



# The Macaulay Library: Using digital media to explore the behavioral phenotype

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Director, Macaulay Library

Cornell University

The **Cornell** Lab  of Ornithology

# Biological Specimens



Magnificent Riflebird  
Specimens at the Netherlands  
Centre for Biodiversity Naturalis



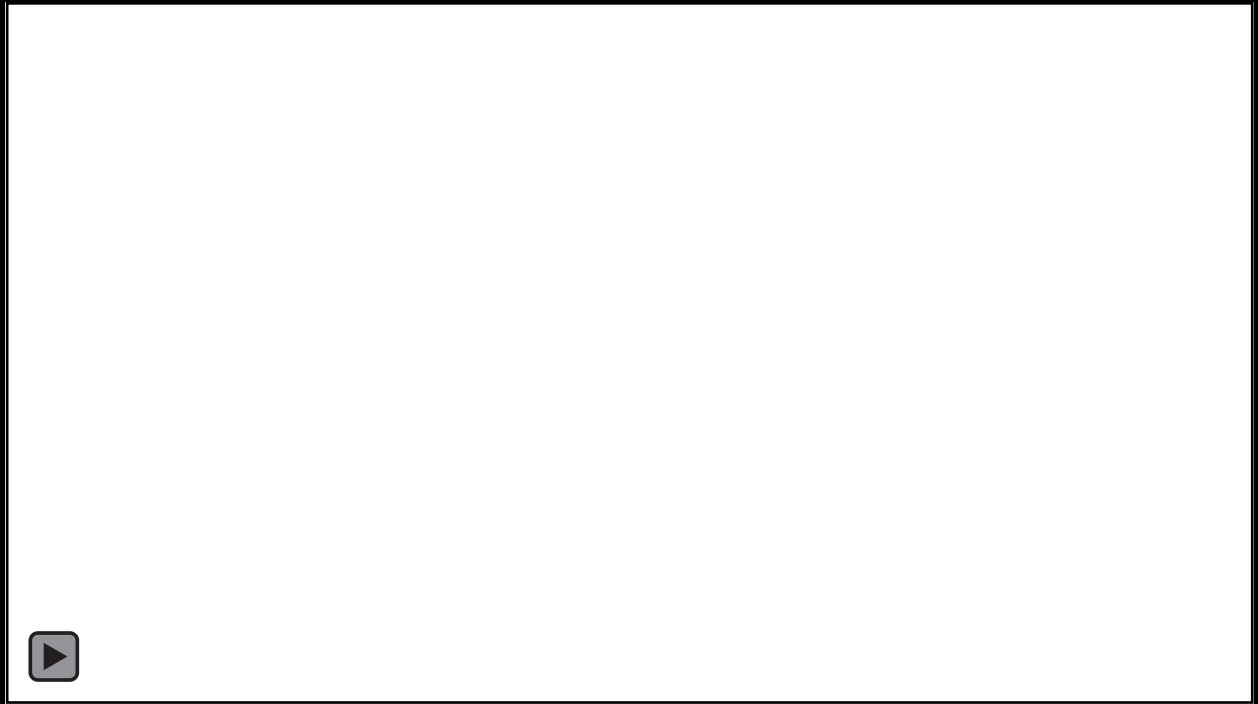
Bird Collection at NMNH  
(Smithsonian Inst)



# Biological Specimens



Magnificent Riflebird  
Specimens at the Netherlands  
Centre for Biodiversity Naturalis



ML Video #455444, Magnificent Riflebird, Indonesia, 2009

# Biological Specimens



Magnificent Riflebird  
Specimens at the Netherlands  
Centre for Biodiversity Naturalis



ML481498 (Piccaninny Plains) & ML481876 (Iron Range NP),  
filmed by Benjamin Clock



# The Macaulay Library



Musician Wren  
(*Cyphorhinus arada*)  
ML Audio #29734  
Recorded by Ted Parker  
August 1982  
Madre de Dios, Peru

The Macaulay collection has over 700,000 audio/video recordings\*



Photo: Conservation International / Haroldo Castro


\*plus over 15.5 Million photos


# Infrastructure

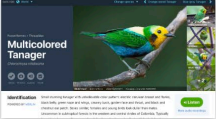
The Cornell Lab of Ornithology  
Macaulay Library Mike Webster (mike-webster) ▾  
Menu ▾

