Prepared for Natural England

SALISBURY PLAIN SSSI

COMMON STANDARDS MONITORING RARE VASCULAR PLANT SURVEY 2008

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1.0 INTRODUCTION

Salisbury Plain Site of Special Scientific Interest is currently undergoing its six-yearly Condition Assessment. A number of rare vascular plants are included in the notification of the SSSI; prior to 2008 the vascular plant interest had not been formally assessed using Common Standards Monitoring guidance. Natural England therefore commissioned an assessment of the species of interest based on review of known recent baseline data, desk-based research and targeted fieldwork. The results of work are intended to underpin the Condition Assessment by supplementing information gleaned from past surveys and recording.

Ten nationally scarce and rare plants, and one regionally rare plant at the southern edge of its range (*Astragalus*), are mentioned on the Citation and are at the centre of the assessment (Table 1). One of these is considered individually notified; the other ten are part of an assemblage.

Table 1: Notified vascular plants

	Species	**Suite (Conservation Objectives)**	**Score[1]**
Individually notified	*Cirsium tuberosum*	Suite 4: vascular plants of lightly managed grasslands.	100
Assemblage	*Astragalus danicus*	-	-
	Carex humilis	-	50
	Cerastium pumilum	Suite 5: vascular plants of disturbed/heavily managed grasslands, crumbly turf, path edges etc.	50
	Galium pumilum	-	100
	Gentianella anglica	-	200
	Minuartia hybrida	Suite 9: vascular plants of ruderal areas.	50
	Orchis ustulata	-	50
	Salvia pratensis	-	200
	Tephroseris integrifolia	-	50
	Thesium humifusum	-	50

Two of the rarest vascular plants in the SSSI are not mentioned on the SSSI Citation. *Dianthus deltoides* – Maiden pink occurs in one location on the East; and *Dianthus armeria* – Deptford pink occurs as a single population in the Central Impact Area, therefore a review of their current status in the SSSI has been included in this report.

2.0 METHODOLOGY

2.1 Desk Study

For all of the species of interest, Natural England gathered historical records from the Salisbury Plain SSSI from several different sources prior to the targeted fieldwork. These included data held by Defence Estates, Wiltshire & Swindon Biological Records Centre and the Wiltshire county botanical recorder, as well as by Natural England itself. Since the desk study was undertaken, a number of additional records have come to light from a report of an extensive survey of the grasslands of Salisbury Plain undertaken by the Nature Conservancy Council in 1985 and 1986 (Porley 1986). Although it was not possible to ground-truth these latter records in 2008, the data were extracted and placed in the databases held by the BSBI county recorder, the W&SBRC and Defence Estates.

[1] English Nature Research Report 690. *A tool for assessing the current conservation status of vascular plants on SSSIs in England* (May 2006).

A review of the species of interest indicated that the populations of half of them had been extensively surveyed by volunteer recorders in the recent past (Table 2) and that the assessment for these species could be reliably undertaken from those data.

Table 2: Vascular plants with well-known distributions and habitats

Species	Details
Astragalus danicus	Extensive survey in 2005/6 undertaken by Bulford Conservation Group (BCG) for Wiltshire Rare Plant Register (WRPR) (Pilkington 2007). A conspicuous plant; well-recorded in eastern ranges.
Carex humilis	Widespread in the Haxton Down and Weatherhill areas; also frequent in southern part of Central Impact Area. Well-recorded from WRPR surveys in 2005/6 and before that, Defence Estates grassland monitoring (NVC) surveys.
Cerastium pumilum	Very rare species, formerly only known from Sidbury Hill area but several additional populations have been found in suitable ephemeral habitats as the result of targeted voluntary survey 2005 - 2008. Early optimal survey period (May).
Cirsium tuberosum	Locally abundant in the Imber ranges; distribution recorded meticulously by Jack Pile and Paul Skelton (Imber Conservation Group) for many years. Targeted survey for *C. tuberosum* was also undertaken by CEH (Walker *et al*. 2001).
Minuartia hybrida	Informal but wide-ranging targeted recording undertaken by volunteers across the SSSI since 2004 for WRPR has greatly extended knowledge of distribution of *M. hybrida*. Before this it was certainly under-recorded in the SSSI.
Thesium humifusum	Widespread in the Haxton Down and Weatherhill areas; also frequent in southern part of Central Impact Area. Well-recorded from WRPR surveys in 2005/6 and before that, Defence Estates grassland monitoring (NVC) surveys.

