Yellow-billed Cuckoo Research along the Lower Colorado River, 2006.

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Lower Colorado River Multi-Species Conservation Plan (LCR/MSCP), 2005.

- The Yellow-billed Cuckoo is recognized as a covered species under the plan (LCR MSCP 2005).

GOALS

- Conserve, monitor and manage Yellow-billed Cuckoo populations and habitat.
- Restoration of 4,050 acres of cottonwood-willow habitat.
- Monitor restoration efforts for their effectiveness in providing habitat for cuckoos.
- Conducting long-term Yellow-billed Cuckoo monitoring.

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2006 LCR-MSCP
Yellow-billed Cuckoo Objectives

- Conduct comprehensive, repeatable surveys in suitable habitat types within the MSCP project boundary.

- Identify cuckoo breeding habitat requirements within the MSCP project boundary.
  - Characterize Vegetation.
  - Measure differences in microclimates.

- Evaluate current survey methodology.

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2006 Cuckoo Study Areas

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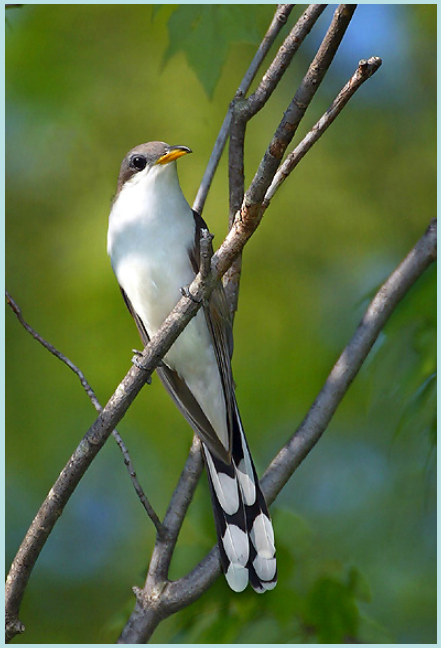
Yellow-billed Cuckoo Survey Methods

- **Four survey periods conducted between 10 June - 10 September, conduct surveys 10 to 14 days apart.**

- **Conduct listen-playback-listen protocol, complete five playback recordings of the Yellow-billed Cuckoo's "kowlp" call, calls one minute apart.**

- **Survey points 100 m apart, 300 m after detections.**



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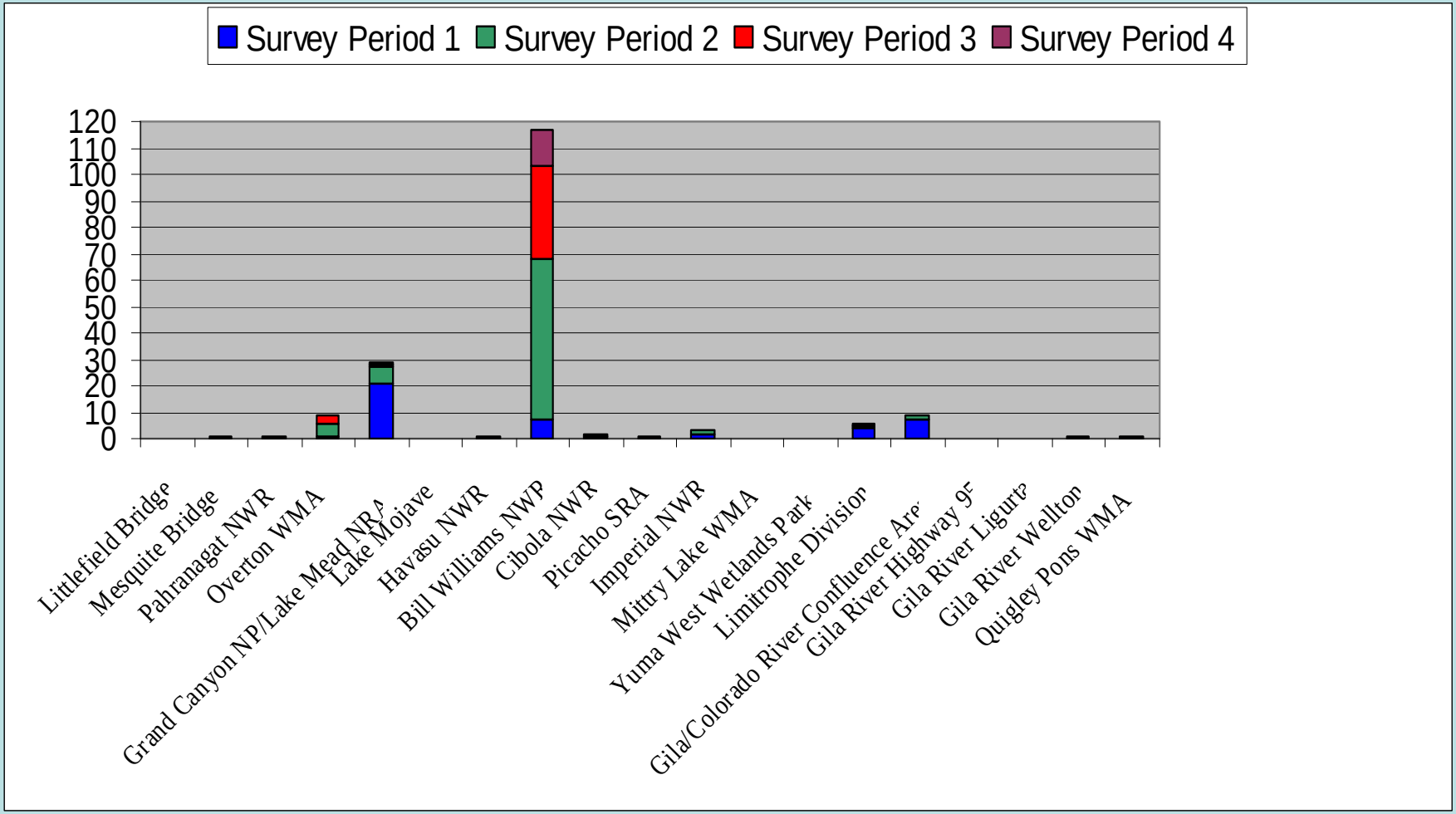
2006 Yellow-billed Cuckoo
Yellow-billed Cuckoo Survey Results



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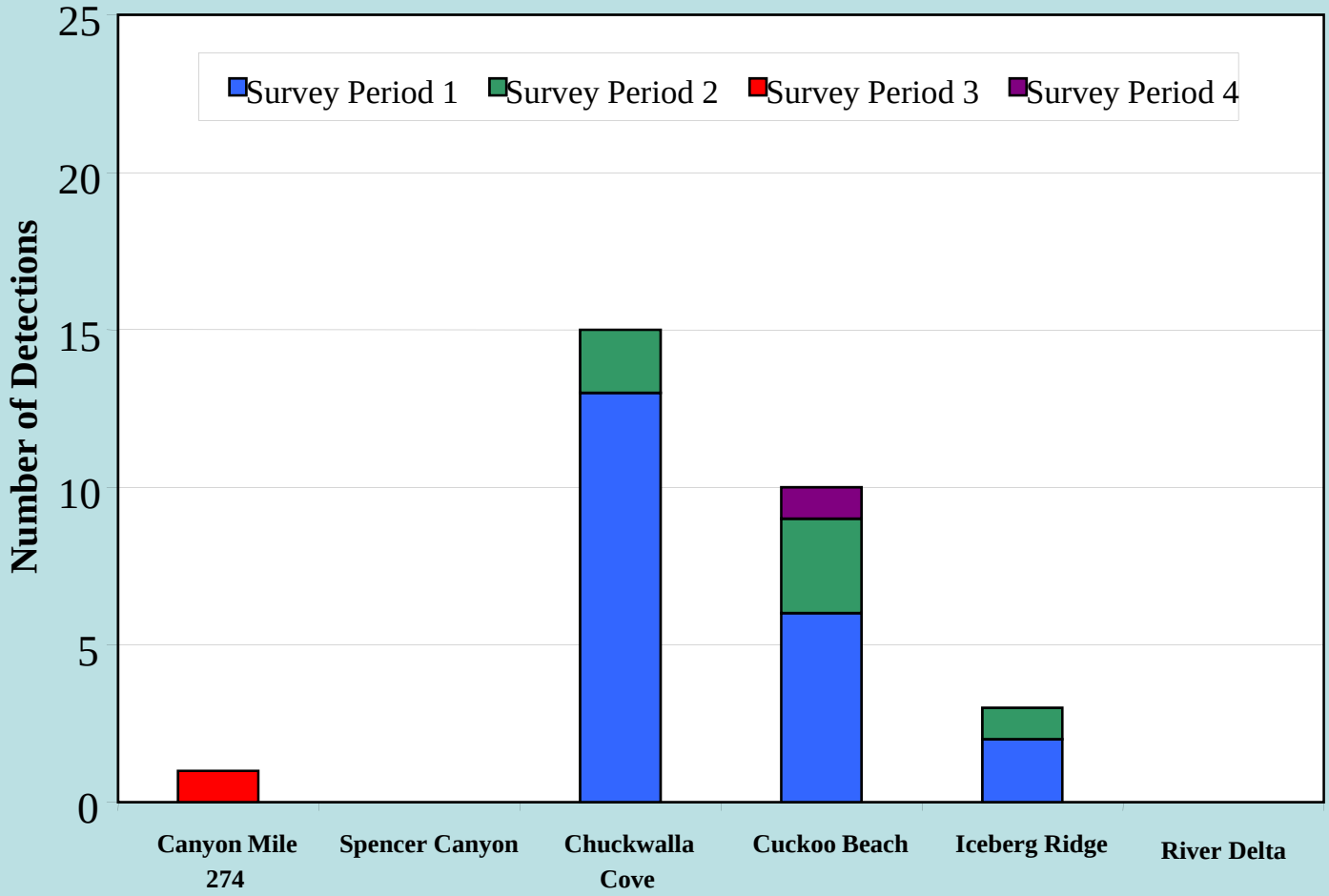
Grand Canyon NP/Lake Mead NRA Detection Distribution



