

= House sparrow =

The house sparrow (*Passer domesticus*) is a bird of the sparrow family *Passeridae* , found in most parts of the world . A small bird , it has a typical length of 16 centimetres (6 @. @ 3 inches) and a mass of 24 ? 39 @. @ 5 grams (0 @. @ 85 ? 1 @. @ 39 ounces) . Females and young birds are coloured pale brown and grey , and males have brighter black , white , and brown markings . One of about 25 species in the genus *Passer* , the house sparrow is native to most of Europe , the Mediterranean region , and much of Asia . Its intentional or accidental introductions to many regions , including parts of Australia , Africa , and the Americas , make it the most widely distributed wild bird .

The house sparrow is strongly associated with human habitations , and can live in urban or rural settings . Though found in widely varied habitats and climates , it typically avoids extensive woodlands , grasslands , and deserts away from human development . It feeds mostly on the seeds of grains and weeds , but it is an opportunistic eater and commonly eats insects and many other foods . Its predators include domestic cats , hawks , owls , and many other predatory birds and mammals .

Because of its numbers , ubiquity and association with human settlements , the house sparrow is culturally prominent . It is extensively , and usually unsuccessfully , persecuted as an agricultural pest , but it has also often been kept as a pet as well as being a food item and a symbol of lust and sexual potency , as well as of commonness and vulgarity . Though it is widespread and abundant , its numbers have declined in some areas . The animal 's conservation status is listed as least concern on the IUCN Red List .

= = Description = =

= = = Measurements and shape = = =

The house sparrow is typically about 16 cm (6 @. @ 3 in) long , ranging from 14 to 18 cm (5 @. @ 5 to 7 @. @ 1 in) . It is a compact bird with a full chest and a large rounded head . Its bill is stout and conical with a culmen length of 1 @. @ 1 ? 1 @. @ 5 cm (0 @. @ 43 ? 0 @. @ 59 in) , strongly built as an adaptation for eating seeds . Its tail is short , at 5 @. @ 2 ? 6 @. @ 5 cm (2 @. @ 0 ? 2 @. @ 6 in) long . The wing chord is 6 @. @ 7 ? 8 @. @ 9 cm (2 @. @ 6 ? 3 @. @ 5 in) , and the tarsus is 1 @. @ 6 ? 2 @. @ 5 cm (0 @. @ 63 ? 0 @. @ 98 in) . In mass , the house sparrow ranges from 24 to 39 @. @ 5 g (0 @. @ 85 to 1 @. @ 39 oz) . Females usually are slightly smaller than males . The median mass on the European continent for both sexes is about 30 g (1 @. @ 1 oz) , and in more southerly subspecies is around 26 g (0 @. @ 92 oz) . Younger birds are smaller , males are larger during the winter , and females are larger during the breeding season . Birds at higher latitudes , colder climates , and sometimes higher altitudes are larger (under Bergmann 's rule) , both between and within subspecies .

= = = Plumage = = =

The plumage of the house sparrow is mostly different shades of grey and brown . The sexes exhibit strong dimorphism : the female is mostly buffish above and below , while the male has boldly coloured head markings , a reddish back , and grey underparts . The male has a dark grey crown from the top of its bill to its back , and chestnut brown flanking its crown on the sides of its head . It has black around its bill , on its throat , and on the spaces between its bill and eyes (lores) . It has a small white stripe between the lores and crown and small white spots immediately behind the eyes (postoculars) , with black patches below and above them . The underparts are pale grey or white , as are the cheeks , ear coverts , and stripes at the base of the head . The upper back and mantle are a warm brown , with broad black streaks , while the lower back , rump and uppertail coverts are greyish @-@ brown .

The male is duller in fresh non @-@ breeding plumage , with whitish tips on many feathers . Wear and preening expose many of the bright brown and black markings , including most of the black throat and chest patch , called the " bib " or " badge " . The badge is variable in width and general size , and some scientists have suggested that patches signal social status or fitness . This hypothesis has led to a " veritable ' cottage industry ' " of studies , which have only conclusively shown that patches increase in size with age . The male 's bill is black in the breeding season and horn (dark grey) during the rest of the year .

The female has no black markings or grey crown . Its upperparts and head are brown with darker streaks around the mantle and a distinct pale supercilium . Its underparts are pale grey @-@ brown . The female 's bill is brownish @-@ grey and becomes darker in breeding plumage approaching the black of the male 's bill .

Juveniles are similar to the adult female but deeper brown below and paler above , with paler and less defined supercilia . Juveniles have broader buff feather edges , and tend to have looser , scruffier plumage , like moulting adults . Juvenile males tend to have darker throats and white postoculars like adult males , while juvenile female tend to have white throats . However , juveniles cannot be reliably sexed by plumage : some juvenile males lack any markings of the adult male , and some juvenile females have male features . The bills of young birds are light yellow to straw , paler than the female 's bill . Immature males have paler versions of the adult male 's markings , which can be very indistinct in fresh plumage . By their first breeding season , young birds generally are indistinguishable from other adults , though they may still be paler during their first year .

