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# Towards a more rational and stable nomenclature for Mallard *Anas platyrhynchos*, Greylag Goose *Anser anser* and their domesticates, including various priority issues, designation of lectotypes, and a First Reviser act

by Thomas M. Donegan

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**SUMMARY.**—Three competing names were introduced by Linnaeus (1758) for Mallard, based on males (*Anas boschas*), females (*A. platyrhynchos*) and the hook-billed domestic breed (*A. adunca*). *A. domestica* (often attributed to J. F. Gmelin, 1789, but arguably better to Brünnich, 1764) was described later for domestic ducks. *A. platyrhynchos* was selected as having priority over its contemporaneous synonyms via First Reviser actions. Priority of widely used *A. p. domestica* remains threatened by the senior *A. adunca* and potentially by the mixed type series of *A. boschas* (comprising wild male Mallards and ducks of mixed or domestic origin). Lectotypes are designated here for *A. boschas* Linnaeus, 1758 (and its synonym *A. boschas fera* Brünnich, 1764, or Bechstein, 1792), using the same male Mallard specimen of wild phenotype illustrated by Albin (1734). This clarifies these names as objective synonyms of one another and as junior synonyms of *A. platyrhynchos*, as all three would then have a type series exclusively of wild Mallards from Western Europe. Garsault and Brünnich both named *Anser domesticus* in the same year, just three weeks apart—on 30 June 1764 and 23 July 1764, respectively. Garsault thus has priority. Consequently, Brünnich's *Anas anser domesticus* represents subsequent usage and his *A. boschas domestica* is not a homonym. Brünnich's *A. anser ferus* and *A. boschas fera* for wild geese and Mallards, respectively, if available, would be primary homonyms of one another. Acting as First Reviser, the latter name is here selected as having priority. Authorship of *Anser ferus* should be attributed to S. G. Gmelin (1770), whose locality of the Caspian Sea results in a potential threat to the priority heretofore afforded to *A. anser rubrirostris* Swinhoe, 1871, for the Eastern Greylag Goose. Brünnich's names *Anser boschas domestica* and *Anas boschas fera* were introduced as apparent trinominals; they were already in widespread use by 1764. In all likelihood Brünnich thought they had been described already, citing Linnaeus (1746, 1758) and Brisson (1760), but neither made these names available under the Code. Brünnich's names for domestics may not have been recognised because the same font was used in his work to denote distinct male and female plumages as for his *domesticus/a* and *ferus/a*, potentially denoting infrasubspecific variation. There is competing evidence as to whether or not he intended to name these units. Irrespective, under Art. 45.6.4 infrasubspecific names later adopted as valid are available. Regarding priority of *A. adunca*, I will separately be asking the Commission to endorse either Brünnich (1764) or J. F. Gmelin (1789) as author of *Anas boschas domestica*. Reversal of priority of *A. adunca* Linnaeus, 1758, vs. *A. boschas domestica* (Brünnich, 1764, or J. F. Gmelin, 1789), reversal of precedence of *Anser ferus* S. G. Gmelin, 1770, vs. *A. anser rubrirostris* Swinhoe, 1871, resolution of the type series for *A. anser* Linnaeus, 1758, and typification of the genus *Anser* Brisson, 1760, also all require ICZN attention.



Figure 1. Specimens referred to in the description of *Anas anser* Linnaeus, 1758, to the extent they were illustrated; A–E in subsection alpha (*'Anser ferus'*), F–G in subsection beta (*'Anser domesticus'*) and H in subsection gamma (*'Anser canadensis fuscus maculatus'*). A: Gessner's (1560: 72) *'Anser ferus'*, probably a Bean Goose *Anser fabalis (sensu lato)*, which was later traced by Aldrovandi (1603: 150; not reproduced here). B: Aldrovandi's (1603: 151) *'Anser ferus Ferraria missus'*, the specimen is poorly illustrated but accompanied by a detailed text description of a Greylag Goose. C: Aldrovandi's (1603: 152) *'Anser ferus alius Belgio missus à Do'*, probably a Bean Goose or Pink-footed Goose *Anser brachyrhynchus*. D: Aldrovandi's (1603: 153) *'Anser ferus alius quem Antonius Malchiauellus donauit'*, resembles no species but perhaps a Greater White-fronted Goose *Anser albifrons* or domestic goose. E: Willughby's (1678, pl. 69) *'Anser ferus'* or *'Wild Goose'*, a juvenile Greylag Goose. F: Willughby's (1678, pl. 75) *'Anser domesticus'* or *'tame Goose'*. G: Gessner's (1555: 141) *'Anser domesticus'*. H: Edwards' (1750, pl. 153) plate of Greater White-fronted Goose.



Greylag Goose *Anas anser* Linnaeus, 1758, is a widespread and familiar grey goose native to Eurasia, in habitats including wetlands and urban parks. Mallard *Anas platyrhynchos* Linnaeus, 1758, is perhaps even more widespread and familiar, occurring either naturally or as an introduced species on all continents except Antarctica and often is the commonest wildfowl species around habitation.

These ducks and geese have been domesticated for centuries, related to human exploitation for meat, eggs, feathers, pâté and *foie gras*. Other wildfowl, e.g. Swan Goose *Anser cygnoides* (Linnaeus, 1758) and Muscovy Duck *Cairina moschata* (Linnaeus, 1758), have also been domesticated. Domestic wildfowl often include individuals with modified phenotypes, such as an expanded posterior body (related to egg laying), faster and more extensive development of muscle tissue for meat, reduced flight feathers or flightlessness (to minimise muscle wastage or escapism) and plumage variations such as predominant white feathering or leucism. Despite this, most domestic wildfowl can be identified by their habits, voice and morphology as being related to one of these two species. There is some introgression with other wildfowl, especially domestic geese derived from Swan Goose. However, Greylag Goose and Mallard are considered ancestral to the majority of farmyard and domestic geese and duck populations, respectively (Sun *et al.* 2014, Zhang *et al.* 2018). Molecular studies have demonstrated that all European domestic geese and one Chinese goose breed are descended from the Greylag, with a separate distinct domestic lineage descended from Swan Goose (e.g. Sun *et al.* 2014). Mallards have been domesticated for 1,800–2,600 years, with two main lineages for meat and egg-laying breeds (Zhang *et al.* 2018).

There is presently an unsustainable situation in wildfowl taxonomy, where *inter alia*: (i) the widely used subspecies name for domestic ducks, *Anas platyrhynchos domestica*, whose earliest plausible author is Brünnich (1764a), is potentially threatened by the priority of *A. boschas* Linnaeus, 1758, owing to the latter's mixed type series of both wild Mallards and mixed origin or domestic ducks; (ii) various post-1758 publications compete for authorship of *A. platyrhynchos domestica* and *Anser anser domesticus*, with interpretative difficulties as to whether certain of these publications qualify to establish an available name under the Code and two are near-contemporaneous and require further study to address the question of priority; (iii) designation of a type species for the genus *Anser* Brisson, 1760, has been attempted at least three times, as *A. anser*, *A. domesticus* and *A. ferus* but none of these is an originally included nominal species; (iv) three names were described contemporaneously for Mallard by Linnaeus (1758), with widespread usage of *Anas platyrhynchos domestica* Brünnich, 1764a, or J. F. Gmelin, 1789, for domestic ducks threatened by its senior synonym *A. adunca* Linnaeus, 1758, introduced for the unusual hook-billed domestic duck breed; (v) the type series of *Anser anser* (Linnaeus, 1758) was based upon the taxonomic concept of a single wild grey goose species, comprising at least three currently recognised species and domestic geese (Fig. 1); and (vi) a long-assumed junior synonym of *A. anser*, namely *A. ferus* S. G. Gmelin, 1770, is based on a specimen of Eastern Greylag Goose *A. a. rubrirostris* Swinhoe, 1871, creating a priority threat to the latter name.

