



Introduction to Tropical Birds

### 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

**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)

### Body Plan & Terminology

**FLIGHT FEATHERS:**

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

**FEET:**

- zygodactyl vs.
- anisodactyl

### Adaptations to Flight

**Energetically Expensive:**  
▼weight ... ▲efficiency

- "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"*)
- vermillion - bright red


### 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** (*syrix*): musical, whistle, or click/rustle
- bill clatter:** toucans
- wing snap:** manakins
- wing flap:** pigeons
- drumming:** woodpeckers

### Tropical vs. Temperate Birds

**Diversity**

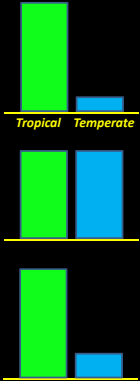
Cocha Cashu (Peru) = 245 spp.  
Hubbard Brook (USA) = 29 spp.  
*\*Flycatchers\**

**Abundance (Density)**

*approximately equal*  
1200 - 2000 birds/ha

**Biomass**

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





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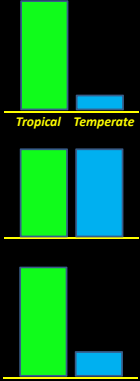
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### Tropical vs. Temperate Birds - Reproduction

**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 produces: ▲ species differentiation  
\*may explain why migrants breed in temperate zone



### Tropical Nestlings - Feeding & Wing Growth

**I**   
tropical nestlings grow slower

**G**   
tropical nestlings fed more often

**C**   
tropical nestlings grow wings faster

from Martin 2015

### Tropical vs. Temperate Birds - Feeding Guilds

**South Carolina**

Guild	Percentage
Carnivore	13%
Insectivore	68%
Frugivore	16%

**Peru (Cocha Cashu)**

Guild	Percentage
Carnivore	11%
Insectivore	53%
Frugivore	35%

**Fruit Availability:**  
Costa Rica: 90% of trees w/ fleshy fruits  
50% = bird-dispersed

### 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
- generalist morphology, simple songs
- ecologically broad, good dispersers  
populations growing  
humans creating Gaps and Edges



Joe Meisel SPAS™ Identification System

Shape, Posture, Activity and Song


SHAPE:

- bill: primary tool , reflects diet
- 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?

BIRD BEAKS



PARAKEETS AND PARROTS



Joe Meisel SPAS™ Identification System

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; polygyny

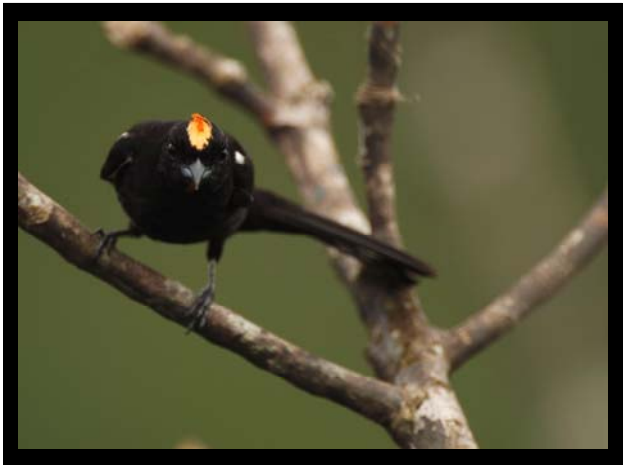




Tanagers (Thraupidae)

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 ...”; 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







Wedge-billed Woodcreeper



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



Ripley the Toucan

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 (+ interior); adaptive radiation; solo



Flycatcher -- Hawking Flight





