



Species Action Plan

GRIZZLED SKIPPER

Pyrgus malvae

1998

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Butterfly Conservation (the British Butterfly Conservation Society) has an overriding objective to ensure a future for butterflies, moths and their habitats. In order to achieve this objective its aims are to:

- raise public awareness of the plight of our butterflies and moths and encourage public involvement in conservation.
- halt the decline of butterflies and moths and maintain or improve the present status of threatened species.
- improve the extent and suitability of key lepidoptera habitats and the environmental quality of the countryside as a whole for all lepidoptera species.
- work with and advise other conservation groups, local bodies and agencies on techniques of land management which favour butterflies and moths and related wildlife.
- acquire and manage habitats for butterflies and moths.
- encourage the research (both at amateur and professional levels) on butterflies and moths.
- support and encourage butterfly and moth conservation world-wide.

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Summary

- The Grizzled Skipper is a relatively widespread species in the southern half of the UK but has declined severely in many areas since 1950. This decline has been most marked in central and eastern counties of England where the species is now rare, and it is becoming far more restricted in its remaining southern strongholds.
- The species is under-recorded and no extensive survey of the number of colonies has been undertaken in any area. However, the current rate of contraction in range in south-east England, where the species status is best known, has been estimated at 46% since the 1980s. The national distribution map is now out of date and identification of core areas in each of its habitat types is required urgently to ensure appropriate conservation action for the species. A **medium** priority is afforded to the conservation action in this plan to protect and increase the number the butterflies colonies in the UK. We will be reviewing this priority when more accurate distribution data are available.
- The Grizzled Skipper occurs in a variety of early successional habitats, which contain selected Rosaceae foodplants growing in short herb-rich vegetation and on bare ground, usually in a mosaic with patches of ranker vegetation, and scrub/woodland edges. The main three habitat types are: (1) woodland clearings and wide rides; (2) unimproved grasslands with scrub (especially downland); and (3) disused artificial (industrial) habitats such as railway lines. The butterfly has declined markedly this century particularly in woodlands, its former stronghold, following the decline in coppice management. The butterfly has also largely been eliminated from rough grasslands within woodland and fenland habitats. At the same time there may have been local increases in a few areas with the creation of new, temporary, early successional habitat through: (i) increased Rabbit grazing during the 1980s; (ii) the Great Storm of 1987 (creating tree fall gap habitats); and (iii) the abandonment of pits, quarries and railway lines in industrial areas.
- The main threats to the butterfly are: (1) continued lack of coppicing and inappropriate ride management in woodlands; (2) improvement, or over or undergrazing of grassland/scrub habitats; (3) lack of management on disused artificial (industrial) habitats and the consequent loss of early successional vegetation; and (4) fragmentation and isolation of existing colonies and the intensive use of the surrounding agricultural land. As many of the butterfly's habitats are transient, the species requires either a cycle of continuous management to maintain early successional stages within a site, or the creation of new areas that can be colonised as existing ones become unsuitable.
- The immediate major objectives of the plan are to halt the rapid decline of this butterfly in the UK and to maintain viable networks of populations throughout its current range. A long term objective of the plan is to restore its 1950 range.
- The objectives of the plan will be achieved by determining current core areas of distribution of the butterfly; and improving information on, and dissemination of, the habitat requirements of the species.
- The Action Plan covers the next ten years, will be monitored annually and reviewed as the situation demands. The reviewing procedure is particularly important for this species, as our current knowledge of its distribution requires updating. The priority and nature of any conservation action should be reviewed in the light of these results.

Part 1 Overview

1.1 PRIORITY STATEMENT

The Grizzled Skipper is widespread though local throughout England and Wales. There has been a gradual decline this century with 768 ten km squares occupied during 1800-1969, compared to 510 ten km squares in 1970-88 (Brereton, 1997). This decline has accelerated in recent decades, particularly in central and eastern counties. However, there may have been local population increases and recolonisations in southern downland sites, as a result of (1) increased grazing levels on its grassland habitat following the recovery of Rabbit populations during the 1980s, and (2) tree fall gap habitats created in the Great Storm of 1987.

While not listed as a species of conservation concern in Biodiversity: The UK Steering Group Report (DOE, 1995) the recent information on local declines (see table 1) suggest that it would now qualify. Thus, based on our current knowledge, **medium** priority should be afforded to conservation action to protect and increase the number of Grizzled Skipper colonies in the UK. This priority will be reviewed when we have more complete distribution data.

1.2 BROAD OBJECTIVES

1. Halt decline in England and Wales.
2. Maintain viable networks of populations throughout its current range.
3. Long term objective to restore its 1950 range, particularly in its woodland habitat.

1.3 LEGAL STATUS

The Grizzled Skipper is not currently listed on Schedule 5 of the 1981 Wildlife and Countryside Act and therefore has no statutory protection.

Population	-size	Little information but the majority of populations are thought to be small (<100 at peak) and on isolated sites are vulnerable to extinction.
	-trend, numbers	The total number of UK colonies is unknown, but in the order of 1100 (see table 1 and 2 below). Many have been lost in the last 20 years. Steady decline recorded over last 20 years on sites in national Butterfly Monitoring Scheme.
	-trend, range	Widespread, but local and declining, especially in woodland. A recent review of ten south-east counties estimated a contraction in range of 46% in 12 years (Brereton, 1997).
Knowledge of	-status	No up-to-date national data have been collated for this species but the number of extant colonies are estimated in Table 1. Location of large and medium colonies in each habitat type, and core areas need to be identified.
	-trends	Good for recent contraction in range in south-east England, but incomplete elsewhere. Monitored on 24 (13 core) sites in BMS.
	-conservation requirements	Good ecological knowledge of its requirements in downland habitats. Moderate knowledge in woodland clearings. Suspected similar ecology in disused artificial habitats, but no research undertaken. Knowledge poor in heathland and other less widely used habitats.