= = = Voice = = =

Most house sparrow vocalisations are variations on its short and incessant chirping call . Transcribed as chirrup , tschilp , or philip , this note is made as a contact call by flocking or resting birds , or by males to proclaim nest ownership and invite pairing . In the breeding season the male gives this call repetitively , with emphasis and speed but not much rhythm , forming what is described either as a song or an " ecstatic call " similar to a song . Young birds also give a true song , especially in captivity , a warbling similar to that of the European greenfinch .

Aggressive males give a trilled version of their call , transcribed as " chur @-@ chur @-@ r @-@ r @-@ it @-@ it @-@ it @-@ it " . This call is also used by females in the breeding season , to establish dominance over males while displacing them to feed young or incubate eggs . House sparrows give a nasal alarm call , the basic sound of which is transcribed as quer , and a shrill chree call in great distress . Another vocalisation is the " appeasement call " , a soft quee given to inhibit aggression , usually given between birds of a mated pair . These vocalisations are not unique to the house sparrow , but are shared , with small variations , by all sparrows .

= = = Variation = = =

There is some variation in the twelve subspecies of house sparrow , which are divided into two groups , the Oriental indicus group , and the Palaearctic domesticus group . Birds of the domesticus group have grey cheeks , while indicus group birds have white cheeks as well as bright colouration on the crown , a smaller bill , and a longer black bib . The subspecies *Passer domesticus tingitanus* differs little from the nominate subspecies , except in the worn breeding plumage of the male , in which the head is speckled with black and underparts are paler . *P. d. balearoibericus* is slightly paler than the nominate but darker than *P. d. bibilicus* . *P. d. bibilicus* is paler than most subspecies , but has the grey cheeks of domesticus group birds . The similar *P. d. persicus* is paler and smaller , and *P. d. niloticus* is nearly identical but smaller . Of the less widespread indicus group subspecies , *P. d. hyrcanus* is larger than *P. d. indicus* , *P. d. hufufae* is paler , *P. d. bactrianus* is larger and paler , and *P. d. parkini* is larger and darker with more black on the breast than any other subspecies .

= = = Identification = = =

The house sparrow can be confused with a number of other seed @-@ eating birds , especially its relatives in the genus *Passer* . Many of these relatives are smaller , with an appearance that is neater or " cuter " , as with the Dead Sea sparrow . The dull @-@ coloured female can often not be distinguished from other females , and is nearly identical to the those of the Spanish and Italian sparrows . The Eurasian tree sparrow is smaller and more slender with a chestnut crown and a black patch on each cheek . The male Spanish sparrow and Italian sparrow are distinguished by their chestnut crowns . The Sind sparrow is very similar but smaller , with less black on the male 's throat and a distinct pale supercilium on the female .

= = Taxonomy and systematics = =

= = = Names = = =

The house sparrow was among the first animals to be given a scientific name in the modern system of biological classification , since it was described by Carl Linnaeus , in the 1758 10th edition of *Systema Naturae* . It was described from a type specimen collected in Sweden , with the name *Fringilla domestica* . Later the genus name *Fringilla* came to be used only for the common chaffinch and its relatives , and the house sparrow has usually been placed in the genus *Passer* created by French zoologist Mathurin Jacques Brisson in 1760 .

The bird 's scientific name and its usual English name have the same meaning . The Latin word *passer* , like the English word " sparrow " , is a term for small active birds , coming from a root word referring to speed . The Latin word *domesticus* means " belonging to the house " , like the common name a reference to its association with humans . The house sparrow is also called by a number of alternative English names , including English sparrow , chiefly in North America ; and Indian sparrow or Indian house sparrow , for the birds of the Indian subcontinent and Central Asia . Dialectal names include sparr , sparrer , spadger , spadgick , and philip , mainly in southern England ; spug and spuggy , mainly in northern England ; spur and sprig , mainly in Scotland ; and spatzie or spotsie , from the German Spatz , in North America .

= = = Taxonomy = = =

The genus *Passer* contains about 25 species , depending on the authority , 26 according to the *Handbook of the Birds of the World* . Most *Passer* species are dull @-@ coloured birds with short square tails and stubby conical beaks , between 11 and 18 cm (4 @.@ 3 and 7 @.@ 1 in) long . Mitochondrial DNA studies suggest that speciation in the genus occurred during the Pleistocene and earlier , while other evidence suggests speciation occurred 25 @,@ 000 to 15 @,@ 000 years ago . Within *Passer* , the house sparrow is part of the " Palaearctic black @-@ bibbed sparrows " group and a close relative of the Mediterranean " willow sparrows " .

