

**Yellow-billed Cuckoos on the San Pedro
RNCA: Population trends, testing the
standard survey method, nest monitoring, and
more!!!!**



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Presentation overview

Overview:

- **Why study the San Pedro Population?**
- **Current population estimates**
- **Current survey method**
- **Assumptions of the method**
- **Study site**
- **Four comparisons of cuckoo detectability**
- **Implications for surveys and population estimates**
- **Parental care and Nest monitoring**



Why the San Pedro?

**3 years of research on the
LCR**

**10 years of research on the
Bill Williams**

**Low cuckoo populations,
widely dispersed, in very
dense habitat, so it's very
difficult to answer the
important questions about
cuckoo biology**



Study Site



Survey using call playback



-Each route (approx 3 km) is surveyed four times between 1 June and 30 August

- Stops are made every 100m

-Contact calls are played 5X at 1 minute intervals

- If a cuckoo is detected, the surveyor moves 300 m and resumes the survey



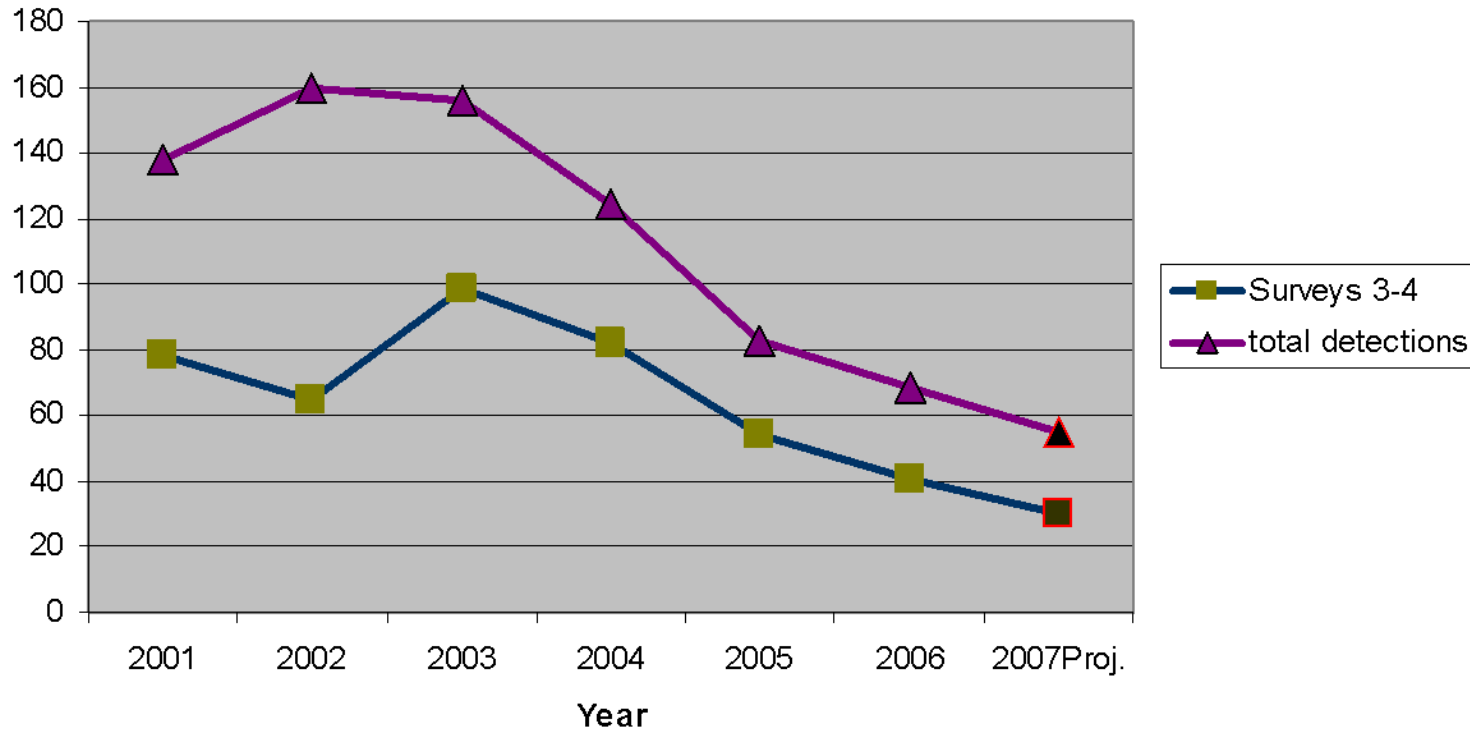
Survey Assumptions

- All birds within 100m will respond.
- All birds respond equally frequently
- Birds won't respond from more than 300 meters, so this distance can be used to separate individuals

