

= Bohemian waxwing =

The Bohemian waxwing ( *Bombycilla garrulus* ) is a starling @-@ sized passerine bird that breeds in the northern forests of Eurasia and North America . It has mainly buff @-@ grey plumage , black face markings and a pointed crest . Its wings are patterned with white and bright yellow , and some feather tips have the red waxy appearance that give this species its English name . The three subspecies show only minor differences in appearance . Females are similar to males , although young birds are less well @-@ marked and have few or no waxy wingtips . Although the Bohemian waxwing 's range overlaps those of the cedar and Japanese waxwings , it is easily distinguished from them by size and plumage differences .

The breeding habitat is coniferous forests , usually near water . The pair build a lined cup @-@ shaped nest in a tree or bush , often close to the trunk . The clutch of 3 ? 7 eggs is incubated by the female alone for 13 ? 14 days to hatching . The chicks are altricial and naked , and are fed by both parents , initially mostly with insects , but thereafter mainly fruit . They fledge about 14 ? 16 days after leaving the egg . Many birds desert their nesting range in winter and migrate farther south . In some years , large numbers of Bohemian waxwings irrupt well beyond their normal winter range in search of the fruit that makes up most of their diet .

Waxwings can be very tame in winter , entering towns and gardens in search of food , rowan berries being a particular favourite . They can metabolise alcohol produced in fermenting fruit , but can still become intoxicated , sometimes fatally . Other hazards include predation by birds of prey , infestation by parasites and collisions with cars or windows . The Bohemian waxwing 's high numbers and very large breeding area mean that it is classified as being of least concern by the International Union for Conservation of Nature .

= = Taxonomy = =

The waxwings are a family , *Bombycillidae* , of short @-@ tailed stocky birds with soft plumage , a head crest and distinctively patterned wings and tails . There are three species , the Bohemian , cedar , and Japanese waxwings . DNA studies and shared features such as a relatively large size , grey underparts and similar undertail patterns suggest that the Japanese and Bohemian waxwings are most closely related within the genus . Although only the cedar and Bohemian waxwings normally have red tips on their wing feathers , this feature is occasionally shown by the Japanese waxwing , suggesting that this was originally a whole @-@ family characteristic that has been lost in one species , rather than an indicator of a close relationship . DNA analysis confirms that the cedar waxwing diverged early from the other members of the family . Outside the genus , the closest relatives of the waxwings are believed to be the silky @-@ flycatchers , the palmchat , and the grey hypocolius , all of which have sometimes been included in the *Bombycillidae* .

The Bohemian waxwing was described by Linnaeus in his *Systema naturae* in 1758 as *Lanius Garrulus* . The waxwings were moved to their own genus , *Bombycilla* , by Vieillot in 1808 . The genus name *Bombycilla* comes from the Greek *bombux* , " silk " and the Modern Latin *cilla* , " tail " ; this is a direct translation of the German *Seidenschwanz* , " silk @-@ tail " , and refers to the silky @-@ soft plumage of the bird . The species name *garrulus* is the Latin for talkative and was applied to this bird , as " *Garrulus Bohemicus* " , by Conrad Gessner in 1555 ; the term is a reference to a supposed likeness to the Eurasian jay ( *Garrulus glandarius* ) rather than to the waxwing 's vocalisations . The English name " waxwing " refers to the bright red tips of the secondary feathers on its wings , which look like drops of sealing wax , while " Bohemian " follows Gessner 's usage , and may refer to the Romani , alluding to the bird 's wanderings , or to its presumed origin from Bohemia . " Waxwing " and " Bohemian waxwing " were first recorded in 1817 , the former as a reference to Vieillot 's separation of this bird from the " chatterers " .

There are three recognised subspecies :

B. g. *garrulus* ( Linnaeus , 1758 ) : the nominate subspecies . Breeds in northern Europe from northern Sweden east to the Ural Mountains .