The taxonomy of the house sparrow and its Mediterranean relatives is highly complicated . The common type of " willow sparrow " is the Spanish sparrow , which resembles the house sparrow in many respects . It frequently prefers wetter habitats than the house sparrow , and it is often colonial and nomadic . In most of the Mediterranean , one or both species occur , with some degree of hybridisation . In North Africa , the two species hybridise extensively , forming highly variable mixed populations with a full range of characters from pure house sparrows to pure Spanish sparrows .

In much of Italy there is a form apparently intermediate between the house and Spanish sparrows , known as the Italian sparrow . It resembles a hybrid between the two species , and is in other respects intermediate . Its specific status and origin are the subject of much debate . In the Alps , the Italian sparrow intergrades over a roughly 20 km (12 mi) strip with the house sparrow , but to the south it intergrades over the southern half of Italy and some Mediterranean islands with the Spanish sparrow . On the Mediterranean islands of Malta , Gozo , Crete , Rhodes , and Karpathos , there are other apparently intermediate birds of unknown status .

== Subspecies ==

A large number of subspecies have been named , of which twelve were recognised in the Handbook of the Birds of the World . These subspecies are divided into two groups , the Palaearctic domesticus group , and the Oriental indicus group . Several Middle Eastern subspecies , including *Passer domesticus biblicus* , are sometimes considered a third , intermediate group . The subspecies *P. d. indicus* was described as a species , and was considered to be distinct by many ornithologists during the nineteenth century .

Migratory birds of the subspecies *P. d. bactrianus* in the indicus group were recorded overlapping with *P. d. domesticus* birds without hybridising in the 1970s , so the Soviet scientists Edward I. Gavrilov and M. N. Korelov proposed the separation of the indicus group as a separate species . However , indicus @-@ group and domesticus @-@ group birds intergrade in a large part of Iran , so this split is rarely recognised .

In North America , house sparrow populations are more differentiated than those in Europe . This variation follows predictable patterns , with birds at higher latitudes being larger and those in arid areas being paler . However , it is not clear how much this is caused by evolution or by environment . Similar observations have been made in New Zealand , and in South Africa . The introduced house sparrow populations may be distinct enough to merit subspecies status , especially in North America and southern Africa , and American ornithologist Harry Church Oberholser even gave the subspecies name *plecticus* to the paler birds of western North America .

domesticus group

P. d. domesticus , the nominate subspecies , is found in most of Europe , across northern Asia to Sakhalin and Kamchatka . It is the most widely introduced subspecies .

P. d. balearoibericus von Jordans , 1923 , described from Majorca , is found in the Balearic Islands , southern France , the Balkans , and Anatolia .

P. d. tingitanus (Loche , 1867) , described from Algeria , is found in the Maghreb from Ajdabiya in Libya to Béni Abbès in Algeria , and to Morocco 's Atlantic coast . It hybridises extensively with the Spanish sparrow , especially in the eastern part of its range .

P. d. niloticus Nicoll and Bonhote , 1909 , described from Faiyum , Egypt , is found along the Nile north of Wadi Halfa , Sudan . It intergrades with *biblicus* in the Sinai , and with *rufidorsalis* in a narrow zone around Wadi Halfa . It has been recorded in Somaliland .

P. d. persicus Zarudny and Kudashev , 1916 , described from the Karun River in Khuzestan , Iran , is found in the western and central Iran south of the Alborz mountains , intergrading with *indicus* in eastern Iran , and Afghanistan .

P. d. biblicus Hartert , 1910 , described from Palestine , is found in the Middle East from Cyprus and south @-@ eastern Turkey to the Sinai in the west and from Azerbaijan to Kuwait in the east .

indicus group

P. d. hyrcanus Zarudny and Kudashev , 1916 , described from Gorgan , Iran , is found along the southern coast of the Caspian Sea from Gorgan to south @-@ eastern Azerbaijan . It intergrades with *persicus* in the Alborz mountains , and with *biblicus* to the west . It is the subspecies with the smallest range .

P. d. bactrianus Zarudny and Kudashev , 1916 , described from Tashkent , is found in southern Kazakhstan to the Tian Shan and northern Iran and Afghanistan . It intergrades with *persicus* in Baluchistan and with *indicus* across central Afghanistan . Unlike most other house sparrow subspecies , it is almost entirely migratory , wintering in the plains of the northern Indian subcontinent . It is found in open country rather than in settlements , which are occupied by the Eurasian tree sparrow in its range . There is an exceptional record from Sudan .

P. d. parkini Whistler , 1920 , described from Srinagar , Kashmir , is found in the western Himalayas from the Pamir Mountains to south @-@ eastern Nepal . It is migratory , like *bactrianus* .