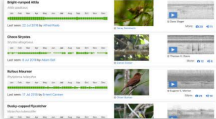
**Your wildlife media archive since 1929**  
Explore birds, amphibians, mammals, and more

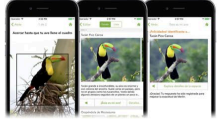
🔍 Enter species name

Orange-breasted Sunbird *Anthobaphes violacea* © Andrew Spencer Macaulay Library eBird 

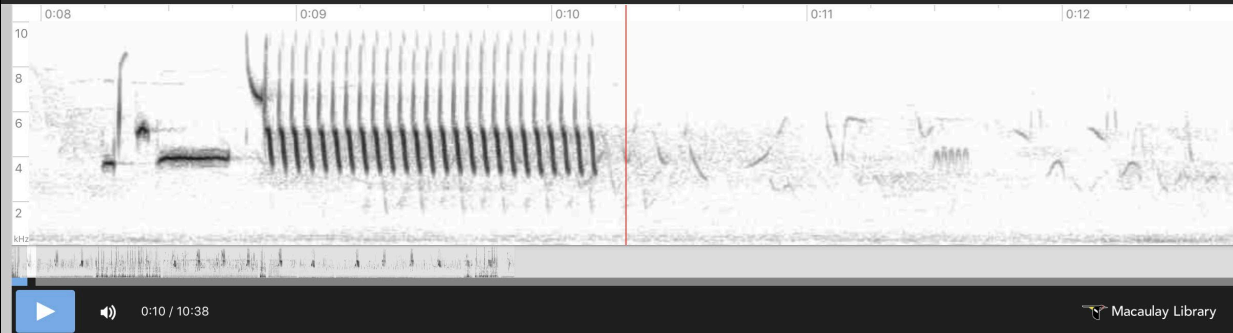
  
**Archive your media**  
Anyone can contribute media to the archive.  
[Archive your media](#)

  
**Explore Species**  
🔍 Enter species name  
Maps, stats, photos, and sounds for any bird in the

  
**Explore Regions**  
🔍 Enter a county, state, pro  
Top rated media anywhere in the world

  
**Merlin Bird ID**  
Free, instant bird ID help for 3,000+ North, Central, and South American, and European birds.

- Currently >140 Tb
- Homemade database (Oracle, moving to Postgres)
- Search (Solar, moving to Postgres)
- Hardware = Cornell IT, but moving to Cloud



## Swamp Sparrow

*Melospiza georgiana* | ML169006

★★★★★ 5 ratings

✓ Your rating: 4

Share

Embed

Add to request

© Matthew D. Medler  
[Search this contributor](#) | [Profile](#)

23 May 2012

Arnot Forest; Irish Hill

Schuyler, New York, United States

[Search this location](#) | [Illustrated Checklist](#)



Age and Sex Unknown – 1

Sounds Song

Behaviors

Breeding

Tags ;

Playback Not Used

Specimen ID CUMV Bird specimens 54895

### Comments

This sparrow was recorded and observed between 11:29 am and 1:19 pm. Phenotypically, it appeared to be a Swamp Sparrow (*Melospiza georgiana*), with a rufous crown, gray median stripe, gray supercilium, brown eyestripe, light moustachial strip and lateral throat-stripe separated by a white malar, white throat, gray breast with light gray streaking, rufous flanks, strongly rufous wings, streaked upperparts, and a rufous tail. However, the bird consistently sang these two unusual song types, unlike any

### Edit ML169006

Download original

License Any Use

Original file 169006.wav  
 (audio/wav)  
 File size: 0KB

Uploaded date 2016-07-20 14:06:34

Source/project ml

### Technical Information

Recorder NAGRA ARES-BB+

Microphone Telinga Pro 6

Accessories Telinga Parabola 54.7cm/15.5cm  
 (21.5in/6.1in)

# Media

# “Specimens”



## Swamp Sparrow

*Melospiza georgiana*

ML169006

© **Matthew D. Medler**  
[Search this contributor](#) | [Profile](#)

📅 **23 May 2012**

📍 **Arnot Forest; Irish Hill**  
Schuyler, New York, United States  
[Search this location](#) | [Illustrated Checklist](#)



