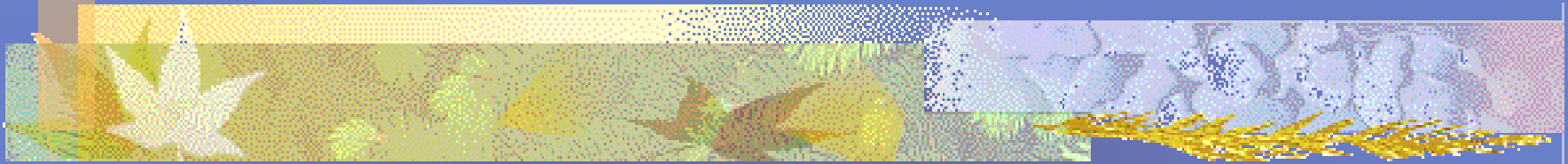


Introduction to Ornithology



Presentation complements of Old Rag Master
Naturalists
by Cathy Mayes



Introduction to Ornithology

- Taxonomy
- Anatomy
- Life Cycle
 - Breeding
 - Foraging
- Molting
- Migration
- Bird Watching
- Conservation & Management



Taxonomy of Birds

Kingdom – Animalia

Phylum – Chordata

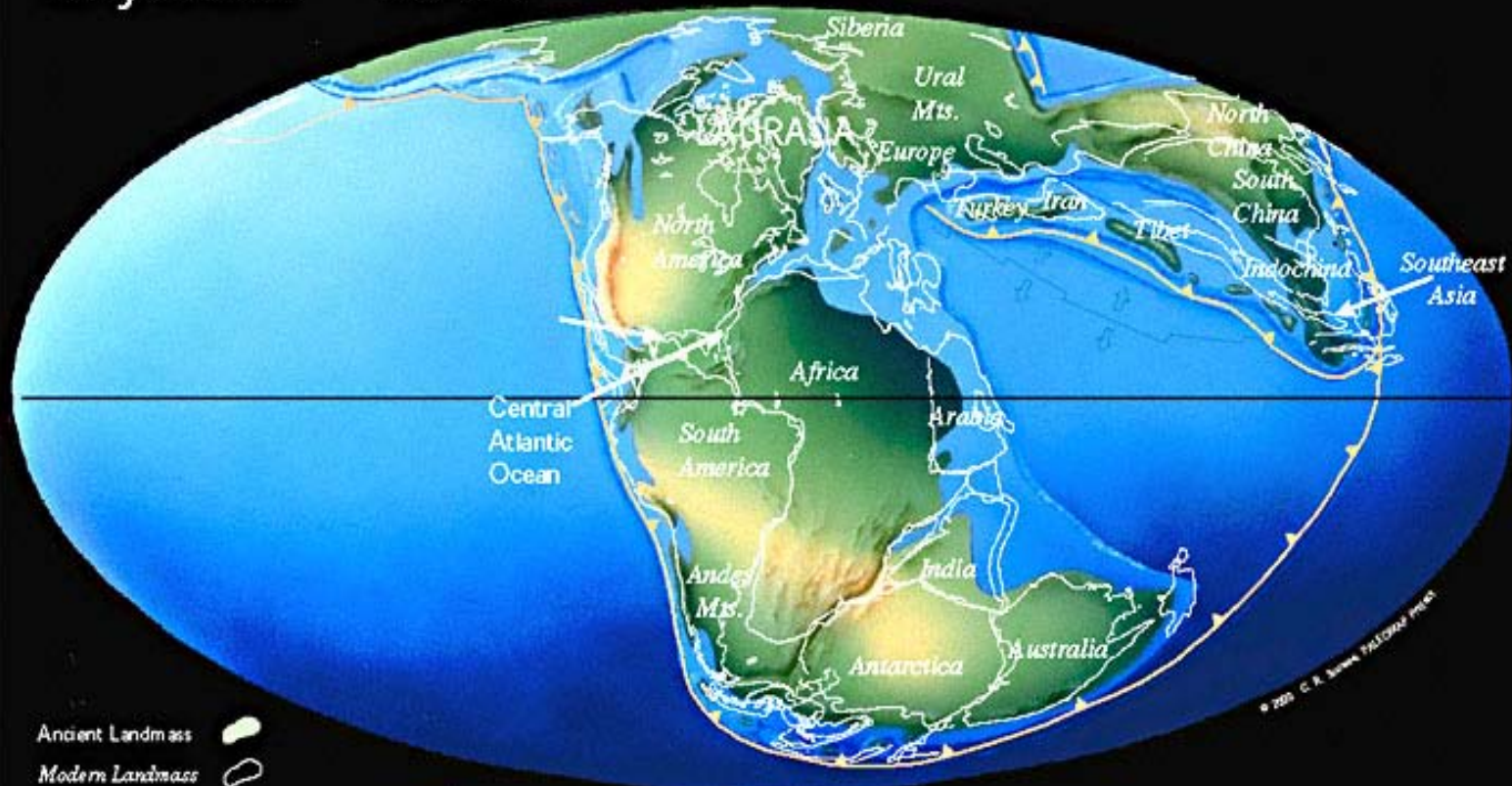
Class – Aves





Order – Passeriformes, Galliformes,...

All orders end in “iformes

Evolution of Birds

Early Jurassic 195 Ma



- Ancient Landmass 
- Modern Landmass 
- Subduction Zone (triangles point in the direction of subduction) 
- Sea Floor Spreading Ridge 

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Evolution of Birds

- Undeniably, birds descended from reptiles.
 - Archaeopteryx
- Characteristics shared by birds and reptiles
 - Single occipital condyle
 - Lower jaw articulates with movable quadrate bones like lizards and snakes. Not hinged as in mammals.
 - Single bone in ear
 - Scales
 - Feathers are actually modified scales
 - Lay eggs







What makes a bird a bird?

