GLOBAL INVASIVE SPECIES DATABASE

FULL ACCOUNT FOR: ***Anas platyrhynchos***

Anas platyrhynchos 正體中文 **System:** Freshwater_terrestrial

Kingdom	Phylum	Class	Order	Family
Animalia	Chordata	Aves	Anseriformes	Anatidae

Common name

Synonym *Anas oustaleti* , Salvadori, 1894
Anas boschas , Linnaeus, 1758

Similar species

Summary The mallard (*Anas platyrhynchos*) is the most common and widely distributed dabbling duck, having a widespread global distribution throughout the northern hemisphere. This migratory species is a highly valued game bird and the source of all domestic ducks with the exception of the Muscovy. Introductions and range expansions of *A. platyrhynchos* for game purposes pose a threat of competition and hybridization to native waterfowl. Also, recent studies hold the mallard as a likely vector for the highly pathogenic avian influenza virus (HPAIV) (H5N1).

view this species on IUCN Red List

Species Description
Anas platyrhynchos is a medium to large dabbling duck ranging from about 50-60 cm in length and 1-1.3 kg. It is strongly sexually dimorphic. Breeding males bear a distinctive green head, narrow white neck-ring, brown breast, brownish-gray dorsal feathers, pale gray sides and belly, black rump and under tail coverts, white outer tail, and strongly recurved black central tail feathers. Their wings are a pale gray with a distinct iridescent blue upperside and secondaries bordered with white leading and trailing edges, white under-wing coverts, and pale gray undersides. Bills are yellow to olive and legs and feet are orange to red. Females have a broken streaky pattern of buff, white, gray, to black on brown. They have white outer tail feathers and under tail coverts, a white belly, and a prominent dark eyeline. Females have similar wings to males including the distinct blue markings. Their bills are gray-black to orange and legs and feet orange to red. Non-breeding male and juvenile plummages similar to female with males bearing a dark green head and both being darker (Drilling *et al*., 2002; Sibley, 2003).

Lifecycle Stages
Only hens care for the young. Mothers do not feed them but rather lead them to food where they feed on their own. Young feed on mostly invertebrates, small crustaceans, molluscs, and fish eggs. Hens stay with the brood until ducklings can fly which usually takes about 50-60 days. Juveniles take initial flights and explore local surroundings. In the autumn they accompany migrating adults but remain subordinate to adults for their first winter. Juveniles reach sexual maturity after 1 year. The recorded for longest life span in the wild is 29 years (Drilling *et al*., 2002).

Uses
Anas platyrhynchos is an extremely common and highly regarded game bird, which has resulted in many introductions. The mallard is also the source of all domestic duck breeds with the exception of the Muscovy (Drilling *et al*., 2002; JNCC, undated). It is used widely for ornamental purpose.

Habitat Description
Anas platyrhynchos prefer lowland habitats and inhabit almost every type a freshwater wetland. However, they do avoid oligotrophic, fast flowing, or unvegetated waters. They breed from 70°N in the Arctic, to 35°N in North Africa, and 20°N in the Middle East. Individuals breeding in temperate regions are sedentary and dispersive, while northern breeders are usually migratory. Mallards usually nest in upland meadows but can be found in a wide variety of places close to water providing cover including grasslands, marshes, bogs, riverine floodplains, dikes, ditches, pastures, cropland, shrubland, fencelines, rock piles, and forests. (Drilling *et al*., 2002; JNCC, undated; Snyder, 1993).

Reproduction
Oviparous. Sexual. Breeding occurs in the early spring. Nest building begins within 5-10 days of establishing a home range in migratory populations. Clutches may consit of 5-14 eggs (but is usually 8-10) laid at about 1 egg/day. Incubation is performed by the female for about 30 days. Hatchlings are relatively precocial and are able to feed themselves, but they are cared for until they can fly. Fledging occurs within 50-60 days of hatching. Second broods within a breeding season are rare among wild mallards but some in urban or high density environments have been known to birth them. Nesting density depends on available space and predator abundance (Drilling *et al*, 2002; NatureServe, 2008).

