

Why Are Moths Important?

Moths are a fascinating but sadly over-looked group of insects that receive much less attention than their showy butterfly cousins. As a result there is a dearth of information about them. Many moths have exacting requirements, discrete flight periods and their caterpillars often feed on only one foodplant. Moths are an essential part of our ecosystem and a fundamental ingredient in the foodchain for many species. Many common birds, eg great tits, feed their young almost exclusively on moth caterpillars, whilst adult moths are preyed upon by bats. Moths are also important pollinators, and play a vital role as the canaries of our countryside, being sensitive indicators quick to respond to changes to our environment. It is, therefore, concerning that a recent study undertaken by Butterfly Conservation and Rothamsted Research found that two-thirds of common and widespread moths in Britain showed a decline in their population over the last 35 years. However, in Scotland fewer species are believed to be in decline and several are increasing in both number and range.

Why Not Join Butterfly Conservation!

Butterfly Conservation is the UK charity taking action to save butterflies, moths and their habitats. You can directly support us by joining Butterfly Conservation. Annual membership entitles you to an informative welcome pack and our colourful magazine 'Butterfly' three times a year. It also includes membership of your local BC branch who organise field trips and talks. For a membership form or for further information, please contact us or visit our website.



**Butterfly
Conservation
Scotland**

Saving butterflies, moths and their habitats

Butterfly Conservation Scotland Balallan House 24 Allan Park Stirling FK8 2QG

Email: scotland@butterfly-conservation.org Tel: 0870 770 6151

www.butterfly-conservation.org



This leaflet was produced by Butterfly Conservation Scotland with financial support from Cairngorms National Park Authority, The European Community through the Cairngorms, North Highland and WELK (Lochaber) LEADER+ Programmes, The Heritage Lottery Fund through the Nadair Trust, The Scottish Executive and Scottish Natural Heritage.

Text by Tom Prescott Photographs by Roy Leverton, Mark Parsons and Paul Pugh

Butterfly Conservation is a registered charity and non-profit making company, limited by guarantee.

Registered Office: Manor Yard, East Lulworth, Wareham, Dorset, BH20 5QP

Registered in England No. 2206468 - Registered Charity No. 254937

Designed and produced by cellcreative 01942 681648

Recording Moths

There are significant gaps in our knowledge of the current distribution and changes in Scotland's moth populations. Even common and easily recognisable species are under-recorded. We need your help to overcome this.

A National Moth Recording Scheme (NMRS) has recently (2006) been set up, led by Butterfly Conservation. Now is the perfect time to get involved whether you are a new recruit or a stalwart moth-er. For more information visit www.mothrecording.org.uk

Moth records should be submitted to your County Moth Recorder. A current list can be found at www.butterfly-conservation.org/bcuk/scotland/records/moths The following minimum information is required; species name, six-figure grid reference, location name, date and your contact details.

Butterfly Conservation would like to acknowledge the support of the following Business Friends of the NMRS, some of whom are suppliers of moth equipment and books.

- ◆ Anglian Lepidopterist Supplies: www.angleps.btinternet.co.uk
- ◆ Apollo Books: www.apollobooks.com
- ◆ B and S Entomological Services: www.entomology.org.uk
- ◆ British Wildlife Publishing: www.britishwildlife.com
- ◆ Cell Creative: www.cellcreative.com
- ◆ Mapmate: www.mapmate.co.uk
- ◆ Watkins and Doncaster: www.watdon.com

Moth-ers Welfare!

Keep yourself safe by...

- ◆ Avoid looking directly at MV-bulbs, consider using sunglasses with UV protection!
- ◆ Do not use cracked or damaged bulbs, check before use.
- ◆ Use waterproof connections and use a rain-shield to protect the bulb.
- ◆ Don't touch MV-bulbs, they get very hot!
- ◆ Ensure trap is plugged into mains via a RCD (earth leakage trip).
- ◆ Beware of any wasps and hornets that may be attracted to sugar, wine ropes and moth-traps.
- ◆ Be prepared for midges!

Want to know more..?