Part 2 Biological Assessment

2.1 INTRODUCTION

The Grizzled Skipper is a small butterfly with a moth-like appearance and a chequerboard pattern.

It occurs in three main habitats: (1) scrubby unimproved grassland, especially chalk downland; (2) woodland clearings; and (3) disused artificial habitats such as quarries, pits and railway lines (Brereton, 1997). In addition, a wide variety of other habitat types are used infrequently including heathland, shingle, sand dunes, and acidic, neutral and marshy grassland (Emmet & Heath, 1989, Morgan, 1989, V. Perrin, pers. comm., G. Barker pers. comm.). The butterfly uses a range of larval foodplants in the Rosaceae, commonly Agrimony, Creeping Cinquefoil and Wild Strawberry.

The Grizzled Skipper occurs throughout southern and central England and Wales, but is generally very local. The strongholds of the butterfly include remaining extensive stretches of scrubby calcicolous grassland and woodland clearings in Buckinghamshire, Dorset, Gloucestershire (the Cotswolds), Hampshire and the Isle of Wight, Kent, Surrey, Sussex and Wiltshire. The butterfly is declining throughout its range especially in the flat and heavily farmed landscapes of eastern England.

2.2 ECOLOGY

Life Cycle

The Grizzled Skipper is generally univoltine, flying from the end of April until mid-June (extremes mid-March to mid-July) (Emmet & Heath, 1989, Brereton, 1997). At large sites the flight period typically extends over 7-9 weeks. The peak flight period in southern England occurs sometime in May, with the exact timing varying by a week or more according to spring weather, site aspect and mean sward height (Brereton, 1997). The flight period is later at more northerly latitudes, although there are no precise comparative data. In the UK a partial second brood has been recorded occasionally in August (*e.g.* Sawford, 1987). New information suggests that a partial overlapping second generation may regularly occur from late June (Brereton, 1997).

Males are territorial, undertaking both perching and patrolling behaviour. When preferred foodplants are widely dispersed at low density (i.e. when habitat quality is low) males may aggregate separately from females in bays above scrub edges. These microhabitats offer shelter, warm micro-climates, good visibility and opportunities to mate with passing females. In contrast, males mix freely with females in habitat patches where preferred foodplants occur at high density (i.e. when habitat quality is high) (Brereton, 1997).

Both sexes are very active through the day, often feeding and basking. When basking a variety of substrates are used which provide warm microclimates and good visibility, most frequently bare ground during the day and taller vegetation from mid-afternoon onwards. A

wide variety of plant species are used as nectar sources, including Bird's-foot Trefoil, Bugle, buttercup spp, Daisy, Dandelion, Common Dog-violet, Ground Ivy, Milkwort, Thyme and Wild Strawberry. Nectar is important to the butterfly and both sexes feed extensively throughout the day including whilst egg-laying or 'defending' territories. Adults usually roost in tall ungrazed and/or uncut vegetation, on the dead flowering spikes of species such as Marjoram, Knapweed or St John's-wort at heights of around 40 cm (Brereton, 1997).

Eggs are laid singly on downy species of the Rosaceae family which are larval foodplants. The principal species used are Agrimony, Creeping Cinquefoil and Wild Strawberry. In southern England Barren Strawberry and Tormentil are equally preferred but tend to be less common on sites. Others used in descending order of importance include Salad Burnet, Bramble, Dog Rose and Wood Avens. Trailing Tormentil and Fragrant Agrimony are likely to be hostplants, but this has not been confirmed. Females may readily lay on three or more Rosaceae species, even on single oviposition flights. The majority of eggs are laid on plants which grow on bare ground or in short vegetation (less than 10 cm). These plants are located in a favourable warm microclimate, but may also be chosen for their elevated nutritional (nitrogen) content. Individual plants on bare ground may have as many as 22 eggs on them, whilst eggs in the surrounding sward may be rare. (Brereton, 1997).

The larval stage lasts two to three months, during which larvae build, and live exclusively in, a series of shelters or 'tents'. Larvae only leave tents to make brief feeding visits to nearby leaves, or to build new shelters. During their early development larvae are confined by their low mobility to the environment around the egg host leaf, but as they develop their mobility increases and, when conditions permit, they become less specific in their use of foodplants and micro-habitats. More nutritionally rich plants growing in rank vegetation (10-50 cm) are widely used when available. The most striking change is the increasing use made of coarse shrubs, especially Bramble which may become the principal foodplant of larger larvae on certain sites. The greater range of foodplants used includes (occasionally) other downy species such as Sweet Briar, Silverweed, and even non-Rosaceae such as Red Clover and Germander Speedwell. It is likely that they can complete development on a single Rosaceae species, though this has not been confirmed.

Larvae move away from their final foodplant shelter to spin a pupal cocoon in low vegetation (less than 30 cm). Pupal positions can be either within or on the surface of vegetation, which influences the timing of adult emergence the following spring; emergence being earlier from pupae located in short vegetation than in longer vegetation (Brereton, 1997).

