European Site Conservation Objectives: Supplementary advice on conserving and restoring site features

South Pennine Moors (Phase 2) Special Protection Area (SPA)
Site Code: UK9007022

Photo credit: Andrew Clark

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About this document

This document provides Natural England's supplementary advice for the European Site Conservation Objectives relating to South Pennine Moors Phase 2 SPA. This advice should therefore be read together with the SPA Conservation Objectives available here.

Where this site overlaps with other European Site(s), you should also refer to the separate European Site Conservation Objectives and Supplementary Advice (where available) provided for those sites.

You should use the Conservation Objectives, this Supplementary Advice and any case-specific advice given by Natural England, when developing, proposing or assessing an activity, plan or project that may affect this site.

The tables provided below bring together the findings of the best available scientific evidence relating to the site's qualifying features, which may be updated or supplemented in further publications from Natural England and other sources. The local evidence used in preparing this supplementary advice has been cited. The references to the national evidence used are available on request. Where evidence and references have not been indicated, Natural England has applied ecological knowledge and expert judgement. You may decide to use other additional sources of information.

This Supplementary Advice to the Conservation Objectives presents attributes which are ecological characteristics of the designated species and habitats within a site. The listed attributes are considered to be those that best describe the site's ecological integrity and which, if safeguarded, will enable achievement of the Conservation Objectives. Each attribute has a target which is either quantified or qualitative depending on the available evidence. The target identifies as far as possible the desired state to be achieved for the attribute.

In many cases, the attribute targets shown in the tables indicate whether the current objective is to 'maintain' or 'restore' the attribute. This is based on the best available information, including that gathered during monitoring of the feature's current condition. As new information on feature condition becomes available, this will be added so that the advice remains up to date.

The targets given for each attribute do not represent thresholds to assess the significance of any given impact in Habitats Regulations Assessments. You will need to assess this on a case-by-case basis using the most current information available.

Some, but not all, of these attributes can also be used for regular monitoring of the actual condition of the designated features. The attributes selected for monitoring the features, and the standards used to assess their condition, are listed in separate monitoring documents, which will be available from Natural England.

These tables do not give advice about SSSI features or other legally protected species which may also be present within the European Site.

If you have any comments or queries about this Supplementary Advice document please contact your local Natural England adviser or email HDIRConservationObjectivesNE@naturalengland.org.uk

About this site

European Site information

Name of European Site	South Pennine Moors (Phase 2) Special Protection Area (SPA)
Location	Lancashire, North Yorkshire, West Yorkshire, Greater Manchester
Site Map	The designated boundary of this site can be viewed here on the MAGIC website
Designation Date	June 1997
Qualifying Features	See section below
Designation Area	20,994.46 hectares
Designation Changes	n/a
Feature Condition Status	Details of the feature condition assessments made at this site can be found using Natural England's Designated Sites System
Names of component Sites of Special Scientific Interest (SSSIs)	South Pennine Moors SSSI
Relationship with other European or International Site designations	The site overlaps with part of the South Pennine Moors SAC
Other information	Natura 2000 Standard Data Form

Site background and geography

The South Pennine Moors SPA (Phases 1 and 2) include the major moorland blocks of the South Pennines from Ilkley in the north to Leek and Matlock in the south. They lie in the Southern Pennines National Character Area, which forms part of the Pennine ridge of hills lying between the Peak District National Park and Yorkshire Dales National Park. This is a landscape of large-scale sweeping moorland and pastures enclosed by drystone walls, with gritstone-dominated settlements contained within narrow valleys.

The Phase 2 SPA includes two discrete blocks of moorland, one south of Ilkley and another on the watershed between Bradford and Burnley and stretching south to Marsden at the northern edge of the Peak District. It covers extensive tracts of semi-natural moorland habitats including upland heath and blanket mire.

The soils within the SPA are generally acidic in nature and nutrient-poor and consist of varying depths of peat overlying a geology of sandstone, gritstone and sedimentary rock. The geomorphology and landscape is one of large expanses of uplands and valleys with associated crags, ledges and escarpments.

The site is of European importance for several upland breeding species of bird, including birds of prey and waders. Habitats around the moorland provide key feeding areas for some key moorland-breeding species in particular both Merlin *Falco columbarius* and Golden Plover *Pluvialis apricaria*. The northern end of the South Pennine Moors SPA is within 10 km of the North Pennine Moors SPA which supports a similar assemblage of upland breeding species.

The South Pennine Moors Phase 2 SPA is flanked on two sides by large urban areas, which means that large numbers of people use the area for access and recreation.

The South Pennine Moors Phase 2 SPA contains the only UK breeding sites for the Twite (also known locally as the ‘Pennine Finch’). Nesting in long heather and bracken beds, this species breeds in colonies and returns to the same location year on year. The food source for this species is solely seeds and the functionally linked meadow land on the in-bye (usually within 2.5km of a breeding colony) is critical to the future success of this species.

Maintenance of the ecosystems on which the birds depend relies on appropriate land management. Management of grazing is complicated by the presence of a large number of commons within the SPA and overgrazing by sheep is a key pressure on the site. Pressures outside the site, in particular the loss of bird feeding areas through agricultural intensification and housing development, increase the vulnerability of the bird populations.

About the qualifying features of the SPA

The following section gives you additional, site-specific information about this SPA's qualifying features. These are the individual species of wild birds listed on Annex I of the European Wild Birds Directive, and/or the individual regularly-occurring migratory species, and/or the assemblages (groups of different species occurring together) of wild birds for which the SPA was classified for.

Qualifying individual species of the SPA:

During the breeding season the SPA regularly supports:

- **Merlin *Falco columbarius***

  At the time of its classification, the SPA supported 28 breeding pairs of merlin, which represented 4.3% of the British breeding population.

