

The status of the Grizzled Skipper *Pyrgus malvae* at Dinham Meadows SSSI and the wider MoD Caerwent Training Area in 2023 & 2024

NRW Evidence Report No. 873

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Grizzled Skipper © Iain Leach

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Crynodeb gweithredol

Cynhaliwyd arolwg i bennu statws a dosbarthiad presennol y gwibiwr brith *Pyrgus malvae* ar SoDdGA Dinham Meadows ac ardal hyfforddi ehangach y Weinyddiaeth Amddiffyn yng Nghaer-went ym mis Mai 2024. Roedd hyn yn dilyn arolwg i bennu cyflwr cynefinoedd yn 2023 gan ddefnyddio Asesiad Cyflym o Gyflwr Cynefin (RHCA), a oedd yn cael ei ddefnyddio mewn arolwg o'r holl safleoedd a feddiennir ledled Cymru. Cofnodwyd cyfanswm o 28 o oedolion mewn pump o unarddeg parth (un ym Mharth 1, chwech ym Mharth 3, pump ym Mharth 4, deg ym Mharth 6, a chwech ym Mharth 8). Ni chofnodwyd unrhyw un yn SoDdGA Dinham Meadows, lle mae'r glöyn byw yn nodwedd hysbysedig a chymhwyso, ond na chyrchwyd pob rhan o'r SoDdGA. Roedd y rhai a gyrchwyd yn cynnal glaswellt wedi'i bori'n fyr gydag ychydig o ffynonellau neithdar ac felly nid oeddent yn addas ar gyfer y gwibiwr brith. Cofnodwyd cynefin cyflwr 'da' mewn chwe pharth (Parth 1, parthau 3 i 6, a Pharth 10), cynefin cyflwr 'teg' ym mharthau 7, 8 ac 11, a chynefin cyflwr 'gwael' ym mharthau 2 a 9.

Gwneir argymhellion ar gyfer gwella cyflwr cynefinoedd ym mhob un o'r unarddeg parth, gan gynnwys rheoleiddio pori, cyflwyno trefniadau torri cydymdeimladol, rheoli prysgwydd, darparu isbriddoedd moel trwy grafu'n fecanyddol, mewnforio priddoedd â lefel isel o faethynnau i greu twmpathau a/neu gloddiau, a thocio ymylon coetir a chreu rhodfeydd coetir. Byddai angen ymgymryd â'r olaf yn ofalus er mwyn peidio effeithio'n negyddol ar y boblogaeth bwysig o ddolenwyr llwydfelyn *Minoa murinata* a geir ar safle'r Weinyddiaeth Amddiffyn yng Nghaer-went. Argymhellir hefyd cynnal arolygon a gwaith monitro mwy rheolaidd o boblogaeth y gwibiwr brith ar safle'r Weinyddiaeth Amddiffyn yng Nghaer-went.

Executive summary

A survey to determine the current status and distribution of the Grizzled Skipper *Pyrgus malvae* on Dinham Meadows SSSI and the wider MoD Caerwent Training Area was undertaken in May 2024. This followed a survey to determine habitat condition in 2023 using a Rapid Habitat Condition Assessment (RHCA) which was being used in a survey of all occupied sites throughout Wales. A total of 28 adults was recorded in five of eleven zones (1 in Zone 1, 6 in Zone 3, 5 in Zone 4, 10 in Zone 6 and 6 in Zone 8). None was recorded in Dinham Meadows SSSI where the butterfly is a notified and qualifying feature although not all SSSI compartments were accessed. Those that were supported a tightly-grazed sward with few nectar sources and were therefore not suitable for Grizzled Skipper. 'Good' condition habitat was recorded in six zones (Zone 1, Zones 3 to 6 & Zone 10), 'Fair' condition habitat in Zones 7, 8 & 11 and 'Poor' condition habitat in Zones 2 & 9.

Recommendations are made for improving habitat condition in all eleven zones including the regulation of grazing, the introduction of sympathetic cutting regimes, scrub control, the provision of bare substrates by mechanical scraping, the importing of low nutrient soils to create some mounds and/or banks, and scalloping woodland edges and creating woodland rides. The latter would need to be undertaken with care so as not to have an adverse impact upon the important population of Drab Looper *Minoa murinata* found at MoD Caerwent. More regular surveys and monitoring of the Grizzled Skipper population at MoD Caerwent is also recommended.

1. Introduction

The Grizzled Skipper (*Pyrgus malvae*) is found throughout southern England and Wales but is becoming increasingly rare. In Wales, it is mainly restricted to the south coast and to post-industrial sites in the northeast. Between 2005 and 2013, the butterfly was recorded from 23 sites with concentrations in north-east Wales, Gwent, Carmarthenshire and Pembrokeshire (Tordoff & Williams, 2014). Key populations occur at Laugharne & Pendine Burrows, Llanmelin Hillfort, Llanymynech Rocks, Merthyr Mawr Warren, MoD Caerwent, Pembrey Forest and Wrexham Industrial Estate, (Williams *et al.*, in prep.). Its scarcity in Wales makes it a strong indicator of high-quality habitat often where unimproved grassland is not threatened by the pressures of modern intensive landscape management. Figure 1 shows UK distribution map for Grizzled Skipper up to 2019 that illustrates the current trend and range reduction.

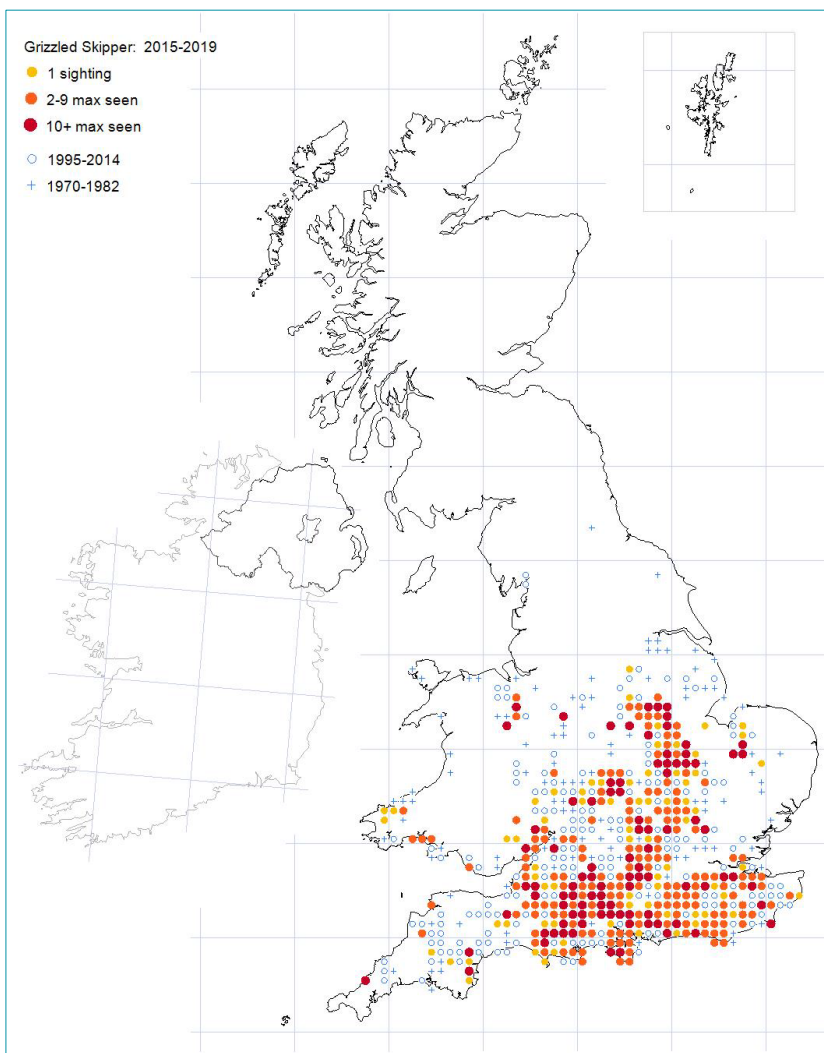


Figure 1. UK Distribution map for Grizzled Skipper to 2019.

In 2023, Butterfly Conservation (BC) conducted a Rapid Habitat Condition Assessment (RHCA) at all the main sites for Grizzled Skipper in Wales (Williams *et al.*, in prep.). This

included surveying the Dinham Meadows SSSI complex as part of a wider site visit to assess the MoD Caerwent Training Area. Grizzled Skipper is a notified and qualifying feature of the SSSI. In this report, the 2023 results will be used alongside data from historical sighting records held by BC. In addition, data gathered from visits made by BC in 2024 and discussions regarding potential habitat management for the site will guide recommendations for consideration.

2. Methods

It is important to state that roughly half of the approximately 235ha MoD Caerwent Training Area was surveyed during 2023. Figure 2 shows the extent of land covered which included three of the four Dinham Meadows SSSI compartments.