Nutrition
An opportunistic omnivore, *Anas platyrhynchos* is a generalist feeder. During the breeding season, a mallard's diet consists of primarily animal food sources including insects such as midge larvae, dragonflies, and caddisfly larvae, as well as aquatic invertebrates such as snails, freshwater shrimp, and terrestrial worms. Outside of the breeding season they eat mostly seeds from moist-soil plants, acorns, aquatic vegetation, cereal crops, and wheat (Drilling *et al*., 2002).

General Impacts
Anas platyrhynchos hybridizes with endemic duck species, some of which are now threatened with extinction. Species experiencing hybridization with mallards include the New Zealand grey duck (*Anas superciliosa*), American black duck *Anas rubripes*, Mexican duck (*Anas platyrhynchos diazi*), Mottled duck (*Anas fulvigula*), the 'Endangered (EN)' Hawaiian Duck (see *Anas wyvilliana* in IUCN Red List of Threatened Species), African black duck (*Anas sparsa*), yellow-billed duck (*Anas undulatta*), and the 'Endangered (EN)' Meller's duck (see *Anas melleri* in IUCN Red List of Threatened Species) (AEWA, 2003; Kulikova *et al*., 2005; Uyehara, 2007; Fox, 2009). As a consequence of introgression, Mexican duck is no longer considered a species and less than 5% of pure non-hybridized grey ducks remain in New Zealand.
In North America and Europe, populations of Mallard are frequently restocked by captive-bred individuals for hunting purposes. Captive individuals hybridize with wild ones which has the potential to threaten the genetic integrity of Mallard. Consequences of this practice are currently under study (Champagnon *et al*., 2009).
Studies have recently indicated that *A. platyrhynchos* is thought to be a long-distance vector for the highly pathogenic avian influenza virus (HPAIV) (H5N1), a serious concern to the poultry industry and public health. Spread of the virus in conjuction with migratory routes and waterfowl infection indicate them as probable vectors. Experiments have shown that mallards are the prime candidate for being the long-distance vector of HPAIV (H5N1) since they excrete significantly higher proportions on the virus than other ducks while they are seemingly immune to its debilitating effects in both studies and wild bird die-offs from HPAIV in Europe and Asia. Furthermore, their extremely wide range and large populations, its presence in nearly every type of wetland, and tolerance to humans provide a potential link to wild waterfowl, domestic animals, and humans rendering it a perfect vector of the deadly HPAIV. Although human infection is rare, this virus has a high fatality rate in infected patients. The possibility of mutation to a more human infectable form and a human-to-human means of transmission, poses a tremendous threat of pandemic proportions.
Additionally, captive reared mallards are believed to increase incidence of some other diseases such as Duck Virus Enteritis (DVE) in wild populations (Keawcharoen, 2008; Weber and Stilianakis, 2007; AEWA, 2003).
Finally, high mallard populations are associated with algal bloom, deoxygenation, and loss of aquatic plants in overpopulated wetlands which can lead to botulism (RSPB, 2008).

Management Info
Anas platyrhynchos is the most harvested waterfowl in North America and Europe. Hunting and hunting restrictions have served as a population control for mallards for many years. The US Fish and Wildlife Service has adopted adaptive harvest management which utilizes population dynamics and monitoring to regulate mallard hunting in order to better manage *A. platyrhynchos* populations in the United States (Nichols, 2007; USFWS, 2007, Drilling *et al*., 2002).
A. platyrhynchos (Mallard) x (*A. superciliosa*) Pacific Black Duck hybrids commonly occur on Lord Howe Island in freshwater and estuarine habitats. A management program using trapping, shooting and opportunistic capture by hand was conducted for five days in October 2007. The majority of ducks were removed by shooting. Hand capture was most efficient but was opportunistic and limited to juveniles and chicks. Trapping was the next most efficient technique but had difficulties with disturbance by the public. Please follow this link for Tracey *et al* (2008) Lord Howe Island Ducks: Abundance, Impacts and Management Options for more details on the management project.