2.2 Field Survey

Of the remaining species, it was considered that there was insufficient knowledge of their current distribution/status in Salisbury Plain SSSI to enable an accurate evaluation to be undertaken. It was decided, therefore, to undertake a targeted field survey of a sample of previously recorded populations between June and July 2008.

Records supplied by Natural England were collated into a short-list of sites to survey and as many populations as possible were visited given constraints of access and optimal survey period. At each site, if the target species was found, its population size was counted or estimated (where practicable) and a record was made of its location using an accurate GPS receiver unit (Garmin model E-Trex Vista HCX with a stated maximum accuracy of 2-3 metres).

The results of the fieldwork and data collection were then used to comment on the condition status of each species by reference to the attributes and targets in the Salisbury Plain Conservation Objectives. This was done in a subjective way, using the tables as a guide.

3.0 SPECIES ASSESSMENT

3.1 Individually Notified Species

3.1.1 *Cirsium tuberosum*

C. tuberosum has been recorded from 26 1 km squares in the Imber ranges, with the majority of the populations concentrated from Imber village west to Warminster Garrison, north of the Imber valley track. Some of the populations in this area - such as the two largest at High Down and Wardens Down - are estimated to support thousands of flowering plants across a large area. Most populations, however, are much smaller, and typically range from a few flowering plants to several dozen. The plant is rare elsewhere on Salisbury Plain, with populations recorded in three 1 km squares in the northern central impact area and a single plant at Haxton Down in the eastern ranges. Although C. *tuberosum* is known from a handful of other sites in Wiltshire and elsewhere in the country, the metapopulation in Salisbury Plain SSSI represents its national stronghold.

Its ecology has been well-studied and on Salisbury Plain it is generally confined to ungrazed or lightly-grazed *Festuca rubra-F. arundinacea* sub-community of CG3d grassland. This rank kind of grassland is in good supply in the western and central parts of the SSSI but is less extensive in the east where shorter swards predominate. *C. tuberosum* appears to be unfussy regarding aspect and slope although many populations have been noted on valley sides. It frequently occurs in association with scattered *Crataegus monogyna* scrub, but it is not clear whether the presence of open scrub exerts a favourable influence on *C. tuberosum* or not.

Although in the past planting of blocks of forestry have had a negative impact on some of the populations on the SSSI (Walker et al. 2001), the main threats today appear to be hybridisation with other *Cirsium* species and inappropriate livestock grazing; and the impacts of military training on populations of *C. tuberosum* are only partially understood but may pose a risk where such is intense e.g. the Imber valley and the area around Ladywell Plantation, for example. Data collected informally by Jack Pile and Paul Skelton over a number of years indicates that the hybrid between *C. tuberosum* and *C. acaule* (*C. x medium*) is also widespread in the western ranges, often being found in close proximity to populations of *C. tuberosum*. *C. acaule* requires short grassland and one of the key conclusions of the CEH research was that maintenance of a sward height greater than 15cm is essential to maintain the integrity of genetically pure *C. tuberosum*. A hybrid between *C. tuberosum* and *C. palustre* has also been occasionally reported from the SSSI although it appears to pose a much lower threat to the genetic integrity of *C. tuberosum*.

The data collected on populations of *C. tuberosum* within Salisbury Plain SSSI suggest that the metapopulation is likely to be relatively stable, with some local gains and losses year on year. The plant appears to have at least some capacity to spread and regenerate, and the largest populations are mostly in relatively remote, little-used parts of the training area.