P. d. indicus Jardine and Selby , 1831 , described from Bangalore , is found in the Indian subcontinent south of the Himalayas , in Sri Lanka , western Southeast Asia , eastern Iran , south @-@ western Arabia and southern Israel .

P. d. hufufae Ticehurst and Cheeseman , 1924 , described from Hofuf in Saudi Arabia , is found in north @-@ eastern Arabia .

P. d. rufidorsalis C. L. Brehm , 1855 , described from Khartoum , Sudan , is found in the Nile valley from Wadi Halfa south to Renk in northern South Sudan , and in eastern Sudan , northern Ethiopia to the Red Sea coast in Eritrea . It has also been introduced to Mohéli in the Comoros .

= = Distribution and habitat = =

The house sparrow originated in the Middle East and spread , along with agriculture , to most of Eurasia and parts of North Africa . Since the mid @-@ nineteenth century , it has reached most of the world , chiefly due to deliberate introductions , but also through natural and shipborne dispersal . Its introduced range encompasses most of North America , Central America , southern South America , southern Africa , part of West Africa , Australia , New Zealand , and islands throughout the world . It has greatly extended its range in northern Eurasia since the 1850s , and continues to do so , as was shown by the colonisations around 1990 of Iceland and Rishiri Island , Japan . The extent of its range makes it the most widely distributed wild bird on the planet .

= = = Introductions = = =

The house sparrow has become highly successful in most parts of the world where it has been introduced . This is mostly due to its early adaptation to living with humans , and its adaptability to a wide range of conditions . Other factors may include its robust immune response , compared to the Eurasian tree sparrow . Where introduced , it can extend its range quickly , sometimes at a rate of over 230 km (140 mi) per year . In many parts of the world it has been characterised as a pest , and poses a threat to native birds . A few introductions have died out or been of limited success , such as those to Greenland and Cape Verde .

The first of many successful introductions to North America occurred when birds from England were released in New York City , in 1852 in order to control the ravages of the linden moth . The house sparrow now occurs from the Northwest Territories to southern Panama , and it is one of the most abundant birds in North America . The house sparrow was first introduced to Australia in 1863 at Melbourne and is common throughout the eastern part of the continent , but has been prevented from establishing itself in Western Australia , where every house sparrow found in the state is killed . House sparrows were introduced in New Zealand in 1859 , and from there reached many of the Pacific islands , including Hawaii .

In southern Africa birds of both the European subspecies *domesticus* and the Indian subspecies *indicus* were introduced around 1900 . Birds of *domesticus* ancestry are confined to a few towns , while *indicus* birds have spread rapidly , reaching Tanzania in the 1980s . Despite this success , native relatives such as the Cape sparrow also occur in towns , competing successfully with it . In South America , it was first introduced near Buenos Aires around 1870 , and quickly became common in most of the southern part of the continent . It now occurs almost continuously from Tierra del Fuego to the fringes of Amazonia , with isolated populations as far north as coastal Venezuela .

= = = Habitat = = =

The house sparrow is closely associated with human habitation and cultivation . It is not an obligate commensal of humans as some have suggested : Central Asian house sparrows usually breed away from humans in open country , and birds elsewhere are occasionally found away from humans . The only terrestrial habitats that the house sparrow does not inhabit are dense forest and tundra . Well adapted to living around humans , it frequently lives and even breeds indoors , especially in factories , warehouses and zoos . It has been recorded breeding in an English coal mine 640 m (2 @,@ 100 ft) below ground , and feeding on the Empire State Building 's observation deck at night . It reaches its greatest densities in urban centres , but its reproductive success is greater in suburbs , where insects are more abundant . On a larger scale , it is most abundant in wheat @-@ growing

areas such as the Midwestern United States .

It tolerates a variety of climates , but prefers drier conditions , especially in moist tropical climates . It has several adaptations to dry areas , including a high salt tolerance and an ability to survive without water by ingesting berries . In most of eastern Asia the house sparrow is entirely absent , replaced by the Eurasian tree sparrow . Where these two species overlap , the house sparrow is usually more common than the Eurasian tree sparrow , but one species may replace the other in a manner that ornithologist Maud Doria Haviland described as " random , or even capricious " . In most of its range the house sparrow is extremely common , despite some declines , but in marginal habitats such as rainforest or mountain ranges , its distribution can be spotty .

= = Behaviour = =

= = = Social behaviour = = =

The house sparrow is a very social bird . It is gregarious at all seasons when feeding , often forming flocks with other types of bird . It roosts communally , its nests are usually grouped together in clumps , and it engages in social activities such as dust or water bathing and " social singing " , in which birds call together in bushes . The house sparrow feeds mostly on the ground , but it flocks in trees and bushes . At feeding stations and nests , female house sparrows are dominant despite their smaller size , and in the reproductive period (usually spring or summer) , being dominant , they can fight for males .