The following books are recommended to help identify macro-moths

Colour Identification Guide to the Moths of the British Isles B.Skinner (1998). A comprehensive photographic guide to all macro-moths of the British Isles. ISBN 0-670-80354-5

Field Guide to the Moths of Great Britain and Ireland P.Waring & M.Townsend, (2003). Illustrated by R.Lewington, it shows all macro-moths in their natural resting postures. ISBN 0-953-13991-3

The following web site can also help with identification

www.ukmoths.org.uk

For more general information about moths and mothing read

Enjoying Moths
R.Leverton (2001). A good introduction to moths and mothing. ISBN 0-85661-124-7

The Natural History of Moths
M.Young (1997). Provides a broad picture of moth biology and ecology. ISBN 0-85661-103-4

No	Species	Month Flying	Best found	Size	Habitat
1	"Grass moth"	6-8	L, FBD, DBD	20-24	Everywhere
2	Six-spot Burnet	6-8	FBD	15-19	Gr
3	Silver-ground Carpet	6-8	L, DBD	14-17	H,S,W,Ga,M
4	Yellow Shell	6-8	DBD	13-16	F,H,S,W,Gr
5	Dark/Common Marbled Carpet	6-9	L, DBD, FAR, occ S & N	14-19	H,S,W,Ga,M
6	Grey Pine Carpet	5-9	L, DBD	13-17	W,P,Ga
7	July Highflyer	7-9	L, DBD	14-18	F,S,Ga,H,W
8	Winter Moth	10-1	L, DBD, FAR	13-16	Everywhere
9	Common Pug	5-6	L	10-12	F,S,Ga,H,W,Ga
10	Chimney Sweeper	6-8	FBD	12-15	Gr,H,W,S
11	Magpie	7-8	DBD, L, FAR	18-25	Ga,W,S,M
12	Clouded Border	6-7	FBD, L	11-14	W,S,F
13	Brimstone Moth	5-7	L, DBD	14-21	H,Ga,W,S,Gr
14	Early Thorn	5-6	L	14-23	W,S,Ga,H
15	Peppered Moth	5-8	L	22-28	W,S,Ga,H
16	Mottled Beauty	6-8	L, FAR, DBD, N	19-26	W,M,S,H,Ga
17	Common Heath	5-6	FBD, DBD	12-15	M
18	Common White Wave	6-7	L, FAR, DBD	15-17	W,S
19	Light Emerald	6-8	L, DBD	18-26	W,S,Ga
20	Poplar Hawk-moth	5-7	L	30-46	W,S,Ga,M,F
21	Lesser Swallow Prominent	5-8	L	20-26	W,M,G,S
22	Garden Tiger	7-8	L	17-20	M,S,Ga,Gr
23	White Ermine	6-7	L	18-23	Ga,H,Gr,M,M,S
24	Large Yellow Underwing	6-10	L, N, S, DBD	1-26	Everywhere
25	Square-spot Rustic	8-10	L, N, S	14-17	W,M,S,F,Gr,Ga,H
26	Bright-line Brown-eye	6-7	L, N, S	14-19	W,M,S,F,Gr,Ga,H
27	Antler Moth	7-9	L, N, S, FBD	12-17	Gr,M
28	Hebrew Character	3-6	L, N, S	15-17	Everywhere
29	Smoky Wainscot	7-8	L, N, S	14-18	Gr,F,Ga,M
30	Sallow	8-9	L,S	14-17	W,S,F,M,Ga
31	Angle Shades	5-10	L,S,FBD	21-25	Everywhere
32	Dark Arches	7-8	L, N, S	19-26	Everywhere
33	Burnished Brass	6-8	L, N	16-19	Gr,Ga,H,F,W,S
34	Silver Y	5-10	L, N, S, FBD	13-21	Everywhere
35	Herald	8-11 & 3-5	L,S	19-23	W,S,Ga,H,F
36	Snout	6-8	L, N, S, DBD	15-19	W,S,H,Ga,F

Key **Best found** L=Light, N=Nectar, S=Sugar, FBD=Flies by day, DBD=Disturbed by day from long
Size = forewing length in mm **Habitat** F=Fen, Gr=Grassland, Ga=Garden, H=Hedgerow, M=Skinner
plate no. illustrated in Colour Identification Guide to the Moths of the British Isles **Wa**

