Silver spotted Skipper *Hesperia comma*

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Climate Change Sensitivity:	POTENTIAL BENEFIT	Ability to Manage:	HIGH
Non climatic threats:	MEDIUM	Vulnerability:	LOW

Summary

The silver spotted skipper is a warmth loving species that is benefiting from climate change. Historic declines resulting from the loss or degradation of habitat are being reversed, in part due to a climate change driven expansion. Adaptation can best focus on facilitating the continued expansion of the species by ensuring effective ecological networks are in place. This should include ensuring the optimum management of existing grassland and the creation of new habitat in areas where natural colonisation is inhibited.

Description

The silver spotted skipper is a small butterfly with orange upper wings, with brown margins and pale orange spots. Males are distinguished from females by a thick black line running through the centre of the forewing. They are easily distinguished from similar skipper species by the numerous silvery spots on the underside of the hindwings.

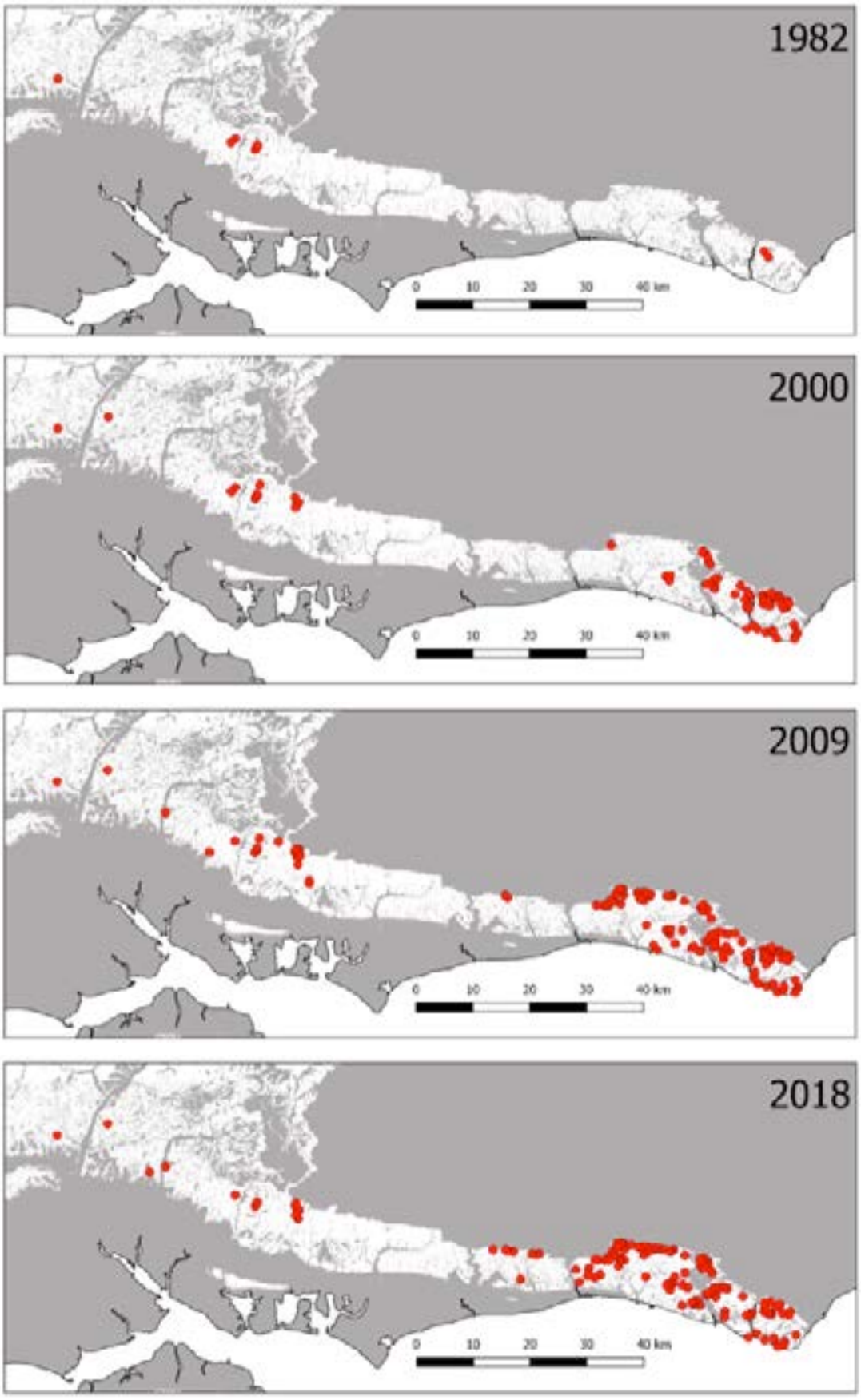
Ecology and distribution

The silver spotted skipper is a warmth loving species that reaches the northern limit of its range in southern England, where it is restricted to unimproved chalk grassland with short turf. It is one of the last butterflies to emerge, appearing in late July or early August, and remains on the wing until early September. There is one generation each year. It lays its eggs on sheep's fescue *Festuca ovina*. Eggs hatch the following March, and caterpillars feed