From what is known of the habitat supporting most of the *C. tuberosum* populations, it would appear that it meets all of the targets for the attributes listed in Table 3c of the CO and therefore the criteria feature is in favourable condition.

3.2 Assemblage Species

3.2.1 *Salvia pratensis*

The first population of *S. pratensis* was reported from Tenantry Down on Salisbury Plain in 1924. It was intermittently monitored over the years by various individuals. Jack Pile monitored it from 1981 and counted the number of inflorescences present in the single patch (a male sterile plant). He has stated that the '*highest number of inflorescences was 100 in 1993, 70 in 1994 and only 20 in 1995 when winter-spring grazing commenced. In 1997 there were 100 inflorescences. Since then numbers of inflorescences have declined steadily due possibly to overgrazing in this area*.' Two other records of the plant from the western ranges - near Erlestoke in 1924 and at West Lavington Down in 1937 - have not been recorded since and are almost certainly extinct.

Quite recently an attempt was made by Defence Estates to bulk up the number of plants of *S. pratensis* at Tenantry Down (pers comm. D. Ash). A single cutting was taken from the extant plant in 2001 and propagated on under glass/plastic. Further cuttings were taken from this single shoot in 2002 and a total of 19 small plants were heeled in during October and November of the same year. Three roughly equal groups were planted out; one group around the parent plant and the other two on a nearby bank where it was thought that they would be less vulnerable to damage. All of the plants were covered with wire mesh to prevent them being dug up by badgers.

In 2006 the population was visited and recorded by at least two different volunteer recorders. On the parent plant eleven stems bearing 26 inflorescences were reported. One of the 2002 transplants was also found on the bank nearby, with one flowering stem. At the time, the main plant was noted to grow on relatively flat ground in rank and quite species-poor CG3d grassland 40-50cm tall where cover of *Bromopsis erecta* was at least 50%. Associated species were mainly other grasses, especially *Holcus lanatus*, *Arrhenatherum elatius* and *Helictotrichon pratense;* herbs included *Knautia arvensis* and *Lotus corniculatus*. Its habitat on Tenantry Down broadly concurs with what is known about habitats supporting known British populations (Plantlife 2004).

A visit to the same location on June 15th 2008 found no sign of the main plant. An intensive search by a small group of people on July 9th only found a single small, non-flowering plant, believed to be one of the 2002 transplants on the nearby bank; it was in a different place to the transplant seen in flower in 2006. Rank CG3d grassland was also present on the bank, where there was slightly greater cover of herbs.

Although *S. pratensis* appears to have declined in its known site, the single plant found on the bank in June 2008 means that it meets its target of presence in Table 3f. When what is known of its habitat is considered against the attributes and targets listed for CG3 grassland in Table 3a of the CO it seems that the overall assessment would be marginal favourable condition. The habitat did not meet certain generic targets (see below) but given the apparent decline of the plant and lack of other sites on Salisbury Plain it would probably be imprudent to modify the Conservation Objectives.

Attribute	Site-specific targets	Actual conditions	Comment
Sward structure: litter	Total extent no more than 25% of the sward	Continuous layer 1-2cm deep	Does not meet advisory/non-mandatory target
Sward structure: average height	Sward 2-15 cms	Average height 45cm	Does not meet advisory/non-mandatory target
Sward composition: grass/herb ratio	40-90% non-Graminae ('herbs')	< 25%	Does not meet mandatory target

3.2.2 *Astragalus danicus*

Salisbury Plain SSSI is the southernmost British locality for *A. danicus,* a species that is currently known from nowhere else in Wiltshire. Its only other confirmed outlying population at High Post Golf Course north of Salisbury is now believed to be extinct (pers. comm. J. Moon 2008). It is a perennial herb of short, species-rich *Festuca ovina-Helictotrichon pratensis* (CG2) and *Bromopsis erecta* (CG3) grassland in the eastern part of the SSSI. It is most frequent within the Bulford Danger Area with a large population known from Silk Hill, but is scattered across the area between Sidbury Hill in the north and Beacon Hill in the south. Overall, it has been recorded in 17 different 1km squares in the SSSI, and although a census count has never been undertaken, it is estimated that thousands of plants are present. Abundant flowering and fruiting have been noted in this population in the last few years but little is known about recruitment of seedlings to the population.