Population estimates for Yellow-billed Cuckoos on the San Pedro RNCA, 2001-2006



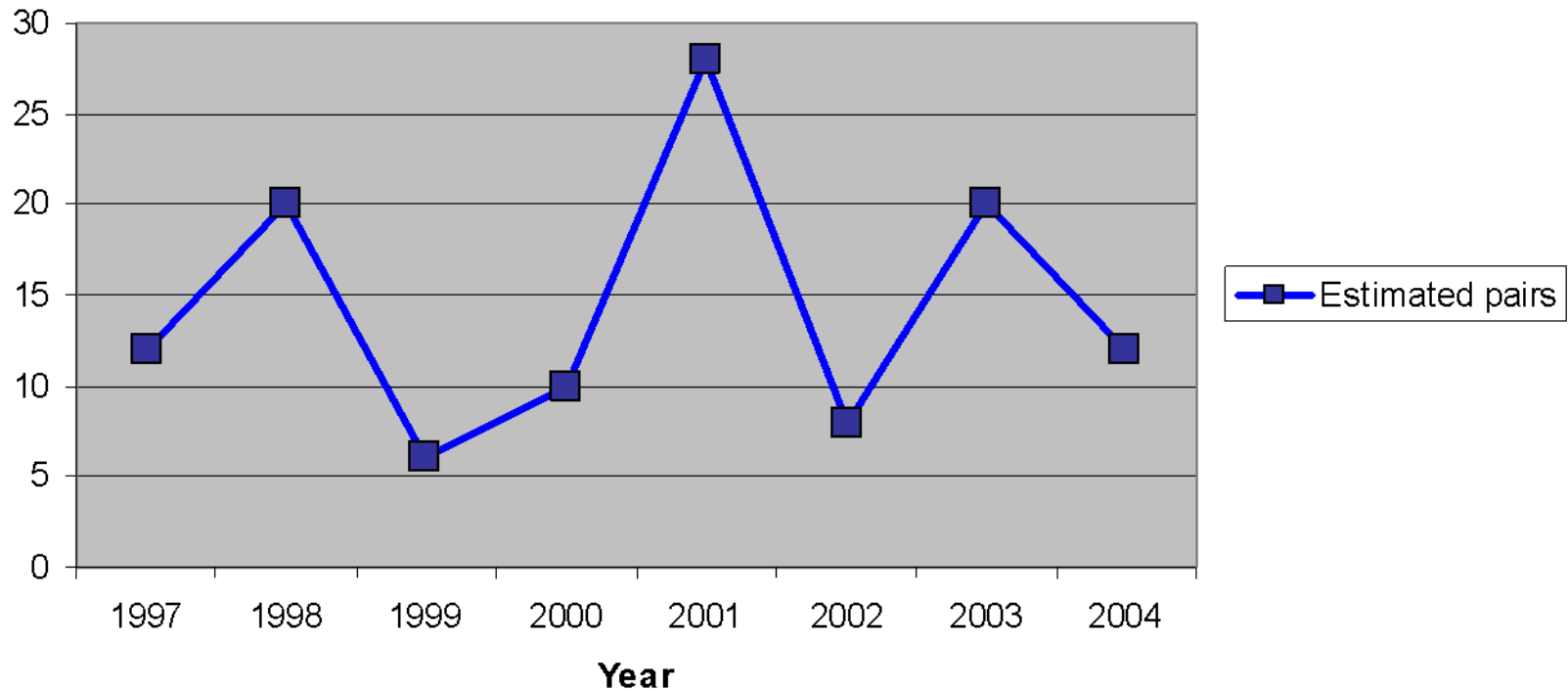
Figure 2. Comparison of YBCU surveys on the SPRNCA, 2001-2006



Population Estimates for the Bill Williams RNWR



Figure 3. Estimated pairs of Yellow-billed Cuckoos on the Bill Williams River NWR, 1997-2004



Problems with population estimates for Yellow-billed Cuckoos

- No marked populations
- Elusive birds with large home range (5-10ha)
- May move 100's or 1000's of meters between detections (telemetry)
- Easy to underestimate – low detectability
- Easy to overestimate – double counting