Caterpillar foodplant	Status in Scotland	Comment
Grasses	Abundant	One of 2-3 species
Bird's-foot trefoil	Common on coasts, not Orkney & Shetland	Scotland's common
Herbaceous plants including cleavers & primrose	Very common	Commonest "Carpet
Cleavers & bedstraws	Common	Quite variable in win
Many including heathers, blaeberry, birch, bramble & willow	Very common	Both species are ext
Coniferous trees	Very common except Shetland	Very similar to equal
Hazels, willows, blaeberry & heather	Very common	Very variable & com
Trees & heather	Abundant	Female flightless, ca
Flowers & leaves of low growing plants & leaves of broadleaved trees	Very common except Shetland	One of around 20 su
Pignut	Common on mainland & Mull	Unmistakeable, thou
Broad-leaved trees & heather	Abundant in north & west, becoming very scarce in east and south	Occurs in vast numb
Aspen & willows	Common except Orkney & Shetland	Distinctive, slight var
Blackthorn, hawthorn & rowan	Common except Shetland	Unmistakeable all ye
Deciduous trees	Common mainland & Orkney	Commonest of the 'C
Mainly deciduous trees	Common except Orkney, Shetland & Outer Hebrides	Famous for the dark
Wide range of woody plants	Common except Orkney & Shetland	By far the commone
Heathers	Abundant on moorland except Shetland	An abundant day-fly
Birch, alder & willows	Common except Orkney & Shetland	Very similar to the al
Wide range of broadleaved trees	Common except Shetland	Greenish colour soo
Aspen, poplars & willows	Common except Shetland & Western Isles	Commonest Hawk-r
Birch	Common except outer isles	Most widespread of
Herbaceous plants especially dock	Common except Shetland	Has declined marke
Herbaceous plants	Common except Shetland	Similar to almost eq
Herbaceous plants & grasses	Abundant	Size & shape diagno
Mainly grasses but also herbaceous plants	Very common	Markings often obsc
Wide range of herbaceous plants	Common	Little variation, main
Grasses especially tough species	Common in suitable habitat	Unmistakeable with
Wide range of broadleaved trees & herbaceous plants	Abundant	Unmistakeable sprin
Grasses especially cock's-foot & reed	Common	Commonest of the 'C
Willows & aspen	Common	Commonest of a nu
Herbaceous & woody plants	Widespread & common	Unmistakeable, has
Grasses	Abundant	Quite variable in col
Mainly nettle	Common	Distinctive shiny met
Low-growing plants	Can be abundant	A migrant that can b
Willows & aspen	Common	Unmistakeable, hibe
Nettle	Abundant except Shetland & Western Isles	Distinctive shape, re

veg, low branches, FAR=Found at rest during day on trunks, fence posts etc
Moorland, P=Plantation, S=Scrub, W=Woodland

ring page no. illustrated in Field Guide to the Moths of Great Britain and Ireland

	Skinner	Waring
of micro moth found in all grassy places, rests vertically on stems by day	-	-
rest Burnet moth, only one with 6 spots	2	47
" moth, similar to Common Carpet, Garden Carpet & others in family	7	134
g shade but pattern consistent	7	135
extremely variable & difficult to tell apart	8	137
y widespread Pine Carpet & Spruce Carpet	8	137
monest of the three species of Highflyer	9	138
n locally defoliate plantations & moorland	9	140
superficially similar species, beginners rarely identify to species	10	142
igh often confused for a dark Common Blue butterfly	11	145
pers on moorland in north & west Scotland	11	146
iation in wing pattern	12	146
ellow moth	11	147
'Thorns', rests with wings held closed over back	13	148
er (melanic) form becoming dominant in industrial areas	14	151
est of the 'Beautys'	16	153
ing moorland moth	17	155
most as common Common Wave but whiter with silvery as opposed to brownish cross-lines	17	56
n fades	17	156
moth, found almost everywhere the foodplant grows	19	226
the 'Prominents' & very similar to Swallow Prominent	20	229
ly in England, still widespread in Scotland	23	233
ually common Buff Ermine	23	234
ostic, commonest of the 'Yellow Underwings'	26	313
ure & difficult to see	28	315
confusion species, in name only, is Brown-line Bright-eye!	29	317
"antler" mark on wing	30	17
g species with characteristic gothic mark on centre of wing	31	318
Wainscots', distinguished by smoky-grey hindwings	31	319
ember of yellowish autumn moths	34	324
distinctive folds in wings with scalloped ends	36	326
our but markings consistent	37	327
allic brassy yellow/green markings	41	334
be extremely abundant in good years	41	334
rnates as an adult	41	337
adily disturbed from traps in the morning	42	338