Pathway
Farming: Mallard domestic breeds or barnyard ducks are used worldwide for meat (Huang *et al*., 2007). Escapes to the wild are frequent.*Anas platyrhynchos* is an extremely popular game bird and has been introduced to new locations for that reason (Uyehara*et al*., 2007).*Anas platyrhynchos* has been introduced to new locations to stock ponds (Uyehara *et al*, 2007).

Principal source: Drilling, Nancy, Rodger Titman and Frank Mckinney. 2002. Mallard (*Anas platyrhynchos*), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: http://bna.birds.cornell.edu/bna/species/658
NatureServe Explorer, 2008. An Online Encyclopedia of Life: *Anas platyrhynchos* - Linnaeus, 1758 Mallard

Compiler: National Biological Information Infrastructure (NBII), Comité français de l'UICN (IUCN French Committee) & IUCN SSC Invasive Species Specialist Group (ISSG)
Updates with support from the Overseas Territories Environmental Programme (OTEP) project XOT603, a joint project with the Cayman Islands Government - Department of Environment

Review: Jocelyn Champagnon, ONCFS - Avifaune Migratrice

Pubblication date: 2010-10-04

ALIEN RANGE

[1] ANTIGUA AND BARBUDA
[1] BRUNEI DARUSSALAM
[1] COOK ISLANDS
[1] FALKLAND ISLANDS (MALVINAS)
[1] GIBRALTAR
[1] JAMAICA
[1] MALI
[1] MARTINIQUE
[2] NEW CALEDONIA
[1] NIGER
[1] SAINT VINCENT AND THE GRENADINES
[1] SEYCHELLES
[1] SVALBARD AND JAN MAYEN
[1] UNITED STATES
[1] VIRGIN ISLANDS, U.S.
[1] AUSTRALIA
[2] CAYMAN ISLANDS
[1] DJIBOUTI
[1] GAMBIA
[1] GUADELOUPE
[1] KIRIBATI
[1] MARSHALL ISLANDS
[1] MICRONESIA, FEDERATED STATES OF
[1] NEW ZEALAND
[1] NIGERIA
[1] SENEGAL
[2] SOUTH AFRICA
[1] THAILAND
[1] VANUATU
[1] ZAMBIA

