

Creation of a drystone wall to create egg-laying habitat for grizzled skipper *Pyrgus malvae* at Ryton Wood Meadows Butterfly Conservation Reserve, Warwickshire, England

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SUMMARY

In an attempt to enhance breeding habitat for the grizzled skipper *Pyrgus malvae* at a site in central England, a low drystone wall was laid to create egg-laying habitat in a herb-rich grassland. During subsequent egg searches, it became apparent that the butterflies preferred to lay eggs on the leaves of creeping cinquefoil *Potentilla reptans* which were growing over stones in the wall. The relatively high egg density found one year after the wall construction suggests that this habitat is now more suitable than a nearby, traditionally used, coppiced ditch habitat.

BACKGROUND

Ryton Wood Meadows, a Butterfly Conservation nature reserve, has been established on an old sand and gravel quarry. The quarrying came to an end in 1995 and the area is now being restored in several phases to herb-rich grassland covering an area of 12.4 ha. The site is an important component in a landscape scale conservation project in which the Warwickshire Branch of Butterfly Conservation is playing an integral part.

The reserve is sandwiched between Ryton Wood, a 104.5 ha ancient woodland (designated a Site of Special Scientific Interest), and Ryton Pools a 38.7 ha Country Park. All three sites are situated within the Princethorpe Woodlands, a heavily wooded area covering 432 ha. This locality is very important for Lepidoptera with 40 species of butterfly and over 570 species of moth having been recorded breeding in the area. Currently 33 butterfly and around 570 moth species are known to breed in the Ryton Wood and Ryton Wood Meadows part of this complex.

Ryton Wood has been actively managed since 1990 and as a result has become the richest area in the Princethorpe Woodlands for Lepidoptera. Due to their central location in the Princethorpe Woodlands, Ryton Wood and Meadows are well situated to provide source populations for colonisations of other parts of this landscape when habitats are suitably restored. There are signs that this is already happening, e.g. the silver-washed fritillary *Argynnis paphia* is believed to have colonised two nearby woodlands with founding adults stemming from the colony at Ryton Wood.

Another key species in the area is the grizzled skipper *Pyrgus malvae*, but it has not fared well and has been on the verge of extinction at the locality for a number of years. It appears to have survived by moving between breeding areas, never staying in one locality for more than three years. New habitat had been created initially by quarrying and clear felling woodland edge, and latterly by coppicing on the northern edge of Ryton Wood. This study describes the creation of egg-laying areas for grizzled skippers in an existing herb-rich meadow by construction of a low drystone wall through areas of larval foodplants.

ACTION

Locality: Ryton Wood Meadows (National Grid ref: SP 378728), a Butterfly Conservation nature reserve, is located in Warwickshire, central England. The reserve lies between Ryton Wood, a 104.5 ha (258 acre) ancient woodland SSSI, and Ryton Pools a 38.7 ha (95.6 acre) Country Park. All three sites are situated within the Princethorpe Woodlands, a heavily wooded area covering 432 ha (1,068 acre).

Butterfly transects: Butterfly populations at Ryton Wood Meadows have been monitored annually since 1990 by recording numbers along a butterfly transect. The figures below (Table 1) demonstrate how grizzled skipper numbers have always remained low. The transect route has not always had suitable grizzled skipper breeding habitat in the immediate vicinity, hence in some years none were recorded along the transect route. However, other observations in favoured spots revealed similarly low numbers.

Drystone wall creation: In the spring of 2006 a 100 m low drystone wall was created along the edge of a 12.4 ha area of herb-rich grassland of varying quality. Grizzled skippers did not use this area for breeding prior to 2006. The area before the wall was built was almost flat and the sward continuous, so despite abundant occurrence of grizzled skipper larval foodplants (creeping cinquefoil *Potentilla reptans* and salad burnet *Sanguisorba minor*) none were suitable for egg-laying. The purpose of the wall within the grassland was to provide not only a permanent breeding location for grizzled skippers but it was hoped also to establish a permanent colony to create the potential for dispersal and colonisation of other nearby sites.

