

**Species name**

Fisher's Estuarine Moth (*Gortyna borelii lunata*)

**Fisher's Estuarine Moth**

Frass volcano at base of Hog's Fennel plant

**Conservation status**

*Annex II; Schedule 5; RDB vulnerable*

**Hog's Fennel****Planting Hog's Fennel****Introduction**

Fisher's Estuarine Moth is reliant on areas of rough grassland where Hog's Fennel (*Peucedanum officinale*), its sole larval foodplant, grows. Long coarse grasses, such as Cock's-foot (*Dactylis glomerata*), Couch (*Elytrigia* spp.) and False Oat-grass (*Arrhenatherum elatius*), are required to fulfil the moth's egg laying requirements.

The optimum habitat for the moth is where there is an abundance of both Hog's Fennel and long coarse grasses. The density of Hog's Fennel across a site is important, it must not be too high, as this will prevent there being the required abundance of grasses for egg laying, or too low, as this will reduce the success of freshly hatched larvae migrating to a Hog's Fennel plant. The most favourable density is one Hog's Fennel plant per m<sup>2</sup>. Hog's Fennel plants must be in at least their third growth year, before they are sufficiently large to fulfil the moth's larval feeding requirements. The plant grows within a range of soil conditions and although in the UK it is naturally found in coastal areas, it will grow well inland.

The moth has an annual life cycle: it is in the egg stage over the winter, from September/October through to April/early May; the larval stage occurs from April through to August; pupation lasts for about a month during August/September and the flight period starts in early September and runs through to about the third week in October.

The larvae are stem borers and feed within the stems of Hog's Fennel from April through to June and then below ground within the plant's rootstock during July and August, when a characteristic 'frass' volcano can be found at the base of plants supporting larvae. Pupation occurs below ground within a bored-out chamber between the rootstock of Hog's Fennel and the surrounding soil.

Fisher's Estuarine Moth has a localised distribution in the UK and is found within just two areas: the north Essex coast and the north Kent coast. In Essex it is found on a number of islands and around the sea wall within the Hamford Water area and this is its stronghold in the UK. In Kent it is known to occur at the Tankerton Slopes, Swalecliffe and Plum Pudding Island near Reculver.

The main areas of habitat where the moth occurs are low lying and vulnerable to coastal flooding and encroachment of salt marsh. Indeed it is thought that the largest population of the moth in the UK, which is found on Skipper's Island in Hamford Water, could be lost at any time as a consequence of flooding. The vulnerability of this site was demonstrated in December 2013, when it was inundated in a tidal surge. The moth's habitat was damaged by the flooding, but has since been showing signs of recovery.

A conservation programme has been in operation in Essex since 2006 that aims to create a landscape-scale network of sites for Fisher's Estuarine Moth that are secure from the threats of flooding. There have been over 25 new areas of habitat for the species created under this project to date, the majority through a bespoke programme set-up under the Higher Level Stewardship scheme. Signs of Fisher's Estuarine Moth's larval feeding have been recorded at the majority of these new areas of habitat and the conservation programme has been very successful. It is planned that the programme will be continued under the new Countryside Stewardship scheme and that it will be extended into areas in Kent where the moth is found.

