



Population Status of the Yellow-billed Cuckoo in the Sacramento Valley

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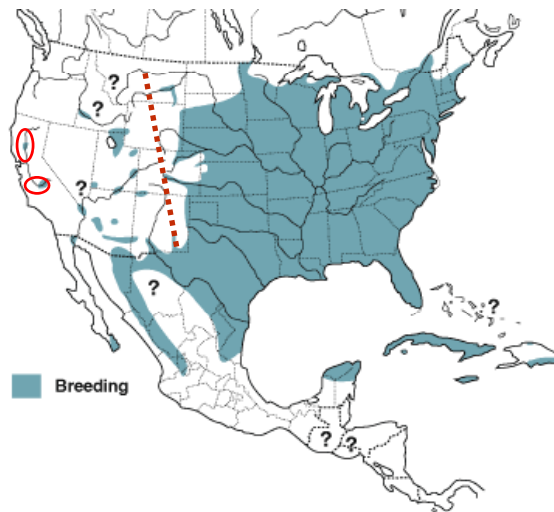
Yellow-billed Cuckoo Distribution

- Riparian obligate in the West
- Uses a variety of habitats in the East



Yellow-billed Cuckoo Distribution

- Western population (DPS) proposed for federal listing (warranted but precluded)
- State Endangered in California



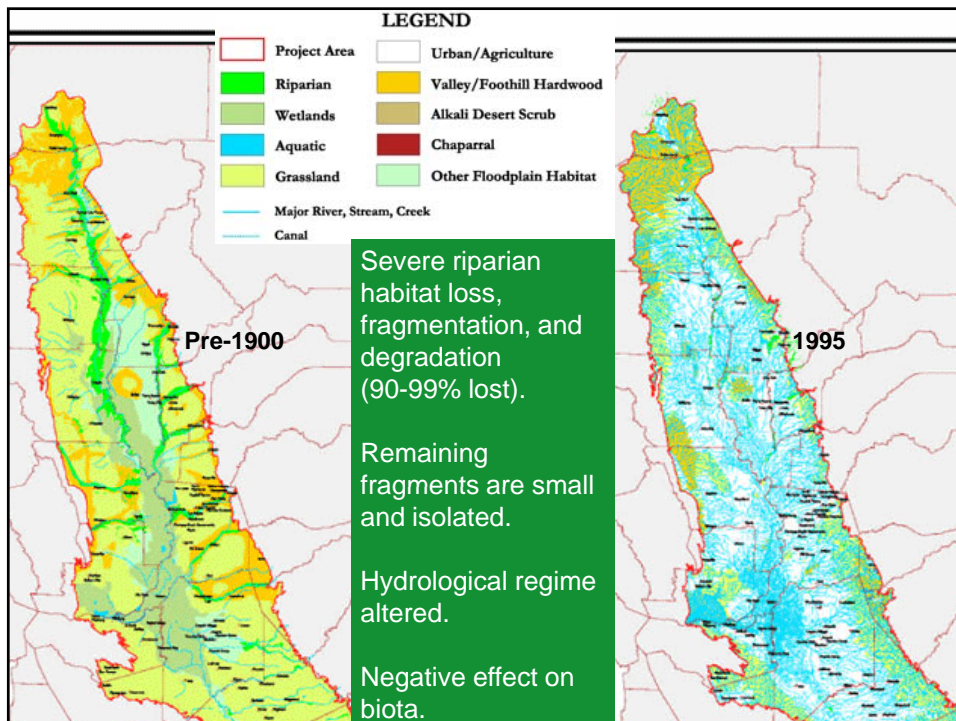
Cuckoo challenges

- Breed from late June into early August
- Extremely elusive
- Need to survey with call playback protocol
- Interpretation of call playback changes in 2003
- Last survey in 2000
- Natural history NOT well known