- Feathers
- Flight for most
- Bills/beaks
- Lay hard-shelled eggs



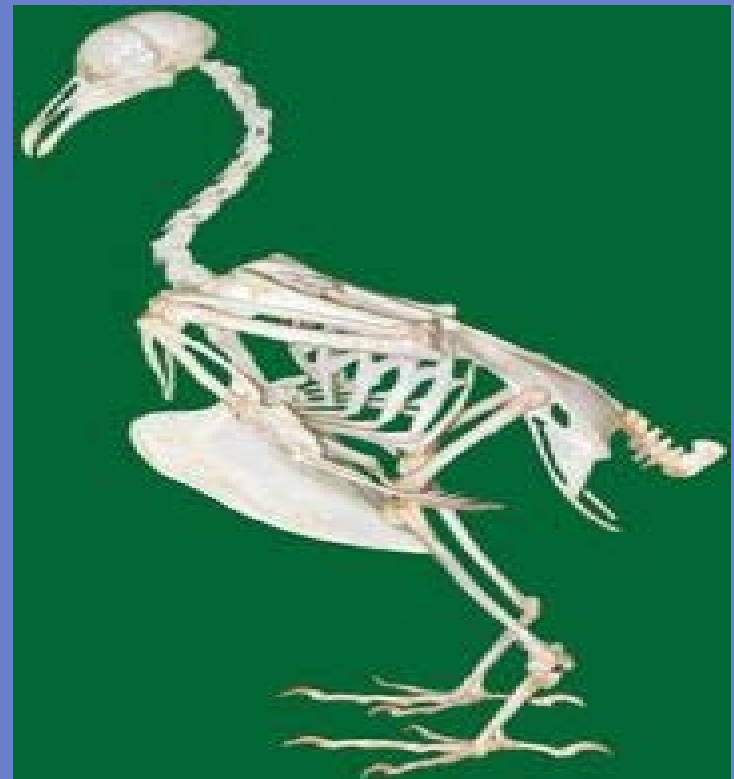
Anatomy of a Bird