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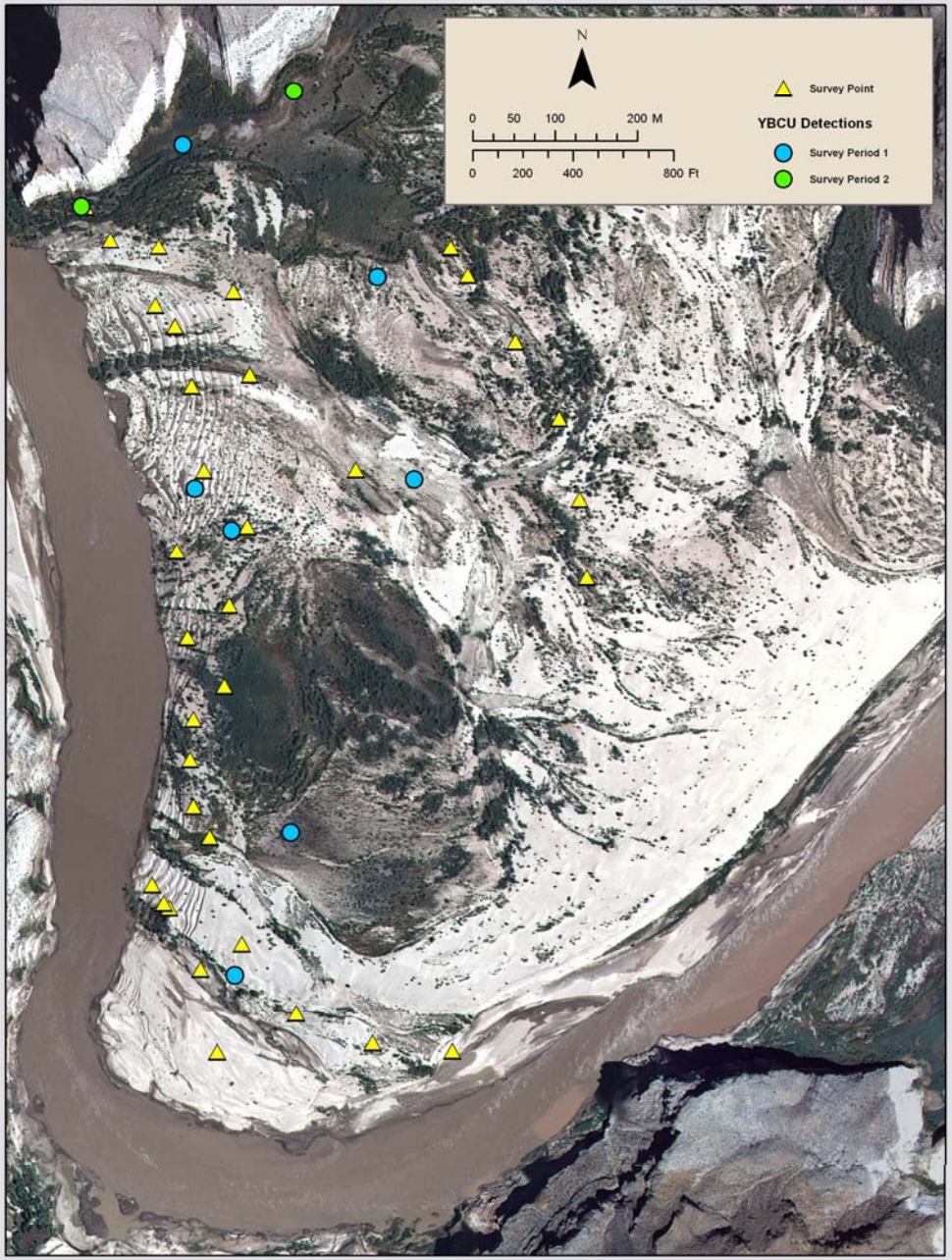

Lake Mead Delta, Chuckwalla Cove

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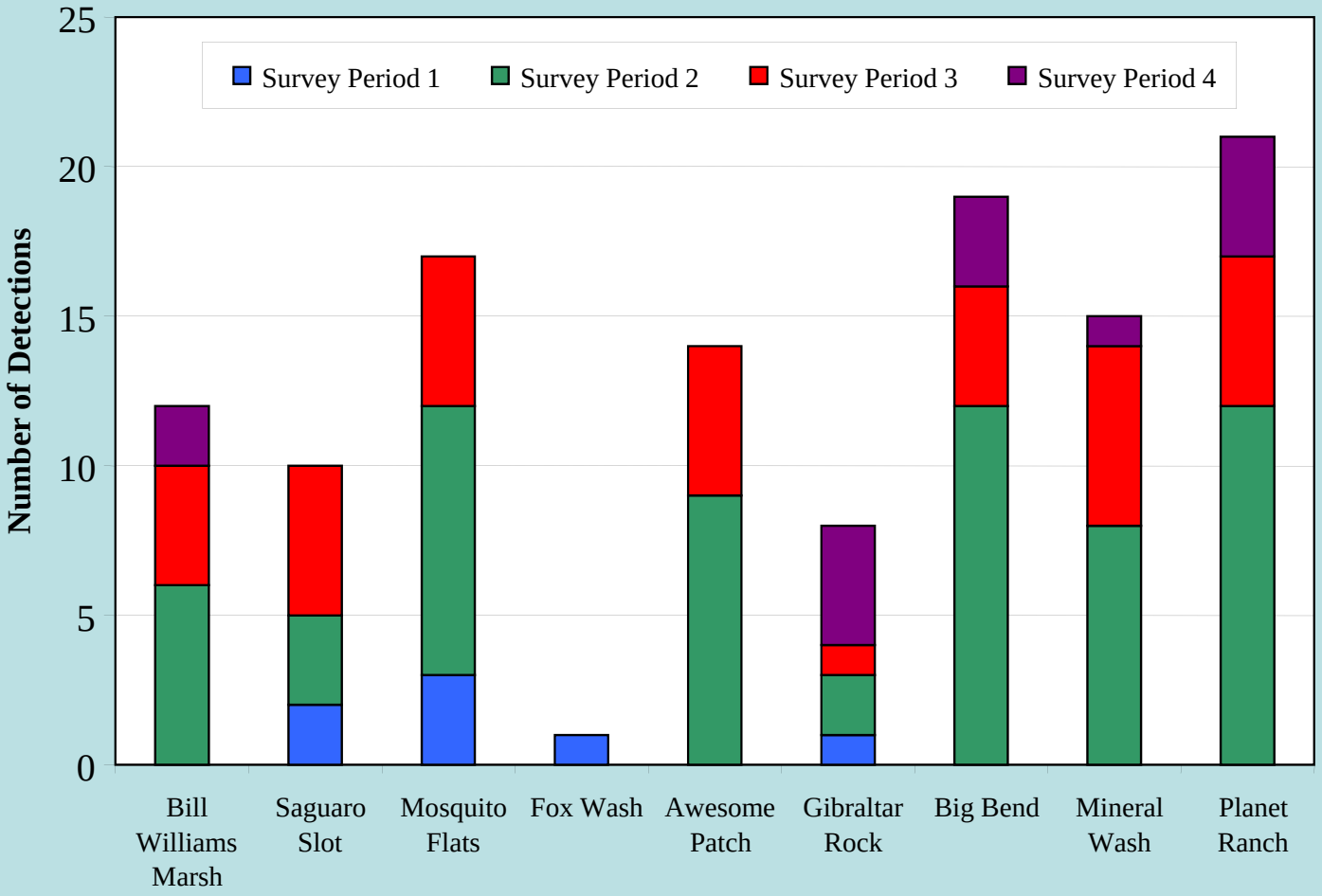
Bill Williams NWR Cuckoo 2006 Detection Distribution