### **Why a bespoke species?**

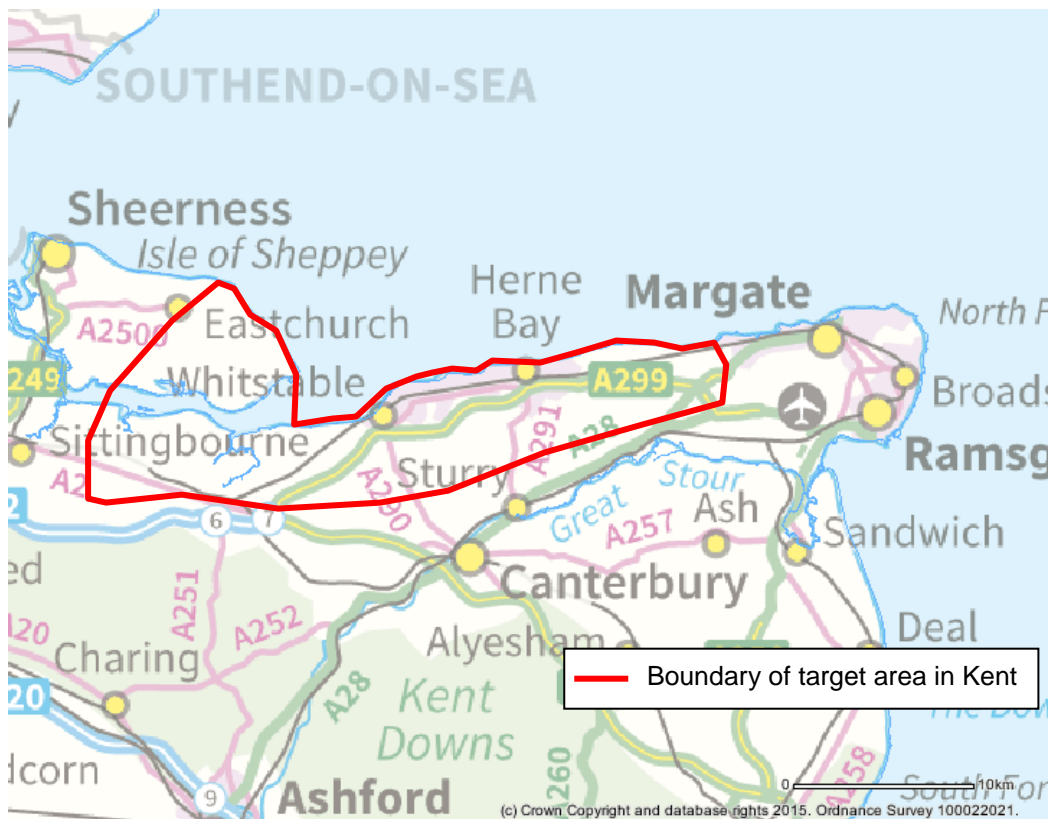
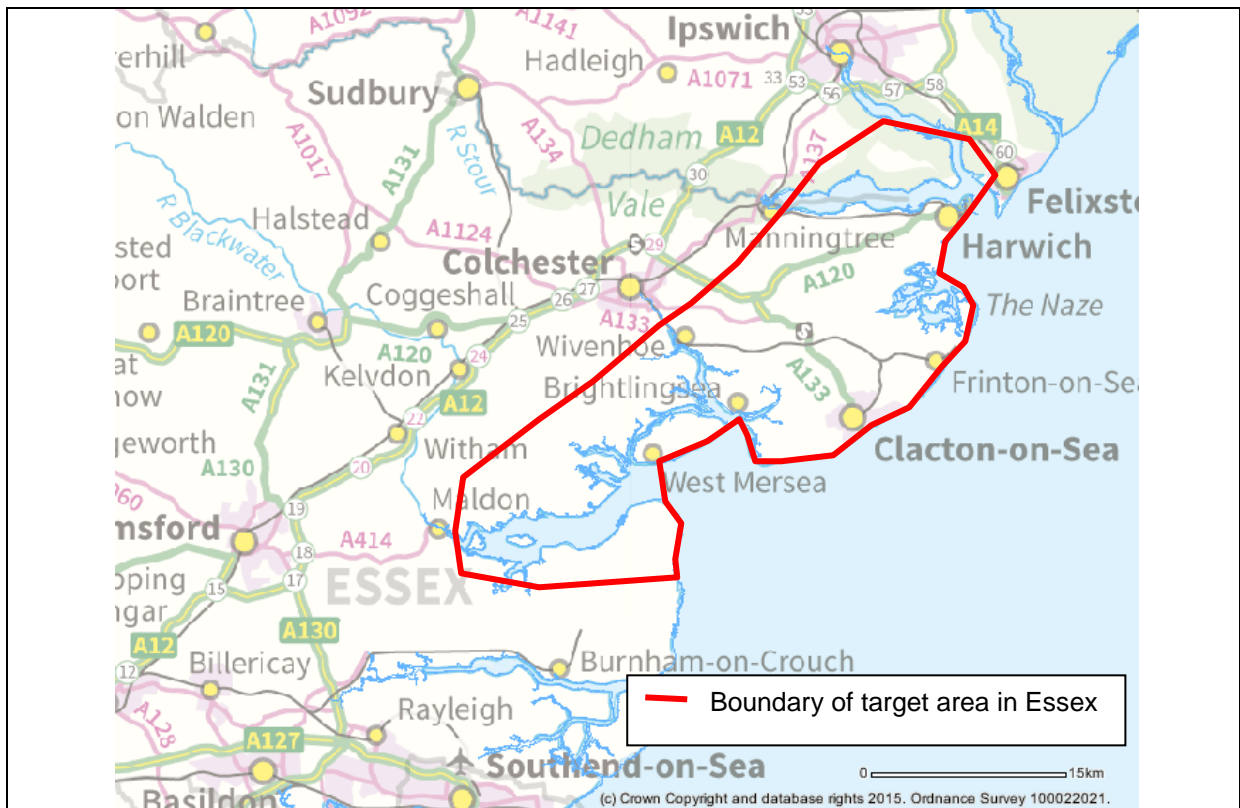
The moth is a specialised species with very specific habitat requirements that require tailored management prescriptions. The required management and degree of complexity will vary according to whether it is an existing area of habitat that requires maintenance/restoration or a new area that needs to be created, either from existing grassland or from bare ground.

