

## Order GALLIFORMES

Morphologically similar, though apparently genetically divergent, group of small to large terrestrial birds (though some species arboreal or partly so). Colloquially often referred to as 'gamebirds', because some of the most familiar pheasants, partridges and grouse are important quarry for shooters, or 'gallinaceous birds', because the Domestic Fowl is a characteristic species. Distributed world-wide (except Antarctica).

Six (or seven) families, containing about 250 species in about 90 genera (or 283 species in 75 genera; Sibley & Ahlquist 1990). Only two families occur naturally in HANZAB region: Megapodiidae (megapodes, scrubfowls and brush-turkeys), with about 19 species in six genera, in A'asia, se. Asia, the Philippines and islands of sw. Pacific; and Phasianidae (pheasants, partridges, Old World and New World quail and allies) with about 160 species in 50 or so genera (189 in 46; Sibley & Ahlquist 1990) distributed in n. and s. America, Africa, Eurasia and Asia; only four species of *Coturnix* indigenous to Aust. and NZ, though many other species have been introduced. The other families are: Tetraonidae (grouse) with 17 species in about six genera, confined to n. hemisphere; Meleagridae (turkeys) with two species in two genera, confined to North America, with one species introduced to Aust. and NZ; Numididae (guineafowl) with 6–7 species in four genera, confined to Africa, with one species introduced to Aust. and NZ (though no definitely feral populations extant); Cracidae (curassows, chachalacas and guans) with 36–50 species in 8–11 genera, confined to Neotropical region.

The families are said to be closely similar in egg-white protein, osteology, immunology and haemoglobins, though the Megapodiidae differ somewhat from other families. DNA comparisons, however, reveal substantial genetic diversity. On the basis of DNA comparisons, Sibley & Ahlquist (1990) placed both Cracidae and Megapodiidae in a separate Order (Craciformes); they also submerged Tetraonidae and Meleagridae within the Phasianidae, and kept New World quail in a separate family, Odontophoridae. The aberrant Hoatzin *Opisthocomus hoatzin* of South America, in the monotypic family Opisthocomidae, has been placed in the Galliformes on the strength of immunological data (Brush 1979) but study of egg-white proteins (Sibley & Ahlquist 1973) and DNA comparisons (Sibley & Ahlquist 1990) show it most closely allied to the Crotophagidae in the Cuculiformes. Here we do not consider Tetraonidae or Cracidae further. History of taxonomic classification of the Order reviewed by Johnsgard (1988) and Sibley & Ahlquist (1990).

Mostly stocky birds with small heads and short broad wings. Flight, generally fast and low but not sustained and no species are long-distance migrants except the European Quail *Coturnix coturnix*. Eleven primaries (including remicle), curved; 9–20 secondaries; eutaxic, except Megapodiidae; 8–32 rectrices. Bill, heavy at base with curved culmen, usually shorter than head. Nostrils often partly covered by operculum; holorrhinal; nares, impervious. Two carotids, except in Megapodiidae. Brightly coloured bare skin, wattles or combs on head in many species. Legs, short, powerful with heavy toes; hind toe present and spurs on tarsus in some. Oil-gland, varies, usually feathered; naked or with short tuft in Megapodiidae; absent in some. Crop, large; gizzard, powerful; caecae, well developed. Syrinx rather simple; tracho-bronchial. Feathers with long aftershaft; down on apteria only.

Clutch-size usually large; 6–15; up to 34 in Malleefowl. Young of most families, downy when hatched; Megapodiidae probably hatch in juvenile plumage (for discussion, see introduction to that Family); precocial, nidifugous. Most species able to fly soon after hatching (3–15 days) but some megapodes can fly almost immediately, though usually only weakly; all can fly strongly before fully grown and before post-natal moult finished. Post-juvenile moult starts within 1 month of hatching and before post-natal moult finishes; complete, or nearly so, outer 2–3 outer primaries and primary coverts retained in most species. Adult post-breeding moult complete, primaries outwards or serially outwards; moult of tail varies between families. Partial pre-breeding moult in many species.