BIBLIOGRAPHY

53 references found for **Anas platyrhynchos**

Managment information

African-Eurasian Migratory Waterbird Agreement., 2003. Guideline on Avoidance Of Introduction of Non-Native Migratory Waterbird Species. Fourth Meeting Of The Technical Committee Of The Agreement On The Conservation Of African-Eurasian Migratory Waterbirds (AEWA) 12-13 May 2003 Tashkent Uzbekistan.
Summary: Available from: http://www.unep-aewa.org/meetings/en/tc_meetings/tc4docs/word/tc4_16_guidelines_%20avoidance.doc [Accessed 11 August 2008]
Drilling, Nancy, Rodger Titman and Frank Mckinney. 2002. Mallard (*Anas platyrhynchos*), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: http://bna.birds.cornell.edu/bna/species/658.
Summary: An in depth profile on *Anas platyrhnychos* with extensive informtation on mallards in North America.
Available from: http://bna.birds.cornell.edu/bna/species/658/articles/introduction [Accessed 12 September 2008]
Fox, T. A. D. 2009. What makes a good alien? Dealing with the problems of non-native wildfowl. British Birds 102: 660-679.
IUCN/SSC Invasive Species Specialist Group (ISSG)., 2010. A Compilation of Information Sources for Conservation Managers.
Summary: This compilation of information sources can be sorted on keywords for example: Baits & Lures, Non Target Species, Eradication, Monitoring, Risk Assessment, Weeds, Herbicides etc. This compilation is at present in Excel format, this will be web-enabled as a searchable database shortly. This version of the database has been developed by the IUCN SSC ISSG as part of an Overseas Territories Environmental Programme funded project XOT603 in partnership with the Cayman Islands Government - Department of Environment. The compilation is a work under progress, the ISSG will manage, maintain and enhance the database with current and newly published information, reports, journal articles etc.
Keawcharoen, Julthatip; van Riel, Debby; van Amerongen, Geert; Bestebroer, Theo; Beyer, Walter E.; van Lavieren, Rob; Osterhaus, Albert D. M. E; Fouchier, Ron A. M; Kuiken, Thijs., 2008. Wild ducks as long-distance vectors of highly pathogenic avian influenza virus (H5NI). Emerging Infectious Diseases. 14(4). APR 2008. 600-607.
Knight-Jones, Theodore J. D.; Hauser, Ruth; Matthes, Doris; Staerk, Katharina D. C., 2010. Evaluation of effectiveness and efficiency of wild bird surveillance for avian influenza. Veterinary Research (Les Ulis). 41(4). JUL-AUG 2010. Article No.: 50.
Summary: Available from: [Accessed 26 July 2010]
NatureServe Explorer, 2008. An Online Encyclopedia of Life: *Anas platyrhynchos* - Linnaeus, 1758 Mallard.
Summary: Available from: http://www.natureserve.org/explorer/servlet/NatureServe?searchName=Anas%20platyrhynchos [Accessed 11 August 2008]
Nichols, James D.; Runge, Michael C.; Johnson, Fred A.; Williams, Byron K., 2007. Adaptive harvest management of North American waterfowl populations: a brief history and future prospects. Journal of Ornithology. 148(Suppl. 2). DEC 2007. S343-S349.
Tracey, J., Lukins, B., and Haseldon, C., 2008. Lord Howe Island Ducks: Abundance, Impacts and Management Options. A report to the World Heritage Unit, Lord Howe Island Board (2008). Invasive Animals Cooperative Research Centre, Canberra.
Summary: Study concerning hybridization between *Anas platyrhynchos* in Australia.
Available from: http://www.feral.org.au/wp-content/uploads/2010/03/Lord-Howe-Island-Ducks-report_2008lr.pdf [Accessed 19 July 2010].
Uyehara, Kimberly J., Andrew Engilis, Jr., and Michelle Reynolds., 2007. Hawaiian Duck&#65533;s Future Threatened by Feral Mallards. USGS Fact Sheet 2007-3047, Edited by James W. Hendley II Graphic design by Judy Weathers. Hawai&#65533;i Cooperative Studies Unit, Pacific Aquaculture and Coastal Resources Center, University of Hawai&#65533;i at Hilo University of California, Davis.
Summary: Available from: http://pubs.usgs.gov/fs/2007/3047/fs2007-3047.pdf [Accessed 19 July 2010]
Uyehara, Kimberly J.; Engilis, Andrew Jr.; Dugger, Bruce D., 2008. Wetland features that influence occupancy by the endangered Hawaiian Duck. Wilson Journal of Ornithology. 120(2). JUN 2008. 311-319.
Varnham, K. 2006. Non-native species in UK Overseas Territories: a review. JNCC Report 372. Peterborough: United Kingdom.
Summary: This database compiles information on alien species from British Overseas Territories.
Available from: http://www.jncc.gov.uk/page-3660 [Accessed 10 November 2009]

