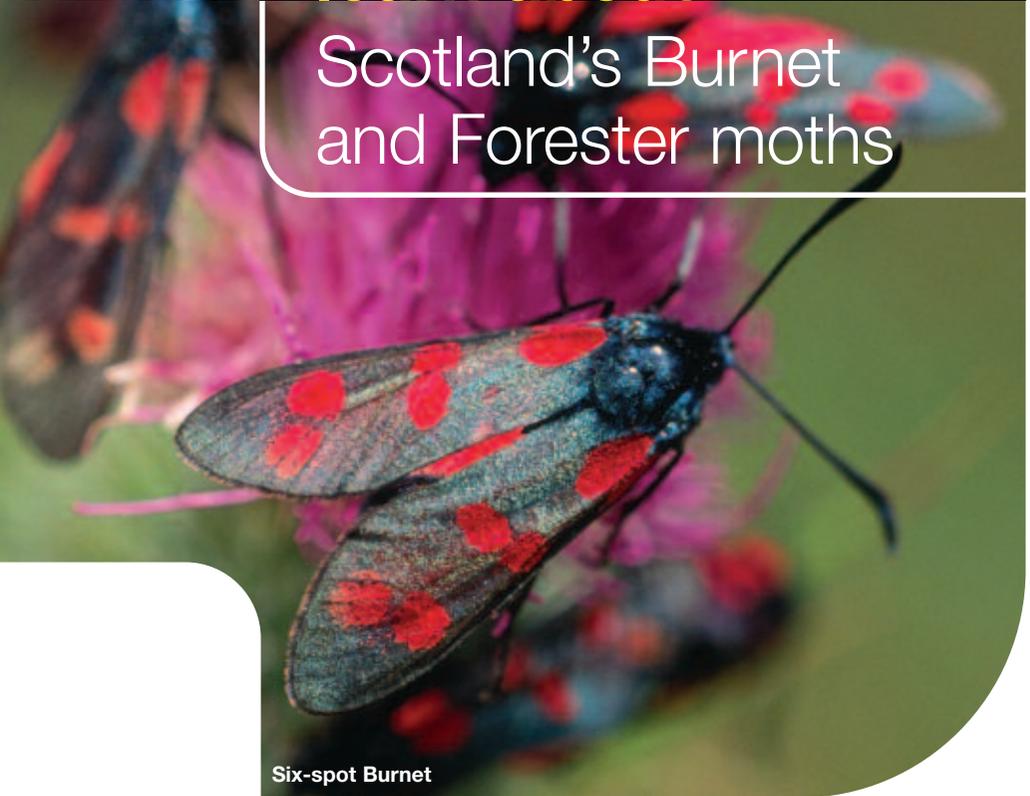




Butterfly
Conservation
Scotland

learn about

Scotland's Burnet and Forester moths



Six-spot Burnet

There are around 800 species of Burnet and Forester moth worldwide. Only ten live in the British Isles with seven in Scotland, (six species of Burnet and one Forester). Five of these are subspecies that are endemic to Scotland *ie* they occur nowhere else in the world!



The specialised habitat of the Scotch Burnet

Their day-flying habits, bright, attractive, crimson warning colours, slow buzzing flight and fondness for nectar, make Burnet moths very conspicuous. They are often mistaken for butterflies.

Only the Six-spot Burnet is widespread, occurring around Scotland's coasts and some inland valleys, all other species have a very localised distribution.

The UK government has listed the Slender Scotch Burnet, New Forest Burnet and Forester moth as UK Biodiversity Action Plan Priority species, in need of urgent conservation action.

The Slender Scotch Burnet is also listed on Scottish Natural Heritage's Species Action Framework, one of 32 species which are the focus of new, targeted management action for five years from 2007.



Burnet look-alikes **Ruby Tiger** left **Cinnabar** top right **Wood Tiger** bottom right

Rarity

Scotland's Burnet moths are some of the most magnificent and rarest insects in the UK. The Slender Scotch Burnet only occurs on Mull and Ulva, the Scotch (or Mountain) Burnet at five to seven colonies in the Cairngorms, the Talisker Burnet from four sites on Skye and the New Forest Burnet, following its extinction in England in 1927, is only known from a single site on the west coast of Scotland.