  In the UK, merlin is confined as a breeding species to heather moorland areas, mainly in the uplands of Northern Ireland, Scotland, Wales and northern England, with small numbers in South-west England.

  A majority of merlin in the UK nest in a shallow scrape on the ground, lined with small twigs, pieces of heather, bracken and other material and concealed by heather. Territories are traditional, and are used repeatedly from year to year by successive generations of birds. Eggs are laid between May and early June and the young in a ground nest will often leave the nest at 18-20 days and scatter into the surrounding undergrowth. They fledge at 25-32 days, and are independent about a month later. One brood a year is raised. Replacement clutches are laid after early egg loss

- **Golden plover *Pluvialis apricaria***

  At the time of its classification, the SPA supported 292 breeding pairs of golden plover, which represented 1.2 % of the British breeding population.

  In Britain, the species is distributed widely throughout upland areas, with concentrations in northern and western Scotland and the north and south Pennines, and smaller outlying groups breeding in Wales and south-west England The English and Welsh populations breed at the southern edge of the species' global range.

  Golden plover nest in a shallow scrape on the ground often hidden by moorland vegetation, favouring a mosaic of dense and short vegetation and large open areas for breeding. Rombalds moor particularly Burley moor region in the north, Oxenhope moor, Stairs swamp and Harry side in the central block of the SPA support good breeding densities of Golden plover whilst the southern block of the SPA supports fewer breeding numbers. Food consists of invertebrates, mainly beetles and earthworms, and so marginal or low-intensity agricultural pastures, adjacent to or nearby moorland nesting habitat, are important feeding grounds in the summer. Eggs are typically laid between April-mid-May and one brood is raised per year.

At this SPA the principal habitats supporting these qualifying species are: Blanket bogs, dry heaths, wet heaths and acid grassland.

Qualifying assemblage of species:

During the breeding season, the SPA regularly supports;

- **an assemblage of characteristic moorland and moorland-fringe species** including *Pluvialis apricaria* (golden plover), *Actitis hypoleucos* (common sandpiper), *Calidris alpina schinzii* (dunlin), *Carduelis flavirostris* (twite), *Gallinago gallinago,* (snipe), *Numenius arquata* (curlew), *Oenanthe oenanthe,* (wheatear), *Saxicola rubetra* (whinchat), *Tringa totanus (*redshank), *Turdus torquatus* (ring ouzel), *Vanellus vanellus* (lapwing), and *Asio flammeus* (short-eared owl).

Common sandpiper predominantly use the dense vegetation in close proximity to the major reservoir complexes in the SPA; Widdop/Gorple, Warley Moor, Walshaw Dean and Warland/ White reservoir's. The central block of the SPA support the core breeding area for Dunlin, predominantly using Lord's and will's allotments and Nab Hill. Twite predominantly use the southern block of the SPA, with the core breeding area being north of the M62 on the edges of Soyland and Rishworth Moor. Snipe use the eastern side of the central block predominantly Pickles rough and Warley moor. Curlew are present throughout the SPA with Oxenhope Moor and Heptonstall Moor supporting high densities during the breeding season. Golden plover use the blanket bog habitat within the SPA and are more common on the higher, flatter and more remote bogs with a mosaic of short and dense vegetation with the area around Oxenhope Moor maintaining high breeding densities. Whinchat are scarce across the SPA and therefore difficult to determine local use across the site. Redshank can be found in the damp moorland fringe habitat near to Oxenhope Moor and Heptonstall Moor. Ring ouzel are scarce across the SPA and therefore difficult to determine local use across the site. Lapwing predominantly use the moorland fringe with shorter vegetation and Oxenhope moor supports the highest breeding pairs on the site. Short-eared owl use the long heather and tall rushes on open moorland to provide cover for the nests predominantly in the central belt of the South Pennine Moors and regularly observed on Wadsworth Moor

At this SPA the principal habitats supporting the assemblage of species are: Blanket bogs, European dry heaths, Acid grassland, Northern Atlantic wet heaths and dense bracken beds when associated with populations of Twite.

Site-specific seasonality of qualifying SPA features

The table below highlights in grey those months in which significant numbers of each mobile qualifying feature are most likely to be present at the SPA during a typical calendar year. This table is provided as a general guide only.

Unless otherwise indicated, the months shown below are primarily based on information relating to the general months of occurrence of the feature in the UK. Where site-based evidence is available and has been used to indicate below that significant numbers of the feature are typically present at this SPA outside of the general period, the site-specific references have been added to indicate this.

Applicants considering projects and plans scheduled in the periods highlighted in grey would benefit from early consultation with Natural England given the greater scope for there to be likely significant effects that require consideration of mitigation to minimise impacts to qualifying bird features during the principal periods of site usage by those features. The months which are *not* highlighted in grey are not ones in which the features are necessarily absent, rather that features may be present in less significant numbers in typical years. Furthermore, in any given year, features may occur in significant numbers in months in which typically they do not. Thus, applicants should not conclude that projects or plans scheduled in months not highlighted in grey cannot have a significant effect on the features. There may be a lower likelihood of significant effects in those months which nonetheless will also require prior consideration.

Any assessment of potential impacts on the features must be based on up-to-date count data and take account of population trends evident from these data and any other available information. Additional site-based surveys may be required.

Feature	Season	Period	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Site-specific references where available
Merlin	Breeding	Summer													
Golden Plover	Breeding	Summer													
Assemblage of moorland birds	Breeding	Summer													

Guide to terms:
Breeding – present on a site during the normal breeding period for that species
Non-breeding - present on a site outside of the normal breeding period for that species (includes passage and winter periods).
Summer – the period generally from April to July inclusive
Passage - the periods during the autumn and spring when migratory birds are moving between breeding areas and wintering areas. These periods are not strictly defined but generally include the months of July – October inclusive (autumn passage) and March – April inclusive (spring passage).
Winter - the period generally from November to February inclusive.

