

# Wildlife of a Locked Spring

Wildlife recorded in the houses and gardens of Ayrshire and Dumfries & Galloway during the COVID-19 coronavirus lockdown in April and May 2020.

## 1. Introduction

On 23 March 2020, Prime Minister Boris Johnson made a public announcement regarding the spread of COVID-19 into the UK, banning all non-essential travel and contact with people outside the home (including family), and closing almost all schools, businesses and amenities. Those with symptoms, and their household, were told to self-isolate, while the most vulnerable were required to shield themselves. People were ordered to keep apart in public and the Police were empowered to enforce the regulations. The situation was popularly termed 'the lockdown'.

Coronavirus is believed to have originated in China in 2019, but by early 2020 had spread to other countries. On 11 March 2020, the World Health Organisation declared a COVID-19 pandemic, the name given to the disease associated with the virus.

Staff from South West Scotland Environmental Information Centre (SWSEIC) had begun working from home on 17 March but following the lockdown addressed the need to cancel or indefinitely postpone all SWSEIC public events planned for the summer of 2020. Upon completion of that task, staff began to consider safe alternatives that would allow wildlife recording to continue.

## 2. The Wildlife at Home Challenge

### 2.1 Concept

The Wildlife at Home Challenge was devised to encourage wildlife recorders to keep submitting records to SWSEIC, despite being largely confined to their house and garden. It was not devised as a project to investigate the wildlife of house and garden.

The Wildlife at Home Challenge was launched in the SWSEIC monthly e-newsletter on 2 April 2020, and subsequently promoted using existing social media contacts. A decision was taken not to promote the Challenge using wider media channels, due to the difficulty of providing training for people with no previous experience of wildlife recording, without which high quality data collection could not be guaranteed.

### 2.2 Use of iRecord

iRecord is a UK online wildlife recording system operated by the Biological Records Centre, which allows members of the public to collate and share sightings, have them checked by experts and made available to support research and decision-making at local and national levels. SWSEIC is able to download all relevant data from iRecord.

iRecord also allows users to set up a separate 'activity' area and it was decided to use such an 'activity' for the Wildlife at Home Challenge. This enabled SWSEIC to request that all data entered

into the Challenge followed a set of rules relating to how, and most importantly where it was collected (see Appendix 1). It also ensured that the Challenge data was kept separate from the general iRecord data and enabled it to be viewed live by also participants, including on various charts and graphs, automatically generated and updated by iRecord.

### 2.3 Rules

The Rules for participating in the Challenge can be found in Appendix 1. There was no way of enforcing these rules. Rather it was left assumed that participants adhered to them – there is no evidence that they did not.

Participants were allowed to record species seen from their home or garden. The purpose of this rule was to allow species such as bats and Swallows to be counted, which might fly over the property, but were unlikely to be observed on the ground. However, it quickly became clear that the rule was so vaguely phrased that it allowed some participants to record (entirely within the rules) birds, mammals and even larger plants such as trees that could be seen at some distance from their home or garden and even, for some coastal properties, out at sea. In many cases this necessitated the use of binoculars or telescopes. In any future project relating to garden wildlife, it may be that the rule should stipulate the air space directly above the home or garden.

### 2.4 Participation

The total number of people joining the iRecord activity was 80. Of these, 54 people submitted records. For the purposes of this report, there were therefore 54 recording sites, though in actual fact not all records at a site necessarily had the same grid reference, as some participants recorded across large gardens and into the surrounding countryside (see 2.3 above).

The Challenge was open to all who were resident in Ayrshire and Dumfries and Galloway (collectively referred to as south west Scotland) during the lockdown. However, it was promoted largely through known SWSEIC contacts, either those signed up for the SWSEIC newsletter (almost 600 people), or in contact with SWSEIC via social media (Twitter & Facebook) channels. As such, the 80 participants (and their sites) constituted a self-selected group, rather than a randomly generated sample of the population/region.

Participants included local experts, some at county recorder level, in the following groups – flowering plants & ferns, bryophytes, bees & wasps, beetles and butterflies & moths. In addition, several are currently employed or retired from professional positions in the conservation and countryside management sector.

### 2.5 Weather

The weather during almost the entire duration of the Challenge was, uncharacteristically, dry and sunny, with only a few wet days towards the end of May. This no doubt encouraged participants to actively record species in their gardens, and may have directly benefited some species groups such as bees. However, consistently cold, clear nights are likely to have affected other species groups, particularly moths.

### 2.6 Feedback

Submission of records using iRecord enabled all participants to view all records submitted to the Challenge within minutes of them being submitted, and there is little doubt that this constant feedback encouraged some participants to increase their recording effort. In particular, iRecord provided constantly updated summary graphs and charts, including a league table of recorders, which is likely to have created a competitive element amongst some recorders, though it was

constantly reiterated by SWSEIC that the Challenge was not simply a competition and that every single record was important.

In addition to constant feedback provided by iRecord, SWSEIC produced weekly e-newsletters that summarised recent records and provided ideas and encouragement for future recording. A number of small prizes were offered as further encouragement to participate, with the emphasis again being primarily on taking part, rather than finding rare species or submitting the most records. SWSEIC is grateful to NHBS Ltd for contributing prizes.

## 3. Results

### 3.1 Validation of Results

A number of groups with difficult to identify species have expert verifiers who actively check iRecord. This was particularly the case with hoverflies, slugs and snails, woodlice, millipedes and centipedes, many bees and wasps, macro moths, amphibians and reptiles, and flowering plants in Ayrshire. A total of 718 records were verified by experts.

Not all species groups have expert verifiers active on iRecord. This includes some of the largest and most popular groups such as birds and, in Dumfries & Galloway, flowering plants. However, correct identification of species in most of these groups can be assumed for most records.

Unfortunately, this leaves a small number of groups with species that can be difficult for the non-expert to identify correctly, notably bryophytes, fungi, lichens, spiders, some beetle groups and some other invertebrate groups. As mentioned above (2.4), for some of these groups, participants in the Wildlife at Home Challenge could themselves be considered experts and their own records accepted without question. For other records in these groups, obvious errors were corrected but otherwise data was accepted in good faith. For future use, such records will be treated as unverified.

### 3.2 Non-house/garden species

For the reasons outlined above (see 2.3), records of certain species have been omitted from this analysis on the basis that they would have been seen at some distance from, or high over, the site. They are not typical house or garden species and their occasional use of such habitat is likely to be by chance. However, the records as submitted did not always make a clear distinction between species in the garden and those observed at some distance. In some cases, such as Harbour Seal and Gannet, the decision not to include them as a garden species was clear-cut, but for others it was more problematical. For example, Mallard and Grey Heron are not typical garden species but certainly do occasionally visit, even quite small, garden ponds. Cuckoos are likely to have been heard from gardens, but the bird is unlikely to have been utilising habitats within the garden boundary. Perhaps, greatest difficulty arises with birds of prey where Sparrowhawks certainly make frequent use of garden habitats, Hen Harriers are extremely unlikely to do so, but species such as Buzzard and Red Kite are regular, if infrequent, garden visitors. Red Kites in Dumfries and Galloway have even been observed feeding from bird tables.

For the purposes of this report, 138 records of the following 26 species have been omitted from the totals used for analysis of house and garden wildlife:

- Harbour Seal (1 record)
- All wildfowl (38 records of 10 species)
- All wading birds (17 records of 4 species)
- All seabirds (2 records of 2 species)

- Grey Heron & Little Egret (19 records)
- All birds of prey except Sparrowhawk (55 records of 5 species)
- Barn Owl (2 records)
- Cuckoo (4 records)

The omission of these species records is not thought significant, but should be borne in mind when considering the results.

### 3.3 Geographical Coverage

Recording sites were widely distributed across Ayrshire and Dumfries & Galloway in both urban and rural locations. Areas with low human populations, such as much of Wigtownshire, eastern Dumfriesshire and those parts of South and East Ayrshire on the edge of the Southern Uplands were, not surprisingly, the most poorly covered.