Habitats

Grizzled Skipper habitats have the following characteristics (Brereton, 1997):

- an abundance of spring nectar plants;
- an abundance of at least one of the following key larval foodplants: Agrimony, Creeping Cinquefoil, Wild Strawberry, or more infrequently Barren Strawberry and Tormentil, growing in short (< 10 cm), herb-rich vegetation and especially on bare ground. This is their preferred breeding vegetation and its presence is the main factor limiting the distribution and abundance of adults at sites;
- patches of ranker vegetation (10-50cm) and scrub/woodland edges.

The Grizzled Skipper occupies three main habitat types:

1) Woodland clearings

A range of woodland clearings are used, including recently cleared coppice, wide rides, glades and young conifer plantations. In these, the main habitat is sparse vegetation with Wild Strawberry, or Barren Strawberry (\pm Bramble). Creeping Cinquefoil and Tormentil may occur along rides. Suitable patches of bare ground are created following cutting or more occasionally by windblow.

The Grizzled Skipper was considered principally to inhabit woodlands at the beginning of the 20th Century (Frowhawk, 1924). Woodland clearings remain a widespread habitat for the butterfly in southern England, but have been much reduced here and have been largely eliminated elsewhere in the country. There have been some recolonisations since the 1987 Great Storm in tree fall gaps, but these populations are likely to be short-lived without management.

2) Unimproved grassland usually with scrub

The butterfly is locally common on the downs and other unimproved calcicolous and base-rich grasslands of southern England. The butterfly may occur in a variety of differing situations including:

- Scrubby calcicolous grassland with Wild Strawberry and Bramble, where suitable conditions are maintained by scrub cutting, grazing (especially by Rabbits) and disturbance by animals such as Pheasants.
- Unimproved grassland (\pm scrub) maintained by low to moderate intensity livestock and/or Rabbit grazing, with Creeping Cinquefoil along cattle tracks, other poach marks or around Rabbit warrens.
- Unimproved grassland usually with scrub maintained by low to moderate intensity livestock and/or Rabbit grazing, with Agrimony growing especially in cattle poached areas or on Mole hills.

(3) Recently abandoned artificial (industrial) habitats

These are the butterfly's main habitat over much of the English midlands. The range of habitats include disused mineral workings, spoil heaps, mines, railway lines, storage depots and even rubbish tips. Vegetation cover is suitably sparse because of the nature of the substrate and the relatively short period since abandonment.

- Wild Strawberry (\pm Bramble) is usually the main foodplant along scrubby disused railways lined with limestone ballast. The suitability of these sites for the butterfly may be prolonged by periodic scrub cutting and Rabbit grazing.
- Creeping Cinquefoil is usually the main foodplant on disused clay workings.

More information is required on the habitat structure of colonies in these habitats.

The Grizzled Skipper occurs less frequently in a range of other habitats, although little information has been published. The butterfly is locally common in acidic grassland/heathland in for example the New Forest (Hampshire), parts of the West Midlands (e.g. Forest of Dean), and in Breckland (Norfolk), where the principal foodplants are likely to

be Tormentil and Creeping Cinquefoil (\pm Bramble, and perhaps Trailing Tormentil). The butterfly occurs on sand dunes in parts of Wales and Devon (e.g. Morgan, 1989). Other habitats include shingle (Dungeness, Kent), motorway embankments (Hertfordshire- may now be extinct), neutral grassland (the Weald) and marshy grassland (Cambridgeshire - may now be extinct). The butterfly formerly occurred widely in rough grasslands, especially on the edge of woodland, but colonies in this habitat are now rare.

2.3 DISTRIBUTION AND POPULATION

Distribution

The Grizzled Skipper is widely distributed throughout western Europe, being absent only from northern Scandinavia, parts of Greece and some of the Mediterranean islands (Higgins & Riley, 1970). A recent review of the status of butterflies in Europe indicates that the species is stable in many countries. However, it is estimated to have declined over the last 25 years by more than 50% in the Netherlands and European Turkey, and by 25-50% in Belgium, Britain, and Croatia with slightly lower rates of decline in the Czech Republic, Germany, Denmark, Finland, Luxemburg, Romania, Sweden, Slovakia and Asian Turkey (Swaay et al., 1997).

In the UK, the butterfly was formerly widely distributed in England and parts of Wales, with occasional records in south Scotland. However, it has declined this century and is now rare in Wales and eastern England and locally common only in central and southern England. The butterfly has not been recorded from Scotland during the 20th century (Thomson, 1980). Nationally the Grizzled Skipper declined in range by over 31% in the period 1940-1969 to 1970-1982 (Warren et al., 1997). Due to the continuation of this decline the national distribution map (see Appendix 1) is now out of date. Recent county atlases and unpublished surveys indicate that the Grizzled Skipper has declined markedly over much of its range since the 1970s (Table 1). For example, in ten south-east counties the butterfly is estimated to have contracted in range by 46% since the late 1980s (144 ten km squares 1970-88, compared to 78 ten km squares 1989-1995; Brereton, 1997, see Appendix 2). The actual decline on a smaller scale (e.g. number of colonies) is likely to be greater (Pollard & Eversham, 1995; Thomas & Abery, 1995). For example, in Bedfordshire in 1989-94 the Grizzled Skipper was recorded in 40% fewer 10 km squares than during 1970-88, but in 71% fewer 2 km squares (Arnold et al., 1997).

Table 1 Status of the Grizzled Skipper in England.

