**Birds All Around Us**

*Birds* are a group of [endothermic](https://en.wikipedia.org/wiki/Endotherm) [vertebrates](https://en.wikipedia.org/wiki/Vertebrate), characterised by [feathers](https://en.wikipedia.org/wiki/Feather), [toothless](https://en.wikipedia.org/wiki/Tooth) [beaked](https://en.wikipedia.org/wiki/Beak) jaws, the [laying](https://en.wikipedia.org/wiki/Oviparity) of [hard-shelled](https://en.wikipedia.org/wiki/Eggshell) eggs, a high [metabolic](https://en.wikipedia.org/wiki/Metabolic) rate, a four-chambered [heart](https://en.wikipedia.org/wiki/Heart), and a strong yet lightweight [skeleton](https://en.wikipedia.org/wiki/Bird_skeleton). Birds live worldwide and range in size from the 5 cm (2 in) [bee hummingbird](https://en.wikipedia.org/wiki/Bee_hummingbird) to the 2.75 m [ostrich](https://en.wikipedia.org/wiki/Common_ostrich). Birds are descendants of extinct [feathered dinosaurs](https://en.wikipedia.org/wiki/Feathered_dinosaur), making them not only the sole surviving [dinosaurs](https://en.wikipedia.org/wiki/Dinosaur) according to [cladistics](https://en.wikipedia.org/wiki/Cladistics), but ranking as the world’s most numerically-successful [class](https://en.wikipedia.org/wiki/Class_(biology)) of [tetrapods](https://en.wikipedia.org/wiki/Tetrapod" \o "Tetrapod), with approximately ten thousand living species, more than half of these being [passerines](https://en.wikipedia.org/wiki/Passerine), sometimes known as perching birds. Birds are the closest living relatives of [crocodilians](https://en.wikipedia.org/wiki/Crocodilia)

The [fossil](https://en.wikipedia.org/wiki/Fossil) record indicates that birds evolved from [feathered ancestors](https://en.wikipedia.org/wiki/Feathered_dinosaur) within the [tetrapod](https://en.wikipedia.org/wiki/Theropod) group, which are traditionally placed within the [saurischian](https://en.wikipedia.org/wiki/Saurischia) [dinosaurs](https://en.wikipedia.org/wiki/Dinosaur). DNA-based evidence finds that birds diversified dramatically around the time of the [Cretaceous–Palaeogene extinction event](https://en.wikipedia.org/wiki/Cretaceous%E2%80%93Paleogene_extinction_event) 66 million years ago, which killed off the [pterosaurs](https://en.wikipedia.org/wiki/Pterosaur) and all the non-avian dinosaur lineages. Birds, especially those in the southern continents, survived this event and then migrated to other parts of the world while diversifying during periods of global cooling. Primitive bird-like dinosaurs that lie outside class Aves proper, in the broader group [Avielle](https://en.wikipedia.org/wiki/Avialae), have been found dating back to the mid-[Jurassic](https://en.wikipedia.org/wiki/Jurassic) period, around 170 million years ago. Many of these early "stem-birds", such as [*Archaeopteryx*](https://en.wikipedia.org/wiki/Archaeopteryx), were not yet capable of fully powered flight, and many retained primitive characteristics like toothy jaws in place of beaks, and long bony tails. [2]

Birds have [*wings*](https://en.wikipedia.org/wiki/Glossary_of_bird_terms#wings) which are more or less developed depending on the species; the only known groups without wings are the [extinct](https://en.wikipedia.org/wiki/Extinct) [moa](https://en.wikipedia.org/wiki/Moa) and [elephant birds](https://en.wikipedia.org/wiki/Elephant_bird). Wings, which evolved from [forelimbs](https://en.wikipedia.org/wiki/Forelimb), gave birds the ability to [fly](https://en.wikipedia.org/wiki/Bird_flight), although further evolution has led to the loss of flight in [flightless birds](https://en.wikipedia.org/wiki/Flightless_bird), including [ratites](https://en.wikipedia.org/wiki/Ratite), [penguins](https://en.wikipedia.org/wiki/Penguin), and diverse [endemic island species of birds](https://en.wikipedia.org/wiki/Endemism_in_birds). The [digestive](https://en.wikipedia.org/wiki/Digestion) and [respiratory systems](https://en.wikipedia.org/wiki/Respiratory_system) of birds are also uniquely adapted for flight. Some bird species of aquatic environments, particularly [seabirds](https://en.wikipedia.org/wiki/Seabird) and some [waterbirds](https://en.wikipedia.org/wiki/Water_bird" \o "Water bird), have further evolved for [swimming](https://en.wikipedia.org/wiki/Aquatic_locomotion).