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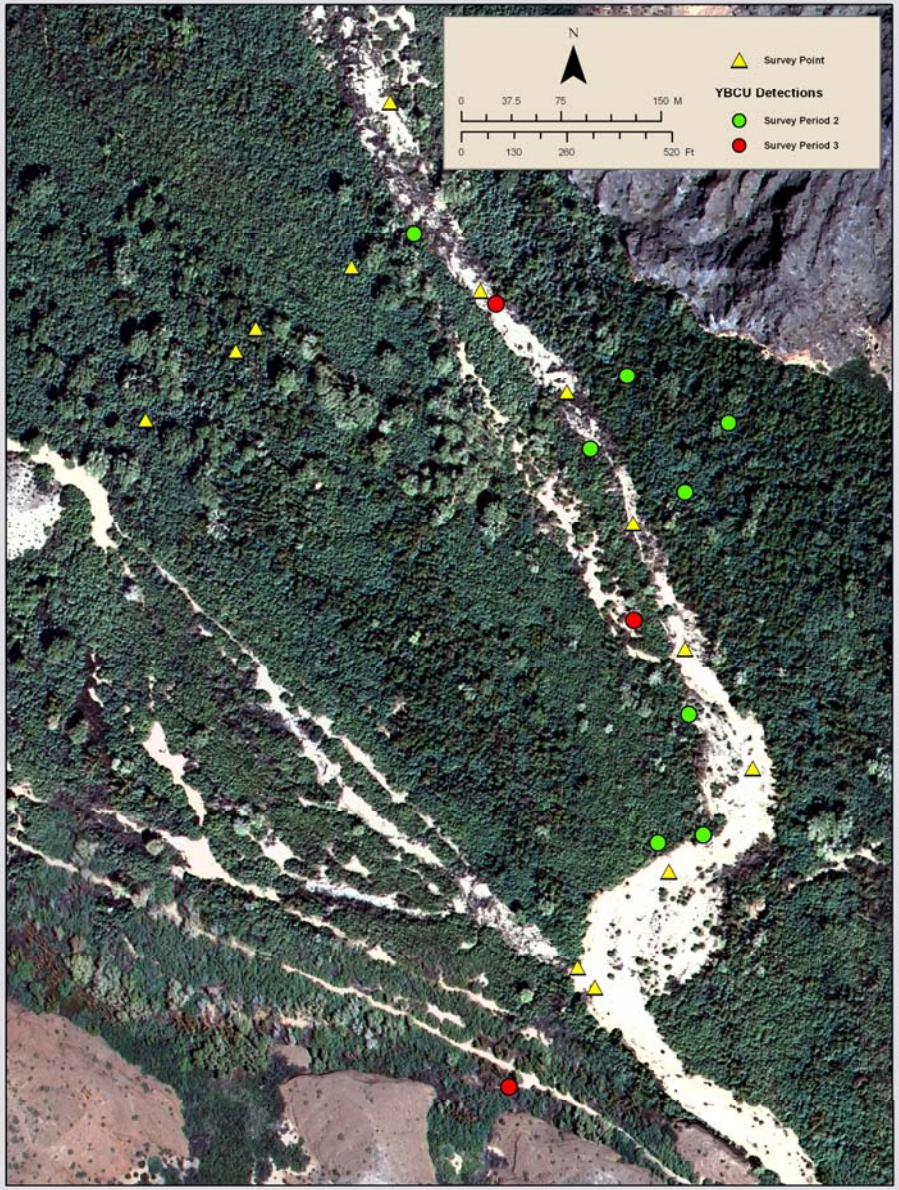

Bill Williams NWR, Awesome Patch

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Habitat Photos of Occupied Sites

Saguaro Slot Site

Mosquito Flats Site

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Bill Williams River NWR

Mineral Wash Site

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Lake Mead NRA

Chuckwalla Cove Site

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Lake Mead NRA

Iceberg Ridge Site

Cuckoo Beach

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Mittry Lake

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Imperial NWR (South Plantation)

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Lake Mojave

Mohave Patch

Waterwheel Cove

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Limitrophe Division South

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Gila River at Hwy. 95

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Havasu NWR

Mature Tamarisk Forest

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Yellow-billed Cuckoo 2006 Breeding Confirmations

- We confirmed five breeding events.
- 1 nesting observation.
- 4 separate juvenile observations.
- 17 probable breeders (e.g., carrying nest material or food).
- 40 possible breeders (e.g, cuckoo pairs detected in same area during repeated surveys).

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Characterizing Yellow-billed Cuckoo Habitat

Focus on general patterns of the distribution and abundance of woody species within riparian habitats of the study region.

OBJECTIVES

To improve knowledge of Yellow-billed Cuckoo habitat requirements we;

1. Characterize riparian habitat at the survey site/patch-level.

2. Sample occupied and unoccupied patches to describe vegetation composition and structure.

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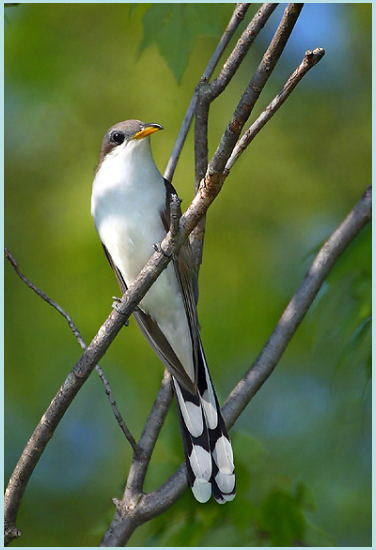
Vegetation Measurement Methods

1. Vegetation sampling plots established in a subset of Yellow-billed Cuckoo survey areas and sites.

2. Co-located with microclimate (HOBO) sampling sites.

3. Each vegetation plot included one main plot and three subplots.

4. Vegetation characteristics method: B-Bird
   - Canopy cover
   - Average top canopy height
   - Distribution and density of woody species
   - Ground cover
   - Litter depth



