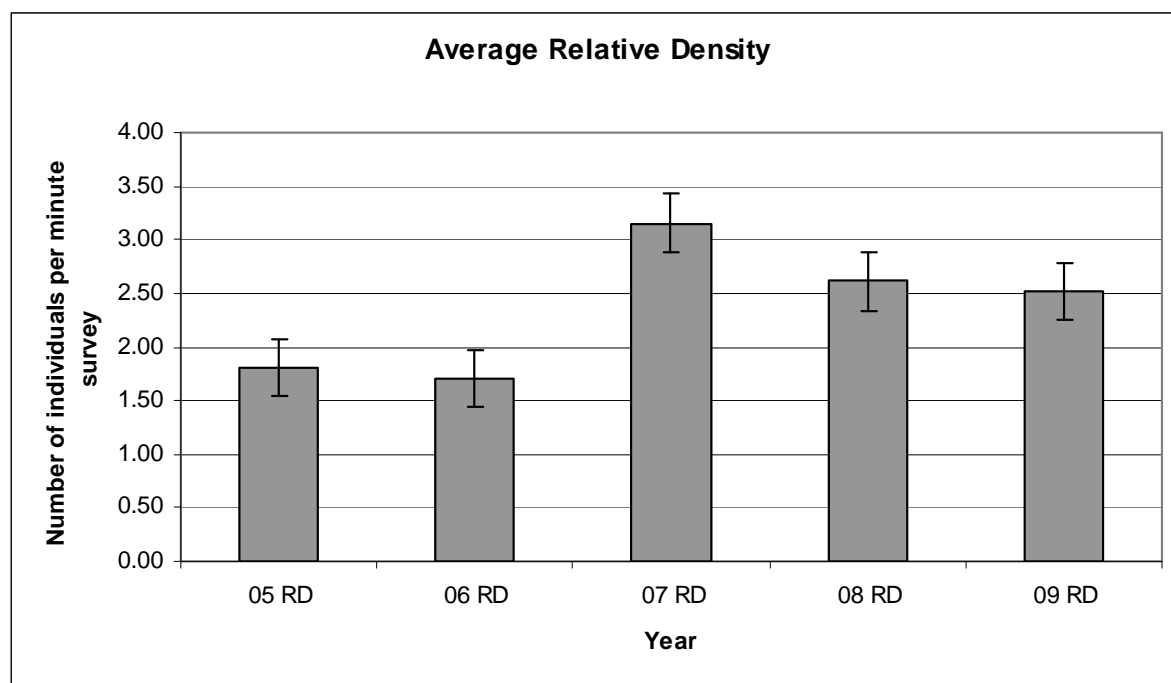
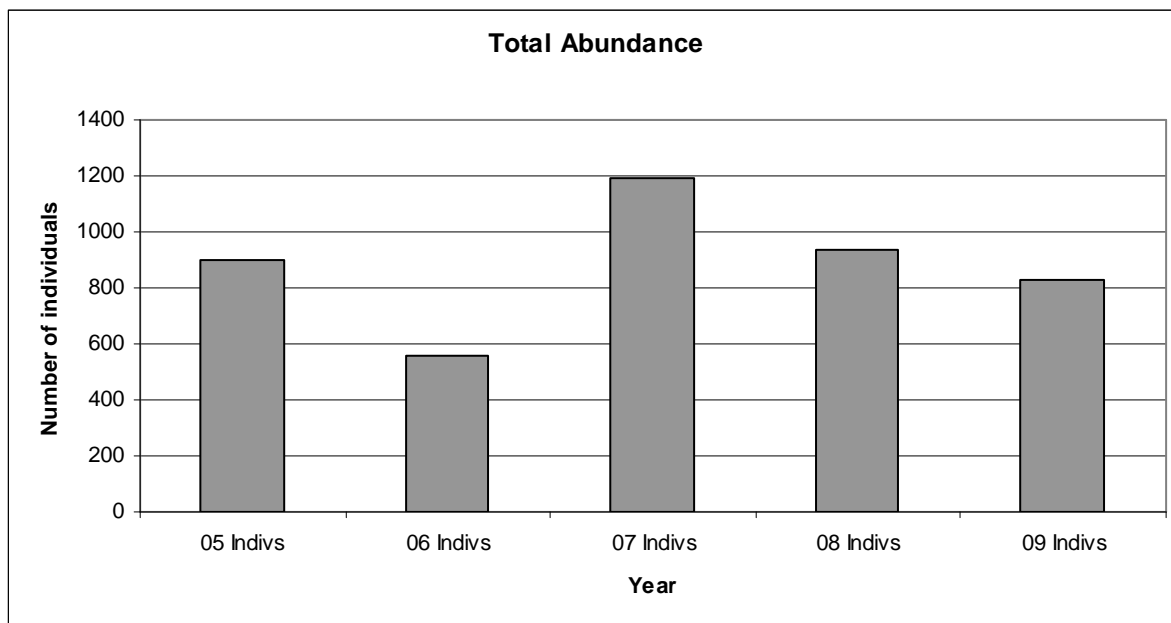
Regarding species of conservation interest, Silver-Washed Fritillary butterflies really stood out in 2009 with their highest recorded abundance (34 individuals) and geographical spread yet, being found in an impressive 9 different transect parcels including not just their regular 6 woodlands but also 3 adjoining grassland parcel edges too. Such an overspill into woodland/grassland fringes is an interesting development, with the butterflies taking advantage of the abundance of thistle flowers in the grasslands for nectaring. No other species of conservation interest were recorded in good numbers however, with reduced abundance and only patchy occurrence of Small Skippers and one single Common Blue sighted only. A single Small Copper butterfly was found, for the first time in this survey series, in the northern grassland area. Lastly Peacock butterflies were again evident nectaring on the widespread thistle patches this year.