Methods Compared



1. Comparison of point counts and call playback surveys on the same 15 km stretch of habitat
2. Double observer call playback counts on the same route
3. Comparison of multiple visits
4. Call playback to marked known location cuckoos to test responsiveness and detectability

1. Comparison of Point counts and call-playback surveys



Detected by both methods

Method	Total	Detected by both methods	
		No	Yes
Call playback	83	58	25
Point count*	23	5	18
Total	106	63	43

* Data courtesy of Glenn Johnson of ASU

2. Comparison of double observer detections



Detected by both
surveyors

Surveyor #	Total	Yes	No
1	67	32	34
2	61	32	29
Total	128	64	63

3. Comparison of multiple visits



Number of Visits Detected

	Same locations	1	2	3	4
Total	53	4	24	39	17
New		5%	25%	27%	15%
Repeat		0%	6%	30%	8%
TOTAL		5%	29%	46%	20%

4. Survey Method Test

- Done with marked, known-location cuckoos
- One person observes with telemetry, one surveys
- They do not communicate, except to confirm that the target bird called
- Surveyor begins 100m from the target bird, plays call 5X, or until target is detected
- Surveyor then moves 300m and repeats.
- Procedure repeated every four days.



Results of survey method test

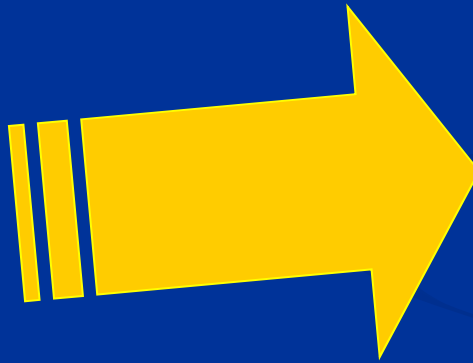


- Only 36% of the cuckoos responded during the first playback (n = 14)

- Cuckoos responded 10% of time when surveyor was 300m away

	at 100 m	at 300m	overall
Observer heard calls	85%	5%	47%
Observer saw bird move	41%	0%	19%

Parental care and nestling growth in Yellow-billed Cuckoos in SE Arizona



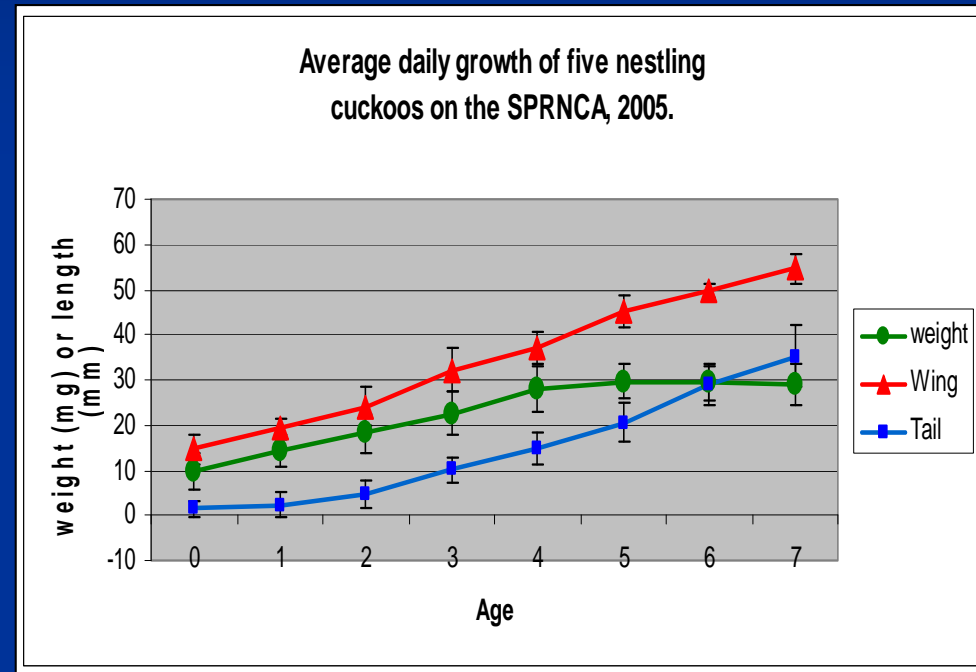
Murrelet Halterman and Lew Oring, University of Nevada, Reno