General

Burnets and Foresters live in discrete and often isolated colonies. Thousands of years of isolation and their limited powers of dispersal have led to the development of new geographical races which differ, often subtly, from each other. Each species has stringent habitat requirements and specific caterpillar foodplants. Both adults and caterpillars frequently bask and therefore require sunny, sheltered sites.

Recognition

Burnets are readily recognisable with crimson (or very rarely yellow) streaks/dots/blotches on a glossy, inky blue/black background. They have jet-black furry bodies and protruding thickish club-like black antennae. Confusion is most likely with the Cinnabar moth which shares the crimson colouration and is also day-flying, but has thin, thread-like antennae. The brightly coloured Tiger moths may also be confused for Burnets. Male and female Burnets are very similar but females have fatter, more rounded bodies, with a pointier end and less powerful flight on slightly smaller wings.

Identification to species requires careful examination of the number, size and shape of the dots/blotches/streaks. See the "On the spot guide" to Burnet identification inside the back cover. The Forester's uniform submetallic green colouration is diagnostic.



Six-spot Burnet mating pair of adults



Scotch Burnet cocoon

Red and yellow for danger!

The day-feeding caterpillars are also brightly coloured with yellow and black dots on a green or greenish-yellow background. These bright colours are warning signs to predators as both adults and caterpillars contain distasteful and toxic cyanide. A hungry bird soon learns this lesson thus reducing predation.

Early stages

The orangey-yellow eggs are laid in batches, usually on the underside of a leaf, and hatch in ten to twelve days. The caterpillars start feeding on the leaf surface before eating the rest of the leaf as they grow larger. All Scotland's Burnet and Foresters over-winter as caterpillars, emerging to resume feeding in the spring, before pupating in the early summer.

Insurance policy

A proportion of the caterpillar population stays in a state of hibernation or diapause for a second or, rarely, a third winter. This is a smart tactic for a sun-loving insect given the vagaries of Scottish summers and also produces a more genetically diverse colony by reducing the risks of in-breeding.

Cocoons

Most species pupate within a characteristic parchment-like whitish-yellow spindle/oval shaped cocoon. Those of the Six-spot and Narrow-bordered Five-spot Burnets are very obvious, placed high-up on stems, advertising the presence of Burnets outwith their flight period. Pupation lasts around a fortnight with the males usually emerging before the females.

Adults

Adults are active during warm or sunny weather, particularly from mid-morning to late afternoon. In poor weather and at night some species rest exposed on flowers and stems.

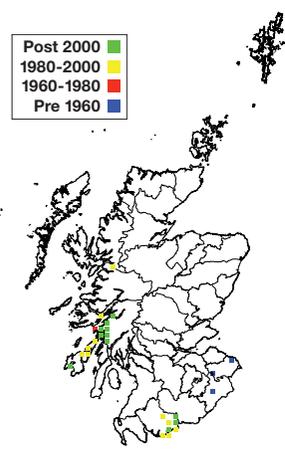
Populations

Colonies can vary in size from 10 to more than 10,000 individuals, whilst there can also be large fluctuations in populations from year to year. This is due to weather, site condition and parasitic flies and wasps, whose maggots feed inside the Burnet moth's caterpillars!

Six-spot Burnet

freshly emerged adult with empty pupal case partly visible out of the top of its papery cocoon





Forester adult

Forester *Adscita statives* (FM)

Adult flight period June to mid-July

Wingspan mm male 25-31, female 22-25

Status local, probably declining. UK BAP Priority species

Scottish distribution

Coastal Argyll and adjacent islands, and south-west Scotland. Old records from the Borders and an isolated single record from north-west Scotland near Shiel Bridge (see map).

British Isles distribution

Local but widely distributed in England and Wales and west coast of Ireland.

ID - Position of spots

Lacks any spots or red colouration.

ID - Other features

Strong submetallic green sheen to forewings and body.

ID - Distinction

Green, no red or spots.

Habitat

Damp meadows, coastal marshes and dry species-rich grassland.

Caterpillar foodplant

Common Sorrel.

Preferred adult nectar plants

Ragged Robin, Wild Thyme, Marsh Thistle and clovers.

Cocoon position

Concealed at base of vegetation.

Cocoon shape and texture

Bluntly spindle-shaped.

Cocoon colour

White.

Habits

Flies in sunshine, during dull weather rests on vegetation.