Generally *A. danicus* prefers old, undisturbed chalk grassland and is sometimes associated with other rare plants of ancient grassland. Where it grows on the barrows and other archaeological remains of Silk Hill, for example, *Tephroseris integrifolia* and *Orchis ustulata* are associated species. However, it also appears to behave as an early colonist of disturbed ground in a few places, favouring crumbling chalky track edges and scraped ground – also possibly favouring these areas due to reduced competition.

When what is known of the habitats supporting *A. danicus* is considered against the attributes and targets listed for CG2 and CG3 grassland in Tables 3a and 3f of the Conservation Objectives (CO) it seems that all of the targets for the individual attributes are met and therefore it is in favourable condition. Given the relative stability of this part of the military training estate there do not appear to be any obvious threats to the plant in the SSSI and there is no evidence that its population size or extent has declined recently. However, there is no historical data to compare its current extent with.

3.2.3 *Carex humilis*

C. humilis is a highly distinctive member of a suite of chalk grassland specialists associated with the Wessex Downs. It is a relatively frequent species in suitable habitat across Salisbury Plain SSSI where it has records in c. 62 1 km squares. It is most abundant in the area south of Tilshead i.e. Copehill Down, in the southern part of the Central Impact Area and on Haxton Down and Weatherhill in the eastern ranges. In areas where long grassland prevails it sometimes persists on barrows and other archaeological remains e.g. Bowls Barrow in the Imber Ranges and White Barrow near Tilshead. More typically, *C. humilis* is found in short, grazed, herb-rich CG2 or CG3 (most commonly the Typical sub-community CG3a). It is quite commonly associated with several other rare plants of old chalk grassland, most notably *Thesium humifusum*, *Tephroseris integrifolia*, *Orchis ustulata* and *Astragalus danicus*.

Most of the Salisbury Plain populations occur in long-established short chalk grassland and appear to be very stable, as long as rabbit / livestock grazing levels are maintained to keep the sward very short. Due to its rhizomatous and densely tufted habit it is not practical to estimate individual population sizes. Typically, though, many populations occur as highly localised patches or scattered tufts within the sward. In a few places it appears to have spread recently from established grassland into open disturbed ground, such as along the gravelly edges of the track to the Demolition Area in the Central Impact Area. Where it grows in semi-disturbed grassland close to heavily-used tracks e.g. Hound Plantation and Haxton Down, it appears to be relatively resilient to trampling and disturbance. However, the largest populations appear to be confined to relatively undisturbed ground.

When what is known of the habitats supporting *C. humilis* is considered against the attributes and targets listed for CG2 and CG3 grassland in Table 3a of the Conservation Objectives all of the targets for the individual attributes are met. It also meets the target of presence in Table 3f and therefore the feature is considered to be in favourable condition. There do not appear to be any obvious significant threats to the plant in the SSSI and there is no evidence that its population size or extent has declined recently. However, there are no historical data to compare its current extent with.

3.2.4 *Cerastium pumilum*

Until 2007, the main locus for *C. pumilum* was disturbed ground in the Haxton Down-Sidbury Hill area. Several small extant populations are now known from that area and it was seen in several of them by the author during visits in spring 2007. In 2007 and 2008 a major extension to the range of the species in the SSSI was established when three additional populations were located in the Imber Ranges in hectads ST94 and SU04. Since then, review of Ron Porley's 1986 survey findings has thrown up three previously unknown populations in the Central Impact Area, although nothing is known about these at present. In summary, *C. pumilum* has been recorded in 10 1km squares in Salisbury Plain SSSI since 1985 and new populations are now being regularly found. It is likely that more populations exist but have not been recorded due to limited numbers of botanists confident about differentiating the species from its congeners, the size of the SSSI and the short survey window for the species. Some additional records have also been provided by Defence Estates but these are not localised beyond management unit/compartment.