= = = Sleep and roosting = = =

House sparrows sleep with the bill tucked underneath the scapular feathers . Outside of the reproductive season , they often roost communally in trees or shrubs . There is much communal chirping before and after the birds settle in the roost in the evening , as well as before the birds leave the roost in the morning . Some congregating sites separate from the roost may be visited by the birds prior to settling in for the night .

= = = Body maintenance = = =

Dust or water bathing is common and often occurs in groups . Anting is rare . Head scratching is done with the leg over the drooped wing .

= = = Feeding = = =

As an adult , the house sparrow mostly feeds on the seeds of grains and weeds , but it is opportunistic and adaptable , and eats whatever foods are available . In towns and cities it often scavenges for food in garbage containers and congregates in the outdoors of restaurants and other eating establishments to feed on leftover food and crumbs . It can perform complex tasks to obtain food , such as opening automatic doors to enter supermarkets , clinging to hotel walls to watch vacationers on their balconies , and nectar robbing kowhai flowers . In common with many other birds , the house sparrow requires grit to digest the harder items in its diet . Grit can be either stone , often grains of masonry , or the shells of eggs or snails ; oblong and rough grains are preferred .

Several studies of the house sparrow in temperate agricultural areas have found the proportion of seeds in its diet to be about 90 % . It will eat almost any seeds , but where it has a choice , it prefers oats and wheat . In urban areas , the house sparrow feeds largely on food provided directly or indirectly by humans , such as bread , though it prefers raw seeds . The house sparrow also eats some plant matter besides seeds , including buds , berries , and fruits such as grapes and cherries . In temperate areas , the house sparrow has an unusual habit of tearing flowers , especially yellow ones , in the spring .

Animals form another important part of the house sparrow 's diet , chiefly insects , of which beetles , caterpillars , dipteran flies , and aphids are especially important . Various non @-@ insect arthropods are eaten , as are molluscs and crustaceans where available , earthworms , and even vertebrates such as lizards and frogs . Young house sparrows are fed mostly on insects until about fifteen days after hatching . They are also given small quantities of seeds , spiders , and grit . In most places , grasshoppers and crickets are the most abundant foods of nestlings . True bugs , ants , sawflies , and beetles are also important , but house sparrows will take advantage of whatever foods are abundant to feed their young . House sparrows have been observed stealing prey from other birds , including American robins .

= = = Locomotion = = =

The house sparrow 's flight is direct (not undulating) and flapping , averaging 45 @.@ 5 kilometres per hour (28 @.@ 3 miles per hour) and about 15 wingbeats per second . On the ground , the house sparrow typically hops rather than walks . It can swim when pressed to do so , by pursuit from predators . Captive birds have been recorded diving and swimming short distances underwater .

= = = Dispersal and migration = = =

Most house sparrows do not move more than a few kilometres during their lifetime . However , there is limited migration in all regions . Some young birds disperse long distances , especially on coasts , and mountain birds move to lower elevations in winter . Two subspecies , *bactrianus* and *parkini* , are predominantly migratory . Unlike the birds in sedentary populations that migrate , birds of migratory subspecies prepare for migration by putting on weight .

= = = Breeding = = =

House sparrows can breed in the breeding season immediately following their hatching , and sometimes attempt to do so . Some birds breeding for the first time in tropical areas are only a few months old and still have juvenile plumage . Birds breeding for the first time are rarely successful in raising young , and reproductive success increases with age , as older birds breed earlier in the breeding season , and fledge more young . As the breeding season approaches , hormone releases trigger enormous increases in the size of the sexual organs and changes in day length lead males to start calling by nesting sites . The timing of mating and egg @-@ laying varies geographically , and between specific locations and years . This is because a sufficient supply of insects is needed for egg formation and feeding nestlings .

Males take up nesting sites before the breeding season , by frequently calling beside them . Unmated males start nest construction and call particularly frequently to attract females . When a female approaches a male during this period , the male displays by moving up and down while drooping and shivering his wings , pushing up his head , raising and spreading his tail , and showing his bib . Males may try to mate with females while calling or displaying . In response , a female will adopt a threatening posture and attack a male before flying away , pursued by the male . The male displays in front of her , attracting other males , who also pursue and display to the female . This group display usually does not immediately result in copulations . Other males usually do not copulate with the female . Copulation is typically initiated by the female giving a soft dee @-@ dee @-@ dee call to the male . Birds of a pair copulate frequently until the female is laying eggs , and the male mounts the female repeatedly each time a pair mates .