B. g. *centralasiae* ( Poliakov , 1915 ) : breeds from the Urals eastwards across northern Asia .

*B. g. pallidiceps* ( Reichenow , 1908 ) : breeds in northwestern North America .

The differences between these forms are small and clinal , and the species could be possibly considered as monotypic . The fossil record includes Pleistocene deposits from the UK and the Carpathian Mountains .

#### = = Description = =

The Bohemian waxwing is a starling @-@ sized bird 19 ? 23 cm ( 7 @.@ 5 ? 9 @.@ 1 in ) in length with a 32 ? 35 @.@ 5 cm ( 12 @.@ 6 ? 14 @.@ 0 in ) wingspan , and an average weight of 55 g ( 1 @.@ 9 oz ) . It is short @-@ tailed , mainly brownish @-@ grey , and has a conspicuous crest on its head . The male of the nominate subspecies has a black mask through the eye and a black throat . There is a white streak behind the bill and a white curve below the eye . The lower belly is a rich chestnut colour and there are cinnamon @-@ coloured areas around the mask . The rump is grey and the tail ends in a bright yellow band with a broad black border above it . The wings are very distinctive ; the flight feathers are black and the primaries have markings that produce a yellow stripe and white " fishhooks " on the closed wing . The adult 's secondaries end in long red appendages with the sealing wax appearance that gives the bird its English name . The eyes are dark brown , the bill is mainly black , and the legs are dark grey or black . In flight , the waxwing 's large flocks , long wings and short tail give some resemblance to the common starling , and its flight is similarly fast and direct . It clammers easily through bushes and trees but only shuffles on the ground .

The soft , dense feathers are kept in good condition by preening . The red waxy tips are the extended and flattened ends of feather shafts , pigmented with astaxanthin and enclosed in a transparent sheath . A study of the cedar waxwings showed that the red tips are few or absent until the third year of life for that related species . All adult waxwings have a complete moult annually between August and January . Juveniles moult at the same time but retain their flight and some other wing feathers .

The female Bohemian waxwing is very similar to the male , but has a narrower yellow terminal band to the tail , a less defined lower edge to the black throat and slightly less distinctive wing markings . Juveniles are duller than adults , with whiter underparts , only a few red wing tips , no black on the throat and a smaller black face mask . Compared to the nominate subspecies , eastern *B. g. centralasiae* is paler , greyer and has little reddish @-@ brown behind the bill . The American subspecies *B. g. pallidiceps* has more colouring on the cheeks and forehead than the nominate form and is otherwise generally duller in appearance .

The range of the Bohemian waxwing overlaps those of both the other members of the genus . The cedar waxwing is smaller than the Bohemian ; it has browner upperparts , a white undertail and a white line above the black eye patch . Adult cedar waxwings have a yellowish belly , and all ages have less strongly patterned wings than the Bohemian waxwing . The Japanese waxwing is easily distinguished from its relatives ; it has a red terminal band to the tail , the black mask extends up the rear of the crest , and there is no yellow stripe or red tips on the wings .

The Bohemian waxwing 's call is a high trill sirrrr . It is less wavering and lower @-@ pitched than that of the cedar waxwing , and longer and lower @-@ pitched than the call of the Japanese waxwing . Other calls are just variants of the main vocalisation ; a quieter version is used by chicks to call parents , and courtship calls , also given during nest construction , have a particularly large frequency range . Although not a call as such , when a flock takes off or lands , the wings make a distinctive rattling sound that can be heard 30 m ( 98 ft ) away .

#### = = Distribution and habitat = =

The Bohemian waxwing has a circumpolar distribution , breeding in northern regions of Eurasia and North America . In Eurasia , its northern nesting limit is just short of the treeline , roughly at the 10 ° C July isotherm , and it breeds south locally to about 51 ° N. Most birds breed between 60 ? 67 ° N , reaching 70 ° N in Scandinavia . The North American subspecies breeds in the northwestern and

north central areas of the continent , its range extending southwards beyond the US border in the Rocky Mountains .

