

Managing for bespoke species/assemblages within Countryside Stewardship – guidance template

<p>Species/assemblage name</p> <p>Lunar Yellow Underwing (<i>Noctua orbona</i>)</p>	<p>Conservation status</p> <p>Section 41, Nationally Scarce</p>
	
<p>Introduction</p> <p>This species has an annual life cycle. The moth flies at night from late June to September, but usually with a period of aestivation ('summer hibernation') in mid-summer. The species overwinters as a larva, feeding primarily on a range of fine-leaved grasses, in particular on the tips of the grasses, including sheep's fescue and wavy hair-grass, being found on those growing in tussocks and often in bare soils, but will also eat a range of low-growing herbaceous plants. It feeds at night from September to late April/May and pupates in a flimsy cocoon in the soil. It frequents dry sandy heathy or calcareous sites with well-drained soils in open situations and in open woodland. The Brecks and Suffolk Sandlings are strongholds for this species, although there are scattered colonies elsewhere, for example south Wiltshire and north Hampshire.</p>	
<p>Why a bespoke species/assemblage?</p> <p>Heavy sheep or cattle-grazing will be detrimental to this species but light grazing can be ideal. Large rabbit populations are also likely to be detrimental in some cases but ideal in others (Sandlings and in Brecks eg Weeting). This is a species, however, that requires open, tussocky conditions and if unmanaged scrub invasion could become an issue. Therefore, ground disturbance, such as through rotovating, ploughing or turf-stripping with the arisings removed, is likely to be needed to maintain sites in suitable conditions in the longer term. In a recent study, of twelve disturbance plots in the Brecks surveyed for the Lunar Yellow Underwing, larvae were found on eight. A similar picture is emerging from disturbance plots undertaken in the Suffolk Sandlings. Management should also aim to leave the standing dead flower heads of grasses in late summer as these may be important for egg-laying and larvae in the winter.</p>	
<p>When and where to apply this guidance</p> <p>This guidance note primarily covers the Brecks of Norfolk and Suffolk and the Suffolk</p>	

Sandlings. Ground disturbance, such as through turf-stripping, should take place over winter, with existing vegetation removed. Grazing animals should be removed from the site as they are likely to graze off any fine grass regeneration, and to avoid any enrichment of bare ground. The aim should be for a mosaic of succession stages on any site, to include disturbed ground through to undisturbed ground in any one year, but with a plentiful supply of tussocks of fine-leaved grasses amongst bare ground.

Advice away from sites in the Brecks and Sandlings is less certain, although management that encourages and annual and plentiful supply of tussocky fine-leaved grassland of free draining soils, possibly amongst bare ground, is likely to be very beneficial. Disused quarry sites can be ideal habitat.

Developing a Countryside Stewardship agreement

Relevant CS options

LH1	Management of lowland heathland
LH2	Restoration of forestry and woodland to lowland heathland
GS6	Management of species rich grasslands
GS7	Restoration towards species rich grasslands
GS13	Management of grassland for target features
SP5	Shepherding supplement
SP8	Native breeds at Risk supplement
SP9	Threatened species supplement

Where the species occurs on a Lowland heathland priority habitat

Prescription guidance for LH1/2

P107 - Provide between [5-25%] bare ground [by turf-stripping or rotovating] [in the areas shown in MAP REF]. Do not create bare ground on historic or archaeological features. Do not disturb bare ground with [vehicles and/or xxxx].

P114 - Clear-fell trees [in the following areas XXXX] [in the following years XXXX] between [1 September and 1 March] and remove all brash/arising from the site [by METHOD]. Do not uproot trees on historic or archaeological features.

P116 – Remove organic litter from [AREAS] in years [XX] [between DATES] by [METHOD] so that [there is no build-up of leaf litter].

P455 - Manage [dense Bracken stands / mature heather] rotationally in years [1 to X] [by forage harvesting]. Cut bracken by hand on [XXXX] historic and archaeological features.

Where the species occurs on a Lowland Dry Acid/Lowland Calcareous Grassland habitat

Prescription guidance for GS6/7

P42 - [Control] [scrub] [in XXXX] [by cutting] so that [by year [NUMBER]] cover [of the [LOCATION] is no more than [5] %]. [Remove all cut material.]

P667 - [From [year NUMBER /establishment] onwards], manage by [light grazing with

sheep] [to maintain a mosaic/bare ground sward] [so that bare ground is estimated to be between 5 and 25% and tussocky fine-leaved grassland estimated to be between 20 and 50%].