42.278, -76.666

[Map](#)

**Age and Sex** Unknown – 1

**Sounds** [Song](#)



**Indigo Bunting** - *Passerina cyanea*  
**Song Sparrow** - *Melospiza melodia*

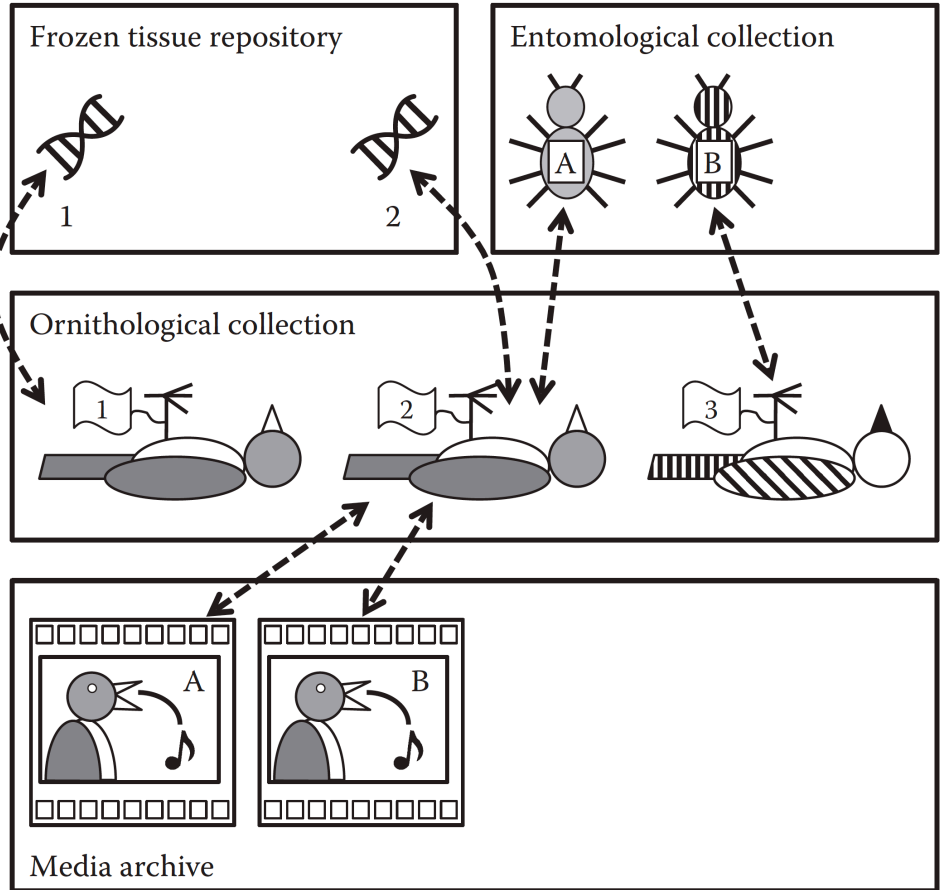
# Media “Specimens”