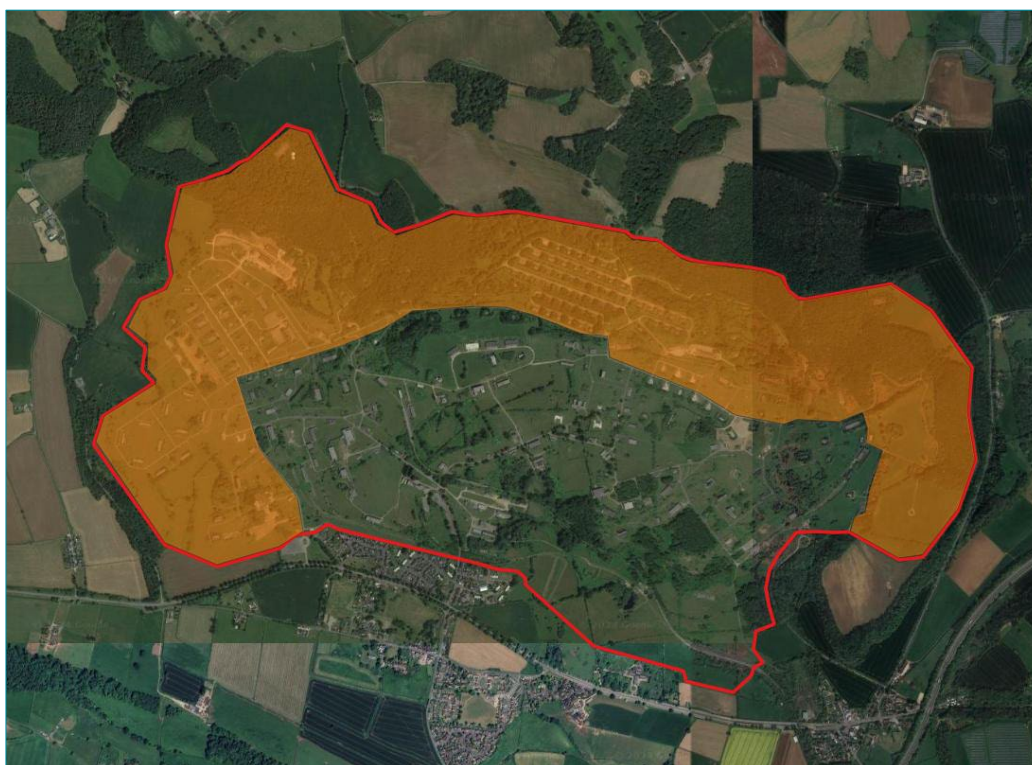


Figure 2. The extent of area covered at MoD Caerwent during the Grizzled Skipper Rapid Habitat Condition Assessment (RHCA) in 2023.

Early contact was made with the landowner (MoD) to conduct the RHCA in 2023 but, due to the volume of training activities already booked in, access wasn't permitted until 13th June. As a result the presence of adults using the site remained unproven until 2024. This also meant that some of original survey targets, such as population health and potential threats during flight season, were not assessed in 2023. Therefore, the 2023 survey focused on current habitat conditions and management. The survey included:

- Mapping of the extent of suitable habitat currently available and areas that are potentially suitable following sympathetic management;

- An assessment of habitat quality. This estimated the amount of suitable larval foodplants in suitable microhabitat, sward height, nectar availability for adults, connectivity of suitable habitat and the presence of scrub and bare ground;
- An assessment of current management regimes and threats to the butterfly population. Recommendations of management improvement should be made.

A 'Grizzled Skipper Survey Form' was completed to provide a useful overview in terms of the presence of key features required by the butterfly, including strengths and limiting factors, along with management information and a threat assessment. The blank survey form template is provided in Appendix 1 along with the supporting notes.

The RHCA method, suitable for mapping at a landscape scale, was developed to trial for the all Wales 2023 Grizzled Skipper surveys (Appendix 2). This involved mapping the extent of suitable, potentially suitable and unsuitable habitat on the site based on key habitat features required by the butterfly; these are:

- Foodplants (Wild Strawberry, Barren Strawberry, Creeping Cinquefoil, Tormentil, Agrimony. Dewberry is used on some sites. Bramble used by later larval stages);
- Mosaic of:
 - short herb-rich vegetation (<10cm), often with stone, rocks or bare ground;
 - Taller vegetation (10-50cm), including dead flowering spikes for shelter, basking and roosting;
 - Abundant spring nectar (Daisy, Bugle, Bulbous buttercup and Bird's-foot Trefoil)
 - Low scrub (<4m) – for mate location, shelter and as foodplant habitat.

Habitat, habitat condition was split into three categories - Good, Fair and Poor - based on the extent and abundance of the key habitat attributes.

The results from the 2023 survey helped to create a Habitat Condition Map which was used to choose areas that should be targeted for survey in 2024. Priority was given to areas where habitat conditions were considered good for Grizzled Skipper and aim to prove that the butterfly was present. Any areas found to support Grizzled Skipper were also subject to further consideration, such as protecting the location from habitat loss and exploring options to increase the availability of good habitat in adjacent areas.

The data gathered in 2024 was mainly focused on Grizzled Skipper presence and habitat management recommendations. Zones were created and mapped out to record and illustrate these data. The main factor for creating a zone is to demonstrate the significance to the current Grizzled Skipper population. Zones contain important metrics found to be consistent within the zone but different to the adjacent zone. A list of important metrics used are shown below:

- Presence;
- Habitat quality;
- Grazing pressure;

- Potential to create better habitat.

Each zone has been allocated a number, and Appendix 3 shows a map for all eleven zones and a table of Target Notes that were generated from the site visit on 17th May 2024.

3. Results

A site visit was made by Mark Hipkin, Alan Sumnall and George Tordoff on Friday 17th May 2024. The morning was partially cloudy but with strong sunshine. The cloud cleared by late morning and the skies remained clear until late afternoon. The maximum temp was 20°C with a light southerly wind (5 mph).

In total, 28 Grizzled Skipper adults were seen on the wing and nectaring, in three hotspots (Figures 3 & 4).

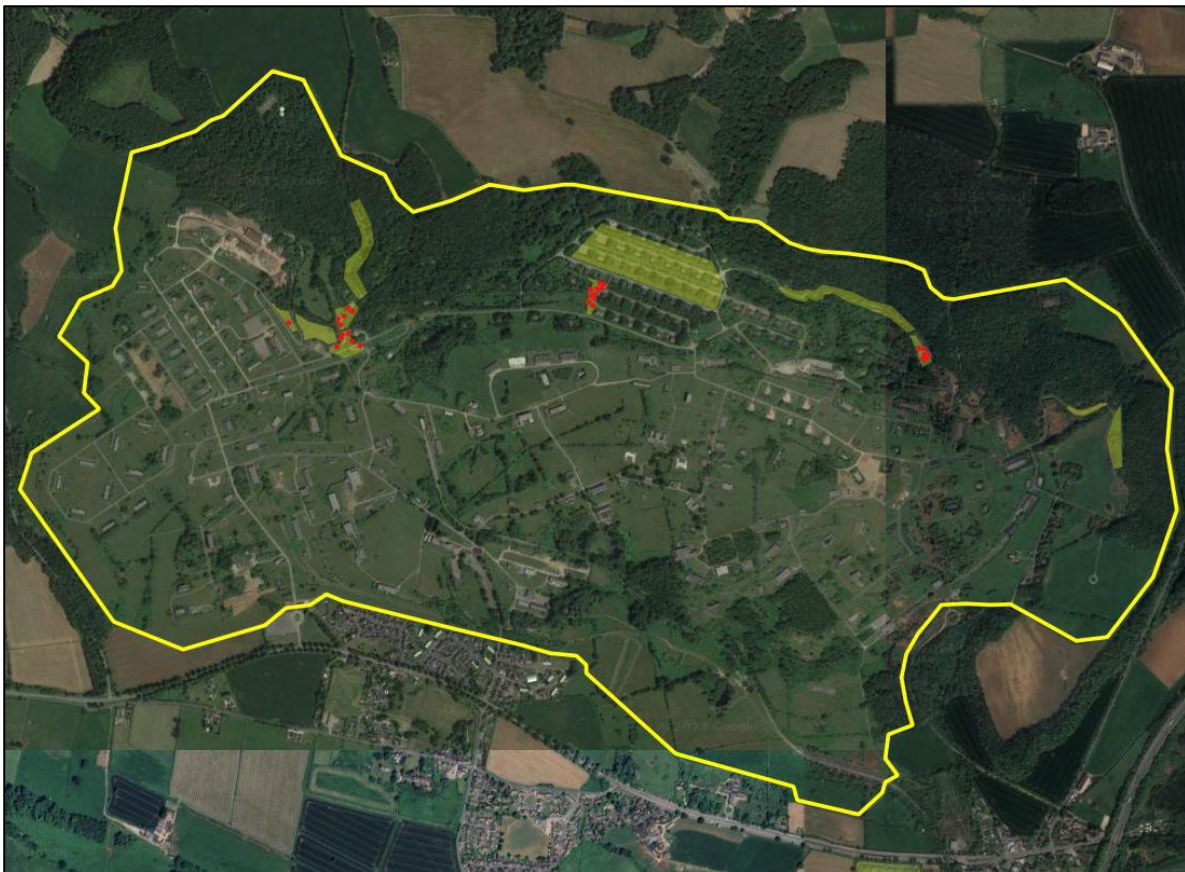


Figure 3. The distribution of adult Grizzled Skipper at MoD Caerwent in 2024, plotted as individuals.



Figure 4. The distribution of adult Grizzled Skipper at MoD Caerwent in 2024, plotted as clusters.

When looking at the clusters of adult Grizzled Skipper sightings in combination with locations of good habitat conditions, four main areas of significance stood out (Table 1; Figure 6). These areas will be treated as **sections** in this report to help focus the presentation of data and guide recommendations. Figure 5 shows the position of the sections and identifies eleven **zones** contained within them.