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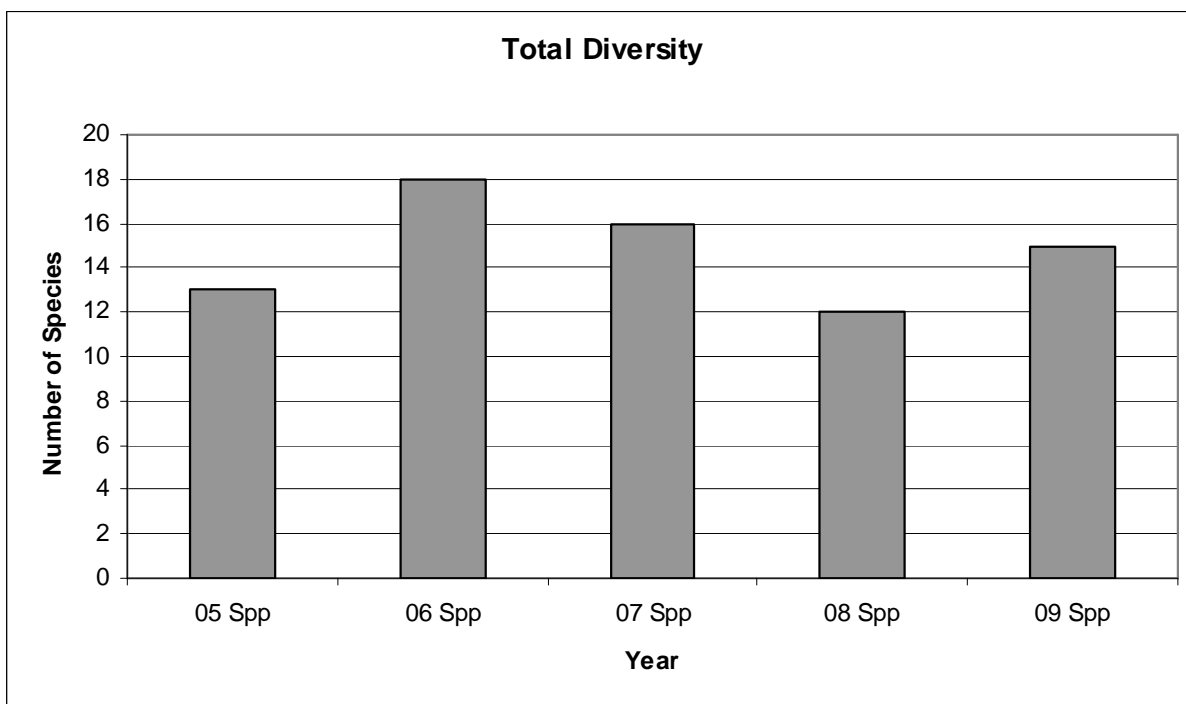
## Integration with previous years (2005-8)

The three graphs and two tables below display the comparative analyses and results for the survey series to date, for comparing the data between transect sections and between the species recorded over the 5 years of survey work.

No statistical analysis has been conducted on this dataset however, which may not be worthwhile given the limitation that only a single survey each year has been conducted and hence is unlikely to represent the conditions of the year as a whole for temporal comparison. Spatial comparisons between different transect sections averaged over the 5-year series might be a better area approach for statistical analysis to compare differences between different parts of the site for butterflies.



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**Table 1 – Transect Sections**