COUNTY	TREND	NO. OF COLONIES	NO. 10 KM SQUARES (and/or TETRADES) and/or 1 KM SQUARES	RECORDING PERIOD	SOURCES
Bedfordshire	Severe decline 1970s-90s	c.20-30	12 (26)	1990-96	Arnold et al., 1997
Berkshire	Slight decline 1970s-90s	c.20	8 (c20)	1987-93	J. Asher, 1994; pers. comm.
Buckinghamshire	Slight decline 1970s-90s	c.50	17 (50)	1987-93	J. Asher, 1994; pers. comm.
Cambridgeshire	Decline 1970s-90s	1	1 (1)	1995-96	V. Perrin pers. comm.
Cheshire	Extinct 1970s	-	-		Rutherford, 1983
Cornwall	Gradual decline this century	5	6	1990-97	Smith, 1997; Adrian Spalding, pers. comm.
Derbyshire	Extinct - 1958, rediscovered 1996	1	1	1996	Harrison & Sterling, 1985; BC (E. Midlands Branch).
Devon	Gradual decline this century	c.30	(45)	1990-97	Bristow et al., 1993; R. Bristow pers. comm.
Dorset	Gradual decline this century	c.100	186	1980-1994	B Shreeve, pers. comm.
Essex	Decline 1970s-90s	3	2	1993-97	Brereton, 1997
Gloucestershire	Slight decline 1970s-90s	c.80	19 (77)	1985-96	BC Gloucestershire Branch, G. Meredith, pers. comm.
Hampshire	Gradual decline 1970s-90s	c.150	(138)	1997	J. Taverner, pers. comm.; D. Green, pers. comm.
Herefordshire	Stable	6	(6)	1990s	Joy, 1997; A Nicholls, pers. c
Hertfordshire	Extinct 1994, recol 1996	8	(8)	1994-97	J. Murray, pers. comm.
Isle of Wight	Stable	c.40-50	(33)	1990-97	D. Green, pers. comm.
Kent	Gradual decline 1970s-90s	c.40-50	20 (46)	1995-97	Philp, 1993; J. Maddocks, pers. comm.
Lincolnshire	Stable	5-6	(3)	1990-97	M. Tyszka, pers. comm.
Middlesex	Extinct 1992	-	-		Brereton, 1997
Norfolk	Stable	c. 8-10	7 (13)	1993-97	Hall, 1991; B. McIlwrath, pers. comm.
Nottinghamshire	Slight increase in 1990's	5	4 (10)	1994 & 96	M Walker, pers. comm.
Northamptonshire	Slight increase in 1990's	22	14	1991-1997	D. Goddard, pers. comm.
Northumberland	Extinct 1918	-	-		Dunn & Parrack, 1986
Oxfordshire	Slight decline 1970s-90s	c.30	c30	18	Asher, (1994); pers. comm.
Shropshire	Possibly declining	5-10	(6)	1990s	Riley, 1991; Joy, 1997; A. Nicholls, pers. comm.
Somerset	Gradual decline this century	c.130	(110) 150	1988-94	Anon, 1995; R. Sutton, pers. comm.
Staffordshire	Decline 1960s-90s	2-3	2	1990s	Warren, 1984; Joy, 1997; A. Nicholls, pers. comm.
Suffolk	Extinct 1979	-	-		Mendel & Piotrowski, 1986
Surrey	Decline 1970s-90s	c.50	12 (52)	1995-97	BC Surrey Branch; G. Jeffcoate, pers. comm.
Sussex	Decline 1970s-90s	c.70	34	1989-94	BC Sussex Branch; Brereton, 1997
Warwickshire	Declining, despite new sites being discovered	c.45	15 (42)	1990s	Joy, 1997; K. Warmington, pers. comm.
Wiltshire	General decline, especially in woodland	136	37 (153)	1982-94	Fuller, 1994
Worcestershire	Decline 1970s-90s	c.9	(13)	1990s	Joy, 1997; A. Nicholls, pers.c
Yorkshire	Gradual decline 1970s to 90s	c.1-2	2	1996	Sutton & Beaumont, 1989 P. Winter, pers. comm.
TOTAL		c.1100			

Table 2 Status of the Grizzled Skipper in Wales and Scotland.

Source (Joy, 1998). Note the Grizzled Skipper is generally believed to be under recorded in Wales.

WALES					
COUNTY	TREND/NOTES	NO. OF COLONIES	NO. 10 KM SQUARES (and/or TETRADES) and/or 1 KM SQUARES	RECORDING PERIOD	SOURCES
Monmouthshire (vc. 35)	Extinct - 1971, rediscovered 1987	1	1	1990-97	Horton, 1994; M Anthony, pers. comm.
Glamorgan (vc. 41)		c.5-10	3	1995-97	N. Jones, pers. comm.
Radnorshire (vc. 43)	No recent records				P. Gay, pers. comm.
Carmarthenshire (vc. 44)	rare on coastal grasslands		4 (9)	1970-88	Morgan, 1989,
Pembrokeshire (vc. 45)	Extinct? No recent records				B. Hancock pers. comm.
Montgomeryshire (vc. 47)		1	1		
Ceredigion (vc. 46)	Gradual decline - only singleton records since 1980	?		1971-83	Fowles, 1983; L.Gander, pers. comm.
Clywd (vc. 50, 51)		3	(5)	1982-97	R. Whitehead, pers. comm.
Gwynedd	5 records since 1975 (Merionethshire vc. 48 (1), Anglesey vc. 52 (1) and Caernavonshire VC. 49-Great Orme area (2) and Harlech (1).	?			Whalley, 1996: A. Fowles pers. comm.
SCOTLAND	Extinct 1896				Thomson (1980)

The butterfly has become extinct in five English counties and reduced to less than five sites in at least five others (Table 1). On the positive side, 1995 - 1997 were very good years for the butterfly, resulting in its rediscovery in Derbyshire and Hertfordshire. Furthermore, it is possible that a number of downland sites in counties such as Dorset were recolonised. Here conditions are now suitable again following the recent recovery of the Rabbit population.