### **When and where to apply this guidance**

This guidance can be applied to existing areas where Hog's Fennel grows in Essex

and Kent and also to sites that are suitable for the creation of new areas of habitat. Sites to be considered for the creation of new habitat need to meet the following criteria.

1. They should be located within the target areas for the project in Essex and Kent (see maps below).
2. Sites should not be at risk of flooding in the foreseeable future. They should be located either behind intact coastal defences or above the 5m contour line.
3. To ensure sites are large enough to support a sustainable population of Fisher's Estuarine Moth they must be a minimum of 0.1ha (1000m<sup>2</sup>) in size.
4. Priority should be given to sites within 4km of the nearest site supporting Hog's Fennel, to promote movement of the moth between sites and to prevent isolation.
5. Sites can be either existing grassland or arable reversion.
6. The aspect of a site is generally not important, but it must not be shaded.
7. To avoid problems with scrub encroachment, sites should not be located directly adjacent to hedgerows, scrub or woodland.
8. Due to Fisher's Estuarine Moth's high conservation status (it is a European protected species), careful consideration must be given to locating a site, as once an area supports the moth it becomes a permanent feature. Landowners must be made aware of the long-term commitment they are making.



**Developing a Countryside Stewardship agreement**

The following Countryside Stewardship revenue and capital works options will be suitable for the maintenance and creation of habitat for Fisher's Estuarine Moth.

<b>Option code</b>	<b>Option title</b>	<b>Option use</b>
GS13	Management of grassland for target features	Management of existing areas of habitat and creation of new sites on permanent grassland.
GS14	Creation of grassland for target features	Creating new areas of habitat on arable land.
SP9	Threatened species supplement	All sites managed to benefit Fisher's Estuarine Moth (existing areas of habitat and new sites)
FM2	Major preparatory works for priority habitats and priority species	To cover all site preparation costs, including site preparation for planting; purchase of Hog's Fennel plugs/seed; purchase of native grass seed mix (as required) and planting/establishment costs.
PA1	Implementation plan	Habitat creation sites, especially those being created from bare ground where site-specific preparation work is necessary.
FG1	Fencing	All habitat creation sites
FG2	Sheep netting	All sites adjacent to grazed areas
FG4	Rabbit fencing supplement	All habitat creation sites
FG12	Wooden field gate	All habitat creation sites

SB1	Scrub control and felling of diseased trees	Scrub control necessary to maintain open grassland habitat at existing sites.
SB2	Scrub control – difficult sites	Scrub control on inaccessible areas of habitat (such as Skipper’s Island)
SP1	Difficult sites supplement	Management of habitat on sites that are inaccessible (island sites) and where machinery access is not possible or very difficult.

### **GS13 – Management of grassland for target features**

#### ***Prescription guidance***

P42 - [Control] [scrub] [in the Hog’s Fennel area] [by target cutting and removing between the 1 November and 28 February] so that [by year three] cover [of the scrub across the area is no more than 5]%. [Remove all cut material.]

P513 - Between [1 September to 28 February inclusive] at least [66%] of the total area covered by this option must support grasses that have been allowed to go to seed and with the seed heads left undisturbed.