Some birds, especially [corvids](https://en.wikipedia.org/wiki/Corvids) and [parrots](https://en.wikipedia.org/wiki/Parrot), are among the most [intelligent animals](https://en.wikipedia.org/wiki/Intelligent_animal); several bird species [make and use tools](https://en.wikipedia.org/wiki/Tool_use_by_animals), and many [social species](https://en.wikipedia.org/wiki/Social_animal) pass on knowledge across generations, which is considered a form of [culture](https://en.wikipedia.org/wiki/Culture). Many species annually [migrate](https://en.wikipedia.org/wiki/Bird_migration) great distances. Birds are social, communicating with visual signals, calls, and [bird songs](https://en.wikipedia.org/wiki/Bird_vocalization), and participating in such social behaviours as [cooperative breeding](https://en.wikipedia.org/wiki/Helpers_at_the_nest) and hunting, [flocking](https://en.wikipedia.org/wiki/Flocking_(behavior)), and [mobbing](https://en.wikipedia.org/wiki/Mobbing_(animal_behavior)) of predators. The vast majority of bird species are [socially monogamous](https://en.wikipedia.org/wiki/Socially_monogamous) (referring to social living arrangement, distinct from genetic monogamy), usually for one breeding season at a time, sometimes for years, but rarely for life. Other species have breeding systems that are [polygynous](https://en.wikipedia.org/wiki/Polyandry) (arrangement of one male with many females) or, rarely, [polyandrous](https://en.wikipedia.org/wiki/Polyandry) (arrangement of one female with many males). Birds produce offspring by laying [eggs](https://en.wikipedia.org/wiki/Egg) which are fertilised through [sexual reproduction](https://en.wikipedia.org/wiki/Sexual_reproduction). They are usually laid in a [nest](https://en.wikipedia.org/wiki/Bird_nest) and [incubated](https://en.wikipedia.org/wiki/Avian_incubation) by the parents. Most birds have an extended period of parental care after hatching. Some birds, such as [hens](https://en.wikipedia.org/wiki/Chicken), lay eggs even when not fertilised, though unfertilised eggs do

Many species of birds are economically important as [food](https://en.wikipedia.org/wiki/Food) for human consumption and raw material in manufacturing, with domesticated and undomesticated birds ([poultry](https://en.wikipedia.org/wiki/Poultry) and [game](https://en.wikipedia.org/wiki/Game_(hunting))) being important sources of eggs, meat, and feathers. [Songbirds](https://en.wikipedia.org/wiki/Songbird), parrots, and other species are popular as pets. [Guano](https://en.wikipedia.org/wiki/Guano) (bird excrement) is harvested for use as a [fertiliser](https://en.wikipedia.org/wiki/Fertilizer). Birds [prominently figure](https://en.wikipedia.org/wiki/List_of_fictional_birds) throughout human culture. About 120–130 species have become extinct due to human activity since the 17th century, and hundreds more before then. Human activity threatens about 1,200 bird species with extinction, though efforts are underway to [protect](https://en.wikipedia.org/wiki/Bird_conservation) them. Recreational [birdwatching](https://en.wikipedia.org/wiki/Birdwatching) is an important part of the [ecotourism](https://en.wikipedia.org/wiki/Ecotourism) industry.