This waxwing is migratory with much of the breeding range abandoned as the birds move south for the winter . Migration starts in September in the north of the range , a month or so later farther south . Eurasian birds normally winter from eastern Britain through northern parts of western and central Europe , Ukraine , Kazakhstan and northern China to Japan . North American breeders have a more southeasterly trend , many birds wintering in southeast Canada , with smaller numbers in the north central and northeastern US states . Birds do not usually return to the same wintering sites in successive years . One bird wintering in the Ukraine was found 6 @, @ 000 km ( 3 @, @ 700 mi ) to the east in Siberia in the following year .

In some years , this waxwing irrups south of its normal wintering areas , sometimes in huge numbers . The fruit on which the birds depend in winter varies in abundance from year to year , and in poor years , particularly those following a good crop the previous year , the flocks move farther south until they reach adequate supplies . They will stay until the food runs out and move on again . In what may be the largest ever irruption in Europe , in the winter of 2004 ? 2005 , more than half a million waxwings were recorded in Germany alone . This invasion followed an unusually warm , dry breeding season . In 1908 , an American flock 60 ? 90 m ( 200 ? 300 ft ) wide was noted as taking two to three minutes to fly over .

The breeding habitat is mature conifers , often spruce although other conifers and broadleaf trees may also be present . More open , wet areas such as lakes and peat swamps with dead and drowned trees are used for feeding on insects . Lowlands , valleys and uplands are used in Eurasia , although mountains tend to be avoided . However , the North American subspecies nests in Canada at altitudes between 900 ? 1 @, @ 550 m ( 2 @, @ 950 ? 5 @, @ 090 ft ) . Outside the breeding season , the waxwing will occupy a wide range of habitats as long as suitable fruits such as rowan are available . It may be found by roads , in parks and gardens or along hedges or woodlands edges . It shows little fear of humans at this time . In winter , waxwings roost communally in dense trees or hedges , sometimes with American robins , fieldfares or other wintering species .

= = Behaviour = =

= = = Breeding = = =

Bohemian waxwings start their return from the wintering grounds in February or March , but northern breeders do not reach their breeding areas until April or early May . This monogamous species nests mainly from mid June to July .

Waxwings are not highly territorial , and , although normally solitary breeders , several pairs may nest close together where there are a number of good nest sites . Males may sometimes deter rivals from approaching their mates , and females may squabble over nest sites . Aggression is shown by sleeking down the feathers and crest , showing the black throat , and opening the bill . The breeding display is almost the opposite of this ; the male erects his body and crest feathers , and turns his head away from the female . The male may repeatedly present a gift of a small item , often food , to his partner , placing it in her open bill . In about 90 % of cases , this display does not lead to copulation . Older males have more red tips to the wings and are preferred by females .

The nest , built by both sexes , is a cup of thin twigs lined with softer material such as fine grass , moss , fur or lichen . It is constructed 1 @. @ 3 ? 15 m ( 4 ? 50 ft ) above the ground in a pine or scrub , commonly close to the trunk . The eggs are a glossy pale blue spotted with black and grey and the clutch is 3 ? 7 eggs , although five or six is most common . The average size of the egg is 24 mm x 18 mm ( 0 @. @ 94 in x 0 @. @ 71 in ) , and it weighs 3 @. @ 8 g ( 0 @. @ 13 oz ) , of which 5 % is shell . The eggs are incubated for 13 ? 14 days by the female alone . She is fed regurgitated berries by her mate , and rarely leaves the nest . The chicks are altricial and naked , and have bright red mouths ; they are fed by both parents , although the male brings most of the food , mainly insects , in the first few days . The young are subsequently fed largely with fruit . The

chicks fledge about 14 ? 16 days after hatching . They are fed by the adults for about two weeks after fledging .