### 3.4 Totals

The total number of records submitted to the Wildlife at Home Challenge was 4208, relating to 954 species, recorded from a total of 54 house and garden sites.

## 4. Discussion

What do the results of the Wildlife at Home Challenge tell us about the state of nature in the houses and gardens of south west Scotland in the spring of 2020? Due to the limited scale of the Challenge and the limitations of the methodology outline above, the results of the Challenge cannot be considered a robust scientific study. It reveals nothing about the population size of any species, and without being repeated at some point in the future, it does little to highlight any significant trends in established populations.

However, the results of the Challenge do provide a snapshot into the wildlife of a habitat that, despite its abundance and popularity with people, has rarely been systematically studied in Britain (see Section 9) and has never been studied across Ayrshire or Dumfries & Galloway. It might also reveal some insights about the people who actively encourage and/or record wildlife in their houses and gardens, though such insights are beyond the scope of this report.




The following five sections discuss, in a little more detail, a number of aspects of the wildlife of houses and gardens in south west Scotland, as indicated by the Wildlife at Home Challenge. These relate to:




- The species groups and species recorded most frequently.
- The importance of different habitats for particular species.
- The importance of the ecosystem services provided by different species.
- The arrival and colonisation of houses and gardens by new species.

## 5. Records by Selected Species Groups


The number of records and species recorded in each of the main species groups during the Challenge was influenced by the ease of observation, difficulty of identification and the skills and experience of individual recorders, as well as the distribution and abundance of the species.



Photographs: Note that most of the images used in the following sections were submitted by participants to the Challenge. Such images are captioned with 'WAHC' and the name of the recorder/photographer.



<b>Mammals</b>	
<b>Total</b> = 68 records, 19 species.	ID confidence level: High.
<b>Summary</b> Some of the largest (both tallest and heaviest) wild animals found in the region are mammals, but they are also some of the most difficult to observe. Excluding marine species, almost all mammal species have been recorded from gardens and urban areas, and many are common in such habitats, but most are nocturnal and many spend their time in deep cover. Nine or ten species of bat are known in the region, but all are difficult of identifying without specialist equipment and skills. As a result, mammals constituted only 1.6% of the total records submitted to the Challenge.	
<b>Top 5 species most frequently recorded:</b>	  WAHC images: Hedgehog @ Jean Muir; Rabbit © Helen O'Donoghue
1. Hedgehog <i>Erinaceus europaeus</i> (13 records at 10 sites) Despite being almost exclusively nocturnal, the most frequently recorded mammal, possibly due to its ease of identification and popularity with the public.	
2. Rabbit <i>Oryctolagus cuniculus</i> (7 records at 7 sites) As a common, easy to identify, species with diurnal habits, it might have been expected to be recorded more frequently. However, it is actively discouraged, if not physically excluded, by many gardeners.	
3. Wood Mouse <i>Apodemus sylvaticus</i> (7 records at 6 sites) A common species but difficult to record, other than by trapping or cat kills. In a predominantly rural area, Wood Mouse was far more common than House Mouse (1 record).	
4. Roe Deer <i>Capreolus capreolus</i> (7 records at 5 sites) Mainly nocturnal and mostly visited large or rural gardens, though not exclusively so.	
5. Red Squirrel <i>Sciurus vulgaris</i> (5 records at 4 sites) A popular species with the public, but requires woodland habitats. Still more commonly recorded than Grey Squirrel (1 record), despite the latter being better adapted to garden habitats.	
<b>Records of notable species</b>	
Eurasian Otter <i>Lutra lutra</i> (1 record at 1 site) This species is widespread in SW Scotland, but few gardens have suitable watercourses and, for those that do, the nocturnal nature of this animal means that it was seldom recorded.	 Image © Saxifraga-Martin Mollet



<b>Birds</b>	
<b>Total</b> = 1123 records, 63 species.	ID confidence level: Very high.
<b>Summary</b> Birds have a longer history of recording, including in gardens, than any other species group. It was therefore no surprise that they constituted a significant proportion (26.7%) of all records submitted to the Challenge. The timing of the Challenge also enabled the arrival of summer migrant species to be recorded though the most frequently recorded species were all residents.	
<b>Top 5 species most frequently recorded:</b>	
1. Blackbird <i>Turdus merula</i> (92 records at 25 sites) The most commonly recorded species in the entire Challenge. Scientific studies have shown breeding density in gardens to be higher than most other habitats.	
2. Blue Tit <i>Cyanistes caeruleus</i> (82 records at 25 sites) A species that makes frequent use of bird tables/feeders and takes readily to nest boxes.	
3. House Sparrow <i>Passer domesticus</i> (78 records at 21 sites) Little sign in SW Scotland of the drastic losses experienced by this species in the south of England.	
4. Dunnock <i>Prunella modularis</i> (74 records at 21 sites) An unobtrusive species, but clearly widespread and common across SW Scotland.	
5. Carrion Crow <i>Corvus corone</i> (72 records at 15 sites) A widespread and common species. Elsewhere in urban Britain its position may have been taken by Magpie, but this species remains uncommon in SW Scotland (6 records).	
	Images: Blackbird © Saxifraga-Jan Nijendijk; Blue Tit © Saxifraga
<b>Records of notable species</b>	
Spotted Flycatcher <i>Muscicapa striata</i> (1 record at 1 site) A single record would not have been notable 20 years ago, being a species that could be readily attracted to nest in garden boxes, but a national decline of 87% 1970-2019 has been reflected in local populations. Similarly, there was a single record of a Willow Tit, another fast declining species, though historically not so closely linked to gardens.	
<b>See also:</b> Swift (p13), House Martin (p14), Song Thrush (p15), Goldfinch (p15), Dunnock (p16), Blackcap (p16), Long-tailed Tit (p16), Pheasant (p20), Swallow (p21), Willow Warbler (p21), Chiffchaff (p21), Collared Dove (p21), Nuthatch (p21).	




<b>Reptiles</b>	
<b>Total</b> = 9 records, 3 species.	ID confidence level: Excellent (records verified by an expert).
<b>Summary</b> All three common species of Scottish reptile were recorded, but only in small numbers and from mainly from rural locations. On the evidence of the Challenge, gardens do not appear to be a significant habitat for local reptile populations.	
<b>Species most frequently recorded:</b> 1. Common Lizard <i>Zootoca vivipara</i> (4 records at 4 sites) Largely a rural, rather than urban species, perhaps associated with dry stone walls around such gardens. 2. Slow Worm <i>Anguis fragilis</i> (3 records at 3 sites) Perhaps the Scottish reptile most associated with gardens, especially compost heaps, but not found to be common during the Challenge. 3. Adder <i>Vipera berus</i> (2 records at 1 site) Rare in urban gardens, the only site being very rural.	
	WAHC image Common Lizard © Lee Paton

<b>Amphibians</b>	
<b>Total</b> = 22 records, 4 species.	ID confidence level: Excellent (records verified by an expert).
<b>Summary</b> Four out of the five species of common Scottish amphibians were recorded, Great Crested Newt being the only species not recorded. This species is known from large areas of Dumfries and Galloway, but small garden ponds are unlikely to be suitable for it to breed. Similarly, the rare Natterjack Toad does not use garden ponds. It appears that all other amphibians do make use of garden habitats.	
<b>Species most frequently recorded:</b> 1. Common Frog <i>Rana temporaria</i> (11 records at 10 sites) Garden ponds and habitats are particularly important for Common Frogs in urban areas of the UK, and it appears that this species makes use of gardens in SW Scotland. 2. Common Toad <i>Bufo bufo</i> (7 records at 6 sites) Prefers larger ponds than frogs for breeding, but where populations exist, terrestrial garden habitats are widely used by this species. 3. Palmate Newt <i>Lissotriton helveticus</i> (2 records at 2 sites) Commonest newt species in SW Scotland but not widely recorded during the Challenge. 4. Smooth Newt <i>Lissotriton vulgaris</i> (2 records inc.1 unconfirmed, from 2 sites) Generally considered to be less common than Palmate Newt in SW Scotland, it was surprising that Smooth was recorded as frequently.	 
	WAHC images: Common Toad © Pete Robinson; Palmate Newt © Jean Robson
<b>See also:</b> Common Frog (p16).	




