

= Garden warbler =

The garden warbler ( *Sylvia borin* ) is a common and widespread small bird that breeds in most of Europe and in western Asia . It is a plain , long @-@ winged and long @-@ tailed typical warbler with brown upperparts and dull white underparts ; the sexes are similar and juveniles resemble the adults . Its two subspecies differ only slightly and interbreed where their ranges overlap . Due to its lack of distinguishing features , this species can be confused with a number of other unstreaked warblers . The garden warbler 's rich melodic song is similar to that of the blackcap , its closest relative , which competes with it for territory when nesting in the same woodland .

The preferred breeding habitat in Eurasia is open woodland with dense low cover for nesting ; despite its name , gardens are rarely occupied by this small passerine bird . The clutch of four or five blotched cream or white eggs is laid in a robust cup @-@ shaped nest built near the ground and concealed by dense vegetation . The eggs are incubated for 11 ? 12 days . The chicks are altricial , hatching naked and with closed eyes , and are fed by both parents . They fledge about 10 days after hatching . Only about a quarter of young birds survive their first year . The garden warbler is strongly migratory , wintering in sub @-@ Saharan Africa . A wide range of habitats are used in Africa , but closed forest and treeless Sahel are both shunned . Insects are the main food in the breeding season , although fruit predominates when birds are fattening prior to migration , figs being a particular favourite where available . These warblers have a mixed diet of insects and fruit in their African wintering grounds .

The garden warbler is hunted by Eurasian sparrowhawks and domestic cats , and its eggs and nestlings are taken by a variety of mammalian and avian predators . It may be host to various fleas , mites and internal parasites , and it is a host of the common cuckoo , a brood parasite . The large and fairly stable numbers and huge range of the garden warbler mean that it is classed as least concern by the International Union for Conservation of Nature . Despite a small population decline in much of its European range , the bird 's breeding distribution is expanding northwards in Scandinavia .

= = Taxonomy = =

The genus *Sylvia* , the typical warblers , forms part of a large family of Old World warblers , the Sylviidae . Fossils from France show that the genus dates back at least 20 million years . The garden warbler and its nearest relative , the blackcap , are an ancient species pair which diverged very early from the rest of the genus , between 12 and 16 million years ago . In the course of time , these two species have become sufficiently distinctive that they have been placed in separate subgenera , with the blackcap in subgenus *Sylvia* and the garden warbler in *Epilais* . These sister species have a breeding range which extends farther northeast than all other *Sylvia* species except the lesser whitethroat and common whitethroat .

The nearest relatives of the garden warbler outside the sister group are believed to be the African hill babbler and Dohrn 's thrush @-@ babbler , both of which should probably be placed in *Sylvia* rather than their current genera , *Pseudoalcippe* and *Horizorhinus* respectively .

The garden warbler was first described by Pieter Boddaert in 1783 . The current genus name is from Modern Latin *silvia* , a woodland nymph , related to *silva* , a wood . The specific *borin* is derived from a local name for the bird in the Genoa area of Italy ; it derives from the Latin *bos* , ox , because the warbler was believed to accompany oxen .

There are two recognised subspecies .

*Sylvia borin borin* ( Boddaert , 1783 ) , the nominate subspecies , breeds in western , northern and central Europe to Finland , central Poland , western Hungary and Bosnia .

*S. b. woodwardi* ( Sharpe , 1877 ) , named for Sharpe 's collaborator Bernard Barham Woodward , breeds in eastern Europe and temperate Asia east to western Siberia .

Intermediate birds occur where the recognised forms meet and interbreed , and have sometimes been given subspecies status , including *S. b. kreczmeri* in Poland and *S. b. pateffi* in Bulgaria , but these are not generally accepted as valid taxa .

## = = Description = =

The garden warbler is 14 cm ( 5 @. @ 5 in ) long with a 7 @. @ 6 ? 8 @. @ 4 cm ( 3 @. @ 0 ? 3 @. @ 3 in ) wing length . The weight is typically 16 ? 22 g ( 0 @. @ 56 ? 0 @. @ 78 oz ) , but can be up to 35 @. @ 5 g ( 1 @. @ 25 oz ) for birds preparing to migrate . It is a plain , long @-@ winged and long @-@ tailed bird with unstreaked olive @-@ brown upperparts and dull white underparts . It has a whitish eyering and a faint pale supercilium , and there is a buff wash to the throat and flanks . The eye is black , the legs are bluish @-@ grey and the strong bill has a grey upper and paler grey lower mandible . The male and female are indistinguishable by external appearance including size . Juveniles have a looser plumage than an adult , with paler and greyer upperparts and a buff tone to the underparts . The eastern subspecies *S. b. woodwardi* is slightly larger and paler than the nominate form with a greyer tone to the upperparts and whiter underparts . The subspecies are hard to distinguish visually where they occur together in Africa , but a wing length greater than 80 mm ( 3 @. @ 1 in ) confirms *S. b. woodwardi* when birds are trapped .