The catalyst for this initiative was a result of apparent ecological grizzled skipper egg-laying preferences, and also management issues. Firstly, egg searches on many

‘brownfield’ sites (i.e. man-made habitats ranging from old quarries and industrial working to railways and roads, which when abandoned their nutrient poor soils are ideal for colonisation by flora which can not compete with highly competitive coarse grasses and herbs found on nutrient rich soils) had found that higher densities of grizzled skipper eggs were located when the larval food plants were growing over stones or man-made rubble, such as bricks. Secondly, as part of a landfill restoration at Ryton Woods, part of the site with a thin over-lying soil was mown to control vigorous weeds. This area had many protruding bricks and stones. The farmer who mowed this area was unprepared to mow it again unless the rubble was removed. Therefore rather than viewing the removal of these bricks and stones as a problem it was seen as an opportunity for grizzled skipper habitat creation.

The method of construction was simple. A line of bricks and rubble, taken from the landfill site, was placed along a low ridge in the grassland running roughly parallel to a metalled road running around the edge of the site (Fig. 1). The wall when completed was 145 m long. Some of the stones or lumps of concrete were quite large while others were small stones or parts of brick or tarmac fragments. The rubble was placed randomly as it came out of the barrow used for transport. Unless the stones were very small (when piled up on one another) the height was one stone/brick laid flat high.

The average height of the dry stone wall was measured by use of a drop disc. The drop disc method was amended from the approved turf height measuring method. The pole was placed as close to the wall as possible and the disc was pushed manually onto the top of the wall. Height measurements were made every 10 m (10 paces) for the entire wall length (14 measurements in total).

Table 1. Number of grizzled skippers recorded in butterfly transects, Ryton Wood Meadows, 1990-2007.

1990	1991	1992	1993	1994	1995	1996	1997	1998
0	0	0	6	3	1	0	0	0
1999	2000	2001	2002	2003	2004	2005	2006	2007
0	0	0	0	0	3	1	3	6



Figure 1. The drystone wall in the herb-rich grassland next to the metalled road, June 2007.

Grizzled skipper egg searches and egg-laying site characteristics along the wall:

The first egg searches were undertaken in the summer of 2006 following completion of the wall earlier that spring. Another, more comprehensive search, was subsequently undertaken on 6 June 2007. Additionally the wall area was searched for dingy skipper *Erynnis tages* eggs.

The following egg-laying information was also noted to assist in future management plans:

- i) length of the leaf that the egg was laid on to the nearest 5 mm
- ii) height of the chosen leaf above the wall
- iii) whether the egg was laid on the under or upper side of the leaf
- iv) plant species on which egg laid (two foodplant species present, creeping cinquefoil *P.reptans* and salad burnet *S. minor*)

Comparison with coppiced habitat: To see how successful the wall was compared to the traditional coppice ditch habitat at Ryton Woods, a survey was also undertaken at this locality. Through egg-searches, the ditch edge was shown to have been used by grizzled

skippers for egg-laying over the previous 3 years. Grizzled skippers have bred intermittently on this edge of the wood where there is a fairly short (8-year) coppice rotation. Much of this coppice is goat willow (sallow) *Salix caprea* and grey willow *Salix cinerea* (Fig. 2). Due to their quick growing nature this habitat only remains suitable for a short time (one to two years subsequent to coppicing).



Figure 2. Coppiced habitat with willow growth, June 2007.

Grizzled skipper egg searches and egg-laying site characteristics in coppiced habitat:

On the same day as the wall search in 2007 (6 June), the south facing recently coppiced (winter 2006) ditch edge was also searched for grizzled skipper eggs (Fig. 3). Grizzled skippers are known to breed on the flatter areas immediately alongside the ditch. Eggs have never been found on the north facing edge despite intensive searches. This north facing habitat is believed to be too cold to provide suitable egg-laying conditions. Only habitat created by coppicing the previous winter was examined. At this locality, there was a choice of three larval food plants: barren strawberry *Potentilla sterilis*, wild strawberry *Fragaria vesca* and bramble *Rubus fruticosus* agg.