Table 1: Supplementary Advice for Qualifying features: A098 *Falco columbarius*; Merlin (breeding)

Attributes		Targets	Supporting and/or Explanatory Notes	Sources of site-based evidence (where available)
Supporting habitat (both within and outside the SPA): function/ supporting process	Conservation measures	Restore management or other measures (whether within and/or outside the site boundary as appropriate) necessary to restore the structure, function and/or the supporting processes associated with breeding Merlin and its supporting habitats.	Active and ongoing conservation management is often needed to protect, maintain or restore this feature at this site. Other measures may also be required, and in some cases, these measures may apply to areas outside of the designated site boundary in order to achieve this target. Further details about the necessary conservation measures for this site can be provided by Natural England. This information will typically be found within, where applicable, supporting documents such as Natura 2000 Site Improvement Plan, Site Management Strategies or Plans, the Views about Management Statement for the underpinning SSSI and/or management agreements. Maintain and extend areas of mature and degenerate heather for provision of nesting habitat. Areas of supporting habitat (within and outside the SPA) should be managed in order to provide prey species such as meadow pipit	NATURAL ENGLAND, 2009. NVC/Habitat survey of South Pennine Moors 2009. Unpublished data. ENGLISH NATURE, 2005. Views about the management of South Pennine Moors SSSI. At http://www.sssi.naturalengland.org.uk/Special/sssi/vam/VAM%201007196.pdf NATURAL ENGLAND, 2014. Site Improvement Plan: South Pennine Moors (SIP225) At http://publications.naturalengland.org.uk/publication/5412834661892096
Supporting habitat (both within and outside the SPA):	Air quality	Restore as necessary the concentrations and deposition of air pollutants to below the site-relevant Critical Load or Level values given for this	The structure and function of the habitats which support this SPA feature may be sensitive to changes in air quality. Exceeding critical values for air pollutants may result in changes to the chemical status of a supporting habitats' substrate, accelerating or damaging	More information about site-relevant Critical Loads and Levels for this SPA is available by

Attributes		Targets	Supporting and/or Explanatory Notes	Sources of site-based evidence (where available)
function/supporting process		feature of the site on the Air Pollution Information System (www.apis.ac.uk).	plant growth, altering vegetation structure and composition and thereby affecting the quality and availability of nesting, feeding or roosting habitats. Critical Loads and Levels are thresholds below which such harmful effects on sensitive UK habitats will not occur to a noteworthy level, according to current levels of scientific understanding. There are critical levels for ammonia (NH3), oxides of nitrogen (NOx) and sulphur dioxide (SO2), and critical loads for nutrient nitrogen deposition and acid deposition. It is recognised that achieving this target may be subject to the development, availability and effectiveness of abatement technology and measures to tackle diffuse air pollution, within realistic timescales. There are currently no critical loads or levels for other pollutants such as Halogens, Heavy Metals, POPs, VOCs or Dusts. These should be considered as appropriate on a case-by-case basis. Ground level ozone is regionally important as a toxic air pollutant but flux-based critical levels for the protection of semi-natural habitats are still under development. The critical values for the supporting habitats of the SPAs are currently being exceeded (November 2018).	using the 'search by site' tool on the Air Pollution Information System (www.apis.ac.uk).
Supporting habitat (both within and outside the SPA): predation	Predation	Reduce and restrict the predation of and associated disturbance of breeding Merlin by native and non-native predators	This will ensure that breeding productivity (number of chicks per pair) and survival are sustained at rates that maintain or restore the abundance of the feature. Impacts to breeding productivity can result directly from predation of eggs, chicks, juveniles and adults, and also from significant disturbance. The presence of predators can influence bird behaviours, such as abandonment of nest sites or reduction of effective feeding. Where evidence suggests predator management is required, measures can include their exclusion through fencing and scaring or by direct control. Any such measures must consider the legal protection of some predators, as well as the likely effects of such control on other qualifying features.	BROWN, A.F & SHEPHERD, K. B. (1991). Breeding birds of the South Pennine Moors. JNCC Report No 7. SHEPHERD, K. B. (2005). South Pennine Moors Breeding Bird Survey 2005. Unpublished report presented to English Nature. KEYSTONE ECOLOGY (2014) South Pennine

Attributes		Targets	Supporting and/or Explanatory Notes	Sources of site-based evidence (where available)
				Moors SSSI/SPA Phase 2. Breeding Bird Surveys 2014. Unpublished report to Natural England.
Breeding population	Population abundance	Restore the size of the breeding Merlin population to a level which is consistently above 28 pairs, whilst avoiding deterioration from its current level as indicated by the latest mean peak count or equivalent.	This will sustain the site's population and ensures it contributes to a viable local, national and bio-geographic population. Due to the mobility of birds and the dynamic nature of population change, the target value given for the abundance of this feature is considered to be the minimum standard for conservation/ restoration measures to achieve. This minimum value may be revised where there is evidence to show that a population's size has significantly changed as a result of natural factors or management measures and has been stable at or above a new level over a considerable period. The values given here may also be updated in future to reflect any strategic objectives which may be set at a national level for this feature. Given the likely fluctuations in numbers over time, any impact assessments should focus on the current abundance of the site's population, as derived from the latest known or estimated level established using the best available data. This advice accords with the obligation to avoid deterioration of the site or significant disturbance of the species for which the site is classified, and seeks to avoid plans or projects that may affect the site giving rise to the risk of deterioration. Similarly, where there is evidence to show that a feature has historically been more abundant than the stated minimum target and its current level, the ongoing capacity of the site to accommodate the feature at such higher levels in future should also be taken into account. Maintaining or restoring bird abundance depends on the suitability of the site. However, factors affecting suitability can also determine other demographic rates of birds using the site including survival (dependent on factors such as body condition which influences the ability to breed or make foraging and / or migration movements) and breeding productivity. Adverse anthropogenic impacts on either of these rates may precede changes in population abundance (e.g. by changing proportions of birds of different ages) but eventually may negatively affect abundance. These rates can be measured/estimated to inform judgements of likely impacts on	JNCC SPA citation KEYSTONE ECOLOGY (2014) South Pennine Moors SSSI/SPA Phase 2. Breeding Bird Surveys 2014. Unpublished report to Natural England. BROWN, A.F & SHEPHERD, K. B. (1991). Breeding birds of the South Pennine Moors. JNCC Report No 7. SHEPHERD, K. B. (2005). South Pennine Moors Breeding Bird Survey 2005. Unpublished report presented to English Nature.

