

= Common firecrest =

The common firecrest (*Regulus ignicapilla*) also known as the firecrest , is a very small passerine bird in the kinglet family . It breeds in most of temperate Europe and northwestern Africa , and is partially migratory , with birds from central Europe wintering to the south and west of their breeding range . Firecrests in the Balearic Islands and north Africa are widely recognised as a separate subspecies , but the population on Madeira , previously also treated as a subspecies , is now treated as a distinct species , the Madeira firecrest , *Regulus madeirensis* . A fossil ancestor of the firecrest has been identified from a single wing bone .

This kinglet is greenish above and has whitish underparts . It has two white wingbars , a black eye stripe and a white supercilium . The head crest , orange in the male and yellow in the female , is displayed during breeding , and gives rise to the English and scientific names for the species . This bird superficially resembles the goldcrest , which largely shares its European range , but the firecrest 's bronze shoulders and strong face pattern are distinctive . The song is a repetition of high thin notes , slightly lower @-@ pitched than those of its relative .

The common firecrest breeds in broadleaved or coniferous woodland and gardens , building its compact , three @-@ layered nest on a tree branch . Seven to twelve eggs are incubated by the female alone . Both parents feed the chicks , which fledge 22 ? 24 days after hatching . This kinglet is constantly on the move and frequently hovers as it searches for insects to eat , and in winter it is often found with flocks of tits . Despite some possible local declines , the species is not the subject of significant conservation concerns owing to its large European population and an expansion of its range over the last century . It may be hunted and killed by birds of prey , and can carry parasites . It is possible that this species was the original " king of the birds " in European folklore .

= = Description = =

The common firecrest is a small plump bird , 9 cm (3 @.@ 5 in) in length with a wingspan of 13 ? 16 cm (5 @.@ 1 ? 6 @.@ 3 in) , and weighs 4 ? 7 grams (0 @.@ 14 ? 0 @.@ 25 oz) . It has bright olive @-@ green upperparts with a bronze @-@ coloured patch on each shoulder , and whitish underparts washed with brownish @-@ grey on the breast and flanks . It has two white wingbars , a tiny black pointed bill , and brownish @-@ black legs . The head pattern is striking , with a black eye stripe , long white supercilium , and a crest which is bright yellow in the female and mainly orange in the male . The sexes are very similar , apart from the crest colour , although the female is a little duller in plumage and on average slightly smaller . Juveniles have a grey tinge to the duller upperparts , and lack the coloured crown ; the other head markings are present , but duller than in the adult . By their first winter , only the flight and tail feathers remain unmoulted , and the young birds are virtually indistinguishable from the adults in the field . This kinglet usually hops with its body held horizontally , and its flight is weak and whirring , with occasional quick evasive turns .

Adult firecrests are unlikely to be confused with any other species ; Pallas 's warbler has a similar head and wing pattern , but its crown stripe is pale lemon , not bright yellow or orange , and its supercilium is also pale yellow , not bright white . The juvenile common firecrest might be confused with the goldcrest , but usually shows enough face pattern to distinguish it from its relative , which has a very plain face at all ages . The firecrest can also be separated from Pallas 's warbler by the warbler 's pale crown stripe and yellow rump . There is more likelihood of confusing the juvenile firecrest with the yellow @-@ browed warbler , which has a similar head pattern ; the warbler (an Asiatic species) has pale fringes to the feathers of the closed wing , a whitish belly and darker brown legs . The yellow @-@ browed warbler also lacks the pale half circle present below the young firecrest 's eye .

= = Taxonomy and systematics = =

The kinglets are a small group of birds sometimes included in the Old World warblers , but frequently given family status , especially as recent research shows that , despite superficial

similarities , the crests are phylogenetically remote from the warblers . The names of the family , Regulidae , and its only genus , *Regulus* , are derived from the Latin *regulus* , a diminutive of *rex* , " a king " , and refer to the characteristic orange or yellow crests of adult kinglets . The common firecrest was first formally described by Dutch zoologist Coenraad Jacob Temminck in 1820 as *Sylvia ignicapilla* ; the relatively late identification of this common European bird arose from a perception that it was just a variety of the goldcrest . The species name is derived from Latin *ignis* " fire " and *capillus* " hair " . The binomial is frequently given as *R. ignicapillus* due to a misunderstanding of Latin grammar .

