Sexual Dimorphism in Yellow-billed Cuckoos

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Sexual dimorphism in birds related to:

- mating system
- food partitioning
- differential parental investment
- individual quality
- mate choice
- intrasexual competition
- role differentiation
- sperm competition

Avian Sexing

- Females heterogametic – CHD gene used to sex birds
- Some species are difficult to sex genetically (raptors, rails, ratites)
- Attempts to sex YBCU in the past have not been successful

Sexual Dimorphism

- Behavioral
- Plumage
- Vocalizations
- Morphology

Behavioral Dimorphism

Yellow-breasted Chat

Plumage dimorphism

Vocalizations

Some species have it all

North American Cuckoos – sexually monomorphic

Objectives

1. Determine if current DNA-based genetic sexing techniques work with Yellow-billed Cuckoos;

2. Determine if tail-spot characteristics can be used to sex cuckoos;

3. Determine if Yellow-billed cuckoos exhibit sexual dimorphism in vocalizations;

4. Determine if morphological measurements and DFA can be used to develop a function to sex Yellow-billed Cuckoos.

Methods

1. Catch cuckoos (2001-2005) on the San Pedro River NCA

2. Send blood samples to Avian Biotech in Florida for sexing.

3. Check genetic sexing against behavioral sexing

METHODS (con ‘t.)