Management

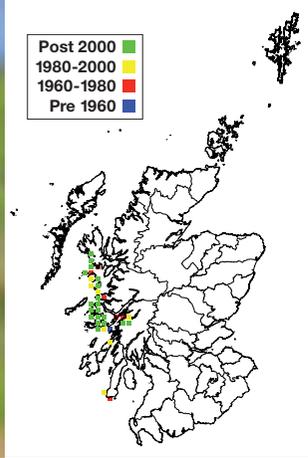
Maintenance of abundant sorrel and nectar plants is essential. This is best achieved through light grazing, whilst a spring/summer grazing break can be beneficial. Both over and under-grazing can be detrimental by reducing sorrel and nectar plants.

Comments

Well camouflaged and thus not as obvious as the Burnet moths. Probably named after the "Lincoln Green" supposedly worn by the foresters in Sherwood Forest. Probably under-recorded.



Transparent Burnet adult



Transparent Burnet caterpillar

Transparent Burnet *Zygaena purpuralis caledonensis* (TrB)

Adult flight period early June to July

Wingspan mm 25-34

Status Nationally Notable A - Na (ie occurs in 16-30 10km squares)

Scottish distribution

The Inner Hebrides from Skye to the northern part of Jura. Also on the mainland around Oban, Ardnamurchan and the south-west tip of the Mull of Kintyre (see map).

British Isles distribution

Endemic subspecies to Scotland.

Welsh subspecies went extinct in 1962.

Absent from England. A different subspecies occurs in the Burren region of western Ireland.

ID - Position of spots (see inside back cover)
Spots replaced by three crimson streaks.

ID - Other features

Wings thinly-scaled giving translucent appearance.

ID - Distinction

Large size, lacks any spots with three crimson streaks.

Habitat

Steep coastal slopes with short turf (<10cm), and limestone areas inland.

Caterpillar foodplant

Wild Thyme.

Preferred adult nectar plants

Wild Thyme.

Cocoon position

Concealed low amongst vegetation.

Cocoon shape and texture

Bluntly spindle-shaped, smooth.

Cocoon colour

Dirty white.

Habits

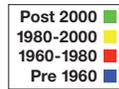
Flies in warm sunshine, rests exposed in poor weather.

Management

Reliant on instability of slopes to maintain sites in early-successional stage and/or moderate grazing to provide bare ground and a short sward. Both over and under-grazing can reduce the abundance of Wild Thyme.

Comments

The thinly-scaled forewings give this species its name. Can be abundant in some years and occurs alongside Slender Scotch Burnet and Talisker Burnet. Probably under-recorded.



Six-spot Burnet adult

Six-spot Burnet *Zygaena filipendulae stephensi* (6SB)

Adult flight period mid-June to late August

Wingspan mm 25-39

Status common, not threatened

Scottish distribution

Widespread around Scottish mainland coast and the Hebrides. Also occurs in the Central Belt and some inland valleys.

British Isles distribution

Common in central and southern England with more coastal distribution in Wales, northern England and Ireland.

ID - Position of spots (see inside back cover)

Six separate crimson spots, but 1 and 2 are close together. Occasionally spots 5 and 6 can be joined and thus superficially very similar to Slender Scotch Burnet.

ID - Other features

Forewings thickly-scaled and opaque.

ID - Distinction

Only species with six spots. Large size, commonest species in Scotland.

Habitat

Wide variety of habitats including dune grasslands, roadside verges and flower-rich meadows.

Caterpillar foodplant

Bird's-foot-trefoil.

Preferred adult nectar plants

Ragwort, angelica, thistles, knapweed.

Cocoon position

Exposed on grass and other stems.

Cocoon shape and texture

Spindle-shaped, irregularly ribbed.

Cocoon colour

Bright yellow to dirty white.

Habits

Flies in warm sunshine and is attracted to a wide variety of flowers. Rests exposed in poor weather.

Management

Requires maintenance of flower-rich areas for nectaring adults and more open areas for caterpillar's foodplant. Many coastal sites do not require management, relying on erosion and deposition. Light grazing is required on more inland/stable sites.

Comments

Britain's commonest Burnet moth but with a predominantly coastal distribution in Scotland. Can occur in huge colonies. Expanding its range inland.