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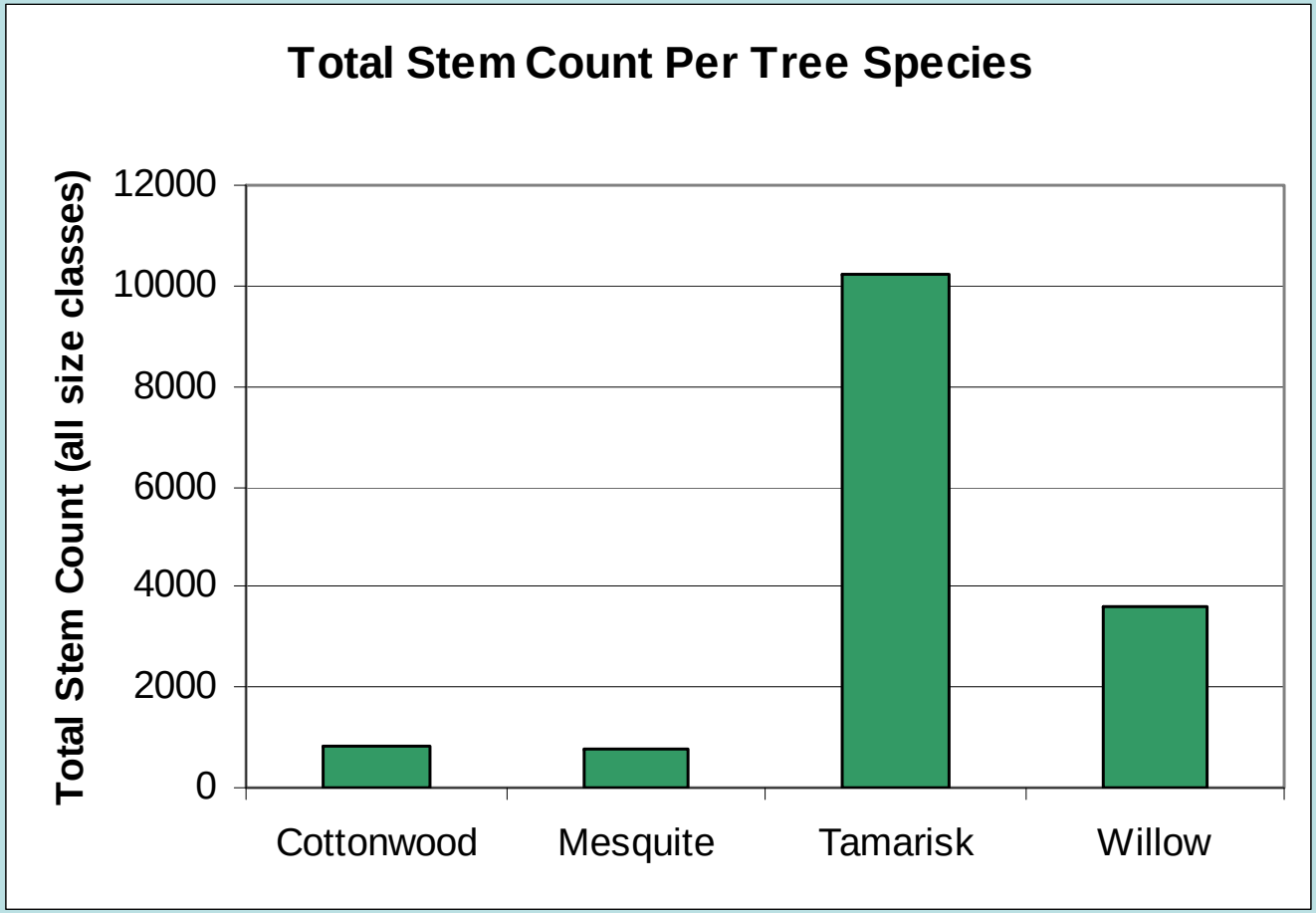
Dominant Tree Species at Cuckoo Survey Sites



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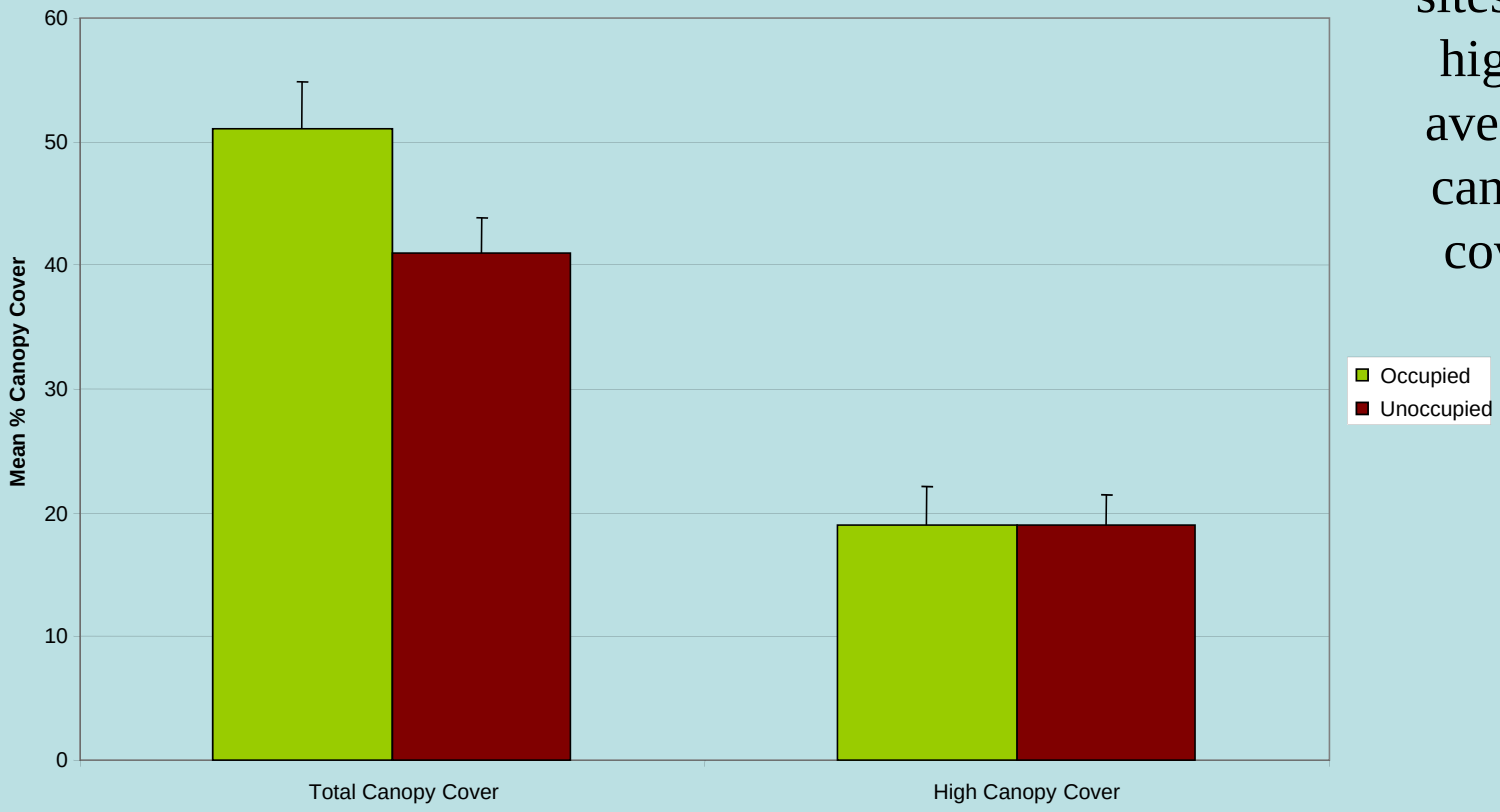
% Canopy Cover in Occupied and Unoccupied Sites



- Occupied sites had higher average canopy cover.

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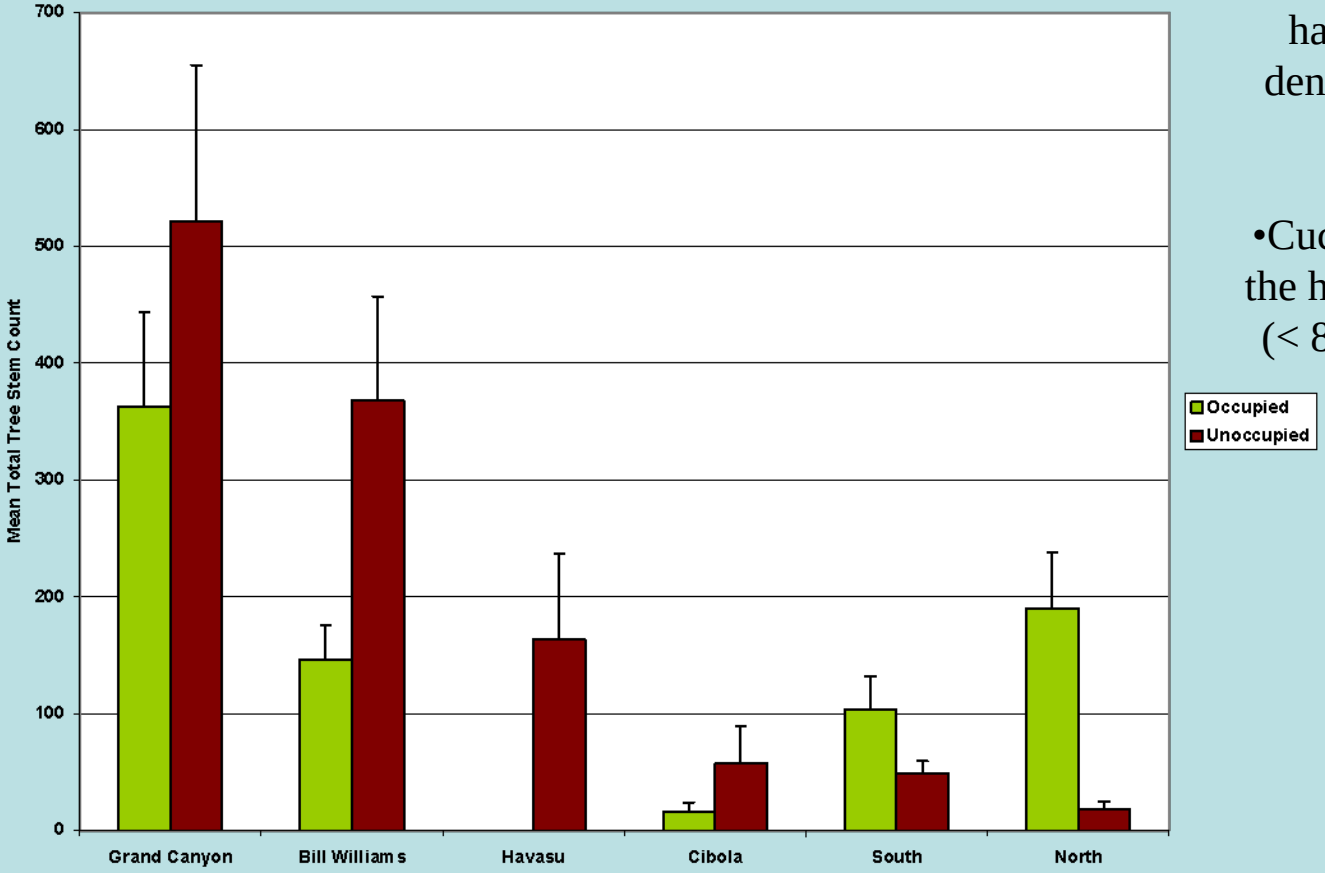
Woody Species Density