General information

AnimalBase, 2004. *Anas boschas*. AnimalBase
Summary: Citation for snyonym *Anas boschas*.
Available from: http://www.animalbase.uni-goettingen.de/zooweb/servlet/AnimalBase/home/speciestaxon?id=2665 [Accessed 18 September 2008]
Baratti, M., Cordaro, M., Dessi-Fulgheri, F., Vannini, M. & Fratini, S. 2009. Molecular and ecological characterization of urban populations of the mallard (*Anas platyrhynchos* L.) in Italy. Italian Journal of Zoology, 76 (3): 330-339.
Barr&#65533;, N., Dutson,G. 2000 - Oiseaux de Nouvelle-Cal&#65533;donie. Liste comment&#65533;e. Suppl&#65533;ment Alauda, 68(3) : 1-48.
Summary: Liste comment&#65533;e des oiseaux de Nouvelle-Cal&#65533;donie
BirdLife International 2004. *Anas superciliosa*. In: IUCN 2007. 2007 IUCN Red List of Threatened Species.
Summary: Available from: http://www.iucnredlist.org/search/details.php/47190/all [Accessed 3 April 2008]
BirdLife International 2008. *Anas platyrhynchos*. In: IUCN 2008. 2008 IUCN Red List of Threatened Species. . Downloaded on 03 April 2009.
Summary: Available from: http://www.iucnredlist.org/details/141504 [Accessed 11 August 2008]
BirdLife International 2008. Species factsheet: *Anas platyrhynchos*. Downloaded from http://www.birdlife.org on 11/8/2008 .
Summary: Available from: http://www.birdlife.org/datazone/sites/index.html?action=SpcHTMDetails.asp&sid=435&m=0 [Accessed 11 August 2008]
Champagnon, J., Guillemain, M., Gauthier-Clerc, M., Lebreton, J.D. & Elmberg, J. 2009. Consequences of massive bird releases for hunting purposes: Mallard *Anas platyrhynchos* in the Camargue, southern France. Wildfowl ,Special Issue 2: 192-201.
Cronk, Q.C.B. and J.L. Fuller., 1995. Plant Invaders. The Threat to Natural Ecosystems. London: Chapman and Hall, 1995 UK&#65533;18.99, pp. 241, ISBN 0-412-48380-7.
Fog, J. 1964. Dispersal and survival of released mallards (*Anas platyrhynchos* L.). Danish Review of Game Biology 4, 1-57.
Gauthier-Clerc, M.; Lebarbenchon, C; Thomas, F. 2007. Recent expansion of highly pathogenic avian influenza H5N1: a critical review. Ibis. 149(2). APR 2007. 202-214.