Many species of galliforms have been introduced throughout the world (Long 1981; Westerskov 1990). In Aust. and NZ, most introductions have failed to establish or maintain feral populations; these are treated separately and briefly under the heading 'Failed introductions' at the end. Species with established feral populations are treated in the normal way.

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## Family MELEAGRIDIDAE turkeys

Two species in one genus; sometimes regarded as a sub-family of Phasianidae (e.g. Johnsgard 1973; Sibley & Ahlquist 1990, references therein); Sibley & Ahlquist (1990) consider turkeys most closely related to grouse (Tetraonidae). Large terrestrial birds, endemic to North America E of Rocky Mts and in Mexico. *Meleagris gallopavo* has been domesticated and introduced to Europe since sixteenth century without ever having established feral populations; latterly introduced to Aust. and NZ, where feral populations have survived.

Plumage primarily dark brown and black. Males about 110 cm long, weighing about 8 kg; females, about 90 cm and 4 kg. Males are generally darker and more iridescent than females and have a beard of long pendulous bristle-like feathers on breast, which about 90% of females do not have. In males the head is naked, coloured blue or red according to mood of bird, with red wattles; in females, head is more fully feathered. Tarsal spurs in males. Plumage of domesticated birds generally white or brown or mixtures of both. Two moults: partial pre-breeding and complete post-breeding.

Turkeys inhabit forests and prairie bushland, preferring a mixture of forest and open fields, roosting in trees and feeding in open areas. Forest edges and borders of fields are important for nesting. Gregarious and sedentary, using quite small areas for a while and periodically moving elsewhere. Dispersal generally occurs in spring. Omnivorous, taking mainly (80%) insects for a month or two after hatching, but adults take fruit, seeds, vegetable matter and invertebrates. Call of both sexes consist of yelping, clucking and purring; during breeding, the loud, far-carrying and well-known gobble is characteristic.

Breeding routine is harem polygyny. Males are non-territorial; may range over 150–2000 ha; females associate with them briefly. Breeding and Courtship Displays include strutting, tail-fanning and wing-dragging. Nest is a simple scrape on ground, lined with grass and leaves. Eggs, buff or cream dotted with red. Clutch-size averages about 11 (7–18). Incubation period, 26–28 days; by female alone. Young, downy, precocial, nidifugous. Broods remain with female for several months and may amalgamate with other broods into large flocks.

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### *Meleagris gallopavo* Feral Turkey

*Meleagris gallopavo* Linnaeus, 1758, *Syst. Nat.*, ed. 10, 1: 156 — North America = Mexico.

Meleager was the son of Oeneus and Althaia of Calydon. Homer described him as a brave and misguided hero, best known for taking part in the hunt of the Calydonian boar, a favourite subject in art. After his death, the women who mourned him wept so much that Artemis changed them into guineafowl, with their tears forming pearl-like spots on the plumage. In the sixteenth and seventeenth centuries some authors curiously confused guineafowl and turkeys (see Brisson 1760, *Ornith.* 2: 158, 176) after the latter's introduction from the New World. Linnaeus could not clear himself of the confusion and misapplied *Meleagris*, undeniably belonging to guineafowl, to the Turkey, adding *gallopavo* (chicken-peacock) after the *Galluspavo* of Gesner (1555). The name 'turkey' has nothing to do with the country of that name and perhaps originated onomatopoeically from the call of the bird.

OTHER ENGLISH NAMES Gobbler, Wild Turkey.

Feral Turkey is used here to indicate that populations in our region originated from domestic stock.

POLYTYPIC Five subspecies (Peters) have been described from the natural range of the species in n. and Central America; introduced to various parts of the world (Long 1981).

**FIELD IDENTIFICATION** Length: male 120–125 cm, female 90–95 cm; weight: male 5–11 kg, female 3–5 kg (Schemnitz 1992). Unmistakable; very large, iridescent blackish or brownish ground-dwelling gamebird with naked head and neck and bright red wattles over bill and on lower foreneck. Sexes differ in plumage, colour of bare parts and size; males larger than females. No seasonal variation. Juveniles separable. Plumage of feral birds fairly similar to that of Wild Turkey in North America; escaped or

released domesticated birds may be white or varying combination of black, brown and white.