<b>Moths</b>	
<b>Total</b> = 708 records, 175 species.	ID confidence level: Excellent (most records verified by an expert).
<b>Summary</b> Moths constituted 16% of all records. Several participants operated moth traps; other species were observed during the day, either as adults or larvae. More moths are recorded in gardens than any other habitat - a result of gardens being the most common trap site, but gardens are undoubtedly an important habitat for many species. All of the most frequently recorded species are common UK springtime moths; equally common in SW Scotland.	
<b>Top 5 species most frequently recorded:</b> 1. Hebrew Character <i>Orthosia gothica</i> (38 records at 9 sites) 2. Common Quaker <i>Orthosia cerasi</i> (22 records at 9 sites) 3. Clouded Drab <i>Orthosia incerta</i> (20 records at 10 sites) 4. Heart & Dart <i>Agrotis exclamatoris</i> (18 records at 7 sites) 5= White Ermine <i>Spilosoma lubricipeda</i> and Small Quaker <i>Orthosia cruda</i> (each 17 records at 7 sites)	
	WAHC image © Pete Robinson
<b>Records of notable species</b>	
Narrow-bordered Bee Hawk-moth <i>Hemaris tityus</i> (1 record at 1 site) A day-flying bumblebee mimic, once widespread but has declined significantly, now being mainly restricted to moorland in western Britain and very rare in SW Scotland. A second record at another site was received just after the end of the Challenge.	
	WAHC image © Buzz Clark
<b>See also:</b> Brown House Moth (p13), White-shouldered House Moth (p13), Spindle Ermine (p), Pebble Prominent (p17), Light Brown Apple Moth (p20), Silver Y (p21).	


<b>Butterflies</b>	
<b>Total</b> = 161 records, 14 species.	ID confidence level: Very high.
<b>Summary</b> Butterflies are popular with gardeners and wildlife recorders, most of the species being colourful and easy to identify. Almost half of the total number of butterfly species known in SW Scotland were recorded during the Challenge, and butterflies constituted 4% of all records submitted to the Challenge.	
<b>Top 5 species most frequently recorded:</b> 1. Orange Tip <i>Anthocharis cardamines</i> (44 records at 27 sites) The Challenge coincided with the flight period of this species, the males of which are very distinctive with their orange wingtips. 2. Peacock <i>Aglais io</i> (30 records at 23 sites) 3. Small Tortoiseshell <i>Aglais urticae</i> (24 records at 18 sites) 4. Green-veined White <i>Pieris napi</i> (23 records at 16 sites) 5. Small White <i>Pieris rapae</i> (10 records at 10 sites)	
	WAHC images: Orange Tip © Jon Noad
<b>Records of notable species</b>	
Comma <i>Polygonia c-album</i> (1 record at 1 site) was recorded from a garden in Annan. They are common and widespread species in England but still uncommon in SW Scotland.	
<b>See also:</b> Red Admiral (p15), Painted Lady (p21).	WAHC image: Comma © Val Russell







<b>Hoverflies</b>	
<b>Total</b> = 94 records, 34 species.	ID confidence level: Excellent (records verified by an expert).
<p><b>Summary</b></p> <p>Hoverflies, true flies in the order Diptera, belong to the family <i>Syrphidae</i>, of which there are more than 270 species in the UK. Some are difficult to identify but many are brightly-coloured, visit garden plants and can be recorded by the non-specialist. Participants in the Challenge were assisted by online support from iRecord expert verifiers.</p>	
<p><b>Top 5 species most frequently recorded:</b></p> <p>1. <i>Eristalis pertinax</i> (12 records at 9 sites) Very similar to several other species, but expert verification via iRecord allowed this species to be frequently recorded.</p> <p>2. <i>Helophilus pendulus</i> (10 records at 6 sites)</p> <p>3= Greater Bulb-fly <i>Meredon equestris</i> &amp; <i>Platycheirus albimanus</i> (each 6 records at 4 sites)</p> <p>5= Marmalade Hoverfly <i>Episyrphus balteatus</i> &amp; <i>Epistrophe elegans</i> (each 5 records at 4 sites)</p>	
	 <p>WAHC image <i>Eristalis pertinax</i> © Jon Noad</p>
<b>See also:</b> Marmalade Hoverfly (p17), Greater Bulb-fly (p19), <i>Syrphus ribesii</i> (p19).	

<b>Ladybirds</b>	
<b>Total</b> = 40 records, 8 species.	ID confidence level: Excellent (records verified by an expert)
<p><b>Summary</b></p> <p>Unsurprisingly, the commonest UK species, the 7-spot, was by far the most frequently recorded ladybird. Several species close to the northern edge of their range, including Kidney-spot and 22-spot were also recorded. Many species are nationally declining, but no records were received of the species considered to be part of the reason for many of the declines – the non-native Harlequin Ladybird, which is known to be present in SW Scotland.</p>	
<p><b>Species most frequently recorded:</b></p> <p>1. 7-spot Ladybird <i>Coccinella septempunctata</i> (23 records at 11 sites) By far the commonest UK species, and also in SW Scotland.</p> <p>2. 10-spot Ladybird <i>Adalia decempunctata</i> (4 records at 3 sites)</p> <p>3. 2-spot Ladybird <i>Adalia bipunctata</i> (3 records at 3 sites)</p> <p>4= Larch Ladybird <i>Aphidecta oblitterata</i>, Cream-spot Ladybird <i>Calvia quatuordecimguttata</i>, Kidney-spot Ladybird <i>Chilocorus renipustulatus</i>, 14-spot Ladybird <i>Propylea quatuordecimpunctata</i>, 22-spot Ladybird <i>Psyllobora vigintiduopunctata</i> (each 2 records)</p>	
	 <p>WAHC image: 7-spot Ladybird © Nic Coombey</p>
<b>See also:</b> 7-spot Ladybird (p19), Kidney-spot Ladybird (p21).	

<b>Bees</b>	
<b>Total</b> = 348 records, 33 species.	ID confidence level: High (many records verified by an expert)
<p><b>Summary</b></p> <p>Spring is the best time for finding and identifying many of the British bee species. Bumblebees are well-known, but solitary and cuckoo bees are more difficult to identify. Several of the recorders were experienced in bee identification, and most of the rarer species were submitted by these recorders. The presence of Tree Bumblebee and Red Mason Bee in the top five most frequently recorded species was surprising as these bees have only recently colonised Scotland.</p>	
<p><b>Top 5 species most frequently recorded:</b></p>	
<p>1. Tree Bumblebee <i>Bombus hypnorum</i> (54 records at 26 sites) First recorded in the UK in 2001, the spread of this species has been dramatic, being first recorded in SW Scotland in 2012. It uses nest sites inadvertently provided by people, such as bird boxes or building cavities. The high number of records during the Challenge will have been assisted by its ease of identification</p>	
<p>2. Large Red-tailed Bumblebee <i>Bombus lapidarius</i> (47 records at 20 sites) An abundant, easy to identify species.</p>	
<p>3. Buff-tailed Bumblebee <i>Bombus terrestris</i> (37 records at 18 sites) Very similar to White-tailed Bumblebee <i>Bombus lucorum</i> (26 records), but springtime queens can more easily be distinguished from each other.</p>	
<p>4= Red Mason Bee <i>Osmia bicornis</i> &amp; Honey Bee <i>Apis mellifera</i> (each 31 records at 10 sites) The Red Mason Bee has continued to spread in SW Scotland, being first recorded in Dumfries and Galloway in 2010. It nests in hollow plant stems and in the old mortar of buildings. The Honey Bee is a semi-domesticated species that has been 'farmed' for centuries.</p>	
	<p>WAHC images: Tree Bumblebee © Nic Coombey; Red Mason Bee © Peter Norman</p>
<b>Records of notable species:</b>	
<p>Turquoise Furrow Bee <i>Lasioglossum cupromicans</i> (1 record at 1 site) Several species of bee with few previous records in SW Scotland were recorded as part of the Challenge, largely due to the efforts of a small number of recorders with specialist bee identification skills, the true distribution of such species being unknown. One such species was Turquoise Furrow Bee.</p>	
	<p>WAHC image: Turquoise Furrow Bee © Jon Noad</p>
<b>See also:</b> Early Mining Bee (p15), Honey Bee (p17), Chocolate Mining Bee (p17), Tawny Mining Bee (p21).	