Breeding densities of this waxwing are typically low compared to other passerines , usually less than ten birds per square kilometre ( 26 per square mile ) even in good habitat , although up to 35 . 6 birds per square kilometre ( 92 per square mile ) have been found in Russia . One brood each year is normal . Maximum recorded ages are 5 years 10 months in North America and more than 13 years 6 months in Europe . The average life expectancy is unknown . Significant causes of death include predation , collisions with windows and cars , and poisoning by road salt consumed when drinking .

= = = Feeding = = =

Waxwings are primarily fruit eaters , but also consume insects during the breeding season . Mosquitoes and midges are the most common prey , but many other insects and some spiders are eaten . They are caught mainly by flycatching from an open perch , but some may be picked off vegetation . Fruit is normally picked from trees , sometimes from the ground , and is usually swallowed whole . In the summer , *Vaccinium* and *Rubus* species and Canada buffaloberry are important items of their diet , while cotoneaster , juniper , haws , rose hips and apples predominate outside the breeding season . Rowan berries are a favourite food , and are eaten whenever available .

Waxwings can eat huge numbers of berries , each bird sometimes consuming several hundred a day , more than double its own weight . One individual was recorded as eating between 600 and 1 @, @ 000 cotoneaster berries in six hours , and defecating every four minutes . Waxwings travel significant distances when feeding and help to disperse the fruit seeds . Waxwings forage in large flocks , sometimes of several hundred birds , which enables them to overwhelm birds such as mistle thrushes attempting to defend their fruit trees .

Fruit is rich in sugar but deficient in other nutrients , so it must be eaten in large quantities . Bohemian waxwings have a large liver which helps to convert sugar to energy . They can metabolise ethanol produced from the fermentation of those sugary fruits more efficiently than humans , but may still become intoxicated , sometimes fatally . Waxwings often drink water or eat snow in winter , since the sugar in their fruit diet tends to dehydrate the birds through an osmotic effect . In the summer , the fruits are juicier and water is less of a problem .

In the past , the arrival of waxwings sometimes coincided with epidemics of cholera or plague , and led to the old Dutch and Flemish name Pestvogel , " plague bird " . The juniper berries on which they fed were thought to offer protection , and people consumed the fruit and burned branches to fumigate their houses .

= = Predators and parasites = =

Waxwings are preyed upon by birds of prey including rough @-@ legged buzzards , Eurasian sparrowhawks , prairie falcons , and great grey shrikes . Merlins attack winter flocks , including those in cities . When alarmed , Bohemian waxwings " freeze " with bill and neck pointing upwards . If this fails , they fly , calling noisily .

Bohemian waxwings are not brood parasitised by the common cuckoo or its relatives in Eurasia because the cuckoo 's young cannot survive on a largely fruit diet . In North America , the waxwing 's breeding range has little overlap with brown @-@ headed cowbird , another parasitic species . Nevertheless , eggs of other birds placed in a Bohemian waxwing 's nest are always rejected . This suggests that in the past , perhaps 3 million years ago , the ancestral waxwing was a host of a brood parasitic species , and retains the rejection behaviour acquired then .

Parasitic mites include *Syringophiloidus bombycillae* , first identified on this species , and the nasal mite *Ptilonyssus bombycillae* . Blood parasites include *Trypanosoma* species , and a *Leucocytozoon* first identified in this waxwing . Bohemian waxwings may carry flatworms and tapeworms , but levels of parasitic worm infestation are generally low .

= = Status = =

The global population of the Bohemian waxwing has been estimated at more than three million birds , and the breeding range covers about 12 @. @ 8 million km<sup>2</sup> ( 4 @. @ 9 million mi<sup>2</sup> ) . Although this species ' population , as of 2013 , appears to be declining , the decrease is not rapid nor large enough to trigger conservation vulnerability criteria . Given its high numbers and huge breeding area , this waxwing is therefore classified by the International Union for Conservation of Nature as being of least concern . The woodlands used by this species are well to the north of major human populations , and the birds can use disturbed habitats , so there are no serious long @-@ term threats to this species .