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
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

© Marie Read

© Jim Wedge/CLO
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
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
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 grasses
- Herbs and Forbs
- Legumes

Bunching grass
Birds of the Edges

Red-bellied woodpecker

Male

Female
# Human Causes of Bird Fatalities

<table>
<thead>
<tr>
<th>Cause</th>
<th>Mortality Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Buildings/windows</td>
<td>5,500</td>
</tr>
<tr>
<td>Cats</td>
<td>1,000</td>
</tr>
<tr>
<td>Power lines</td>
<td>800</td>
</tr>
<tr>
<td>Communication Towers</td>
<td>750</td>
</tr>
<tr>
<td>Pesticides</td>
<td>700</td>
</tr>
<tr>
<td>Vehicles</td>
<td>700</td>
</tr>
<tr>
<td>Wind Turbines</td>
<td>1</td>
</tr>
<tr>
<td>Other</td>
<td>1,000</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>10,451</strong></td>
</tr>
</tbody>
</table>

What feathered morsel is in my eyes?
Predation

Male

Female
Picture credits: Cornell Laboratory of Ornithology
Pbase.com
National Wildlife Federation