Attributes		Targets	Supporting and/or Explanatory Notes	Sources of site-based evidence (where available)
			abundance targets. Unless otherwise stated, the population size will be that measured using standard methods such as peak mean counts or breeding surveys. This value is also provided recognising there will be inherent variability as a result of natural fluctuations and margins of error during data collection. Whilst we will endeavour to keep these values as up to date as possible, local Natural England staff can advise on whether the figures stated are the best available.	
Supporting habitat (both within and outside the SPA): extent and distribution	Extent and distribution of supporting breeding habitat	Restore the extent, distribution and availability of suitable breeding habitat which supports breeding Merlin for all necessary stages of its breeding cycle (courtship, nesting, feeding)	Conserving or restoring the extent of supporting habitats and their range will be key to maintaining the site's ability and capacity to support the SPA population. The information available on the extent and distribution of supporting habitat used by the feature may be approximate depending to the nature, age and accuracy of data collection. This target will apply to any critical supporting habitat which is known to occur outside the site boundary. It is likely that merlin hunt in habitats around the moorland edge and changes in prey abundance here could affect breeding performance. These issues should be considered for development proposals on land around the SPA. The extent/condition of required habitats was not known at time of designation	NATURAL ENGLAND, 2009. NVC/Habitat survey of South Pennine Moors 2009. Unpublished data, Natural England. South Pennine Moors In-bye bird survey (Bradford South Pennines moorland fringe bird survey 2013 , Calderdale South Pennines moorland fringe bird survey 2010 & 2012, Kirklees South Pennines moorland fringe bird survey 2012)
Supporting habitat (within the SPA): structure	Vegetation characteristics	Restore a high proportion of medium to tall (>50 cm) ground vegetation within nesting habitat.	The height, cover, variation and composition of vegetation are often important characteristics of habitats supporting this feature which enable successful nesting/rearing/concealment/roosting. Many bird species will have specific requirements that conservation measures will aim to maintain, for others such requirements will be less clear. Activities that may directly or indirectly affect the vegetation of supporting habitats and modify these characteristics may	NATURAL ENGLAND, 2009.NVC/Habitat survey of South Pennine Moors 2009. Unpublished

Attributes		Targets	Supporting and/or Explanatory Notes	Sources of site-based evidence (where available)
			adversely affect the feature.	data, Natural England.
Supporting habitat (both within and outside the SPA): disturbance	Minimising disturbance caused by human activity	Restrict and reduce the frequency, duration and/or intensity of disturbance to nesting, feeding and/or communal roosting birds so that the Merlin population is not significantly disturbed during the breeding period.	The nature, scale, timing and duration of some human activities can result in the disturbance of birds at a level that may substantially affect their behaviour, and consequently affect the long-term viability of the population. Disturbing effects can for example result in changes to feeding or roosting behaviour, increases in energy expenditure due to increased flight, abandonment of nest sites and desertion of supporting habitat (both within or outside the designated site boundary where appropriate). This may undermine successful nesting, rearing, feeding and/or roosting, and/or may reduce the availability of suitable habitat as birds are displaced and their distribution within the site contracts. Disturbance associated with human activity may take a variety of forms including noise, light, sound, vibration, trampling, and presence of people, animals and structures. Ground-nesting birds can be at particular risk from disturbance. Merlin are thought to be particularly sensitive to disturbance in the early spring when selecting nest sites.	
Supporting habitat (both within and outside the SPA): structure	Landscape	Maintain a high proportion of open and unobstructed terrain within and around nesting and feeding areas.	This feature is known to favour large areas of open terrain, largely free of obstructions, in and around its nesting, roosting and feeding areas. Often there is a need to maintain an unobstructed line of sight within nesting, feeding or roosting habitat to detect approaching predators, or to ensure visibility of displaying behaviour. The merlin requires extensive open ground for hunting. It feeds chiefly on small birds caught in open country and hunts by perching in an elevated position to locate prey, usually on rocks or tree stumps. Once prey is sighted, it is usually caught after a short distance surprise attack, following a low flight from the perch. Other hunting techniques include prolonged persistent chasing and vertical stooping. An open landscape may also be required to facilitate movement of birds between the SPA and any off-site supporting habitat.	NATURAL ENGLAND, 2009. NVC/Habitat survey of South Pennine Moors 2009. Unpublished data, Natural England.
Supporting habitat (both within and outside the SPA):	Food availability within supporting habitat	Maintain a high availability of small birds and day-flying moths during the breeding season.	The availability of an abundant food supply is critically important for successful breeding, adult fitness and survival and the overall sustainability of the population. The merlin feeds chiefly on small birds caught in open country, though small	NATURAL ENGLAND, 2009. NVC/Habitat survey of South Pennine Moors

Attributes		Targets	Supporting and/or Explanatory Notes	Sources of site-based evidence (where available)
function/ supporting process			mammals and insects are often important. Prey is usually caught in the air close to or on the ground, and is plucked and decapitated before being brought to the nest. As a result, inappropriate management and direct or indirect impacts which may affect the distribution, abundance and availability of prey may adversely affect the population.	2009. Unpublished data, Natural England.
Version Control Advice last updated: n/a				
Variations from national framework of integrity-guidance: Water quality/quantity (target removed) as species or their prey species are not dependent on this target.				