Photo by Vanya Rohwer



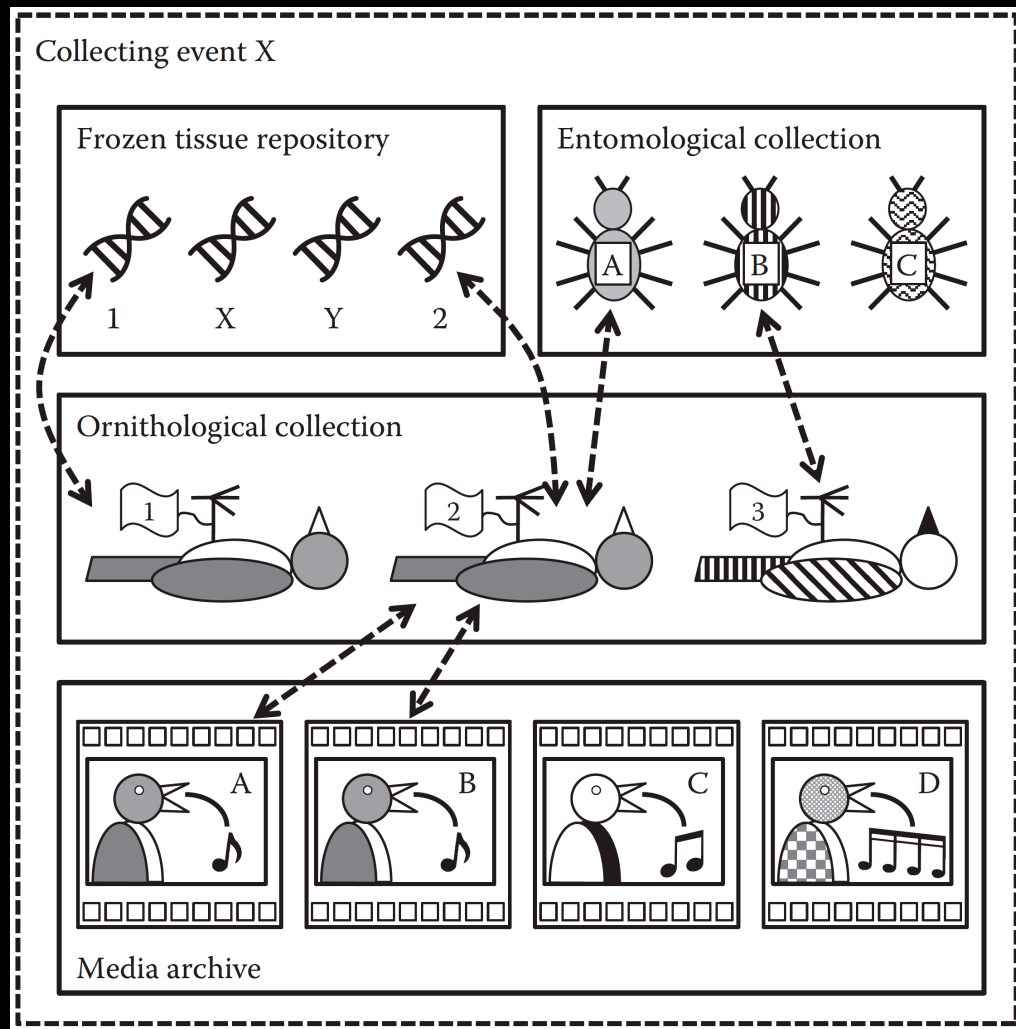
# Extended Specimens

Collecting event X



# Extended Specimens

- (1) Blurs distinction between specimens and data
- (2) Organized around specimens, but also collecting events



# Sources of Media



- The original contributor (e.g., recordist) retains copyright and owns the media.
- Licenses it to ML, usually for “any lab use”.
- License is similar to CC-BY, but does not allow (automatically) for any use.
- Contributors are not charged a fee.
- No fee to use media for research and most educational purposes.