4. Look at vocalizations to determine male-female differences

5. Look at photographs to determine male-female differences

6. Use measurements to build DFA

Take blood samples

Monitor activity every 2-4 days

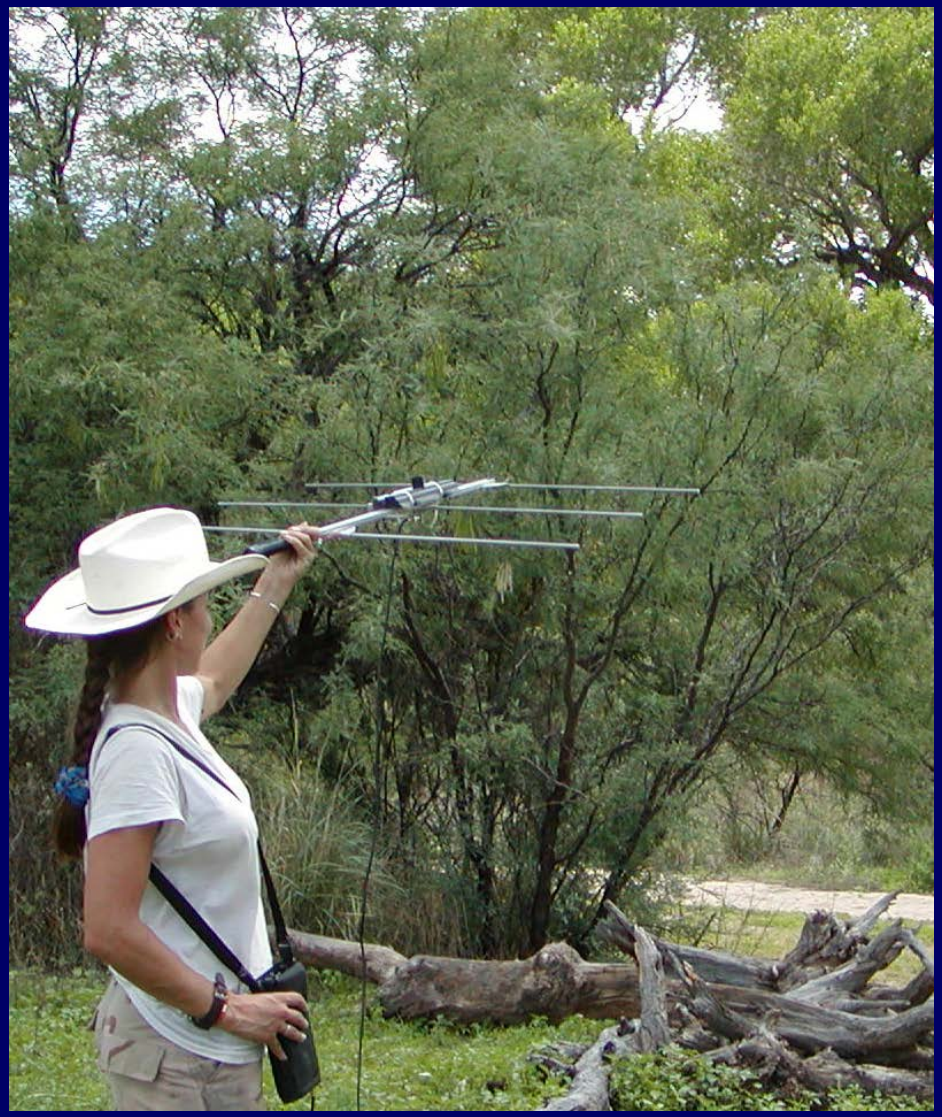
- 2 adults banded in 2001

- 9 adults banded in 2002

-15 adults banded in 2003

-14 adults in 2004

-12 adults in 2005



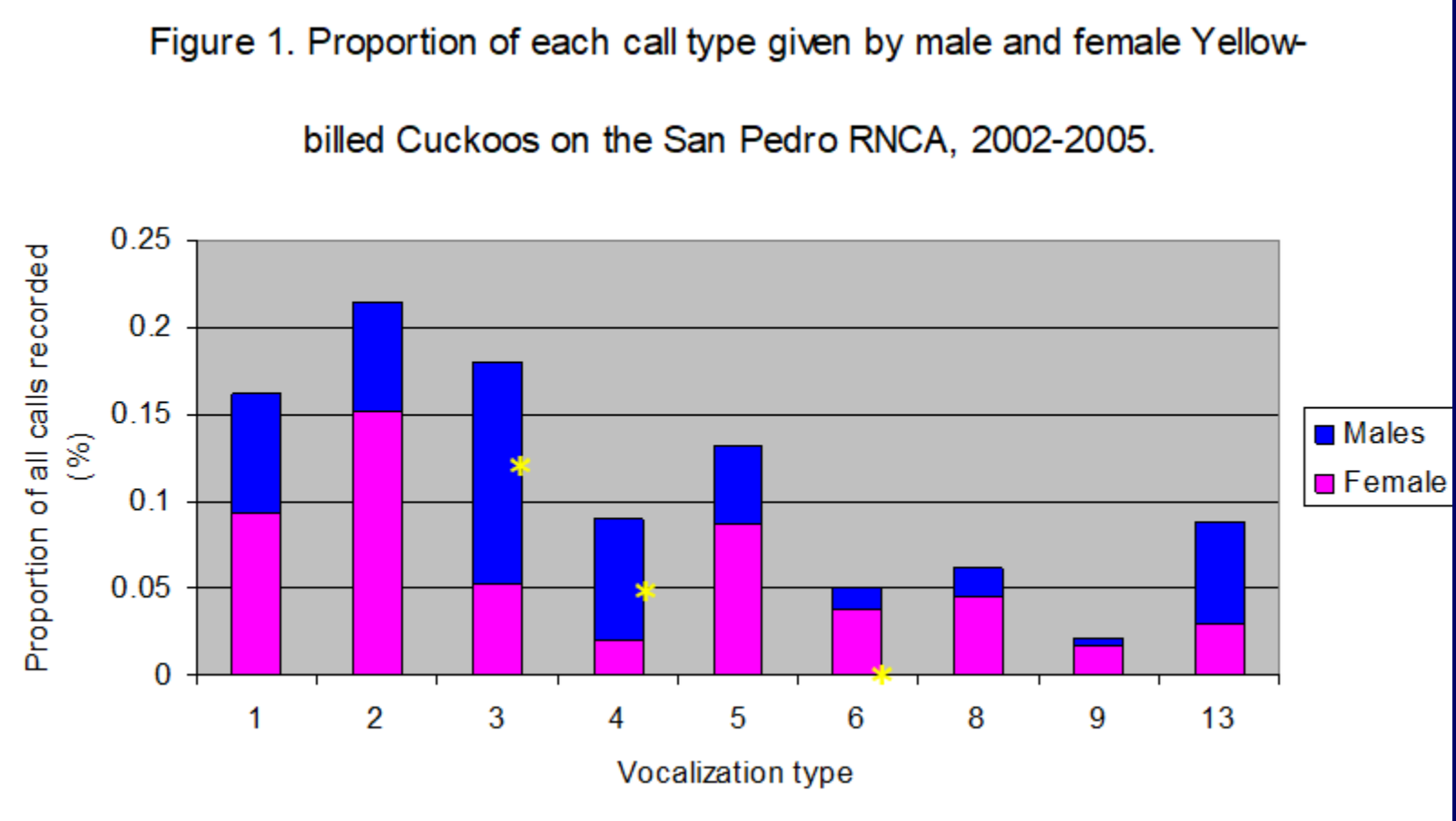
49/52 samples successfully sexed!