Table 2: Supplementary Advice for Qualifying features: A140 *Pluvialis apricaria*; Golden plover (breeding)

Attributes		Targets	Supporting and/or Explanatory Notes	Sources of site-based evidence (where available)
Supporting habitat (both within and outside the SPA): function/ supporting process	Water quality/ quantity	Where the supporting habitats of the SPA feature are dependent on surface water, maintain water quality and quantity at standards which provides the necessary conditions to support breeding Golden Plover	For many SPA features which are dependent on wetland habitats supported by surface water, maintaining the quality and quantity of water supply will be critical, especially at certain times of year during key stages of their life cycle. Poor water quality and inadequate quantities of water can adversely affect the availability and suitability of breeding, rearing, feeding and roosting habitats. Typically, meeting the surface water and groundwater environmental standards set out by the Water Framework Directive (WFD 2000/60/EC) will also be sufficient to support the SPA Conservation Objectives but in some cases more stringent standards may be needed to support the SPA feature. Further site-specific investigations may be required to establish appropriate standards for the SPA.	NATURAL ENGLAND, 2009. NVC/Habitat survey of South Pennine Moors 2009. Unpublished data, Natural England.
Supporting habitat (both within and outside the SPA): function/ supporting process	Conservation measures	Restore management or other measures (whether within and/or outside the site boundary as appropriate) necessary to restore the structure, function and/or the supporting processes associated with breeding Golden Plover and its supporting habitats.	See notes for the attribute in table 1 above. Breeding occurs on upland blanket bogs, wet heaths and acid grassland. Marginal pasture land adjacent to SPA are known to be important feeding grounds. This off site, supporting habitat, feeding ground is functionally linked to the SPA and key to success of breeding on the moorland. Golden plover usually feed on short grazed pastures and molehill abundance can be a good surrogate measure for food availability (i.e. earthworm density). Wetter, undrained pastures are also preferred for feeding as this can increase Tipulid abundance (May-June main food supply). Additionally larger, more level fields are preferred compared to steep slopes.	NATURAL ENGLAND, 2009. NVC/Habitat survey of South Pennine Moors 2009. Unpublished data, Natural England. South Pennine Moors In-bye bird survey (Bradford South Pennines moorland fringe bird survey 2013, Calderdale South Pennines moorland fringe bird survey 2010 & 2012, Kirklees South Pennines moorland fringe bird survey 2012) ENGLISH NATURE, 2005. Views about the management of South Pennine Moors SSSI. At

Attributes		Targets	Supporting and/or Explanatory Notes	Sources of site-based evidence (where available)
				http://www.sssi.naturalengland.org.uk/Special/sssi/vam/VAM%201007196.pdf NATURAL ENGLAND, 2014. Site Improvement Plan: South Pennine Moors (SIP225) At http://publications.naturalengland.org.uk/publication/5412834661892096
Supporting habitat (both within and outside the SPA): function/ supporting process	Air quality	Restore as necessary the concentrations and deposition of air pollutants to below the site-relevant Critical Load or Level values given for this feature of the site on the Air Pollution Information System (www.apis.ac.uk).	See notes for the attribute in table 1 above	More information about site-relevant Critical Loads and Levels for this SPA is available by using the 'search by site' tool on the Air Pollution Information System (www.apis.ac.uk).
Supporting habitat (both within and outside the SPA): predation	Predation	Reduce or restrict the predation and associated disturbance of breeding Golden Plovers caused by native and non-native predators.	This will help to ensure that breeding productivity (the number of chicks per pair) and survival are sustained at rates that maintain or restore the abundance of the feature. Impacts to breeding productivity can result directly from predation of eggs, chicks, juveniles and adults, and also from significant disturbance. The presence of predators can influence bird behaviours, such as abandonment of nest sites or reduction of effective feeding. Where evidence suggests predator management is required, measures can include their exclusion through fencing and scaring or by direct control. Any such measures must consider the legal protection of some predators, as well as the likely effects of such control on other qualifying features.	JNCC SPA citation BROWN, A.F & SHEPHERD, K. B. (1991). Breeding birds of the South Pennine Moors. JNCC Report No 7. SHEPHERD, K. B. (2005). South Pennine Moors Breeding Bird Survey 2005. Unpublished report presented to English Nature. KEYSTONE

Attributes		Targets	Supporting and/or Explanatory Notes	Sources of site-based evidence (where available)
				ECOLOGY (2014) South Pennine Moors SSSI/SPA Phase 2. Breeding Bird Surveys 2014. Unpublished report to Natural England.
Breeding population	Population abundance	Maintain the size of the breeding Golden Plover population at a level which is consistently above 292 pairs, whilst avoiding deterioration from its current level as indicated by the latest mean peak count or equivalent.	See notes for this attribute above in table 1.	JNCC SPA citation KEYSTONE ECOLOGY (2014) South Pennine Moors SSSI/SPA Phase 2. Breeding Bird Surveys 2014. Unpublished report to Natural England. BROWN, A.F & SHEPHERD, K. B. (1991). Breeding birds of the South Pennine Moors. JNCC Report No 7. Breeding Birds of the South Pennine Moors, Brown & Shepherd 1990. SHEPHERD, K. B. (2005). South Pennine Moors Breeding Bird Survey 2005. Unpublished report presented to English Nature.
Supporting habitat (both within and outside the SPA): extent	Extent and distribution of supporting breeding habitat	Restore the extent, distribution and availability of suitable breeding habitat which supports breeding Golden Plover for all necessary stages of its breeding	Conserving or restoring the extent of supporting habitats and their range will be key to maintaining the site's ability and capacity to support the SPA population. The information available on the extent and distribution of supporting habitat used by the feature may be approximate depending to the nature, age and accuracy of data collection.	NATURAL ENGLAND, 2009. NVC/Habitat survey of South Pennine Moors 2009. Unpublished data,