The International Commission on Zoological Nomenclature (ICZN) will shortly be asked to resolve these priority and typification issues under forthcoming Case 3799 (see Anon. 2019) and others. Prior to that, it is advisable to resolve as many of these issues as possible, and the purpose of this paper is to address the first two of them; some background is also provided on some of the others.



## Type specimens of *Anas anser* and other names for grey geese

The widely used name *Anser anser* (Linnaeus, 1758), is based on a taxonomically mixed concept and has no extant type specimens or illustrations of this material. In the mid 1700s, it seems many ornithologists recognised just one, general grey goose concept. Specimens of most or all of the Bean Goose *Anser fabalis* (*sensu lato*), Greater White-fronted Goose *A. albifrons* and Greylag Goose had been described morphologically by this period, but they were not routinely identified as separate species. Gessner (1555) referred to four different classes of goose and Aldrovandi (1603) described some of them in different sections, but this did not gain traction. Linnaeus (1758) separately named only Lesser White-fronted Goose *Anas erythropus*, including sources depicting or describing all the other species under *A. anser* Linnaeus, 1758. Plates depicting specimens referred to in the original description of the latter name are shown in Fig. 1.

Linnaeus' (1758: 123) description of *Anas anser* starts with a vague description of unidentifiable grey geese from Sweden, then refers to the corresponding account of his earlier *Fauna Svecica* (Linnaeus 1746: 32, para. 90). Next and unusually, Linnaeus (1758) introduced a subsection labelled alpha, citing the 'Anser ferus' (or wild goose) of earlier authors, thereby cross-referencing a non-binominal name. Other names of earlier authors, many of them longer than three words, were cited by Linnaeus in the same format in his species accounts. He did not make available the names 'Anser ferus' (or 'Anser domesticus', which follows in his subsection beta), since neither name appears in the left margin and none of the words 'variety', 'form' or their abbreviations were used (Art. 45.6.4 of the *Code*). The alpha subsection cites Aldrovandi (1603), Gessner (1555), Willughby (1676) and Ray (1713). Under Art. 72.4.1, 'the type series of a nominal species-group taxon consists of all the specimens included by the author in the new nominal taxon (whether directly or by bibliographic reference)'. The most detailed account, based partly on Gessner (1555) and which the other cited authors drew upon heavily, is the 'Anser ferus' of Aldrovandi (1603: book 19, chapter 18, pp. 147–154). Aldrovandi's (1603) entire chapter 18 was cited by Linnaeus (1758), rather than specific pages or plates.

Aldrovandi (1603), following Gessner (1555, 1560), may have identified at least three and possibly four of the wild grey geese species regularly found in Europe, given four separate subsections in his 'Anser ferus'. None of these accounts was placed in his descriptions of different goose species by Linnaeus (1758). The bird in the first of Aldrovandi's (1603: 150) four plates ('Anser ferus Ornithologi') has a bicoloured relatively small bill, as detailed in the text ('rostrum nigro untrinque per medium croceo'). The description is clearly a Bean Goose. The relevant plate was apparently traced by Aldrovandi (1603) from the identical plate in Gessner (1555: 158; Fig. 1A). Gessner's later *Icones* (1560: 72) includes the same plate. Gessner (1555) commented that he thought this plate to be of a Greylag Goose (using the German vernacular) but that would be inconsistent with his text and line drawing. Aldrovandi's (1603: 151) second plate ('Anser ferus Ferraria missus'; Fig. 1B) is accompanied by a text description of a specimen provided to him by Alfonso Cataneo, Duke of Ferrara, which is a perfect and detailed account of a wild Greylag, including its modified neck feathers, orange legs and bill, white vent, white markings on the wing feathers and structural similarities to domestic geese. The plate is rather odd, for example showing isolated dark secondaries, rather than the whole wing being dark. Aldrovandi's (1603: 152) third plate ('Anser ferus alius ex Belgio missus à Do'; Fig. 1C) is based on a Belgian specimen. Due to its small bill and the text description, it appears likely to be another Bean Goose or a Pink-footed Goose. Finally, Aldrovandi's (1603: 153) fourth plate entitled 'Anser ferus alius quem Antonius Malchiauellus donauit' (Fig. 1D) depicts a large-billed goose with unusually modified neck

feathers and no white front, but belly markings broadly resembling Greater White-fronted Goose. It could be that species or an unusual domestic goose, or perhaps an interpolation based on two or more species, or an artefact. The Biblioteca Universitaria di Bologna holds coloured versions of all these plates, but in each case the colouring is interpolated, inconsistent with the corresponding text account, and therefore they are ignored here.

Also under his alpha subsection, Linnaeus (1758) cited the 'Anser ferus' or 'Wild Goose' of Willughby (1676: 274) and the 'Anser ferus' of Ray (1713: 146, no.A.4), which is an abridged version of Willughby (1676). Willughby (1676) drew extensively on Aldrovandi's (1603: 149) text. Willughby (1676, pl. 69; Fig. 1E) additionally depicted a gosling, presumably of Greylag Goose, which is the only grey goose that breeds regularly in the English Midlands, where Willughby was based (Nottinghamshire).

Next, the beta subsection references the pre-Linnaean name 'Anser domesticus'. Referenced bibliographic works under subsection beta, and the specimens that they are based upon, describe or depict domestic geese descended from Greylags: (i) the 'Anser domesticus' of Gessner (1555: 141; Fig. 1G), a white domestic goose; (ii) 'Anser Domesticus' or 'The Tame Goose' of Willughby (1676: 273, pl. 75; Fig. 1F), with the plate showing an inelegant domestic goose and the text discussing domestic geese of various plumages; and (iii) the corresponding account in Ray (1713: 136) based on Willughby (1676). Finally, the gamma subsection refers to a plate and text in Edwards (1750: 153; Fig. 1H) of Greater White-fronted Goose *Anser albifrons* (Scopoli, 1769) from North America. Linnaeus' description ends with a note that *Anas anser* occurs in Europe and America, and is mostly boreal. A morphological description then follows in an unnumbered paragraph, which perfectly describes Edwards' White-fronted Goose. A separate paragraph not within any labelled subsection of a Linnaean description would not usually be regarded as part of the account of a distinct variant. However, in context, as this text described only the specimen mentioned in the gamma subsection that immediately precedes it, it is better interpreted as referring only thereto.