The house sparrow is monogamous , and typically mates for life . Birds from pairs often engage in extra @-@ pair copulations , so about 15 % of house sparrow fledglings are unrelated to their mother 's mate . Male house sparrows guard their mates carefully to avoid being cuckolded , and most extra @-@ pair copulation occurs away from nest sites . Males may sometimes have multiple mates , and bigamy is mostly limited by aggression between females . Many birds do not find a nest and a mate , and instead may serve as helpers around the nest for mated pairs , a role which

increases the chances of being chosen to replace a lost mate . Lost mates of both sexes can be replaced quickly during the breeding season . The formation of a pair and the bond between the two birds is tied to the holding of a nest site , though paired house sparrows can recognise each other away from the nest .

===== Nesting =====

Nest sites are varied , though cavities are preferred . Nests are most frequently built in the eaves and other crevices of houses . Holes in cliffs and banks , or tree hollows , are also used . A sparrow sometimes excavates its own nests in sandy banks or rotten branches , but more frequently uses the nests of other birds such as those of swallows in banks and cliffs , and old tree cavity nests . It usually uses deserted nests , though sometimes it usurps active ones . Tree hollows are more commonly used in North America than in Europe , putting the sparrows in competition with bluebirds and other North American cavity nesters , and thereby contributing to their population declines .

Especially in warmer areas , the house sparrow may build its nests in the open , on the branches of trees , especially evergreens and hawthorns , or in the nests of large birds such as storks or magpies . In open nesting sites , breeding success tends to be lower , since breeding begins late and the nest can easily be destroyed or damaged by storms . Less common nesting sites include street lights and neon signs , favoured for their warmth ; and the old open @-@ topped nests of other songbirds , which are then domed over .

The nest is usually domed , though it may lack a roof in enclosed sites . It has an outer layer of stems and roots , a middle layer of dead grass and leaves , and a lining of feathers , as well as of paper and other soft materials . Nests typically have external dimensions of 20 × 30 cm (8 × 12 in) , but their size varies greatly . The building of the nest is initiated by the unmated male while displaying to females . The female assists in building , but is less active than the male . Some nest building occurs throughout the year , especially after moult in autumn . In colder areas house sparrows build specially created roost nests , or roost in street lights , to avoid losing heat during the winter . House sparrows do not hold territories , but they defend their nests aggressively against intruders of the same sex .

House sparrows ' nests support a wide range of scavenging insects , including nest flies such as *Neottiophilum praestum* , *Protocalliphora* blowflies , and over 1 @, @ 400 species of beetle .

===== Eggs and young =====

Clutches usually comprise four or five eggs , though numbers from one to ten have been recorded . At least two clutches are usually laid , and up to seven a year may be laid in the tropics or four a year in temperate latitudes . When fewer clutches are laid in a year , especially at higher latitudes , the number of eggs per clutch is greater . Central Asian house sparrows , which migrate and have only one clutch a year , average 6 @. @ 5 eggs in a clutch . Clutch size is also affected by environmental and seasonal conditions , female age , and breeding density .

Some intraspecific brood parasitism occurs , and instances of unusually large numbers of eggs in a nest may be the result of females laying eggs in the nests of their neighbours . Such foreign eggs are sometimes recognised and ejected by females . The house sparrow is a victim of interspecific brood parasites , but only rarely , since it usually uses nests in holes too small for parasites to enter , and it feeds its young foods unsuitable for young parasites . In turn , the house sparrow has once been recorded as a brood parasite of the American cliff swallow .

The eggs are white , bluish @-@ white , or greenish @-@ white , spotted with brown or grey . Subelliptical in shape , they range from 20 to 22 mm (0 @. @ 79 to 0 @. @ 87 in) in length and 14 to 16 mm (0 @. @ 55 to 0 @. @ 63 in) in width , have an average mass of 2 @. @ 9 g (0 @. @ 10 oz) , and an average surface area of 9 @. @ 18 cm² (1 @. @ 423 in²) . Eggs from the tropical subspecies are distinctly smaller . Eggs begin to develop with the deposition of yolk in the ovary a few days before ovulation . In the day between ovulation and laying , egg white forms , followed by eggshell . Eggs laid later in a clutch are larger , as are those laid by larger females , and egg size is

hereditary . Eggs decrease slightly in size from laying to hatching . The yolk comprises 25 % of the egg , the egg white 68 % , and the shell 7 % . Eggs are watery , being 79 % liquid , and otherwise mostly protein .

The female develops a brood patch of bare skin and plays the main part in incubating the eggs . The male helps , but can only cover the eggs rather than truly incubate them . The female spends the night incubating during this period , while the male roosts near the nest . Eggs hatch at the same time , after a short incubation period lasting 11 ? 14 days , and exceptionally for as many as 17 or as few as 9 . The length of the incubation period decreases as ambient temperature increases later in the breeding season .

Young house sparrows remain in the nest for 11 to 23 days , normally 14 to 16 days . During this time , they are fed by both parents . As newly hatched house sparrows do not have sufficient insulation they are brooded for a few days , or longer in cold conditions . The parents swallow the droppings produced by the hatchlings during the first few days ; later , the droppings are moved up to 20 m (66 ft) away from the nest .