Scotch Burnet caterpillar



Scotch Burnet adult

Scotch (Mountain) Burnet

Zygaena exulans subochracea (SB)

Adult flight period mid June to late July

Wingspan mm 22-33

Status Red Data Book species (RDB3 - Rare)

Scottish distribution

Only known from five to seven colonies on mountain slopes in eastern Cairngorms.

British Isles distribution

Only occurs in Scotland.

ID - Position of spots (see inside back cover)

Five crimson spots; 6 absent, 1 elongate almost reaching 3 and distinctly longer than 2.

ID - Other features

Wings thinly-scaled giving translucent appearance, thickly-haired body.

ID - Distinction

Only montane species, small size.

Habitat

Recent studies have found colonies in three distinct habitats: (a) shortish dry Crowberry heath (the classic habitat), (b) Deergrass/Mat-grass grassland and (c) Blanket bog. Altitude range 650-1050m. Areas of open ground and bare rock may also be important.

Caterpillar foodplant

Mainly Crowberry but also Cowberry, Blaeberry and Heather.

Preferred adult nectar plants

Common Bird's-foot-trefoil, Cowberry and Mountain Everlasting.

Cocoon position

Concealed low amongst vegetation.

Cocoon shape and texture

Bluntly spindle-shaped, rough.

Cocoon colour

Yellowish-white.

Habits

Flies strongly in sunshine and rests concealed low down in vegetation in poor weather.

Management

Severe wind exposure probably maintains sites in the absence of grazing. However, light grazing especially by deer and hares, may be beneficial in preventing heather shading out crowberry.

Comments

First discovered in 1871. Two to three new colonies have been discovered in the last couple of years on nearby hills, proving it to be under-recorded. Despite localised distribution not believed to be threatened, although climate change may pose a threat. The Scotch Burnet is also known as the Mountain Burnet.



Slender Scotch Burnet caterpillar



Slender Scotch Burnet adult

Slender Scotch Burnet *Zygaena loti scotica* (SSB)

Adult flight period mid-June to early July

Wingspan mm 25-30

Status Red Data Book species (RDB3 - Rare)

Species Action Framework species. UK BAP Priority species

Scottish distribution

Only known from five populations on Mull, Ulva and Gometra.

British Isles distribution

Only known from Scotland, where subspecies is endemic.

ID - Position of spots (see inside back cover)

Five crimson spots; 5 and 6 merged to form kidney shaped blotch.

ID - Other features

Wings thinly-scaled giving translucent appearance, thickly-haired body.

ID - Distinction

Yellowish-brown legs, merged outer kidney shaped blotch and translucent wings.

Habitat

South or south-west facing slopes/undercliffs near sea, on short (<25cm) herb-rich grassland, associated with basalt rocks.

Caterpillar foodplant

Common Bird's-foot-trefoil.

Preferred adult nectar plants

Common Bird's-foot-trefoil, Milkwort, Cat's-ear and Wild Thyme.

Cocoon position

Concealed amongst vegetation on/near ground.

Cocoon shape and texture

Oval-shaped, smooth.

Cocoon colour

Dirty white.

Habits

Flies in strong sunshine. In poor weather rests low down and can be difficult to find.

Management

Requires short turf and bare ground. This can be provided in part by inherent instability of sites (ie natural rockfalls/land slips). However, grazing, ideally by cattle, is desirable to poach the ground and prevent vegetation getting too rank.

Comments

Believed to be extinct on Morvern (last recorded in 1945). Undiscovered colonies may exist on Mull's remote coastline. Invasion by cotoneaster and bracken is a problem at some sites.



New Forest Burnet caterpillar



New Forest Burnet adult

New Forest Burnet *Zygaena viciae argyllensis* (NFB)

Adult flight period July

Wingspan mm 21-31

Status Red Data Book species (RDB1 - Endangered) - fully protected
UK BAP Priority species

Scottish distribution

Only known from one site on west coast.

British Isles distribution

Only known from Scotland where subspecies is endemic.

ID - Position of spots (see inside back cover)

Five crimson spots; 6 absent, spot 4 larger than 3 which is small and elongate.

ID - Other features

Forewings thickly-scaled and opaque.
Body thickly-haired.

ID - Distinction

Small size, five clearly defined spots.

Habitat

Steep south-facing grassy slopes with short vegetation (c10cm).

Caterpillar foodplant

Meadow Vetchling and Common Bird's-foot-trefoil.