Butterfly
Conservation
Scotland

learn about

Scotland's common moths



Yellow Shell

Scotland has only 33 butterflies but over 1300 different moths! They can be found everywhere from sandy shores to the tops of Scotland's highest mountains. Even a small urban garden can be home to around 100 species. In fact, wherever there are plants there will be moths! Moths are fascinating and very easy to observe and study. This leaflet will help you identify some of the commonest and show you what you need to start "mothing".

Moths have the same life-cycle as butterflies with four stages;

1. Egg (ovum)
2. Caterpillar (larva)
3. Pupa (chrysalis)
4. Adult (imago)

They also both belong to the same order **Lepidoptera** derived from the Greek '*lepis*' = scale and '*pteron*' = wing, and have two pairs of wings.

Moth Myths

1. **All moths are dull, brown and less colourful than butterflies.**
This is simply not true! Several moths are very brightly coloured whilst others are cryptically marked and beautifully camouflaged.
2. **All moths fly at night.**
Most species do but many only fly during the day, or fly both by day and night.
3. **Only butterflies have clubbed antennae.**
Almost true, but the day-flying Burnet moths are the main exception to this rule possessing club-like antennae.
4. **All moths eat clothes!**
In Scotland only 3 or 4 of the c1300 species of moths do so and they prefer dirty clothes hidden away in the dark, and don't like being disturbed or spring-cleaned!

Macro or Micro?

Moths are artificially divided into two groups; the **macros** (larger) and **micros** (smaller). Moths in families comprising predominantly large moths being the **macros**, the rest being predominantly small moths are the **micros**. However, in reality some individual **micros** are in fact bigger than some **macros**! Nonetheless, this division is very convenient, particularly for beginners. In Scotland there are approximately 500 **macros** and 800 **micros**.



Identification of most **macros** is relatively straightforward only requiring patience, perseverance and little specialist knowledge. They all have common names and can be found within the pages of a single guidebook. By contrast most **micros** only have scientific names and are covered in several specialist books. It is not surprising, therefore, that the majority of beginners start with the **macros** only moving on to the **micros** once their experience and confidence has increased.

First Catch Your Moth

- ◆ More moths are active on mild, cloudy, still nights with no moon.
- ◆ Steady drizzle can be good, but cold nights, heavy rain and strong winds are best avoided.
- ◆ Look for moths throughout the year as different species are on the wing at different times of year, although more appear in the summer.

There are several methods that can be used to find moths, none of these kill or are harmful to moths.

1. Natural Attractants

Most nectar plants that attract butterflies will also attract moths both at night and day. Simply search suitable flowering plants particularly for an hour or two after dusk using a torch. The most attractive to moths are sallow blossom, ragwort, buddleia, night-scented stock, hemp agrimony, sweet william and over-ripe blackberries.

2. Sugaring

Moths can also be attracted to artificial nectar called "sugar". To make "sugar" you will need.

- ◆ 454g tin of black treacle.
- ◆ 1Kg brown sugar, (the darker the better).
- ◆ 500ml brown ale (for the moths not you!).
- ◆ Paint brush.

Slowly heat the ale in a large pan and simmer for five minutes. Stir in and dissolve the sugar, followed by the treacle and then simmer for two minutes. Allow to cool before decanting into a container. Fizzy drinks like Cola or Irn Bru may be used in place of the ale. A drop of rum stirred in just before use is recommended but not essential.

Paint the mixture at eye level onto 10-20 tree trunks or fence posts just before dusk and check for moths by torch-light for the first two hours of darkness.

Sugaring is notoriously fickle, giving different results on apparently similar nights. However, it tends to work better when used regularly.

3. Wine Ropes

This is an alternative method to sugaring. You will need.

