Mallard

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The **mallard** (/ˈmælɑrd/ or /ˈmælərd/) or **wild duck** (*Anas platyrhynchos*) is a dabbling duck which breeds throughout the temperate and subtropical Americas, Europe, Asia, and North Africa, and has been introduced to New Zealand, Australia, Peru, Brazil, Uruguay, Argentina, Chile, the Falkland Islands and South Africa.[2] This duck belongs to the subfamily Anatinae of the waterfowl family Anatidae.

The male birds (drakes) have a glossy green head and are grey on wings and belly, while the females have mainly brown-speckled plumage. Mallards live in wetlands, eat water plants and small animals, and are gregarious. This species is the ancestor of most breeds of domestic ducks.[3]

Mallard

Female (left) and male (right)

Conservation status

Least Concern (IUCN 3.1)[1]

Scientific classification

Kingdom:	Animalia
Phylum:	Chordata
Class:	Aves
Order:	Anseriformes
Family:	Anatidae
Genus:	*Anas*
Species:	***A. platyrhynchos***

Binomial name

Anas platyrhynchos

Linnaeus, 1758

Subspecies

A. p. platyrhynchos Linnaeus, 1758
A. p. domesticus Linnaeus, 1758
A. p. conboschas C. L. Brehm, 1831 (disputed)

Contents

Taxonomy and evolution

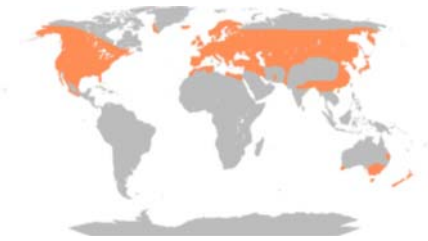
Plate 221 of the *Birds of America* by John James Audubon

The mallard was one of the many bird species originally described by Carl Linnaeus in his 18th-century work, *Systema Naturae*, and still bears its original binomial name.[4]

The name *mallard* is derived from the Old French *malart* or *mallart* "wild drake", although its ultimate derivation is

unclear. It may be related to (or at least influenced by) an Old High German masculine proper name *Madelhart*, clues lying in the alternate English forms "maudelard" or "mawdelard".[5] *Masle* (male) has also been proposed as an influence.[6]

Mallards frequently interbreed with their closest relatives in the genus *Anas*, such as the American black duck, and also with species more distantly related, such the northern pintail, leading to various hybrids that may be fully fertile.[7] This is quite unusual among such different species, and apparently is because the mallard evolved very rapidly and recently, during the Late Pleistocene. The distinct lineages of this radiation are usually kept separate due to non-overlapping ranges and behavioural cues, but are still not fully genetically incompatible.[8] Mallards and their domesticated conspecifics are also fully interfertile.



Global range (native and introduced)

Synonyms

Anas boschas Linnaeus, 1758

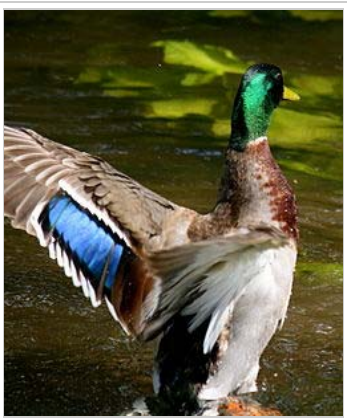
The genome of *Anas platyrhynchos* was sequenced in 2013.[9]

Mallards appear to be closer to their Indo-Pacific relatives than to their American ones judging from biogeography. Considering mitochondrial DNA D-loop sequence data, they may have evolved in the general area of Siberia; mallard bones rather abruptly appear in food remains of ancient humans and other deposits of fossil bones in Europe, without a good candidate for a local predecessor species.[10] The large ice age palaeosubspecies which made up at least the European and west Asian populations during the Pleistocene has been named *Anas platyrhynchos palaeoboschas*.

In their mitochondrial DNA, mallards are differentiated between North America and Eurasia,[11] however, in the nuclear genome there is a particular lack of genetic structure.[12] Haplotypes typical of American mallard relatives and spotbills can be found in mallards around the Bering Sea.[13] The Aleutian Islands hold a population of mallards that appear to be evolving towards a subspecies, as gene flow with other populations is very limited.[10]

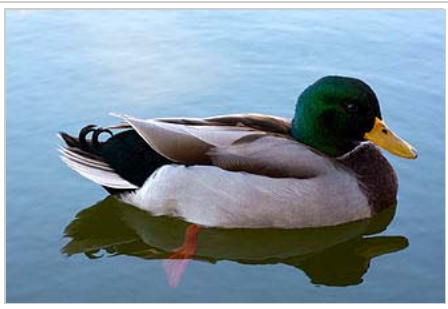
The size of the mallard varies clinally, and birds from Greenland, although larger than birds further south, have smaller bills and are stockier. They are sometimes separated as subspecies, the Greenland mallard (*A. p. conboschas*).

