



## Modern Bird Diversity

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# Classifying Modern Birds

- ▶ Class: Aves
- ▶ Order: Passeriformes
- ▶ Family: Turdidae
- ▶ Genus: *Ixoreus*
- ▶ Species: *I. naevius*
- ▶ Specific Epithet: *naevius*



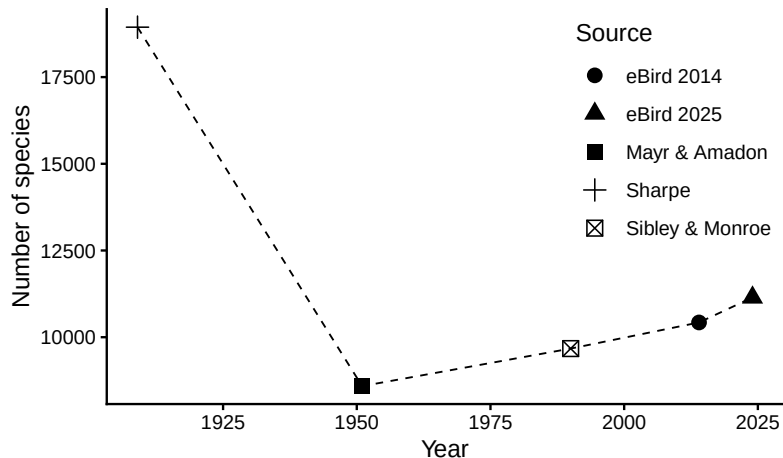
# Classifying Modern Birds

How do we quantify taxonomic diversity in birds?

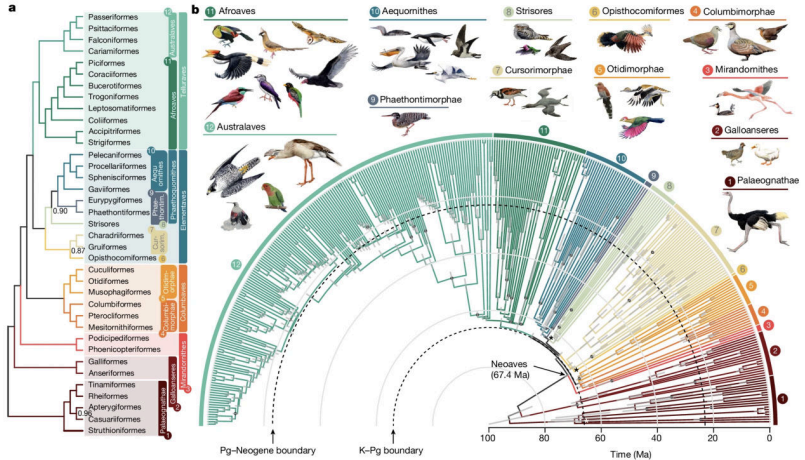
- ▶ 1 class
- ▶ ~40 orders
- ▶ ~247 families
- ▶ ~2312 genera
- ▶ ~10,699 species

\*via Gill & Prum. Know these to an order of magnitude!

# Why might species numbers change over time?



# Higher-level Avian Taxonomy



(Stiller et al. 2024)

# Paleognathae



Stuthioniformes (ostriches, 2 spp.)

(*Struthio camelus*)

# Paleognathae



Rheiformes (Rheas, 2 spp.)

(*Rhea americana*)

# Paleognathae



Apterygiformes (Kiwis, 5 spp.)

(*Apteryx maxima*)



## Paleognathae



Casuariformes (Emus and Cassowaries, 4 spp.)

(*Casuarus casuarius*)

# Paleognathae



Tinamiformes (Tinamous, 47 spp.)

(*Tinamus major*)

## Neognathae: Galloanseres



Important orders: Galliformes (“landfowl”, 300 spp.)

(*Alectura lathamī*)

## Neognathae: Galloanseres



Anseriformes (“waterfowl”, 177 spp.)

(*Anseranas semipalmata*)

## Neognathae: “Orphaned” Neoaves



Caprimulgiformes (swifts, nightjars, hummingbirds, etc., 602 spp.)

(*Uropsalis lyra*)

## Neognathae: “Orphaned” Neoaves



Cuculiformes (cuckoos, 149 spp.)

(*Coccyzus longirostris*)

## Neognathae: “Orphaned” Neoaves



Columbiformes (pigeons, 344 spp.)

(*Ptilinopus magnificus*)

## Neognathae: “Orphaned” Neoaves



Charadriiformes (shorebirds, gulls, terns, etc., 383 spp.)

(*Leucophaeus pipixcan*)



# Neognathae: Neoaves: Aequornithes



Sphenisciformes (penguins! 18 spp.)

(*Pygoscelis papua*)

## Neognathae: Neoaves: Aequornithes



Procelariiformes (tube-nosed seabirds, e.g. petrels and albatrosses, 147 spp.)