The plain appearance of the garden warbler means that it can be confused with several other species . The melodious and icterine warblers usually have long bills and a yellowish tint to their plumage . The booted warbler is similar in colour , although it is smaller , more delicately built and has a flesh @-@ coloured bill . Western and eastern olivaceous warblers are also relatively small , and have white outer tail feathers as well as a pinkish bill . Juvenile barred warblers , which lack the obvious barring of adults , are much larger than garden warblers and have a pale double wingbar .

Juvenile garden warblers have a partial moult mainly involving the body plumage between June and September prior to migration . Adults also have a similar , but sometimes more extensive , partial moult in late summer , and a complete moult in their African wintering areas before the return migration .

## = = = Voice = = =

The male 's song , usually delivered by birds in dense cover , is a rich musical warbling usually delivered in bursts of a few seconds duration , but sometimes for longer periods . The song is confusable with that of the blackcap , although compared to that species it is slightly lower @-@ pitched , less broken into discrete song segments and more mellow . Both species have a quiet subsong , a muted version of the full song , which is much more difficult to separate . The most frequent call of the garden warbler is a sharp kek @-@ kek , which is repeated rapidly when the bird is alarmed . A quiet rasping tchurr @-@ r @-@ r @-@ r resembling the main call of the common whitethroat is also sometimes heard . The juvenile has a quia alarm vocalisation . The garden warbler will occasionally mimic other birds , and is itself frequently mimicked by the blackcap . Both *Sylvia* warblers will also sing against common nightingales , which have a similar song despite being unrelated . Subsong may be heard on the wintering grounds in Africa , developing into the full song in March and April prior to the return to Europe .

## = = Distribution and habitat = =

The garden warbler breeds in most of Europe between the 12 ? 28 ° C ( 54 ? 82 ° F ) isotherms and east across temperate Asia to the Yenisei River in Siberia . Its range extends further north than any other *Sylvia* warbler . All populations are migratory , wintering in sub @-@ Saharan Africa as far south as South Africa . Birds from central Europe initially migrate to the southwest , reorientating to the south or southeast once in Africa , although Scandinavian migrants may head south through the Alps and across the Mediterranean Sea . *S. b. woodwardi* reaches Africa by a more easterly route , many birds passing through the Arabian Peninsula . When garden warblers cross the Sahara , they fly at night , resting motionless and without feeding in suitable shade during the day . During their journey , they can metabolise not only body fat but also up to 19 % of their breast and leg muscles and 39 % of their digestive tract . Many birds pause for a few days to feed after the desert crossing

before continuing further south .

The nominate subspecies occurs in the western and central parts of the winter range , although some birds occur as far east as Kenya . *S. b. woodwardi* winters in eastern and southern Africa . Movements in Africa are poorly known , although at least some birds return to the same location in subsequent years . There are only a handful of records of birds recorded in Europe in winter , from Corsica , the UK and Ireland . Spring migration routes are poorly known , but appear to lie more directly across the Mediterranean . This warbler has occurred as a vagrant in Afghanistan , Djibouti , Iceland , São Tomé and Príncipe , Somalia , Yemen , Svalbard , Jan Mayen and Madeira .

The breeding habitat of the garden warbler is open areas with dense bushes , including thickets and woodland edges . Shady areas and a bushy or herbaceous undergrowth are preferred , as are woods adjacent to rivers or reed beds . A tolerance of willow , alder and birch allows it to breed farther north and at higher altitudes than any other European *Sylvia* warbler . Mature conifers and dense plantations are avoided , although young conifer plantations with thick undergrowth are suitable for nesting . Despite its name , it is not a bird of gardens . In Africa , a wide range of habitats with trees are used , although closed forests and arid areas are again avoided . This warbler occurs at altitudes of up to 2 @, @ 600 m ( 8 @, @ 500 ft ) in suitable mountain woodland , although in East Africa it is usually found at a lower altitude than the blackcap , and in moister areas than the common whitethroat .