Table 1. Number of Grizzled Skipper adults recorded at MoD Caerwent in 2024 and habitat condition in 2023.

| Zone | Grizzled Skipper | Habitat condition |
|------|------------------|-------------------|
| 1 | 1 | Good |
| 2 | 0 | Poor |
| 3 | 6 | Good |
| 4 | 5 | Good |
| 5 | 0 | Good |
| 6 | 10 | Good |
| 7 | 0 | Fair |
| 8 | 6 | Fair |
| 9 | 0 | Poor |
| 10 | 0 | Good |
| 11 | 0 | Fair |
| - | 28 | - |

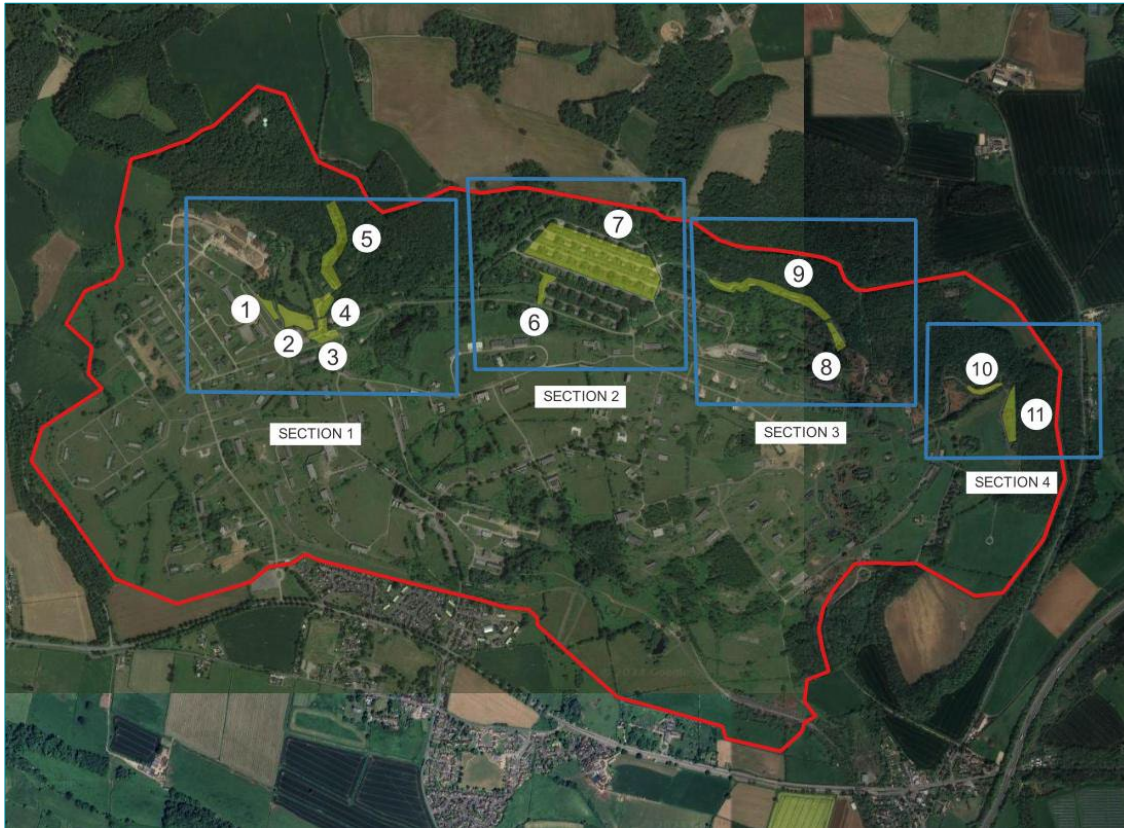


Figure 5. Sections 1 to 4 and Zones 1 to 11 at MoD Caerwent.

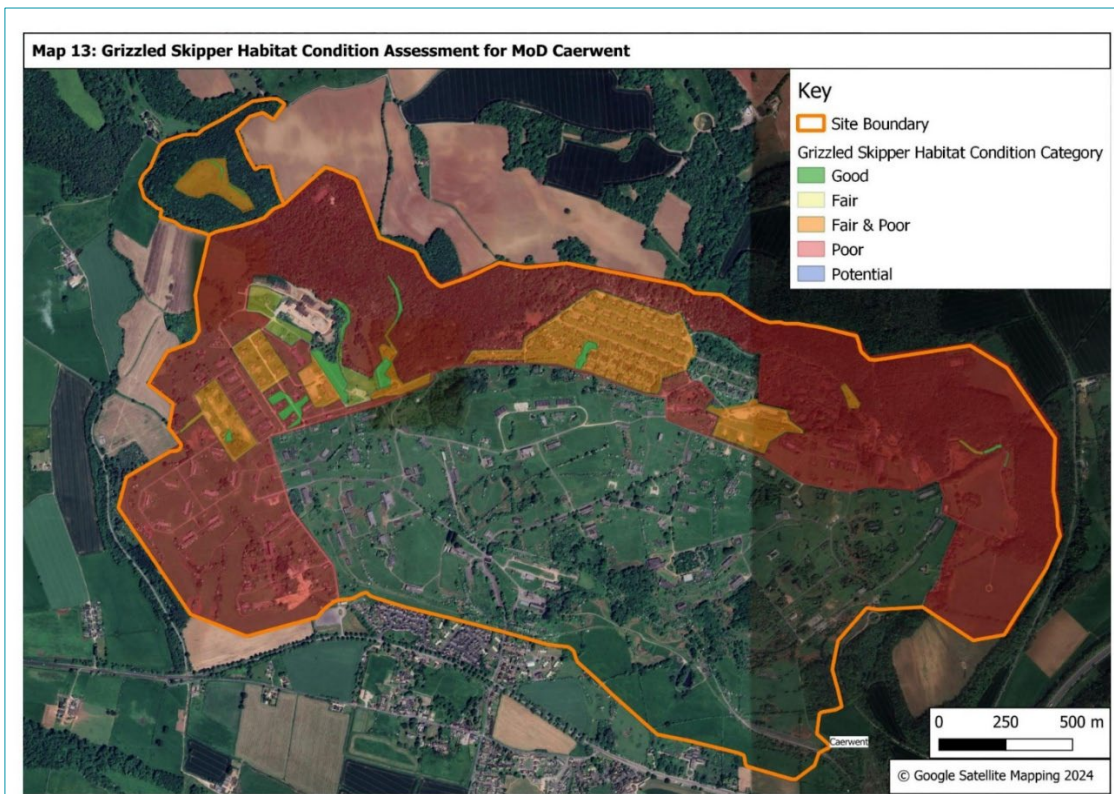


Figure 6. Habitat condition map for MoD Caerwent.

3.1 Section 1

Section 1 contains five zones that were targeted for assessment in 2024 (Figure 7), the most important being Zone 3 and Zone 4 where 6 and 5 adults were recorded respectively. These two zones were found to have some of the best habitat for Grizzled Skipper during the 2023 RHCA survey. The most valuable feature shared by Zones 3 & 4 is a rocky embankment either side of the road that passes through both zones. The interesting difference between the two zones is that a cattle grid and fence form a boundary between them which means that Zone 3 holds very good habitat conditions despite it being open to the same level of grazing that has resulted in overgrazed grassland throughout much of MoD Caerwent.

Zone 4 contains a small raised area adjacent to the road which appears to be managed for scrub control. The area itself is dominated by broad grasses with some nectar sources but very little bare ground. The openness created by this managed area was having a positive impact on the extremely valuable road embankments in Zone 4 but it was felt there were options to improve this area by creating more bare ground.

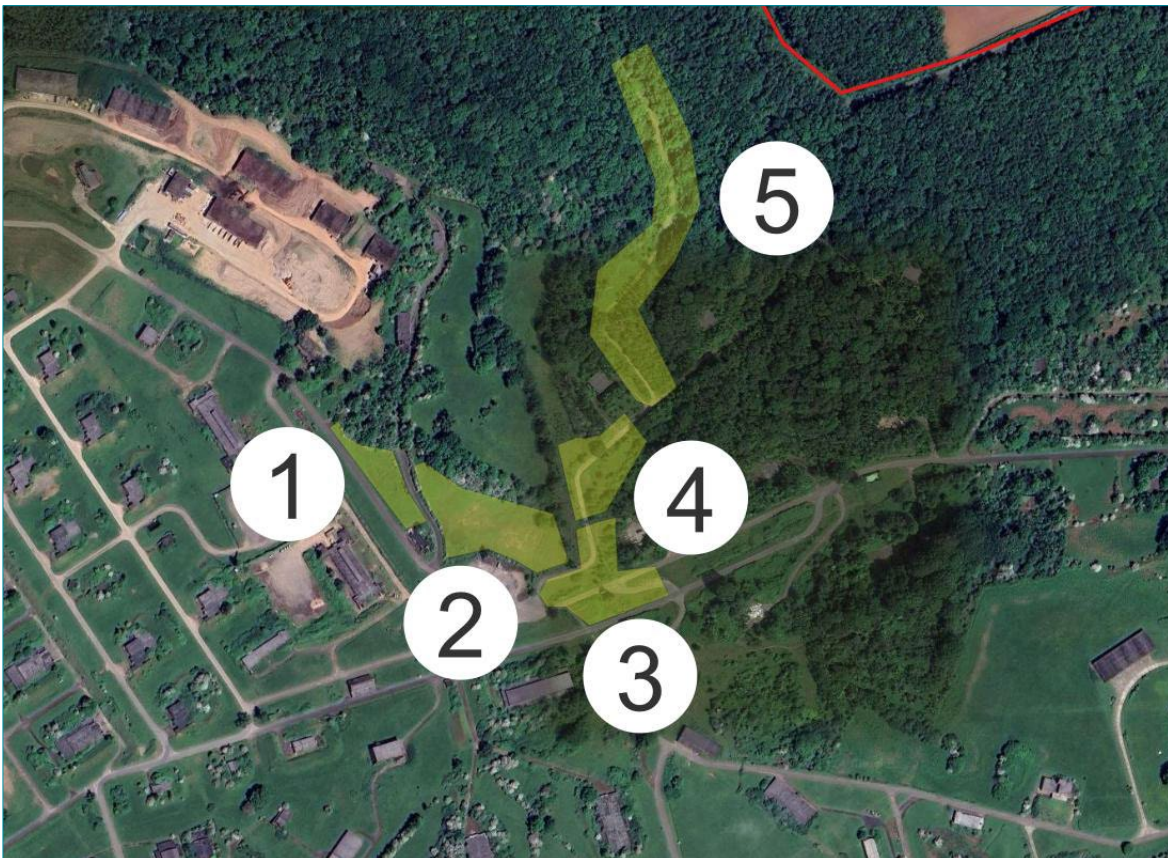


Figure 7. The five zones in Section 1 at MoD Caerwent.