# Sources of Media



Researchers



Citizen Scientists

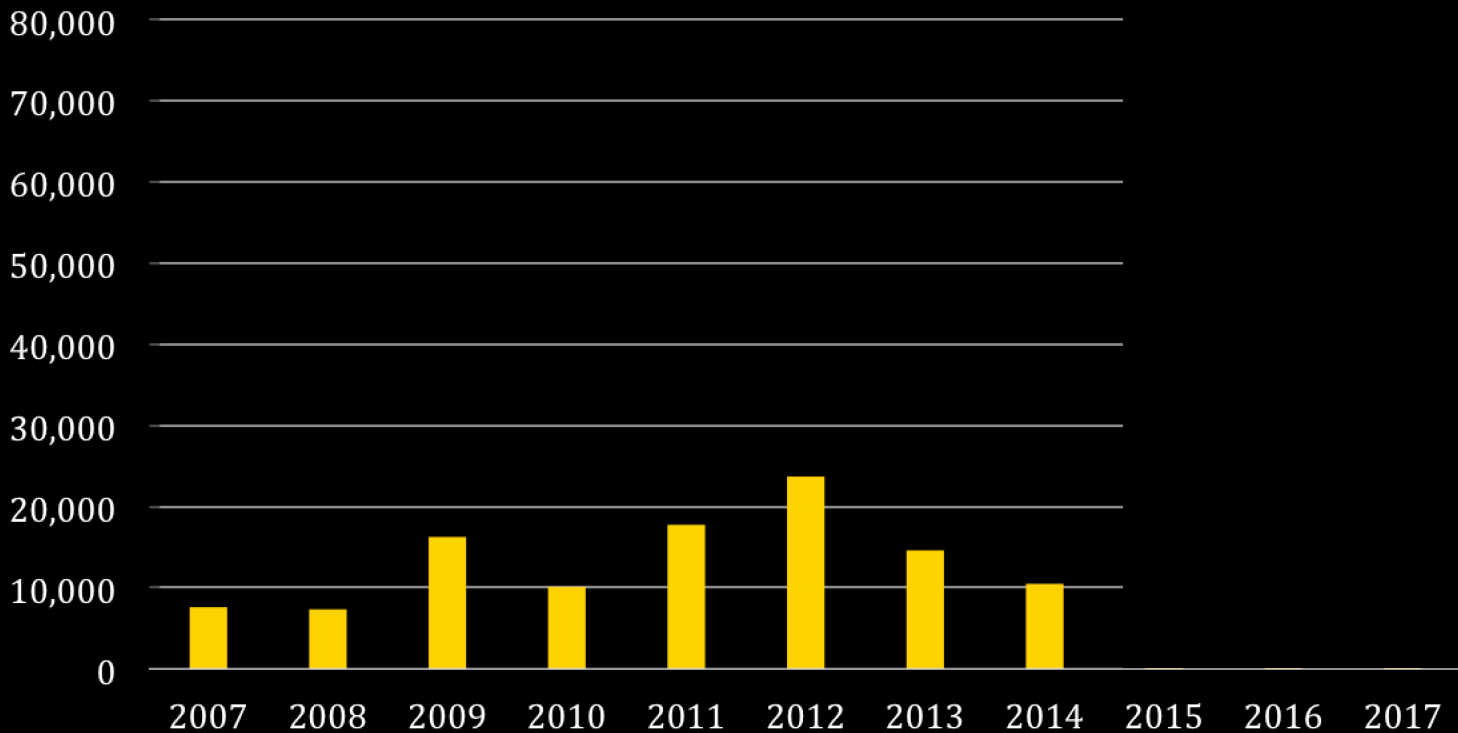


Other Collections



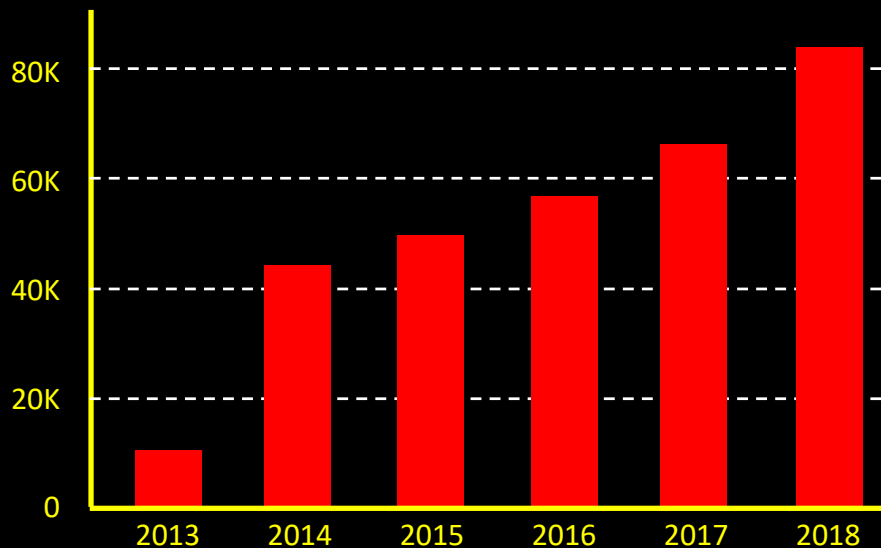


# New Digital Audio Assets by Year

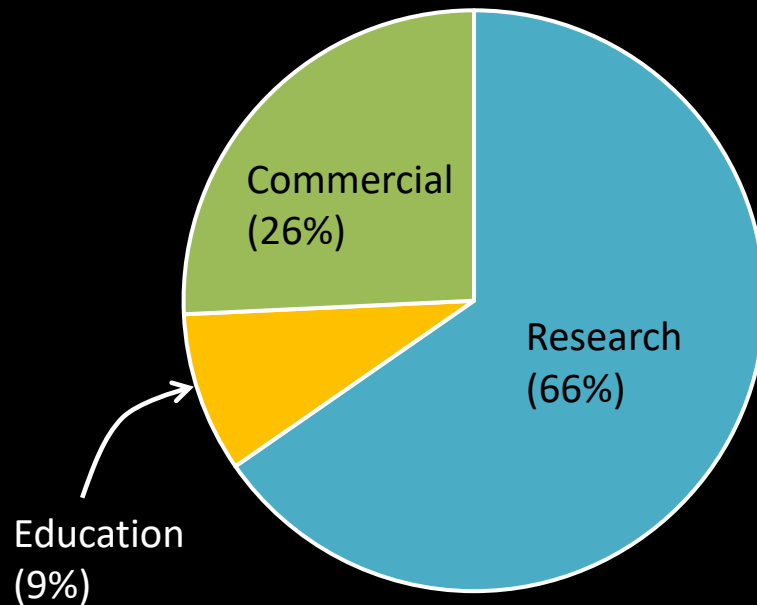


# Macauley Library Requests

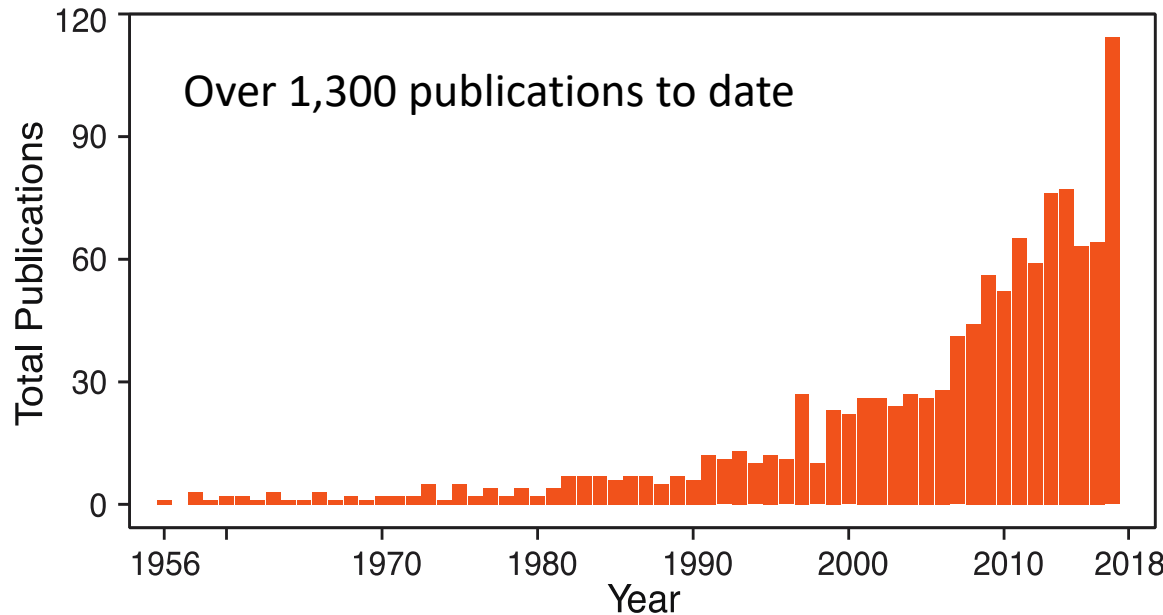
Files Delivered



Request Types



# Macaulay Library Publications



CONTRIBUTIONAL RECORDS OF BIRDS FROM  
EFFECTS OF THE NORTHERN PERUVIAN  
FOR BIOGEOGRAPHY OF

The field identification of North American pitits

ScienceDirect  
www.sciencedirect.com  
1674 (2006) 1164–1174

applied  
acoustics

ScienceDirect  
Pitch-related cues in the songs of sympatric mountain  
and black-capped chickadees  
Bernard Lohr

n and extraction using  
esian inference

Halkias\*, Daniel P.W. EU  
Department of Electrical Engineering, 500  
Gold, New York, NY 10027, United States  
Received 10 April 2008; accepted 2 April 2008; available online 28 July 2008