**Description Adult male** Head and most of upper part of neck, bare with sparse small black-brown bristles; colour of skin varies seasonally, with mood and individually: face, bluish or grey; back of head, and neck and wattles, bright red to pale pinkish. Plumage of rest of neck and upperbody, dark brown to blackish with close black barring and iridescent bronze or green sheen;

most feathers with black terminal band, giving scaly appearance. Tail, russet-brown to buff-bronze, narrowly and evenly barred black and with broad black subterminal band and thin pale russet-brown to cinnamon tip, forming sharp semi-circular pale border and dark subterminal band when tail fanned; shafts of rectrices, whitish at base. Primaries, boldly barred black and white; white bars, about half width of black bars; secondaries like primaries but bars more equal in width, less regular and more blotched, barring becoming more prominent towards primaries; tertials, dark bronze-brown, with short white bars or blotches along edges. Secondary coverts, as upperparts with rather large plain panel on bases of greater secondary coverts. Underbody, like upperbody; narrow elongated feathers on centre of upper breast form a beard; under tail-coverts, black with broad russet-brown tips. Tibia, feathered, black, with faint buff-white edges to feathers. Bill, blue-grey to grey or grey-black, often with pinkish or reddish tip. Iris, dark red-brown. Legs, grey or pinkish with spur on rear of leg. **Adult female** Like male but much smaller, with paler, browner, less iridescent plumage; usually no beard (or shorter than that of male), smaller wattles, and no spurs; neck may be grey or bluish with pink or red face and wattles. **Juvenile** Body and upper wing-coverts, black-brown with narrow cream to buff streaking, and light-brown spots and faint vermiculations. Tail and remiges, like adult. **Immature** Head and neck appear black and hairy; sparsely feathered but much more so than adult. Rest of plumage, similar to that of adult female.

**Similar species** None.

Often seen in small flocks; in breeding periods, usually of several females and one male. Most often seen in open farmland, sometimes bordering forest and clearings in bushland and forest. Often roost on fence posts. Tail, long and broad, usually drooping down. Males strut about when displaying, with wattles extended, body flattened, wings drooped and tail held erect and fanned. Usually seen walking; often run when startled. Fly strongly, for up to 400 m. Voice a familiar throaty gobble, mostly from males; give short clucks or trills when disturbed.

**HABITAT** Farmland and grassland, interspersed with wooded cover. On King and Flinders Is, in farmland with scattered hedgerows, woodlots or wind-rows (Pescott 1985; S.J. Cowling), tall grasslands of introduced grasses (Pescott 1985) and *Poa* (J.R. Starks). In NZ, recorded to 600 m asl; mostly in open farming country adjoining forest, clearings in forest, pastoral foothills (S.J. Cowling; K. E. Westerskov).

**DISTRIBUTION AND POPULATION** USA and Mexico; reintroduced to w., e. and central USA, s. Mexico, and se. Canada. Introduced to Hawaii, Europe, Aust. and NZ (Long 1981).

**Aust. Tas.** King I.: widespread; more than 359 birds counted, Apr. 1988 (J.R. Starks); maintained as semi-feral flocks

by some farmers (S.J. Cowling). Furneaux Grp: introduced to Prime Seal I., before 1950 and established by 1950 (Tarr 1950); good numbers recorded Flinders I., Jan. 1985 (Pescott 1985). **SA** Kangaroo I.: kept on free range since 1950s, but not truly feral (Lashmar 1988). **WA** Feral birds recorded on Garden I., in SW, after a turkey farm was established in 1946; feral population extirpated soon after 1958 (Storr & Johnstone 1988).

**NZ** Birds of Mexican origin (via England) were present in Hawke's Bay, Nelson and Canterbury by 1890s, but did not remain established (Oliver). Subsequent introductions round Wanganui in early 1920s, and round Wellington, Hawke's Bay and Marlborough in 1950s (Long 1981; Oliver). Unsuccessfully introduced to Chatham Is in 1890s (Oliver). Common but sparsely spread throughout most regions of NI (Westerskov 1990; Oliver). Maintained as semi-feral flocks by some farmers in Waipu, NI (S.J. Cowling).

Have disappeared from some areas where previously established (Oliver). Adults and young taken by feral cats (Lashmar 1988).