Population

Grizzled Skipper populations (colonies) may number more than 500 individuals at the peak of the flight period, although the majority are thought to be small (less than 100 at peak). Large and small populations may be aggregated, leading to a metapopulation* structure (Brereton, 1997).

Evidence from a three year marking study over an extensive area of fragmented downland in West Sussex indicates that the butterfly has low mobility and forms a mixture of **closed** (majority of individuals resident), **intermediate** and **patchy** (high turnover of individuals) population structures (Brereton, 1997). These may be grouped (connected) leading to a Boorman-Levitt type metapopulation structure, with more or less equal-sized local populations (Boorman & Levitt, 1973). Population structure is influenced by a number of factors, including the size and quality of habitat patches and the structure of bordering

* A metapopulation is a collection of local populations, connected by occasional dispersal, in which there are local extinctions and colonisations (Gilpin & Hanski, 1991).

vegetation. High foodplant density in large habitat patches, together with tall bordering vegetation, leads to a closed population structure; low foodplant density and open bordering vegetation leads to a more open structure and more patchy populations. In patchy populations, males more often congregate on scrub edges.

The Grizzled Skipper is capable of crossing stands of 100m wide mature woodland, but habitats such as woodland and improved grassland form barriers to dispersal for the majority of individuals. Mark-Release-Recapture data suggests that separate colonies probably exist where they are separated by 100m of woodland, dense scrub or improved grassland, or 500m of unoccupied unimproved grassland or scattered scrub. Movements of 1.5 km have been recorded between captures, but the butterfly may be capable of moving much further (Brereton, 1997).

Where the butterfly occurs in actively coppiced woodland, numbers rise and fall with the coppice cycle, being most abundant in early stages. In vigorous hazel coppice, numbers have been shown to reach a peak 2 years after cutting and fall to zero after 4 years (Warren and Thomas, 1992). A regular rotation is therefore needed for the Grizzled Skipper to persist in coppice woodland, with new parts being cut regularly within colonising distance (c. 100m). Interconnecting rides are also likely to be of considerable benefit (Fuller and Warren, 1994).

2.4 LIMITING FACTORS

Historical

Loss of woodland clearings through decline in traditional woodland management, especially coppicing.

Loss of unimproved grassland/scrub habitats through agricultural improvement.

Alteration of unimproved grassland/scrub habitats through overgrazing or abandonment.

Fragmentation and isolation of both woodland and grassland sites (break up of metapopulations).

Deterioration of disused artificial habitats through natural succession.

Current and Future Limiting Factors

Continuing changes in woodland management, especially loss of open clearings and a reduction in the frequency of sizeable canopy gaps within modern high forest systems, resulting in an increased distance between new clearings and old ones.

Continuing decline in the market for coppice produce (although this may have recently been reversed in some areas).

Continuing deterioration of unimproved grassland/scrub and disused artificial habitats through natural succession.

Continuing fragmentation and isolation of habitats.

2.5 RESUME OF CONSERVATION TO DATE

Ecology and Conservation Requirements

A three year study has been undertaken of the butterfly's ecology, population structure and habitat requirements in downland and woodland clearing habitats in West Sussex (Brereton, 1997). Research indicates that the butterfly's ecology is essentially the same in woodland and grassland and that the majority of populations are small and linked to others by occasional movement. No similiar research has been carried out in artificial habitats, heathland, sand-dunes etc.

It is now reasonably clear what vegetation structure to aim for in woodland and grassland management. However there is some uncertainty as to how to maintain colonies on recently created and sparsely vegetated artificial habitats, where vegetation is highly dynamic. A further concern is the best way of managing colonies which currently rely on Rabbit grazing, especially as this is unpredictable and unreliable in the long term. Research is required into the effects of management on the butterfly in all habitat types.

Study of habitat selection by the butterfly indicates that its habitats are dynamic. In the long term, potential habitats for the butterfly may be important for future colonisation as existing ones gradually become unsuitable.

Monitoring

Evidence from marking studies indicate that the butterfly can be adequately monitored by standard transects (Brereton, 1997). The Butterfly Monitoring Scheme now has transect data from 24 occupied sites, although only 13 sites have been monitored for longer than 7 years (used to calculate an annual index) and only 5 for 15 years. Many other sites are monitored by Butterfly Conservation, and other volunteers, but these data are not collated nationally.

Current Studies

No detailed studies are currently being carried out on this species, but some monitoring and conservation management is being implemented on several sites. An attempt to re-establish the butterfly to a now tiny, isolated site in Essex has been made recently (J. Dawson, pers. comm.), but the long term viability of this population is in doubt. A number of Grizzled Skippers recorded in 1997 in the north Lancashire limestone area, were almost certainly from an unauthorised introduction. While the long term viability of this introduction is uncertain, there are fairly extensive areas of suitable habitat present.