On Salisbury Plain *C. pumilum* usually occupies a distinctive habitat. It prefers open, lightly to moderately disturbed ground in the vicinity of tracks used by military vehicles, where well-drained chalky/flinty soil is exposed and kept open by scuffing. *C. pumilum* is always diminutive, with individual plants often reaching only 1-3 cm high and it is a very poor competitor. It frequently shares its habitat with other short-cycle annuals including *Minuartia hybrida*, Basil Thyme *Clinopodium acinos,* Annual meadow-grass *Poa annua*, Fern-grass *Catapodium rigidum* and Thyme-leaved sandwort *Arenaria serpyllifolia*. Its habit of also growing with other

small annual mouse-ears, especially Little mouse-ear *C. semidecandrum* and dwarf forms of the perennial Common mouse-ear *C. fontanum* means that it is easily overlooked; however it is often locally abundant with many hundreds of plants growing in an area only a few metres long.

When what is known of the habitats supporting *C. pumilum* is considered against the attributes and targets listed in Tables 3d (Suite 5) of the Conservation Objectives all of the targets for the individual attributes are met and therefore the feature is in favourable condition. However, it is recommended that Table 3d is modified in one respect with regard to this species. Given the scarcity of the species in Salisbury Plain SSSI and the localised and diffuse nature of its habitat, it is not practical to measure the extent of its potential habitat (Attribute: Niche availability).

There do not appear to be any obvious significant threats to the plant in the SSSI and in fact it appears to be increasing. It is probable that more populations will be found in the future.

3.2.5 *Galium pumilum*

In Salisbury Plain SSSI *G. pumilum* has been recorded from two 10 km squares in the Central Impact Area, centred on the very species-rich CG3 of Slay Down. It was first recorded there by Ron Porley and his colleagues in 1985-6 and was found in two different places on Slay Down. One of these populations was searched for and found in 2007 by Sharon Pilkington and Sarah Grinsted. The other population was searched for in 2008 but not found although it was relatively late in the summer when flowers are nearly over, making the plant far more difficult to spot. Two other records further north have also recently come to light from reliable recorders, dating from 1985-6 and 1997. These arrived too late to be verified by fieldwork in 2008. Four additional records for *G. pumilum* were provided in the desk study by Defence Estates in the Central Impact Area. Although these records were undated, they had ten-figure grid references, meaning that the navigational function of a GPS unit could be used to navigate relatively accurately to each location. However, none of these records was confirmed during fieldwork.

The site of the confirmed population at Slay Down is in species-rich CG3d on a gentle east-facing slope. Many low ant-hills cover the side of the down and the *G. pumilum* is associated with these. When visited in 2008 the grassland was considered to be in excellent condition, with 60-70% cover of herbaceous species and negligible scrub. There was negligible disturbance from either troop training or shell impacts and patches of the invasive Tor-grass *Brachypodium pinnatum* - which is widespread in the Central Impact Area due to wildfires - were small and few. The sward height slightly exceeded the target for CG3 in Table 3a at 15-20 cm. The habitat of the other population recorded from Slay Down was in similar grassland on the plateau of the down. Grasslands in the area between Charlton Down and Slay Down where other unconfirmed populations of *G. pumilum* have been recorded were considered to be of variable quality. In some instances the records were from high quality CG3 similar to that on Slay Down, usually on slopes. Much of the remaining grassland was rather rank and dominated by *Bromopsis erecta* and was an unpromising habitat for *G. pumilum*.

Although it remains to confirm the extent of the *G. pumilum* metapopulation, the species meets its target of presence in Table 3f. When what is known of its habitat at Slay Down is reviewed against the attributes and targets listed for CG3 grassland in Table 3a of the CO it seems that the overall assessment would be marginal favourable condition. The habitat did not quite meet its target for sward height (see above) but met all of the others. This may be a consideration for a review of grazing management in the Slay Down area. The presence of ant hills may be important, with their shorter swards – and the abundance of such may be influenced by surrounding sward height.