There are two widely recognised subspecies of common firecrest , nominate *R. i. ignicapilla* and Mediterranean *R. i. balearicus* (Jordans , 1923) . The latter form is found on the Balearic Islands and in north Africa , and is slightly paler below and greyer above than the nominate subspecies . Other subspecies have been claimed , including southeastern *R. i. caucasicus* , North African *R. i. laeneni* , and Crimean *R. i. tauricus* . The Madeira firecrest , *R. madeirensis* , was formerly also considered to be a subspecies of the common firecrest , but phylogenetic analysis based on the cytochrome b gene showed that the Madeiran form is distinct at the species level . Cytochrome b gene divergence between the Madeira firecrest and the European bird is 8 @. @ 5 % , comparable with the divergence level between other recognised *Regulus* species , such as the 9 % between the goldcrest and the golden @-@ crowned kinglet . The island form also differs in morphology and vocalisations . The proposed split was accepted by the Association of European Rarities Committees (AERC) in 2003 , although some authorities , like The Clements checklist , have not yet recognised the new species .

The flamecrest or Taiwan firecrest (*Regulus goodfellowi*) of Taiwan has sometimes been viewed as a race of the common firecrest ; however , the flamecrest 's territorial song , which resembles those of the Himalayan races of the goldcrest , and genetic data indicate that the flamecrest is closely related to the Himalayan goldcrest and only distantly to the two firecrest species . The kinglets on the Canary Islands , which were also considered to be close to firecrests , have now been shown to comprise two subspecies of goldcrest .

= = = Fossils = = =

There are a few Pleistocene (2 @. @ 6 million to 12 @, @ 000 years ago) records from Europe and Israel of extant *Regulus* species , mostly goldcrests or unidentifiable to species , but also a Spanish specimen of firecrest . A left ulna from Bulgaria was identified as belonging to a fossil species , *Regulus bulgaricus* , from 2 @. @ 6 ? 1 @. @ 95 mya . This appears to be ancestral to the common firecrest , with the goldcrest diverging from this lineage in the Middle Pleistocene .

= = Distribution and habitat = =

The common firecrest breeds in lowland broadleaf forest , preferring cork oak and alder where available , otherwise beech and holly . It also uses mixed broadleaf and conifer woodland , and stands of spruce , European silver fir , cedar and pines , often with undergrowth of juniper , ivy and wild rose . In drier Mediterranean habitats it is found in conifers , evergreen oak , and mixed woodlands up to 2 @, @ 800 m (9 @, @ 200 ft) . Unlike more specialised birds such as Eurasian nuthatch and common treecreeper , both of which forage on trunks , the crests do not need large woodlands , and their population density is independent of forest size . In winter it is less reliant on conifers than the goldcrest , moving from forest to fringes and scrub . It occurs singly or in pairs , spending much time in the tree canopy , although frequently venturing into bushes and other lower vegetation . This species can thrive in fairly urban areas , provided that suitable habitat is available in parks or large gardens ; population densities in gardens can be comparable with the maximum levels found in natural habitats .

The nominate subspecies breeds in Europe from southern England , France , Spain and Portugal east to Belarus , northwestern Ukraine , and Greece , and north to the Baltic and southern Latvia . There are isolated populations east of the main range in Abkhazia , the Crimea and Turkey . Its

range lies between the 16 and 24 ° C (61 and 75 ° F) July isotherms . Southern birds are largely resident , unlike northern and eastern populations which are migratory , wintering mainly in Mediterranean areas and the far west of Europe from Portugal north to Britain . *R. i. balearicus* is resident in the Balearic Islands and the northern parts of Morocco , Algeria and Tunisia . This species has been recorded as a vagrant from Norway , Finland , Estonia , Cyprus , Egypt and Lebanon .

= = Behaviour and ecology = =

= = = Breeding = = =

The common firecrest is monogamous . The male sings during the breeding season , often with its crest raised , and has a display which involves pointing its bill at another bird , showing the crest and strong face pattern . This differs from the display of the plainer @-@ faced goldcrest , which bows its head to emphasise the crest . The breeding territory is about 0 @.@ 5 hectares (1 @.@ 2 acres) , and may overlap with neighbouring goldcrest territories . Firecrests will sometimes defend their territories against goldcrests with the crest raised and a great deal of wing @-@ fluttering , but the amount of actual competition between the species may not be very great . A Spanish study suggested that territorial conflicts between the species , and other phenomena like males singing mixed or alternating songs , were most frequent when one species locally far outnumbered the other ; in other circumstances , the two kinglets learned to ignore each other 's songs . In his courtship display the male firecrest raises his crest , points it towards his mate and hovers over her before mating takes place .