- Occupied Bill Williams and Grand Canyon/Lake Mead sites had lower average total tree density while unoccupied sites were denser.

- Cuckoos did not use areas with the highest density of small trees (< 8 cm dbh), mostly tamarisk.

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Microclimate Characterization of Yellow-billed Cuckoo Habitat

Characterizing microclimate (temperature, relative humidity, soil moisture) of locations occupied by cuckoos.

Therefore we hypothesize that microclimate may differ between riparian habitats that are used or not used by cuckoos.

OBJECTIVES

1. Examined microclimate of a occupied Yellow-billed Cuckoo site as a surrogate of microclimate at a specific nest location.

2. Examined how microclimate (temperature and relative humidity) vary between Yellow-billed Cuckoo occupied and unoccupied sites.

3. Compared soil moisture at Yellow-billed Cuckoo occupied and random sites.

4. Finally, microclimate variables to vegetation structure and species composition.

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Microclimate Methods

DATA LOGER PLACEMENT

Microclimate data were collected at random locations and in habitat in which cuckoos were found in 2005 or 2006 (occupied locations).

Latitude	Area Name
North	Bill Williams NWR
North	Grand Canyon NP/Lake Mead NRA
North	Overton WMA
North	Havasu NWR
North	Pahranagat NWR
South	Mittry Lake
South	Gila River at Gila/Colorado Confluence
South	Colorado River at Gila/Colorado Confluence
South	Cibola NWR
South	West Wetlands Park, Yuma

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Microclimate Methods cont.

Temperature and Relative Humidity

•HOBOs were placed at occupied cuckoo detection sites.

•Random UTM coordinates were assigned from aerial photographs from each study site within appropriate cuckoo habitat boundaries.

Soil Moisture

•Soil moisture was recorded below each HOBO, and at 1.0 m, 2.0 m, and 3.0 m in each cardinal direction.

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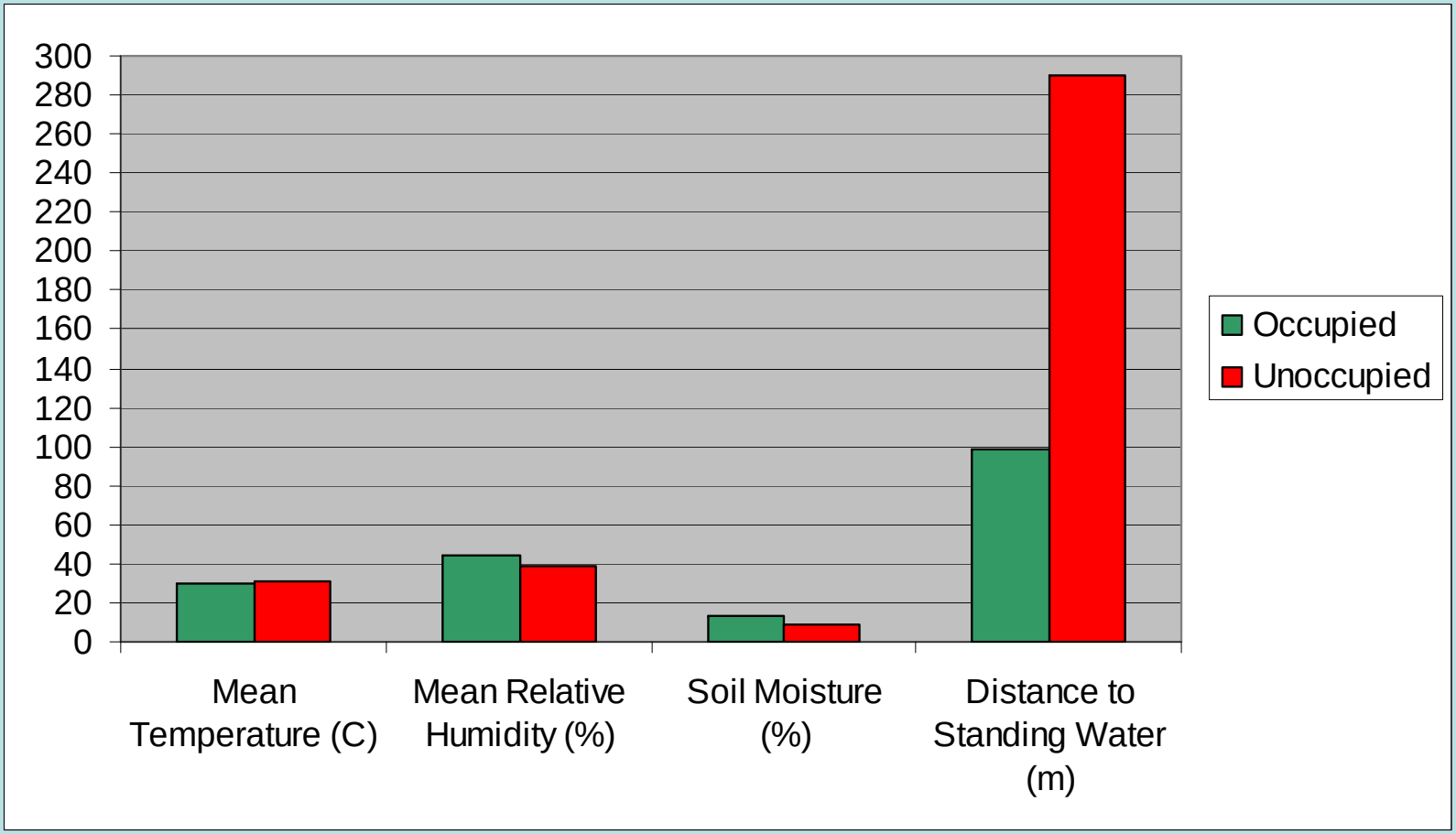
Microclimate Characterization Results