Zone 1 had all the features required for it to qualify as good habitat for Grizzled Skipper and a single adult was found nectaring during the 2024 visit. Like Zone 3, there are no barriers to prevent it from being overgrazed. Zone 1 has a good southwest facing slope and a thinly vegetated embankment that supports the road. This feature in particular was most valuable

to the butterfly population. Without control over grazing in this zone, it will struggle to improve its floristic richness, but the creation of more bare ground would help.

Zone 2 is an area within one of the Dinham Meadows SSSI field complexes. When surveyed on 13th June 2023 and 17th May 2024, it was found to be a tightly grazed sward lacking in diversity or nectar sources. The zone does contain bare ground possibly as a result of poaching by cattle due to its favourable south facing slope. The habitat is currently in poor condition but given its close proximity to two extremely important zones for Grizzled Skipper, there is high potential to make improvements here.

Zone 5 differs from the other zones because it is dominated by woodland. An access track through wood creates a ride which splits Zone 5 in half running along its length. The track is conveniently climbing a south facing slope and so it gathers sunlight throughout the day. In the lower half, there is a clearing which appears to be maintained by regular scrub clearance operations. The openness created within this zone produced a valuable heat trap and there were several common species using it such as Green-veined White and Peacock. However, Grizzled Skipper was not found. The managed area was generally poor in nectar sources and the sward was dominated by broad grasses. The zone returned a score of good overall as all the important habitat features were found present along the embankments of the track. The zone was extremely similar to parts of Pembrey Forest where Grizzled Skipper is still present in small numbers. If some additional clearings could be created as well as some fine tuning of current management, then colonisation from adjacent zones may occur.

3.2 Section 2

Section 2 contains two zones, Zones 6 & 7, that were targeted for assessment in 2024 (Figure 8). Zone 6 supported of the best habitat for Grizzled Skipper during the 2023 RHCA survey, and ten adults were recorded here the following year. Indeed, it supported the highest adult density across all occupied south Wales sites in 2023 and 2024 (Williams, in prep.). These results make it important to understand what the current management regime is for Zone 6 and how similar habitat conditions can be created nearby to allow the population to spread out. Grizzled Skipper was not found in Zone 7.

Zone 6 is a tall steep embankment with a ridge that runs roughly north to south. The position of the ridge means that it is nicely located to catch the late spring sunshine in the morning and afternoon. The seemingly low nutrient soil that forms the bank results in a floristically rich vegetation and therefore abundant nectar sources. There are frequent patches of bare soil and areas where the vegetation cover is thin. Scrub is thinly scattered and largely missing from the zone but there is extensive scrub nearby. It is unclear whether the current habitat- condition for Zone 6 is the result of specific management or a mixture of poor nutrient soils and general wider site management for the benefit of the MoD training operations. The zone is fenced off against stock that graze the wider site which certainly allows for the abundance in nectar sources and seed heads.

The adjacent Zone 7 supports a mixture of habitats. There is a complex of buildings set out in three rows, with access roads separating them. In addition to the roads, there are tall and

steep embankments between the rows of buildings and these banks have potential to be improved for the benefit of Grizzled Skipper. Their south-southwest facing slopes are currently in fair condition but there is abundance of Wild Strawberry and well-scattered scrub. The embankments are dominated by grassland but with a poor availability of nectar sources. There is also a lack of bare ground. The embankments are subject to periodic scrub management control but it does not appear to be focused on improving the habitat condition -long term.

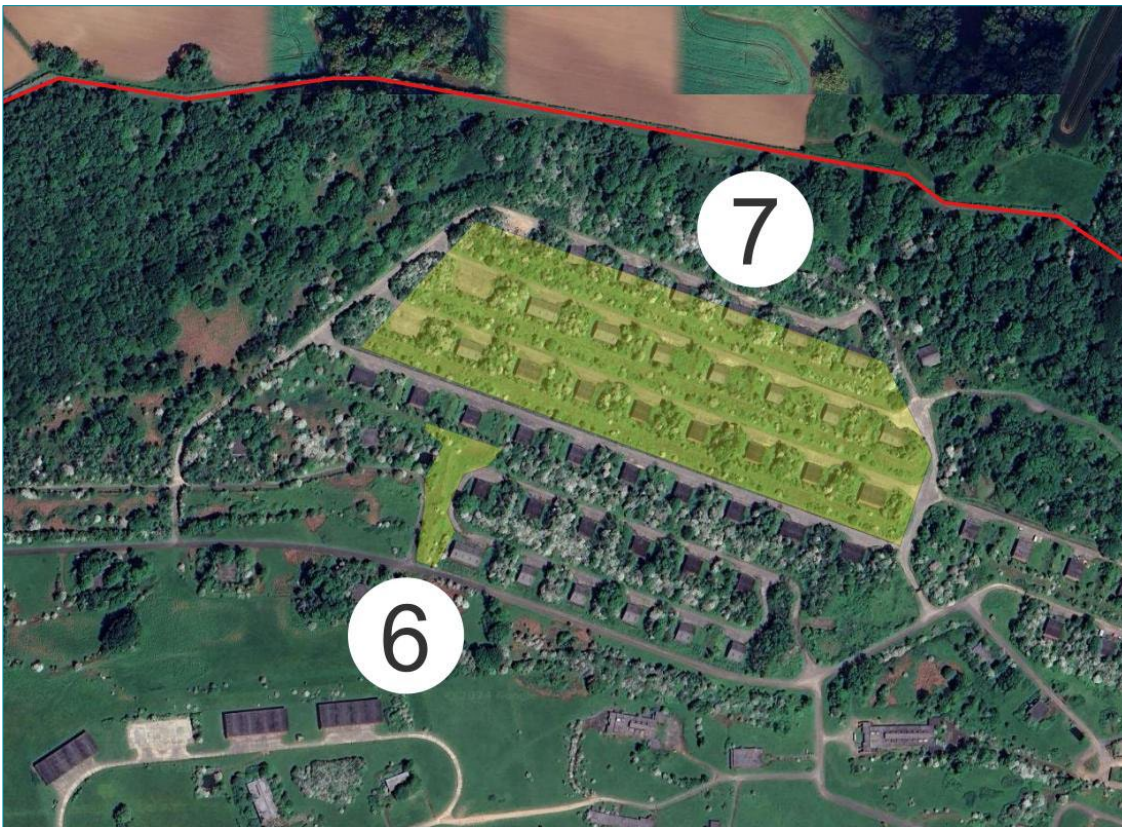


Figure 8. The two zones in Section 2 at MoD Caerwent.

3.3 Section 3

Section 3 contains two zones, Zones 8 & 9, that were targeted for assessment in 2024 (Figure 9). The 2023 RHCA found the condition of these zones to be fair. However, historical records highlight that Grizzled Skipper had been seen in the vicinity of Zone 8. It was therefore pleasing that 6 adults were found here in 2024. The habitat in this section is dominated by woodland with a clearing and access road which roughly runs east to west creating an effective butterfly ride. These zones are found behind stockproof fencing and a cattle grid so benefit from avoiding the grazing pressure found elsewhere on site. Both Zone 8 and Zone 9 support an important population of Drab Looper *Minoa murinata* which is extremely uncommon in Wales. The moth, the larvae of which feed on Wood Spurge *Euphorbia amygdaloides*, does share a requirement for clearings in woods to be maintained albeit slightly differently. Therefore, if any habitat management operations were to be taken

up in this section it would be worth considering looking at creating good habitat for both species.

Zone 8 is a clearing adjacent to a single track access road surrounded by trees. The embankment on the northern side of the road faces southwest and is open to the afternoon sun. The embankment supports an abundance of foodplants and also has a good variety of nectar sources. On the opposite side of the road, the ground falls away into a clearing which creates a good heat trap. The clearing is dominated by grassland but is not particularly rich in nectar sources, seed heads and bare ground. The clearing does have a good mix depressions and mounds which create an assortment of bank faces. On some of these faces, the sward is thin with occasional bare soil. There is very little low level scrub with the transition between grassland and mature trees fairly abrupt. Given the lack of grazing in this area, it is assumed that the clearing is managed regularly using brushcutters etc. Several Drab Looper adults were found flying in the clearing, with the foodplant scattered at low density along the wooded edge.

Zone 9 is continuation of Zone 8 with the single track access road creating a ride. Zone 9 contains two buildings and an overgrown structure but doesn't have any clearings that match the one in Zone 8. The embankment on the northern side of the road contains an abundance of bare ground, foodplants and seed heads. However, there is no low-level scrub or open grassland to found here. The habitat condition for Grizzled Skipper in this zone is poor but this could be changed to good by creating some clearings. There were more frequent sightings of Drab Looper in this zone, particularly in the vicinity of the overgrown structure. This same location held carpets of Wood Spurge.