At 14 points along the ditch at about 10 m intervals (10 paces) the height of the herb sward was measured with a sward stick immediately above the ditch rim in the habitat known to be used for egg-laying.



Figure 3. Ditch section coppiced in winter 2006, and surveyed in June 2007.



Figure 4. Creeping cinquefoil leaves growing over a rubble block along the wall, a favoured grizzled skipper egg-laying spot, June 2007.

CONSEQUENCES

Drystone wall dimensions: After completion in spring 2006, the wall measured 145 m in length and average wall height (14 height measurements taken: 5, 12, 4, 8, 8, 13, 7, 14, 12, 3, 10, 7, 10 and 13 cm) was 8.9 cm.

Observations of adult grizzled skippers: The first ever grizzled skipper to be seen in the grassland where the wall had been laid was observed in early summer 2006, the first record in the butterfly transect in this area was in 2007.

Grizzled skipper egg counts and egg-laying site characteristics along the wall: In mid-June 2006 at the very end of the grizzled skipper flight season, two eggs were located on creeping cinquefoil growing over the wall.

On the 6 June 2007 the wall was more comprehensively searched for eggs. Only the habitat created by the wall was examined and not the rest of this grassland as from earlier surveys this was known to be unsuitable for egg-laying. The results of the June 2007 survey are summarised in Table 2. A total of 40 eggs were found, all laid on creeping cinquefoil. Some isolated leaves growing very close to the rock/stone surface were very popular and often had 2-3 eggs laid on them (Fig. 4 and 5). No eggs were found on salad burnet despite some very suitable looking plants.

Over the entire 145 m length of wall, one egg was found, on average, every 3.6 m. The average leaf length used was 2.65 cm (range: 2.0 – 5.0 cm). The average height of a leaf on which an egg(s) had been laid above a rock/stone was 2.12 cm (range: 0.5 – 6.0 cm).



Figure 5. Two grizzled skipper eggs laid on the underside of a creeping cinquefoil leaf, June 2007.

It became apparent when searching the wall for eggs that some parts were insufficiently high to create the ideal egg laying conditions as in some areas the cinquefoil was growing over bare rock but was not used for egg laying because the surrounding vegetation shaded the cinquefoil (Fig. 6).

Dingy skipper egg count: The wall area was searched for dingy skipper *Erynnis tages* eggs and although three were found, more were located in typical dips in open habitat in the adjacent meadow.

Grizzled skipper egg searches and egg-laying characteristics in coppiced habitat: A total of seven eggs were located along the coppiced ditch, the egg-laying site characteristics where these were found are summarised in Table 3. The total ditch length was 154 m of which 54 m was deemed suitable (open enough) for grizzled skippers. All eggs were located on barren strawberry on the flat recently coppiced (winter 2006-2007) coppice area. No eggs were found on bramble or wild strawberry, the other two potential foodplants growing along the ditch edge.

Table 2. Grizzled skipper eggs found and egg-laying site characteristics along the wall, 6 June 2007.