<b>Slugs &amp; Snails</b>	
<b>Total</b> = 90 records, 22 species.	ID confidence level: Excellent (records verified by an expert).
<b>Summary</b> Given the predominantly dry weather during the Challenge, combined with the unpopularity of slugs and snails amongst gardeners, the number of records and species recorded was surprisingly high. Much of this can be attributed to the high level of support from the iRecord expert verifier. Conversely, the Large Black Slug, one of the commonest UK species, was surprisingly scarce.	
<b>Top 5 species most frequently recorded:</b> 1. Common Garden Snail <i>Cornu aspersum</i> (15 records at 12 sites) Ubiquitous throughout lowland UK, but thought to be introduced to Britain in Roman times. 2. Brown-lipped Snail <i>Cepaea nemoralis</i> (11 records at 10 sites) 3. White-lipped Snail <i>Cepaea hortensis</i> (9 records at 9 sites) 4. Green Cellar Slug <i>Limacus maculatus</i> (7 records at 6 sites) 5= Leopard Slug <i>Limax maximus</i> , Iberian Three-band Slug <i>Ambigolimax valentianus</i> & Netted Field Slug <i>Deroceras reticulatum</i> (each 6 records at 5 sites)	
	
	WAHC image: Common Garden Snail © Nic Coombey
<b>See also:</b> Leopard Slug (p18), Netted Field Slug (p19).	

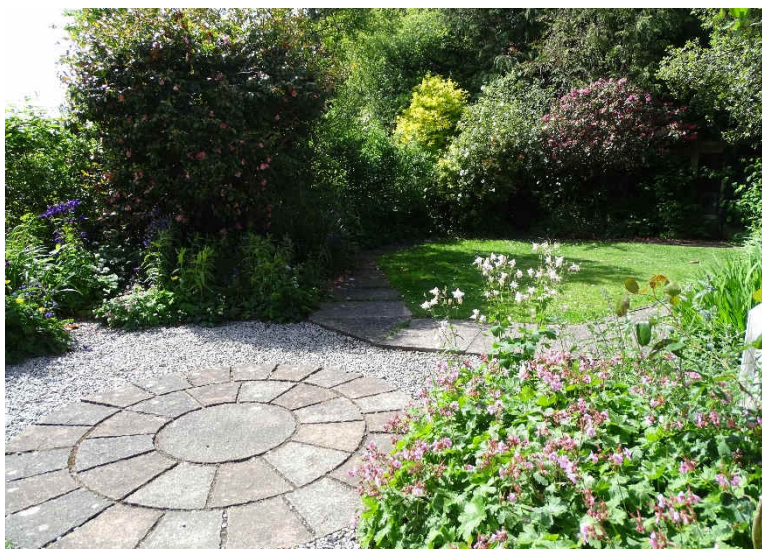
<b>Woodlice, Centipedes and Millipedes</b>	
<b>Total</b> = 61 records, 17 species.	ID confidence level: Excellent (records verified by an expert).
<b>Summary</b> Woodlice (Isopods) are the most species-rich group of terrestrial crustaceans, with around 45 species in the UK. Centipedes and millipedes (Myriapods) are characterised by segmented bodies with many pairs of legs. There are more than 100 UK species. Garden species in both groups are typically found in damp places under stones and logs. Identification during the Challenge was assisted by an iRecord expert verifier.	
<b>Top 3 species most frequently recorded:</b> 1. Common Rough Woodlouse <i>Porcellio scaber</i> (12 records at 12 sites) Probably occurs in most gardens, but requires a little practice to distinguish from similar species. 2. Common Shiny Woodlouse <i>Oniscus asellus</i> (12 records at 10 sites) Similar in occurrence to the above species. 3. White-legged Snake Millipede <i>Tachypodoiulus niger</i> (8 records at 8 sites)	
	
	WAHC image: Common Shiny Woodlouse © Nic Coombey
<b>Records of notable species</b>	
Southern Pill Woodlouse <i>Armadillidium depressum</i> (1 record at 1 site) A record of a pill woodlouse from a garden in Glencaple was confirmed on iRecord as Southern Pill Woodlouse, the first record for Scotland. It is active at night on loosely mortared walls, especially with limestone or lime mortar. It is considered an introduction outside of its main range in SW England. The most northerly record was previously in Lancashire.	
	WAHC image: Southern Pill Woodlouse © Alison Robertson
<b>See also:</b> Common Rough Woodlouse (p18), <i>Lithobius forficatus</i> (p19).	



<b>Flowering Plants</b>	
<b>Total</b> = 915 records, 257 species.	ID confidence level: High
<p><b>Summary</b></p> <p>Flowering plants constituted 21% of all the records submitted in the Challenge, but the total of 257 flowering plant species was 27% of all species recorded. Participants were requested not to record species that had been planted, but this can sometimes be difficult to judge and the total no doubt includes some species of planted origin. However, the great majority of the records relate to self-seeded species that many gardeners would consider weeds, although in the case of some, attractive weeds that are tolerated.</p>	
<p><b>Top 5 species most frequently recorded:</b></p> <p>1. Daisy <i>Bellis perennis</i> (15 records at 15 sites) A native species found on stream banks, lake margins, dune-slacks and the margins of upland flushes, but much more familiar across the UK as a weed of lawns and playing fields, roadside verges and pastures.</p> <p>2= Cleavers <i>Galium aparine</i>, Stinging Nettle <i>Urtica dioica</i>, Lesser Celandine <i>Ficaria verna</i>, Ash <i>Fraxinus excelsior</i> (each 14 records at 14 sites)</p>	
	 <p>WAHC image: Daisy © Nic Coombey</p>
<b>Records of notable species</b>	
<p>New Zealand bitter-cress <i>Cardamine corymbosa</i> (1 record at 1 site) A small annual that naturally is found in alpine tundra and rocky coastal habitats in New Zealand and a small area of Australia, but was first recorded in Scotland as a weed on the rock garden at the Royal Botanic Garden Edinburgh by 1975. It has since spread via the horticultural trade and has become naturalised on paths, cultivated ground and in pavement cracks. Its discovery in a garden in Ochiltree was the first record for Ayrshire.</p>	
	 <p>WAHC image © Bruce Philp</p>
<p><b>See also:</b> Ivy-leaved Toadflax (p14), Navelwort (p14), Procumbent Pearlwort (p14), Common Groundsel (p14), Annual Meadow Grass (p14), Sweet Vernal Grass (p15), White Clover (p15), Yarrow (p15), Ramsons (p15), Cleavers (p18), Creeping Buttercup (p18), Ground Elder (p18), Broad-leaved Dock (p18).</p>	






## 6. Selected Species Records by Habitat



Houses and gardens, though often perceived as a single habitat, are actually made-up of several different habitats, many of which mimic wild habitats, but all of which usually occur in very small units. Many of the species associated with houses and gardens actually require more than one of these mini-habitats, but the close proximity of houses and gardens to each other often provides the necessary range and extent of habitats.