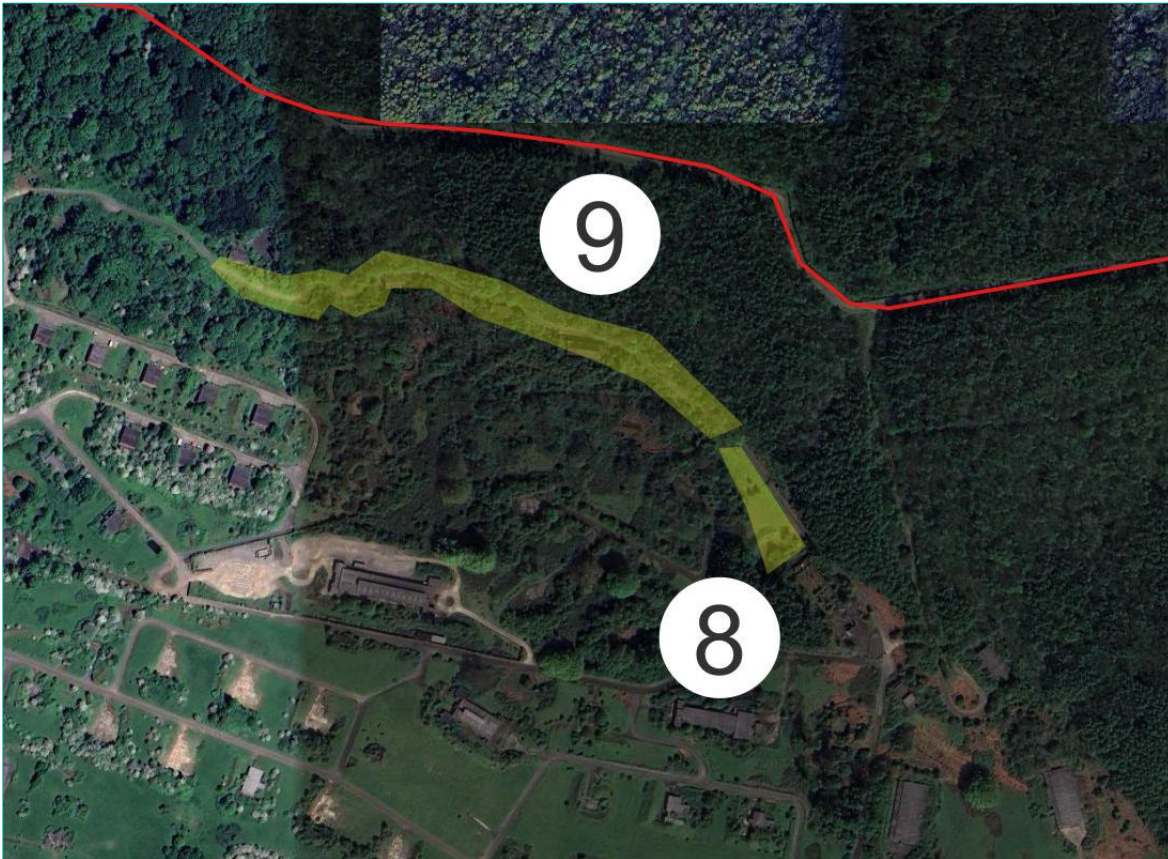


Figure 9. The two zones in Section 3 at MoD Caerwent.

3.4 Section 4

Section 4 contains two zones, Zones 10 & 11, that were targeted for assessment in 2024 (Figure 10). Section 4, unlike the other sections, did not produce any sighting of adults during the 2024 visit. However, historical records show that adults have been observed nearby. Zone 10 was considered to have good habitat conditions for Grizzled Skipper during the 2023 RHCA survey and there are areas close by which would benefit from sympathetic management.

Zone 10 is an area of mixed scrub and woodland edge. A single track access road passes through it which is cut into the ground and has formed a nice south facing embankment. This steep embankment contains an abundance of foodplant, seed heads and bare ground. There is frequent low scrub and nectar sources. Since this zone is small, the only feature missing is a wider area of grassland but this zone could be important if other areas nearby are improved for the butterfly.

Zone 11 is similar to Zone 10 but with an area of grassland adjacent to the road embankment. The grassland appears to be kept open as a result of regular cutting but this has led to it being dominated by broad grasses with few nectar sources. Foodplants, seed heads and bare ground are abundant on the embankment but do not occur in the grassland

part of the zone. If it is possible to make changes to the existing habitat management for this zone, it could become good for Grizzled Skipper.

Section 4 contains one of the Dinham Meadows SSSI field complexes. This has not been treated as a zone but if the current management plans for the fields can be changed, it would also potentially become an important area for Grizzled Skipper.



Figure 10. The two zones in Section 4 at MoD Caerwent.

4. Recommendations

It should be noted that Grizzled Skipper occurs at only a handful of sites in Wales. Whilst each site has its own unique characteristics, optimal habitat conditions are typically infrequent and the butterfly is restricted to small areas within a wider habitat matrix. To exacerbate matters, Grizzled Skipper does not occupy all areas of optimal habitat.

The key attributes promoting optimal habitat conditions can also vary within each site, and an understanding of these is critical to identifying appropriate habitat management actions. For example, optimal habitat conditions at MoD Pendine are most frequent within the transition zone between open tarmac hardstanding and heavily vegetated fixed dune. At MoD Caerwent Training Area, the most important feature appears to be thinly vegetated embankments with low nutrient soils, with such areas supporting the three population hotspots and optimal habitat conditions.

The recommendations given below have three main foci:

- Identifying the important population hotspots on site;

- Developing a plan to maintain the areas of good condition habitat;
- Improving habitat adjacent to population hotspots.

Recommendations for each zone will be set out to compliment the other zones found in the same section.

4.1 Section 1

Zone 1 is open to grazing but does support habitat in good condition. The best areas around the embankment could be scraped in patches to create bare ground and give opportunities for flowering plants to spread into. This area would be suitable for importing low nutrient soils to create some mounds and/or banks. If this zone became the focus of investment then erecting a stock-proof fence would also benefit the habitat management long term.

Zone 2 is part of the Dinham Meadows SSSI and was found to be overgrazed during two spring visits in 2023 and 2024. While the position of this zone gives it great potential for becoming extremely important for Grizzled Skipper, the current SSSI management might not allow for significant changes. The zone would benefit from being rested for a season to see how floristically rich it is. In the following year, creation of bare ground might be useful particularly if mounds or banks of low nutrient soils could be formed. In the longer term, a grazing plan to keep the area being lost to scrub encroachment will be necessary.

Zone 3 and zone 4 are in good condition and so the recommendation would be to keep the management of these areas the same. It will be beneficial to clarify what, if any, cutting of the vegetation in Zone 4 is taking place. The small raised plateau area found in Zone 4 could do with more diversity within the sward with increased nectar sources. It could also do with more bare ground and perhaps creating bare patches will lead to an increase in nectar sources. It may be possible to place low nutrient soil in mounds on the plateau which could colonise naturally over time with Birds-foot-trefoil, etc.

Zone 3 is extremely interesting as it is one of the only zones that is open to stock from the wider site that is in good condition for Grizzled Skipper. Further monitoring of this small zone is recommended to understand why it remains good and if that might help in other parts of the site where stock control is not practical.

Zone 5 is effectively operating as a butterfly ride with an access track winding roughly north to south. The clearing in the lower half is positioned well but the vegetation where the cutting is being done has become rank. The clearing could do with creating bare ground. Low nutrient soil being dumped in mounds would do well here. If this is not possible then scraping the vegetation in patches would create short term benefits. However, this operation might need to be repeated over a number of years with a plan to rotate scraped areas. Elsewhere in Zone 5, further clearings of scalloped edges to the access track would increase butterfly diversity generally in the zone.

4.2 Section 2

Zone 6 is an extremely important area for the Grizzled Skipper population at MoD Caerwent. The tall and steep embankment supports optimal habitat conditions. It is extremely important to understand what has led to its current condition and to maintain it as sympathetically as possible. If not already highlighted as an important area to the landowner, then that should be a priority. Regular monitoring – at least on an annual basis – would be important.

Zone 7 contains south facing banks that appear to be a good match to that of Zone 6. The main difference is that the vegetation has become increasingly rank. As a result, floristic richness has suffered and there is a distinct lack of bare soil. The recommendation here would be to create a plan for cuts on the banks to be done annually. There is a consideration that creating too much bare soil on the banks could lead to instability and erosion. Therefore, the plan should look at cutting areas on rotation with scattered patches where vegetation is cut back to bare soil.

4.3 Section 3

Zone 8 appears to be the most likely of the Grizzled Skipper population hotspots to lose optimal habitat conditions. The clearing does appear to be lacking an abundance of nectar sources and bare soil is largely missing. The zone does provide a good example of the importance of mounds and banks within a clearing, and it was at some of the thinly vegetated slopes where Grizzled Skipper adults were watched sunning themselves. It will be worth confirming if regular operations to keep the clearing open are being carried out and if so the methodology may need to be altered. In an updated methodology, making sure cuttings are removed from the area will be important. Also actively looking to create bare patches – particularly on the steep bank slopes – would be a worthwhile task. The population hotspots found at this zone should be monitored on an annual basis.

Zone 9 is effectively a butterfly ride with mature trees on both sides of a single track access road. Options to make changes in this zone are limited but if possible it would be worth identifying areas where clearings or scalloped edges could be introduced. This zone is important for Drab Looper and there are a few locations where Wood Spurge is locally abundant. Wood Spurge responds well to clearing but not to persistent clearing. It might therefore be worth looking at options where zones might be cleared on rotation over a long period of time.

4.4 Section 4

Zones 10 & 11 did not produce any Grizzled Skipper sightings during the 2024 survey. Active intervention here is therefore less urgent than in Sections 1 to 3. In the wider context, part of one of the Dinham Meadows SSSI field complexes is adjacent to both these zones. The main actions within this section would be to create more nectar sources and bare soil in Zone 11 and the Meadow. Importing low nutrient soil to form mounds and banks would work extremely well here.

5. Partnership collaboration

The MoD Caerwent Training Area, which contains the Dinham Meadows SSSI, is a special location for biodiversity. As with many MoD owned land parcels, habitats benefit from a lack of intensive land management. Natural Resources Wales (NRW) has active interest in a few areas of land within the site that have been designated. They are managing these areas but also working with the landowner to manage a selection of non-designated areas that add ecological value to the site.

Butterfly Conservation has formed links with the site in the past. This has mainly been due to the hard work of a previous County Moth Record for Gwent, Dr. Martin Anthoney. Since these visits have stopped, Butterfly Conservation has missed out in collecting valuable data for a number of species including Grizzled Skipper, Dingy Skipper and Drab Looper.