Vocalizations

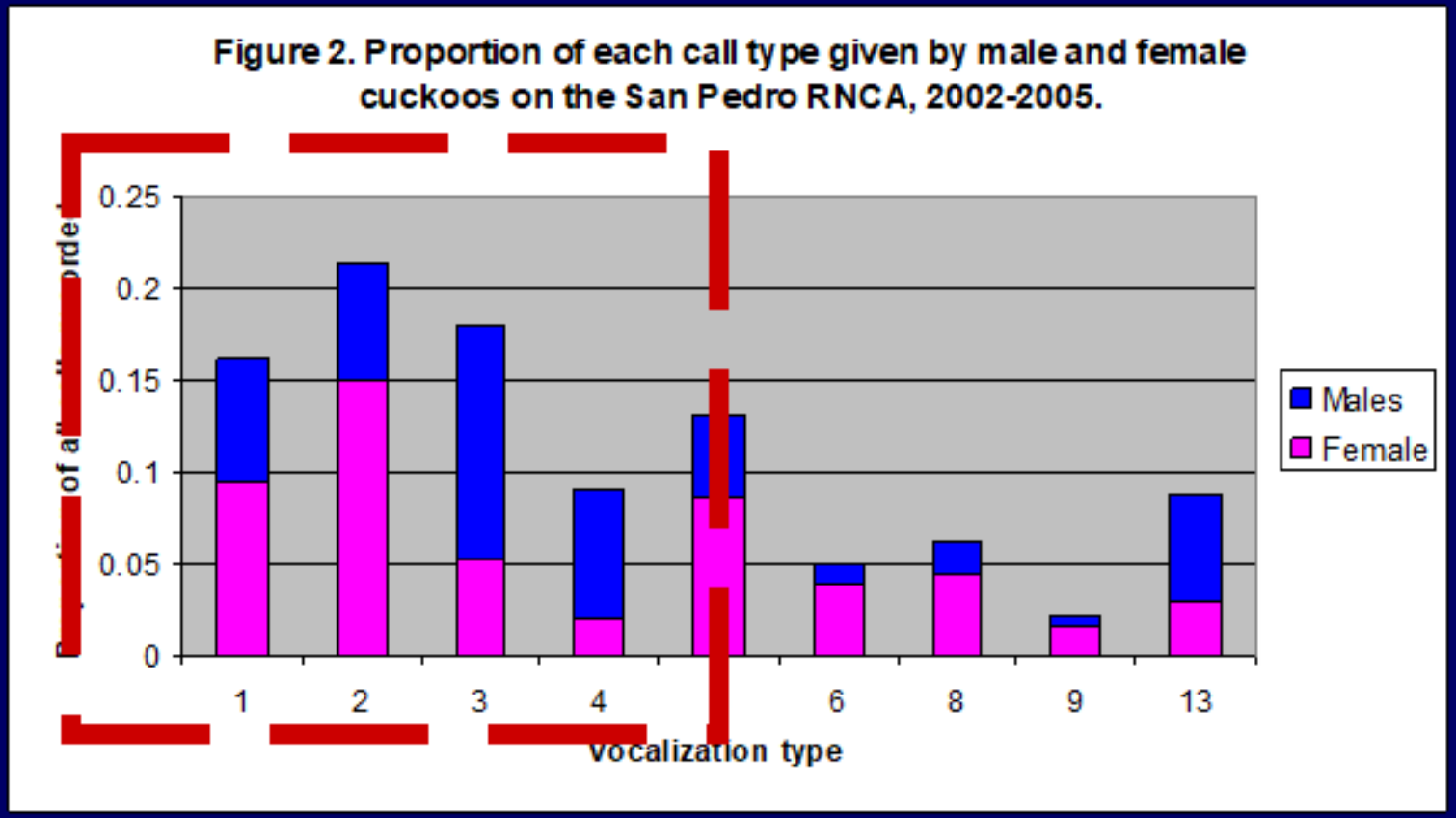
Vocalization Types

- 1. Kuk only
- 2. more kuk
- 3. equal numbers of kuks and kows
- 4. more kows
- 5. kow only
- 6. Coo call

