**Introduction to Tropical Birds**

**Body Plan & Terminology**

**HEAD:**
- lores (b/w eye & bill)
- eyestripe vs. superciliary
- eye ring
- malar stripe (mustache)
- nape vs. throat

**BODY:**
- chest (breast)
- belly
- vent (b/w legs & tail)
- rump (dorsal)

**FEET:**
- zygodactyl vs. anisodactyl

**FLIGHT FEATHERS:**
- primaries (wing)
- secondary coverts ("shoulder")
- wing bars (tips of coverts)
- rectrices (tail)

**Adaptations to Flight**

**Energetically Expensive:**
- "hollow" bones
- reduced musculature (legs)
- ovovivipary
- poop (or regurgitate) before flight
- one-way air flow

**Colors - Specialized Terminology**

**Terminology:**
- rufous - reddish chestnut
- fulvous - dull yellow
- cerulean - bright blue
- plumbeous - lead color ("plomo")
- vermilion - bright red

Taxonomy & Diversity

Class Aves

Best understood at family level:
- hummingbirds
- woodpeckers
- toucans, etc., all are families

Well-established (English) common names

9,900 spp. worldwide
- S. America = 3200
- Ecuador = 1616
- USA = 770 species

Body Plan & Terminology
**Color Pigments vs. Structural Colors**

**Pigments:**
- black: melanin; adds strength (to keratin); wingtips
- red, orange, yellow: carotenoids

**Structural Colors:**
- blue: fine surface particles (melanin) scatter light
- green: coarse particles scatter differently (Parrots)
- green 2: blue-scatter atop yellow pigment

**Geographic Distribution of Color**

**Are tropical birds more colorful?**
more blues & greens in tropics

**Coloration by habitat usage**
- **canopy:** colorful - low predation, visual mate selection
  songs are boring
- **understory:** cryptic [or iridescent] - high predation risk
  songs are gorgeous
- **migrants:** colorful (breeding) + drab (non-breeding)

**Bird Song**

**Species Identification**
- “if you have to see the bird, you’re already lost”
- we will learn common calls in each site
- pay attention to tone and structure

**Why Sing?**
- territory establishment & defense
- attract mates, and pair-bond
- song vs. alarm call vs. contact note

**Types of sounds**
- **song** (pyriform): musical, whistle, or click/rustle
- bill clatter: toucans
- wing snap: manakins
- wing flap: pigeons
- drumming: woodpeckers

**Tropical vs. Temperate Birds**

**Diversity**
- **Cocha Cashu** (Peru) = 245 spp.
- **Hubbard Brook** (USA) = 29 spp.
  *Flycatchers*

**Abundance (Density)**
- approximately equal
  - tropical: 1200 – 2000 birds/ha
  - temperate: 1200 – 2000 birds/ha

**Biomass**
- tropics = 5X temperate (bird kg/ha)
  *Cracids* -- rely on year-round fruit

**Tropical vs. Temperate Birds**

**Diversity**
- **Cocha Cashu** (Peru) = 245 spp.
- **Hubbard Brook** (USA) = 29 spp.
  *Flycatchers*

**Abundance (Density)**
- approximately equal
  - tropical: 1200 – 2000 birds/ha
  - temperate: 1200 – 2000 birds/ha

**Biomass**
- tropics = 5X temperate (bird kg/ha)
  *Cracids* -- rely on year-round fruit
Intro to Tropical Birds

“Cracids” (family Cracidae)

Tropical vs. Temperate Birds - Reproduction

Breeding Season
- Temperate: breeding concentrated in summer
  - longer day length
- Tropics: breeding spread out

Eggs
- Temperate: 1-2 clutches/year
  - 3-5 eggs / clutch
- Tropics: 2-4 clutches/year
  - 2-3 eggs / clutch

Nest Predation
- much higher in tropics: 80-90% of nests
  - may explain why migrants breed in temperate zone

Tropical Nestlings - Feeding & Wing Growth

- tropical nestlings fed more often
- tropical nestlings grow wings faster

South Carolina
- Carnivore: 13%
- Insectivore: 68%
- Frugivore: 16%

Peru (Cocha Cashu)
- Carnivore: 11%
- Insectivore: 53%
- Frugivore: 35%

Bird Groups & Characteristics - by Habitat

FOREST INTERIOR:
- larger eyes
- cryptic coloration, complex songs
- ecologically restricted, poor dispersers: narrow ranges
- small clutch sizes, high predation
  - populations falling
  - many endangered species