Preferred adult nectar plants

Wild Thyme.

Cocoon position

Concealed low amongst vegetation.

Cocoon shape and texture

Spindle-shaped, strongly ribbed.

Cocoon colour

Pale yellow.

Habits

Flies in strong sunshine. In poor weather rests low down and can be difficult to find.

Management

Light grazing to promote caterpillar foodplant and prevent vegetation getting too rank. However, overgrazing can be detrimental.

Comments

Became extinct in the New Forest in 1927 and first discovered in western Scotland in 1963. Sympathetic management has increased the population from about 20 in 1990 to peak at over 9,000 in 2003. The latest estimate, in 2010, was just over 3,000.



Talisker Burnet caterpillar

Talisker Burnet a typical site showing steep maritime cliffs

Talisker Burnet *Zygaena Ionicerae jocelynae* (TaB)

Adult flight period end of June through July

Wingspan mm 22-40

Status Red Data Book species (RDB3 - Rare)

Scottish distribution

Four isolated colonies all on Skye.

British Isles distribution

Only known from Scotland where subspecies is endemic.

ID - Position of spots (see inside back cover)

Five separate crimson spots; 6 absent, 3 small, 4 and 5 large. However, often the spots are suffused and occasionally confluent.

ID - Other features

Forewings thickly-scaled and opaque.
Body thickly-haired.

ID - Distinction

Large size, five spots, thickly-haired body, only known from Skye. Spots larger (especially 4 and 5), more suffused and occasionally confluent compared to Narrow-bordered Five-spot Burnet.

Habitat

South to south-west facing steep ungrazed maritime undercliffs with short to tall (5-90cm) vegetation.

Caterpillar foodplant

Primarily Meadow Vetchling but occasionally Bird's-foot-trefoil and clover.

Preferred adult nectar plants

Knapweed, Ragwort, Devil's-bit Scabious, Wild Thyme, Hemp Agrimony.

Cocoon position

Exposed on grass and other stems.

Cocoon shape and texture

Spindle-shaped, irregularly ribbed, rough.

Cocoon colour

Pale whitish-yellow.

Habits

Flies in warm sunshine,
rests exposed in poor weather.

Management

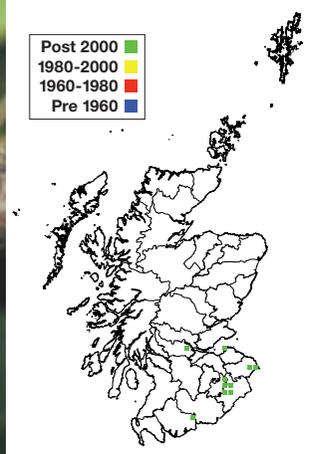
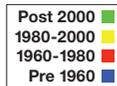
Natural rock falls and soil slippage usually keep occupied sites in suitable condition. The natural instability of sites is therefore important.

Comments

Only recognised as a subspecies with its original discovery on Skye in 1961. Doing well at core site but satellite colonies are probably very small.

Talisker Burnet adult





Narrow-bordered Five-spot Burnet adult

Narrow-bordered Five-spot Burnet

Zygaena lonicerae latomarginata (NB5SB)

Adult flight period late June through July

Wingspan mm 22-40

Status common, not threatened

Scottish distribution

Increasing, with around a dozen colonies in the Borders and Dumfries and Galloway. Moving north with new colonies at Aberlady Bay and near Falkirk (see map).

British Isles distribution

Common in England and parts of north and south Wales. Subspecies *insularis* is widespread in the northern part of Ireland.

ID - Position of spots

 (see opposite)

Five separate crimson spots;
6 absent, 3 small.

ID - Other features

Forewings thickly-scaled and opaque.

ID - Distinction

Large size, five separate clearly defined spots, body not as hairy as Talisker Burnet.

Habitat

Roadside verges/embankments and flower-rich grasslands.

Caterpillar foodplant

Primarily Meadow Vetchling but occasionally Bird's-foot-trefoil and Clover.

Preferred adult nectar plants

Ragwort, angelica, thistles, knapweed.

Cocoon position

Exposed on grass and other stems.

Cocoon shape and texture

Spindle-shaped, irregularly ribbed, rough.

Cocoon colour

Pale whitish-yellow.

Habits

Flies in warm sunshine and is attracted to a wide variety of flowers, rests exposed in poor weather.