exclusively on the leaves of sheep's fescue. Females are highly selective about the sites on which they lay eggs, selecting hot micro-climates. Historically, this meant the only suitable oviposition choices were tufts of sheep's fescue less than 10 cm tall adjacent to patches of bare ground such as rabbit scrapes or animal tracks, on south facing slopes (Thomas *et al* 1986). More recently, warmer summers have led to sheep's fescue occurring in taller swards, a reduction in the requirement for bare ground, and the use of a wider range of topography, including north facing slopes, becoming suitable (Davies *et al* 2006).

Historically, the silver spotted skipper was recorded on chalk soils over much of southern Britain and as far north as the Yorkshire Wolds, but in the second half of the 20th century it underwent a dramatic decline (Thomas *et al* 1986). The main cause of this decline was the loss of short-turfed unimproved grassland, largely due to agricultural intensification and the abandonment of extensive grazing, and the decline in rabbit populations due to myxomatosis.

Conservation intervention, the recovery of rabbit populations, and climate change have reversed this decline, and by 2000 the species had undergone a partial re-expansion in England (Davies *et al* 2005), with more than three times the number of populations present than in 1982 (Lawson *et al* 2013).

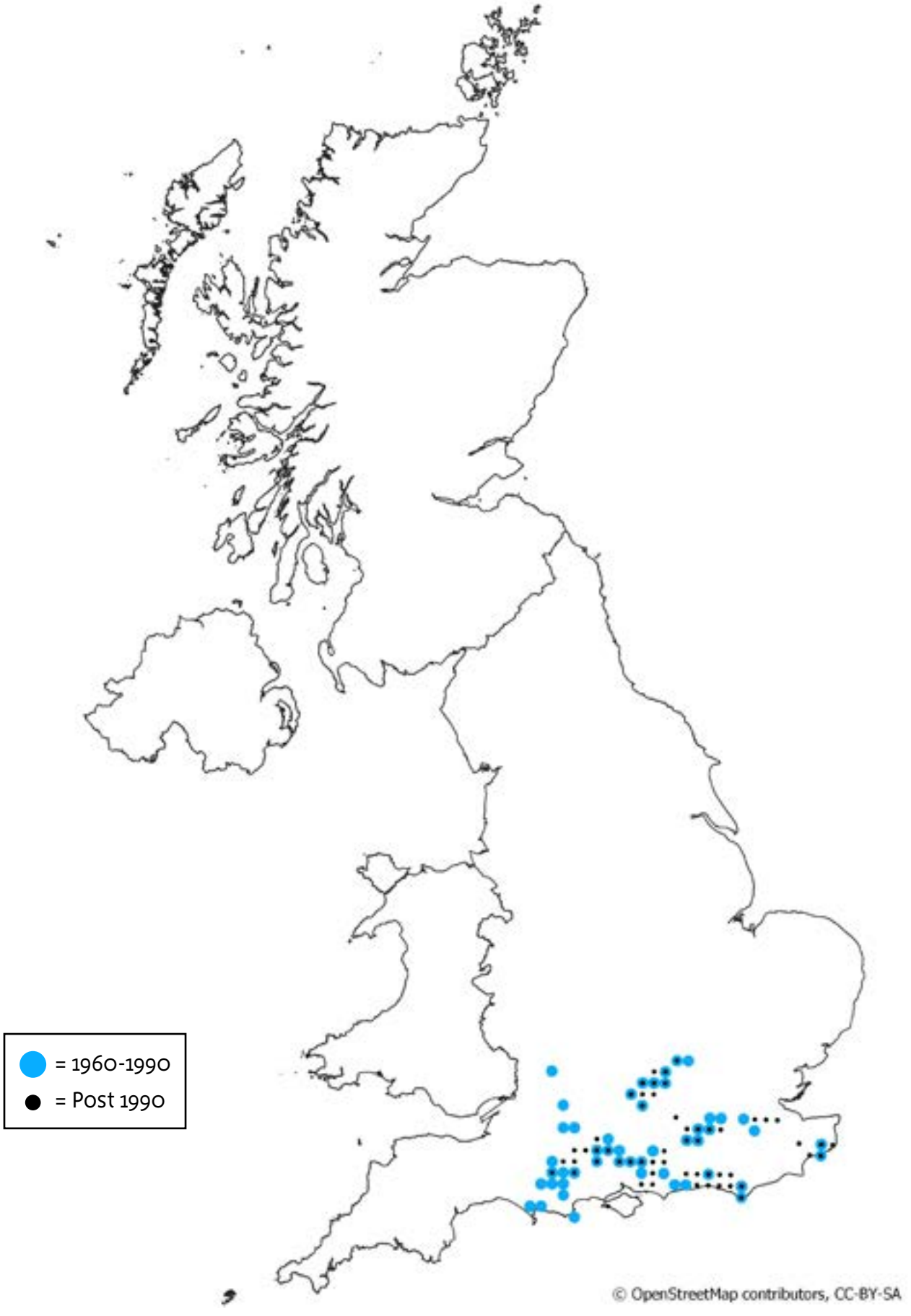
Figure 1: Changes in the distribution of silver spotted skipper in the South Downs, 1982 to 2018. White shading represents chalk geology, red circles represent locations of populations (Bennie 2020).