Gemmell, N. J., Flint, H.J., 2000. Taxonomic status of the brown teal (*Anas chlorotis*) in Fiordland. Conservation Advisory Science Notes No. 326, Department of Conservation, Wellington.
Gillespie, G.D. 1985.Hybridation, introgression and morphometric differentiation between Mallard (*Anas platyrhynchos*) and Grey duck (*Anas superciliosa*) in Otago, New Zealand.The Auk 102: 459-469.
Summary: Available from: http://elibrary.unm.edu/sora/Auk/v102n03/p0459-p0469.pdf [Accessed 28 March 2008]
Gillespie, Grant D., 1985. Hybridization, Introgression, and Morphometric Differentiation between Mallard (*Anas platyrhynchos*) and Grey Duck (*Anas superciliosa*) in Otago, New Zealand. The Auk, Vol. 102, No. 3 (Jul., 1985), pp. 459-469.
Global Diversity Information Facility, 2008. *Anas platyrhynchos* Linnaeus, 1758. Global Diversity Information Facility.
Summary: Good distribution information for *Anas platyrhynchos*
Groves, R. H., & Francesco Di Castri., Biogeography of Mediterranean Invasions. Cambridge [England] ; New York : Cambridge University Press, 1991.
Summary: Australia and South Africa chapters
Haddon, Malcolm., 1984. A Re-Analysis of Hybridization between Mallards and Grey Ducks in New Zealand. The Auk, Vol. 101, No. 1 (Jan., 1984), pp. 190-191.
Haddon, W Malcolm., 1998. Introgressive hybridisation, clucks, and ecological character displacement. New Zealand Journal of Zoology, 1998, Vol. 25: 245-248.
Hatzofe, Ohad A and Yoram Yom-Tov A., 2002. Global Warming and Recent Changes in Israel s Avifauna. Israel Journal of Zoology Volume 48, Number 4 / 2002.
ITIS (Integrated Taxonomic Information System), 2008. Online Database *Anas platyrhynchos* Linnaeus, 1758
Summary: An online database that provides taxonomic information, common names, synonyms and geographical jurisdiction of a species. In addition links are provided to retrieve biological records and collection information from the Global Biodiversity Information Facility (GBIF) Data Portal and bioscience articles from BioOne journals.
Available from: http://www.itis.gov/servlet/SingleRpt/SingleRpt?search_topic=TSN&search_value=175063 [Accessed 10 March 2008]
JNCC, undated. A6.31 Mallard *Anas platyrhynchos* (non-breeding).
Summary: Available from: http://www.jncc.gov.uk/pdf/UKSPA/UKSPA-A6-31.pdf [Accessed 11 August 2008]
Jourdain, Elsa; Gauthier-Clerc, Michel; Bicout, Dominique J.; Sabatier, Philippe., 2007. Bird migration routes and risk for pathogen dispersion into western Mediterranean wetlands. Emerging Infectious Diseases. 13(3). MAR 2007. 365-372.
Kulikova, Irina V., B, Sergei V. Drovetski, Daniel D. Gibson, Ryan J. Harrigan, Sievert Rohwer, Michael D. Sorenson, Kevin Winker, D, Yuri N. Zhuravlev, and Kevin G. McCracken, D., 2005. Phylogeography of the Mallard (*Anas platyrhynchos*): Hybridization, dispersal, and lineage sorting contribute to complex geographic structure. The Auk: Vol. 122, No. 3 pp. 949–965.
Laikre, L., Palm, A., Josefsson, M., Utter, F. & Ryman, N. 2006. Release of alien populations in Sweden. Ambio 35(5): 255-261.
Munoz-Fuentes, V., C. Vila., A. j. Green., J. J. Negro., and M.D. Sorenson., 2007. Hybridization between white-headed ducks and introduced ruddy ducks in Spain. Molecular Ecology (2007) 16, 629–638.
Munoz, M. J.; Sanchez-Vizcaino, J. M.; Peris, S., 2006. Short communication. Can highly pathogenic avian influenza (HPAI) reach the Iberian Peninsula from Asia by means of migratory birds? Spanish Journal of Agricultural Research. 4(2). JUN 2006. 140-145.
New Zealand Conservation Trust Website. New Zealand Introduced Animals > Mallard Duck.
Summary: Available from: http://www.nzconservationtrust.org.nz/introduced-details.asp?id=93 [Accessed 2 February 2008]
Nummi, Petri., Kjell Sjberg, Hannu Pys, and Johan Elmberg., 2000. Individual foraging behaviour indicates resource limitation: an experiment with mallard ducklings. Can. J. Zool. 78: 1891–1895 (2000).