COUNTING BIRDS: THE PROBLEM OF VARIABLE  
HEARING ABILITIES  
JOHN T. EMLEN  
Department of Zoology  
University of Wisconsin  
Madison, Wisconsin 53706 USA  
MICHAEL J. DEJONG  
Department of Biology  
University of St. Thomas  
St. Paul, Minnesota 55105 USA

IE SONGS OF THE CRITICALLY  
S WREN AND THE RELATED  
WHITE WREN

E. PARRA<sup>1,2</sup> AND D.  
No. 1 N° 184-10, Bogotá  
trea 20 N° 36-61, Bogotá  
Windsor, Windsor, ON

GEOGRAPHIC VARIATION IN  
BUNTING, PASSERINA CYANEA

THE EFFECT OF THE  
INTRUDER ON RESPONSES  
VOCALIZATIONS OF MANTILLATA PALLIATA  
ALOUATTA PALLIATA PALLIATA  
by  
JAMES MATHER WHITEHEAD  
University of North Carolina, Chapel Hill

AVIFAUNA OF THE GUYANA SOUTHERN RUPUNUNI, WITH  
COMPARISONS TO OTHER SAVANNAS OF NORTHERN SOUTH  
AMERICA  
Mark B. Robbins<sup>1</sup>, Michael J. Braun<sup>2</sup> & David W. Finch<sup>3</sup>

VARIATION IN SONG COMPOSITION OF THE INDIGO  
BUNTING, PASSERINA CYANEA  
NETH A. SHIVITZ & WILLIAM L. THOMPSON  
Wayne State University, Detroit, Michigan

# The Road Ahead

- Moving to the Cloud
- Strategic partnerships with other collections
- AI-enabled approaches to data quality & search





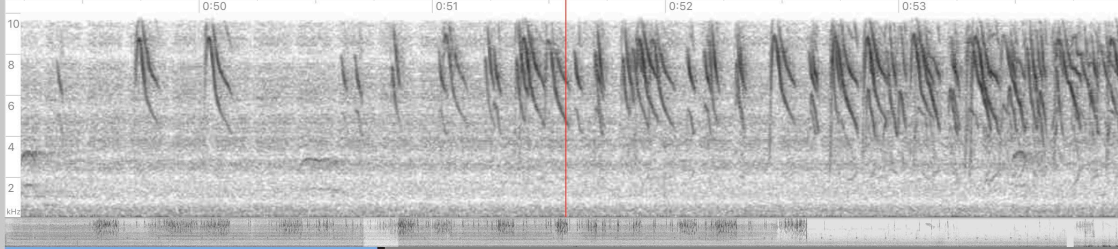
# Strategic Partnerships

The Cornell Lab of Ornithology  
Macaulay Library

Mike Webster (mike webster) Language

Birds Enter species name

Instituto Alexander von Humboldt - Colección de Sonidos Ambientales Explore the collection



0:50 0:51 0:52 0:53

10 8 6 4 2

0:51 / 2:33

Macaulay Library

**Burnished-buff Tanager**  
*Stilpnia cayana* | ML168373661 | IAvH-CSA18613


★★★★★ 2 ratings  
+ Rate quality...

Share Embed Report


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Search this contributor | Profile

27 Nov 2018 7:57 AM  
eBird Checklist S50263166

Tercer tramo, vda. La Carbonera, Santa María  
Boyacá, Colombia  
Search this location | Illustrated Checklist



Age Unknown  
Sex Unknown  
Sounds Call; Song  
Behaviors  
Breeding  
Tags  
Playback Not Used  
Specimen ID  
Comments  
Un individuo colectado  
Observation details