Indoors	
<p><b>Summary</b></p> <p>Participants in the Challenge were not asked to record whether species were observed indoors, but a number did so. Some species can be assumed to have been indoors, as they seldom survive long outdoors, and others are known to require (or are frequently found) indoor spaces, at least during part of their life cycle.</p>	
<p><b>Selected Species:</b></p> <p>1. Swift <i>Apus apus</i> (38 records at 12 sites) A summer migrant bird, declining in the UK, that spends almost its entire life on the wing, landing only at the nest site, usually in the roof space under the eaves of old buildings. Most records from the survey are likely to involve birds flying over.</p> <p>2. White-shouldered House Moth <i>Endrosis sarcitrella</i> (7 records at 6 sites) A common micro-moth, found almost worldwide due to its association with humans. Being continuously-brooded, it can be found at any time of year and feeds on dried food such as grain, but also inhabits birds' nests.</p> <p>3. Cobweb Spider <i>Pholcus phalangioides</i> (4 records at 4 sites) Also known as Daddy Long-legs Spider, this non-native species is a predator of house spiders, but is unable to survive outdoors.</p> <p>4. Saxon Wasp <i>Dolichovespula saxonica</i> (3 records at 3 sites) Usually nests in trees and bushes, but the most likely species of wasp to enter buildings, where they can become a pest. An uncommon species in SW Scotland.</p> <p>5. Brown House Moth <i>Hofmannophila pseudospretella</i> (6 records at 3 sites) Another common micro-moth, introduced to Britain in the 1840s.</p>	 
<p>WAHC image: Cobweb Spider © Jon Noad Swift © Saxifraga-Luc Hoogenstein</p>	
<p><b>See also:</b> Swallow (p21).</p>	

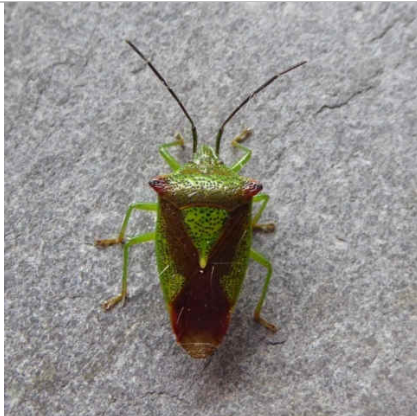



Walls	
<b>Summary</b> Due to the mild and wet climate, western Britain has one of the best wall floras in Europe. Old stone walls, especially of limestone or pointed with lime mortar hold the greatest variety.	
<b>Selected Species:</b> 1. House Martin <i>Delichon urbicum</i> (11 records at 10 sites) A summer migrant that still nests on a few sea cliffs in SW Scotland, but almost all UK nest sites since the early 1900s have been in close association with people, building nests on outer walls of buildings, often under the eaves.	
2. Ivy-leaved Toadflax <i>Cymbalaria muralis</i> (8 records at 8 sites) A non-native plant thought to have been introduced to Oxford in the 17th century. The seed-heads bend towards dark spaces, enabling it to seed into cracks in the wall.	
3. Zebra Spider <i>Salticus scenicus</i> (5 records at 5 sites) A spider with especially enlarged eyes which it uses to hunt down and jump on its prey, often on walls.	
4. Maidenhair Spleenwort <i>Asplenium trichomanes</i> (5 records at 5 sites) A small fern that grows in wall crevices and on mossy branches.	
5. Wall-rue <i>Asplenium ruta-muraria</i> (3 records at 3 sites) Another small fern of walls, less distinctive than that above.	WAHC images: Ivy-leaved Toadflax © Peter Norman; Maidenhair Spleenwort © Nic Coombey
<b>Records of notable species:</b>	
Navelwort <i>Umbilicus rupestris</i> (1 record at 1 site) Also known as Wall Pennywort, this species is common in much of western Britain, but uncommon in SW Scotland. The record came from Dalbeattie, close to the only other known sites for this species in Dumfries & Galloway.	
	WAHC image: Navelwort © Helen O'Donoghue
<b>See also:</b> Common Lizard (p7), Southern Pill Woodlouse (p11), Red Mason Bee (p10)	

Paving & Bare Ground	
<b>Summary</b> Hard paving, driveways and gravel paths support a surprising range of species, especially annual plants and invertebrates. The habitat is also likely to be valuable for lichens and spiders, but few participants in the Challenge were experienced in these groups.	
<b>Selected Species:</b> 1. Procumbent Pearlwort <i>Sagina procumbens</i> (12 records at 12 sites) An inconspicuous flowering plant, common between paving slabs and similar places.	
2. Common Groundsel <i>Senecio vulgaris</i> (12 records at 10 sites) A weed of cultivated and disturbed ground.	
3. Annual Meadow Grass <i>Poa annua</i> (8 records at 8 sites) A pioneer species in disturbed habitats, common in the UK.	
4. Small Black Ant <i>Lasius niger</i> (5 records at 5 sites) The most common UK ant in gardens.	
5. Common Cord-moss <i>Funaria hygrometrica</i> (2 records at 1 site) Characteristic of bonfire sites and bare ground.	WAHC image: Procumbent Pearlwort © Mark Pollitt

Lawns	
<p><b>Summary</b></p> <p>Lawns, including bare patches on lawns, appears an unattractive habitat for garden wildlife, and regular mowing might be seen as detrimental. However, a number of species are adapted to make use of lawns, even if only as part of their life cycle. This includes feeding birds, nesting bees and low-growing weeds. Grassland fungi was not recorded, due to the timing of the Challenge during the spring.</p>	
<p><b>Selected Species:</b></p> <p>1. Song Thrush <i>Turdus philomelos</i> (20 records at 16 sites) One of a number of birds that feed on garden lawns.</p> <p>2. Early Mining Bee <i>Andrena haemorrhoa</i> (6 records at 6 sites) This species nests singly in short swards on lawns.</p> <p>3. Sweet Vernal Grass <i>Anthoxanthum odoratum</i> (9 records at 9 sites) The grass which gives newly-cut lawns their distinctive smell. As with all grasses, it is adapted to lawn life by growing from near the base rather than from the tip.</p> <p>4. White Clover <i>Trifolium repens</i> (9 records at 9 sites) One of several plants that avoid the mowing by growing close to the ground.</p> <p>5. Yarrow <i>Achillea millefolium</i> (6 records at 5 sites)</p>	 <p>WAHC image: Early Mining Bee © Catherine Bloomfield</p>
<p><b>See also:</b> Daisy (p), Blackbird (p)</p>	

Flowerbeds	
<p><b>Summary</b></p> <p>Many gardens are specifically designed and managed to have a continuous cycle of flowering plants, many of which provide nectar for visiting insects. But flowerbeds, despite regular cultivation, can also provide seeds and other food and habitat for wildlife.</p>	
<p><b>Selected Species:</b></p> <p>1. Goldfinch <i>Carduelis carduelis</i> (38 records at 24 sites) Recently increased in gardens due to use of seed feeders, but also attracted to flowerheads, especially Teasel, Lavender and Dandelion.</p> <p>2. Ramsons <i>Allium ursinum</i> (12 records at 12 sites) Also known as Wild Garlic, it is a common woodland wild flower but appears equally at home in shady flowerbeds.</p> <p>3. Dark-edged Bee Fly <i>Bombylius major</i> (10 records at 9 sites) A bumblebee mimic that feeds on nectar from spring flowers, such as Primroses and Violets but the larvae are nest parasites of ground-nesting and solitary bees.</p> <p>4. Red Admiral <i>Vanessa atalanta</i> (8 records at 8 sites) A colourful and frequent visitor to garden flowers.</p> <p>5. Common Flower Bug <i>Anthocoris nemorum</i> (2 records at 2 sites) A predatory insect of low-growing vegetation that feeds on aphids and red spider mites.</p>	 <p>WAHC image: Dark-edged Bee Fly © Pete Robinson</p>
<p><b>See also:</b> Butterflies (p), Hoverflies (p), Bees (p)</p>	