# Diet and feeding

[*Birds' diets*](https://en.wikipedia.org/wiki/Glossary_of_bird_terms#dietary_classification_terms_(-vores)) are varied and often include [nectar](https://en.wikipedia.org/wiki/Nectar_(plant)), fruit, plants, seeds, [carrion](https://en.wikipedia.org/wiki/Carrion), and various small animals, including other birds. Because birds have no teeth, their [digestive system](https://en.wikipedia.org/wiki/Digestive_system) is adapted to process [unmasticated](https://en.wikipedia.org/wiki/Mastication) food items that are swallowed whole.

Birds that employ many strategies to obtain food or feed on a variety of food items are called generalists, while others that concentrate time and effort on specific food items or have a single strategy to obtain food are considered specialists. Birds' feeding strategies vary by species. Many birds [glean](https://en.wikipedia.org/wiki/Gleaning_(birds)) for insects, invertebrates, fruit, or seeds. Some hunt insects by suddenly attacking from a branch. Those species that seek [pest](https://en.wikipedia.org/wiki/Pest_(organism)) [insects](https://en.wikipedia.org/wiki/Insect) are considered beneficial 'biological control agents' and their presence encouraged in [biological pest control](https://en.wikipedia.org/wiki/Biological_pest_control) programmes.

Nectar feeders such as [hummingbirds](https://en.wikipedia.org/wiki/Hummingbird), [sunbirds](https://en.wikipedia.org/wiki/Sunbird), [Lories, and lorikeets](https://en.wikipedia.org/wiki/Lories_and_lorikeets) amongst others have specially adapted brushy tongues and in many cases bills designed to fit [co-adapted](https://en.wikipedia.org/wiki/Coevolution) flowers. [Kiwis](https://en.wikipedia.org/wiki/Kiwi) and [shorebirds](https://en.wikipedia.org/wiki/Shorebird) with long bills probe for invertebrates; shorebirds' varied bill lengths and feeding methods result in the separation of [ecological niches](https://en.wikipedia.org/wiki/Ecological_niche). [Loons](https://en.wikipedia.org/wiki/Loon), [diving ducks](https://en.wikipedia.org/wiki/Diving_duck), [penguins](https://en.wikipedia.org/wiki/Penguin) and [auks](https://en.wikipedia.org/wiki/Auks) pursue their prey underwater, using their wings or feet for propulsion, while aerial predators such as solids, [kingfishers](https://en.wikipedia.org/wiki/Kingfisher) and [terns](https://en.wikipedia.org/wiki/Tern) plunge dive after their prey. [Flamingos](https://en.wikipedia.org/wiki/Flamingo), three species of [prion](https://en.wikipedia.org/wiki/Prion_(bird)), and some ducks are [filter feeders](https://en.wikipedia.org/wiki/Filter_feeder). [Geese](https://en.wikipedia.org/wiki/Geese) and [dabbling ducks](https://en.wikipedia.org/wiki/Dabbling_duck) are primarily grazers. [2]

Some species, including [frigate birds](https://en.wikipedia.org/wiki/Frigatebird), [gulls](https://en.wikipedia.org/wiki/Gull), and [skuas](https://en.wikipedia.org/wiki/Skua), engage in [kleptoparasitism](https://en.wikipedia.org/wiki/Kleptoparasitism), stealing food items from other birds. Kleptoparasitism is thought to be a supplement to food obtained by hunting, rather than a significant part of any species' diet; a study of [great frigate birds](https://en.wikipedia.org/wiki/Great_frigatebird) stealing from [masked boobies](https://en.wikipedia.org/wiki/Masked_booby) estimated that the frigate birds stole at most 40% of their food and on average stole only 5%. Other birds are [scavengers](https://en.wikipedia.org/wiki/Scavenger); some of these, like [vultures](https://en.wikipedia.org/wiki/Vulture), are specialised carrion eaters, while others, like gulls, [corvids](https://en.wikipedia.org/wiki/Corvid), or other birds of prey, are opportunists.