Parcel no.	05 Indivs	06 Indivs	07 Indivs	08 Indivs	09 Indivs	05-09 Indivs Av	05 RD	06 RD	07 RD	08 RD	09 RD	05-09 Relative Density Av	05 Spp	06 Spp	07 Spp	08 Spp	09 Spp	05-09 Spp Av
1	30	31	7	23	17	22	1.58	1.35	0.58	1.77	1.31	1.32	4	6	1	5	7	5
2	6	17	32	30	30	23	0.46	1.06	1.68	3.00	2.50	1.74	3	7	6	4	5	5
3	4	1	6	4	1	3	0.67	0.20	0.67	0.67	0.17	0.47	1	1	4	4	1	2
4	90	57	163	160	151	124	2.00	1.54	3.62	3.81	3.60	2.91	4	9	8	6	9	7
5	61	42	92	96	106	79	2.44	2.00	3.29	4.00	6.63	3.67	3	6	5	5	8	5
6	19	11	20	11	21	16	1.19	0.79	1.33	1.10	1.50	1.18	4	4	5	6	7	5
7	70	103	45	64	38	64	3.50	9.36	4.50	9.14	4.75	6.25	5	9	6	7	7	7
8	64	45	63	60	43	55	1.45	1.41	2.33	2.40	2.15	1.95	6	7	8	8	7	7
9	10	32	31	64	31	34	0.56	2.13	2.38	2.29	3.10	2.09	1	4	4	7	4	4
10	13	10	18	24	24	18	1.30	3.33	2.25	4.80	3.43	3.02	3	2	9	5	8	5
11	28	20	10	11	5	15	3.11	2.22	1.00	1.22	0.50	1.61	3	4	3	3	5	4
12	27	19	52	62	87	49	1.42	1.36	4.33	3.65	4.83	3.12	2	4	5	4	6	4
13	33	33	74	36	12	38	1.50	2.36	4.93	2.77	0.71	2.45	3	5	3	4	2	3
14	26	24	130	42	109	66	1.18	1.71	6.19	1.83	5.45	3.27	2	3	4	5	8	4
15	51	32	23	9	26	28	1.46	1.52	1.15	0.56	1.44	1.23	5	7	6	4	5	5
16	14	4	30	27	41	23	1.08	0.31	2.14	2.45	3.42	1.88	2	1	2	3	5	3
17	95	37	86	45	26	58	3.06	1.95	5.06	2.65	1.44	2.83	4	5	4	4	6	5
18	42	14	38	22	10	25	2.21	1.08	2.11	2.20	0.67	1.65	2	5	3	3	2	3
19	44	10	77	40	16	37	1.91	1.00	7.70	3.64	1.78	3.21	3	3	5	5	3	4
20	10	1	25	6	5	9	2.00	0.33	6.25	1.50	1.25	2.27	1	1	1	2	1	1
21	12	14	42	26	1	19	0.92	2.33	6.00	2.89	0.17	2.46	3	2	3	5	1	3
22	75	3	89	49	12	46	1.50	0.19	3.07	1.44	0.63	1.37	4	2	2	4	1	3
24	48	0	0	2	0	10	6.86	0.00	0.00	0.50	0.00	1.47	3	0	0	2	0	1
25	5	0	27	14	9	11	0.45	0.00	2.70	1.75	1.29	1.24	3	0	2	2	1	2
26	24	0	12	10	4	10	6.00	0.00	4.00	3.33	1.00	2.87	3	0	1	2	1	1
ALL	901	560	1192	937	825	883	1.81	1.70	3.15	2.61	2.52	2.36	13	18	16	12	15	15

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**Table 2 – Species Recorded:** individual numbers (abundance) & transect section numbers (frequency)

SPECIES	05 Abund	06 Abund	07 Abund	08 Abund	09 Abund	05-09 Av Abundance	05 Freq	06 Freq	07 Freq	08 Freq	09 Freq	05-09 Av Frequency
Small Skipper	35	23	1	38	9	21	5	5	1	9	3	5
Essex Skipper	3	0	33	0	0	7	1	0	11	0	0	2
Large Skipper	2	1	1	2	2	2	1	1	1	1	2	1
Clouded Yellow	0	1	0	0	0	1	0	1	0	0	0	1
Brimstone	2	1	0	0	0	1	1	1	0	0	0	0
Large White	9	62	27	45	24	33	7	13	13	16	12	12
Small White	15	16	19	42	36	26	7	7	12	17	11	11
Green-veined White	0	4	4	2	3	3	0	3	4	2	3	2
Purple Hairstreak	0	2	1	0	0	1	0	1	1	0	0	0
Small Copper	0	0	0	0	1	0	0	0	0	0	1	0
Small Blue	0	1	0	0	0	1	0	1	0	0	0	1
Brown Argus	0	0	1	0	0	1	0	0	1	0	0	1
Common Blue	0	21	0	0	1	4	0	6	0	0	1	1
White Admiral	0	0	1	0	0	0	0	0	1	0	0	1
Red Admiral	0	3	0	0	0	1	0	3	0	0	0	1
Painted Lady	0	7	2	0	313	64	0	4	2	0	11	3
Peacock	1	0	4	17	19	8	1	0	3	10	8	4
Comma	2	2	0	4	8	3	2	2	0	4	6	3
Silver-washed Fritillary	13	16	26	19	34	22	3	5	6	5	9	6
Speckled Wood	5	6	5	10	9	7	3	5	4	4	3	4
Marbled White	0	0	0	1	0	1	0	0	0	1	0	1
Gatekeeper	198	179	92	138	131	148	23	17	17	16	17	18
Meadow Brown	611	214	974	619	233	530	26	21	22	24	22	23
Ringlet	5	1	1	0	2	2	1	1	1	0	1	1
TOTAL 24 SPECIES												