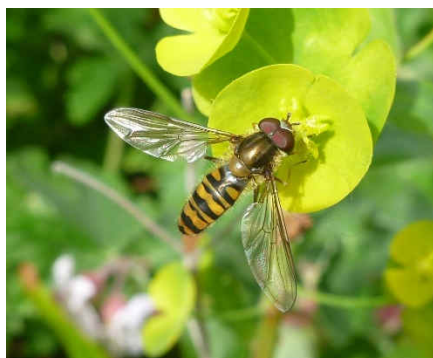
Trees & Shrubberies	
<b>Summary</b> After ponds, trees and shrubs are considered to be the biggest attraction to wildlife in gardens. This is not solely related to the species, but also to the vertical structure and micro-habitats that they provide.	
<b>Selected Species:</b> 1. Dunnock <i>Prunella modularis</i> (74 records at 21 sites) The most complicated pairing strategy in the UK - a male and a female (monogamy), more than one male paired with the same female (polyandry), a male and more than one female (polygyny), or two males and two females (polygynandry)! 2. Blackcap <i>Sylvia atricapilla</i> (13 records at 10 sites) Sings from tops of trees & shrubs but nests in dense cover, often Bramble thickets. 3. Long-tailed Tit <i>Aegithalos caudatus</i> (8 records from 8 sites) Makes bottle-shaped nests in dense bushes, using moss, camouflaged with lichen with interwoven cobwebs, and lined with as many as 1500 feathers. 4. Hawthorn Shieldbug <i>Acanthosoma haemorrhoidale</i> (7 records at 7 sites) The main food is haws, but adults also eat leaves, including those of other trees and shrubs. 5. Spindle Ermine Moth <i>Yponomeuta cagnagella</i> (2 records at 2 sites) Larvae live in webs and can temporarily defoliate Spindles.	 <p>WAHC image: Hawthorn Shieldbug © Val Russell</p>
<b>See also:</b> Most other species mentioned in this report.	



Ponds	
<b>Summary</b> Participants were not asked whether they had a pond, and the few records of species associated with ponds suggest that most did not, despite the fact that other studies have shown ponds to be the single best feature to attract garden wildlife, and not just for pond life – one participant reported Tree Sparrows bathing in his pond.	
<b>Selected Species:</b> 1. Common Frog <i>Rana temporaria</i> (11 records at 10 sites) The best known pond inhabitant, though it also requires suitable terrestrial habitat. Several participants in the Challenge reported frogspawn. 2. Large Red Damselfly <i>Pyrrhosoma nymphula</i> (8 records at 8 sites) The Challenge was too early in the year for most adult damsel/dragonflies, but this species is the earliest flying of them, accounting for more records than any other species of Odonata. 3. Marsh Marigold <i>Caltha palustris</i> (3 records at 3 sites) An attractive species, associated with wet areas as well as pond edges. 4. Great Diving Beetle <i>Dytiscus marginalis</i> (2 records at 2 sites) A voracious predator of invertebrates, tadpoles, even small fish. 5. Common Duckweed <i>Lemna minor</i> (2 records at 2 sites)	 <p>WAHC image: Large Red Damselfly © Catherine Bloomfield</p>
<b>See also:</b> Amphibians (p7).	




## 7. Selected Species Records by Ecosystem Service



In addition to providing interest and enjoyment for people, garden wildlife also provides a range of free ecological services that are essential for the health of the garden and often provide benefits to the surrounding countryside. Perhaps best known of these is pollination, but there are many others. The effects of weeds and pests in gardens has been subject to much discussion, but few species have an entirely negative impact and there are many species that provide a biological control on pests.

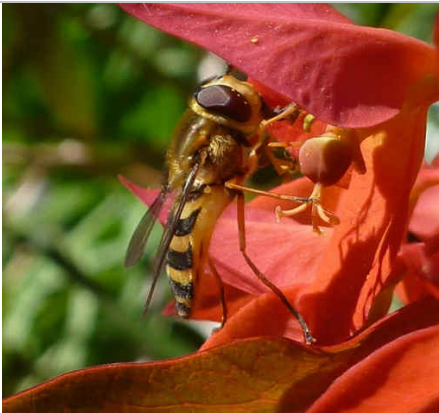
Pollinators	
<b>Summary</b> Apart from those plants that use wind to disperse pollen, which includes all of our cereal crops, many plants have evolved mechanisms to encourage pollen transfer by insects. Bees are the most frequently mentioned pollinators, but not all of the 250 species in Britain are pollinators and of those that are, some are more effective than others. Furthermore, the role of many other insects involved in pollination is not widely recognised. Gardens cannot support the huge numbers of pollinating insects required in the countryside, but as good pollinator habitats in the countryside decline, the role of gardens becomes increasingly important.	
<b>Selected Species:</b>  1. Honey Bee <i>Apis mellifera</i> (31 records at 11 sites) The most frequently recorded pollinator, widely believed to be the main species responsible for pollination in Britain but this semi-domesticated species is actually less effective than many other species of bee and fly.  2. Marmalade Hoverfly <i>Episyrphus balteatus</i> (5 records at 4 sites) Considered the second-most important group of pollinators after wild bees but little research into fly pollinators has been conducted compared with bees. They may carry less pollen but make a greater number of flower visits.  3. Chocolate Mining Bee <i>Andrena scotica</i> (9 records at 7 sites) Of all UK bee species, 90% do not live in colonies, but the importance of these solitary bees, such as the Chocolate Mining Bee, in pollination is often underestimated. They do not have baskets for carrying pollen, meaning that each time they visit a flower they lose far more pollen than social bees, making them more efficient pollinators.  4. Pebble Prominent <i>Notodonta ziczac</i> (2 records at 2 sites) New research suggests moths play a vital role as overnight pollinators of a wide range of flowers and plants, carrying pollen on their thorax rather than their mouthparts. Species with a hairy thorax, such as Pebble Prominent, are most effective.  5. Two-banded Longhorn beetle <i>Rhagium bifasciatum</i> (1 record at 1 site) Not widely perceived as pollinators, many beetles, including longhorn beetles, provide a valuable pollination service.	  
<b>See also:</b> Hoverflies (p9), Bees (p10).	

Recyclers	
<b>Summary</b> Though seldom appreciated, a number of species carry out essential recycling roles, even slugs, many of which feed on decomposing organic matter such as dead leaves dung and even dead slugs. In the compost heap they can be a valuable part of the composting process.	
<b>Selected Species:</b>  1. Common Rough Woodlouse <i>Porcellio scaber</i> (12 records at 12 sites) Woodlice are detritivores, mainly feeding upon organic detritus, such as dead leaves and dead wood.  2. Black Sexton Beetle <i>Nicrophorus humator</i> (10 records at 8 sites) The undertakers of the garden, attracted to dead animals such as a mice, which they bury, then lay their eggs nearby so that the newly hatched larvae have a ready source of food.  3. Leopard Slug <i>Limax maximus</i> (6 records at 5 sites) The preferred diet of the Leopard or Great Grey Slug is fungi, dead plant or animal matter making it a useful species.  4. Jelly Ear Fungus <i>Auricularia auricula-judae</i> (5 records at 5 sites) Usually on dead or decaying Elder; one of the few fungi recorded in the Challenge.  5. Earthworms <i>Lumbricus spp.</i> (2 records at 2 sites of 2 species) Earthworms provide nutrients, break down toxic elements and interact with water and air to help maintain a healthy soil. Hopefully the few records do not represent a true picture, but rather the difficulty in identifying many species.	  WAHC images: Black Sexton Beetle © Peter Norman; Leopard Slug © Valerie Harrison
<b>See also:</b> Common Shiny Woodlouse (p11).	