- Skeleton
- Feathers
- Bills and Beaks

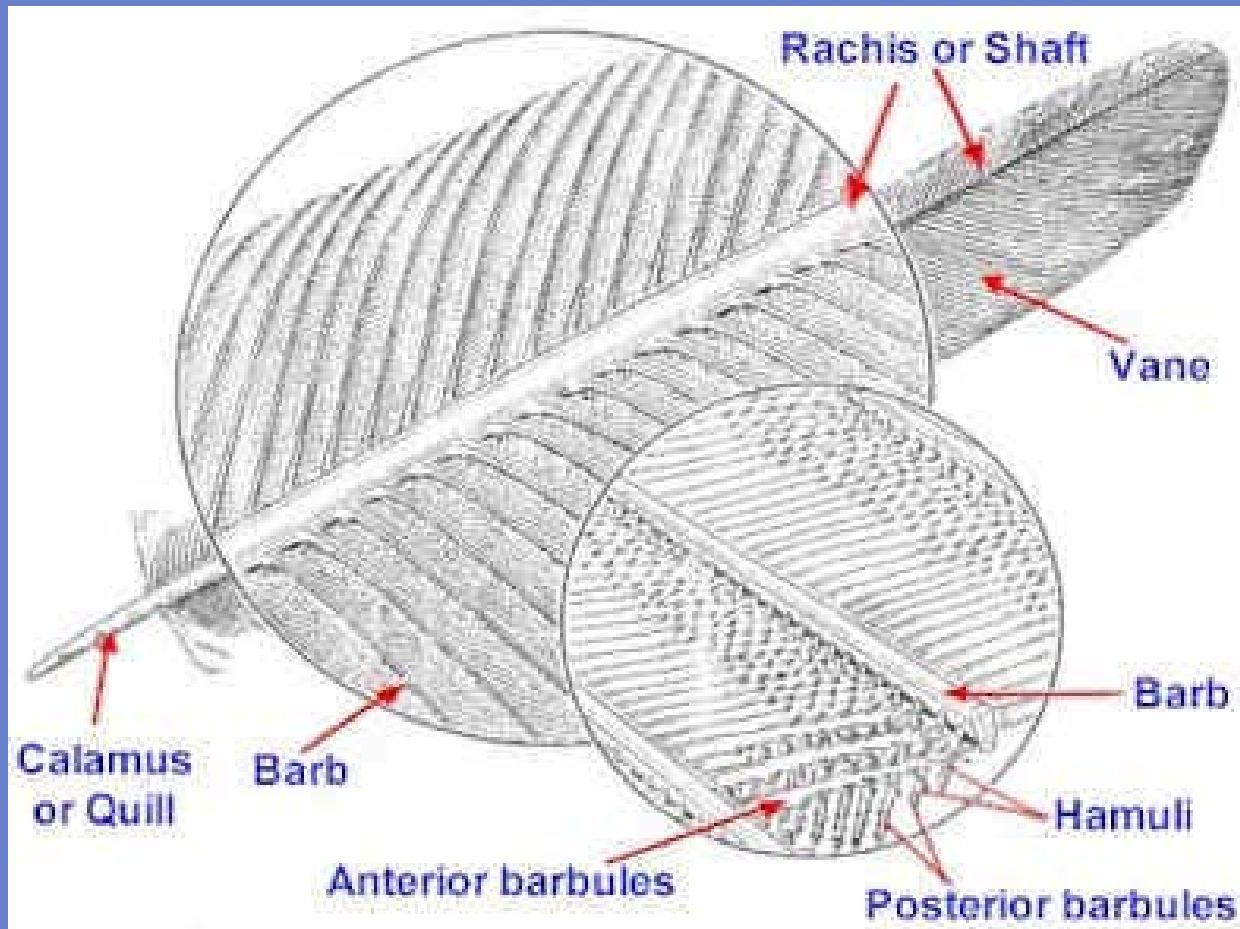
Skeleton of a bird

Adaptations for flight:

- Fusiform Shape/streamlining
- Porous Bones
- “Keel”
- Fused Vertebrae
- 4 Toes



Anatomy of a Contour Feather



Coloration

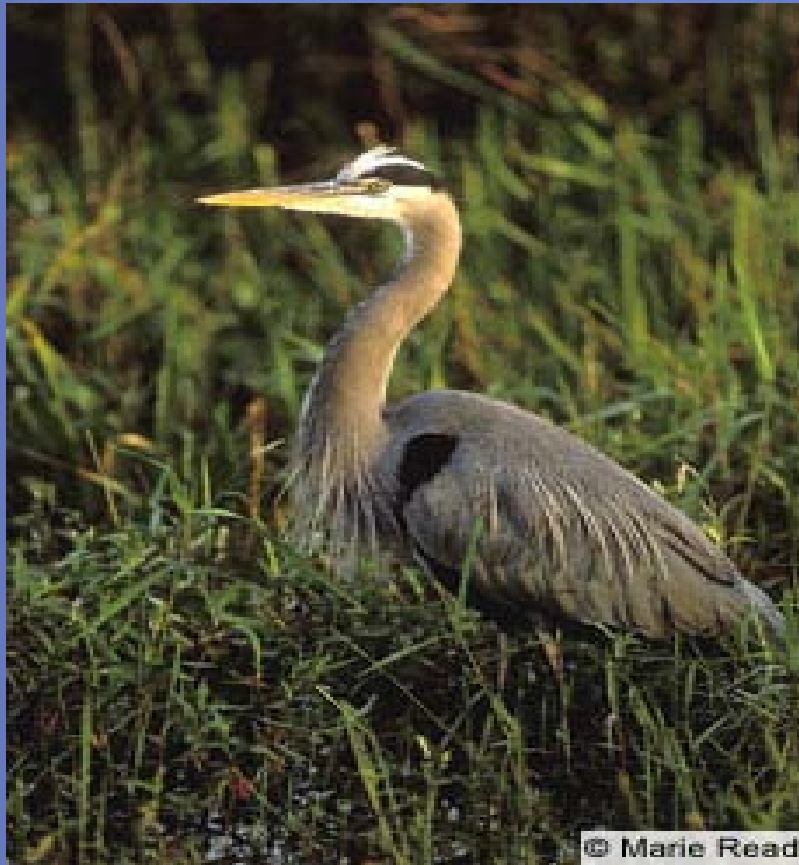




Feather types

1. **Contour** – includes flight, body and auriculars (ear coverts)
2. **Semiplumes** – small, white feathers hidden beneath contour feathers
3. **Down** – fluffy tuft usually for insulation
4. **Filoplumes** – slender hair-like feathers found near all body feathers.
5. **Bristles** – stiff, tapered feather found almost exclusively on face and neck.

Bills and Beaks



Bills and Beaks



Osprey



Life Cycle of a Bird

- Foraging
- Breeding
- Molt
- Migration

Foraging



American kestrel



Breeding - courtship

- Birds have very unique and complex courtship and breeding strategies
- Coloration in feathers play large role in courtship
- Singing, mate feeding, dancing
- Monogamy to polygamy
- Seasonal mate selection to life-long partnerships.

Breeding - Sexual Dimorphism



Sexual Dimorphism





Bird Songs

- Songs range from simple to complex
- Singing typical for males. Some species the females sing.
- Function – Advertisement
 - Territorial
 - Attracting mate – fitness (loudest singer, etc)
 - Pair bonding

Breeding – Egg laying

- Variations in size, shape, and color
- Clutch sizes
 - Determinate vs. indeterminate
 - Multiple clutches
 - Incubation
 - Brood parasitism



Common Nest Types



Common Nest Types



Molting



Eastern Meadowlark
(eclipse plumage)



Eastern Meadowlark
(breeding plumage)