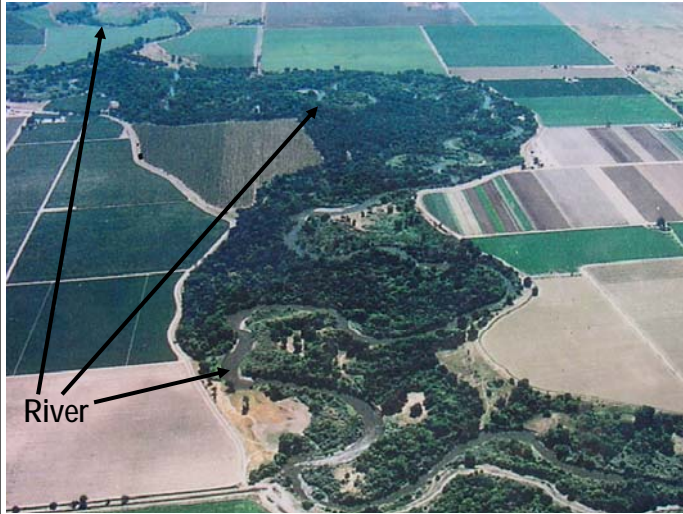


Today's Outline

- Overview of Sacramento Valley Riparian
- Survey methods 2010
- Results
 - Cuckoo numbers
 - Habitat use
- Comparison to previous surveys
- Future needs



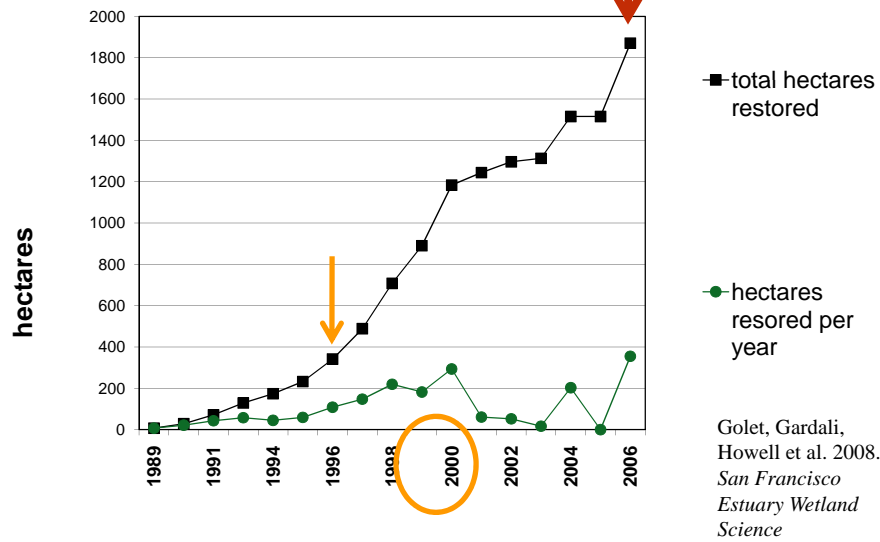
Sacramento Valley – Agricultural matrix



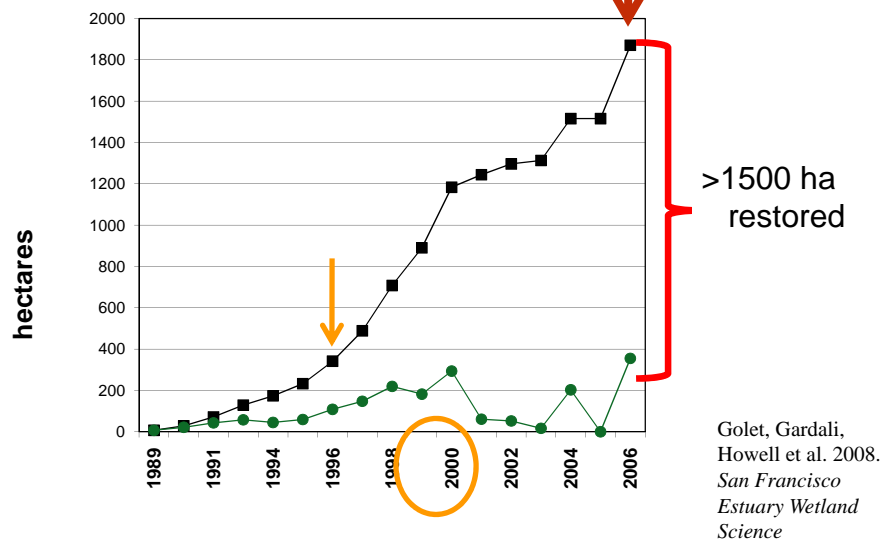
Sacramento Valley – Riparian Restoration



