

The effect of cutting grass for butterfly conservation at Witch Lodge Field, Somerset, England

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SUMMARY

The grassland at Witch Lodge Field, Somerset has been cut annually since 1979 using a brush cutter to maintain butterfly habitat. Despite management, many butterfly species have declined on the site including several species of conservation concern. These declines may be attributable to both increases in the proportion of grass in the sward and grass 'greening'.

BACKGROUND

Over the last 200 years, over half of the 59 species of butterflies in the UK have undergone a substantial decline in range (>20%). Fifteen species have declined by over 50% and five have become extinct. Annual data collected by the Centre for Ecology and Hydrology (CEH) indicates that some species are subject to declines even on protected areas that are specifically managed for butterflies. The declines in most of these butterflies have come about due to habitat destruction as a result of agricultural intensification, afforestation, changes in land management (e.g. cessation of coppicing and reduction of grazing), and continuing habitat fragmentation. The effects of climate change are also of concern.

This case describes attempts at maintaining and enhancing remnant grasslands in an area subject to afforestation. The site, in Somerset, southwest England, supports many scarce butterflies such as the Duke of Burgundy fritillary *Hamearis lucina*.

ACTION

Study site: The grassland is located at Witch Lodge Field, at the Northern edge of the Blackdowns plateau, in Somerset. Here, conifer and mixed broad-leaved plantations have grown up and replaced the open heath land and grasslands that were present in the 1950s and 60s. There are however, still small remnants of old meadows, glades, clearings and other grasslands which provide important butterfly habitats. Since 1979, volunteers from

the West Country branch of Butterfly Conservation (in conjunction with the Forestry Commission) have managed a 1 acre (0.405 ha) area of herb-rich grassland, for butterflies. As there are few rabbits *Oryctolagus cuniculus* on the site they are ineffective at maintaining a short grass sward, therefore grass-cutting is undertaken each year, to promote butterfly habitat.

Grass cutting: The grassland has been cut annually (between December and January) since 1979 using a brush cutter (Stihl grass trimmer, 10cc). The trimmings are then raked away usually into nearby hedges or the border of the site. This management was deemed a good substitute for grazing as it provided a sward length and plant composition required by the grassland butterfly species present in the area. The grass is cut to approximately 5 - 10 cm in length. Using a brush cutter (even if more time-consuming) is a more gentle approach than a mower and much more easily transportable. Using a brush cutter has the added advantage of producing a more uneven sward length as the cut can be greater than that of a mower if desired. It also avoids potential problems such as soil compaction and crushing of invertebrates, as encountered when using heavier cutting machinery.

Butterfly monitoring: A fixed 300 m transect is monitored weekly between April and September. Transects are walked at a slow steady pace. The number of each butterfly species either side and ahead of the walker is recorded on a standardized pro forma. Counts are only made during the day and when certain weather criteria are met (warm, bright, with light winds).

CONSEQUENCES

Effect of grass cutting on vegetation composition: Since management began in 1979, the vegetation has become more green and dense in spite of meticulous removal of enriching elements such as grass cuttings. However, the flora has maintained its diversity and some species may have benefited from the

management. In 2006, over 100 early purple orchids *Orchis mascula* were observed in flower.

Effect of grass cutting on butterfly abundance & diversity: A total of 33 species were recorded between 1997 and 2005 and monitoring is ongoing. (See Table 1 for the maximum count of each butterfly species during transect-observations from April to

Table 1. Maximum counts of each butterfly species during transect observations from April to September, 1997 to 2005, Witch Lodge Field.