NON-FOREST (Gap + Edge):
- smaller eyes
- generalized morphology, simple songs
- ecologically broad, good dispersers
  - populations growing
  - humans creating Gaps and Edges

“Boiga irregularis”

Tropical Nestlings

South Carolina

Peru (Cocha Cashu)

Fruit Availability:
- Costa Rica: 90% of trees w/ fleshy fruits
  - 50% = bird-dispersed
- Martin 2015
Joe Meisel SPAS™ Identification System

**Shape, Posture, Activity and Song**

**Shape:**
- bill: primary tool, reflects diet
  - primary vs. secondary
  - shape: rectangular, hooked, etc.
- head: small or large
- neck: long or short
- legs: long or short
- feet: anisodactyl or zygodactyl
- tail: long or short, pointed or squared

**Posture:**
- upright, erect vs. horizontal
- hunched vs. elongated
- neck in flight: straight or retracted?
- wings in flight: flat or dihedral?

**Activity:**
- pounding trunk: woodpecker
- hitching up trunk: woodpecker, woodcreeper (no-pounding)
- hover over flower: hummingbird
- “sally flight”: flycatcher

**Song:**
- use mnemonic devices: “clown car”, “machine gun”, “coke bottle”
- raucous squawking: parrots and macaws
- musical frolicking: wrens; often in duet, always low
- breathy cooing: pigeons
- raspy scream: hawks

**Hummingbirds (Trochilidae)**

Brilliant, tiny, swift flower-feeders

**Sh:** small; long, slender bill
**P:** erect
**A:** hovering w/ fast wingbeats
**S:** non musical, usually clicks; buzzing wingbeats very audible

**Ecology:** nectar-feeders & pollinators; trapline sequence of flowers; polygamy
Tanagers (*Thraupidae*)

Colorful canopy frugivores in flocks

- **Sh:** medium-sized, very “bird-shaped”; average bill
- **P:** horizontal
- **A:** active foragers on small fruits, often moving in mixed-species flocks
- **S:** non-distinctive, twittery chips

**Ecology:** ripe fruits, seed dispersers; mixed-species flocks; highly mobile

---

**Paradise Tanager**
**Trogons (Trogonidae)**

Attractive, sedentary frugivores, heard more than seen

Sh: large-bodied, long tail rectangular (parallel sided); short legs
P: very erect, tail straight below
A: perch, then "sally flight" for fruit
S: regular, repeated "Cow - Cow - Cow - Cow ..."; echoing, ventriloquial
Ecology: dispersers of med. fruits; cavity nesters (w/ wasps, termites)

---

**Surucua Trogon, song**

---

**Woodcreepers (Dendrocolaptidae)**

Camouflaged, trunk-foraging insectivores

Sh: large-bodied, long tail w/ free tips, anisodactyl feet; strong, long bill
P: long-bodied, head first up a tree
A: "hitch" up trunk, swoop to next; flick bark & leaves for insects
S: loud, forceful calls, unmusical; often repetitive
Ecology: insectivores, solo + mixed species; predators -> insect diversity
**Toucans & Araçaris (Ramphastidae)**

*Brash, frugivore/omnivores, travel in packs*

- **Sh**: big classic bill, large bodied, short legs
- **P**: erect, breast puffed out
- **A**: perch in open canopy; travel in groups; reach for fruits; *gulpers*
- **S**: croakers (like frog) vs. yelpers (like puppy)

*Ecology*: frugivores & carnivores; seed dispersers; altitudinal migrants
**Toco Toucan, nest robbing**

**Flycatchers (Tyrannidae)**

*Active, hyper-diverse insectivores, confusingly marked*

- **Sh:** small-bodied, large head (“cabezón”), flat bill, rictal bristles
- **P:** very erect, head held high (a Tyrant)
- **A:** “sally flight” for aerial insects (“hawking”) from perch in open
- **S:** not musical, but can be distinctive; help ID visually similar species

**Ecology:** open habitats (+ interiors); adaptive radiation; solo

---

**Flycatcher -- Hawking Flight**
Parts of Your Binoculars

- eyepiece
- focus knob
- diopter
- centre hinge
- objective lens

Fold/Unfold to Avoid Double-Vision

Adjust Diopter so Both Eyes See Clearly