Part 3 Actions and Work Programme

This section has been divided into the standard headings Policy and Legislative; Site Safeguard and Acquisition; Land Management; Species Protection and Licensing; Advisory; International; Future Research and Monitoring; Communications and Publicity; Review. Actions are given a low, medium or high priority. The lead organisation(s) concerned for each action is/are named.

Definition of Colony Size: Large = >500 adults; medium = 100-500 adults, small = <100 adults.

Area of search is defined in NCC (1989, figure 2, page 18).

For key to abbreviations see page 19.

3.1 POLICY AND LEGISLATIVE

**Lead
organisation(s)
concerned**

Action 1 PRIORITY: HIGH

Include habitat requirements of Grizzled Skipper, and the potential for habitat restoration when drawing up or revising prescriptions in relevant land management schemes and grants e.g. ESAs, the new all Wales agri-environment scheme, WES, Countryside Stewardship.

**MAFF, CCW,
EN**

Action 2 PRIORITY: HIGH

Improve financial incentives for coppice restoration, appropriate ride and glade management, and active broad-leaved woodland management throughout range (especially measures that will increase the size and frequency of canopy gaps and clearings).

FA (+ LAs)

Action 3 PRIORITY: MEDIUM

Encourage the provision of low-input permanent grass margins around occupied woodlands (e.g. with targeting of Countryside Stewardship).

**MAFF, EN,
CCW, FA**

Action 4 PRIORITY: HIGH

Include habitat requirements of Grizzled Skipper when drawing up mitigation or restoration measures in the development control process (*planning gain*) for defunct quarries, pits, clay workings, etc. which are located near to existing colonies.

LAs

Action 5 PRIORITY: MEDIUM

Include habitat requirements of Grizzled Skipper in the management of (public open space) disused railway networks in regions where the butterfly occurs. **LAs**

3.2 SITE SAFEGUARD AND ACQUISITION

Action 6 PRIORITY: MEDIUM

Designate as SSSI three large or medium colonies per search area (or as many as exist if less than three), where this will help improve habitat management. **EN, CCW**

Action 7 PRIORITY: HIGH

Encourage protection of all large/medium colonies through management agreements and/or reserve acquisition. **All**

3.3 LAND MANAGEMENT

Action 8 PRIORITY: HIGH

Incorporate needs of the Grizzled Skipper in management plans/site management statements on all SSSIs and agri-environment scheme agreement land with colonies. **EN, CCW, MAFF**

Action 9 PRIORITY: HIGH

Maintain/restore coppicing and woodland management throughout range (especially measures that will increase the frequency of large canopy gaps near existing populations and linking wide rides). **All**

Action 10 PRIORITY: HIGH

Encourage appropriate grazing regimes and scrub management on scrubby grassland and disused artificial habitats. **All**

Action 11 PRIORITY: HIGH

Encourage appropriate grazing, mowing, and scrub management regimes in grassland and disused habitats in regions where the Grizzled Skipper occurs. **All**

Action 12 PRIORITY: MEDIUM

Encourage restoration or creation of suitable breeding habitat within former range, where there is potential for re-establishing viable networks of populations, concentrating on regions where the Grizzled Skipper still occurs.

**EN, MAFF,
CCW, NT,
WT, BC,
WTs.**

3.4 SPECIES PROTECTION AND LICENSING

Action 13 PRIORITY: LOW

Conduct strategic re-introductions of Grizzled Skipper (and any parasitoids that may be identified) into networks of suitably restored habitat, where natural colonisation is unlikely in the foreseeable future.

BC etc.

3.5 ADVISORY

Action 14 PRIORITY: HIGH

Advise conservation agencies and site owner/managers on the location of occupied and other suitable (but unoccupied) sites and on practical habitat management for the Grizzled Skipper and how to incorporate this with other management priorities and interests.

**BC, CCW,
EN**

Action 15 PRIORITY: MEDIUM

Advise on habitat restoration techniques on potential and former sites.

BC,

Action 16 PRIORITY: MEDIUM

Produce a brief, practical guide on habitat management for the Grizzled Skipper, incorporating this with management for other wildlife.

**BC, EN,
CCW**

Action 17 PRIORITY: MEDIUM

Ensure the conservation importance and management requirements of the Grizzled Skipper are incorporated into any relevant national and local Biodiversity Action Plans.

**JNCC,
CCW, EN,
LAs, BC,
WTs**

3.6 INTERNATIONAL

No action proposed.

3.7 FUTURE RESEARCH, SURVEY AND MONITORING

Action 18 PRIORITY: HIGH

Collate all recent records, update national distribution map and determine core regions of distribution.

**BC, ITE,
JNCC.**

Action 19 PRIORITY: HIGH

Identify location of all large/medium colonies.

**BC, EN,
CCW.**

Action 20 PRIORITY: MEDIUM

Conduct further research on habitat requirements, ecology and management techniques especially in disused artificial habitats, sand-dunes and acid grassland/heathland.

All

Action 21 PRIORITY: HIGH

Continue monitoring on a range of sites representing each habitat type throughout the UK. Incorporate Rabbit monitoring (i.e. dung counts) where appropriate.

**BC, ITE, EN,
CCW, FE.**

Action 22 PRIORITY: MEDIUM/HIGH

Collate transect data annually and calculate annual index of abundance to compare trends on individual sites

**BC, ITE,
JNCC.**

Action 23 PRIORITY: MEDIUM

Identify potentially suitable, unoccupied habitats within 10-20 km of existing populations, and assess possibility of re-establishment.