Typification of *Anas anser* Linnaeus, 1758, is incapable of a satisfactory resolution herein because the name is universally applied to Greylag Goose and the only wild Greylag specimens in the original description (Figs. 1B, 1E) were included by Linnaeus (1758) in his *A. anser* under subsection 'alpha'. Under Art. 72.4, neither specimens included as 'distinct variants (e.g. by name, letter or number)' nor those which the author 'doubtfully attributes to the taxon' may be part of the type series. Linnaeus' (1758) citation of an alpha variant in his *A. anser* description was unusual; he more often started with an unnumbered subsection then listed other variants starting with beta. It is therefore arguable that the alpha variant is the 'main', rather than a 'distinct', variant. However, even then, the materials under alpha are likely to be 'doubtfully attributed', since the introduction of an alpha subsection was quite unusual. Some ICZN Commissioners have communicated that they would not support a lectotype designation (without recourse to plenary power) from among the alpha subsection specimens. Linnaeus' (1758) insertion of the alpha symbol in his description virtually denudes *A. anser* of any type materials, except those in his own collection, which as discussed below are no longer extant for geese. The Commission will in due course be asked to use its plenary power to set all previous designations aside and select Aldrovandi's Greylag from Ferrara as the type.

It took some decades for the other grey goose species placed by Linnaeus (1758) and subsequent authors in *Anas anser* or 'Anser ferus' to be recognised specifically. Latham (1785, 1787) first recognised the Bean Goose (his description covering both pink- and orange-legged birds) as separate from Greylag. He did so first in an English-language publication, then two years later named *Anser fabalis* Latham, 1787. He seems to have been

the first post-1758 author to restrict *Anser anser* to Greylag, although Willughby (1676, 1678) had done so earlier for 'Anser ferus'. Latham's taxonomy largely contradicted that of earlier and contemporary authors, in which 'Anser anser' or 'Anser ferus' were usually rooted in the Bean Goose or other more migratory or northern species (e.g. Gessner 1555, 1560, Aldrovandi 1603, Linnaeus 1746, 1758, Pallas 1769, Schäffer 1774, 1789), but his restriction ultimately was accepted. Baillon (1834) later distinguished Pink-footed Goose from Bean Goose, describing *Anser brachyrhynchus* and restricting *A. fabalis* to Bean Goose.

Probably a neotype or lectotype designation will be necessary in due course for Latham's *A. fabalis*, since it has a mixed type series (see Witherby *et al.* 1943), but such a step is outside my scope here and best awaits a prior Commission ruling on the type specimens of *Anas anser*.

### Authorship and dating of the name *Anser domesticus* for domestic geese

Linnaeus (1758) made available names for various domesticates of wild birds, notably *Columba oenas domestica* Linnaeus, 1758, for pigeons and two domestic breeds (*australis* Linnaeus, 1758, and *orientalis* Linnaeus, 1758) of Swan Goose *Anser cygnoides* (Linnaeus, 1758). However, he did not formally name domestic Mallards or Greylag Geese. The pre-Linnean name 'Anser domesticus' was merely referred to by Linnaeus (1758: 123) in his account of *Anas anser* under subsection 'beta' without any name in the margin, thus the name is not available. Nonetheless, Linnaeus (1758) was cited by his contemporaries and followers, and is still incorrectly cited by some today (e.g. www.GBIF.org, www.natureserve.org; Sirsat *et al.* 2006) as author of *A. anser domesticus* and *A. boschas domestica*. Linnaeus' contemporaries and followers who used names for domestic wildfowl, including Brisson, Brünnich, Pallas, S. G. Gmelin, J. F. Gmelin and Bechstein, seem to have assumed these names to have been authored by Linnaeus. It is therefore complicated to establish which of them made the names available, as in each case an assessment is required as to whether usage in works that do not purport to be descriptions meet (or do not meet) the requirements of availability under the Code. The dating and authorship of *Anser domesticus* for domestic geese are particularly problematic.

Brisson (1760: 262) first used 'Anser domesticus' (and, at p. 308, 'Anas domestica') in combination after 1758, attributing these names to Linnaeus, 1758, and establishing the genus *Anser* Brisson, 1760, for geese. Unlike his genera, Brisson's species names are not available for nomenclatural purposes pursuant to opinions, resolutions and directions of ICZN since the early 1900s (ICZN 1950, 1955, 1958, 1963). These rulings are based on the conclusion that, although Brisson (1760) used genera consistent with Linnean binominal nomenclature, his species names did not consistently use such a scheme for the purposes of Art. 11.4 (see Gentry 1987).

Four years later, Brünnich (1764a) published numerous species-group names of northern and Arctic species in *Ornitologia borealis*. Under genus 'Anas', he (at pp. 13–14) introduced 'ANSER *domesticus*' in a numbered account in the highest hierarchy of the work, following two accounts named 'ANSER *ferus*'. He then authored similarly numbered accounts (at p. 20) for 'BOSCHAS *fera*' and 'BOSCHAS *domestica*'. These would appear obvious trinomials, introduced in a way that would usually confer availability under Art. 45. They are *a priori* trinomial names, not infrasubspecific names, so Art. 10.2 does not apply to require another indication such as the word 'form' or 'variety' in order to make these names available. Brünnich (1764a) was an enthusiastic early adopter of Linnean binominal nomenclature. However, his authorship of 'Anas anser ferus', 'Anas anser domesticus', 'Anas boschas fera' and 'Anas boschas domestica' has not previously been recognised.

For example, Sherborn (1922: 308), Phillips (1923: 3) and Richmond (1992) attributed *Anas domestica* to Gmelin (1789: 538). Richmond (1992) considered *A. anser domesticus* and *A. anser fera* to have been made available by Bechstein (1792: 382) and Schäffer (1789: 67), respectively; Sherborn (1922: 364) concurred regarding the latter. *A. domestica* of Gmelin's (1789) authorship would be based upon a mixed type series as, among others, he cited Albin's (1734) plate of the Madagascar endemic, Meller's Duck *A. melleri* (Fig. 2I). However, that is irrelevant if Brünnich (1764a) made the name available first.