Attributes		Targets	Supporting and/or Explanatory Notes	Sources of site-based evidence (where available)
and distribution		cycle (courtship, nesting, feeding)	This objective will apply to any critical supporting habitat which is known to occur outside the site boundary. Golden Plover may travel up to 4 km from their nesting sites to feed. Marginal pastures adjacent to the SPA are also known to be likely important feeding grounds for this feature. Where this off-site but supporting habitat is regularly used and strongly 'functionally-linked' to the SPA, it will be key to breeding success on the moorland. Golden plover nest in a shallow scrape on the ground often hidden by moorland vegetation, favouring a mosaic of dense and short vegetation and large open areas for breeding. Rombalds moor particularly Burley moor region in the north of the site, Oxenhope moor, Stairs swamp and Harry side in the central block of the SPA support good breeding densities of Golden plover whilst the southern block of the SPA supports fewer breeding numbers. Golden plover usually feed on short grazed and invertebrate-rich pastures and molehill abundance can be a good surrogate measure for food availability (i.e. earthworm density). Wetter, un-drained pastures are also preferred for feeding as this can increase cranefly (Tipulid) abundance (during May-June this is their main food supply). Additionally larger, more level fields are preferred compared to steep slopes.	Natural England.
Supporting habitat (both within and outside the SPA): function/supporting process	Hydrology	Restore the area of damp or waterlogged habitat used for feeding by breeding Golden Plover	Changes in source, depth, duration, frequency, magnitude and timing of water supply or flow can have important implications for this feature. Such changes may affect the quality and suitability of habitats used by birds for nesting, drinking, preening, rearing, feeding or roosting. Unless these have already been undertaken, further site-specific investigations may be required to fully inform conservation measures for this feature and/or the likelihood of impacts on this attribute. Grip blocking schemes to re-wet moorland areas will help restore previous water table levels and contribute to restoration of suitable habitat for this feature.	
Supporting habitat (within the SPA): structure	Vegetation characteristics	Restore a mosaic (typically a 1:3 ratio) of short (<5 cm) to tall (10-15 cm) vegetation within breeding areas used by Golden Plover.	The height, cover, variation and composition of vegetation are often important characteristics of habitats supporting this feature which enable successful nesting/rearing/concealment/roosting. Many bird species will have specific requirements that conservation measures will aim to maintain, for others such requirements will be less clear.	NATURAL ENGLAND, 2009. NVC/Habitat survey of South Pennine Moors 2009. Unpublished data,

Attributes		Targets	Supporting and/or Explanatory Notes	Sources of site-based evidence (where available)
			Activities that may directly or indirectly affect the vegetation of supporting habitats and modify these characteristics may adversely affect the feature.	Natural England.
Supporting habitat (both within and outside the SPA): minimising disturbance	Minimising disturbance caused by human activity	Restrict and reduce the frequency, duration and/or intensity of disturbance affecting nesting, roosting, and/or foraging birds so that the Golden Plover population is not significantly disturbed during the breeding period.	The nature, scale, timing and duration of some human activities can result in the disturbance of birds at a level that may substantially affect their behaviour, and consequently affect the long-term viability of the population. Such disturbing effects can for example result in changes to feeding or roosting behaviour, increases in energy expenditure due to increased flight, abandonment of nest sites and desertion of supporting habitat (both within or outside the designated site boundary where appropriate). This may undermine successful nesting, rearing, feeding and/or roosting, and/or may reduce the availability of suitable habitat as birds are displaced and their distribution within the site contracts. Disturbance associated with human activity may take a variety of forms including noise, light, sound, vibration, trampling, and presence of people, animals and structures. Ground-nesting birds such as waders can be at particular risk from disturbance. This feature is particularly sensitive to disturbance and can be affected by people over 200 metres away.	
Supporting habitat (both within and outside the SPA): structure	Landscape	Maintain open and unobstructed terrain within and around nesting, roosting and feeding sites used by breeding Golden Plover.	This feature is known to favour large areas of open terrain, largely free of obstructions, in and around its nesting, roosting and feeding areas. Often there is a need to maintain an unobstructed line of sight within nesting, feeding or roosting habitat to detect approaching predators, or to ensure visibility of displaying behaviour. An open landscape may also be required to facilitate movement of birds between the SPA and any off-site supporting habitat.	NATURAL ENGLAND, 2009. NVC/Habitat survey of South Pennine Moors 2009. Unpublished data, Natural England.
Supporting habitat (both within and outside the SPA): function/ supporting process	Connectivity with supporting habitats	Maintain the safe passage of birds moving between nesting and feeding areas used by breeding Golden Plover.	The ability of the feature to safely and successfully move to and from nesting and feeding areas is critical to their breeding success and to the adult fitness and survival. This target will apply within the site boundary and where birds regularly move to and from off-site habitat where this is relevant.	
Supporting habitat (both within and outside the SPA):	Food availability within supporting habitat	Maintain the availability of key prey items (e.g. earthworms, leatherjackets, beetles, spiders) at prey sizes preferred by Golden Plover.	The availability of an abundant food supply is critically important for successful breeding, adult fitness and survival and the overall sustainability of the population. As a result, inappropriate management and direct or indirect impacts which may affect the distribution, abundance and availability of prey may adversely affect the population.	PIERCE HIGGINS, J.W. *et al* (2009). Impacts of climate on prey abundance account for