Species	1997	1998	1999	2000	2001	2002	2003	2004	2005
Small skipper	20	11	10	8	12	11	21	2	4
Large skipper	13	3	9	9	5	5	14	4	4
Dingy skipper	4	3	4	1	1	0	0	0	0
Grizzled skipper	4	2	1	0	0	0	0	0	0
Wood white	2	3	1	0	0	0	0	0	0
Clouded yellow	0	3	1	10	0	2	0	1	0
Brimstone	4	5	2	7	1	6	8	10	2
Large white	6	11	17	6	3	10	4	7	4
Small white	4	3	12	9	4	3	3	3	4
Green-veined white	3	2	6	4	5	7	6	8	4
Orange tip	4	4	3	5	0	3	1	2	4
Green hairstreak	2	0	0	0	0	0	0	0	2
Purple hairstreak	0	1	0	0	0	0	0	0	0
White-letter hairstreak	0	1	0	2	1	0	1	1	0
Small copper	1	2	1	2	1	1	2	0	0
Brown argus	2	1	0	1	0	0	1	1	1
Common blue	15	2	2	2	2	2	39	8	9
Holly blue	1	2	3	0	0	0	1	1	0
Duke of Burgundy	15	21	18	11	3	5	9	3	3
Red admiral	1	1	2	4	2	0	4	0	4
Painted lady	3	1	3	6	4	3	5	2	1
Small tortoiseshell	54	2	2	4	4	5	16	2	1
Peacock	103	13	5	40	31	45	33	15	27
Comma	0	1	2	8	4	3	6	8	4
Dark green fritillary	1	0	0	0	0	0	0	0	0
Silver-washed fritillary	5	2	3	4	11	6	7	8	9
Speckled wood	4	4	5	9	7	6	4	3	3
Marbled white	221	36	78	49	71	51	89	77	33
Gatekeeper	80	54	21	52	31	32	66	114	116
Meadow brown	60	39	88	34	14	13	19	19	11
Ringlet	128	25	143	102	106	147	118	73	75
Small heath	0	1	0	0	0	0	0	0	0
Number of counts in year	25	18	23	23	12	24	21	17	15

September from 1997 through to 2005. Note that the number of counts in a given year ranges from 12 to 25.

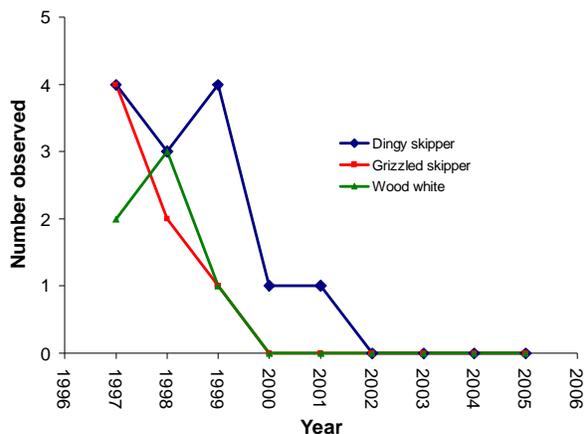


Figure 1. The maximum number of grizzled skippers, dingy skippers and wood whites observed each year from 1997 to 2005.

Since 1997, only two small heath butterflies *Coenonympha pamphilus* were recorded (in 1998) and are now believed to be extirpated from the site. Given that it occurs where there are fine grasses and the sward is short and sparse, it is not likely it will re-establish given the present habitat conditions at Witch Lodge Field. The small heath though, is a fairly widespread and common species in the British Isles. In 2000, two much rarer species, the grizzled skipper *Pyrgus malvae* and the wood white *Leptidea sinapis* disappeared from the site and have not been observed since. Similarly, the dingy skipper *Erynnis tages* (another local species) became extirpated in 2002 (see Figure 1 for number of observed grizzled skippers, dingy skippers and wood whites from 1997 to 2005).

However, the green hairstreak *Callophrys rubi*, observed only in 1997, has recently recolonised. It has been seen again in 2006 in considerable numbers. Its food plants, dyers greenweed *Genista tinctoria* and bird's-foot trefoil *Lotus corniculatus* are now abundant at the site.

A patch of grassland was left unmanaged on the site for several years to see what would happen. This resulted in succession to woodland with species including wild service tree *Sorbus torminalis* colonising.

Conclusions: Many of the butterfly species recorded in 1997 have declined on the site including several species of conservation concern (e.g. dingy skipper, grizzled skipper, wood white and Duke of Burgundy fritillary). This is despite annual cutting of the grass in order to maintain a short sward. It is believed that these declines are due to the increase in density and 'greening' of the grass. This resulting vegetation structure appears to make the site no longer suitable for some butterflies. In my opinion, the current cutting regime, although labour intensive, effectively mimics the presence of grazing animals and maintains a habitat structure suitable for the less common butterflies, and that increasing winter temperatures due to climate change may be the cause of increased density and 'greening' of the grass sward.

Grazing is a planned management option for Witch Lodge Field, as well as extending the site further. This will happen once a forthcoming Heritage Lottery Fund project for the Blackdowns is in place. An adjoining field has recently been prepared in order to add wild flower seed to create further habitat for butterflies. The field has never been ploughed and retains a wide diversity of flora and fauna.