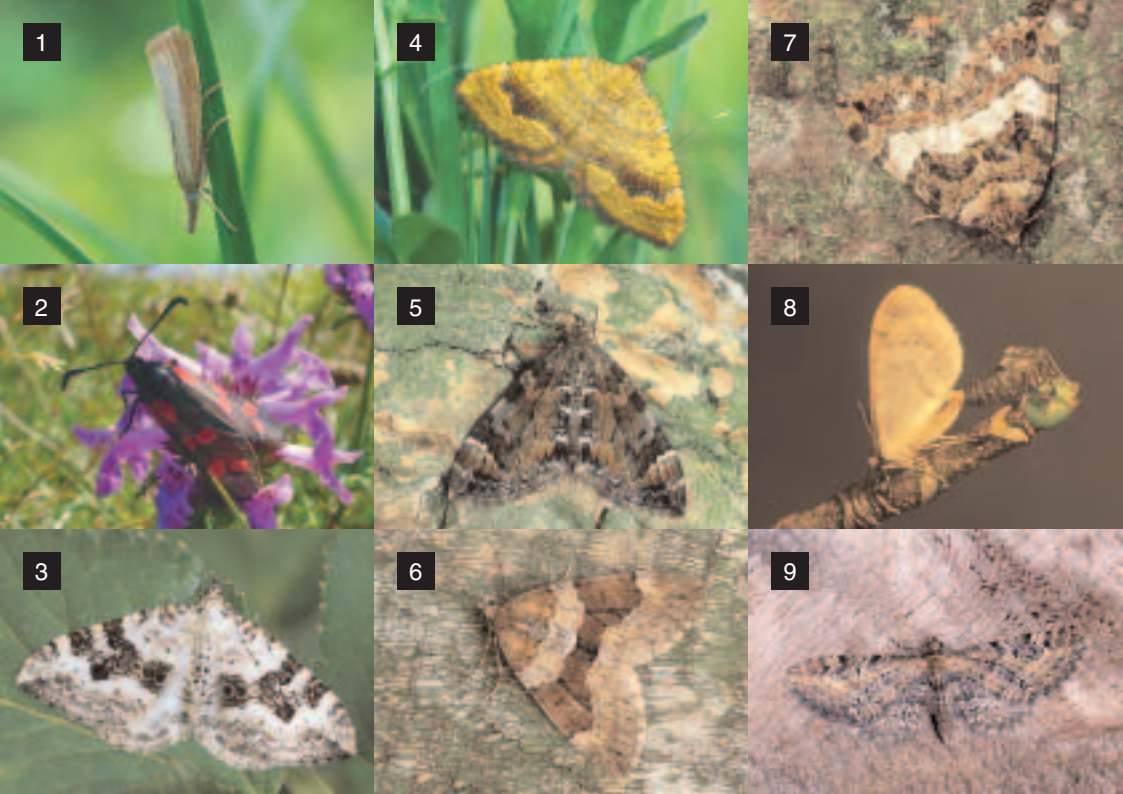
- ◆ Bottle of cheap red wine (definitely not for you!).
- ◆ 1Kg sugar.
- ◆ 1m lengths of untreated thick cord or light rope made from absorbent material.

Heat the wine and stir in and dissolve the sugar. Allow to cool and soak the lengths of rope. Drape the "wine ropes" over low branches, bushes or fences just before dusk and check for moths by torch-light for the first two hours of darkness.

4. Light

It is well known that moths are attracted to lights at night, although the reasons for this are unclear. Leave outside and porch lights on after dark. Check lit windows, walls and fences for moths during first two hours of darkness and again in the morning. You can make lit surfaces more attractive by draping a white sheet over them.

However, it is more effective and efficient to use specifically designed moth-traps. A trap run on a muggy night in July/August can easily catch over a thousand moths comprising up to one hundred different species! There are three common kinds of light-trap available, the Heath, the Skinner and the Robinson. The following bullet points summarise the pros ◆ and cons ◆ of each.



Heath trap *A vertical fluorescent tube producing ultra-violet light, set on a rectangular box.*

- ◆ Powered by 12V battery or the mains so can be used away from mains power.
- ◆ Light and can flat-pack for storage and transport.
- ◆ Cheapest trap.
- ◆ Attracts significantly fewer moths than the other two models (could be an advantage for the beginner) but still a good variety.