The chicks ' eyes open after about four days and , at an age of about eight days , the young birds get their first down . If both parents perish , the ensuing intensive begging sounds of the young will often attract replacement parents who feed them until they can sustain themselves . All the young in the nest leave it during the same period of a few hours . At this stage they are normally able to fly . They start feeding themselves partly after one or two days , and sustain themselves completely after 7 to 10 days , 14 at the latest .

= = Survival = =

In adult house sparrows , annual survival is 45 ? 65 % . After fledging and leaving the care of their parents , young sparrows have a high mortality rate , which lessens as they grow older and more experienced . Only about 20 ? 25 % of birds hatched survive to their first breeding season . The oldest known wild house sparrow lived for nearly two decades ; it was found dead 19 years and 9 months after it was ringed in Denmark . The oldest recorded captive house sparrow lived for 23 years . The typical ratio of males to females in a population is uncertain due to problems in collecting data , but a very slight preponderance of males at all ages is usual .

= = = Predation = = =

The house sparrow 's main predators are cats and birds of prey , but many other animals prey on them , including corvids , squirrels , and even humans ? the house sparrow has been consumed in the past by people in many parts of the world , and it still is in parts of the Mediterranean . Most species of bird of prey have been recorded preying on the house sparrow in places where there are extensive records . Accipiters and the merlin in particular are major predators , though cats are likely to have a greater impact on house sparrow populations . The house sparrow is also a common victim of roadkill ; on European roads , it is the bird most frequently found dead .

= = = Parasites and disease = = =

The house sparrow is host to a huge number of parasites and diseases , and the effect of most is unknown . Ornithologist Ted R. Anderson listed thousands , noting that his list was incomplete . The commonly recorded bacterial pathogens of the house sparrow are often those common in humans , and include Salmonella and Escherichia coli . Salmonella is common in the house sparrow , and a comprehensive study of house sparrow disease found it in 13 % of sparrows tested . Salmonella epidemics in the spring and winter can kill large numbers of sparrows . The house sparrow hosts avian pox and avian malaria , which it has spread to the native forest birds of Hawaii . Many of the diseases hosted by the house sparrow are also present in humans and domestic animals , for which the house sparrow acts as a reservoir host . Arboviruses such as the West Nile virus , which most commonly infect insects and mammals , survive winters in temperate areas by going dormant in

birds such as the house sparrow . There are a few records of disease extirpating house sparrow populations , especially from Scottish islands , but this seems to be rare .

The house sparrow is infested by a number of external parasites , which usually cause little harm to adult sparrows . In Europe , the most common mite found on sparrows is *Proctophyllodes* , the most common ticks are *Argas reflexus* and *Ixodes arboricola* , and the most common flea on the house sparrow is *Ceratophyllus gallinae* . A number of chewing lice occupy different niches on the house sparrow 's body . *Menacanthus* lice occur across the house sparrow 's body , where they feed on blood and feathers , while *Brueelia* lice feed on feathers and *Philopterus fringillae* occurs on the head .

= = Physiology = =

House sparrows express strong circadian rhythms of activity in the laboratory . They were among the first bird species to be seriously studied in terms of their circadian activity and photoperiodism , in part because of their availability and adaptability in captivity , but also because they can " find their way " and remain rhythmic in constant darkness . Such studies have found that the pineal gland is a central part of the house sparrow 's circadian system : removal of the pineal eliminates the circadian rhythm of activity , and transplant of the pineal into another individual confers to this individual the rhythm phase of the donor bird . The suprachiasmatic nuclei of the hypothalamus have also been shown to be an important component of the circadian system of house sparrows . The photoreceptors involved in the synchronisation of the circadian clock to the external light @-@ dark cycle are located in the brain and can be stimulated by light reaching them directly though the skull , as revealed by experiments in which blind sparrows , which normally can still synchronise to the light @-@ dark cycle , failed to do so once India ink was injected as a screen under the skin on top of their skull .

Similarly , even when blind , house sparrows continue to be photoperiodic , i.e. show reproductive development when the days are long but not when the days are short . This response is stronger when the feathers on top of the head are plucked , and is eliminated when India ink is injected under the skin at the top of the head , showing that the photoreceptors involved in the photoperiodic response to daylength are located inside the brain .

House sparrows have also been used in studies of nonphotic entrainment (i.e. synchronisation to an external cycle other than light and dark) : for example , in constant darkness , a situation in which the birds would normally reveal their endogenous , non @-@ 24 @-@ hour , " free @-@ running " rhythms of activity , they instead show 24 @-@ hour periodicity if they are exposed to two hours of chirp playbacks every 24 hours , matching their daily activity onsets with the daily playback onsets . House sparrows in constant dim light can also be entrained to a daily cycle based on the presence of food . Finally , house sparrows in constant darkness can be entrained to a cycle of high and low temperature , but only if the difference between the two temperatures is large (38 versus 6 degrees Celsius) ; some of the tested sparrows matched their activity to the warm phase , and others to the cold phase .