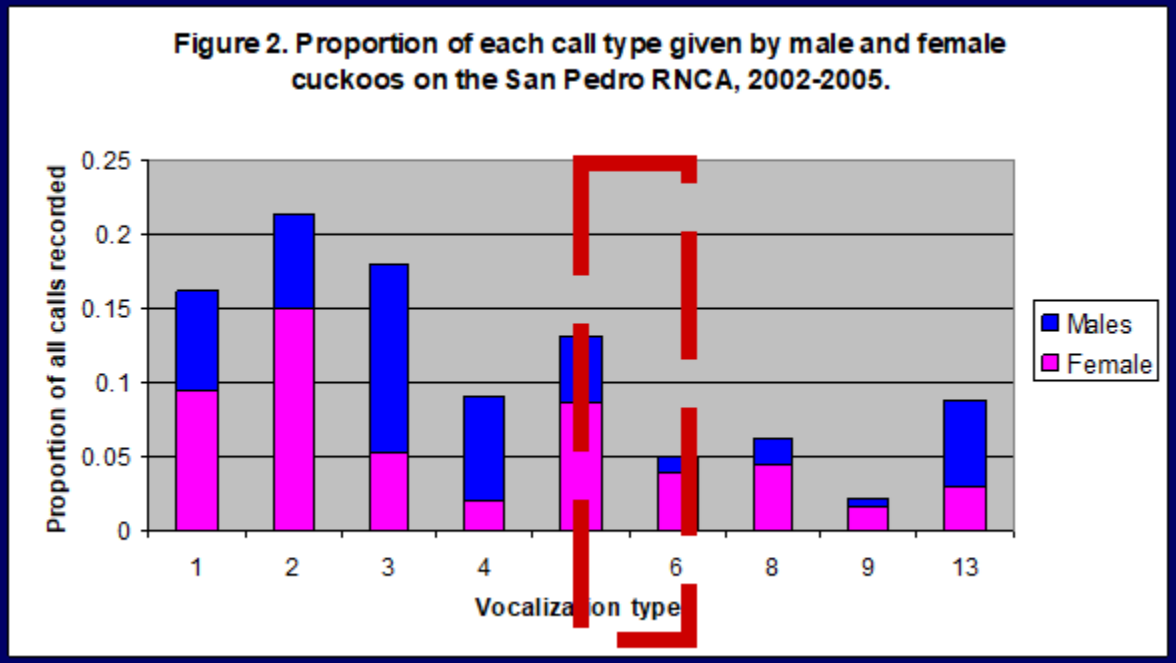
Male and female vocalizations



Male and Female cuckoos have different calls.



Unmated males do not give the coo call.



There is no difference in shape or extent of white in the tail spots.

Table 2. Mean measurements (mm) of ASY male and female Yellow-billed Cuckoos captured on the San Pedro Riparian Conservation Area, 2002-2005. Means+ SD, Sample sizes (N) and ranges are given.

Measurement	Female	Male	*t*-test*
Weight	66.6 ± 6.7 (13) 46 - 80	61.4 ± 5.2 (27) 50 - 73	*t = 1.46*; *p* = 0.081
Wing Chord	151.2 ± 5.0 (13) 145-164	145.7 ± 3.4 (29) 139-152	*t* = 1.56; *p* = 0.067
Bill Length	20.6 ± 1.5 (13) 18.1 - 23.1	20.2 ± 1.3 (28) 16.6 - 23.3	*t* = 0.49; *p* = 0.32
Bill Depth	9.1 ± 0.13 (13) 8.5 - 9.9	8.9 ± 0.5 (28) 7.9-10.1	*t = 0.41*; *p* = 034.
Tarsus	31.64 ± 1.6 (13) 28.5 - 34.6	31.0 ± 1.8 (28) 27.9 - 36	*t* = 0.62; *p* = 0.27
Tail	152.9 ± 8.8 (13) 140 - 173	146.3 ± 9.9 (29) 126 - 168	*t* = 1.58; *p* = 0.062

*t-test assuming unequal variance

Discriminant Function Analysis

Sample DFA function:

1032+9.57260**Wing**+52.40822**BillDepth**+0.52983**Tail**
+0.86655**Weight**

69% Females correctly classified

81% Males correctly classified

Can male and female cuckoos Be separated by DFA?

QUESTIONS

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The Dangers of CuckooBusting - be very afraid!!

Other considerations