Skinner trap *In essence a larger version of the Heath trap with option of two bulbs; a horizontal fluorescent tube or an MV (mercury vapour) bulb.*

- ◆ MV version can catch as many moths as a Robinson.
- ◆ Actinic version can be used away from mains power.
- ◆ Easy to open and observe catch.
- ◆ Can be collapsed when not in use and for transport.
- ◆ Cheaper than a Robinson trap.
- ◆ MV version requires mains electricity or a generator.
- ◆ Actinic version attracts fewer moths.
- ◆ Moths sometimes escape once caught.

Robinson trap *An MV (mercury vapour) bulb set on a round, plastic container.*

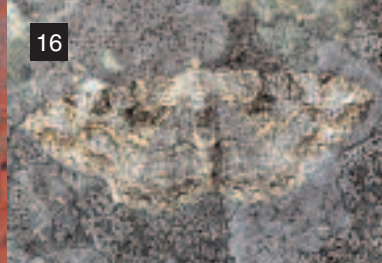
- ◆ Catches large numbers of moths which tend not to escape.
- ◆ Perhaps the most efficient trap.
- ◆ Does not collapse so takes up a lot of room when not in use and to transport.
- ◆ Requires mains electricity or a generator.
- ◆ Expensive.



10



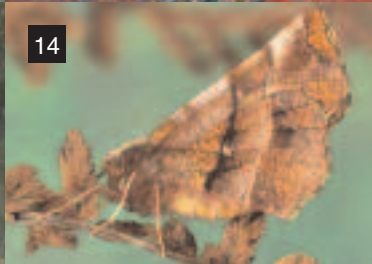
13



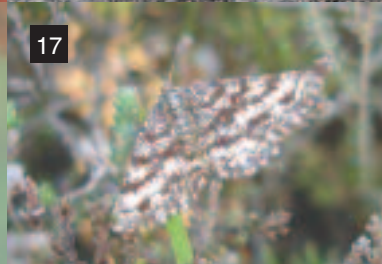
16



11



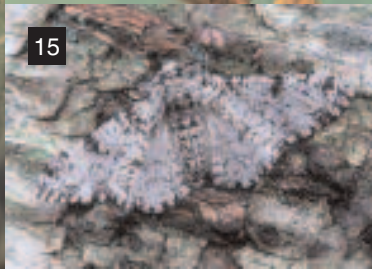
14



17



12



15



18

Moth-trap Top-tips

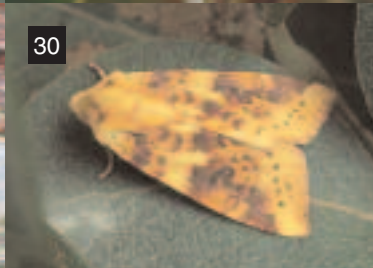
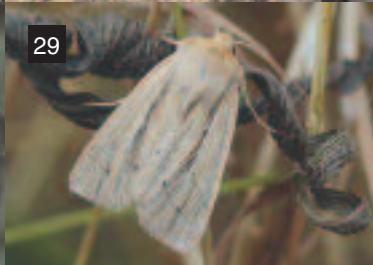
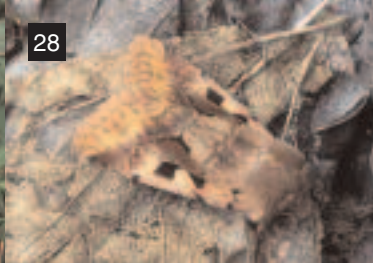
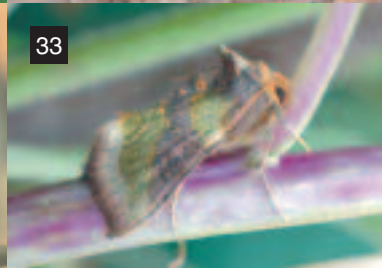
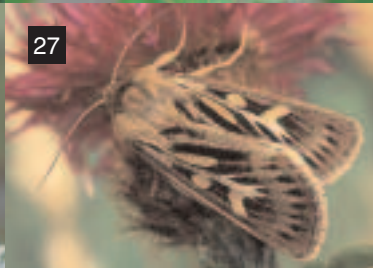
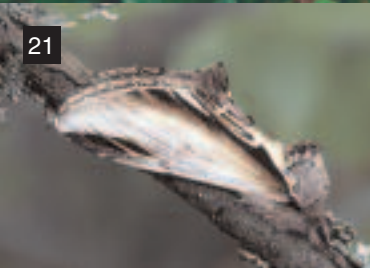
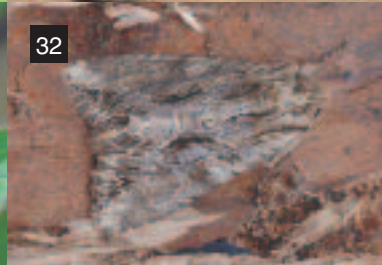
The principles of using any moth-trap are similar.