Allocated egg number	Leaf length (cm)	Height (cm) of leaf above stones	On underside of leaf	Foodplant	Eggs/leaf
1	5.0	1.5	Yes	Creeping cinquefoil	1
2&3	3.5	4.0	Yes	Creeping cinquefoil	2
4	3.5	4.0	Yes	Creeping cinquefoil	1
5&6	3.0	3.0	Yes	Creeping cinquefoil	2
7&8&9	2.0	1.5	Yes	Creeping cinquefoil	3
10	4.0	0.5	Yes	Creeping cinquefoil	1
11	3.0	1.0	Yes	Creeping cinquefoil	1
12	3.0	2.5	Yes	Creeping cinquefoil	1
13	2.5	0.5	Yes	Creeping cinquefoil	1
14	2.0	2.0	Yes	Creeping cinquefoil	1
15	2.0	1.5	Yes	Creeping cinquefoil	1
16	3.0	3.5	Yes	Creeping cinquefoil	1
17	2.5	1.5	Yes	Creeping cinquefoil	1
18	2.5	1.5	Yes	Creeping cinquefoil	1
19	2.0	0.5	Yes	Creeping cinquefoil	1
20	3.0	2.5	Yes	Creeping cinquefoil	1
21	2.5	0.5	Yes	Creeping cinquefoil	1
22	2.5	3.5	Yes	Creeping cinquefoil	1
23&24&25	2.5	2.0	Yes	Creeping cinquefoil	3
26	2.5	1.5	Yes	Creeping cinquefoil	1
27	2.5	2.5	Yes	Creeping cinquefoil	1
28	2.0	1.0	Yes	Creeping cinquefoil	1
29	2.5	2.0	Yes	Creeping cinquefoil	1
30	2.0	1.5	Yes	Creeping cinquefoil	1
31	2.5	1.5	Yes	Creeping cinquefoil	1
32	3.0	0.5	Yes	Creeping cinquefoil	1
33	2.5	2.0	Yes	Creeping cinquefoil	1
34	2.0	2.5	Yes	Creeping cinquefoil	1
35	3.0	0.5	Yes	Creeping cinquefoil	1
36	2.5	2.5	Yes	Creeping cinquefoil	1
37	2.0	1.5	Yes	Creeping cinquefoil	1
38	4.0	6.0	Yes	Creeping cinquefoil	1
39	5.0	6.0	Yes	Creeping cinquefoil	1
40	5.0	5.0	Yes	Creeping cinquefoil	1
mean = 2.65		mean = 2.12			

Table 3. Grizzled skipper eggs found and egg-laying site characteristics along the coppiced ditch, 6 June 2007.

Allocated egg number	Leaf length (cm)	Height above stones (cm)	On underside of leaf	Foodplant	Eggs/leaf
1& 2	2	2.5	Yes	Barren strawberry	2
3	3	2.5	Yes	Barren strawberry	1
4	2.5	4	Yes	Barren strawberry	1
5	2.5	2	Yes	Barren strawberry	1
6	1.5	3	Yes	Barren strawberry	1
7	2.5	2.5	Yes	Barren strawberry	1
mean = 2.29		mean = 3.0			



Figure 6. Along some lengths of the wall, tall growth of grasses and bird's-foot trefoil *Lotus corniculatus* suppress and shade the low growing creeping cinquefoil making it unsuitable for egg-laying.

Some isolated leaves growing very close to bare earth at the apex of the ditch were found to be very popular (from this and earlier surveys) and often had two or three eggs laid on them. In 2007, one leaf was found with two eggs, all others were singles. All eggs were laid on the underside of leaves, as at the wall.

Over the entire 154 m length of ditch edge, one egg was found, on average, every 22 m; over the 54 m of what was considered suitable ditch habitat, this equated to one egg every 7.7 m. The average leaf length used was 2.29 cm (range: 1.5 – 3.0 cm). The average height of a leaf on which an egg(s) had been laid above the soil was 3 cm (range: 2.0 – 4.0 cm).

The average turf height above the ditch along the section deemed to provide breeding habitat was determined as 8.9 cm (14 measurements: 5, 12, 4, 8, 8, 13, 7, 14, 12, 3, 10, 7, 10 and 12 cm).

Conclusions and recommendations: The results of egg searches and observations of adult butterflies in the vicinity, hopefully indicate that grizzled skippers have colonised this part of the reserve. It appears that the drystone wall has created additional egg-laying

habitat for grizzled skippers. Adding extra rubble to the areas where the wall is currently too low (e.g. in some areas the cinquefoil was growing over bare rock but was not used for egg laying because the surrounding vegetation shaded the cinquefoil) would be worthwhile to further enhance the habitat, and extension of the wall along the entire length of the south-facing ditch edge is being considered.

It is too early to conclude that the creation of grizzled skipper habitat has increased the population size. However, the relatively high egg density located in 2007 indicates that this will be a strong possibility in future years, and one year after the wall construction observations suggest that it appears that this habitat is now more suitable than the traditionally used coppiced ditch habitat at Ryton Woods.

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