P667 - [From [year 1 onwards], manage by [\*cutting vegetation between **1 and 25 August** on a three year rotation to control scrub and maintain an open grassland habitat, always leaving at least two thirds of the site uncut in any one year.] [Remove all cuttings that would otherwise damage the sward].

*\*At some sites encroaching scrub should be target cut and removed each year over the winter rather than cutting the site on a three year rotation in August. The prescription wording should be tailored accordingly.*

#### ***Indicators of Success***

[By year 3], species [Hog’s Fennel should be frequent], and flowering during [June to August].

[By year 3] cover of [coarse grasses (Couch, Cock’s-Foot, False Oat-grass, Timothy) should be between 25% and 75%].

[In all years] from [1 September to 28 February] at least [66%] of the whole field

should have grasses that are allowed to go to seed and with the seed heads left undisturbed.

## **GS14 – Creation of grassland for target features**

### ***Prescription guidance***

P420 – [\*In year 1], establish a grassy sward [by sowing the following native seed mix: 40 % Crested Dogstail, 25% Red Fescue, 20% Common Bent and 15% Cock’s-foot]. Establish the grassy sward by [15 October].

*\*Or year two if considerable site preparation is required to get scrub and weeds under control.*

P423 – Establish [Hog’s Fennel by planting plugs or sowing seed, following guidance provided by your Natural England adviser.]

P428 - [Cut vegetation at least four times between April and September in the first growth year after sowing the grass seed mix. In the second growth year cut and remove vegetation in September/October.]

P667 - [From [year 3 onwards], manage by [cutting vegetation between **1 and 25 August** on a three year rotation to control scrub and maintain an open grassland habitat, always leaving at least two thirds of the site uncut in any one year.] [Remove all cuttings that would otherwise damage the sward].

### ***Indicators of Success***

[By year 5], species [Hog’s Fennel should be frequent], and flowering during [June to August].

[By year 5] cover of [coarse grasses (Couch, Cock’s-Foot, False Oat-grass, Timothy) should be between 25% and 75%].

[By year 3] from [1 September to 28 February] at least [66%] of the whole field should have grasses that are allowed to go to seed and with the seed heads left undisturbed.

## **SP9 – Threatened species supplement**

### ***Prescriptions***

P697 - Carry out the management for [Fisher’s Estuarine Moth] [so that by year [5] [habitat conditions are provided] [as set out in the Implementation Plan produced by [name, organisation] dated [date]].

## **FM2 – Major preparatory works for priority habitats and priority species**

### ***Specifications***

S1 [Complete the works as set out in the approved [Implementation plan, produced by [name, organisation] dated [date].]

S2 [Agree a specification for the works with Natural England in Year 1 of your agreement.]

S3 Provide a minimum of \*3 written quotations for completion of the work, identifying associated costs. Agree the selected quotation with Natural England.

S4 [Complete the works as set out in the approved specification with the agreed timescale.]

*\*There is only one grower producing Hog's Fennel plugs for the programme and therefore only one quote will be possible for the purchase of plants.*

## **PA1 – Implementation plan**

### ***Specifications***

S1 Produce an Implementation Plan following the attached brief [name] dated [date] [and guidance for creating habitat for Fisher's Estuarine Moth].

S2 The plan must be submitted to [Natural England] for approval by [date].

### **Site monitoring**

Sites will require monitoring for general habitat conditions, establishment/growth of Hog's Fennel and for signs of Fisher's Estuarine Moth. The monitoring requirements will vary according to whether the site is an existing area of habitat or a newly created area of habitat. The aim is to keep monitoring as simple as possible, so that it can be conducted by agreement holders and inexperienced NE advisers. Monitoring guidelines can be tailored to each site and included as part of the implementation plan, but the general requirements are detailed below.

#### *Existing areas of habitat*

- A walkover survey will be required in July/August to record the abundance of Hog's Fennel plants, % cover of coarse grass and any problems with encroachment of scrub or undesirable species (i.e. Creeping Thistle, Ragwort and Docks) at random stops across the site (the number of stops will depend on the size of the site).
- Signs of Fisher's Estuarine Moth will be recorded by checking an agreed number (depending on size of the site) of Hog's Fennel plants for frass volcanoes in July/August.
- Surveys should be conducted annually.