- ◆ Fill the trap with cardboard egg boxes/trays, to provide rough surfaces and dark crannies where moths can hide.
- ◆ Place the trap on an old white sheet, spread out on the ground to prevent moths that land short being trampled on when checking the trap.
- ◆ Set away from other light sources eg street lights.
- ◆ Set the trap on habitat boundaries to catch a broader mix of species.
- ◆ Keep the light on all night, you will lose most of your catch if not!
- ◆ Check the trap before the sun shines directly on it, heating and unsettling those inside, or choose a site shaded from the early morning sun.
- ◆ If you don't have time to check the catch early in the morning move the trap to a cool, shaded position. Block the entrance and cover the trap with a sheet.
- ◆ Don't forget to check for moths around the trap as well as in it!

5. Other Techniques

Not all moths fly at night or are attracted to light, nectar or 'sugar'. Sampling an area by these methods alone will, therefore, not pick-up all species. You can also try...

- ◆ Day-time and dusk searches netting naturally flying adults.
- ◆ Searching for and rearing caterpillars through to adulthood.



Moth Welfare

- ◆ Avoid handling moths as you may damage them.
- ◆ Put moths in clear containers for close inspection.
- ◆ Only one moth per container and ensure it can move around freely.
- ◆ A sharp tap will usually dislodge moths from egg trays into containers.
- ◆ Keep potted moths in a cool place (ie fridge) to prevent them becoming active and rubbing off their scales.
- ◆ Try to avoid regularly trapping on consecutive nights to prevent repeatedly recapturing the same individuals.
- ◆ Release moths away from the trap, ideally at dusk, in long/thick vegetation.
- ◆ Garden birds will soon learn to feast upon moths lying outside the trap or at release sites so...
- ◆ Check your trap as early as possible in the morning.
- ◆ Or cover with a sheet at dawn and put the trap in the shade.
- ◆ Or try to discourage birds by placing a plastic snake or owl nearby!

National Moth Night

This is a celebration of Britain's moths and moth recording. It has taken place annually since 1999, the date varying each year in order to focus recording effort on different species. The event is run jointly by Butterfly Conservation and Atropos, a journal for butterfly, moth and dragonfly enthusiasts. For more information visit:

www.nationalmothnight.info

Moth Identification

One of the first steps in moth identification is recognising the commoner species. As an aid, details and photographs of 36 of Scotland's commonest and more distinctive moths are provided within this leaflet. All species are likely to be encountered by beginners almost anywhere in Scotland. Some moths are renowned for being extremely variable particularly in colour, pattern and even size. Also as moths age they lose wing-scales and become less well-marked making identification more difficult. Some moths are very difficult to tell apart and even puzzle the experts, so don't expect to be able to identify every moth you find!

Top ID Tips

- ◆ Buy a good identification guide.
- ◆ Always have some clear containers to hand.
- ◆ Wing shape and pattern are often more helpful than colour.
- ◆ Check flight period, distribution, foodplants and habitats.
- ◆ Start early in the season (April) when fewer species are on the wing.
- ◆ Look for moths regularly so that you become acquainted with the commoner or better marked species.
- ◆ Don't be afraid to ask for help from your County Moth Recorder or others, ideally with the moth still available.
- ◆ Identification from photographs is possible for most species.
- ◆ Moths will remain alive in a container in the fridge for a day or two while you ponder their identity.
- ◆ Above all have fun and appreciate them whether you know their name or not!