Water and drinking

Water is needed by many birds although their mode of excretion and lack of [sweat glands](https://en.wikipedia.org/wiki/Sweat_gland) reduces the physiological demands. Some desert birds can obtain their water needs entirely from moisture in their food. They may also have other adaptations such as allowing their body temperature to rise, saving on moisture loss from evaporative cooling or panting. Seabirds can drink seawater and have [salt glands](https://en.wikipedia.org/wiki/Salt_gland) inside the head that eliminate excess salt out of the nostrils.

Most birds scoop water in their beaks and raise their head to let water run down the throat. Some species, especially of arid zones, belonging to the [pigeon](https://en.wikipedia.org/wiki/Columbidae), [finch](https://en.wikipedia.org/wiki/Estrildidae), [moosebird](https://en.wikipedia.org/wiki/Coliidae), [button-quail](https://en.wikipedia.org/wiki/Turnicidae) and [bustard](https://en.wikipedia.org/wiki/Otididae) families are capable of sucking up water without the need to tilt back their heads. Some desert birds depend on water sources and [sandgrouse](https://en.wikipedia.org/wiki/Sandgrouse) are particularly well known for their daily congregations at waterholes. Nesting sandgrouse and many plovers carry water to their young by wetting their belly feathers. Some birds carry water for chicks at the nest in their crop or regurgitate it along with food. The pigeon family, flamingos and penguins have adaptations to produce a nutritive fluid called [crop milk](https://en.wikipedia.org/wiki/Crop_milk) that they provide to their chicks.

Feather care

Feathers being critical to the survival of a bird, require maintenance. Apart from physical wear and tear, feathers face the onslaught of fungi, [ectoparasitic](https://en.wikipedia.org/wiki/Ectoparasitic) feather mites and [birdlike](https://en.wikipedia.org/wiki/Bird_louse). The physical condition of feathers are maintained by [*preening*](https://en.wikipedia.org/wiki/Glossary_of_bird_terms#preening) often with the application of secretions from the [*preen gland*](https://en.wikipedia.org/wiki/Glossary_of_bird_terms#preen_gland). Birds also bathe in water or dust themselves. While some birds dip into shallow water, more aerial species may make aerial dips into water and arboreal species often make use of dew or rain that collect on leaves. Birds of arid regions make use of loose soil to dust-bathe. A behaviour termed as [anting](https://en.wikipedia.org/wiki/Anting_(bird_activity)) in which the bird encourages ants to run through their plumage is also thought to help them reduce the ectoparasite load in feathers. Many species will spread out their wings and expose them to direct sunlight and this too is thought to help in reducing fungal and ectoparasitic activity that may lead to feather damage.

Migration



*Main article:*[*Bird migration*](https://en.wikipedia.org/wiki/Bird_migration)

[](https://en.wikipedia.org/wiki/File:CanadianGeeseFlyingInVFormation.jpg)Many bird species migrate to take advantage of global differences of [seasonal](https://en.wikipedia.org/wiki/Season) temperatures, therefore optimising availability of food sources and breeding habitat. These migrations vary among the different groups. Many land birds, [shorebirds](https://en.wikipedia.org/wiki/Shorebird), and water birds undertake annual long distance migrations, usually triggered by the length of daylight as well as weather conditions. These birds are characterised by a breeding season spent in the [temperate](https://en.wikipedia.org/wiki/Temperate) or [Polar Regions](https://en.wikipedia.org/wiki/Polar_region) and a non-breeding season in the [tropical](https://en.wikipedia.org/wiki/Tropical) regions or opposite hemisphere. Before migration, birds substantially increase body fats and reserves and reduce the size of some of their organs.