Cumulative Restoration Efforts

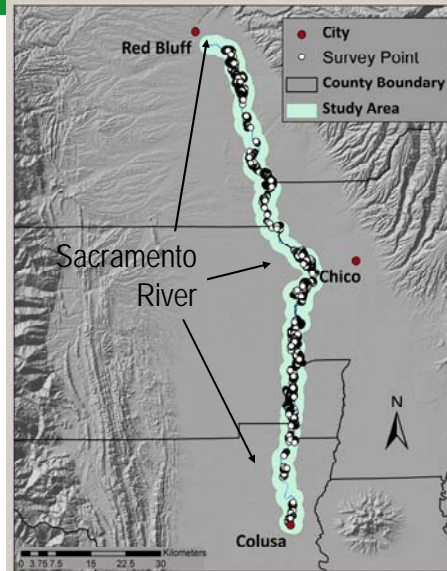


Cumulative Restoration Efforts



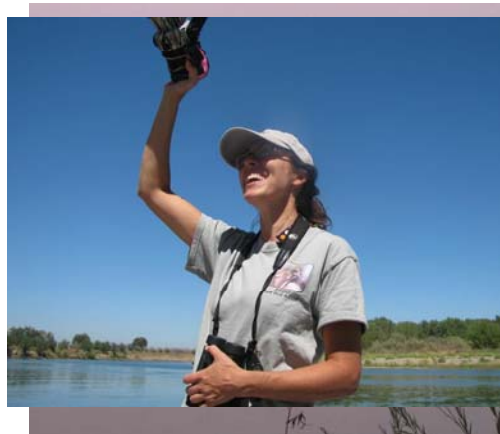
Methods: How to stalk a cuckoo!

- Covered 104 miles!
- 1500 survey points
 - Each pt 100-150m apart
 - Surveyed four times

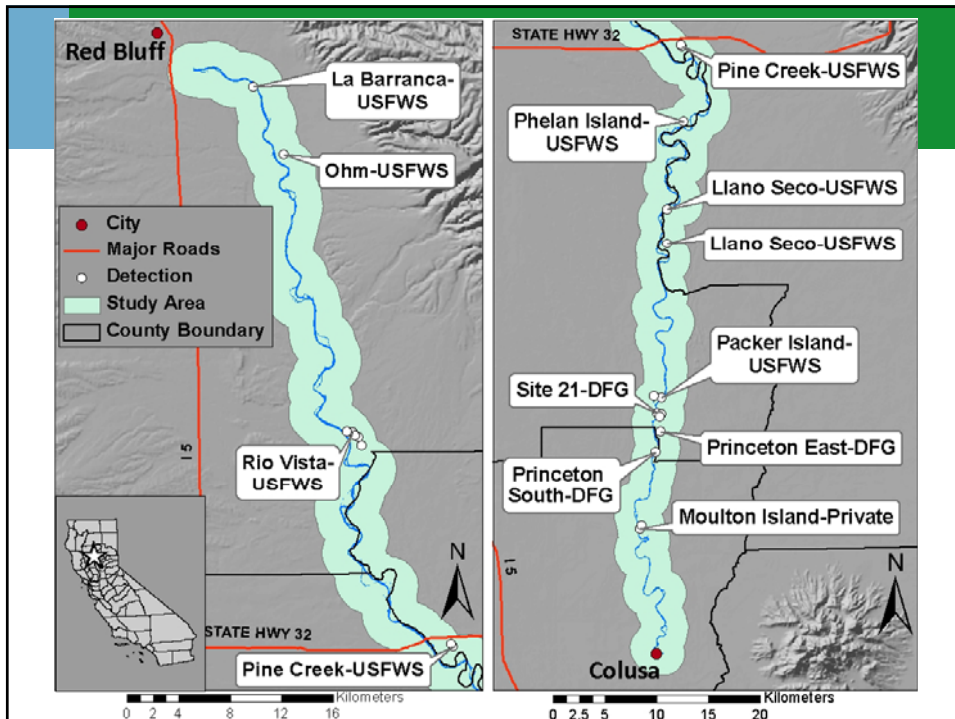
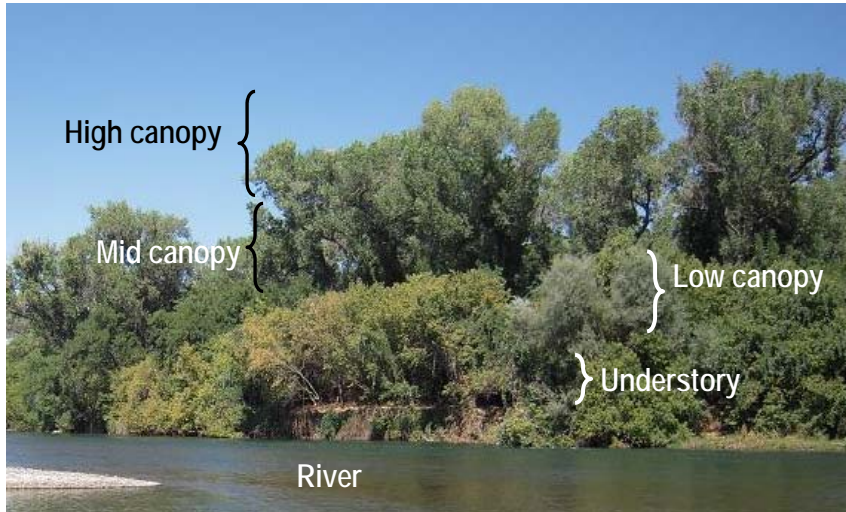