= = Behaviour = =

= = = Breeding = = =

Garden warblers first breed when they are one year old , and are mainly monogamous , although the male at least may sometimes deviate from this . When males return to their breeding areas , they establish a territory . *Sylvia* warblers are unusual in that they vigorously defend their territories against other species in their genus as well as conspecifics . Blackcaps and garden warblers use identical habits in the same woods , yet aggressive interactions mean that their territories never overlap . Similar songs are a feature of the *Sylvia* warblers as a group , and it has been suggested that this promotes interspecific competition and helps to segregate territories between related species . However , it appears more likely from later studies that segregation of sympatric species , other than the blackcap and garden warbler , is due to subtle differences in habitat preferences rather than interspecies aggression . There are typically 3 ? 9 territories per hectare ( 1 @. @ 2 ? 3 @. @ 6 per acre ) , but in prime habitat , such as moist willow or birch woodland or young deciduous regrowth , there may be more than 10 pairs per hectare ( 4 per acre ) . Individual territories are similar in size to those of blackcaps at 0 @. @ 2 ? 0 @. @ 76 ha ( 0 @. @ 49 ? 1 @. @ 88 acres ) .

A male attracts a female to his territory through song and a display which involves rapid wing beating while perched . He will also build a number of simple nests ( cock 's nests ) to show to his mate , although only rarely will she complete the structure , usually starting afresh . The nest is concealed in vegetation , the nature of which depends on local availability . *Rubus* species are commonly used in temperate regions , with willow predominating in alpine valleys . Sometimes , particularly in stinging nettles , the nest may be built around a number of vertical stems , in the manner of a reed warbler . The nest is normally between 0 @. @ 3 and 1 @. @ 2 m ( 0 @. @ 98 and 3 @. @ 94 ft ) above the ground , and very rarely higher than 2 m ( 6 @. @ 6 ft ) . The nest is a cup of dry grass , moss and twigs , with a soft lining of finer plant material or hair . It is larger and heavier than a blackcap 's nest , averaging 8 @. @ 3 cm ( 3 @. @ 3 in ) high and 11 @. @ 2 cm ( 4 @. @ 4 in ) wide with a cup 5 @. @ 5 cm ( 2 @. @ 2 in ) deep and 6 @. @ 3 cm ( 2 @. @ 5 in ) wide .

The first eggs are laid in late April in southern Germany , early May in northwest Europe , and late May in Finland . The season is prolonged with some birds nesting as late as July . The clutch is typically four or five eggs ( range two to six ) , which are usually whitish or buff with grey , purple and brown blotches . The average size of the egg is 20 mm x 15 mm ( 0 @. @ 79 in x 0 @. @ 59 in ) , and it weighs 2 @. @ 2 g ( 0 @. @ 078 oz ) , of which 6 % is shell . The eggs are incubated for 11 ?

12 days by both adults , although only the female stays on the nest at night . The chicks are altricial , hatching naked and with closed eyes , and are fed by both parents . They fledge about 10 days after hatching ( range 9 ? 12 ) , leaving the nest shortly before they are able to fly . They are assisted with feeding for a further two weeks , and the family may stay together for a few days after that . The short incubation and fledging times may be a result of predation pressure , the rapid development of the chicks enabling them to leave the vulnerable nest as early as possible , even while still flightless . This avoids the possible loss of an entire brood , but means that the adults must provide food to the young for a significant period until they can fend for themselves . One brood per year is normal , although a few second broods are known .

The southward migration starts in mid @-@ July , with larger numbers departing in August and peaking in early September . Most adults have gone by mid @-@ September , although juveniles may linger for another month .

On average , just over 50 % of breeding pairs are successful in producing at least one fledged young from a nest , with early breeding and low population density being factors increasing success . In the UK , more than 50 % of the failures are due to predation and about 30 % result from food shortages in bad weather . The annual survival rate is about 50 % for adults and 26 % for juveniles in their first year . The typical lifespan is two years , but a bird in Sweden lived to ten years and two months Much greater ages , up to 24 years , have been recorded in captive garden warblers .

#### = = = Feeding = = =

The garden warbler feeds mainly on insects in the breeding season , although other small invertebrates such as spiders are also eaten . It picks its prey off leaves and twigs , sometimes hovering to do so . It normally forages at less than 6 m ( 20 ft ) above the ground . After nesting , there is a genetically controlled switch to a fruit diet , although insects are still consumed while the birds fatten prior to migration ; birds gain weight more rapidly from a diet containing both fruit and insects than either alone . Berries and other soft fruit are preferred , and figs are particularly important for birds preparing to migrate . This predilection gives rise to the Italian beccafico ( fig pecker ) and Portuguese felosa @-@ das @-@ figueiras ( fig @-@ tree warbler ) as names for this species . On this diet a bird can gain weight quickly and the liver increases the rate at which it produces fatty acids for storage in adipose tissue .