Cuckoo Nests on San Pedro River

Parameter	Avg.	Range
Eggs/nest (n=21)	2.0	1-3
No. hatch (n=21)	1.9	1-3
No. fledged (n=21)	1.8	1-3
Apparent nest success (n=47)	66%	range 33-79%
Incubation Time	11 days	
Age at fledge	6 days	5-8 days
Weight at fledge	30gms	29-35 gms
Adult weight (n=20)	63 gms	46-80 gms

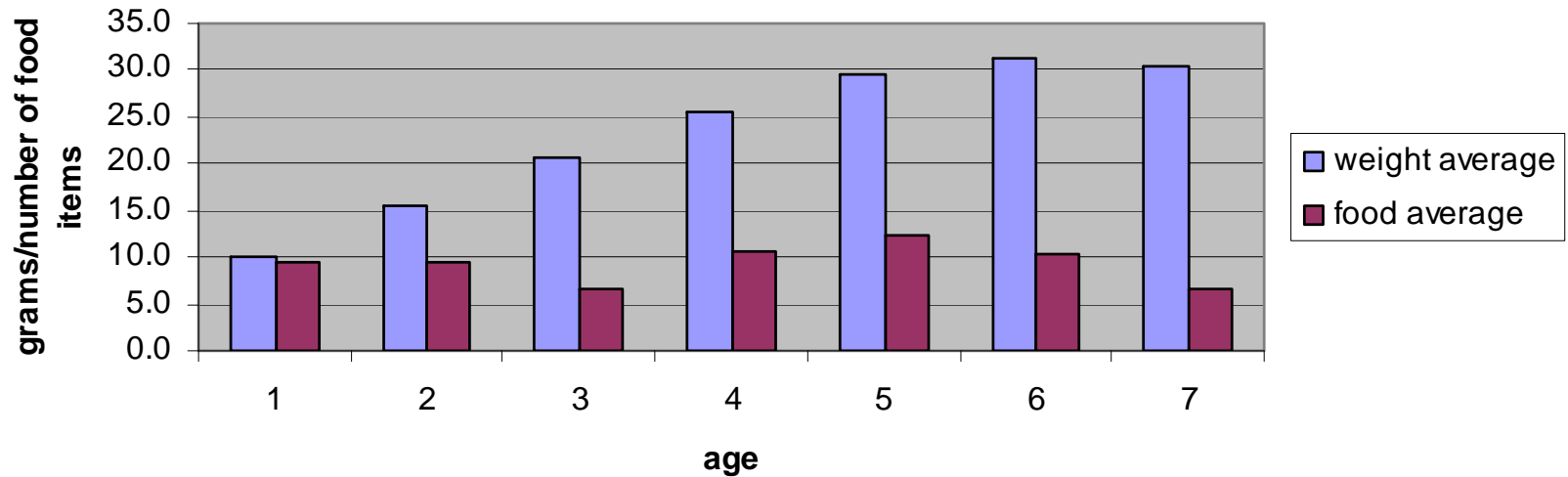
Nestling Growth Results

- Weight increased from 8 gms at hatching to 30 gms at 4 days old, then plateaued.
- Wings and tails continued to grow until fledging (when we could no longer measure them)