= = Relationships with humans = =

The house sparrow is closely associated with humans . They are believed to have become associated with humans around 10 @,@ 000 years ago . Subspecies *bactrianus* is least associated with humans and considered to be evolutionarily closer to the ancestral non @-@ commensal populations . Usually , it is regarded as a pest , since it consumes agricultural products and spreads disease to humans and their domestic animals . Even birdwatchers often hold it in little regard because of its molestation of other birds . In most of the world the house sparrow is not protected by law . Attempts to control house sparrows include the trapping , poisoning , or shooting of adults ; the destruction of their nests and eggs ; or less directly , blocking nest holes and scaring off sparrows with noise , glue , or porcupine wire . However , the house sparrow can be beneficial to humans as well , especially by eating insect pests , and attempts at the large @-@ scale control of the house

sparrow have failed .

The house sparrow has long been used as a food item . From around 1560 to at least the nineteenth century in northern Europe , earthenware " sparrow pots " were hung from eaves to attract nesting birds so that the young could be readily harvested . Wild birds were trapped in nets in large numbers , and sparrow pie was a traditional dish , thought , because of the association of sparrows with lechery , to have aphrodisiac properties . Sparrows were also trapped as food for falconers ' birds and zoo animals . In the early part of the twentieth century , sparrow clubs culled many millions of birds and eggs in an attempt to control numbers of this perceived pest , but with only a localised impact on numbers . House sparrows have been kept as pets at many times in history , though they have no bright plumage or attractive songs , and raising them is difficult .

= = = Status = = =

The house sparrow has an extremely large range and population , and is not seriously threatened by human activities , so it is assessed as least concern for conservation on the IUCN Red List . However , populations have been declining in many parts of the world . These declines were first noticed in North America , where they were initially attributed to the spread of the house finch , but have been most severe in Western Europe . Declines have not been universal , as no serious declines have been reported from Eastern Europe , but have even occurred in Australia , where the house sparrow was introduced recently .

In Great Britain , populations peaked in the early 1970s , but have since declined by 68 % overall , and about 90 % in some regions . In London , the house sparrow almost disappeared from the central city . The numbers of house sparrows in the Netherlands have dropped in half since the 1980s , so the house sparrow is even considered an endangered species . This status came to widespread attention after a female house sparrow , referred to as the " Dominomus " , was killed after knocking down dominoes arranged as part of an attempt to set a world record . These declines are not unprecedented , as similar reductions in population occurred when the internal combustion engine replaced horses in the 1920s and a major source of food in the form of grain spillage was lost .

Various causes for the dramatic decreases in population have been proposed , including predation , in particular by Eurasian sparrowhawks ; electromagnetic radiation from mobile phones ; and diseases . A shortage of nesting sites caused by changes in urban building design is probably a factor , and conservation organisations have encouraged the use of special nest boxes for sparrows . A primary cause of the decline seems to be an insufficient supply of insect food for nestling sparrows . Declines in insect populations result from an increase of monoculture crops , the heavy use of pesticides , the replacement of native plants in cities with introduced plants and parking areas , and possibly the introduction of unleaded petrol , which produces toxic compounds such as methyl nitrite .

Protecting insect habitats on farms , and planting native plants in cities benefit the house sparrow , as does establishing urban green spaces . To raise awareness of threats to the house sparrow , World Sparrow Day has been celebrated on 20 March across the world since 2010 . Over the recent years , the house sparrow population has been on the decline in many Asian countries and this decline is quite evident in India. To promote the conservation of these birds , in 2012 , the then Chief Minister of Delhi , Ms. Sheila Dikshit , declared the house sparrow as the state bird of Delhi .

= = = Cultural associations = = =

To many people across the world , the house sparrow is the most familiar wild animal and , because of its association with humans and familiarity , it is frequently used to represent the common and vulgar , or the lewd . One of the reasons for the introduction of house sparrows throughout the world was their association with the European homeland of many immigrants . Birds usually described later as sparrows are referred to in many works of ancient literature and religious texts in Europe and western Asia . These references may not always refer specifically to the house

sparrow , or even to small , seed @-@ eating birds , but later writers who were inspired by these texts often had the house sparrow in mind . In particular , sparrows were associated by the ancient Greeks with Aphrodite , the goddess of love , due to their perceived lustfulness , an association echoed by later writers such as Chaucer and Shakespeare . Jesus 's use of " sparrows " as an example of divine providence in the Gospel of Matthew also inspired later references , such as that in Shakespeare 's Hamlet and the Gospel hymn His Eye Is on the Sparrow .