Migration is highly demanding energetically, particularly as birds need to cross deserts and oceans without refuelling. Land birds have a flight range of around 2,500 km (1,600 mi) and shorebirds can fly up to 4,000 km (2,500 mi), although the [bar-tailed godwit](https://en.wikipedia.org/wiki/Bar-tailed_godwit) is capable of non-stop flights of up to 10,200 km (6,300 mi). [Seabirds](https://en.wikipedia.org/wiki/Seabird) also undertake long migrations, the longest annual migration being those of [sooty shearwaters](https://en.wikipedia.org/wiki/Sooty_shearwater), which nest in [New Zealand](https://en.wikipedia.org/wiki/New_Zealand) and [Chile](https://en.wikipedia.org/wiki/Chile) and spend the northern summer feeding in the North Pacific off Japan, [Alaska](https://en.wikipedia.org/wiki/Alaska) and [California](https://en.wikipedia.org/wiki/California), an annual round trip of 64,000 km (39,800 mi). Other seabirds disperse after breeding, travelling widely but having no set migration route. [Albatrosses](https://en.wikipedia.org/wiki/Albatross) nesting in the [Southern Ocean](https://en.wikipedia.org/wiki/Southern_Ocean) often undertake circumpolar trips between breeding seasons.

Some bird species undertake shorter migrations, travelling only as far as is required to avoid bad weather or obtain food. [Irruptive](https://en.wiktionary.org/wiki/irruptive) species such as the boreal [finches](https://en.wikipedia.org/wiki/Finch) are one such group and can commonly be found at a location in one year and absent the next. This type of migration is normally associated with food availability. Species may also travel shorter distances over part of their range, with individuals from higher latitudes travelling into the existing range of conspecifics; others undertake partial migrations, where only a fraction of the population, usually females and subdominant males, migrates. Partial migration can form a large percentage of the migration behaviour of birds in some regions; in Australia, surveys found that 44% of non-passerine birds and 32% of passerines were partially migratory.

[Altitudinal migration](https://en.wikipedia.org/wiki/Altitudinal_migration) is a form of short distance migration in which birds spend the breeding season at higher altitudes and move to lower ones during suboptimal conditions. It is most often triggered by temperature changes and usually occurs when [the normal territories](https://en.wikipedia.org/wiki/Territory_(animal)) also become inhospitable due to lack of food. Some species may also be nomadic, holding no fixed territory and moving according to weather and food availability. [Parrots](https://en.wikipedia.org/wiki/True_parrots) as a [family](https://en.wikipedia.org/wiki/Family_(biology)) are overwhelmingly neither migratory nor sedentary but considered to either be dispersive, irruptive, nomadic or undertake small and irregular migrations.

The ability of birds to return to precise locations across vast distances has been known for some time; in an experiment conducted in the 1950s, a [Manx shearwater](https://en.wikipedia.org/wiki/Manx_shearwater) released in [Boston](https://en.wikipedia.org/wiki/Boston) in the United States returned to its colony in [Skomer](https://en.wikipedia.org/wiki/Skomer" \o "Skomer), in Wales within 13 days, a distance of 5,150 km (3,200 mi). Birds navigate during migration using a variety of methods. For [diurnal](https://en.wikipedia.org/wiki/Diurnal_animal) migrants, the [sun](https://en.wikipedia.org/wiki/Sun) is used to navigate by day, and a stellar compass is used at night. Birds that use the sun compensate for the changing position of the sun during the day by the use of an [internal clock](https://en.wikipedia.org/wiki/Chronobiology). Orientation with the stellar compass depends on the position of the [constellations](https://en.wikipedia.org/wiki/Constellation) surrounding [Polaris](https://en.wikipedia.org/wiki/Polaris). These are backed up in some species by their ability to sense the Earth's [geomagnetism](https://en.wikipedia.org/wiki/Geomagnetism) through specialised [photoreceptors](https://en.wikipedia.org/wiki/Photoreceptor_cell).