Brünnich's (1764a) names for domesticates may not have been recognised as available names previously because they were introduced in the same font and hierarchy as that used for the words 'mas', 'foemina', 'pullus' and 'varietas', which indicate male, female, juvenile forms and unnamed varieties, respectively. Under Art. 1.3.5, names proposed 'as means of temporary reference and not for formal taxonomic use as scientific names in zoological nomenclature' are excluded. Under Art. 45.6.4, Brünnich's (1764a) names would be infrasubspecific if 'the content of the work unambiguously reveals that the name was proposed for an infrasubspecific entity'. His use of lower case italics to denote sex and age could be taken as an indication to denote a merely infrasubspecific feature for domestics. However, that may not be the best interpretation. In the Code's Glossary, a 'name' is defined as '(1) (general) A word, or ordered sequence of words, conventionally used to denote and identify a particular entity (e.g. a person, place, object, concept). (2) Equivalent to scientific name (q.v.). (3) An element of the name of a species-group taxon: see generic name, subgeneric name, specific name, subspecific name.' Of course, Brünnich's (1764a) usage of 'mas' and 'pullus' are not plausibly 'names', either under this definition or as a result of Art. 1.3.5, but in principle *ferus/a* and *domesticus/a* fall under the first of the Glossary's definitions. Notably, each of these was widely used as a name with taxonomic connotations or for distinct groupings of wild and domestic wildfowl in the pre-Linnaean literature, as well as by Linnaeus (1746, 1758) and Brisson (1760), both of whom were cited by Brünnich (1764a) as his main sources. Adjectival names like '*fera*' and '*domestica*' are generally acceptable (Art. 11.9.1.1); the name '*domestica*' was indeed already formally described for domestic populations in other avian genera, e.g. *Gallus gallus domesticus* Linnaeus, 1758, and *Columba oenas domestica* Linnaeus, 1758. Brünnich (1764a) probably assumed that his names *domesticus/a* and *ferus/a* had Linnaeus (1758) or Brisson's (1760) authorship already; whether their font is more relevant than this context can be debated; the availability of these Brünnich names will need to be considered by the Commission when it addresses the priority threat posed by *Anas adunca* to *A. domestica*. As Brünnich (1764a) is entirely in Latin, he probably had little other option than to write out 'pullus', 'mas' and 'foemina' as Latin words. He may have used the same font for two different infraspecific contexts, but it is not clear that he intended both types of usage to denote infrasubspecific variations. Even if the evidence of font were to trump other contextual evidence, Art. 45.6.4.1 would likely still apply to save Brünnich's authorship: 'a name that is infrasubspecific under Art. 45.6.4 is nevertheless deemed to be subspecific from its original publication if, before 1985, it was either adopted as the valid name of a species or subspecies or was treated as a senior homonym'. The names *domestica/us* for geese and ducks were widely used after 1764, albeit not usually with Brünnich's (1764a) authorship, including prior to 1985. (The names *ferus/fera* are less used, being long regarded as synonyms at species and subspecies level, but still were used into the 20th century.) If his authorship is accepted, as Brünnich (1764a) placed all these names in *Anas*, his two *ferus/a* and two *domesticus/a* would *a priori* be primary homonyms. However, there is a competing claim in priority for his domestic goose name.

In the same year as Brünnich (1764a), Garsault (1764, pl. 679) used the name *Anser domesticus* alongside an original plate of a white domestic goose. Garsault included



depictions of various taxonomic groups—plants, mammals and some birds—used in contemporary medicine. Each is given a French and Latin name on the relevant plate, and these are repeated in the index. Critically, Garsault (1764) deployed only one- or two-name epithets, and thus is a work rooted in binominal nomenclature making his names available (Welter-Schultes *et al.* 2008, Welter-Schultes & Klug 2009, 2011).

Welter-Schultes & Klug (2009) discussed possible reasons as to why Garsault's (1764) animals and birds deployed a binominal system, when neither of the same author's works on plants nor contemporary or later French authors such as Brisson (1760) or Buffon (1770–83) did so. Garsault's (1764) bird names overall seem mostly Brissonian, not Linnean, in origin as might be expected from a publication of this era by a French author, given that Brisson was at the time arguably the world's leading ornithologist (e.g. Allen 1910) and had published his career-defining *magnus opus* on birds (Brisson 1760) just a few years earlier.

Only eight of Garsault's (1764) 34 bird names are binominal (i.e., comprising genus and species names), the rest all being single, genus-like, names. Twenty-two of the 34 bird names in Garsault (1764) are the same as those in Brisson (1760) for the same species concept (disregarding a single-letter difference in the spelling of one name and a hyphen), including 'Anser domesticus'. The remaining 12 names used by Garsault (1764) show no clear pattern that might imply a single source, as noted by Welter-Schultes & Klug (2009), but none is novel, all of them having been used by pre-Linnean authors, e.g., Gessner (1555, 1560), Aldrovandi (1603 and other volumes), Belon (1555, 1557), Barrère (1745) or Charleton (1668, 1677). Several of Garsault's (1764) two-word names, e.g., 'Alcedo muta' for Common Kingfisher and 'Aquila regalis' for Golden Eagle, do not follow Linnaeus' names (these being *Alcedo ispida* Linnaeus, 1758 and *Aquila chrysaetos* Linnaeus, 1758). Arnault de Nobleville & Salerne (1756–57) may have been a source for other taxonomic groups (Welter-Schultes & Klug 2009).

There is therefore no evidence that Garsault (1764) was even aware of Linnaeus' (1758) work or bird names. His names and taxonomy are largely Brissonian; Brisson's (1760) species names were not consistently binominal and so are not available, as discussed above (ICZN 1950, 1955, 1958, 1963). Welter-Schultes *et al.* (2008) and Welter-Schultes & Klug (2009), who considered all of Garsault's (1764) animal names to be available, made reference to possible knowledge by Garsault of Linnean nomenclature via Daubenton, who went on to adopt binominal nomenclature some decades later. However, closer in time to 1764, Daubenton co-authored the *Planches enluminées* (Martinet *et al.* 1765–83), which did not include Latin names—binominals were later specified for species newly recognised therein by Stadius Müller (1776), Pennant (1786), Gmelin (1789) and others. Daubenton's main collaborator, Count Buffon, adopted a French-language-only system (e.g. Buffon 1770–83), later becoming a fierce critic of binominal nomenclature (e.g. in Buffon & Daubenton 1749–67; see Sloan 1976). There is no requirement in the Code or any of the decisions or rulings on Brisson's works that an author must not be a follower of (or employ species names based upon) Brisson (1760).

Welter-Schultes *et al.* (2008), Welter-Schultes & Klug (2009, 2011) and Dubois & Bour (2010) discussed the numerous consequences for priority and authorship due to the discovery of, and assessment of the availability of names in, Garsault (1764), with a particular focus on some of his mammal and herptile names. The goose name *Anser domesticus* Garsault, 1764, was considered available by Welter-Schultes & Klug (2009), but they recommended that specialists in other taxonomic groups consider further the consequences of Garsault's proposed authorships. For birds, Welter-Schultes & Klug's (2009) suggestions were broadly accepted by Dickinson & Remsen (2013) without comment. However, they did not list subspecies names used for domesticates, so Garsault's goose name was not considered.

For the reasons above, Garsault (1764) and Brünnich (1764a) are both regarded as likely involving a valid description of *A. anser domesticus*. These works were published in the same year and so an issue of priority arises if Brünnich's (1764a) name is available. Garsault (1767: aij) asserted that Garsault (1764) was published in June 1764. This likely constitutes sufficient evidence of the publication date for Art. 21.7. The precise date would be deemed as the last day of the month, i.e. 30 June 1764, under Art. 21.3.1.

The dating of Brünnich (1764a) is more complicated and requires other evidence to be taken into account. The work has a preface dated 20 February 1764, but this is not the publication date. Dickinson *et al.* (2011) noted that 'The dates on the preface, if any, and on the title page ... generally reflect the points at which the writing and the printing of the work, respectively, were completed.' The actual publication date of Brünnich (1764a) would therefore have been later. For the reasons below, Brünnich's (1764a) work can be dated as 23 July 1764, which is three weeks after Garsault (1764).

On 23 July 1764, Brünnich wrote a three-page somewhat cryptic letter to Linnaeus which, from its context and based upon a reply of 20 August 1764, appears likely to have attached a published version of his *Ornithologia borealis*. The letter and its response have been digitised by the Uppsala University Library and are currently available online at [www.alvin-portal.org](http://www.alvin-portal.org). The Linnean Society in London holds Linnaeus' own copy of *Ornithologia borealis* but it contains no indications as to date of receipt (W. Beharrell *in litt.* 2022).