3.2.6 *Gentianella anglica*

G. anglica is an enigmatic species in Salisbury Plain SSSI. Most of its records are concentrated in the SU05 hectad in the Central Impact Area where it appears to have been mostly associated with shell craters, as well as sparse chalky banks in species-rich vegetation. In this area it has been recorded in ten 1km squares, but no records are less than 20 years old. Other unsubstantiated records were provided in the desk study by Defence Estates, indicating small numbers of sites elsewhere in the eastern ranges and the Central Impact Area. Some

of these were searched for in the current survey but none were found. The survey window for *G. anglica* is very narrow - it is most easily seen in early June and it is nearly impossible to find when it is not flowering.

From what is known of other extant populations on the margins of Salisbury Plain - for example at Cheverell Hill, Scratchbury Hill and Parsonage Down - *G. anglica* usually requires very short, species-rich CG2 or CG3 with germination pockets provided by localised disturbance e.g. light cattle poaching. Sometimes it is also present where bare chalk is exposed in sunny, sheltered situations. Given the many thousands of shell craters of various ages in the Central Impact Area, much suitable habitat for the species is still present in the SSSI and so it seems reasonable to assume that a residual population of *G. anglica* could still be there.

For the purposes of the Condition Assessment, it cannot be shown to meet the target of presence in Table 3f; however, given the large number of shell craters in the area, most of which are unsurveyed, the indirect attributes are met and the likelihood is that the plant is still present - therefore, the species is judged to be in Favourable condition. Also, although it may occur in short calcareous turf (CG2-7) and be assessed through Table 3a, this table is not really appropriate to assess the condition of a resource located predominantly in shell craters. It would therefore be appropriate to mention *G. anglica* requirements under the bare ground attribute for CG2/CG3/CG7. More information is urgently required to assess the status of this population in Salisbury Plain SSSI.

3.2.7 *Minuartia hybrida*

Until quite recently there were only a few records for *M. hybrida* within the SSSI, mostly in the eastern ranges. However, extensive recording by a small number of voluntary recorders from 2005 onwards has significantly increased its known range on Salisbury Plain, where it is now known to be widespread wherever there is active regular disturbance of dirt tracks. It is especially frequent in the Imber Ranges and the Haxton Down area. The only area where it is mostly absent is in the Central Impact Area where tracks are relatively rare. It is likely that the Salisbury Plain metapopulation is one of the largest in the British Isles and total population size may exceed hundreds of thousands of plants.

M. hybrida requires disturbed, freely-draining calcareous ground and track edges are a favourite microhabitat in the SSSI. It is possible that it is spread around the extensive network of tracks in mud on the tyres and tracks of military vehicles. Occasionally it is also encountered on ant-hills and in scuffs in species-rich chalk grassland (such as at Hound Plantation in the east where it grows alongside *Thesium humifusum*). On Sidbury Hill it takes advantage of parched, bare chalk in a linear earthwork ascending the hill. Sometimes it shares its habitat with *Cerastium pumilum*. *M. hybrida* clearly thrives on the high levels of military training undertaken on the plain in recent years, and has abundant disturbed habitat in which to spread.

The species meets all of the targets listed in Table 3e (Suite 9) of the CO and is therefore considered to be in favourable condition. It is highly likely that more locations will be found in the future. The Table 3e attribute for niche availability requires suitable habitat to be mapped for this species and this may not be practical given the sheer extent of potential habitat on Salisbury Plain.

3.2.8 *Orchis ustulata*

O. ustulata requires very short, closely-grazed ancient downland and is only found in very herb-rich CG2 or CG3 grassland. It is frequently but not exclusively associated with archaeological remains and is a member of a suite of rare downland species often found growing together. Other members of the suite include *Thesium humifusum*, *Carex humilis*, *Gentianella anglica* and *Tephroseris integrifolia* subspecies *integrifolia*. In the eastern ranges of the SSSI *Astragalus danicus* is also an associate of *O. ustulata*. Common associates often include other orchids, *Hippocrepis comosa*, *Filipendula vulgaris* and *Asperula cynanchica*.