Relationship with humans

*Main article:*[*Birds in culture*](https://en.wikipedia.org/wiki/Birds_in_culture)

[](https://en.wikipedia.org/wiki/File:Industrial-Chicken-Coop.JPG)

[Industrial farming](https://en.wikipedia.org/wiki/Industrial_farming) of [chickens](https://en.wikipedia.org/wiki/Chicken)

Since birds are highly visible and common animals, humans have had a relationship with them since the dawn of man. Sometimes, these relationships are [mutualistic](https://en.wikipedia.org/wiki/Mutualism_(biology)), like the cooperative honey-gathering among [honeyguides](https://en.wikipedia.org/wiki/Honeyguide) and African peoples such as the [Borana](https://en.wikipedia.org/wiki/Borana_people). Other times, they may be [commensal](https://en.wikipedia.org/wiki/Commensalism), as when species such as the [house sparrow](https://en.wikipedia.org/wiki/House_sparrow) have benefited from human activities. Several bird species have become commercially significant agricultural pests, and some pose an [aviation hazard](https://en.wikipedia.org/wiki/Bird_strike). Human activities can also be detrimental, and have threatened numerous bird species with extinction ([hunting](https://en.wikipedia.org/wiki/Hunting), [avian lead poisoning](https://en.wikipedia.org/wiki/Avian_lead_poisoning), [pesticides](https://en.wikipedia.org/wiki/Pesticide), [roadkill](https://en.wikipedia.org/wiki/Roadkill), [wind turbine](https://en.wikipedia.org/wiki/Wind_turbine) kills and predation by pet [cats](https://en.wikipedia.org/wiki/Cat) and [dogs](https://en.wikipedia.org/wiki/Dog) are common sources of death for birds).

Birds can act as vectors for spreading diseases such as [psittacosis](https://en.wikipedia.org/wiki/Psittacosis), [salmonellosis](https://en.wikipedia.org/wiki/Salmonellosis), [campylobacteriosis](https://en.wikipedia.org/wiki/Campylobacteriosis), mycobacteriosis (avian [tuberculosis](https://en.wikipedia.org/wiki/Tuberculosis)), [avian influenza](https://en.wikipedia.org/wiki/Avian_influenza) (bird flu), [giardiasis](https://en.wikipedia.org/wiki/Giardiasis), and [cryptosporidiosis](https://en.wikipedia.org/wiki/Cryptosporidiosis) over long distances. Some of these are [zoonotic diseases](https://en.wikipedia.org/wiki/Zoonosis) that can also be transmitted to humans.

Economic importance

*See also:*[*Pet § Birds*](https://en.wikipedia.org/wiki/Pet#Birds)

[](https://en.wikipedia.org/wiki/File:FishingCormorants.jpg)

The use of cormorants by Asian fishermen is in steep decline but survives in some areas as a tourist attraction.

Domesticated birds raised for meat and eggs, called [poultry](https://en.wikipedia.org/wiki/Poultry), are the largest source of animal protein eaten by humans; in 2003, 76 million tons of poultry and 61 million tons of eggs were produced worldwide. [Chickens](https://en.wikipedia.org/wiki/Chicken) account for much of human poultry consumption, though domesticated [turkeys](https://en.wikipedia.org/wiki/Domesticated_turkey), [ducks](https://en.wikipedia.org/wiki/Domestic_duck), and [geese](https://en.wikipedia.org/wiki/Domestic_goose) are also relatively common. Many species of birds are also hunted for meat. Bird hunting is primarily a recreational activity except in extremely undeveloped areas. The most important birds hunted in North and South America are waterfowl; other widely hunted birds include [pheasants](https://en.wikipedia.org/wiki/Pheasant), [wild turkeys](https://en.wikipedia.org/wiki/Wild_turkey), quail, [doves](https://en.wikipedia.org/wiki/Dove), [partridge](https://en.wikipedia.org/wiki/Partridge), [grouse](https://en.wikipedia.org/wiki/Grouse), [snipe](https://en.wikipedia.org/wiki/Snipe), and [woodcock](https://en.wikipedia.org/wiki/Woodcock). [Mutton birding](https://en.wikipedia.org/wiki/Muttonbirding) is also popular in Australia and New Zealand. Though some hunting, such as that of mutton-birds, may be sustainable, hunting has led to the extinction or endangerment of dozens of species.