**MOVEMENTS** Sedentary. No long-distance movements recorded (Oliver; S.J. Cowling).

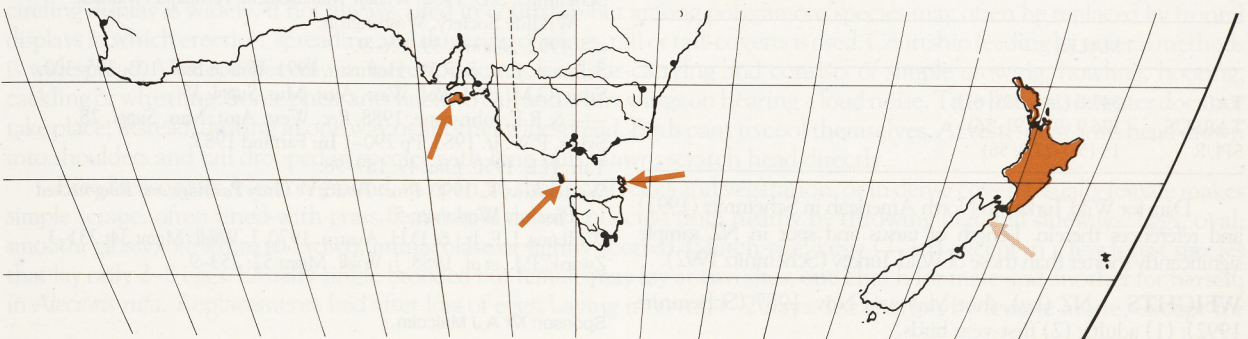
**FOOD** Mainly herbivorous; green plant material, seeds of grass and weeds, berries, fruit, waste grain and acorns, and insects including grasshoppers, beetles and ants. **Behaviour** Feed mainly on ground, during day. Pick shoots and leaves; sometimes use feet to scratch for food. Ingest grit to grind hard foods in gizzard (NZRD). Change habitat with availability of food (Zwank *et al.* 1988).

**Adult At Taupo** (45 stomachs, autumn; Schemnitz 1992): Plants: rye *Lolium* 100% freq., 50% vol.; clover *Trifolium* 96, 48; nettle *Urtica* 11, 0.4; Dandelion *Taraxacum officinale* 7, 0.4. Insects: Orthoptera: Gryllidae: crickets 4, tr.; Acrididae/Tettigoniidae grasshoppers 2, tr. Grit 47, 2. **Other records** Green plant material; grass and weed seeds; berries; fruits; waste grain; Fagaceae: acorns *Quercus*. Insects: Orthoptera: grasshoppers; Hymenoptera: Formicidae: ants. Grit (NZRD).

**Young** At first, chicks said to eat insects only (NZRD).

**Intake** No information.

**SOCIAL ORGANIZATION AND BEHAVIOUR** Virtually nothing known of birds in HANZAB region; unreferenced statements taken from NZRD. Extraliminally, information in Hewitt (1967) and Dickson (1992). Gregarious all year. In NZ, autumn and winter, wild hens move about in flocks, but males range alone. On King I., Tas., in May, seen in flocks of 28 birds (7–66; 13) (J.R. Starks); observed flying in evenings to low branches of wind-breaks, presumably to roost for night (S.J. Cowling). Polygamous; in NZ in early spring flocks break up and males acquire harems of up to four or five females; older males call and fight off younger males and attract hens. During laying, incubation, and when rearing brood, hen leads solitary existence.



**VOICE** No information from HANZAB region. In North America, well-known from work of Hale & Schein (1962), revised with sonagrams in Hale *et al.* (1969); and of Bailey (1967). Best known call is loud Gobble, audible to 1.5 km, used by male to proclaim territory and attract females; followed by Low Drumming, audible to perhaps 40 m; Gobble declines as breeding season progresses. Females may, more rarely, Gobble. Other calls include: Clucking and Trilling in alarm; Yelping to regroup after scattering; soft Trilling; Hisses; Croaks; Whines; and Barks. **Young** Give Peeps, Trills, high-pitched Screams, and low cat-like Purrs.