Regional; Temperature, Relative Humidity, Soil Moisture, Distance for Water



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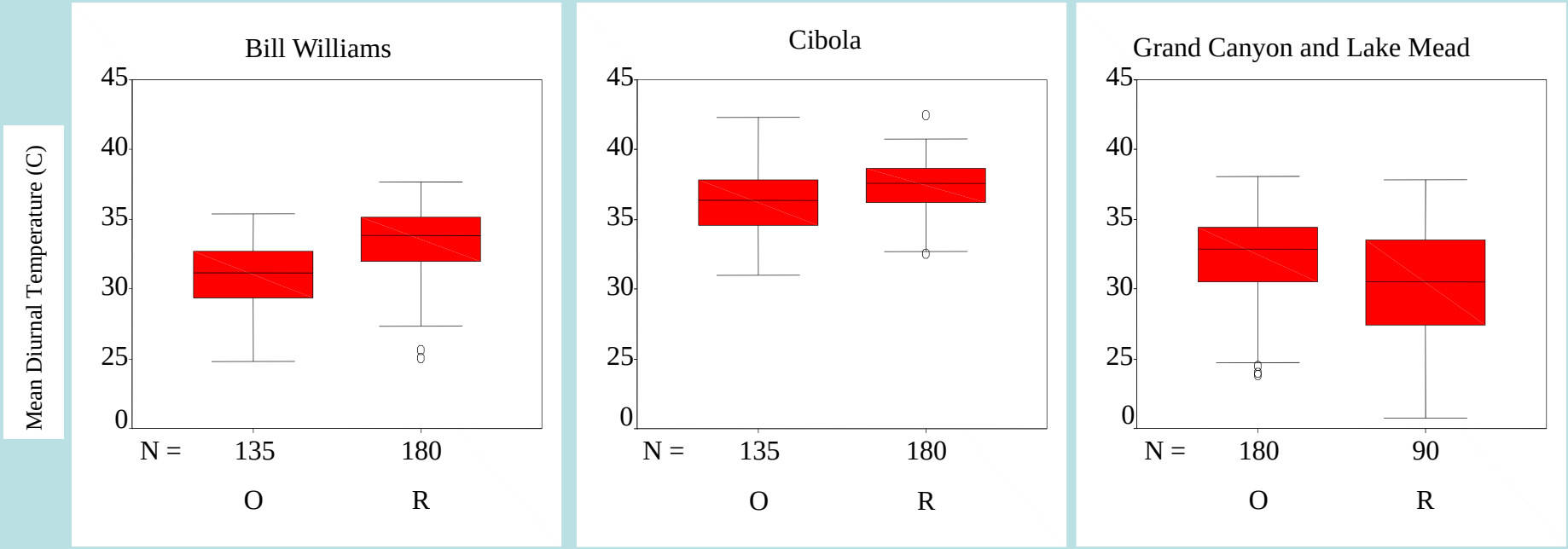
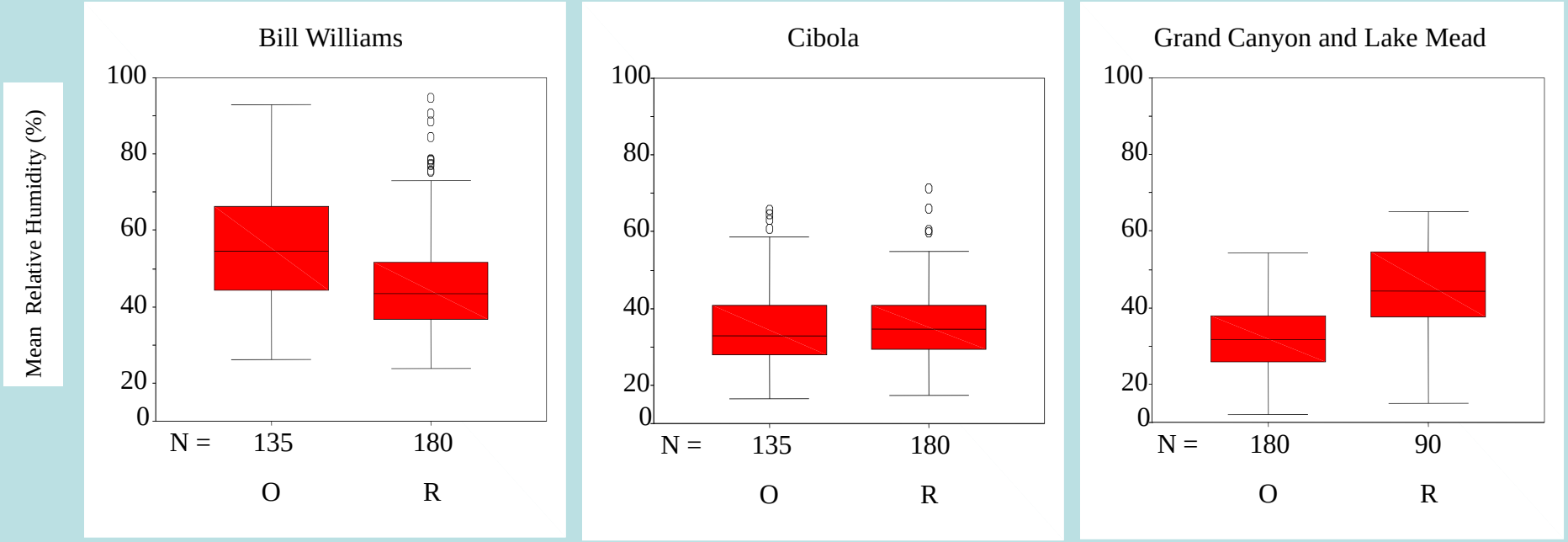
Microclimate Characterization Results

Area Diurnal Temperature



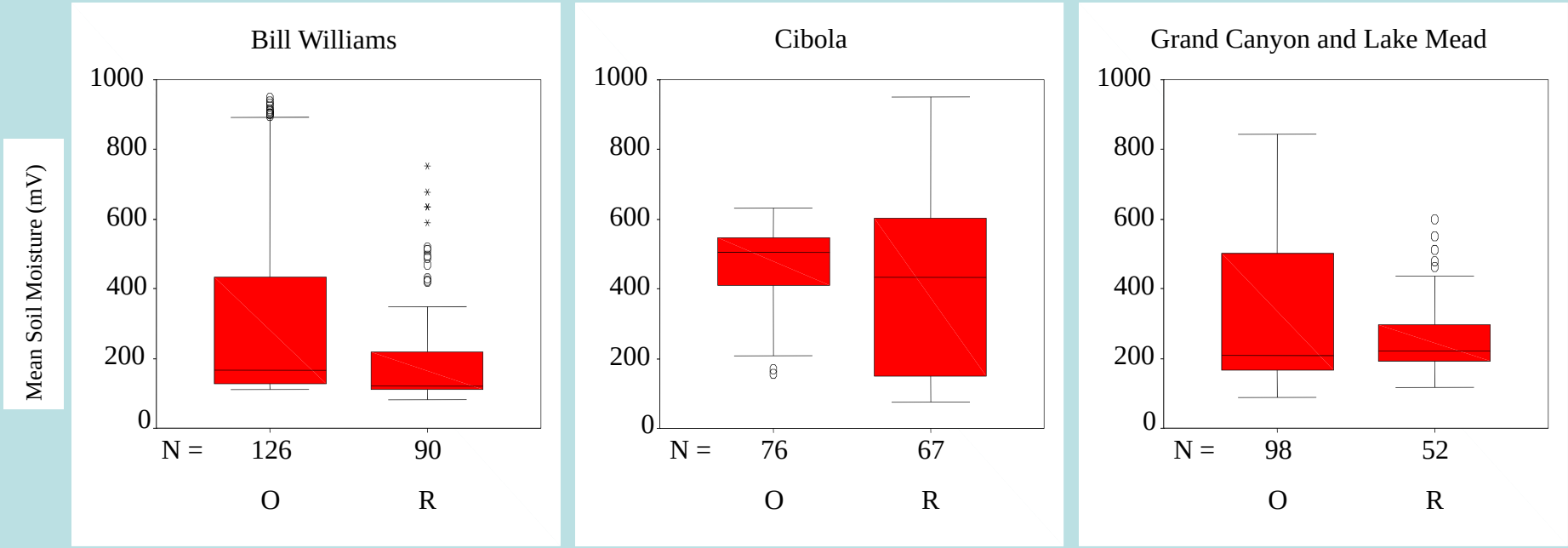
Microclimate Characterization Results

Area Relative Humidity



Microclimate Characterization Results

Area Soil Moisture



Microclimate Characterization Summary

•Overall, we found a lot of variability, and based on one years worth of data.

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Evaluation of Yellow-billed Cuckoo Survey Method

•No way to know for certain that an area with no detections is unoccupied.

OBJECTIVES

1. Examine patterns in cuckoo responses to the number of playback recordings played.

2. Examine Cuckoo detection rates according to study areas.

3. Examine Cuckoo detection rates across the breeding season.

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Overall Evaluation of Cuckoo Survey Method

- 72% of cuckoo detections were solicited through playback at all study sites.
- 64% of cuckoo detections, solicited or unsolicited, were aural.
- 27% were both heard and seen, while 9% were visual only.