Other commercially valuable products from birds include feathers (especially the [down](https://en.wikipedia.org/wiki/Down_feather) of geese and ducks), which are used as insulation in clothing and bedding, and seabird faeces ([guano](https://en.wikipedia.org/wiki/Guano)), which is a valuable source of phosphorus and nitrogen. The [War of the Pacific](https://en.wikipedia.org/wiki/War_of_the_Pacific), sometimes called the Guano War, was fought in part over the control of guano deposits.

Birds have been domesticated by humans both as pets and for practical purposes. Colourful birds, such as [parrots](https://en.wikipedia.org/wiki/Parrot_(family)) and [mynas](https://en.wikipedia.org/wiki/Myna), are bred in [captivity](https://en.wikipedia.org/wiki/Aviculture) or kept as pets, a practice that has led to the illegal trafficking of some [endangered species](https://en.wikipedia.org/wiki/Endangered_species). [Falcons](https://en.wikipedia.org/wiki/Falcon) and [cormorants](https://en.wikipedia.org/wiki/Cormorant) have long been used for [hunting](https://en.wikipedia.org/wiki/Falconry) and [fishing](https://en.wikipedia.org/wiki/Cormorant_fishing), respectively. [Messenger pigeons](https://en.wikipedia.org/wiki/Messenger_pigeon), used since at least 1 AD, remained important as recently as [World War II](https://en.wikipedia.org/wiki/World_War_II). Today, such activities are more common either as hobbies, for entertainment and tourism, or for sports such as [pigeon racing](https://en.wikipedia.org/wiki/Pigeon_racing).

Amateur bird enthusiasts (called birdwatchers, twitches or, more commonly, [birders](https://en.wikipedia.org/wiki/Birding)) number in the millions. Many homeowners erect [bird feeders](https://en.wikipedia.org/wiki/Bird_feeder) near their homes to attract various species. [Bird feeding](https://en.wikipedia.org/wiki/Bird_feeding) has grown into a multimillion-dollar industry; for example, an estimated 75% of households in Britain provide food for birds at some point during the winter.

In religion and mythology

[](https://en.wikipedia.org/wiki/File:Vogel_Drei_(Meister_der_Spielkarten).jpg)"The 3 of Birds" by the [Master of the Playing Cards](https://en.wikipedia.org/wiki/Master_of_the_Playing_Cards), 15th-century Germany

Birds play prominent and diverse roles in religion and mythology. In religion, birds may serve as either messengers or priests and leaders for a [deity](https://en.wikipedia.org/wiki/Deity), such as in the Cult of [Make make](https://en.wikipedia.org/wiki/Makemake_(mythology)), in which the [Tangata Manu](https://en.wikipedia.org/wiki/Tangata_manu) of [Easter Island](https://en.wikipedia.org/wiki/Easter_Island) served as chiefsor as attendants, as in the case of [Hugin and Minim](https://en.wikipedia.org/wiki/Hugin_and_Munin), the two [common ravens](https://en.wikipedia.org/wiki/Common_raven) who whispered news into the ears of the [Norse god](https://en.wikipedia.org/wiki/Norse_god) [Odin](https://en.wikipedia.org/wiki/Odin). In several civilisations of [ancient Italy](https://en.wikipedia.org/wiki/History_of_Italy), particularly [Etruscan](https://en.wikipedia.org/wiki/Etruscan_mythology) and [Roman](https://en.wikipedia.org/wiki/Ancient_Rome) [religion](https://en.wikipedia.org/wiki/Religion_in_Ancient_Rome), priests were involved in [augury](https://en.wikipedia.org/wiki/Augur), or interpreting the words of birds while the "auspex" (from which the word "auspicious" is derived) watched their activities to foretell events.

They may also serve as [religious symbols](https://en.wikipedia.org/wiki/Religious_symbolism), as when [Jonah](https://en.wikipedia.org/wiki/Jonah) (Hebrew: יוֹנָה, [dove](https://en.wikipedia.org/wiki/Dove)) embodied the fright, passivity, mourning, and beauty traditionally associated with doves. Birds have themselves been deified, as in the case of the [common peacock](https://en.wikipedia.org/wiki/Common_peacock), which is perceived as Mother Earth by the [Dravidians](https://en.wikipedia.org/wiki/Dravidian_people) of India. In religious images preserved from the Inca and Tiwanaku empires, birds are depicted in the process of transgressing boundaries between earthly and underground spiritual realms. Indigenous peoples of the central Andes maintain legends of birds passing to and from metaphysical worlds.