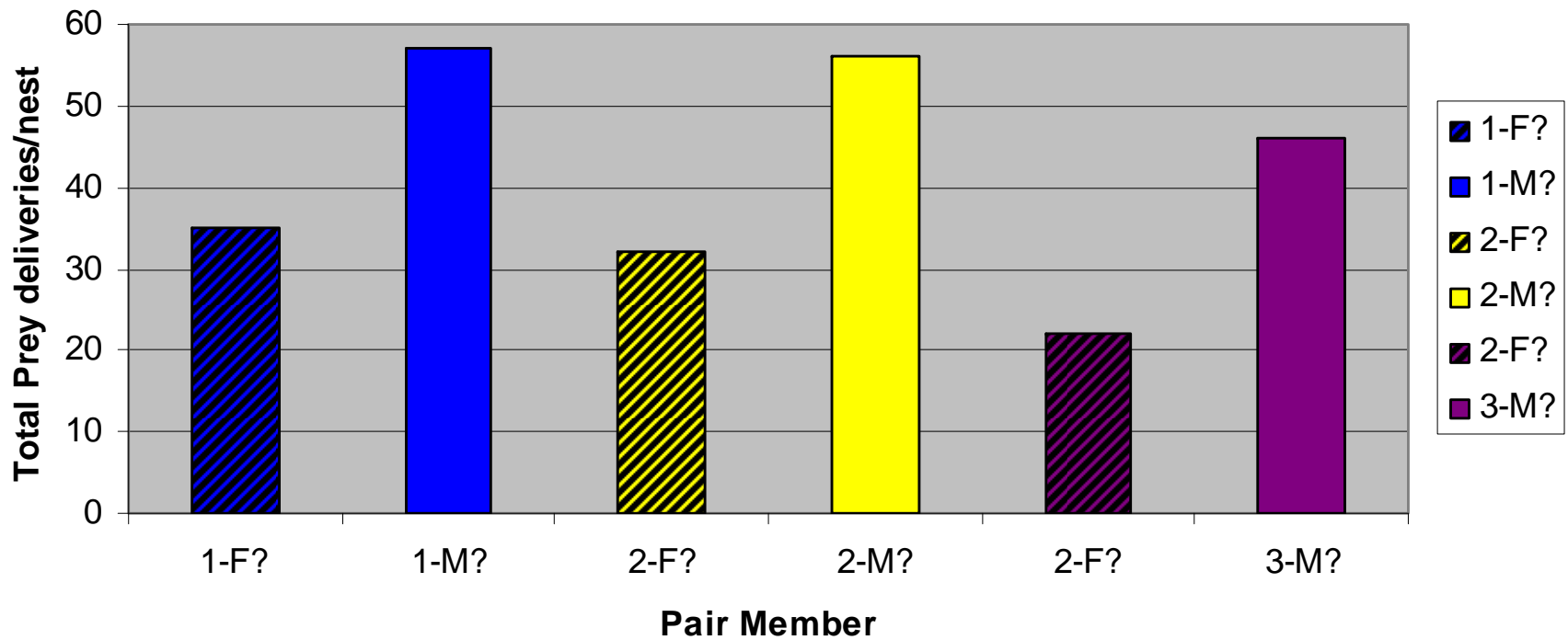


Feeding and weight gain of Cuckoo Nestlings

Growth and prey consumed by nestling Yellow-billed Cuckoos on the San Pedro River, 2005 (n=3).



Disproportionate Prey Deliveries by mates (n=6)



Conclusion – Nesting Biology

- Yellow-billed Cuckoos leave the nest at a young age
- Parents make minimal visits to the nest
- Apparently nesting life history is strongly geared towards minimizing nest predation





Summary

1. Cuckoo populations on the SPRNCA appear to be declining rather than fluctuating.
2. Call playback detects more birds than point counts
3. On a single survey, at least 30% of birds present are not detected
4. Each subsequent survey detects birds at new locations
5. Less than 40% of cuckoos may be responding during a single survey.
6. Can we combine these results to determine accurately the number of cuckoos in an area – NO



Discussion

1. Every banded bird ($n = 30$) moved 100's to 1000's of meters from it's banding location.
2. Cannot determine territories, even with telemetry – only home ranges
3. Home ranges on the San Pedro often overlap
4. Point counts don't work
5. Call Playback misses multiple birds on each survey
6. Cannot determine accurate population estimates
7. Need an index of cuckoo density

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- Photos are by M. Halterman unless otherwise noted



QUESTIONS



Comparison of detections/survey hour and per km



		YEAR		
		2002	2003	2004
Kern River	detec/km	1.3	1.0	1.0
	detec/hour	0.22	0.13	0.22
Bill Williams	detec/km	2.5	2.9	1.5
	detec/hour	0.15	0.17	0.17
San Pedro RNCA	detec/km	3.4	2.5	2.0
	detec/hour	0.88	1.65	1.33

Recommendations

- Adopt an index of cuckoo density other than territories to assess populations
- Multiple surveys (4 recommend)
- Assess populations by locating and monitoring nests
- Repeat multiple observer comparison in areas of lower cuckoo density, and throughout the season.



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3. Comparison of multiple visits

	VISIT				
Same location?	1	2	3	4	Total
New	4	21	23	13	61
Repeat	0	3	16	4	23
Total	4	24	39	17	84

Comparison of multiple visits

VISIT

Same location?	1	2	3	4	Total
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Study site: San Pedro River National Conservation Area

-Conducting surveys and banding since 2001

-Point count and call playback comparison in 2005 on 15km stretch of the river

-Double observer comparison in 2005

-Method test with marked birds during 2004 and 2005



What do these estimates tell us about a 'population'?



Nine years of survey data from the Bill Williams River NWR