In understanding the context of Brünnich's July letter to Linnaeus and the latter's response, it must be mentioned that Brünnich (1764b) published another book, *Entomologia*, the same year. Its preface is dated 17 March 1764, and a similarly archived letter unambiguously attaching it, sent to Linnaeus, is dated 4 May 1764. It appears that Brünnich's *Ornithologia borealis* took longer from preface to print than *Entomologia*. Brünnich's letter of 23 July 1764 to Linnaeus mentions having already sent Linnaeus his entomological work and then cryptically states: 'En aliud, Vir Generose, in historia naturali specimen, vena frigida, quippe media hyeme in vasto avium museo elaboratum, quod si Tibi vel tantum ex parte arrideat, gaudebo; sin minus, ignoscas, Vir Generose, me stadium hoc propriis viribus et nullius consultis hactenus excoluisse. Ignotae aves, quarum icones addere ob ingentes sumtus mihi haud fuit possibile, una cum aliis rarioribus a Per-illustri Possessore Dno Pennant Esqr sunt oblatae.' [Rough translation, noting that Brünnich's Latin grammar has been criticised by some scholars: 'Another thing, O Generous Man, an example in natural history, a cold vein, indeed in the middle of winter elaborated in a vast bird museum, of which if it smiles at you even in part, I shall be glad; if not, forgive me, O Generous Man, I have studied this interest with my own strength and without any counsel. Unknown birds, the plates of which it was not possible for me to add, on account of the enormous cost, together with the other rarer ones are offered by the very illustrious owner Mr. Pennant Esq.'] Notably, Brünnich's (1764a) work was based on Christian Fleischer's collection in Denmark, so the text would have been finalised on the date specified in the preface—February 1764—at the end of the winter. Linnaeus' response of 20 August 1764 acknowledged *Ornithologia borealis*, providing detailed comments on it (including on Brünnich's domestic pigeons, but not his wildfowl!), finally expressing thanks also for the copy of *Entomologia*. From this and other archived correspondence, it can be seen that Brünnich held Linnaeus in high esteem, so he might have been among the first to be sent new publications such as this. The later publication of Brünnich's *Ornithologia borealis* compared to his *Entomologia* might be explained by the author's attempts to include plates in the former work, which he ultimately decided against due to cost.