It has therefore been extremely beneficial for Butterfly Conservation to undertake the survey for Grizzled Skipper on behalf of NRW. Within this report, there are several recommendations which Butterfly Conservation is presenting to help protect the Grizzled Skipper population on site. It is hoped that, as a result of these recommendations, there will be an opportunity for Butterfly Conservation to work closely with NRW and the MoD to increase the ecological value of the site for the benefit of all parties.

Below are a few points that might help maximise the effect of partnership working in the future:

- Butterfly Conservation would like to commit a member of the Wales Conservation Team or South Wales Branch Volunteers to making at least one visit each year;
- Butterfly Conservation would be happy to arrange a coordinated partnership visit to provide expertise or engage in onsite discussions for future habitat management actions;
- Butterfly Conservation would be open to providing onsite supervision or training to contractors carrying out operations as informed by the recommendations in this report;
- Butterfly Conservation would benefit from the support of NRW to arrange visits at key times in the flight season so that valuable data collection and monitoring can be completed;
- Butterfly Conservation would like to explore options to help connect the three existing Grizzled Skipper population hotspots on site;
- Butterfly Conservation would like to look closely into the status of Drab Looper on site and provide more detailed recommendations to protect the species here.

6. References

Howe, M.A. 2022. *Pyrgus malvae* account November 2022. NRW unpublished account. Natural Resources Wales, Bangor.

Tordoff, G.M. & Williams, C. 2014. Status of the Grizzled Skipper butterfly (*Pyrgus malvae*) in Wales. Butterfly Conservation Report No. **S14-06**. Butterfly Conservation Wales, Swansea.

Williams, C., Tordoff, G. & Hipkin, M. in prep. A survey of Welsh populations of the Grizzled Skipper *Pyrgus malvae* in 2023 and 2024. Butterfly Conservation Wales unpublished report for Natural Resources Wales.

Appendix 1. Grizzled Skipper survey form (2023) & supporting notes

| SITE DETAILS | | | |
|---|----------|---------------------------------------|--|
| SITE NAME | | SURVEYOR | |
| ADMINISTRATIVE COUNTY | | NETWORK/LARGER SITE | |
| OS GRID REF | | VICE COUNTY | |
| ASPECT | | SLOPE (FLAT/GENTLE/MODERATE/STEEP) | |
| ALTITUDE | | PRIMARY HABITAT ON SITE | |
| 10KM SQUARE | | HABITAT USED BY SPECIES (SEE NOTE 1) | |
| SITE OWNER / MANAGER | | CONSERVATION STATUS | |
| MAP: INFORMATION TO INCLUDE | | | |
| <ul style="list-style-type: none"> SITE BOUNDARY SLOPE IF VARIES WITHIN SITE MAIN FLIGHT/BREEDING AREAS WHERE GRIZZLED SKIPPER ARE STILL PRESENT INDIVIDUAL SIGHTINGS FLIGHT AREAS WHERE SPECIES HAS DISAPPEARED EXTENT OF SUITABLE HABITAT ON SITE KEY NECTARTING AREAS 'QUICK HABITAT CONDITION ASSESSMENT' OF SITE – SEE SEPARATE METHODOLOGY DETAILED HABITAT CONDITION ASSESSMENT AREAS (IF UNDERTAKEN) | | | |
| FOODPLANT AVAILABILITY (SEE NOTE 2) | | | |
| PRIMARY FOODPLANT PRESENT | | | |
| PRIMARY FOODPLANT ABUNDANCE | | | |
| SECONDARY FOODPLANT PRESENT | | | |
| SECONDARY FOODPLANT ABUNDANCE | | | |
| LIMITING FACTORS AT SITE LEVEL (SEE NOTE 3) | | | |
| FACTOR | COMMENTS | | |
| | | | |
| FACTOR | COMMENTS | | |
| | | | |
| HABITAT CONDITION WITHIN AREA(S) USED BY GRIZZLED SKIPPER (SEE NOTE 4) | | | |
| KEY FACTOR | COMMENTS | | |
| SWARD HEIGHT | | | |
| FOODPLANT ABUNDANCE | | | |
| NECTAR PLANT ABUNDANCE | | | |
| ABUNDANCE SEED HEADS (>30CM TALL) FROM PREVIOUS YEAR | | | |
| BARE GROUND – ABUNDANCE AND DISTRIBUTION | | | |
| SCRUB – COVER AND DISTRIBUTION – NOTE IN TERMS OF SHADE & SHELTER | | | |
| SITE MANAGEMENT | | | |
| TYPE OF MANAGEMENT SCHEME | | | |
| CURRENT MANAGEMENT FOR SPECIES | | | |
| MANAGEMENT NEEDED | | | |
| THREATS TO POPULATION (SEE NOTE 5) | | | |
| THREAT | COMMENTS | THREAT LEVEL (SEE NOTE 6) | |
| | | | |

GRIZZLED SKIPPER SURVEY FORM SUPPORTING NOTES

Grizzled Skipper Key Requirements:

- Larval foodplants
- Mosaic of short herb-rich vegetation (<10cm) often with stone, rocks or bare ground patches.
- Taller vegetation (10-50cm), including dead flowering spikes, for shelter, basking roosting
- Spring nectar
- Low scrub for mate-location and as foodplant habitat.

1. Primary habitat on site:

- Woodland clearings and wide rides
- Unimproved grassland with scrub
- Disused artificial habitats (industrial habitats e.g. railway lines).
- Also heathland, shingle, sand dune, acidic, neutral, marshy grassland.

2. Foodplant availability

*Subjective assessment only – will be further informed by habitat condition assessment where required (using Brereton 2005 methodology).

Principle foodplants:

Agrimony

Creeping Cinquefoil

Wild Strawberry

Also: Barren Strawberry, Tormentil, Salad Burnet, Bramble, Dog-rose, Wood Avens

D – Dominant

A – Abundant

F – Frequent

O – Occasional

R – Rare

3. Limiting factors at site level

- Lack of foodplant
- Sward too tall/rank/lack of grazing
- Sward too short/overgrazed
- Too much scrub
- Too little scrub
- Distribution of scrub
- Too little bare ground
- Too little nectar

- Lack of seed heads from previous year
- Lack of coppicing/glade or ride opening (woodland only)
- Poor habitat connectivity

4. Habitat condition

Known/presumed nectar sources:

- Bugle
- Common Dog-violet
- Daisy
- Germander Speedwell
- Ground Ivy
- Milkwort
- Thyme
- Wild Strawberry
- Yellow-Dandelion types
- Yellow vetches e.g. Bird's-foot Trefoil

Seed heads – dead flowering spikes from previous year e.g. Marjoram, St John's-wort, Knapweed spp, Ribwort Plantain.

5. Threats

- Lack of coppicing and inappropriate ride management (woodlands)
- Improvement of grassland/scrub habitat
- Undergrazing of grassland/scrub habitat
- Overgrazing of grassland/scrub habitat
- Lack of management on disused artificial habitats and consequent loss of early successional vegetation
- Fragmentation and isolation of existing colonies and intensive use of surrounding agricultural land.
- Development
- Natural succession
- Management e.g. loss woodland management
- Re-quarrying
- Restoration
- Other
- Agricultural improvement – loss grassland/scrub habitats

6. Level of threat

- High /Imminent
- Medium
- Low / Long-term

Appendix 2. Grizzled Skipper ‘rapid’ habitat condition assessment trial methodology

Grizzled Skipper Quick Habitat Condition Assessment – Wales Trial

1. Main Site Features

Annotate aerial map of site with altitude, aspect, slope (flat/gentle/moderate/steep), shade/shelter and main habitat types – grassland, scrub etc. Note any key nectaring areas. Use Grizzled Skipper Survey Form to further document these attributes and describe current management and limiting factors.

2. Determine Flight Area of Butterfly

Determine flight area of butterfly – walk over whole site at peak flight period. Flight area is the main area occupied by the butterfly where aggregations of the butterfly are found flying freely together. Record locations of adults seen with GPS. If adults patchily spread over large area identify sub-populations and survey separately.

3. Extent of Suitable, Potentially Suitable and Unsuitable Habitat on Site

Key Habitat Features Required by Butterfly:

- Foodplants (Wild Strawberry, Barren Strawberry, Creeping Cinquefoil, Tormential, Agrimony. Dewberry is used on some sites. Bramble used by later larval stages.)
- Mosaic of:
 - short herb-rich vegetation (<10cm), often with stone, rocks or bare ground.
 - Taller vegetation (10-50cm), including dead flowering spikes for shelter, basking and roosting.
 - Abundant spring nectar (Daisy, Bugle, Bulbous buttercup and Bird's-foot Trefoil)
 - Low scrub (<4m) – for mate location, shelter and as foodplant habitat
- a) **Suitable Habitat:** foodplant(s) in a mosaic of short and tall vegetation with bare ground, nectar and scattered scrub.
- b) **Potentially Suitable Habitat:** rare foodplant(s) growing in a rank sward.
- c) **Unsuitable:** No or almost no foodplant present / unsuitable habitat type.
- Determine extent of Suitable, Potentially Suitable and Unsuitable habitat within flight area and outside it, if present (may not be utilised due to isolation etc).