In Africa , the warbler eats insects as well as berries , and the fruits of the introduced Spanish flag is a favourite where present . An increase in body mass occurs again before the northward migration , birds fattening even more rapidly than prior to their southward journey . Most internal organs ( including the liver , spleen , intestines , kidneys and heart ) and the flight muscles lose weight during the journey over the Sahara , although the testes quadruple in mass in preparation for the breeding season . Unlike drier @-@ habitat species like the common whitethroat , they leave from savanna rather than the treeless Sahel further north .

Fruit is normally picked by a perched bird , although there is a record of a mulberry fruit being taken in flight . Garden warblers often feed with conspecifics and other fruit @-@ eating passerines . Over 35 plant species have been recorded as food for this warbler just in central Europe , with many additional species being consumed in the Mediterranean region and on the African wintering grounds .

#### = = Predators and parasites = =

The main predators of the garden warbler are Eurasian sparrowhawks and domestic cats . Some falcons will also take adults , and the Eleonora 's falcon hunts the garden warbler and many other small passerines as they migrate across the Mediterranean . Eurasian jays and Eurasian magpies take the eggs and young of warblers , as do mammals such as stoats , weasels and squirrels . The garden warbler is a host of the common cuckoo , a brood parasite . The blackcap has a much lower level of parasitism than its relative because the cuckoo 's eggs are often rejected .

External parasites of the garden warbler include the fleas *Ceratophyllus gallinae* and *Dasypsyllus*

gallinulae and the mite *Syringophilosis borini* , named after its host . Two species of protozoan parasites in the genus *Isospora* occur in garden warblers , *I. sylvianthina* and *I. sylviae* . Samples from two sites showed infection levels above 74 % and 28 % respectively for the two species . The extent of infection does not impact on the bird 's body mass or the amount of body fat . Three strains of another protozoan , *Haemoproteus parabelopolskyi* are found only in the garden warbler , and form a monophyletic group . Seventeen further members of that group are found only in the blackcap , and another three occur in the African hill babbler , supporting the shared ancestry of the three bird species .

= = Status = =

The garden warbler has a very large range of 9 @, @ 650 @, @ 000 km<sup>2</sup> ( 3 @, @ 700 @, @ 000 mi<sup>2</sup> ) , and its population in Europe is estimated at 17 ? 31 million breeding pairs . Allowing for birds breeding in Asia , the total population is between 54 ? 124 million individuals . There is no evidence of any serious decline in numbers , so it is classified by the International Union for Conservation of Nature as being of least concern .

There has been a slight decline in numbers in Europe since 1980 , although the Scandinavian population is growing . Climate change appears to be affecting the migration pattern of the garden warbler and blackcap . Both are arriving in Europe earlier than previously , and blackcaps and juvenile ( but not adult ) garden warblers are departing nearly two weeks later than in the 1980s . Birds of both species are longer @-@ winged and lighter than in the past , suggesting a longer migration as the breeding range expands northwards .

= = In culture = =

In his *History of Animals* , Aristotle considered that the garden warbler eventually metamorphosed into a blackcap . The composer Olivier Messiaen used the song of the garden warbler as the basis for his 1971 solo piano piece *La fauvette des jardins* , the title being the French name of the species . His *Turangalîla @-@ Symphonie* , a major work inspired by the legend of Tristan and Iseult , has a summer garden scene as its sixth movement . This features the song of the warbler , along with the those of the nightingale and blackbird .

The garden warbler is prized as a gastronomic delicacy in Mediterranean countries . French epicure Jean Anthelme Brillat @-@ Savarin said of the warbler when cooked like ortolan bunting " if it were the size of a pheasant , it would be worth an acre of land " . An Italian stuffed sardine dish *sarde a beccafico* derives its name from its supposed resemblance to the cooked birds , known in that country as *beccafico* , fig @-@ pecker .

Old names for the garden warbler , such as *strawsmear* , *small straw* and *haychat* , are often derived from its choice of nesting material , although the commonest of the English folk names was " *pettychaps* " . These names were often shared with other warblers including the blackcap , common whitethroat and common chiffchaff .