BC

Action 24 PRIORITY: LOW

Identify potentially suitable, unoccupied habitats in former range greater than 20 km from existing populations and assess viability.

BC

Action 25 PRIORITY: HIGH

Investigate dispersal ability of the Grizzled Skipper, the effect of habitat loss and isolation of colonies on population viability.

**BC, EN,
CCW, ITE**

Action 26 PRIORITY: LOW

Conduct research on parasitoids and species associated with Grizzled Skipper habitats.

BC, ITE etc.

Action 27 PRIORITY: MEDIUM

Investigate role of Rabbit grazing in maintaining habitats and extent of species reliance on Rabbit grazing.

**BC, EN,
CCW, ITE.**

3.8 COMMUNICATIONS AND PUBLICITY

Action 28 PRIORITY: HIGH

Publicise this action plan, the decline of the Grizzled Skipper and measures needed to conserve it.

All

3.9 REVIEW

Action 29 PRIORITY: HIGH

Review this action plan annually and update in five years if necessary.

**EN, CCW,
BC**

Key to abbreviations

All = All organisations listed

BC = Butterfly Conservation

CCW = Countryside Council for Wales

EN = English Nature

FA = Forestry Authority

FE = Forest Enterprise

ITE= Institute of Terrestrial Ecology

JNCC = Joint Nature Conservation Committee

LAs = Local Authorities

MAFF = Ministry of Food and Fisheries

NT = National Trust

WOAD = Welsh Office Agricultural Department

WT = Woodland Trust

WTs = Wildlife Trusts

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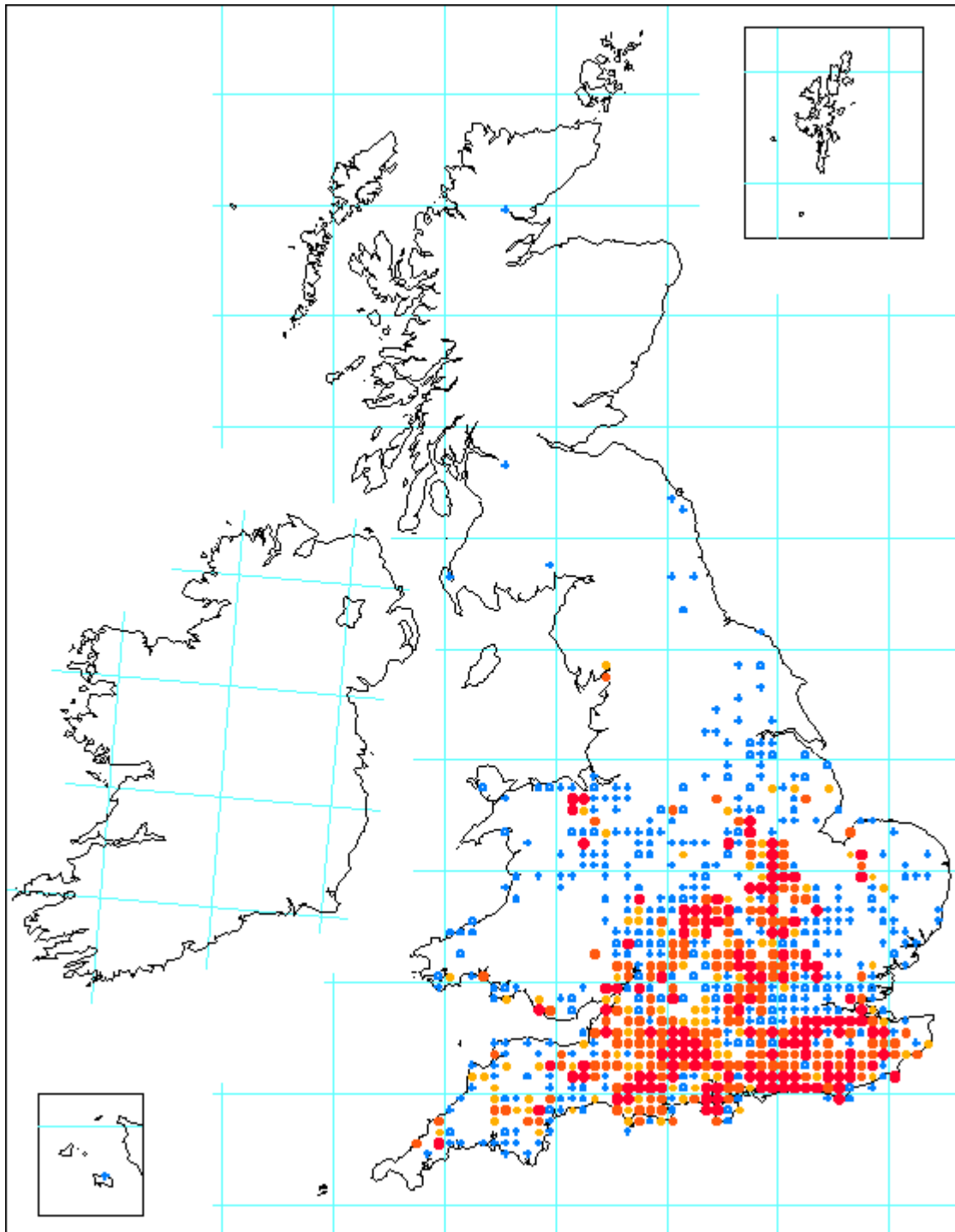
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Appendix 1 The approximate distribution of the Grizzled Skipper

Butterflies for the New Millennium project (2001).