Methods: How to stalk a cuckoo!

- Covered 104 miles!
- 1500 survey points
- Boat Surveys
- Worked with USFWS, DFG, TNC, & River Partners
- Used call playback method
- Lots of work!

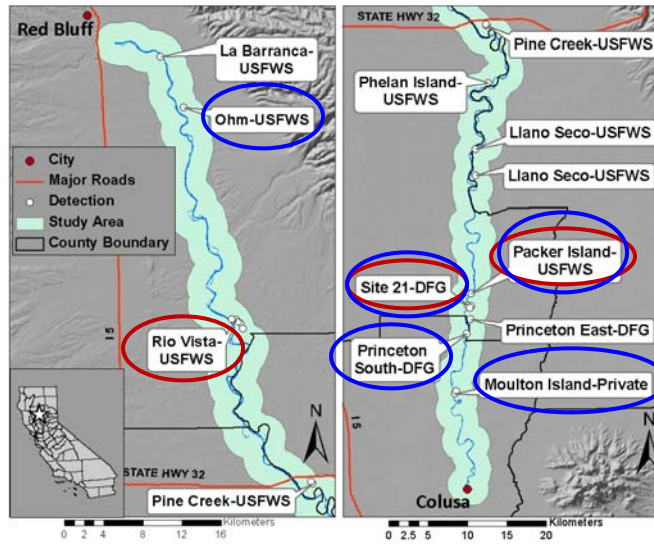


Cuckoo Hideouts – Veg surveys



Results!

- 24 detections
- 18 individ.
 - USFWS – 11
 - DFG - 6
 - Private – 1
- 3 sites had multiple terr.
- ~8 detections involved boat