4. Habitat Condition of Suitable Habitat on Site

Keep very simple to allow rapid assessment of habitat, particularly on large sites which it would otherwise be difficult to collect useful information for. Due to mosaic requirement keep mapping at a fairly coarse scale to pick up all the different elements the butterfly needs. If the whole site falls within one category, then map as such. If, as likely the case on larger sites, different areas support different condition categories then split as considered appropriate.

| Habitat condition category | Habitat parameters / explanation |
|----------------------------|---|
| Good | <p>The habitat includes at least 5 of the following parameters, including all of the first 4 listed,</p> <ul style="list-style-type: none"> • Abundant spring (April to mid-June) nectar sources; • Abundance of at least one of the following key larval food-plants: Agrimony, Creeping Cinquefoil, Wild Strawberry, or more infrequently Barren Strawberry, Tormentil and Dewberry; • Larval food-plants are growing in short (<10cm), herb-rich vegetation; • Sheltered (by low scrub/woodland edge), sunny site • A vegetation mosaic exists whereby patches of taller vegetation (10-50cm) including dead flowering spikes are present; • Bare ground is frequent with larval foodplants often adjacent; • Some taller vegetation with larger leaves (e.g. Bramble and larger cinquefoil leaves); |
| Fair | <p>The habitat includes at least 4 of the following parameters, including both of the first 2 listed,</p> <ul style="list-style-type: none"> • Vegetation is moderately species-rich with Frequent/ Occasional nectar • The key larval foodplants may be locally frequent but are not found throughout the area • The optimal height around larval foodplants may not always be achieved (e.g. due to lack of grazing or other management). • The site may or may not be sheltered. • The vegetation may not provide a range of conditions e.g. no mosaic • Bare ground is present but may not be Frequent |
| Poor | <p>The habitat includes at least 4 of the following parameters, including both of the first 2 listed</p> <ul style="list-style-type: none"> • Relatively species-poor vegetation with Occasional nectar sources • The key larval foodplants are Occasional at most • The vegetation structure is sub-optimal for the species (e.g. it may be too tall and rank) • There are few larval foodplants located in suitable egg-laying conditions • Bare ground is infrequent at most • Little shelter is provided or scrub colonisation is well advanced |
| Potentially Suitable | <p>The habitat includes at least two of the following parameters, including one of the first two listed</p> <ul style="list-style-type: none"> • The key larval foodplants are Rare • The vegetation is species-poor or has an unsuitable structure but could be restored by management • There is no bare ground or short/sparse vegetation • The habitat may be very open or scrubbing over |
| Not Suitable | <p>No or almost no foodplants present/unsuitable habitat type.</p> |

DAFOR Scale for feature abundance.

| DAFOR code | Percentage cover of area | Explanation |
|----------------|--------------------------|--|
| D (Dominant) | >75% | Habitat feature dominant |
| A (Abundant) | 51-75% | Habitat feature commonly occurring |
| F (Frequent) | 26-50% | Habitat feature always in view |
| O (Occasional) | 11-25% | A few patches supporting habitat feature present |
| R (Rare) | 1-10% | Habitat feature rare in area |
| N (None) | 0 | No habitat feature found in area. |

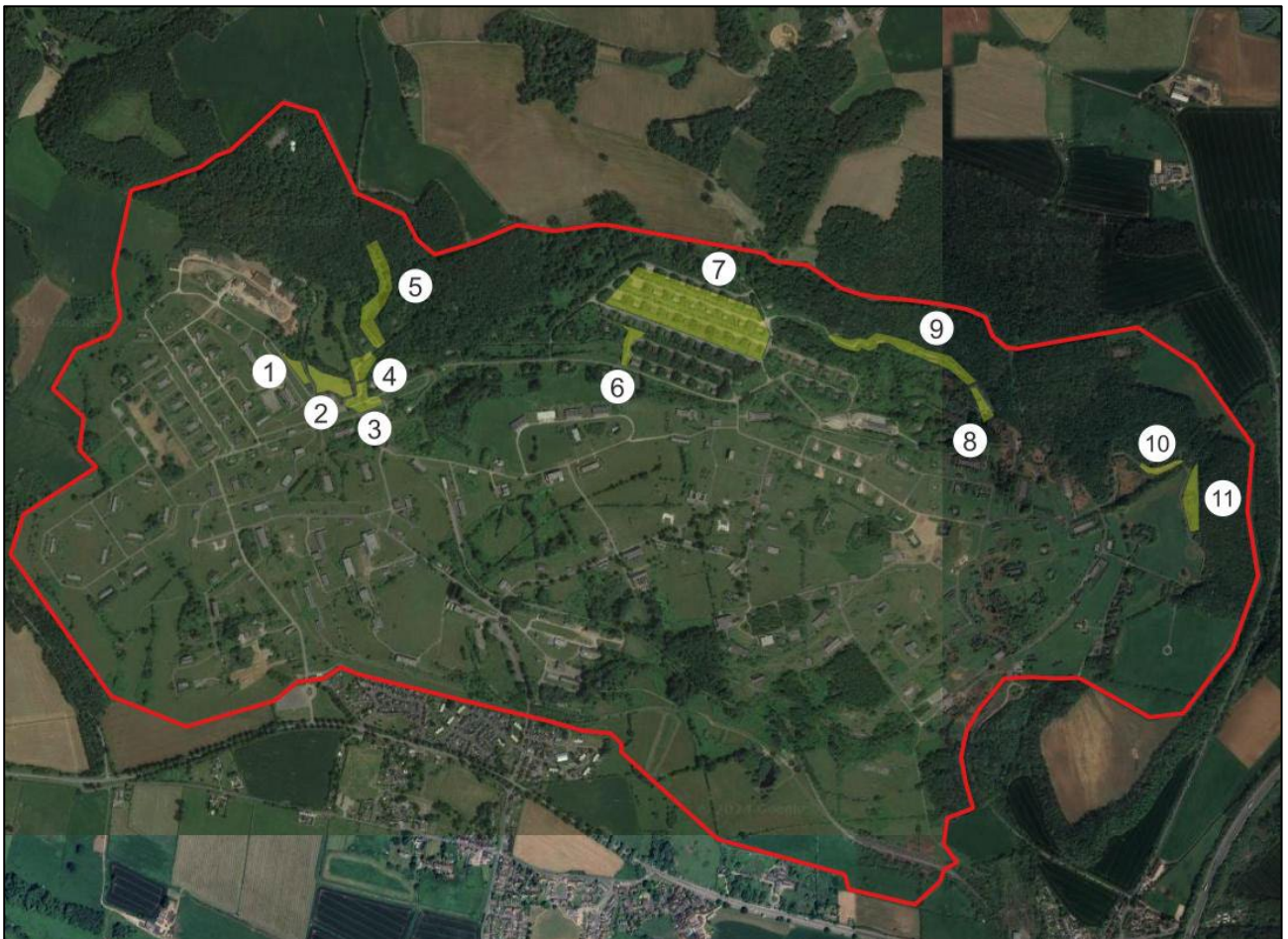
Additional Notes to Make – use Grizzled Skipper Survey Form

- **Current management regime**
- **Threats/potential threats to butterfly**
- **Proposed management** - describe details of management that would enhance site for Grizzled Skipper especially for fair and poor habitat condition categories.
- **Constraints** – outline any factors that might constrain Grizzled Skipper at this site e.g. lack of foodplants, nectar, isolation, too shady etc.

4. Brereton Type Habitat Condition Assessment

- For smaller sites, if time, could collect some attribute info at finer scale along lines of Brereton assessment.

Appendix 3. MoD Caerwent Grizzled Skipper survey target notes



| Site name | Target note number | OS grid ref | Target note |
|------------------------|--------------------|-------------|---|
| Caerwent Training Area | Zone 1 | ST46599184 | <p>0.19ha area of grassland situated between two roads adjacent to one of the enclosed SSSI meadows and a small stand of trees. The area is open to unregulated grazing but did have a scattering of nectar sources and wasn't showing signs of being completely overgrazed. Seed heads from the previous year were thinly scattered and embankment supporting the road had bare patches of ground with some Wild Strawberry. Lack of scrub.</p> <p>The zone produced 1 Grizzled Skipper on the wing and nectaring</p> <p>Condition: Good</p> <p>Recommendations: The area would benefit from better control over the grazing which would help a richer mosaic of scrub and grassland. It would also lead to more nectar sources going to seed and spreading. Creating more bare patches on the south-west facing slope by scraping ground or tipping low nutrient soil would benefit the area greatly.</p> |
| Caerwent Training Area | Zone 2 | ST46679181 | <p>0.58ha area of grassland which is the southern section of one of the Dinham Meadows SSSI's. The wider field complex is fenced but appears to be treated as a single grazing unit. The zone has a good south-facing slope and there is some bare ground. However, the tightly grazed vegetation with lack of nectar sources (during grizzled skipper flight period) and no scrub makes it poor for the butterfly.</p> <p>The zone did not produce any Grizzled Skipper sightings</p> <p>Condition: Poor</p> <p>Recommendations: If the conditions of the SSSI allow then the zone would benefit from different grazing regime to the rest of the field complex. This would of course require a new fence to be installed. The management of this compartment would encourage the spread and abundance in nectar sources and allow some of the seed head to stand into following year. The zone would also benefit from creating patches of bare ground and keeping them thinly vegetated.</p> |

| Site name | Target note number | OS grid ref | Target note |
|------------------------|--------------------|-------------|--|
| Caerwent Training Area | Zone 3 | ST46769177 | <p>0.50ha area of grassland with scattered scrub. The zone is dissected by a winding road which passes between stoney embankments in the north of the zone. This northern part of this zone had particularly good habitat conditions for Grizzled Skippers with abundant nectar source, good availability of seed heads and scattered patches of bare ground – particularly on the embankments. There was also an abundance of Wild Strawberry here. Previous records of Grizzled Skipper have been made here so it was good to find them still present. But perhaps the most interesting thing about this zone is that it is not enclosed and that the habitat maintains high value to Grizzled Skippers despite being adjacent to a wider area that is particularly overgrazed.</p> <p>The zone produced 6 Grizzled Skipper and 1 Dingy Skipper</p> <p>Condition: Good</p> <p>Recommendations: No intervention needed in the short-term but it will be interesting to monitor, grassland species diversity, scrub encroachment and bare ground patches. It will probably be worth using the best parts of this zone as an example for habitat creation in similar parts of the site where keeping control over grazing is difficult.</p> |
| Caerwent Training Area | Zone 4 | ST46769186 | <p>0.37ha grassland with scattered scrub. This zone is immediately north of zone 3 but stock are kept from here using fencing and cattle grid. The road that dissects zone 3 continues through this zone with stoney embankments on both sides. An open area of grassland with thinly scattered scrub is found on the east of the road forms a slightly elevated plateau. The open nature of this plateau might be the result of annual habitat management operations? The embankments provide the crucial mosaic of habitat conditions that Grizzled Skippers thrive in. However, elsewhere in this zone nectar sources and foodplant are uncommon including on the plateau. The micro climate found in this zone was attractive a number of butterflies and was one of the best zones on the site.</p> <p>The zone produced 5 Grizzled Skippers and 6 Dingy Skippers</p> <p>Condition: Good</p> <p>Recommendations: Continue with current habitat management in this zone. The only actions that might improve the plateau area would be to introduce bare ground by creating mounds or banks with imported low nutrient ground. Also if any vegetation/scrub cutting is being carried out it will be worth trying to remove the arisings from the area.</p> |