It frequently occurs in suitable habitats as scattered individual plants, so many of the previous records on Salisbury Plain do not necessarily represent long-standing or sustainable populations. Its best-known site is at Silk Hill in the Bulford Ranges, where it is one of the special plants of the archaeological remains there. In 2008 a rough count of flowering spikes on the barrows indicated a population size of at least 30 plants, with another group of nine seen in open short grassland near a plantation. However, a search in some previously recorded

locations failed to find any plants and generally the sward across much of the plain is likely to be too high for it. In the absence of reliable historical population data it is difficult to determine whether significant losses have occurred, and new sites are occasionally discovered.

The current assessment has therefore been made on the habitat supporting the Silk Hill population. Despite its shortness and diversity, *Bromopsis* attains 20-25% cover across the saucer barrows, placing the community firmly in CG3. When the condition of this grassland is considered via Table 3a of the Conservation Objectives all of the targets for the individual attributes are met. It also meets the target of presence in Table 3f and therefore the feature is considered to be in favourable condition.

3.2.9 *Tephroseris integrifolia*

T. integrifolia subsp. *integrifolia* is very rare within the SSSI. Its only confirmed extant population is at Silk Hill, where it is found in the same grassland as *Orchis ustulata.* It is very characteristic of the species that it is associated with archaeological banks such as those of tumuli and holloways and it is rarer in open grassland e.g. it occurs on Parsonage Down SSSI and Pewsey Downs SSSI. It has very exacting habitat requirements very close to those of *O. ustulata*.

The population on Silk Hill is mostly found on the rims of the saucer barrows and individual plants are widely scattered. In June 2008 twelve flowering or fruiting plants were counted on two barrows with the majority (nine) on the eastern rim of one barrow. A visit to the area in 2007 only revealed one flowering plant, possibly attesting to the fickleness of its flowering. There is also a handful of other unconfirmed and unlocalised records of *T. integrifolia* elsewhere in the SSSI (from NVC surveys carried out for Defence Estates in 1996). A few additional sites have also come to light recently in the Central Impact Area and require confirmation. However, it is possible that some of the shorter, species-rich swards in the Slay Down area have potential to support *T. integrifolia*.

The current assessment has therefore been made on the CG3 grassland supporting the Silk Hill population. When the condition of this grassland is considered via Table 3a of the Conservation Objectives all of the targets for the individual attributes are met. It also meets the target of presence in Table 3f and therefore the feature is considered to be in favourable condition.

3.2.10 *Thesium humifusum*

T. humifusum is relatively widespread on Salisbury Plain, occurring in approximately 40 1 km squares. It shows a distinct preference for sunny, close-grazed CG2 or CG3, often on banks. Most of its larger populations are in relatively undisturbed grassland although in some places e.g. near Hound Plantation on Haxton Down it grows as a pioneer in scuffed ground. Elsewhere on Haxton Down it has been seen by the author in quite long CG3d and it would appear that its population in this area is large enough to support colonisation of atypical habitats – or could be persisting in an area that used to be shorter and more favourable for it, and might disappear eventually unless grazing increases again.

It is most widespread in short downland in the Haxton Down and Weatherhill areas, where populations can number hundreds of plants. Another locus for *T. humifusum* in the SSSI is in the Larkhill and Westdown Ranges where it frequently grows alongside *Carex humilis*. The long grassland which dominates much of the Central Impact Area and Imber Ranges means that *T. humifusum* is quite rare in those areas.

Most of the Salisbury Plain SSSI populations occur in long-established chalk grassland and appear to be stable, as long as rabbit / livestock grazing levels are maintained to keep the sward very short. It appears to be tolerant of a little disturbance.

When the condition of typical CG2/CG3 grassland supporting *T. humifusum* is considered via Table 3a of the Conservation Objectives all of the targets for the individual attributes are met. It also meets the target of presence in Table 3f and therefore the feature is considered to be in favourable condition.