Garden Weeds	
<b>Summary</b> A weed can be simply defined as a plant growing where it is not wanted. There are some wildlife gardeners who therefore claim that there are no weeds in their garden, but for many others, the constant struggle to remove unwanted plants can take up much activity in the garden.	
<b>Selected Species:</b>  1. Cleavers <i>Galium aparine</i> (14 records at 14 sites) Produces large quantities of sticky seeds that are viable for up to six years.  2. Creeping Buttercup <i>Ranunculus repens</i> (13 records at 13 sites) A deep-rooted plant of lawns, borders and bare ground.  3. Ground Elder <i>Aegopodium podagraria</i> (11 records at 11 sites) A non-native species, widely perceived as one of the most aggressive and difficult to control garden weeds. It is, however, a valuable nectar source for species such as hoverflies.  4. Broad-leaved Dock <i>Rumex obtusifolius</i> (10 records at 10 sites) A 'weed' with a tap-root, one metre or more deep.  5. Field Horsetail <i>Equisetum arvense</i> (3 records at 3 sites) The only horsetail species recorded during the Challenge. Appears to be not such a widespread weed as elsewhere.	  WAHC image: Cleavers © Saxifraga-Ed Stikvoort
<b>See also:</b> Ivy-leaved Toadflax (p14), Common Groundsel (p14), Annual Meadow Grass (p14), Yarrow (p15).	




Garden Pests	
<b>Summary</b> As with weeds, the definition of what constitutes a garden pest is somewhat imprecise. In reality, many species thought of as pests, also provide some beneficial ecological function. However, there is a small number of species that many gardeners would happily live without.	
<b>Selected Species:</b>	  WAHC images: Netted Field Slug © Jim Logan; Common Cockchafer © Peter Norman
1. Netted Field Slug <i>Deroceras reticulatum</i> (6 records at 5 sites) One of the most common slugs and also one of the most damaging garden pests, feeding on leaves, particularly of young seedlings. Also an agricultural pest.	
2. Vine Weevil <i>Otiorhynchus sulcatus</i> (9 records at 6 sites) Adult weevils notch leaf margins and larvae eat roots, causing death to some plants, especially those grown in containers.	
3. Common Cockchafer <i>Melolontha melolontha</i> (7 records at 6 sites) The fat, creamy-white larvae can cause damage to the roots and leaves of garden plants.	
4. Greater Bulb-fly <i>Meredon equestris</i> (6 records at 4 sites) The larvae of this hoverfly, also known as Narcissus Fly, burrows into the underground bulbs of Daffodils and Bluebells, sometimes destroying them.	
5. Australian Flatworm <i>Australplana sanguinea</i> (2 records at 2 sites) An earthworm predator; slightly more common in the Challenge than New Zealand Flatworm (1 record).	
<b>See also:</b> Small White (p8), Common Garden Snail (p11), Saxon Wasp (p13), Common Flower Bug (p15), Common Wasp (p19).	

Garden Pest Controllers	
<b>Summary</b> For many pests found in the garden there are natural predators that exert some control on pest populations.	
<b>Selected Species:</b> 1. 7-spot Ladybird <i>Coccinella septempunctata</i> (23 records at 11 sites) The best known of the garden aphid predators. 2. Common Wasp <i>Vespula vulgaris</i> (28 records at 16 sites) Usually seen as an annoyance, this species controls the numbers of potential pests like greenfly and many caterpillars. 3. A hoverfly <i>Syrphus ribesii</i> (4 records from 4 sites) The larvae of most garden hoverflies, including <i>Syrphus ribesii</i> feed on aphids. 4. A centipede <i>Lithobius forficatus</i> (4 records at 4 sites) Centipedes are predatory animals which consume many species that damage garden plants. 5. Snail Hunter <i>Cychnus caraboides</i> (1 record at 1 site) Like many ground beetles, the Snail Hunter helps to control plant pest populations, since both the larval and adult stages are voracious predators of many small slugs and snails.	 WAHC image: <i>Syrphus ribesii</i> © Nic Coombey
<b>See also:</b> Hedgehog (p5), Slow Worm (p7), Ladybirds (p9), Hoverflies (p9).	

## 8. Selected Records by Species Origin

Wildlife is constantly changing, both as a result of natural and man-made phenomena. Several of the species recorded during the Challenge originate elsewhere. Some are here to stay, others migrate between different locations.

Non-native Species	
<p><b>Summary</b></p> <p>A native range is defined in Scottish Law as “the locality to which the animal or plant of that type is indigenous, and does not refer to any locality to which that type of animal or plant has been imported (whether intentionally or otherwise) by any person.” It therefore follows that non-native species in SW Scotland are those that have been imported (intentionally or otherwise) into SW Scotland by people.</p> <p>A species from a distant foreign country with a known human pathway to SW Scotland is easy to define as non-native, but it is not always easy to define others. Beech for example is widely accepted to be non-native in Scotland with all existing trees being descended from stock that was historically planted. But what of Beech Leaf Miner <i>Orchestes fagi</i>, a beetle that feeds within Beech leaves in its larval stages? It may have made its own way here from England, rather than being introduced with the tree. In which case, is it non-native, or a species taking advantage of human habitat modification in exactly the same way as many native species? There can never be answers to such conundrums. A pragmatic approach was therefore taken to identifying non-native species, including those only with unequivocal evidence. On that basis, 268 (6.4%) of records and 85 (8.9%) of Challenge species were non-native.</p> <p>It is not the case that all non-native species are invasive weeds or pests in the garden, indeed many gardens comprise largely non-native plants. Nor is it inevitable that these species will escape from the garden and become a problem in the wild. Most species that escape from gardens have a short life in the wild, with only a minority becoming naturalised</p>	
<p><b>Selected Species:</b></p> <p>1. Light Brown Apple Moth <i>Epiphyas postvittana</i> (9 records at 4 sites) An Australian micro-moth probably first accidentally introduced to Cornwall in the 1930s. Now common in SW Scotland.</p> <p>2. Pheasant <i>Phasianus colchicus</i> (12 records at 12 sites) Native to Asia, introduced to Britain by Norman times, possibly as early as Roman times, but only popular as a gamebird from the 19th century. Still extensively reared and released.</p> <p>3. Spanish Bluebell <i>Hyacinthoides hispanica</i> (1 record at 1 site, and 2 records of the hybrid <i>Hyacinthoides x massartiana</i>) All these records may relate to the hybrid, as may some of the 9 records of the native species. Despite this, native Bluebell does not seem threatened in the wild.</p> <p>4. Sycamore <i>Acer pseudoplatanus</i> (8 records at 8 sites) A native of south and central Europe, possibly a Roman introduction, more likely the Middle Ages. Now naturalised.</p> <p>5. Tiger Worm <i>Eisenia fetida</i> (4 records at 4 sites) A native species but some stock of North American origin is available commercially to be deliberately introduced for composting.</p>	 <p>WAHC image: Light Brown Apple Moth © Jon Noad</p>
<p><b>See also:</b> Rabbit (p5), Common Garden Snail (p11), Iberian Three-band Slug (p11), Brown House Moth (p13), Cobweb Spider (p13), Ivy-leaved Toadflax (p14), Australian Flatworm (p19).</p>	


Migratory Species	
<b>Summary</b> A number of species migrate from other countries or elsewhere in Britain to spend the summer in SW Scotland and several of these visit gardens. The Challenge also began early enough to record some winter migrant birds prior to their departure, including Fieldfare (3 records at 2 sites) and Redwing (1 record at 1 site). Migrant insects tend to be more frequently found later in the summer.	
<b>Selected Species:</b>	
1. Swallow <i>Hirundo rustica</i> (44 records at 25 sites). Perhaps the best known summer migrant bird due to its close association with people, often nesting in outbuildings.	
2. Willow Warbler <i>Phylloscopus trochilus</i> (16 records at 11 sites) Seemingly more common in gardens of SW Scotland than its close relative, Chiffchaff.	
3. Chiffchaff <i>Phylloscopus collybita</i> (10 records at 8 sites) Almost identical in appearance to Willow Warbler, but easily distinguished by its song.	
4. Silver Y Moth <i>Autographa gamma</i> (4 records at 4 sites) One of the commonest migrant moths.	
5. Painted Lady <i>Vanessa cardui</i> (1 record at 1 site)	
<b>See also:</b> Spotted Flycatcher (p6), Swift (p13), House Martin (p14), Blackcap (p16).	