Attributes		Targets	Supporting and/or Explanatory Notes	Sources of site-based evidence (where available)
function/ supporting process			Wetter, undrained fields with a shallow gradient are preferred feeding sites for golden plover. They usually feed on earthworms in March to April and crane-fly adults and larvae between May to June. The number of molehills can be generally correlated with earthworm density. Impacts that affect soil moisture may be particularly relevant.	fluctuations in a population of a northern wader at the southern edge of its range. Global Change Biology,
Version Control Advice last updated: N/A				
Variations from national framework of integrity-guidance: N/A				

Table 3: Supplementary Advice for Qualifying features: internationally important breeding bird assemblage

Attributes		Targets	Supporting and/or Explanatory Notes	Sources of site-based evidence (where available)
Supporting habitat (both within and outside the SPA): function/supporting process	Water quality/quantity	Where the supporting habitats of the SPA feature are dependent on surface water ensure water quality and quantity is maintained to a standard which provides the necessary conditions to support the assemblage feature.	For many SPA features which are dependent on wetland habitats supported by surface water, maintaining the quality and quantity of water supply will be critical, especially at certain times of year during key stages of their life cycle. Poor water quality and inadequate quantities of water can adversely affect the availability and suitability of breeding, rearing, feeding and roosting habitats. Typically, meeting the surface water and groundwater environmental standards set out by the Water Framework Directive (WFD 2000/60/EC) will also be sufficient to support the SPA Conservation Objectives but in some cases more stringent standards may be needed to support the SPA feature. Further site-specific investigations may be required to establish appropriate standards for the SPA.	NATURAL ENGLAND, 2009. NVC/Habitat survey of South Pennine Moors 2009. Unpublished data, Natural England.
Assemblage of species	Assemblage abundance	Maintain the presence of the breeding bird assemblage associated with upland moorland and its fringes and the abundance of each of its component populations, whilst avoiding deterioration from current levels of abundance as indicated by the latest mean peak counts or equivalent.	This will sustain the assemblage population and contribute to viable local, national and bio-geographic populations of its component species. Due to the dynamic nature of assemblage component populations, this target may be subject to periodic review. However, the continued presence of the assemblage and its component populations is considered to be the minimum standard for conservation or restoration measures and therefore where at any time the assemblage abundance is greater than the target value given, any measure or impact assessment should take account of the greater abundance. This meets with the obligation to avoid deterioration of a European site or significant disturbance of the species for which the site is classified, and seeks to avoid plans or projects giving rise to the risk of such deterioration or disturbance. Similarly, where there is evidence to show that a feature has historically been more abundant than the stated minimum target and its current level, the ongoing capacity of the site to accommodate the feature at such higher levels in future should also be taken into account. Whether to maintain or restore depends on the overall presence of the assemblage and its component populations and should only change in response to this, excepting natural change. Fluctuations of individual assemblage component species alone should not necessarily change the target.	BROWN, A.F & SHEPHERD, K. B. (1991). Breeding birds of the South Pennine Moors. JNCC Report No 7. SHEPHERD, K. B. (2005). South Pennine Moors Breeding Bird Survey 2005. Unpublished report presented to English Nature. KEYSTONE ECOLOGY (2014) South Pennine Moors SSSI/SPA Phase 2. Breeding Bird Surveys 2014 CROWTHER & WILKINSON

Attributes		Targets	Supporting and/or Explanatory Notes	Sources of site-based evidence (where available)
			Whilst we will endeavour to keep these values as up to date as possible, local Natural England staff can advise on whether the figures stated are the best available.	(2008) Breeding twite survey in the South Pennines. RSPB. RSPB, 2010. Breeding twite survey in the South Pennines - additional sites RSPB. .
Assemblage of species	Diversity of species	Maintain the overall species diversity of the SPA assemblage.	This will ensure the bird assemblage reflects the diversity of species the SPA supports. Assemblage diversity is a product of species richness (the number of different species present), abundance (population size of each assemblage component species) and relative 'importance' (an assessment of the conservation status of each assemblage component, described below). Each component makes a different contribution to the diversity of the assemblage, and changes to some components may be considered to affect diversity more than others. Negative changes to small numbers of relatively important assemblage components may have a similar overall effect to negative changes in larger numbers of less important components. The populations of each of the 'main component' assemblage species to be maintained or restored will be those bird species strongly characteristic of the particular SPA habitat, including those 'named components' listed on the SPA citation. In addition to the main components, other components should be considered as these contribute collectively to the assemblage diversity, in particular proportionally abundant populations of species of conservation importance. Examples are those 'red-listed' as Birds of Conservation Concern and/or those listed on Sections 41/42 of the Natural Environment & Rural Communities Act 2006. The species composition of an assemblage may change over time. However, to meet this target, the total number of all native bird species contributing to the assemblage species richness should not decline significantly. At the time of its classification, the SPA assemblage included key breeding populations of merlin, golden plover, twite, lapwing, curlew, short-eared owl, dunlin, snipe, redshank, common sandpiper whinchat, ring ouzel and wheatear.	
Supporting habitat (both within and	Extent and distribution of	Maintain the extent and distribution of habitat which	Conserving or restoring the extent of supporting habitats and their range will be key to maintaining the site's ability and capacity to support the SPA	NATURAL ENGLAND, 2009.