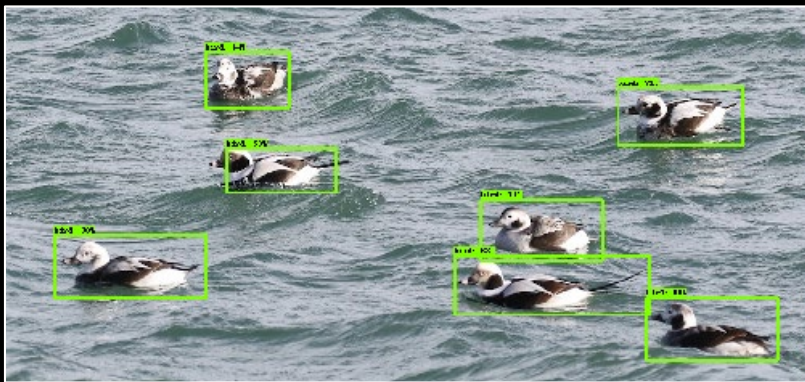
Instituto Alexander von Humboldt - Colección de Sonidos Ambientales

Edit ML168373661 Download original

License Any Lab Use=eBird  
Original file MTB20181127\_084017\_073\_-.Tangara\_cayana.wav

Provide infrastructure & technical support

Curator Tools to facilitate direct uploads by other collections



# AI-Enabled Pipelines (Data Quality)

Manage Media

24 April 11:02 AM

Eagle Lakes Park, Florida, US

Done

View

Filter

4

1

0

Filter species

1 American White Pelican *Pelecanus erythrorhynchos*

Details

Change species

Add media

12 Brown Pelican *Pelecanus occidentalis*

Details

Media

Select: 4

1

0

Change species

Add media

Filename.ext

Verified

Filename.ext

Verified

Filename.ext

Verified

Filename.ext

American White Pelican

Filename.ext

1 file is selected Deselect

ID Suggestion

Powered by Merlin

American White Pelican

*Pelecanus erythrorhynchos*

Change species

Delete

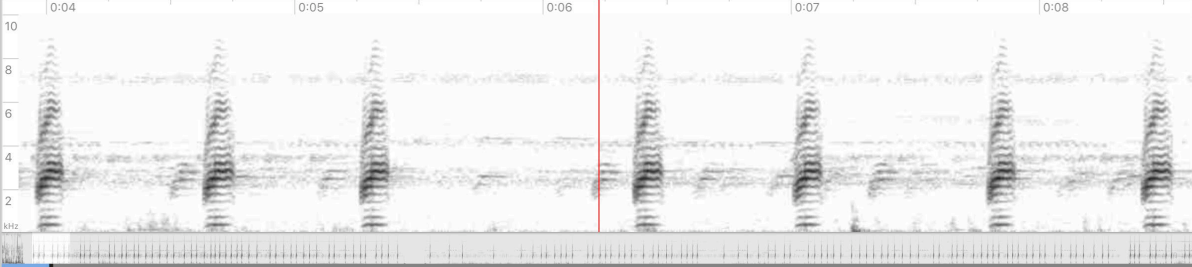
Rating

★★★★★

# Media “Specimens”

The Cornell Lab of Ornithology  
**Macaulay Library** Search Get involved How to News About [Donate](#) Mike Webster (mike webster) Language

Birds Enter species name



0:04 0:05 0:06 0:07 0:08

10 8 6 4 2 kHz

0:06 / 2:30 Macaulay Library

## Hyperolius phantasticus

*Hyperolius phantasticus* | ML134095


★★★★★ 4 ratings  
[+ Rate quality...](#)

[Share](#) [Embed](#) [Add to request](#)

© Rayna C. Bell  
[Search this contributor](#)

9 Oct 2009 7:10 PM

Estuaire, Gabon  
[Search this location](#) | [Illustrated Checklist](#)



0.4536, 10.2781 [Map](#)

**Age and Sex** Adult Male – 1

**Sounds**

**Behaviors**

**Breeding**

**Tags**

**Playback** Unspecified

**Specimen ID** CUMV Amphibian specimens 14899

**Comments**

Calling from leaf in secondary vegetation, 1 meter above ground, near muddy lawn at forest edge. Humidity: 100%. Collectors: Bryan L. Stuart, Rayna C. Bell, Pascal Minko, Toussaint Essone.

**Technical Information**

Recorder EDIROL R-09

Microphone RØDE NTG2

Accessories

**Archival Information**

Cataloged 19 Apr 2010 by Jessie Barry

Digitized 19 Apr 2010 by Jessie Barry

Edited 19 Apr 2010 by Jessie Barry



# Thanks!

The **Cornell** Lab  of Ornithology