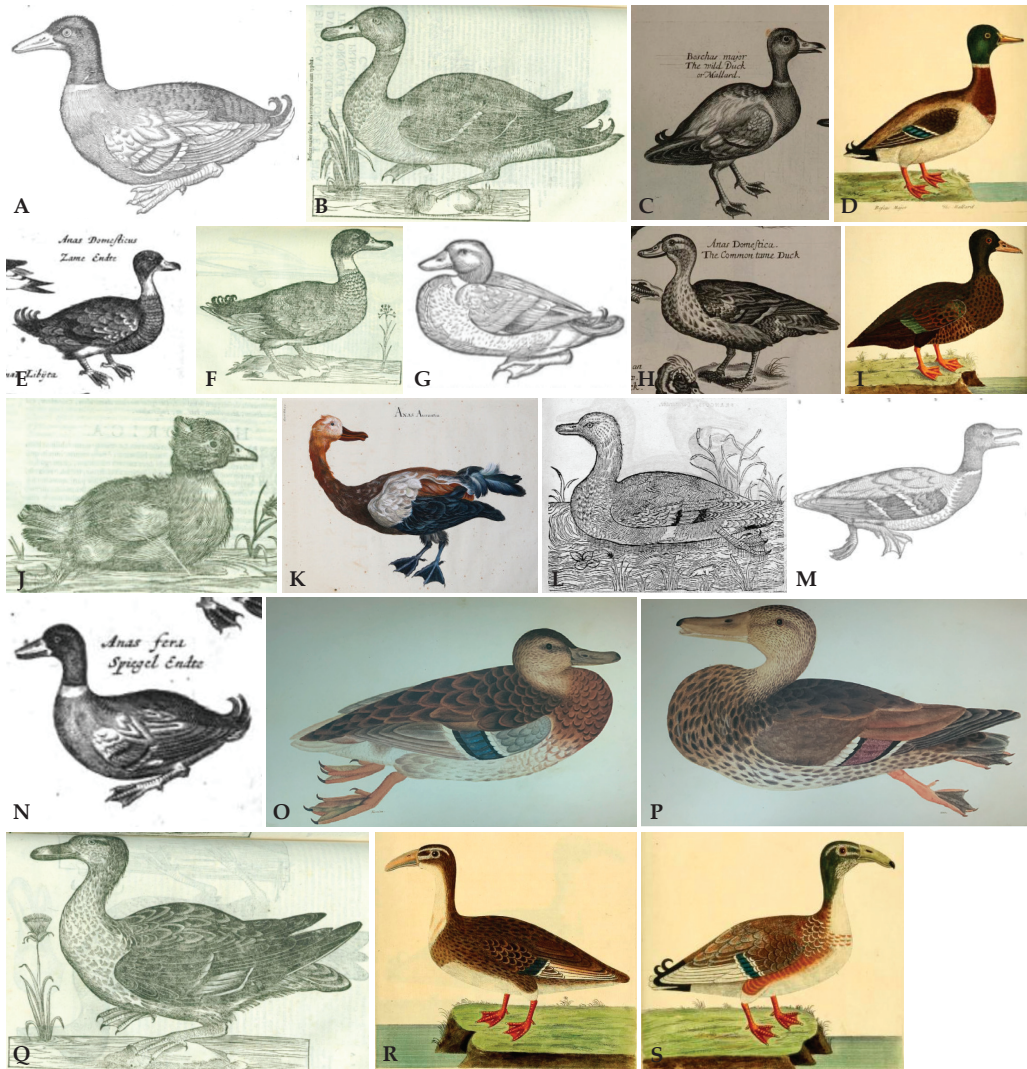


Figure 2. Specimens in the original type series of the following duck names: (i) *Anas boschas* Linnaeus, 1758 (A–D; the bird illustrated in D being designated as the lectotype); (ii) *A. boschas fera* (A–D if this name was authored by either Bechstein (1792) or Brünnich (1764a), but additionally M–N if authored by Brünnich; the bird illustrated in D being designated as the lectotype); (iii) *A. domestica* J. F. Gmelin, 1789, with direct references (E–I) and indirect references (J–L); (iv) *A. platyrhynchos* (O–Q), and (v) *A. adunca* (example only, not the full series, R). A: Gessner’s (1555: 114) ‘*Anas torquata minor*’. B: Aldrovandi’s (1603, book 19, p. 212) ‘*Boschas major f. Anas torquata minor*’. C: Willughby’s (1678, pl. 72) ‘*Boschas major*’ or ‘wild Duck or Mallard’. D: Albin’s (1734, pl. 100), ‘*Boschas major* or Mallard’, the specimen illustrated here being the selected lectotype of both *A. boschas* Linnaeus, 1758, and *A. boschas fera*, whether of Brünnich, 1764, or Bechstein, 1792. E: Jonston’s (1657, pl. 49) ‘*Anas Domesticus Zame Endre*’. F: Aldrovandi’s (1603: 189), ‘*Anas domesticus*’. G: Gessner’s (1555: 96), ‘*Anas domestica*’. H: Willughby’s (1676, pl. 75) ‘*Anas Domestica*’, the ‘common Tame duck’. I: Albin’s (1734, pl. 99) ‘*Madagascar Duck*’, i.e. Meller’s Duck *A. melleri*. J: Aldrovandi’s (1603: 188) duckling. K: Marsili’s (1726, pl. 54) ‘*Anas aurantia*’, a Ruddy Shelduck *Tadorna ferruginea*. L: Belon’s (1555: 160, 1557: 32) ‘*Canard*’, a Gadwall *Mareca strepera*. M: Gessner’s (1555: 115) ‘*Anas fera torquata maiore*’. N. Jonston’s (1657, pl. 49) ‘*Anas fera Spiegel Endte*’. O–P: Rudbeck’s ‘*Anas flaviatilis rufa* ...’ (both unnumbered pages in Rudbeck 1986, vol. 2). Q: Aldrovandi’s (1603: 232) ‘*Anas platyrhynchos, pedibus luteis*’, with head not entirely visible due to page bend. R–S: Albin’s (1734, pl. 96–97) two hook-billed ducks (a domestic Mallard breed), being the sole two illustrated syntypes of the name *Anas adunca* Linnaeus, 1758.



## Three competing names for Mallard, their history of usage and priority

Duck taxonomy was thrown into disarray at its inception with the naming of three contemporaneous subjective synonyms for Mallard by Linnaeus (1758): *Anas boschas* was the most detailed account, based mostly on wild males (Figs. 2A–D); *A. platyrhynchos* was based on wild females (Figs. 2O–Q); and *A. adunca* on the ‘hook-billed’ domestic breed (e.g. Fig. 2R–S).

Linnaeus (1746, 1758, 1766) and earlier authors were clearly confused by the different plumages of male and female Mallards, apparently originating with the account of ‘*Anas platyrhynchos, pedibus luteis*’ by Aldrovandi (1603, book 19, p. 232; Fig. 2Q). That work described and illustrated female Mallards separately from males. Perhaps Aldrovandi observed groups of all-female-like Mallards in Italy in early autumn, when males are in eclipse plumage and near fully grown juveniles would be in ‘female’ plumage. Other pre-Linnaean authors (e.g. Willughby 1676) had difficulty identifying Aldrovandi’s (1603) ‘*Anas platyrhynchos, pedibus luteis*’ but Linnaeus (1758) decided to name it as a separate species nonetheless. The *platyrhynchos* description is based on two plates of female Mallards by Rudbeck (published posthumously as Rudbeck 1985, 1986; Figs. 2O–P), Aldrovandi’s (1603: 232) line drawing (Fig. 2Q) and texts that cited the latter work such as Willughby (1678). All of these sources refer to female, juvenile or eclipse Mallards.

Confusion was exacerbated when Linnaeus (1766) placed the name *A. platyrhynchos* Linnaeus, 1758, into subjective synonymy with the name for Northern Shoveler *A. clypeata* Linnaeus, 1758. The latter has broadly similar female plumage to Mallard, but with different wing speculum coloration and a large spatula-like bill, features not mentioned in any of the accounts or plates referred to by Linnaeus (1758) in his description of *A. platyrhynchos*.

Linnaeus’ (1766) proposed synonymy of *A. platyrhynchos* with *A. clypeata* stood for over a century. Latham (1824: 293), Shaw (1824: 84), Bonaparte (1826, section 256), and Selby (1833: 305), for example, all recognised *A. boschas* for Mallard and *A. b. domestica* for domestic birds. Lönnberg (1906) first noted that *A. platyrhynchos* and *A. boschas* pertain to female and (mostly) male Mallards, respectively. Disrupting more than 150 years of usage, he chose *platyrhynchos* over *boschas*, citing ‘page priority’ (i.e. *platyrhynchos* appeared first in the pages of Linnaeus 1758). Today, such a designation would not accord with Recommendation 24A of the Code, since usage of *A. boschas* was well established at the time (‘In acting as First Reviser ... an author should select the name, spelling or nomenclatural act that will best serve stability and universality of nomenclature.’). However, this does not affect the validity of Lönnberg’s (1906) First Reviser action, which predates that guidance and remains valid today, since breach of a recommendation would not invalidate it.

Lönnberg’s (1906) proposal was accepted by essentially all major 20th and 21st century taxonomic works and field guides, including Hartert *et al.* (1912: 134), Peters (1931: 159), Witherby *et al.* (1943: 231), Hellmayr & Conover (1948: 325), Peterson *et al.* (1983: 58), Snow & Perrins (1998: 218), Svensson *et al.* (1999: 48, 2010: 24) and Dickinson (2003: 66). *A. platyrhynchos* Linnaeus, 1758, is the only name in use today for Mallard, including by all major bird checklists (Dickinson & Remsen 2013: 17, del Hoyo & Collar 2014: 144, Clements *et al.* 2022, Gill *et al.* 2023).

The name *A. adunca* Linnaeus, 1758, has barely been used since the 1800s. However, it has been used on a handful of occasions since 1899 (e.g. Pieters 1980: 540), precluding its treatment as a *nomen oblitum* and automatic reversal of precedence under Art. 23.9. To determine precedence among the three contemporaneously introduced names *A. platyrhynchos*, *A. adunca* and *A. boschas*, the following First Reviser actions are relevant:



- (a). *A. platyrhynchos* vs. *A. adunca*: Rookmaaker & Pieters (2000: 275) noted that a specimen labelled *A. adunca* in an historic collection refers to *A. platyrhynchos* Linnaeus, 1758. By citing both names and using *A. platyrhynchos* as valid, these authors, apparently inadvertently, acted as First Revisers under Art. 24.2.1.
- (b). *A. boschas* vs. *A. adunca*: Rees (1819: no page numbers, section 'DUCK') is the earliest publication I have found that cited both names and recognised *boschas* over *adunca*.

As it is a name for a domestic breed, *Anas adunca* Linnaeus, 1758, technically has priority over *A. boschas domestica* of Brünnich, 1764a, or *Anas domestica* J. F. Gmelin, 1789. Reversal of priority for the near-obsolete *A. adunca* Linnaeus, 1758, requires ICZN attention. The type series of *A. platyrhynchos* exclusively comprises female Mallards of apparently wild phenotype. However, that of *A. boschas* Linnaeus, 1758 involves both wild and mixed or domestic phenotypes, thereby threatening use of the name *A. domestica* Brünnich, 1764a, for domesticates.