In culture and folklore

[](https://en.wikipedia.org/wiki/File:17.6-24-1974-Cuerda-seca-flisepanel.jpg)Painted [tiles](https://en.wikipedia.org/wiki/Tiles) with design of birds from [Qajar dynasty](https://en.wikipedia.org/wiki/Qajar_dynasty)

Birds have featured in culture and art since prehistoric times, when they were represented in early [cave paintings](https://en.wikipedia.org/wiki/Cave_painting). Some birds have been perceived as monsters, including the mythological [Roc](https://en.wikipedia.org/wiki/Roc_(mythology)) and the [Māori](https://en.wikipedia.org/wiki/M%C4%81ori_people)'s legendary [*Pouākai*](https://en.wikipedia.org/wiki/Poukai), a giant bird capable of snatching humans. Birds were later used as symbols of power, as in the magnificent [Peacock Throne](https://en.wikipedia.org/wiki/Peacock_Throne) of the [Mughal](https://en.wikipedia.org/wiki/Mughal_era) and [Persian](https://en.wikipedia.org/wiki/History_of_Iran) emperors. With the advent of scientific interest in birds, many paintings of birds were commissioned for books.

Among the most famous of these bird artists was [John James Audubon](https://en.wikipedia.org/wiki/John_James_Audubon), whose paintings of [North American birds](https://en.wikipedia.org/wiki/List_of_North_American_birds) were a great commercial success in Europe and who later lent his name to the [National Audubon Society](https://en.wikipedia.org/wiki/National_Audubon_Society). Birds are also important figures in poetry; for example, [Homer](https://en.wikipedia.org/wiki/Homer) incorporated [nightingales](https://en.wikipedia.org/wiki/Nightingale) into his [*Odyssey*](https://en.wikipedia.org/wiki/Odyssey), and [Catullus](https://en.wikipedia.org/wiki/Catullus) used a [sparrow](https://en.wikipedia.org/wiki/Sparrow) as an erotic symbol in his [Catullus 2](https://en.wikipedia.org/wiki/Catullus_2). The relationship between an [albatross](https://en.wikipedia.org/wiki/Albatross) and a sailor is the central theme of [Samuel Taylor Coleridge](https://en.wikipedia.org/wiki/Samuel_Taylor_Coleridge)'s [*The Rime of the Ancient Mariner*](https://en.wikipedia.org/wiki/The_Rime_of_the_Ancient_Mariner), which led to the use of the [term as a metaphor for a 'burden'](https://en.wikipedia.org/wiki/Albatross_(metaphor)). Other [English](https://en.wikipedia.org/wiki/English_language) metaphors derive from birds; [vulture funds](https://en.wikipedia.org/wiki/Vulture_fund) and vulture investors, for instance, take their name from the scavenging vulture.

Perceptions of bird species vary across cultures. [Owls](https://en.wikipedia.org/wiki/Owl) are associated with bad luck, [witchcraft](https://en.wikipedia.org/wiki/Witchcraft), and death in parts of Africa, but are regarded as wise across much of Europe. [Hoopoes](https://en.wikipedia.org/wiki/Hoopoe) were considered sacred in [Ancient Egypt](https://en.wikipedia.org/wiki/Ancient_Egypt) and symbols of virtue in [Persia](https://en.wikipedia.org/wiki/Persia), but were thought of as thieves across much of Europe and harbingers of war in [Scandinavia](https://en.wikipedia.org/wiki/Scandinavia). In [heraldry](https://en.wikipedia.org/wiki/Heraldry), birds, especially [eagles](https://en.wikipedia.org/wiki/Eagle_(heraldry)), often appear in [coats of arms](https://en.wikipedia.org/wiki/Coats_of_arms).