Description



Iridescent speculum feathers of the male

The mallard is a medium-sized waterfowl species although is often slightly heavier than most other dabbling ducks. It is 50–65 cm (20–26 in) long (of which the body makes up around two-thirds), has a wingspan of 81–98 cm (32–39 in),[14] and weighs 0.72–1.58 kg (1.6–3.5 lb).[15][16] Among standard measurements, the wing chord is 25.7 to 30.6 cm (10.1 to 12.0 in), the bill is 4.4 to 6.1 cm (1.7 to 2.4 in) and the tarsus is 4.1 to 4.8 cm (1.6 to 1.9 in).[17]



Iridescent feathers of the male head

The breeding male mallard is unmistakable, with a glossy bottle-green head and white collar which demarcates the head from the purple-tinged brown

breast, grey brown wings, and a pale grey belly. The rear of the male is black, with the dark tail having white borders.[18] The bill of the male is a yellowish orange tipped with black while that of the female is generally darker ranging from black to mottled orange. The female mallard is predominantly mottled with each individual feather showing sharp contrast from buff to very dark brown, a coloration shared by most female dabbling ducks, and has buff cheeks, eyebrow, throat and neck with a darker crown and eye-stripe.[18]

Both male and female mallards have distinct iridescent purple blue speculum feathers edged with white, prominent in flight or at rest, though temporarily shed during the annual summer moult. Upon hatching, the plumage colouring of the duckling is yellow on the underside and face (with streaks by the eyes) and black on the backside (with some yellow spots) all the way to the top and back of the head. Its legs and bill are also black. As it nears a month in age, the duckling's plumage will start becoming drab, looking more like the female (though its plumage is more streaked) and its legs will lose their dark grey colouring.[18] Two months after hatching, the fledgling period has ended and the duckling is now a juvenile. Between three to four months of age, the juvenile can finally begin flying as its wings are fully developed for flight (which can be confirmed by the sight of purple speculum feathers). Its bill will soon lose its dark grey colouring and its sex can finally be distinguished by three factors. The bill colouring is yellow in males, black and orange for females. The breast feathers are reddish-brown for males, brown for females. The centre tail feather is curled for males (called a drake feather), straight for females.

During the final period of maturity leading up to adulthood (6–10 months of age), the plumage of female juveniles remains the same while the plumage of male juveniles slowly changes to its characteristic colours. This plumage change also applies to adult mallard males when they transition in and out of their non-breeding eclipse plumage at the beginning and the end of the summer moulting period. The adulthood age for mallards is 14 months and the average life expectancy is 3 years, but they can live to twenty.[19]

Several species of duck have brown-plumaged females which can be confused with the female mallard. The female gadwall (*A. strepera*) has an orange-lined bill, white belly, black and white speculum which is seen as a white square on the wings in flight, and is a smaller bird.[18] More similar to the female mallard in North America are the American black duck (*A. rubripes*), which is notably darker hued in both sexes than the mallard, and the mottled duck (*A. fulvigula*), which is somewhat darker than the female mallard, with no white edge on the speculum and slightly different bare-part colouration.

An American black duck (top left) and a male mallard (bottom right) in eclipse plumage

In captivity, domestic ducks come in wild-type plumages, white, and other colours. Most of these colour variants are also known in domestic mallards not bred as livestock, but kept as pets, aviary birds, etc., where they are rare but increasing in availability.

A noisy species, the male has a nasal call, and a high-pitched whistle, while the female has a deeper *quack* stereotypically associated with ducks.[20][21]

The mallard is a rare example of both Allen's Rule and Bergmann's Rule in birds. Bergmann's Rule, which states that polar forms tend to be larger than related ones from warmer climates, has numerous examples in birds. Allen's Rule says that appendages like ears tend to be smaller in polar forms to minimize heat loss, and larger in tropical and desert equivalents to facilitate heat diffusion, and that the polar taxa are stockier overall. Examples of this rule in birds are rare, as they lack external ears. However, the bill of ducks is very well supplied with blood vessels and is vulnerable to cold.

Due to the malleability of the mallard's genetic code, which gives it its vast interbreeding capability, mutations in the genes that decide plumage colour are very common and have resulted in a wide variety of hybrids such as Brewer's duck (mallard × gadwall, *Anas strepera*).[22]

Distribution and habitat

A mallard quacking
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The mallard is widely distributed across the Northern and Southern Hemispheres, North America from southern and central Alaska to Mexico, the Hawaiian Islands, and across Eurasia, from Iceland and southern Greenland and parts of Morocco (North Africa) in the west, Scandinavia to the north, and to Siberia, Japan,and South Korea, in the east, Australia and New Zealand in the Southern hemisphere.[14] It is strongly migratory in the northern parts of its breeding range, and winters farther south. For example, in North America, it winters south to Mexico, but also regularly strays into Central America and the Caribbean between September and May.[23]

The mallard inhabits a wide range of habitat and climates, from Arctic tundra to subtropical regions. It is found in both fresh- and salt-water wetlands, including parks, small ponds, rivers, lakes and estuaries, as well as shallow inlets and open sea within sight of the coastline. Water depths of less than 1 metre (3.3 ft) are preferred, birds avoiding areas more than a few metres deep. They are attracted to bodies of water with aquatic vegetation.[21]