IoS for GS6/7

[in all years] [species Lunar Yellow underwing] [should be present and maintained] on the site

[By year X/ in all years], cover of [tussocky fine-leaved grasses should be between 20% and 50%]

[By year X/ in all years], the average sward height [over winter] should be [between 5-10cm (excluding flowering heads)]

[in all years] Cover of bare ground, [including dry crumbly soil, soft damp soil, bare rock, cobbles, gravel and encrusting lichens] must be between [5% and 25%]. ~~[By year XX, localised patches of bare ground around rabbit warrens must be smaller than 5m x 5m].~~

Where the species occurs on non-priority grassland, Option GS13 should be used according to the prescriptions set out for GS6.

Prescription guidance for SP5/SP8

The best grassland sites seem to be those that are lightly grazed by sheep (sites heavily grazed by cattle known to be unsuitable) combined with disturbance by rabbits to give rise to a mosaic of habitats. Old flowering grassheads should be available for oviposition, so sheep should be excluded from late summer/autumn, but if it is light and the site is big enough then probably other times of year would be acceptable.

Prescription guidance for SP9

It is likely that this species and its foodplant require large areas of land. Early successional stages are required to promote the tussocky grassland mosaic, and some ground disturbance, such as limited turf stripping, may encourage the foodplant and consequently populations of the moth. No management should be undertaken in late summer/autumn. A minimum swipecut of 15cm above soil level in late autumn could be undertaken, this to include the removal of heavy cuttings to avoid litter build up (light mowings from driest sites can be left in situ). Prevention of scrub encroachment may be necessary to maintain open conditions. Restocked forestry areas can be temporarily beneficial for the moth, with bare soil exposed through mechanical tree planting, followed with targeted herbicide application along planted trees (in strips) to prevent coarse grass growth.

The threatened species supplement could be used to create a mosaic of ground disturbance plots based on different methods which provide suitable habitat in the following seasons. A summary of techniques can be found in (Ellis *et al.* 2012).

Prescription guidance for WD2

This species requires tailored management of glades and rides within woodlands to encourage fine-leaved tussocky grassland habitat favoured by this species. A woodland

management plan (PA3) is required to specify the management required at each site. The options available within WD2 in combination with GS6/7 or GS13 and SP9 will deliver the required grassland habitat within woodland involving extensive disturbance.

How to survey/monitor: The best method is to search for larval stages in late winter/early spring by searching after dark. The adult moth can also be found by light trapping, although this does not necessarily indicate breeding at the site as it is a strong flyer.

Further information

See Ellis, S, Bourn, N. & Bulman, C. 2012. *Landscape-scale conservation for butterflies and moths: lessons from the UK*. Butterfly Conservation, Wareham. This contains a chapter entitled Specialist moths in Breckland creating bare ground habitat on a landscape scale (including the Lunar Yellow Underwing), see <http://butterfly-conservation.org/files/landscape-scale-conservation-for-butterflies-and-moths-low-resolution.pdf>

Butterfly Conservation has produced a factsheet on this species, see http://butterfly-conservation.org/files/lunar_yellow_underwing-psf.pdf, and has also produced a number of reports based on annual survey and autecological studies, the last being from 2012.

See also Parsons, M.S. & Haggett, G.M. 2007. The distribution, ecology and conservation of the Lunar Yellow Underwing *Noctua orbona* (Hufnagel) in the Breck District of Norfolk and Suffolk. *Entomologist's Record and Journal of Variation*, **119**: 203-211, and Waring, P. & Townsend M. 2009. *Field Guide to the Moths of Great Britain and Ireland*. British Wildlife Publishing, Gillingham. (Second edition).

Additional information from Haggett G.M. (2011) Lunar Yellow Underwing *Noctua orbona* (Hufnagel), Larval Survey in Norfolk and Suffolk Breckland 2010-2011 Butterfly Conservation, Wareham. (Report No. S11-17):

N. orbona favours open ground sward where young plants of fine-leaved grasses grow without competition and where the adult moth can lay eggs on flower seedheads of those grasses for hatching larvae to move to the well-drained tuft base and for early instars to feed at the very tips of young short blades. Optimum sites are light, well-drained acid or calcareous sandy slopes with the common essential of open sward often with stones or fragments and the total absence of coarse grass or herbaceous cover.

Such sites are now rare in the Breck and occupy but a fraction of the total area of heathland SSSIs.

When favoured sites become overwhelmed by coarse aggressive growth then *N. orbona* is unable to breed there. Its presence then depends upon micro-habitat such as verges of minor roads, tracks and paths that will temporarily support fine-leaved grass to which it migrates, and it will utilise young or stunted bracken growth, advance growth of small stature Bracken of light foliage over fine grasses for example at Froghill MoD. But in the wider area of the Breck heaths that are in the main mown or sheep-grazed its existence is dependent on small pockets of the preferred habitat and in consequence in small populations.

Authorship/version control

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