Image: Swallow © Saxifraga-Ab H Baas

Recent Arrivals	
<b>Summary</b> Species that have arrived in new locations as a result of natural, rather than human-assisted spread, are considered native, though in many cases it is impossible to be certain about their origin. Botanists have termed some plants as archaeophytes, species that became established in a geographical area before AD 1500, and others as neophytes after that date. A similar terminology could be applied to animals.	
<b>Selected Species:</b> <div>1. Collared Dove <i>Streptopelia decaocto</i> (29 records at 17 sites) First bred in Britain in 1955, followed by a rapid expansion. Now abundant throughout the whole of Britain.</div> <div>2. Nuthatch <i>Sitta europaea</i> (7 records at 7 sites) Once restricted largely to SE England but spread north during the 20th century, first regularly breeding in Scotland from 1989. Now widespread in Dumfries &amp; Galloway, but no records were received during the Challenge for Ayrshire.</div> <div>3. Tawny Mining Bee <i>Andrena fulva</i> (4 records at 4 sites) One of several bee species to expand into Scotland in the last 10 years.</div> <div>4. Kidney-spot Ladybird <i>Chilocorus renipustulatus</i> (2 records at 2 sites) Only recorded in SW Scotland during the last 10 years.</div> <div>5. Cinnamon Bug <i>Corizus hyoscyami</i> (1 record at 1 site) A red and black plant bug, historically confined to the south coast of England, which has now reached Scotland.</div>	 <div>WAHC image: Cinnamon Bug © Alison Robertson</div>
<b>See also:</b> Tree Bumblebee (p10), Red Mason Bee (p10).	

WAHC image: Cinnamon Bug © Alison Robertson

## 9. Comparison with similar studies

There are an estimated 25 million dwellings in the UK, a high proportion of which have gardens, which have been estimated to cover 4330 km<sup>2</sup>. Despite this, there have been very few studies of their ecological importance. The few that have been undertaken (see below) have largely been based in large city conurbations in England, with next to nothing investigated in Scotland or in rural gardens.

### 9.1 Jennifer Owen's garden in Leicester

A small (741m<sup>2</sup>) suburban garden in Leicester was studied by Jennifer Owen between 1972 and 2002, recording a total of 2673 species. Owen was a professional entomologist and had assistance from other professionals, but considered her total to be a significant under-estimate of all species present.

### 9.2 Buckingham Palace

A large (16 ha) and unique garden in the centre of London, studied primarily in 1996 and 1997 (with some later additions) by 100 professionals from the Natural History Museum and elsewhere, recording more than 5000 species.

### 9.3 Biodiversity in Urban Gardens in Sheffield (BUGS)

Probably the most detailed study of garden wildlife in the UK, undertaken by the University of Sheffield in 2001-2002. The study investigated 50 gardens across the city, mapping the features of each one and of the surrounding environment, followed by intensive invertebrates sampling, with additional records provided by the garden owners. The focus was on finding evidence to enhance breeding populations, rather recording absolute numbers of species. BUGS2 was a follow-on study of the environmental and biodiversity value of domestic gardens in five cities in the UK, carried out from 2004-2007.

### 9.4 Big Garden Birdwatch

Not a study of garden wildlife as a whole, but a long-running (since 1979) survey, initially for children, run by RSPB in an effort to monitor changing bird populations in gardens. Around half a million people across the UK now take part annually. Results are available at a local authority scale, enabling greater comparison with the Wildlife at Home Challenge results. There are similar, if smaller, schemes for some other species groups, such as butterflies.

None of the above studies is directly comparable with the Wildlife at Home Challenge, but a broad comparison between the Challenge and the Big Garden Birdwatch is shown in the table below.

### Comparison of common garden bird species using results from the Wildlife at Home Challenge 2020 and the Big Garden Birdwatch 2020.

Species were ranked in both studies according to the percentage of gardens in which they occurred. The respective rankings are shown below (broken down into local authority areas for Big Garden Birdwatch only). Note that the Big Garden Birdwatch is held in the winter so species such as Swallow and Swift have been omitted from the comparison.

	WAHC	Big Garden Birdwatch 2020			
	Ayrshire & D&G	D&G	E. Ayr	N. Ayr	S. Ayr
Blackbird	1	2	1	2	2
Blue Tit	2	4	4	4	3
House Sparrow	3	3	3	3	4
Dunnock	4	7	-	10	10
Starling	5	10	6	7	7
Goldfinch	6	11	14	14	12
Woodpigeon	7	9	-	-	6
Carrion Crow	8	-	-	-	-
Great Tit	9	6	8	6	-
Robin	10	1	2	1	1

Species not ranked in the top 15 are marked (-).

The only species to appear in the top 10 of all four local authority areas in the Big Garden Birdwatch but not to feature in the WAHC top 10 was Chaffinch. Other species featuring in the Big Garden Birdwatch top 10s but not the WAHC top 10 were Coal Tit, Collared Dove and Magpie.



## 10. Potential for Future Projects

The Wildlife at Home Challenge was planned and implemented at short notice, due to exceptional circumstances. As previously stated, the results do not constitute a scientific study. However, the Challenge has proved a useful pilot for a more detailed recording project that could be carried out in the future, potentially in collaboration with a university, which could use the power of wildlife recorders to provide valuable information about habitats that have never been studied in detail in Scotland, whilst at the same time raising public awareness of wildlife, recording and wildlife gardening.

Potential subjects that could be addressed in a future project include (but are not limited to) the following:

- How many species are found in gardens compared to the wider countryside?
- What contribution do garden ponds make to regional amphibian populations?
- Which garden plants are most valuable to sustain populations of insect pollinators?
- Are there any species restricted to gardens?
- What makes a garden good for wildlife?
- Are native plants better for wildlife than non-native?
- Are organic gardens better for wildlife?
- Do old gardens have more wildlife than those established more recently?

## Appendix 1: Rules of the Wildlife at Home Challenge

1. All wildlife must be seen within or from a single house and garden that is located within Ayrshire or Dumfries & Galloway.
2. All records from each recorder should relate to a single site only. Feel free to submit other incidental wildlife records from your essential work, shopping and exercise trips via iRecord, but not within the 'Wildlife at Home' iRecord activity please.
3. Species do not have to be present in the house or garden, as long as they are seen from it. For example, birds flying over are acceptable.
4. So long as you are confident about identification, auditory records and records from tracks and signs are acceptable.
5. Records of wildlife from inside your house or outbuilding are acceptable (and encouraged). For example, spiders in your bath.
6. The recording period runs from 1 April 2020, until the end of the coronavirus restrictions on travel (whenever that might be).
7. All records should be of wild or naturalised species. No planted garden species allowed.
8. All records should be submitted via the iRecord 'Wildlife at Home' activity page and include your name (pseudonyms not allowed).
9. We recommend that you do not use your full address for the location of your records as this will appear on iRecord for the public to view. We are happy to accept records allocated to street or village names or the names of broad areas.
10. Submission of photographs is encouraged, but is not essential.
11. Records will be verified through the iRecord verification system. Verifiers exist for some, but not all, species groups. For the purposes of this challenge, records that are not-verified by iRecord will be taken in good faith and considered as correct for all common species within their known range/habitat. Records of rare, unusual or difficult to ID species should be supported by photographs and/or descriptions to aid verification.
12. The judges decisions are final.

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