Male

Fledgling

Juveniles

Female landing

Drake in flight

Behaviour

Feeding

The mallard is omnivorous and very flexible in its foods choice. Its diet may vary based on several factors, including the stage of the breeding cycle, short-term variations in available food, nutrient availability, and inter and intraspecific competition.[24] The majority of the mallard's diet seems to be made up of gastropods, invertebrates (including beetles, flies, lepidopterans, dragonflies, and caddisflies), crustaceans, worms, many varieties of seeds and plant matter, and roots and tubers. During the breeding season, male birds were recorded to have eaten 37.6% animal matter and 62.4% plant matter, most notably *Echinochloa crus-galli*, and nonlaying females ate 37.0% animal matter and 63.0% plant matter, while laying females ate 71.9% animal matter and only 28.1% plant matter.[25] Plants generally make up a larger part of the bird's diet,

especially during autumn migration and in the winter.[26][27]

It usually feeds by dabbling for plant food or grazing; there are reports of it eating frogs. It usually nests on a river bank, but not always near water. It is highly gregarious outside of the breeding season and forms large flocks, which are known as *sords*.[28]

Breeding

Mallards usually form pairs (in October and November in the Northern hemisphere) only until the female lays eggs at the start of nesting season which is around the beginning of spring, at which time she is left by the male who joins up with other males to await the moulting period which begins in June (in the Northern hemisphere). During the brief time before this, however, the males are still sexually potent and some of them either remain on standby to sire replacement clutches (for female Mallards that have lost or abandoned their previous clutch) or forcibly mate with females that appear to be isolated or unattached regardless of their species and whether or not they have a brood of ducklings.

Eggs and nest

The nesting period can be very stressful for the female since she lays more than half her body weight in eggs. She requires a lot of rest and a feeding/loafing area that is safe from predators. When seeking out a suitable nesting site, the female's preferences are areas that are well concealed, inaccessible to ground predators, or have few predators nearby. This can include nesting sites in urban areas such as roof gardens, enclosed courtyards, and flower boxes on window ledges and balconies more than one story up, which the ducklings cannot leave safely without human intervention. The clutch is 8–13 eggs, which are incubated for 27–28 days to hatching with 50–60 days to fledgling. The ducklings are precocial and fully capable of swimming as soon as they hatch. However, filial imprinting compels them to instinctively stay near the mother not only for warmth and protection but also to learn about and remember their habitat as well as how and where to forage for food. When ducklings mature into flight-capable juveniles, they learn about and remember their traditional migratory routes (unless they are born and raised in captivity). After this, the juveniles and the mother may either part or remain together until the breeding season arrives.

Egg, Collection Museum Wiesbaden

Female swimming with ducklings that are less than a week old

When they pair off with mating partners, often one or several drakes end up left out. This group sometimes targets an isolated female duck, even one of a different species, and proceeds to chase and peck at her until she weakens, at which point the males take turns copulating with the female. Lebret (1961) calls this behaviour "Attempted Rape Flight" and Cramp & Simmons (1977) speak of "rape-intent flights". Male mallards also occasionally chase other male ducks of a different species, and even each other, in the same way. In one documented case of "homosexual necrophilia", a male mallard copulated with another male he was chasing after the chased male died upon flying into a glass window.[29] This paper was awarded with an Ig Nobel Prize in 2003.[30]

Two males

Mallards are opportunistically targeted by brood parasites, occasionally having eggs laid in their nests by Redheads, ruddy ducks, lesser scaup, gadwalls, northern shovelers, northern pintails, cinnamon teal, common goldeneyes, and other mallards. These eggs are generally accepted when they resemble the eggs of the host mallard, although the hen may attempt to eject them or even abandon the nest if parasitism occurs during egg laying.[31] Mallards of all ages (but especially young ones) and in all locations must contend with a wide diversity of predators including raptors, mustelids, corvids, snakes, raccoons, opossums, skunks, turtles, large fish and felids and canids, including domesticated ones.[32] The most prolific natural predators of adult mallards are red foxes (which most often pick off brooding females) and the faster or larger birds of prey, i.e. peregrine falcons or *Haliaeetus* eagles, although both types of predator kill far fewer than human hunters.[33][34] In North America, adult mallards face no fewer than 15 species of birds of prey, from hen harriers and short-eared owls (both smaller than a mallard) to huge bald and golden eagles, and about a dozen species of mammalian predator, not counting several more avian and mammalian predators who threaten eggs and nestlings.[31]

Mallards are also preyed upon occasionally by 'unorthodox' species, such as the Grey heron (*Ardea cinerea*), European herring gull (*Larus argentatus*) and the Northern pike (*Esox lucius*).