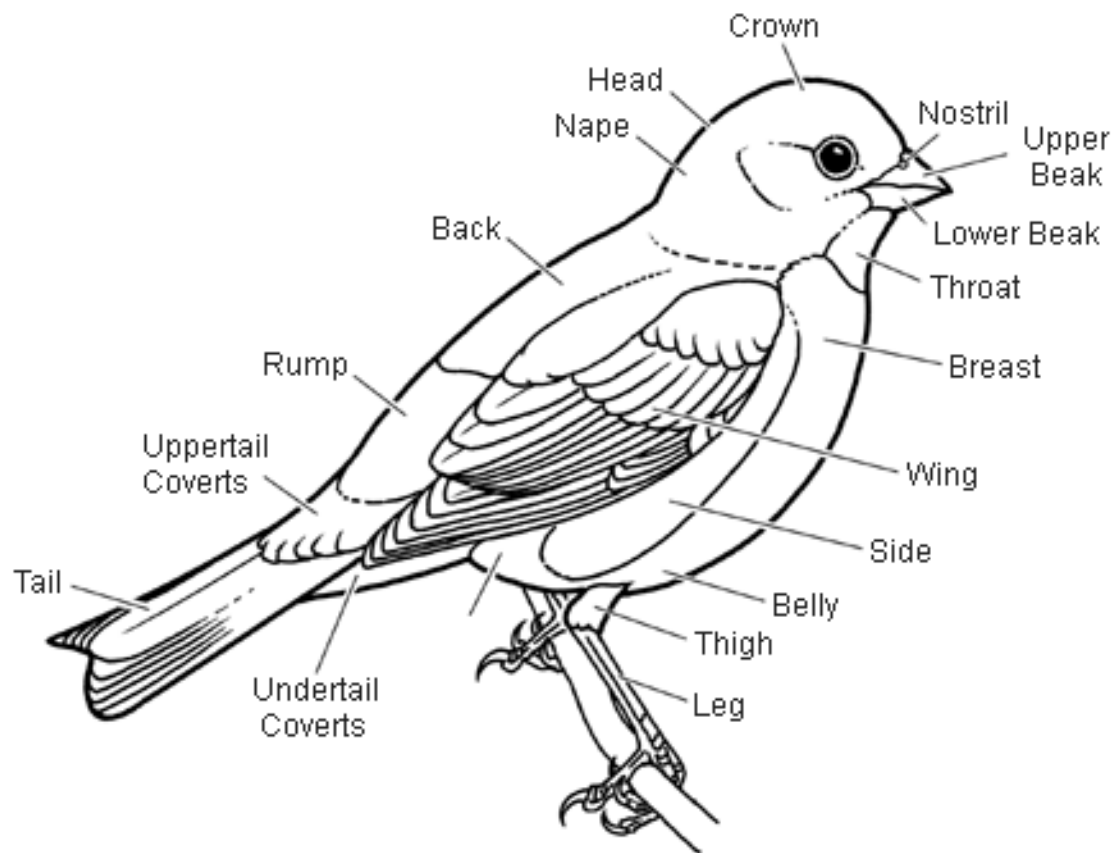
Bird Watching

- Binoculars and Field Guides
- Song
- Silhouette
- Field marks
- Habitat

Silhouettes



Field Marks



Wing Bars & Eye Rings



Female American Goldfinch



Female Scarlet Tanager



Threats to Bird Populations

- Habitat loss
- Pesticides
- Man
- Predation

Declining Forest Birds



Ovenbird



Black-and-white warbler

Declining Forest Birds



Male Golden-winged
Warbler



Wood thrush

Declining Meadow Birds



Bunching grass

- Bunching grasses
- Herbs and Forbs
- Legumes

Birds of the Edges



Male



Female

Red-bellied woodpecker



Human Causes of Bird Fatalities

Buildings/windows	5,500
Cats	1,000
Power lines	800
Communication Towers	750
Pesticides	700
Vehicles	700
Wind Turbines	1
Other	1,000
Total	10,451

Source: Erickson, *et.al*, 2002. "Summary of Anthropogenic Causes of Bird Mortality" Proceedings of the 2002 International Partner's in Flight Conference, Monterrey, California.

What feathered morsel is in my
eyes?



Predation



Male



Female



Picture credits: Cornell Laboratory of Ornithology

Pbase.com

National Wildlife Federation