Management

Late summer cutting of verges/embankments and light seasonal grazing of meadows to promote flower-richness.

Comments

Slowly colonising and increasing in the Borders, Dumfries and Galloway and the Central Belt.

Identification

Burnet moth identification often requires close observation of several individuals at each colony due to the potential variability within species, and similarity between species. The approachability of Burnet moths makes identification from photographs possible in most situations.

‘On the spot’ guide to Burnet identification

FIVE CLEAR SPOTS (fig a)

Scotch Burnet

Five crimson spots; **6** absent, **1** elongate almost reaching **3** and distinctly longer than **2**.

Slender Scotch Burnet

Five crimson spots; **5** and **6** merged to form kidney shaped blotch.

New Forest Burnet

Five crimson spots; **6** absent, spot **4** larger than **3** which is small and elongate.

Talisker Burnet

Five crimson spots; **6** absent, **3** small, **4** and **5** large. Spots larger (especially **4** and **5**), more suffused and often confluent compared to **NB5SB**.

Narrow-bordered Five-spot Burnet

Five separate clearly defined crimson spots; **6** absent, **3** small, **4** and **5** large.

SIX CLEAR SPOTS (fig b)

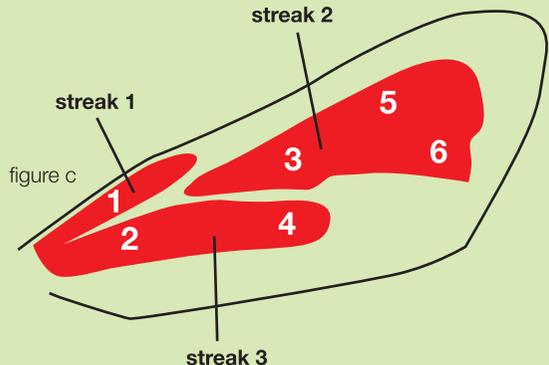
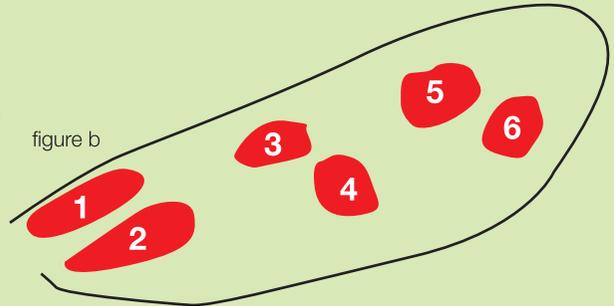
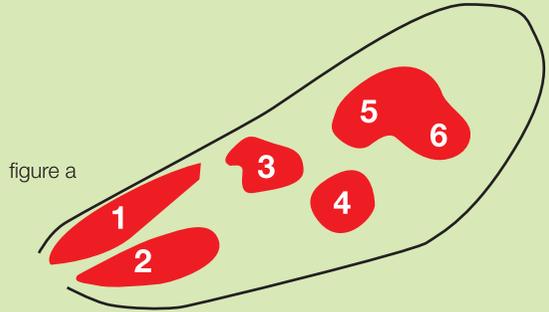
Six-spot Burnet

Six separate crimson spots; but **1** and **2** can be close together.

MERGED SPOTS (fig c)

Transparent Burnet

Spots replaced by three crimson streaks; **1** streak, **2** and **4** streak, **3**, **5** and **6** streak.



Recording

All of Scotland's Burnet and Forester moths are under-recorded, so we welcome any records of sightings. Please post or email details of species, site name, date, approximate number seen and six-figure grid reference to our office in Stirling (see address below). Information on identification, habitat requirements and management of Scotland's seven Burnet moths and the Forester moth can be found inside.

Butterfly Conservation is a UK charity, with 15,000 members (over 1000 in Scotland). We work closely with local communities, landowners, the Scottish Government, Scottish Natural Heritage and other conservation partners to safeguard Scotland's butterflies and moths and their habitats, by:

- ◆ Advising landowners on managing land for butterflies and moths.
- ◆ Carrying out surveys, monitoring and research on our most threatened species.
- ◆ Training volunteers to enable them to take action for butterflies and moths.
- ◆ Making recommendations to the Scottish Government on its environmental policies.
- ◆ Encouraging everyone to cherish and enjoy butterflies and moths.

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