Conservation


The last male Mariana mallard

Unlike many waterfowl, mallards have benefited from human alterations to the world. They are very adaptable, being able to live and even thrive in urban areas which may have supported more localized, sensitive species of waterfowl before development. The release of feral mallards in areas where they are not native sometimes creates problems through interbreeding with indigenous waterfowl. These non-migratory mallards interbreed with indigenous wild ducks from local populations of closely related species through genetic pollution by producing fertile offspring. Complete hybridization of various species of wild ducks gene pools could result in the extinction of many indigenous waterfowl. The wild mallard itself is the ancestor of most domestic ducks and its naturally evolved wild gene pool gets genetically polluted in turn by the domesticated and feral populations.[35][36][37]

The mallard is considered an invasive species in New Zealand.[14] There, and elsewhere, mallards are spreading with increasing urbanization and hybridizing with local relatives.[38] Over time, a continuum of hybrids ranging between almost typical examples of either species will develop; the speciation process beginning to reverse itself.[39] This has created conservation concerns for relatives of the mallard, such as the Hawaiian duck,[38][40] the *A. s. superciliosa* subspecies of the Pacific black duck,[38][41][42][43] the American black duck,[38][44][45][46] the mottled duck,[38][47][48] Meller's duck,[49] the yellow-billed duck,[39] and the Mexican duck,[38][48] in the latter case even leading to a dispute whether these birds should be considered a species[50] (and thus entitled to more conservation research and funding) or included in the mallard.

The availability of mallards, mallard ducklings, and fertilized mallard eggs for public sale and private ownership, either as livestock or as pets, is currently legal in the United States except for the state of Florida which has currently banned domestic ownership of mallards. This is to prevent hybridisation with the native mottled duck.[51]

Mallards are also causing severe "genetic pollution" of South Africa's biodiversity by breeding with endemic ducks, although the *Agreement on the Conservation of African-Eurasian Migratory Waterbirds* applies to the mallard. The hybrids of mallards and the yellow-billed duck are fertile and can produce more hybrid offspring. If this continues, only hybrids will occur and in the long term this will result in the extinction of various indigenous waterfowl. The mallard duck can cross breed with 63 other species and is posing a severe

threat to the genetic integrity of indigenous waterfowl. Mallards and their hybrids compete with indigenous birds for resources such as food, nest sites and roosting sites.[37]


Several drakes swim in a pond

The Eastern or Chinese spot-billed duck is currently introgressing into the mallard populations of the Primorsky Krai, possibly due to habitat changes from global warming.[13] The Mariana mallard was a resident allopatric population—in most respects a good species—apparently initially derived from mallard-Pacific black duck hybrids;[52] unfortunately, it became extinct in the late twentieth century.[53]


Ducklings following mother in Boston Harbor, USA

The Laysan duck is an insular relative of the mallard with a very small and fluctuating population. Mallards sometimes arrive on its island home during migration, and can be expected to occasionally have remained and hybridized with Laysan ducks as long as these species have existed. But these hybrids are less well adapted to the peculiar ecological conditions of Laysan Island than the local ducks, and thus have lower fitness, and furthermore, there were—apart from a brief time in the early 20th century when the Laysan duck was almost extinct—always many more Laysan ducks than stray mallards. Thus, in this case, the hybrid lineages would rapidly fail.

In the cases mentioned above, however, ecological changes and hunting have led to a decline of local species; for example, the New Zealand grey duck population declined drastically due to overhunting in the mid-20th century.[43] Hybrid offspring of Hawaiian ducks seem to be less well-adapted to native habitat, and utilizing them in reintroduction projects apparently reduces success.[38][54] In summary, the problems of mallards "hybridizing away" relatives is more a consequence of local ducks declining than of mallards spreading; allopatric speciation and isolating behaviour have produced today's diversity of mallard-like ducks despite the fact that in most if not all of these populations, hybridization must have occurred to some extent.

Relationship with humans


By Carl Friedrich Deiker (1875)

The mallard is depicted in a marginal decoration of the 15th century English illuminated manuscript the Sherborne Missal.[55]

Since 1933, the Peabody Hotel in Downtown Memphis, Tennessee has maintained a long tradition of keeping one mallard drake and four mallard hens, called *The Peabody Ducks*, as a popular hotel attraction and as guests of honour. The mallards are provided by a local farmer and friend of the Peabody Hotel and are rotated out and returned to the farm for a new team of mallards every three months. This tradition has also been maintained and observed at the other Peabody Hotels in Little Rock, Arkansas and Orlando, Florida.[56]

Although mallard do not have as fine a flavour as teal, they have the advantage of being one of the larger ducks, so are selected for breeding for shooting and the table.[57] Shot sizes four and five are recommended for a clean and efficient kill in shooting mallard.[58]

The children's picture book *Make Way for Ducklings*, published in 1941 and winner of the 1942 Caldecott Medal for its illustrations, is the story of a pair of mallards who decide to raise their family on an island in the lagoon in Boston Public Garden in Massachusetts.[59]

Duck Head, a U.S. clothing brand, uses the image of a mallard's head as its logo.[60]