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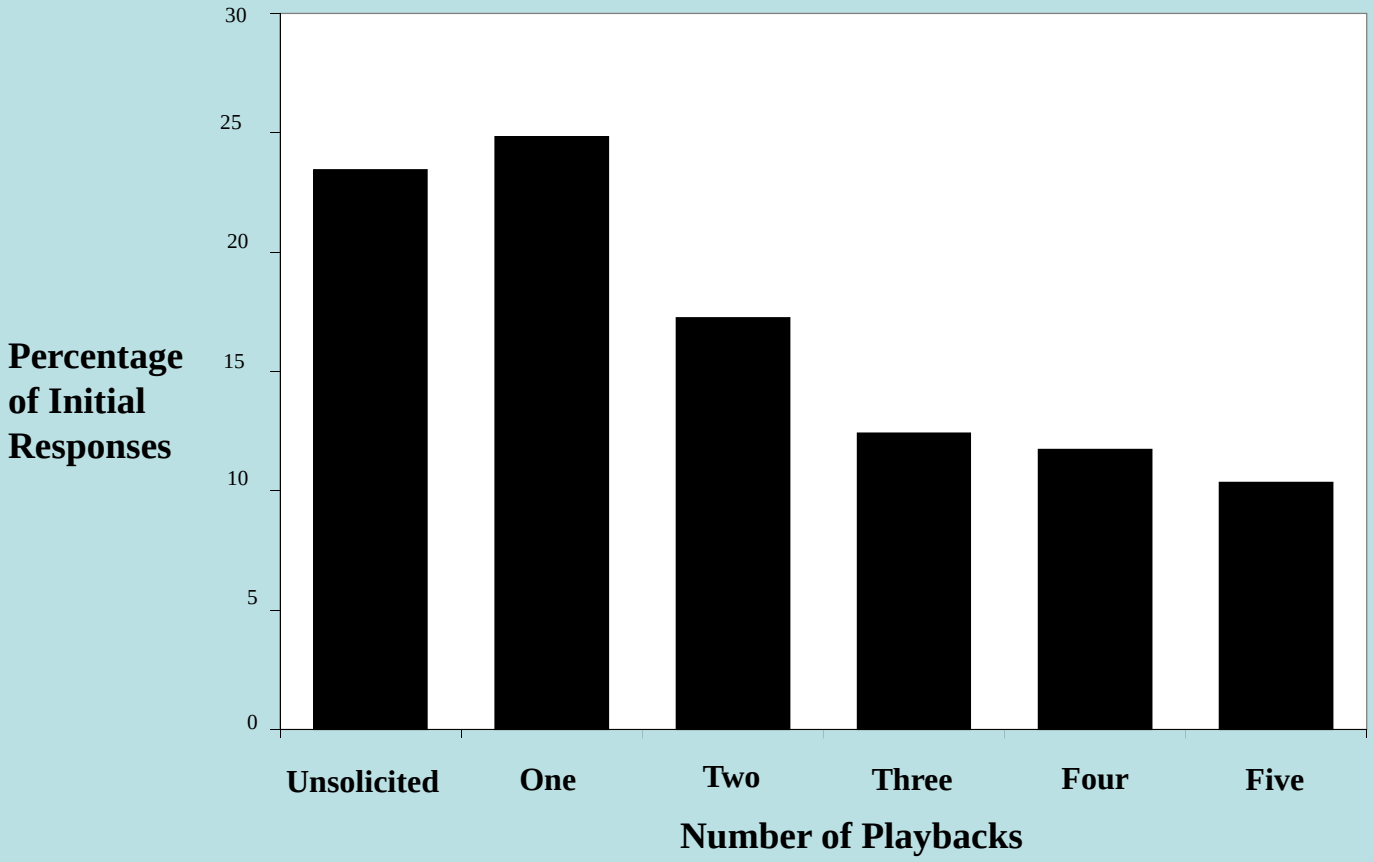
Cuckoo responses to the number of playback recordings played



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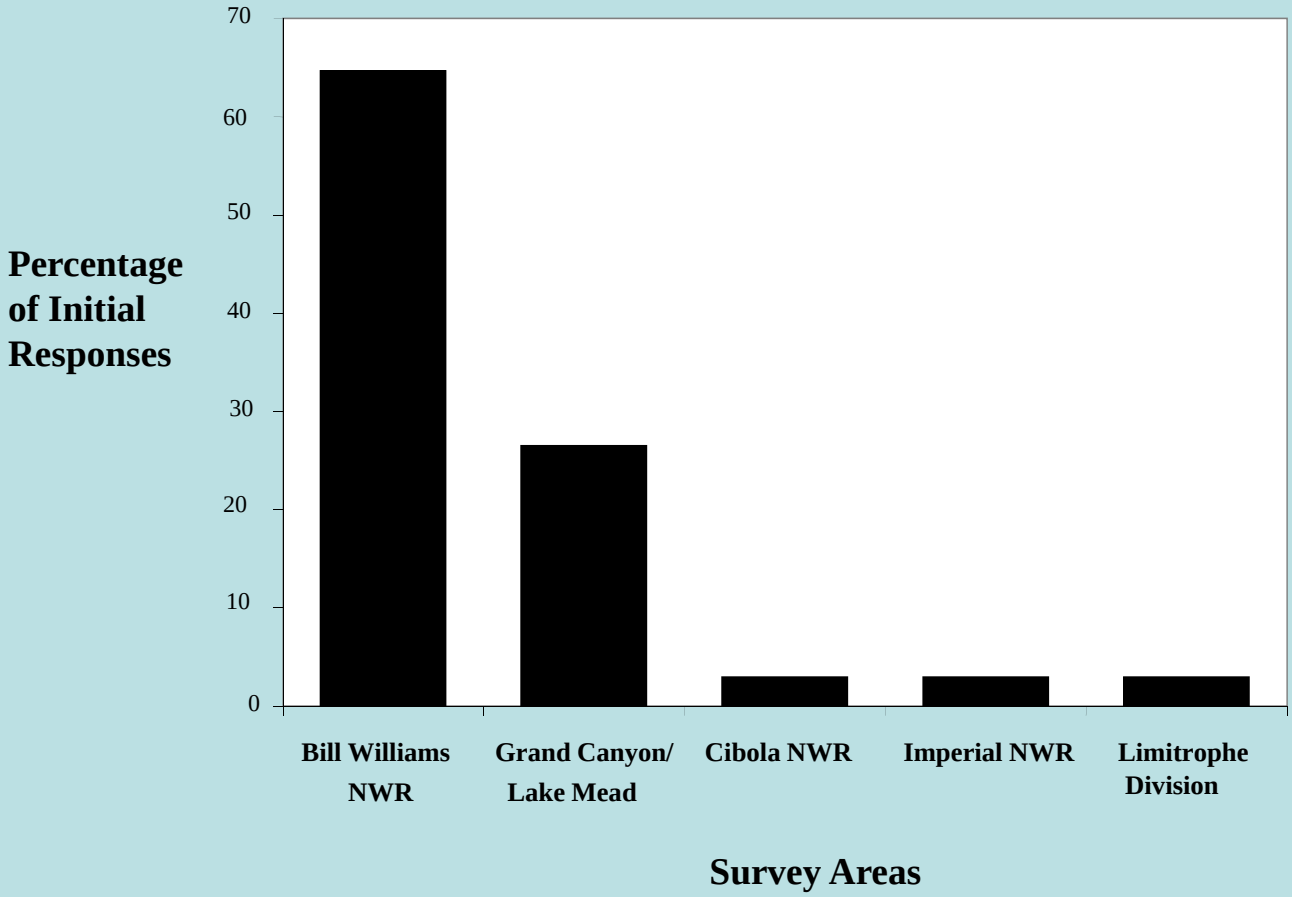
Percentage of Yellow-billed Cuckoo Unsolicited responses by Survey Area