| Site name | Target note number | OS grid ref | Target note |
|------------------------|--------------------|-------------|---|
| Caerwent Training Area | Zone 5 5 | ST46829205 | <p>1.43ha of deciduous woodland with clearing. This zone is further north than zone 4 and represents a transition from grassland dominated zone into one dominated by woods. There is an access track that travels the full length of the zone roughly in two as it runs its full length. There is also a clearing to the west of the track in the southern half of the zone which appears to be cut frequently. The margins of the of both sides of the track contained abundant nectar source, foodplants and bare ground. The clearing created a nice sheltered spot where common butterflies such as Peacock and Green-veined Whites were on the wing, but no Grizzled Skippers or Dingy Skippers were noted. The clearing did have some scrub along the margins which created a nice transition from cut area to surrounding trees. However, the clearing was lacking in nectar sources and bare ground.</p> <p>The zone did not produce any Grizzled Skipper sightings</p> <p>Condition: Good</p> <p>Recommendations: This zone was similar in quality to zone 8, which is further east on the site, and holds Grizzled Skippers. This gives optimism that this zone might also be valuable to them with a few changes. The main change that would benefit the zone would be to introduce bare ground as a much more dominant feature in the clearing. Ideally this might be the introduction of poor nutrient soil which could be shaped to for banks and dips. The clearing appears to be nutrient rich with broad grasses dominating flowering plants so any future clearance works would be advised to scrape arisings from area after cutting.</p> |
| Caerwent Training Area | Zone 6 | ST47539194 | <p>0.30ha area of grassland with scattered scrub. The highest count and density of Grizzled Skipper sightings came from this zone. The main feature of this zone is the tall and steep embankment. The embankment is roughly shaped like a 'T' with favourable slopes facing South, East and West. A particularly good South-east facing corner producing a early morning suntrap. The area was textbook Grizzled Skipper habitat with an abundance of nectar sources and foodplants. Lots of seedheads and areas of bare ground. It was difficult to tell whether the embankment was being managed to maintain its openness or whether the soil conditions meant that the habitat condition remains fairly stable?</p> <p>The zone produced 10 Grizzled Skippers and 2 Dingy Skippers</p> <p>Condition: Good</p> <p>Recommendations: This zone is extremely important to the Grizzled Skipper population on site that produced the highest density of sightings from South Wales from surveys conducted in 2023 and 2024. Therefore, recommendations would be to highlight the value of this spot to all partners and continue with current habitat management or monitor closely to track any detrimental changes to the zone</p> |

| Site name | Target note number | OS grid ref | Target note |
|------------------------|--------------------|-------------|---|
| Caerwent Training Area | Zone 7 | ST47699202 | <p>5.52ha area of mixed habitats. This zone is in close proximity to zone 6 and holds a significant area of SSW facing banks and it is these features that were of most interest. The banks are dominated by grassland with regular patches of scrub which form large stands in places. The grassland was not particularly floristically rich and was dominated by broad grasses. There was a lack of bare ground but Wild Strawberry was found scattered widely throughout the zone.</p> <p>The zone did not produce any Grizzled Skipper sightings</p> <p>Condition: Fair</p> <p>Recommendations: Given the close proximity to the highly valuable zone 6 there is an opportunity to manage the SSW facing banks of this zone to create matching habitat conditions. There does appear to be management operations ongoing to keep scrub from dominating the banks. Therefore it would be worthwhile investigating whether these operations could be fine-tuned to create more structure to the vegetation on the banks and create more bare ground.</p> |
| Caerwent Training Area | Zone 8 | ST48529174 | <p>0.24ha area of deciduous woodland with clearing. This zone was the only example of a clearing supporting Grizzled Skippers on site. The important steep south facing banks contributed to large areas in this zone. An embankment cutting north of the road was thinly vegetated with lots of foodplant and bare soil. A long and fairly tall embankment supporting the road was dominated by grassland. Further south of the road mounds of soil created lots of banks which were covered in a thick sward but with occasional patches where broad grasses were less dominant which supported some nectar sources and exposed soil. It was not clear whether this area was being managed for its ecological value or not. The transition from clearing to mature trees was fairly abrupt and so low level scrub was largely missing. Small patches of Wood Spurge were found along parts of the woodland edge</p> <p>The zone produced 6 Grizzled Skipper, 4 Dingy Skippers and 4 Drab Loopers</p> <p>Condition: Fair</p> <p>Recommendations: The clearing was only thinly populated in nectar sources and bare ground and so addressing that would have a positive impact. Of all the population hotspots this one feels like it is closest to losing Grizzled Skippers in the future. However, they are still present here and so intervention in habitat management should be carefully planned. It would be worth monitoring the zone closely on an annual basis to track changes. It is also worth noting that if this clearing continues to support Grizzled Skippers it should be used as a model for creating clearings elsewhere on site if possible</p> |

| Site name | Target note number | OS grid ref | Target note |
|------------------------|--------------------|-------------|--|
| Caerwent Training Area | Zone 9 | ST48359188 | <p>1.30ha area of deciduous woodland with overgrown clearing. This zone was included for two reasons. First it supports the best habitat conditions for Drab Looper. Second it has potential to create a corridor for Grizzled Skipper movement between population hotspots. A road running through this zone creates a butterfly ride and the embankment on the north of the road catches the afternoon sun. The embankment has a good mixture of nectar sources, bare soil and Wild Strawberry. There area a couple of buildings south of the road and an overgrown structure. There was masses of Wood Spurge growing around the overgrown structure and it was also in smaller amounts near the buildings and where the road snaked around to create more shaded areas.</p> <p>The zone did not produced any Grizzled Skipper but did have 9 Drab Loopers</p> <p>Condition: Poor</p> <p>Recommendations: When taking into account that the only clearing on site that holds Grizzled Skippers is in the adjacent zone it gives added potential to successfully recreating something similar in this zone. Add to that the presence of Drab Loopers in this zone that would also benefit from clearing work, albeit managed differently over the long term, then the benefits of doing habitat management are apparent. There is the complication that the ground conditions in this zone, with a steep slope either side of the road, will make creating clearings a challenge. It is worth this section being looked at more closely in the future to work out if make plans to create clearings is feasible.</p> |
| Caerwent Training Area | Zone 10 | ST49029154 | <p>0.20ha area of mixed habitats in the smallest zone to be described. The road that passes through the zone is cut into the bank and supports a narrow grassland verge. Both sides of the road there is lots of low level scrub. The embankment faces south and supports lots of Wild Strawberry, nectar sources and bare soil with rocky exposures.</p> <p>The zone did not produce any Grizzled Skipper sightings</p> <p>Condition: Good</p> <p>Recommendations: This small zone in isolation does would not be able to support Grizzled Skippers in isolation but if adjacent areas could be improved it might become important. Therefore no action required here</p> |

| Site name | Target note number | OS grid ref | Target note |
|------------------------|--------------------|-------------|---|
| Caerwent Training Area | Zone 11 | ST49129146 | <p>0.58ha area of mixed habitats dominated by grassland and scrub. The road passes through this zone separates it from the Dinham Meadows SSSI. There is an embankment on the northeast side of the road which faces southwest and gathers the afternoon sun. The embankment supports lots of Wild Strawberry, nectar sources and seed heads. It also has bare soil and rocky exposures. Above the embankment is an area of grassland which is becoming rank. Beyond that there is mature wood and there are also scrub patches within the zone.</p> <p>The zone did not produce any Grizzled Skipper sightings</p> <p>Condition: Fair</p> <p>Recommendations: If it is possible it would be beneficial to change the management of the grassland area to create bare patches and increase the nectar source abundance. Introducing mounds of low nutrient soils to the grassland area would work well here and create bare soil and allow plants like Birds-foot-trefoil to spread into.</p> <p>The adjacent SSSI meadow would be better resource for spring flying butterflies if the grazing stock were removed from February until July. Managing compartment within the Meadow with electric fencing might help create better habitat conditions to have the biggest impact.</p> |

Data Archive Appendix

The data archive contains:

[A] The final report in Microsoft Word and Adobe PDF formats.

[B] ~~A full set of maps produced in JPEG format.~~

[C] ~~A series of GIS layers on which the maps in the report are based with a series of word documents detailing the data processing and structure of the GIS layers.~~

[D] ~~A set of raster files in ESRI and ASCII grid formats.~~

[E] ~~A database named [name] in Microsoft Access 2000 format with metadata described in a Microsoft Word document [name.doc].~~

[F] ~~A full set of images produced in [jpg/tiff] format.~~

[G] Species records held in Welsh Invertebrate Database (WID).

Metadata for this project is publicly accessible through Natural Resources Wales' Data Discovery Service <https://metadata.naturalresources.wales/geonetwork/srv> (English version) and <https://metadata.cyfoethnaturiol.cymru/geonetwork/cym/> (Welsh Version). The metadata is held as record no. **NRW_DS161340**.

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