References

1. BirdLife International (2012). "*Anas platyrhynchos*" (http://www.iucnredlist.org/details/22680186). *IUCN Red List of Threatened Species. Version 2013.2*. International Union for Conservation of Nature. Retrieved 26 November 2013.
2. Long, John L. (1981). *Introduced Birds of the World*. Agricultural Protection Board of Western Australia. pp. 21–493.
3. "Anas platyrhynchos (On-line), Digital Morphology" (http://digimorph.org/specimens/anas_platyrhynchos/skull/). The University of Texas at Austin. 2004. Retrieved 23 August 2012.
4. Linnaeus, Carl (1758). *Systema naturae per regna tria naturae, secundum classes, ordines, genera, species, cum characteribus, differentiis, synonymis, locis. Tomus I. Editio decima, reformata* (in Latin). Stockholm: Laurentius Salvius. p. 125.
5. "mallard". *Oxford English Dictionary* (2nd ed.). Oxford University Press. 1989.
6. "mallard" (http://oed.com/search?searchType=dictionary&q=mallard). *Oxford English Dictionary* (3rd ed.). Oxford University Press. September 2005.
7. Phillips, John C. (1915). "Experimental studies of hybridization among ducks and pheasants". *Journal of Experimental Zoology* **18** (1): 69–112. doi:10.1002/jez.1400180103 (https://dx.doi.org/10.1002%2Fjez.1400180103).
8. Kraus, R.H.S.; Kerstens, H.H.D.; van Hooft, P.; Megens, H.-J.; Elmberg, J.; Tsvey, Arseny; Sartakov, Dmitry; Soloviev, Sergej A.; Crooijmans, Richard P.M.A.; Groenen, Martien A.M.; Ydenberg, Ronald C.; Prins, Herbert H.T. (2012). "Widespread horizontal genomic exchange does not erode species barriers among sympatric ducks" (http://www.biomedcentral.com/1471-2148/12/45/). *BMC Evolutionary Biology* **12** (45): 45. doi:10.1186/1471-2148-12-45 (https://dx.doi.org/10.1186%2F1471-2148-12-45).
9. Huang, Y.; Li, Y.; Burt, D.W.; Chen, H.; Zhang, Y.; Qian, Wubin; Kim, Heebal; Gan, Shangquan; Zhao, Yiqiang; Li, Jianwen; Yi, Kang; Feng, Huapeng; Zhu, Pengyang; Li, Bo; Liu, Qiuyue; Fairley, Suan; Magor, Katharine E; Du, Zhenlin; Hu, Xiaoxiang; Goodman, Laurie; Tafer, Hakim; Vignal, Alain; Lee, Taeheon; Kim, Kyu-Won; Sheng, Zheya; An, Yang; Searle, Steve; Herrero, Javier; Groenen, Martien A.M. et al. (2013). "The duck genome and transcriptome provide insight into an avian influenza virus reservoir species" (http://www.nature.com/ng/journal/vaop/ncurrent/abs/ng.2657.html). *Nature Genetics* (Nature Publishing) **45** (7): 776–783. doi:10.1038/ng.2657 (https://dx.doi.org/10.1038%2Fng.2657). PMC 4003391 (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4003391). PMID 23749191 (https://www.ncbi.nlm.nih.gov/pubmed/23749191).
10. Kulikova, Irina V.; Drovetski, S.V.; Gibson, D.D.; Harrigan, R.J.; Rohwer, S.; Sorenson, Michael D.; Winker, K.; Zhuravlev, Yury N.; McCracken, Kevin G. (2005). "Phylogeography of the Mallard (*Anas platyrhynchos*): hybridization, dispersal, and lineage sorting contribute to complex geographic structure". *The Auk* **122** (3): 949–965. doi:10.1642/0004-8038(2005)122[0949:POTMAP]2.0.CO;2 (https://dx.doi.org/10.1642%2F0004-8038%282005%29122%5B0949%3APOTMAP%5D2.0.CO%3B2). (Erratum: *The Auk* 122 (4): 1309, doi:10.1642/0004-8038(2005)122[1309:POTMAP]2.0.CO;2 (https://dx.doi.org/10.1642%2F0004-8038%282005%29122%5B1309%3APOTMAP%5D2.0.CO%3B2).)
11. Kraus, R.H.S.; Zeddeman, A.; van Hooft, P.; Sartakov, D.; Soloviev, S.A.; Ydenberg, Ronald C.; Prins, Herbert H.T. (2011). "Evolution and connectivity in the world-wide migration system of the mallard: Inferences from mitochondrial DNA" (http://www.biomedcentral.com/1471-2156/12/99). *BMC Genetics* **12** (99): 99. doi:10.1186/1471-2156-12-99 (https://dx.doi.org/10.1186%2F1471-2156-12-99). PMC 3258206

(https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3258206). PMID 22093799 (https://www.ncbi.nlm.nih.gov/pubmed/22093799).