The nest is often suspended from a hanging branch usually at no great altitude , although Eric Simms reported nests at heights from 2 @.@ 5 to 20 m (8 @.@ 2 to 65 @.@ 6 ft) . Firecrests may favour breeding close to northern goshawk nests . That large bird will prey on potential predators of the firecrest such as Eurasian sparrowhawks , and nest robbers like grey squirrels , Eurasian jays and great spotted woodpeckers . As is typical for the family , the nest is a closed cup built in three layers with a small entrance hole near its top . The nest 's outer layer is made from moss , small twigs , cobwebs and lichen , the spider webs also being used to attach the nest to the thin branches that support it . The middle layer is moss , and this is lined with feathers (up to 3 @.@ 000) and hair . The nest is smaller , deeper and more compact than that of the goldcrest , about 8 cm (3 @.@ 1 in) across and 5 ? 7 cm (2 @.@ 0 ? 2 @.@ 8 in) deep , with a wall thickness of about 2 cm (0 @.@ 79 in) . The nest is constructed by the female alone , although the male will accompany the female while she builds the nest over a period of a few days to three weeks .

Laying starts in western Europe at the end of April , and in the east of the range in late May ; second clutches , which are common , commence in June to July . The eggs are pink with very indistinct reddish markings at the broad end , unlike those of Madeira firecrest which are described as like those of a *Phylloscopus* warbler (white with some brown speckles) . The eggs are 14 mm x 10 mm (0 @.@ 55 in x 0 @.@ 39 in) and weigh 0 @.@ 7 g (0 @.@ 025 oz) , of which 5 % is shell . The clutch size in Europe is 7 ? 12 eggs , but probably smaller in northwest Africa . The female incubates the eggs for 14 @.@ 5 to 16 @.@ 5 days to hatching , and broods the chicks , which fledge eight to ten days later . Both parents feed the chicks and fledged young . This species becomes sexually mature after one year , and has a life expectancy of less than two years .

Although their ranges overlap substantially , hybridisation between goldcrests and firecrests seems to be prevented by differences in courtship rituals and different facial patterns . Even in aviary studies in which a female goldcrest was given an artificial eyestripe to facilitate mating with a male firecrest , the chicks were never raised by the mixed pair , and appeared to be poorly adapted compared to the parent species .

= = = Feeding = = =

All species of kinglet are almost exclusively insectivorous , preying on small arthropods with soft cuticles , such as springtails , aphids and spiders . They also feed on the cocoons and eggs of spiders and insects , and occasionally take pollen . All species will hover to catch flying insects . Although the similarly sized firecrest and goldcrest are often found together , there are a number of factors that reduce direct competition for food . Common firecrests prefer larger prey than goldcrests . Although both will take trapped insects from spider webs on autumn migration , firecrests will also eat the large orb @-@ web spiders (on rare occasions kinglets have been found stuck in a spider web , either unable to move or dead) .

The common firecrest feeds in trees , exploiting mainly the upper surface of branches in coniferous habitat and of leaves in deciduous trees . This is in contrast to the goldcrest , which frequently feeds on the undersides of branches and leaves . In winter , flocks of common firecrests cover a given distance about three times faster than do goldcrests , and ignore the smallest prey items preferred by their relative ; large invertebrates are killed by beating them repeatedly against a branch . The differences in behaviour are facilitated by subtle morphological differences ; firecrests have broader bills with longer rictal bristles (which protect a bird 's eye from food items it is trying to capture) , and these features reflect the larger prey taken by the species . The firecrest 's less forked tail may reflect its longer episodes of hovering while hunting . Firecrests forage more often while standing , and have a foot better adapted for perching , whereas the goldcrest 's longer hind toe reflects its habit of moving vertically along branches while feeding . It also has a deep groove in the soles of its feet capable of gripping individual needles , while firecrests have a smoother underside to the foot .

Young common firecrests are fed almost exclusively with springtails ; larger food items are not accepted , and spiders are occasionally regurgitated . From the fifth day onwards , the nestling diet includes aphids and a high amount of snail shells , the latter being needed for bone growth . After the second week , the food includes larger moths and caterpillars , as well as various arthropods typically avoided by adults , such as harvestmen , earwigs , and centipedes .

In winter , the firecrest joins loose flocks of other wanderers such as tits and warblers . This kinglet , like other species that prefer mixed @-@ species foraging flocks in winter , hunts over a greater range of heights and vegetation types than when feeding alone . For species that tend to feed in flocks , foraging success while in a flock was about twice that for solitary birds . In some areas , wintering birds have developed the habit of coming to feeding stations and bird tables for fatty food , sometimes with goldcrests or warblers such as the common chiffchaff and blackcap . The kinglet 's digestive system is adapted to an entirely insectivorous diet , whereas *Sylvia* warblers include fruit in their autumn diet . A Spanish study compared that genus with the insectivorous firecrest and *Phylloscopus* warblers . The results showed that , relative to body weight , the insect @-@ eaters had shorter intestines , but longer gut passage times than the *Sylvia* species . The insect @-@ eaters are also generally slightly smaller than the omnivores .