Attributes		Targets	Supporting and/or Explanatory Notes	Sources of site-based evidence (where available)
outside the SPA): extent and distribution	supporting breeding habitat	supports the SPA assemblage feature during all necessary stages (breeding, moulting, roosting, loafing, and feeding) of the breeding period.	population. The information available on the extent and distribution of supporting habitat used by the feature may be approximate depending to the nature, age and accuracy of data collection. This target will apply to any supporting habitat which is known to occur outside the site boundary such as off-site feeding/foraging grounds. The principal habitats known or likely to support the assemblage feature at this SPA are: blanket bog, dry heath, wet heath, acid grassland. Habitats that form a small part of the total extent of the SPA and / or are not primary reasons for the SAC or SSSI designation may be important for some species, for example bracken areas are important for Twite. The extent of supporting habitat was not known at designation of site.	NVC/Habitat survey of South Pennine Moors 2009. Unpublished data, Natural England.
Supporting habitat (both within and outside the SPA): minimising disturbance	Minimising disturbance caused by human activity	Restrict the frequency, duration and/or intensity of disturbance affecting nesting, roosting, foraging, feeding, moulting and/or loafing birds so that the SPA assemblage feature is not significantly disturbed	The nature, scale, timing and duration of some human activities can result in the disturbance of birds at a level which may significantly affect their behaviour, and consequently impact on the long-term viability of their population. Such disturbing effects can for example result in changes to feeding or roosting behaviour, increased energy expenditure due to more frequent flights, abandonment of nest sites, disrupted incubation of eggs and desertion of supporting habitat (both within or outside the designated site boundary where appropriate). Anthropogenic disturbance of birds may in effect reduce the availability to the birds of suitable habitat through temporary or long-lasting displacement of birds from affected areas and may result in their redistribution within the site or displacement from it. Disturbance associated with human activity may take a variety of forms including noise, light, sound, vibration, trampling and sight of people, animals and structures.	
Supporting habitat (both within and outside the SPA): structure/function	Quality of supporting breeding habitat	Maintain the structure, function and availability of the following habitats which support the main component species of the SPA assemblage feature for all stages (nesting, moulting, roosting, loafing, feeding) of the breeding period;	The site's ability to support and sustain an assemblage comprising a distinct or diverse mix of species will be reliant on the overall quality and diversity of the habitats that support them. The feeding and roosting habitats which support the assemblage will occur within, and in some cases outside, the site boundary. This target is applicable to both circumstances. Due to the large number of species and natural fluctuations in the overall composition of an assemblage, it is not practical to provide specific targets relating to each supporting habitat relevant to the assemblage. Generally speaking, the specific attributes of each supporting habitat may include	NATURAL ENGLAND, 2009. NVC/Habitat survey of South Pennine Moors 2009. Unpublished data, Natural England. CSM visits by

Attributes		Targets	Supporting and/or Explanatory Notes	Sources of site-based evidence (where available)
		blanket bog, dry heath, wet heath and acid grassland.	vegetation characteristics and structure, surface water depth, food availability, connectivity between nesting, roosting and feeding areas both within and outside the SPA. Further advice will be provided by Natural England on a case by case basis. The main component-species of the assemblage at this SPA include: twite, lapwing, curlew, short-eared owl, dunlin, snipe, redshank, common sandpiper whinchat, ring ouzel and wheatear.	Natural England
Supporting habitat (both within and outside the SPA): function/supporting process	Conservation measures	Maintain management or other measures (whether within and/or outside the site boundary as appropriate) necessary to maintain the structure, function and/or the supporting processes associated with the SPA assemblage feature and its supporting habitats.	Active and ongoing conservation management is often needed to protect, maintain or restore this feature at this site. Other measures may also be required, and in some cases, these measures may apply to areas outside of the designated site boundary in order to achieve this target. Further details about the necessary conservation measures for this site will typically be found within, where applicable, supporting documents such as Natura 2000 Site Improvement Plan, Site Management Strategies or Plans, the Views about Management Statement for the underpinning SSSI and/or management agreements. Manage to maintain areas of mature heather on dry heath and wet heath. Manage to maintain hydrological functionality of blanket bog and to restore degraded blanket bog	NATURAL ENGLAND, 2009. NVC/Habitat survey of South Pennine Moors 2009. Unpublished data. CSM visits by Natural England ENGLISH NATURE, 2005. Views about the management of South Pennine Moors SSSI. At http://www.sssi.naturalengland.org.uk/Special/sssi/vam/VAM%201007196.pdf NATURAL ENGLAND, 2014. Site Improvement Plan: South Pennine Moors (SIP225) At

Attributes		Targets	Supporting and/or Explanatory Notes	Sources of site-based evidence (where available)
				http://publications.naturalengland.org.uk/publication/5412834661892096
Assemblage of species	Predation	Reduce or restrict predation and disturbance of the species comprising the SPA assemblage caused by native and non-native predators.	This will ensure that breeding productivity (the number of chicks per pair) and survival are sustained at rates that maintain or restore the abundance and diversity of the feature. Impacts to breeding productivity can result directly from predation of eggs, chicks, juveniles and adults, and also from significant disturbance. The presence of predators can influence bird behaviours, such as abandonment of nest sites or reduction of effective feeding. Where evidence suggests predator management is required, measures can include their exclusion through fencing and scaring or by direct control. Any such measures must consider the legal protection of some predators, as well as the likely effects of such control on other qualifying features.	KEYSTONE ECOLOGY (2014) South Pennine Moors SSSI/SPA Phase 2. Breeding Bird Surveys 2014. Unpublished report to Natural England. BROWN, A.F & SHEPHERD, K. B. (1991). Breeding birds of the South Pennine Moors. JNCC Report No 7. SHEPHERD, K. B. (2005). South Pennine Moors Breeding Bird Survey 2005. Unpublished report presented to English Nature. CROWTHER & WILKINSON (2008) Breeding twite survey in the South Pennines. RSPB. RSPB, 210. Breeding twite

Attributes		Targets	Supporting and/or Explanatory Notes	Sources of site-based evidence (where available)
				survey in the South Pennines - additional sites.
Version Control Advice last updated: N/A				
Variations from national framework of integrity-guidance: N/A				