#### *New areas of habitat*

- The establishment of Hog's Fennel will need to be assessed in April/May and July/August each year for two years following planting plugs/broadcasting



seed. This will be conducted through a walkover survey with random stops (the number will depend on the size of the site) to record the number of Hog's Fennel plants per 4m<sup>2</sup>.

- A site is considered to be successful where at least 70% of Hog's Fennel plugs have established for planted sites or where there are Hog's Fennel seedlings growing across at least two thirds of the site for seeded areas.
- From the third year following planting/broadcasting onwards the site will be surveyed as per existing areas of habitat.

It is anticipated that landowners will have responsibility for monitoring the site under guidance from their NE adviser. The results from monitoring can be discussed during annual aftercare calls/visits and any problems addressed. NE advisers should use the same monitoring technique, together with indicators of success, when conducting Integrated Site Assessments (ISAs).

Further information

### **Existing areas of habitat**

These will be naturally occurring areas where Hog's Fennel grows or areas planted with Hog's Fennel as part of the conservation programme (mainly through HLS agreements). The management aims and requirements at these sites will be as follows:

- Maintain/restore the grassland habitat to promote the required density of Hog's Fennel plants and cover of coarse grass. This may involve planting more Hog's Fennel.
- To maintain the rough grassland habitat it will be necessary to control scrub. The level of intervention necessary will depend on the site in question. Scrub can be controlled through target cutting and removing over the winter, with follow-up spot herbicide treatment as required. Alternatively, sites can be managed on a three year rotational mowing programme, with no more than a third of the site cut in any one year. All mowing needs to be conducted between the 1<sup>st</sup> and 25<sup>th</sup> August, when Fisher's Estuarine Moth is pupating below ground.
- Sites should not be grazed as this is detrimental to populations of Hog's Fennel and Fisher's Estuarine Moth.
- Many areas of habitat are very small (<0.2ha) and management is regularly conducted using hand tools rather than machinery and is therefore more labour intensive than traditional grassland management.

## **Creating new areas of habitat**

From habitat creation trials and success under tailored HLS agreements, we know that we can successfully create habitat for Fisher's Estuarine Moth by planting plugs into suitable grassland or by creating the habitat from bare ground within areas of arable reversion. For new areas of habitat, the following bespoke site management will be required:

### *Creating habitat from bare ground*

- A clean seed bed with a fine tilth should be established. A grass seed mix containing 85% fine grasses and 15% coarse grasses should be autumn sown.
- If establishing Hog's Fennel from seed, this can be broadcast when the grass seed mix is sown. If planting Hog's Fennel plugs, these should be planted at one plant per 1-2m<sup>2</sup> in October/November in the year after the grass seed mix has been sown. The site will also need protecting with rabbit-proof fencing if planting plugs.
- The establishing grassland will require cutting at least four times between April and September in the first year following sowing the grass seed mix.
- In the second year, the whole area should be cut (and the cuttings removed) in September/October.
- From the third year onwards, the grassland should be managed as per existing areas of habitat (see above).

### *Creating habitat on areas of established grassland*

- Any undesirable species (e.g. Creeping Thistle, Ragwort and Nettles) and scrub will need to be controlled prior to commencing establishment of habitat for Fisher's Estuarine Moth.
- Site preparation will involve cutting the grass very short in late summer/early autumn and removing the cuttings. All areas will also need to be protected with rabbit-proof fencing and stock-proof fencing if adjacent areas are grazed.
- Following site preparation, Hog's Fennel plugs will need to be planted at one plant per 1-2m<sup>2</sup> in October/November.
- The whole area should be cut (and the cuttings removed) in the September/October following planting.
- From the second year after planting onwards, the grassland should be managed as per existing areas of habitat (see above).

As well as the specific management requirements detailed above, sites will require monitoring by the agreement holder/NE adviser for establishment of Hog's Fennel, general site conditions and signs of Fisher's Estuarine Moth. If any issues arise it may be necessary to amend management to achieve the desired results.

The species-specific management and monitoring work required for Fisher's Estuarine Moth justifies the need for bespoke species guidance and also use of the threatened species supplement.

Authorship/version control

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