12. Kraus, R.H.S.; van Hooft, P.; Megens, H.-J.; Tsvey, A.; Fokin, S.Y.; Ydenberg, Ronald C.; Prins, Herbert H.T. (2013). "Global lack of flyway structure in a cosmopolitan bird revealed by a genome wide survey of single nucleotide polymorphisms". *Molecular Ecology* (January 2013) **22** (1): 41–55. doi:10.1111/mec.12098 (https://dx.doi.org/10.1111%2Fmec.12098). PMID 23110616 (https://www.ncbi.nlm.nih.gov/pubmed/23110616).
13. Kulikova, Irina V.; Zhuravlev, Yury N.; McCracken, Kevin G. (2004). "Asymmetric hybridization and sex-biased gene flow between Eastern Spot-billed Ducks (*Anas zonorhyncha*) and Mallards (*A. platyrhynchos*) in the Russian Far East". *The Auk* **121** (3): 930–949. doi:10.1642/0004-8038(2004)121[0930:AHASGF]2.0.CO;2 (https://dx.doi.org/10.1642%2F0004-8038%282004%29121%5B0930%3AAHASGF%5D2.0.CO%3B2).
14. Cramp 1977, p. 505
15. "Mallard" (http://www.allaboutbirds.org/guide/Mallard/id). *All About Birds*. Cornell Lab of Ornithology.
16. Dunning, John B., Jr., ed. (1992). *CRC Handbook of Avian Body Masses*. CRC Press. ISBN 978-0-8493-4258-5.
17. Madge, Steve (1992). *Waterfowl: An Identification Guide to the Ducks, Geese, and Swans of the World*. Houghton Mifflin Harcourt. ISBN 978-0-395-46726-8.
18. Cramp 1977, p. 506
19. Robinson, R.A. (2005). "Mallard *Anas platyrhynchos*" (http://blx1.bto.org/birdfacts/results/bob1860.htm). *BirdFacts: profiles of birds occurring in Britain & Ireland (BTO Research Report 407) (http://www.bto.org/birdfacts)*. Thetford: BTO. Retrieved 10 February 2015.
20. Rogers, D. (2001). "*Anas platyrhynchos* (On-line)" (http://animaldiversity.org/accounts/Anas_platyrhynchos/). *Animal Diversity Web*. Museum of Zoology, University of Michigan. Retrieved 8 December 2006.
21. Cramp 1977, p. 507
22. "Brewer's Duck" (http://web4.audubon.org/bird/BoA/F39_G4c.html). *audubon.org*. National Audubon Society. Retrieved 19 May 2012.
23. Herrera, Néstor; Rivera, Roberto; Ibarra Portillo, Ricardo; Rodríguez, Wilfredo (2006). "Nuevos registros para la avifauna de El Salvador" [New records for the avifauna of El Salvador] (http://www.sao.org.co/publicaciones/boletinsao/01-Herrera.etal.RecordsSalvador.pdf) (PDF). *Boletín de la Sociedad Antioqueña de Ornitología* (in Spanish) **16** (2): 1–19.
24. Krapu, Gary L.; Reinecke, Kenneth J. (1992). "Foraging ecology and nutrition". In Batt, Bruce D.J.; Afton, Alan D.; Anderson, Michael G.; Ankney, C. Davison; Johnson, Douglas H.; Kadlec, John A.; Krapu, Gary L. *Ecology and Management of Breeding Waterfowl*. Minneapolis: University of Minnesota Press. pp. 1–30 (10). ISBN 978-0-8166-2001-2.
25. Swanson, George A.; Meyer, Mavis I.; Adomaitis, Vyto A. (1985). "Foods consumed by breeding mallards on wetlands of south-central North Dakota". *Journal of Wildlife Management* **49** (1): 197–203. doi:10.2307/3801871 (https://dx.doi.org/10.2307%2F3801871). JSTOR 3801871 (https://www.jstor.org/stable/3801871).
26. Gruenhagen, Ned M.; Fredrickson, Leigh H. (1990). "Food use by migratory female mallards in northwest Missouri". *Journal of Wildlife Management* **54** (4): 622–626. doi:10.2307/3809359 (https://dx.doi.org/10.2307%2F3809359). JSTOR 3809359 (https://www.jstor.org/stable/3809359).
27. Combs, Daniel L.; Fredrickson, Leigh H. (1990). "Foods used by male mallards wintering in southeastern Missouri". *Journal of Wildlife Management* **60** (3): 603–610. doi:10.2307/3802078 (https://dx.doi.org/10.2307%2F3802078). JSTOR 3802078 (https://www.jstor.org/stable/3802078).
28. Ross, Terry. "Group Name for Birds: A Partial List" (http://baltimorebirdclub.org/gnlist.html). Baltimore Bird Club. Retrieved 3 June 2007.