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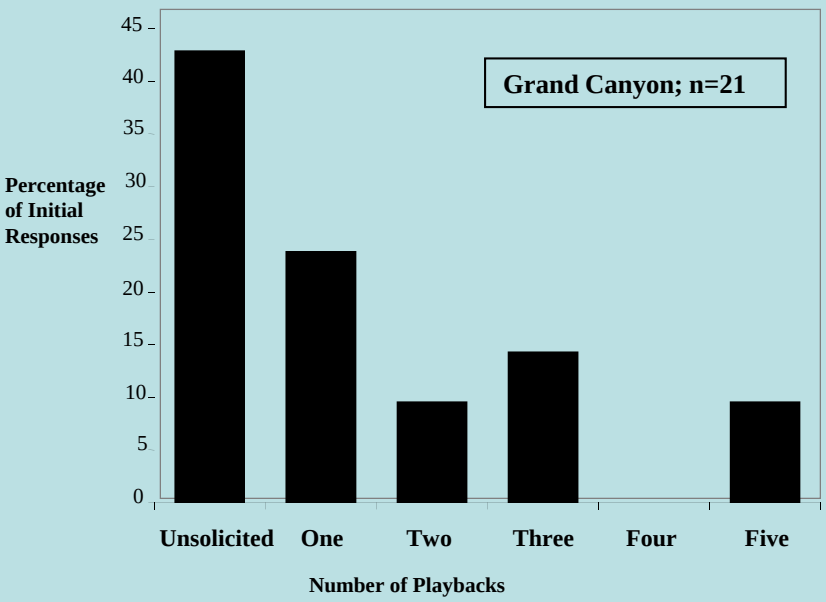
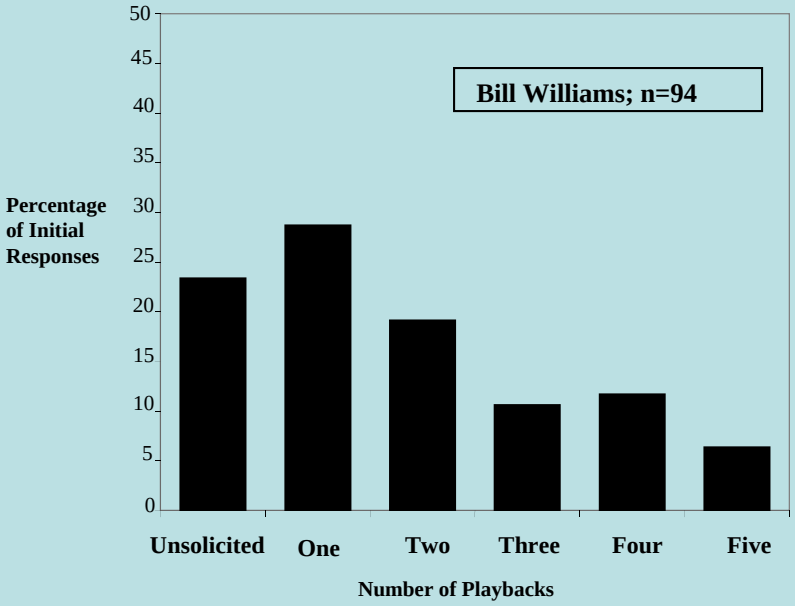
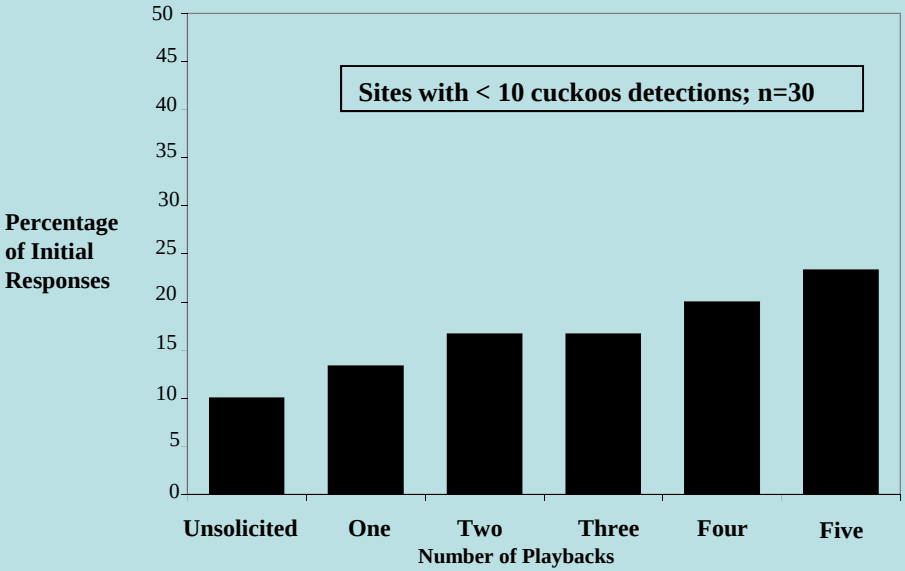
Percentage of Cuckoo Unsolicited/Solicited Responses by Survey Area







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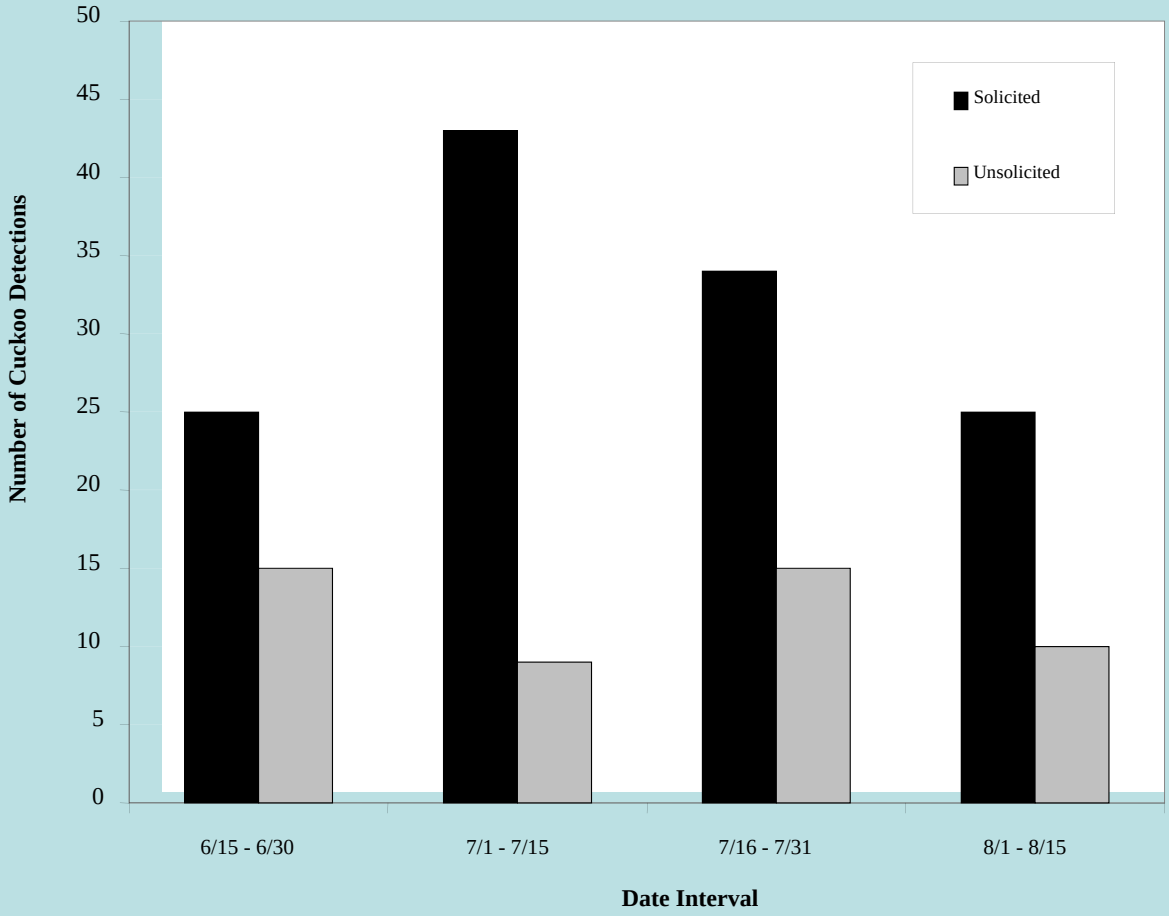
Yellow-billed Cuckoo Response and Detection Types by Season



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Survey Methodology Modifications for 2007

- To increase detection probabilities may use different calls of the cuckoo to solicit a response.

- We may increase the number of visits during the second and third periods.

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Plans for 2007 Field Season

- **Continue Yellow-billed Cuckoo surveys to further track distribution and abundance.**
- **Occupancy Rates?**
- **Conduct more nest searching in order to determine breeding status.**
- **Continue to evaluate survey methodology.**

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Yellow-billed Cuckoo multiscale habitat characterization

Continue within-patch habitat measures of plant species density and vegetative cover;

Continue microclimate measurements;

Spatial distribution of patches and patch sizes at the landscape scale.

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