3.3 Other Species

3.3.1 *Dianthus deltoides*

D. deltoides has only been recorded from one part of Salisbury Plain SSSI, in the valley known as Bourne Bottom in the eastern ranges. It was first recorded in 1876 and over the years has been noted in two places in the same area. The last confirmed sighting of the species at Bourne Bottom was in 2001 when Kevin Walker meticulously recorded the location of two flowering plants with many seedlings nearby. He noted that the plants were in a small area of bare chalk surrounded by short grassland in the valley bottom, away from the main heavily-used valley track.

In June 2004 Kevin Walker returned to the site with Sharon Pilkington but found no more plants. In 2007 the area was searched again with negative results and in 2008 Sharon Pilkington and Sarah Grinsted made a very careful search on three separate occasions between June 13th and July 20th, with Kevin Walker's 2001 field notes as a guide. These confirmed that the search was centred in the correct area but no plants were found. It was noted that no bare chalk was present in the area and grassland in this part of the valley bottom had mostly closed cover. It is known that Defence Estates has undertaken scrub clearance work in this area in the past (unspecified date) to keep grassland open and create disturbance niches in the area but it is unclear whether it was directed at *D. deltoides*. Therefore it seems probable that *D. deltoides* has disappeared from Bourne Bottom, though it is possible that it may return if its former habitat is disturbed to create more bare chalk niches in the near future – although the longevity of the seed is poorly understood. Techniques such as hand-scraping to open up small patches of turf, scarification or simply deliberate scuffing by tanks could all be considered and it may prove to be a good candidate for the attention of the Bulford Conservation Group.

The species therefore does not meet its target of presence in Table 3d of the CO. From what was noted of the habitat in its former location this also fails to meet its targets for the following attributes:

- Bare ground: marginal but not likely to exceed 5%;
- Disturbance: vegetation away from the track has experienced little recent disturbance;
- Negative indicators: encroachment; tall vegetation especially grasses has encroached upon open ground.

Given the above, this feature is in unfavourable condition.

3.3.2 *Dianthus armeria*

A single population of *D. armeria* was discovered in a remote valley near Black Heath in the Central Impact Area by Phil Wilson c. 1990, too late to list it in the SSSI Citation. The population has been intermittently surveyed since. The site lies within an active shelling area and grassland fires in the summer are not infrequent. Much of the Black Heath area bears evidence of local fires where patches of *Brachypodium pinnatum* have developed at the expense of the chalk grassland flora. This species is otherwise relatively scarce on Salisbury Plain. In 1997 the colony was damaged by a wildfire. In 1999 Phil Wilson revisited the site and reported that grassland had recovered and at least 50 *D. armeria* plants were present. The population was revisited in 2006, 2007 and 2008 and despite the presence of *B. pinnatum* in the area the colony appears to be at least stable, with more than 60 flowering and fruiting plants scattered over an area approximately 1 hectare in size – and therefore can be judged as being in Favourable condition.

The population lies close to the top of a south-facing slope, in species-rich CG3d dotted with ant-hills. No other rare species are known from this location.

3.4 Overall Vascular Plant Assemblage Result

Salisbury Plain SSSI has a rare vascular plant assemblage, comprising 11 species mentioned on the Citation, scoring 900 points (see English Nature Research Report 690), which greatly exceeds the generic conservation objective threshold of 200 points. Another two nationally rare species have been considered in this report. Of the 13 species considered in this report, 11 were found to be present and two were not found - *Dianthus deltoides* which may have disappeared and *Gentianella anglica* which is more likely to still be present. Overall, the Vascular Plant Assemblage must be judged as being in Favourable condition, as although the *Gentianella* was not found it is likely to still be present and the indirect attributes were met.

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Further information

Natural England evidence can be downloaded from our **Access to Evidence Catalogue**. For more information about Natural England and our work see **Gov.UK**. For any queries contact the Natural England Enquiry Service on 0300 060 3900 or e-mail **enquiries@naturalengland.org.uk** .

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