**BREEDING** No information from feral populations in Aust. or NZ.

**PLUMAGES** No skins available for study. Sexes differ in plumage, size and structure from first winter. Feathers have well-developed aftershfts. Hatch in natal down. Post-natal moult introduces juvenile plumage, evident from third week but held only briefly; body-feathers and remiges have narrow pointed tips. Followed by post-juvenile moult, which introduces first-immature (first-basic) plumage; acquisition evident by about Week 7; outer juvenile primary usually retained, and juvenile p9 sometimes retained, and identified by pointed tips; body-feathers have rounded tips like adult female. Thereafter followed by complete pre-breeding and partial post-breeding moults with no change in appearance (definitive alternate and basic plumages); body-feathers of adult male have rather square tips; contour-feathers of adult female have slightly rounded tips.

For general description of plumages and bare parts, see Field Identification; also see Campbell (1974), Leopold (1943), Schemnitz (1992), Sykes (1983). **Downy young** Top of head, light brown, spotted dark brown; upperparts, pinkish buff to cinnamon-brown blotched brown; underparts, pale pinkish-buff to cream grading to whitish breast and throat (Fjelds  1977). Feral birds may be nearly black-and-white above.

**MOULTS** Described for North America by Leopold (1943), Williams & Austin (1970) and Schmutz & Hoffman (1991). **Post-natal** Complete; begins with remiges by Day 1 and finishes with head about Week 11. **Post-juvenile** Complete except for outer juvenile primaries (usually only p10 retained in domestic and feral birds); begins with tail by Week 4 (overlapping post-natal), finishes with head about Week 16. **First pre-breeding** Varies; partial body-moult with some wing-coverts and rectrices; extent possibly depends on weight and date of hatching. Adults undergo two moults per year: complete **pre-breeding** and partial body **post-breeding** moults; if moulted, primaries moult outwards; secondaries inwards from p3 then p10 and p1; rectrices centrifugal in post-juvenile, centripetal but irregular in adult.

**MEASUREMENTS** NZ, adult males, shot May and Nov. 1987 (Schemnitz 1992).

	MALES
TAIL	343.0 (245–505; 61)
TARSUS	126.9 (97–191; 56)
SPUR	15 (5.0–27.8; 56)

Data for Wild Turkey in North American in Schemnitz (1992) and references therein. Length of tarsus and spur in NZ sample significantly shorter than those of Wild Turkey (Schemnitz 1992).

**WEIGHTS** NZ (kg), shot May and Nov. 1987 (Schemnitz 1992): (1) adults; (2) first-year birds.

	MALES	FEMALES
(1)	8.3 (5.2–10.6; 56)	3.9 (3.2–5.2; 10)
(2)	4.9 (2.7–6.3; 16)	2.9 (1.6–4.1; 23)

Adult males in May: 6.6 (0.94; 5.2–8.2; 11); in Nov. 8.76 (0.93; 6.0–10.6; 5). Adult males as heavy or heavier than Wild Turkeys in North America; most females, lighter (Schemnitz 1992).

**STRUCTURE** Wing, broad, rounded. Eleven primaries; p11 minute. Sixteen secondaries. Tail long, broad, rounded; 18 rectrices; in display, male lifts and fans tail in large semicircle. Males have long narrow tuft of feathers hanging from central breast; in NZ, length of beard of males 146 (4–229; 56); nine of 56 males had two beards and two had three beards (Schemnitz 1992). Bill, heavy, slightly downcurved. Head and neck essentially naked in adults; males have protuberance (caruncle) over bill, warts on neck and wattle (sac) on foreneck up to chin; warts and wattle present but less developed in females. Tarsus, long, stout, unfeathered; shorter in domestic and feral populations than in wild populations (Leopold 1943). Males have spur on rear of tarsus.

**AGEING AND SEXING** Reviewed for Wild Turkey by Larson & Taber (1980); criteria applicable to Feral Turkey (Schemnitz 1992).

**GEOGRAPHICAL VARIATION** Wild Turkey has five (Peters) to seven (Campbell 1974) recognized subspecies. Has been domesticated since fifteenth century; all domestic stocks probably derived from nominate *gallopavo* of central Mexico.

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