= = = Voice = = =

The contact call is three or four thin high notes , similar to that of goldcrest , but slightly lower in pitch , zit @-@ zit @-@ zit rather than see @-@ see @-@ see . The song is a succession of call notes in a longer and slightly more varied sequence . Typically there are 11 ? 14 notes per song , becoming louder and faster , with the final three notes slightly different from the preceding ones : zit @-@ zit @-@ zit @-@ zit @-@ zit @-@ zit @-@ zit @-@ zit @-@ zit @-@ zirt.zirt.zirt. The song usually lasts 0 @.@ 5 ? 2 @.@ 5 seconds , shorter than the 3 @.@ 5 ? 4 @.@ 0 seconds for the goldcrest , and may be repeated up to eight times a minute . In May and June , singing is most frequent after dawn , but continues less often throughout the day . Later in the breeding season , song becomes largely confined to the morning .

The song of the Mediterranean subspecies of common firecrest , *R. i. balearicus* , is very similar to that of the nominate form , but one factor in separating the Madeiran firecrest from common firecrest is that the island bird 's song is divided into three phrases , two of them consisting of modified display and anger calls . Its display calls also use a larger frequency range and more harmonics

than those of the continental subspecies . Male goldcrests and Madeiran firecrests sometimes show a territorial response to recordings of the songs or calls of the common firecrest , but the reverse is apparently not true , because the songs of the common firecrest are simpler in construction than those of its relatives .

= = = Predators and parasites = = =

Throughout the firecrest 's range , the main predator of small woodland birds is the Eurasian sparrowhawk , which takes avian prey as up to 98 % of its diet . The tawny owl relies more on mammalian catches , but about one @-@ third of its food is forest birds . Eggs and young may be taken by grey squirrels , Eurasian jays and great spotted woodpeckers . The firecrest appears to be virtually unknown as a host of the common cuckoo , a widespread European brood parasite .

The invasive Argentine ant (*Linepithema humile*) is common in the Mediterranean area , and reduces arthropod numbers by removing most native ant species . The reduction in prey items is greatest in the tree canopy , and has a greater effect on species like the firecrest that feed high in the foliage . Less food is available for chicks , and parents have to spend more time foraging .

Data on specific parasites of the firecrest is lacking , but the widespread moorhen flea , *Dasysyllus gallinulae* has been recorded in a related *Regulus* species . A number of feather mites have been recorded in the genus , including *Proctophyllodes glandarinus* on firecrest . These mites live on fungi growing on the feathers . The fungi found on the plumage may feed on the keratin of the outer feathers or on feather oil .

= = Status = =

The common firecrest expanded its range in the nineteenth and twentieth centuries , colonising northern France , followed by first breeding in the Netherlands in 1928 and Denmark in 1961 . In Britain , it had only been recorded a handful of times by 1839 , but first bred in 1962 , and is now widespread as a breeding bird in much of southern England . Milder winters have meant that more birds can winter further north , and therefore the breeding range can expand without incurring the risks involved in lengthy migrations . A population was found in northern Morocco in 1986 .

Population growth may be limited by lack of suitable habitat , and there may be local declines due to loss of conifers through storms or replacement by plantations of native deciduous trees . There may also be localised losses in areas of high heavy metal pollution , which particularly affects ground feeders like thrushes and conifer foliage gleaners , including both European *Regulus* species . Conifer specialists suffer from the loss and poor quality of needles , and the consequent decrease in abundance of their invertebrate food . The common firecrest has a large range and a population estimated at 10 ? 30 million individuals , most in Europe . The population is believed to be stable in the absence of evidence for any declines or serious threats , and it is therefore classed as least concern on the IUCN Red List .

= = In culture = =

Aristotle and Pliny relate the legend of a contest amongst the birds to see who should be their king , the title to be awarded to the one that could fly highest . Initially , it looked as though the eagle would win easily , but as he began to tire , a small bird which had hidden under the eagle 's tail feathers emerged to fly even higher and claimed the title . Following from this legend , in much European folklore the wren has been described as the " king of the birds " or as a flame bearer . However , these terms were also applied to the *Regulus* species , the fiery crowns of the goldcrest and firecrest making them more likely to be the original bearers of these titles , and , because of the legend 's reference to the " smallest of birds " becoming king , the title was probably transferred to the equally tiny wren . The confusion was assisted by the similarity and consequent interchangeability of the Ancient Greek words for the wren (????????? basileus , " king ") and the crests (?????????? basiliskos , " kinglet ") . In English , the association between the firecrest and Eurasian wren was

reinforced by the kinglet 's old name of " fire @-@ crested wren " .