### The type series for *Anas boschas* Linnaeus, 1758

In his original description of *A. boschas*, Linnaeus (1758: 127) referred to several prior sources, whose authors' specimens constitute the type series. First, in lines 1–2, he referred to his earlier 'Anas reatricibus intermediis (maris) recurvatis, rostro recto' account in *Fauna Svecica* (Linnaeus 1746: 34–35, para. 97). This includes a text description of a male Mallard, presumably based on the author's observations or specimens, a list of vernacular names and an essentially identical list of references to earlier works as in his later account (Linnaeus 1758). Next, in lines 3–4, Linnaeus (1758) mentioned the 'Anas fera torquata minor' of Gessner (1555), Aldrovandi (1603) and Ray (1713). Taking these in turn: (i) Gessner (1555: 114; Fig. 2A) included an illustration of a male Mallard that differs from the pure wild phenotype in lacking any strong contrast between the breast and belly, so is probably of domestic or mixed origin; (ii) Aldrovandi (1603, book 19, chapter 35 [*sic* = chapter 25, p. 212]; Fig. 2B) contained a description and plate of a male Mallard, which also lacks contrast on the underparts, so is also doubtfully of wild origin; and (iii) Ray (1713: 145, para. A.1) included an abridged version of Willughby's (1676) text and referenced Aldrovandi's (1603) account. In lines 5–6, the 'Boschas major' of Willughby (1676) and Albin (1734) are cited. These are: (i) the 'wild duck or mallard' of Willughby (1676: 284, pl. 72; Fig. 2C), who illustrated a male Mallard but described both male and female in the text, while referring to Aldrovandi's (1603) account; and (ii) Albin (1734: 89, pl.100; Fig. 2D), with a colour-illustrated male Mallard consistent with a wild bird and a detailed description.

The second set of materials cited by Linnaeus (1758) are in subsection 'beta', referring to the 'Anas domestica' of earlier authors. As with the corresponding goose name, this is a subtitle for part of the *boschas* account cross-referencing a pre-Linnean name, without any new name in the margin; the name 'domestica' for ducks was not made available by Linnaeus (1758) (e.g. Sherborn 1922, Richmond 1992). None of the illustrated specimens incorporated here forms part of the type series of *A. boschas*, as they are listed under a distinct variant beta, for purposes of Art. 72.4.1, for the same reasons as discussed above in relation to subsections of the *Anas anser* Linnaeus, 1758 description. Those of the beta subsection materials based on illustrations are shown in Figs. 2E–H.

As above, Linnaeus (1746) was one of the sources cited in the same author's later original description; the relevant account referred to various of the same texts as cited in Linnaeus (1758) but his earlier work cited additional materials. The first is a wild male Mallard illustrated by Gessner (1555: 115; Fig. 2M), which was incorrectly identified by Linnaeus (1746) as a female. Although on the adjacent page of the same work as cited by

Linnaeus (1758), this cannot properly be regarded as part of the type series as it is in a separate named section ('*Anas fera torquarta maiore*') and Linnaeus (1758) chose not to cite it. Additionally, Linnaeus (1746) referred to the '*Anas fera Spiegel Endte*' of Jonston (1657, pl. 49; Fig. 2N), a male Mallard with a uniformly dark belly so potentially of domestic or mixed origin. Linnaeus (1758) placed this account under form beta, so it can also be ignored as not being part of the type series of *A. boschas*.

There are no Mallards (or geese) in Linnaeus' original collection in Sweden (E. Åhlander *in litt.* 2021) nor any birds in his collection in the Linnean Society in London (G. Douglas *in litt.* 2005). Thus, no extant duck specimens studied by Linnaeus are part of the type series.

## Designation of a lectotype for *Anas boschas* Linnaeus, 1758

For the reasons listed above, *A. boschas* Linnaeus, 1758, has a mixed type series (as regards some widely used schemes for trinomial nomenclature), by including both wild Mallards and birds apparently of either mixed or domestic phenotype and of doubtfully wild origin. As a result, the name *A. boschas* Linnaeus, 1758, is currently at risk of competing with *A. boschas domestica* Brünnich, 1764a, or *A. domestica* J. F. Gmelin, 1789, as a name for domestic ducks. A lectotype designation is therefore necessary.

The name *A. boschas* was originally intended to encapsulate morphotypes referable to wild, male Mallards and for over a century was used for wild Mallard. Any lectotype designation should therefore promote the status of this name as a synonym at species and subspecies level for wild Mallard *A. platyrhynchos* Linnaeus, 1758, and not for domesticates. The specimen illustrated in the colour plate entitled '*Boschas major*, the Mallard' by Albin (1734: 89, pl. 100; Fig. 2D) is hereby selected as lectotype. The plate unambiguously depicts a male Mallard of wild phenotype; it is accompanied by a page-long description with measurements of the specimen. Albin's plates were based on his own studies of specimens mostly in England, probably in the London area. Albin (1731, 1734) stated that he illustrated birds from life; none of the specimens from his works is extant or traceable today.

This lectotype designation restricts the type locality of *A. boschas* to England, probably the London area. This does not disrupt subspecies taxonomy of *A. platyrhynchos* and maintains the subjective synonymy of *A. boschas* with *A. platyrhynchos*. Hartert *et al.* (1912) suggested to restrict the type locality of the latter to Sweden, perhaps because the original description is based principally on specimens of female Mallards drawn by Rudbeck (1985, 1986; Figs. 2O–P) in Sweden. However, there is also an Italian Mallard type specimen in the series, described and depicted by Aldrovandi (1603; Fig. 2Q). As those authors did not designate a lectotype and because part of the type series originates outside Sweden, their restriction is incorrect. The type series of *A. platyrhynchos* is exclusively from Western Europe (Sweden and Italy). Excluding use of *domestica*, Mallard is often regarded as monotypic, although some recognise *A. p. conboschas* C. L. Brehm, 1831, for Greenland or North American populations (e.g. Clements *et al.* 2022). Both *A. platyrhynchos* and *A. boschas* now have a type series exclusively of wild-plumage Mallards from Western Europe, so they are now synonyms at both species and subspecies levels.

## Names for domesticates and wild geese, and Mallards, and their authors, including a First Reviser act and a lectotype for *Anas boschas fera*

The following conclusions and nomenclatural acts follow from the above:

1. The authorship and date of the name for domestic geese is *Anser domesticus* Garsault, 1764.

2. *Anas anser domesticus* as used by Brünnich (1764a) is a subsequent usage of Garsault's name. As Garsault (1764) used the genus *Anser* for geese, the duck *Anas boschas domestica* Brünnich, 1764, cannot be a homonym of the same author's congeneric name for geese, and so Brünnich's duck name has his authorship, unless it is regarded as infrasubspecific.
3. The names *Anas anser ferus* Brünnich, 1764, and *A. boschas fera* Brünnich, 1764, to the extent they are available, are primary homonyms because they differ from one another only by adjectival gender agreement. The first would also be a junior synonym of *Anser anser* Linnaeus, 1758, and the second also a junior synonym of *Anas boschas* Linnaeus, 1758, and *A. platyrhynchos* Linnaeus, 1758.
4. Under Recommendation 24, when acting as First Reviser 'an author should select the name, spelling or nomenclatural act that will best serve stability and universality of nomenclature'. It is therefore necessary to consider the type series for Brünnich's (1764a) names *fera* and *ferus*, and what alternative authorship and application those names would take if one or the other is afforded priority.
5. Brünnich's (1764a) goose description is problematic, as it references the 'Anser ferus' subaccount of Linnaeus (1746), which involves a mixed type series of multiple grey goose species (similar to the alpha subaccount of *Anas anser* Linnaeus, 1758, as illustrated in Fig. 1). The type series of *Anas anser* Linnaeus, 1758, will eventually be addressed in an application to ICZN. Introducing the possibility of similar actions for a putative Brünnich (1764a) description of *Anas anser ferus* of contested availability would complicate and reduce the prospects of that case. In contrast to the goose name, *Anas boschas fera* Brünnich, 1764, if selected, could be firmed up herein as a synonym of *A. platyrhynchos* Linnaeus, 1758, and *A. boschas* Linnaeus, 1758.
6. If Brünnich's (1764a) wild goose name is not selected (or is unavailable), then Gmelin (1770), a novel authorship, has priority for *Anser ferus*. His sole type specimen is no longer extant but quite clearly of Eastern Greylag Goose *A. anser rubrirostris* Swinhoe, 1871,<sup>1</sup> resulting in an issue of priority that will require ICZN deliberation.
7. Brünnich's (1764) description of *A. boschas domestica* is succinct: 'multis ludens coloribus; hospitatur ubique' ('playing with many colours; kept everywhere') and he gave the Danish vernacular name. His work was based principally upon Christian Fleischer's collection, although an account like this might also have rested on field observations: he mentioned no specimens in his accounts. Steinheimer (2005), who attempted to catalogue extant pre-1800 bird specimens held in Europe, did not list the Fleischer collection; similarly, van Grouw & Bloch (2015) found no trace. Brünnich's (1764a) citation of 'Fn 131' in the immediately preceding account of *boschas* refers to the relevant

<sup>1</sup> The name *Anser ferus* was attributed by Richmond (1992) to Schäffer (1789: 67), whose main reference plate (Schäffer 1774) shows a Bean Goose, albeit with references to earlier authors that bring into consideration the mixed type series of *A. anser*. Pallas (1769: 26, 28) used the name 'Anser ferus' earlier in italicised form, noting its distribution and migratory status, but without citing earlier authors' accounts or any description that would count as an indication or description under Art. 12. His usage is a *nomen nudum*. Gmelin (1770: 68–69) has been overlooked to date, but seems to have been first to use the name *A. ferus* in a manner that suffices to confer availability. He travelled in south-west Russia including around the Caspian Sea and described its birds, including a goose he referred to as *A. ferus*, providing measurements and ecological remarks. Although large, his measurements are consistent with *A. anser rubrirostris* Swinhoe, 1871, which is the region's only common goose. Gmelin's (1770) specimen was reportedly 9 ft long (which must refer to wingspan—being long for Greylag and certainly bigger than any other grey goose); at >9 pounds/4.5 kg, it is at the upper end of variation in the species. In reporting the only grey goose he observed (at a locality where only one species regularly occurs), providing measurements of a specimen and ecological notes, including its hissing call when provoked, then discussing all other wildfowl he observed in the region by their different morphology and names, this suffices for a description.

- section of the second edition of *Fauna Svecica* (Linnaeus 1761: 46) and provides context, but it is included only for *A. b. fera*, not *A. b. domestica*, so neither that publication nor its sources are relevant to the latter description. There is, however, no ambiguity in Brünnich's (1764a) application of this name to domestic ducks of varied plumage, with a type series either from Fleischer's now lost collection or generally in Scandinavia (probably Denmark).
8. If *Anas boschas fera* Brünnich, 1764a, is not an available name or is not selected via First Reviser action, then authorship falls to Bechstein (1792: 389). In a perfunctory account, Bechstein (1792) did little more than cite Linnaeus (1758). It could be argued that Bechstein's (1792) name is not available pursuant to Art. 11.5.2 (citation of a previously unavailable name without taxonomic concept). However, Bechstein's (1792) attribution to Linnaeus (1758) is arguably better regarded as an incorrectly reported authorship and not subsequent use of a Linnean name. The type series of Bechstein's (1792) name would be that of the opening section of Linnaeus' (1758) *A. boschas*, including the specimens illustrated in Figs. 2A–D. Brünnich's (1764a) description would bring into account additional materials from Linnaeus (1746; see Figs. 2M–N). Thus, Brünnich's (1764a) name and Bechstein's (1792) name (if the former is unavailable) would share most of the same type series, as did *A. boschas* Linnaeus, 1758 (prior to the lectotype designation above).
  9. *Anas boschas fera* Brünnich, 1764a, is hereby selected to have priority over its primary homonym *A. anser ferus* Brünnich, 1764a, pursuant to a First Reviser action under Art. 24 and 52.3.
  10. The type series of *A. b. fera* is subject to the same issues of it being mixed at subspecies level, as for *A. boschas* Linnaeus, 1758, which has essentially the same type series (see above). The same lectotype chosen for *A. boschas*, i.e. 'Boschas major, the Mallard' of Albin (1734: 89, pl. 100; see Fig. 2D) is here also selected as lectotype for *A. boschas fera*. This places the names *A. boschas* and *A. b. fera* for ducks into objective synonymy and avoids any competition for priority or ambiguity with *A. b. domestica*. It also places the name *A. b. fera* into the synonymy of *A. platyrhynchos* Linnaeus, 1758, for the same reasons as for *A. boschas*.
  11. If Brünnich's (1764a) trinomials for domestic and wild waterfowl are not considered available names, then the First Reviser act in para. 9 would fall away, but the lectotype for *A. boschas fera* in para. 10 remains valid, as the lectotype is part of the type series of that name and the designation is necessary, irrespective of authorship (Brünnich 1764a, or Bechstein 1792).

## Conclusions

In summary, the relevant names discussed here and their authors are:

*Anser anser* (Linnaeus, 1758). Greylag Goose (subject to ICZN action on its type series). Potential synonym: *Anser ferus* S. G. Gmelin, 1770 (subject to Commission action on priority vs. *A. a. rubrirostris* Swinhoe, 1871; for now, prevailing usage should be maintained).

*A. a. rubrirostris* Swinhoe, 1871.

*A. a. domesticus* Garsault, 1764.



*Anas platyrhynchos* Linnaeus, 1758. Mallard.

Synonym at species level: *Anas adunca* Linnaeus, 1758 (through First Reviser action of Rookmaaker & Pieters 2000). Synonyms at species and subspecies level: *A. boschas* Linnaeus, 1758 (via First Reviser action of Lönnberg 1906); *A. boschas fera* Brünnich, 1764a (author Bechstein, 1792, if former is not considered to have made the name available, i.e. if Brünnich's authorship of *A. boschas domestica* is not endorsed in the forthcoming ICZN case on *A. domestica*).

*A. p. conboschas* C. L. Brehm, 1831.

*A. p. domestica* Brünnich, 1764a (author J. F. Gmelin, 1789, if Brünnich's authorship not endorsed in the forthcoming ICZN case). Synonym at subspecies level: *A. adunca* Linnaeus, 1758 (subject to ICZN decision on priority; for now, prevailing usage should be maintained).

Other synonyms for some of these names exist and additional subspecies have been proposed. Thus, the above synonymy is not comprehensive, addressing only the senior names for the nominate wild phenotype of currently recognised subspecies in Greylag and Mallard, subspecies names for domestic wildfowl and the name *ferus/fera* as used for geese and ducks. Clearly, ICZN attention is necessary to deal with remaining issues affecting names of these birds.

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