29. Moeliker, C.W. (2001). "The first case of homosexual necrophilia in the Mallard *Anas platyrhynchos* (Aves: Anatidae)" (http://www.hetnatuurhistorisch.nl/fileadmin/user_upload/documents-nmr/Persberichten/Persberichten/persberichten_2013/DSA8_243-248.pdf) (PDF). *Deinsea* **8** (243–247).
30. MacLeod, Donald (8 March 2005). "Necrophilia among ducks ruffles research feathers" (http://education.guardian.co.uk/higher/research/story/0,9865,1432991,00.html). *The Guardian*. Retrieved 9 December 2006.
31. Drilling, Nancy; Titman, Roger; McKinney, Frank (2002). Poole, A., ed. "Mallard (*Anas platyrhynchos*)" (http://bna.birds.cornell.edu/bna/species/658). *The Birds of North America Online*. Ithaca: Cornell Lab of Ornithology. doi:10.2173/bna.658 (https://dx.doi.org/10.2173%2Fbna.658). Retrieved 1 February 2011.
32. "Anas platyrhynchos" (http://www.fs.fed.us/database/feis/animals/bird/anpl/all.html). US Forest Service. Retrieved 23 August 2012.
33. "Impact of Red Fox Predation on the Sex Ratio of Prairie Mallards" (http://www.npwrc.usgs.gov/resource/mammals/sexratio/revised.htm). USGS Northern Prairie Wildlife Research Center. 3 August 2006. Retrieved 23 August 2012.
34. "Geese Ducks and Swans: Anatidae – Mallard (Anas Platyrhynchos): Species Accounts – Mallards, Eat, Male, and Female" (http://animals.jrank.org/pages/539/Ducks-Geese-Swans-Anatidae-MALLARD-Anas-platyrhynchos-SPECIES-ACCOUNTS.html). JRank. Retrieved 7 September 2014.
35. "Mottled Ducks : The Problem : Hybridization; Florida Fish and Wildlife Conservation Commission" (http://web.archive.org/web/20060420042916/http://www.myfwc.com/duck/mottled/theproblem.htm). Florida Fish and Wildlife Conservation Commission. Archived from the original (http://myfwc.com/duck/mottled/theproblem.htm) on 20 April 2006. Retrieved 23 August 2012.
36. Bowers, Frank (May 2002). "Environmental assessment for control of free-ranging resident mallards in Florida" (http://www.fws.gov/southeast/news/2002/Mallards/). US Fish and Wildlife Service. Retrieved 23 August 2012.
37. "Invasive Alien Bird Species Pose A Threat, Kruger National Park, Siyabona Africa Travel (Pty) Ltd – South Africa Safari Travel Specialist" (http://www.krugerpark.co.za/krugerpark-times-3-6-bird-threat-22588.html). *Krugerpark.co.za (http://www.krugerpark.co.za)*. Retrieved 23 August 2012.
38. Rhymer, Judith M.; Simberloff, Daniel (1996). "Extinction by hybridization and introgression". *Annual Review of Ecology and Systematics* **27**: 83–109. doi:10.1146/annurev.ecolsys.27.1.83 (https://dx.doi.org/10.1146%2Fannurev.ecolsys.27.1.83).
39. Rhymer, Judith M. (2006). "Extinction by hybridization and introgression in anatine ducks" (http://www.actazool.org/temp/%7B73B99493-DF40-41F1-A96E-595F6E15B833%7D.pdf) (PDF). *Acta Zoologica Sinica* **52** (Supplement): 583–585.
40. Griffin, C.R.; Shallenberger, F.J.; Fefer, S.I. (1989). "Hawaii's endangered waterbirds: a resource management challenge". In Sharitz, R.R.; Gibbons, I.W. *Proceedings of Freshwater Wetlands and Wildlife Symposium*. Aiken, South Carolina: Savannah River Ecology Lab. pp. 155–169.
41. Gillespie, Grant D. (1985). "Hybridization, introgression, and morphometric differentiation between Mallard (*Anas platyrhynchos*) and Grey Duck (*Anas superciliosa*) in Otago, New Zealand" (http://sora.unm.edu/sites/default/files/journals/auk/v102n03/p0459-p0469.pdf) (PDF). *The Auk* **102** (3): 459–469.
42. Rhymer, Judith M.; Williams, Murray J.; Braun, Michael J. (1994). "Mitochondrial analysis of gene flow between New Zealand Mallards (*Anas platyrhynchos*) and Grey Ducks (*A. superciliosa*)" (http://sora.unm.edu/sites/default/files/journals/auk/v111n04/p0970-p0978.pdf) (PDF). *The Auk* **111** (4): 970–978. doi:10.2307/4088829 (https://dx.doi.org/10.2307%2F4088829).
43. Williams, Murray; Basse, Britta (2006). "Indigenous gray ducks, *Anas superciliosa*, and introduced mallards, *A. platyrhynchos*, in New Zealand: processes and outcome of a deliberate encounter" (http://www.actazool.org

/temp/%7B819A6F5F-484C-4938-AB7D-F6B2EB691E47%7D.pdf) (PDF). *Acta Zoologica Sinica* **52** (Supplement): 579–582.