Warmer summers have reduced the silver spotted skipper's need for bare ground and very short turf on south facing slopes, and have allowed it to breed in taller swards and on north-facing slopes, increasing the area of potentially suitable habitat. However, many populations remain small and the limited dispersal ability of the butterfly is restricting its expansion (Wilson, Davies & Thomas 2010), with sites over 2 km from existing sites less likely to be colonised (Lawson *et al* 2013). The species is still vulnerable to localised extinction, with populations at the species' northern margin and on north-facing slopes most likely to suffer extinction (Lawson *et al* 2012). The more recent decline in rabbit populations with the associated impact on sward conditions and the extent of bare ground has arrested the recent expansion of the silver spotted skipper and led to local losses, especially at the western margin of its current range (N.Bourn pers. comm.).The species has been shown to colonise protected areas more readily than non-designated grassland (Lawson *et al* 2014), highlighting the role of conservation management in promoting its expansion.

Butterfly Conservation's presence records for silver spotted skipper over 2 timeslices, 1960-1990 and post 1990, are shown on the map below (10 km grid scale).

Presence of silver spotted skipper records, 10km².
Source: Butterfly Conservation: Butterflies for the New Millennium.



Confidence in climate change impacts[35]

Distribution change: HIGH CONFIDENCE Mechanism: HIGH CONFIDENCE

The life-cycle of the silver spotted skipper is dependent on the availability of a hot micro-climate, with egg laying being temperature-dependent (Davies *et al* 2006). Historically, the availability of host plants in sufficiently hot micro-climates was restricted to sparse short swards on south facing slopes, in close proximity to bare ground. This made the butterfly vulnerable to changes in sward height, as demonstrated by its previous decline following reductions in grazing by livestock and rabbits.

Warmer summers have increased the availability of suitable micro-climates. Females have been shown to alter their choice of egg-laying site in relation to the ambient temperature, utilising a greater range of sward conditions and topography within existing sites (Davies *et al* 2006). This has increased the area available to the butterfly within its current range, and facilitated its northward expansion (Bennie *et al* 2013, 2020). These benefits might be offset to a degree by the decline of bare ground, due to milder winters leading to an increased length of the growing season.

Please read this case study alongside the relevant habitat sheets.

Adaptation options

Climate change adaptation for this species in England means facilitating its positive response to increasing temperatures. The management of existing sites can ensure suitable swards for the species. In most cases, the provision of short turf to improve the resilience of populations to cooler summers will remain important, however adults have been shown to become heat stressed at high ambient temperatures (Davies *et al* 2006), so the provision of suitable shading via patches of longer turf or scrub is likely to be beneficial, especially on south facing slopes.

- Sward management can be adjusted to reflect the changing oviposition preferences of the butterfly and promote greater variation in sward height, ideally achieved through cattle or mixed grazing.
- To ensure suitable sward conditions stocking levels may need adjustment to compensate for changes in rabbit populations.
- The provision of isolated scrub to provide shading may be encouraged on south facing sites, especially those prone to drought.
- To increase population size and number of colonies by natural processes, habitat restoration and creation should be targeted to expanding existing sites, and ensuring that suitable habitats are separated by less than 2km.
- Site boundaries and conservation objectives should be reviewed and, where necessary, adjusted to reflect the changing patterns of use by the butterfly and projected changes to its distribution.
- Translocation to suitable sites unlikely to be colonised naturally could be considered, although action to promote the natural expansion of the species should be the priority.

35 An assessment of the strength of evidence that distributions are changing and the mechanisms causing change are understood. Refer to Part B, section 5 of the species section introduction for more information.

Relevant Countryside Stewardship options

GS6 Management of species-rich grassland

GS7 Restoration towards species-rich grassland

References and further reading

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Wilson, R. J., Davies, Z. G., & Thomas, C. D. (2010). Linking habitat use to range expansion rates in fragmented landscapes: a metapopulation approach. Ecography, 33(1), 73-82.