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(Dark full spot all records from 1995-1999; open circles all records between 1970-1982; cross all pre 1970 records).



Appendix 2 Declining status of the Grizzled Skipper in south-east England by 10 km squares (developed from Brereton, 1997)

County	Status prior to 1970	No. 10 km squares		
		1970-88	1989-94	Status 1995-97
Bedfordshire	Widespread & locally common (C. Baker pers. comm)	20	12	12
Cambridgeshire	Locally common (V. Perrin pers. comm.)	16	4	1 site
Essex	Widespread & locally common (Firmin <i>et al.</i> , 1975)	11	3	3 colonies, 2 tetrads
Hertfordshire	Locally common (Sawford, 1987)	14	5	No records 1994-96, 8 between 1996-7
Kent	Widespread (Philp, 1993)	20	8	20
Middlesex	Locally common (Plant, 1987)	5	1	None since 1992
Suffolk	Locally common (Mendel & Piotrowski, 1986)	3	0	None since 1979
Surrey	Widespread & locally abundant (Collins, 1995)	16	11	12
Sussex	Widespread & locally abundant (Pratt, 1981)	39	34	Stable
Total		144	78	
Status	Generally widespread & locally abundant	54% decline		Generally stable

Appendix 3 Conservation requirements of the Grizzled Skipper

Grizzled Skipper habitats have the following characteristics:

- an abundance of spring nectar plants
- an abundance of at least one of the following key larval foodplants: Agrimony, Creeping Cinquefoil, Wild Strawberry, or more infrequently Barren Strawberry and Tormentil growing in short (< 10 cm), herb-rich vegetation and especially on bare ground. This is preferred breeding vegetation and its presence is the main factor limiting the distribution and abundance of adults at sites.
- patches of ranker vegetation and scrub/woodland edges.

Habitat

The Grizzled Skipper occupies three broad habitat types:

1) Woodland Clearings The aim is to ensure suitable areas of regenerating woodland or wide rides with abundant Wild Strawberry or Barren Strawberry (\pm Bramble for the later larval stages) growing over bare ground in open, sunny conditions. Ideal conditions are provided in woodland re-growth in the first few years following felling or coppicing or in wide sunny rides which are occasionally disturbed, creating areas of bare ground. A network of open, sunny rides and glades is beneficial and may be essential to link clearings in high forest woodland. Coppicing ride edge vegetation on a short rotation may also be helpful where no substantial area can be managed as coppice. Details of coppice and ride management are given in Fuller and Warren (1994).

2) Unimproved grassland with scrub The aim is to maintain a mosaic of short herb-rich grassland with bare ground (for breeding, adult feeding and basking, and larval development), ranker grassland (for adult roosting, larval development and pupation) and scrub (for mate-location and as foodplant habitat).

Shorter vegetation must include an abundance of either Wild Strawberry, Creeping Cinquefoil or Agrimony, preferably with a number of the plants growing over bare ground. Scrub needs to occur as an edge, preferably at the base of slopes.

Bare ground/foodplant conditions may be created in a variety of ways, including:

- For Wild Strawberry: through scrub clearance, and Rabbit or Pheasant scraping over rendzina soils.
- For Creeping Cinquefoil: through cattle grazing, Rabbit scraping and burrowing.
- For Agrimony: through cattle grazing and Mole activity (hills).

A patchy sward with both short (<10) and ranker (10-50 cm) vegetation may be created in a variety of ways, including:

- By low to moderate stock grazing, especially winter cattle. This is the preferred management as bare ground is created as well as short vegetation. Sheep grazing is only likely to be successful if bare ground is created simultaneously through scrub clearance or animal disturbance.
- By moderate Rabbit grazing (also creates bare ground).
- By mowing annually in September (to c5 cm). This is least favoured, as both a supply of bare ground and a heterogeneous sward need to be created through other activity *e.g.* Rabbit grazing.

Moderate to heavy spring stock grazing is to be avoided as it eliminates nectar sources, which appear vital to the butterfly. Heavy grazing by stock or Rabbit is also detrimental as it creates a uniform short sward which is not favoured by the butterfly.

Sites with grassland vegetation maintained mainly by Rabbit grazing need to be carefully monitored as Rabbit populations are unpredictable. A contingency plan to implement spasmodic stock grazing in the event of a population crash, or Rabbit control and/or Rabbit proof fencing in the event of a population explosion needs to be established.

Patches of scrub (totalling up to about 30% of the grassland area), should be retained, and ideally managed so that a proportion is cut each year on long rotation (*e.g.* 20 years).

3) Disused artificial habitats

These are essentially grassland sites \pm scrub, therefore many of the principles described above are applicable. However, research is required into the ecology of the butterfly in these habitats.

In many respects these are the most difficult sites to conserve, because: (1) many are small and isolated; (2) the vegetation is highly transient; (3) the introduction of grazing to maintain suitable conditions may be particularly problematic; and (4) bare ground is created highly artificially.

There is little experimental evidence to draw upon, but a combination of mowing, scrub clearance and occasionally bulldozing may be required to conserve colonies.

4) Other

Management of heath/acid grassland is not as well known as other habitat types but is probably similar to calcicolous grassland with the maintenance of mosaics of bare/ short vegetation with taller patches.