44. Johnsgard, Paul A. (1967). "Sympatry changes and hybridization incidence in Mallards and Black Ducks". *American Midland Naturalist* **77** (1): 51–63. doi:10.2307/2423425 (https://dx.doi.org/10.2307%2F2423425).
45. Avise, John C.; Ankney, C. Davison; Nelson, William S. (1990). "Mitochondrial gene trees and the evolutionary relationship of Mallard and Black Ducks" (http://faculty.sites.uci.edu/johncavise/files/2011/03/105-mallard-black-ducks.pdf) (PDF). *Evolution* **44** (4): 1109–1119. doi:10.2307/2409570 (https://dx.doi.org/10.2307%2F2409570).
46. Mank, Judith E.; Carlson, John E.; Brittingham, Margaret C. (2004). "A century of hybridization: decreasing genetic distance between American black ducks and mallards". *Conservation Genetics* **5** (3): 395–403. doi:10.1023/B:COGE.0000031139.55389.b1 (https://dx.doi.org/10.1023%2FB%3ACOGE.0000031139.55389.b1).
47. Mazourek, J.C.; Gray, P.N. (1994). "The Florida duck or the mallard?" (https://web.archive.org/web/20070810190700/http://www.floridaconservation.org/duck/mottled/documents/WeCantHaveBothArtcle.doc). *Florida Wildlife* **48** (3): 29–31. Archived from the original (http://www.floridaconservation.org/duck/mottled/documents/WeCantHaveBothArtcle.doc) (DOC) on 10 August 2007.
48. McCracken, Kevin G.; Johnson, William P.; Sheldon, Frederick H. (2001). "Molecular population genetics, phylogeography, and conservation biology of the mottled duck (*Anas fulvigula*)". *Conservation Genetics* **2** (2): 87–102. doi:10.1023/A:1011858312115 (https://dx.doi.org/10.1023%2FA%3A1011858312115).
49. Young, H. Glyn; Rhymer, Judith M. (1998). "Meller's duck: A threatened species receives recognition at last". *Biodiversity and Conservation* **7** (10): 1313–1323. doi:10.1023/A:1008843815676 (https://dx.doi.org/10.1023%2FA%3A1008843815676).
50. American Ornithologists' Union (AOU) (1983). *Check-list of North American Birds* (6th ed.). Washington, DC: American Ornithologists' Union.
51. "Mallard Possession Rule" (http://myfwc.com/wildlifehabitats/managed/waterfowl/mallard-possession-rule/). Florida Fish and Wildlife Conservation Commission. Retrieved 10 February 2015.
52. Yamashina, Y. (1948). "Notes on the Marianas mallard". *Pacific Science* **2**: 121–124.
53. Madge, Steve; Burn, Hilary (2010) [1989]. *Wildfowl* (https://books.google.com/books?id=gFawO8q9VfIC&pg=PA211#v=onepage&q&f=false). London: Christopher Helm Publ. p. 211. ISBN 1408138956.
54. Kirby, Ronald E.; Sargeant, Glen A.; Shutler, Dave (2004). "Haldane's rule and American black duck × mallard hybridization". *Canadian Journal of Zoology* **82** (11): 1827–1831. doi:10.1139/z04-169 (https://dx.doi.org/10.1139%2Fz04-169).
55. Clark, Kenneth (1977). *Animals and Men*. London: Thames and Hudson. p. 107. ISBN 0-500-23257-1.
56. "Peabody Ducks" (http://www.peabodymemphis.com/peabody-ducks/). The Peabody Memphis Tennessee Hotels. Retrieved 19 May 2012.
57. Carter, Louisa. "Wild duck recipes" (http://www.bbc.co.uk/food/wild_duck). BBC.
58. "Countryside Alliance" (http://www.countryside-alliance.org/ca/article/faqs). Retrieved 22 March 2015.
59. McCloskey, Robert (1961) [1941]. *Make Way For Ducklings*. New York: The Viking Press. ISBN 0-670-45149-5.
60. "Our Story" (http://duckhead.com/our-story/). Duck Head International LLC. Retrieved 15 February 2015.

Bibliography

- Bagemihl, Bruce (1999). *Biological Exuberance: Animal Homosexuality and Natural Diversity*. St. Martin's Press. pp. 479–481. ISBN 978-0-312-19239-6.
- Cramp, Stanley, ed. (1977). *Handbook of the Birds of Europe the Middle East and North Africa, the Birds of the Western Palearctic*. Volume 1: Ostrich to Ducks. Oxford: Oxford University Press. ISBN 978-0-19-857358-6.
- Johnson, Kevin P.; Sorenson, M.D. (1999). "Phylogeny and biogeography of dabbling ducks (genus *Anas*): a comparison of molecular and morphological evidence" (http://sora.unm.edu/sites/default/files/journals/auk/v116n03/p0792-p0805.pdf) (PDF). *The Auk* **116** (3): 792–805. doi:10.2307/4089339 (https://dx.doi.org/10.2307%2F4089339).

External links

- Mallard at RSPB's Birds by Name (http://www.rspb.org.uk/wildlife/birdguide/name/m/mallard/index.aspx)
- Northern Mallard at Birds in Backyards (http://www.birdsinbackyards.net/species/Anas-platyrhynchos)
- BirdGuides Mallard Page (http://www.birdguides.com/species/species.asp?sp=027083)
- Mallard videos, photos, and sounds (http://ibc.lynxeds.com/species/mallard-anas-platyrhynchos) at the Internet Bird Collection
- Mallard Species Account (http://www.birds.cornell.edu/AllAboutBirds/BirdGuide/Mallard.html) – Cornell Lab of Ornithology
- Ageing and sexing by Javier Blasco-Zumeta & Gerd-Michael Heinze (http://aulaenred.ibercaja.es/wp-content/uploads/78_MallardAplatyrhynchos.pdf) (PDF; 5.7 MB)
- Mallard photo gallery (http://vireo.acnatsci.org/search.html?Form=Search&SEARCHBY=Common&KEYWORDS=Mallard&showwhat=images&AGE=All&SEX=All&ACT=All&Search=Search&VIEW=All&ORIENTATION=All&RESULTS=24) at VIREO (Drexel University)

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