(*Diomedea sanfordi*)

## Neognathae: Neoaves: Aequornithes



Pelecaniformes (pelicans, ibises, Shoebill, etc., 118 spp.)

(*Theristicus caudatus*)

Neognathae: Neoaves: Telluraves: Afroaves



Accipitriformes (raptors, 266 spp.)

(*Theristicus caudatus*)

Neognathae: Neoaves: Telluraves: Afroaves



Strigiformes (owls, 244 spp.)

(*Otus rutilus*)

Neognathae: Neoaves: Telluraves: Afroaves



Coraciiformes (kingfishers and relatives, 177 spp.)

(*Baryphengus martii*)

Neognathae: Neoaves: Telluraves: Afroaves



Piciformes (woodpeckers and relatives, 445 spp.)

(*Hemicircus concretus*)

Neognathae: Neoaves: Telluraves: Australaves



Psittaciformes (parrots, 398 spp.)

(*Probosciger aterrimus*)



Neognathae: Neoaves: Telluraves: Australaves



Falconiformes (falcons / “murder parrots”, 67 spp.)

(*Herpetotheres cachinnans*)

Neognathae: Neoaves: Telluraves: Australaves



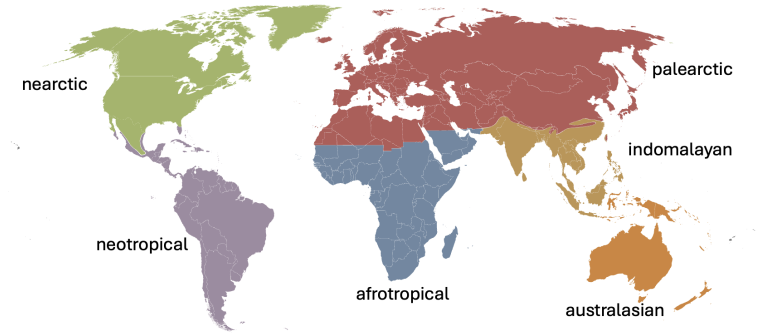
Passeriformes (“perching birds”, 6,456 spp.) (!)

(*Setophaga townsendi*)

Which of the following is *not* a member of Neoaves?

- a) Canada Goose
- b) Ring-necked Parakeet
- c) Rufous Hummingbird
- d) Ring-billed Gull
- e) Burrowing Owl

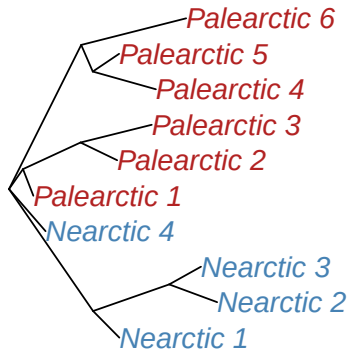
# Biogeographic Realms



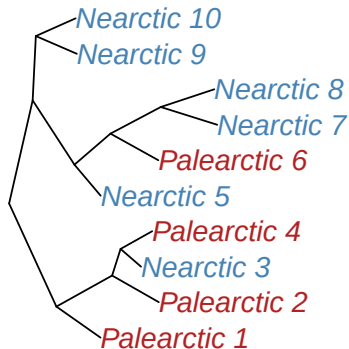
(*Herpetotheres cachinnans*)

Which phylogeny is more consistent with these regions?

**A**



**B**



## Nearctic: 1 endemic Subfamily

Endemism / endemic: the state of a taxon being found only in a single defined geographic location



Timaliinae (Wrentit)

(*Chamaea fasciata*)

Palearctic: 1 endemic family



Prunellidae (accentors)

(*Prunella collaris*)

“Holarctic”: 4 endemic families or subfamilies



Gaviidae (divers or loons), Tetraoninae (grouse), Alcidae (auks), and Bombycillidae (waxwings).

(*Bombycilla garrulus*)



## Neotropical: 31 families



Rheidae (Rheas), Ramphastidae (toucans), Jacamars (Galbulidae), many more

(*Rhea americana*)

## Afrotropical: 6 families



Coliidae (mousebirds), Struthionidae (ostriches), Numididae (guinea fowl)

(*Colius striatus*)

Indomalayan: 1 endemic family



Irenidae (fairy-bluebirds)

(*Irena tweeddalii*)

## Australasian: 13 endemic families

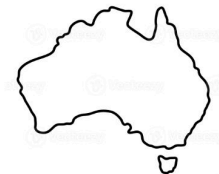


Meliphagidae (honeyeaters), Paradisaeidae (birds of paradise),  
Cacatuidae (cockatoos)

(*Pteridophora alberti*)

# Speciation, extinction, and dispersal shape biogeography

Where would you expect to find higher levels of endemism and why?



- a) Montana: It is more centrally located in its continent
- b) Australia: It experiences less extinction
- c) Montana: It experiences more extinction
- d) Australia: It is more isolated from other landmasses

## References

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