Parmley, E. Jane; Bastien, Nathalie; Booth, Timothy F.; Bowes, Victoria; Buck, Peter A.; Breault, Andre; Caswell, Dale; Daoust, Pierre-Yves; Davies, J. Chris; Elahi, Seyyed Mehdy; Fortin, Madeleine; Kibenge, Fred; King, Robin; Li, Yan; North, Norman; Ojkic, Davor; Pasick, John; Pryor, Sydney Paul; RobInson, John; Rodrigue, Jean; Whitney, Hugh; Zimmer, Patrick; Leighton, Frederick A., 2008. Wild bird influenza survey, Canada, 2005. Emerging Infectious Diseases. 14(1). JAN 2008. 84-87.
Pascal, M., Barr, N., De Garine-Wichatitsky, Lorvelec, O., Fr tey, T., Brescia, F., Jourdan, H. 2006. Les peuplements n o-cal doniens de vert b br s : invasions, disparitions. Pp 111-162, in M.-L. Beauvais *et al*., : Les esp ces envahissantes dans l archipel n o-cal donien, Paris, IRD ditions, 260 p.+ c d rom
Summary: Synth se des introductions d esp ces de vert br s en Nouvelle-Cal donie et valuation de leurs impacts.
Randler, Christoph., 2002. Avian hybridization, mixed pairing and female choice. Animal Behaviour Volume 63, Issue 1, January 2002, Pages 103-119.
Rhymer, J.M. 2006. Extinction by hybridization and introgression in anatine ducks. Acta Zoologica Sinica 52(Supplement): 583–585,
Summary: Available from: http://www.actazool.org/pdftemp/%7B73B99493-DF40-41F1-A96E-595F6E15B833%7D.pdf [Accessed 28 March 2008]
Rhymer, J.M. & Simberloff, D.1996. Extinction by hybridization and introgression. Annu. Rev. Ecol. Syst. 27: 83-109.
Rhymer, J.M., Williams, MJ., Braun,M.J.1994.Mitochondrial analysis of gene flow between New Zealand Mallards (*Anas platyrhynchos*) and Grey Duck (*Anas superciliosa*). The Auk, 111(4): 970-978.
Summary: Available from: http://elibrary.unm.edu/sora/Auk/v111n04/p0970-p0978.pdf [Accessed 28 March 2008]
Rhymer, J.M., Williams, MJ., Kingsford, R. 2004 - Implications of phylogeography and population genetics for subspecies taxonomy of Grey (Pacific Duck) *Anas superciliosa* and its conservation in New Zealand. Pacific Conservation biology, 10: 57-66.
Rhymer, Judith M., Murray J. Williams and Michael J. Braun., 1994. Mitochondrial Analysis of Gene Flow between New Zealand Mallards (*Anas platyrhynchos*) and Grey Ducks (*A. superciliosa*). The Auk, Vol. 111, No. 4 (Oct., 1994), pp. 970-978.
Snyder, S. A. 1993. *Anas platyrhynchos*. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer).
Summary: Available from: http://www.fs.fed.us/database/feis/animals/bird/anpl/all.html#INTRODUCTORY [Accessed 11 August 2008]
Sol, Daniel., Sarah Timmermans & Louis Lefebvre., 2002. Behavioural flexibility and invasion success in birds. Animal Behaviour, 2002, 63, 495–502 doi:10.1006/anbe.2001.1953.
The Royal Society for the Protection of Birds (RSPB)., 2008. Mallard.
Summary: Available from: http://www.rspb.org.uk/wildlife/birdguide/name/m/mallard/ [Accessed 11 August 2008]

U.S. Fish and Wildlife Service. 2007. Adaptive Harvest Management: 2007 Hunting Season. U.S. Dept. Interior, Washington, D.C. 44pp. Available online at: http://www.fws.gov/migratorybirds/mgmt/AHM/AHM-intro.htm
Summary: Information concerning Adaptive Harvest Management which is used for the management of *Anas platyrhynchos*.
Available from: http://data.gbif.org/species/13809817/commonName/Mallard [Accessed 14 September]
Weber, Thomas P.; Stilianakis, Nikolaos I., 2007. Ecologic immunology of avian influenza (H5N1) in migratory birds. Emerging Infectious Diseases. 13(8). AUG 2007. 1139-1143.
Williams, Christen L., Richard C. Brust, Timothy T. Fendley, Gerald R. Tiller Jr. and Olin E. Rhodes Jr., 2005. A Comparison of Hybridization between Mottled Ducks (*Anas fulvigula*)and Mallards (*Anas platyrhynchos*) in Florida and South Carolina using Microsatellite DNA Analysis. Conservation Genetics. Volume 6, Number 3 / May, 2005.