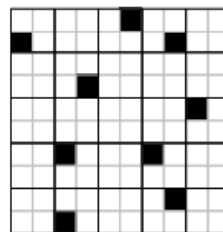
Occupancy Modeling



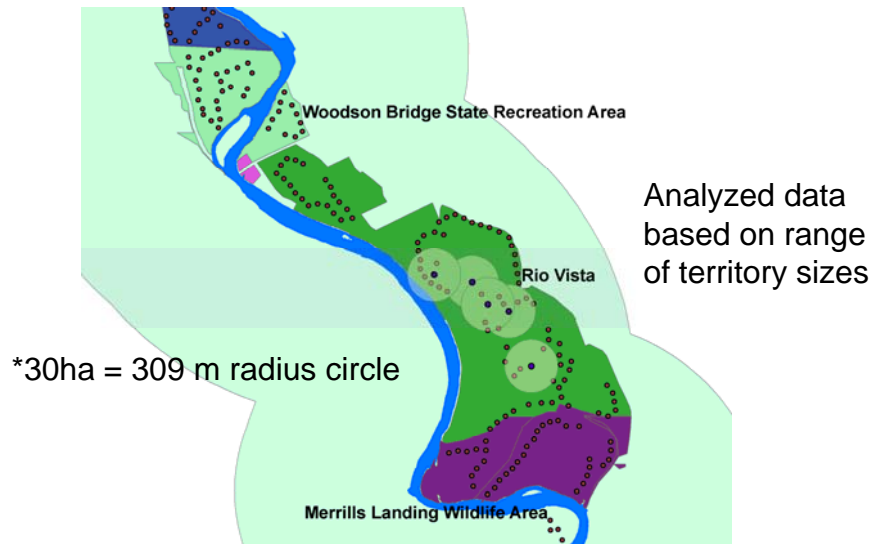
- Detectability (p) can convert counts (C) into abundance (N)

$$\hat{N} = \frac{C}{\hat{p}} \quad E(C) = pN$$

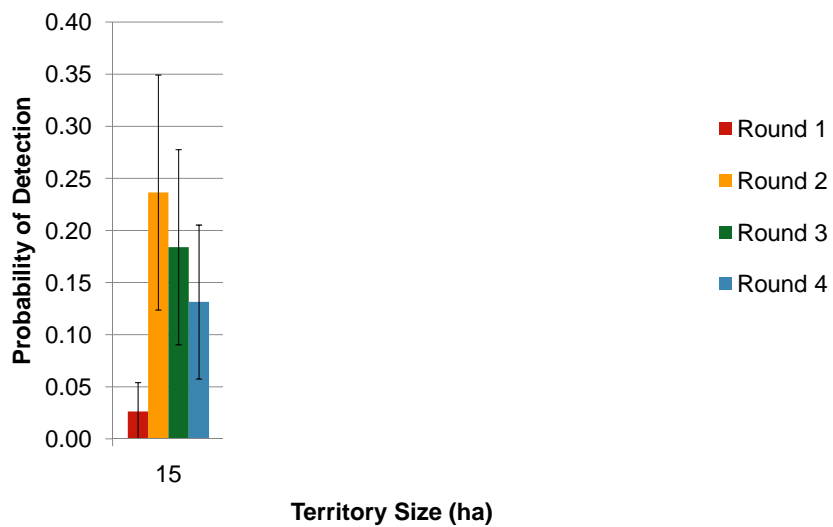
- How to define the sampling unit?
- 4 units: 100% occupied (4/4)
- 25 units: 36% occupied (9/25)
- 100 units: 9% occupied (9/100)



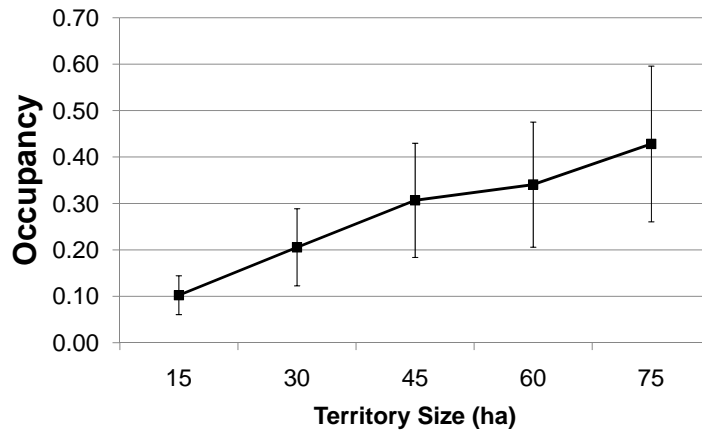
Territory size example: 30 ha*



Detectability varies with date and is highest in July



Occupancy varies with area (Territory size)

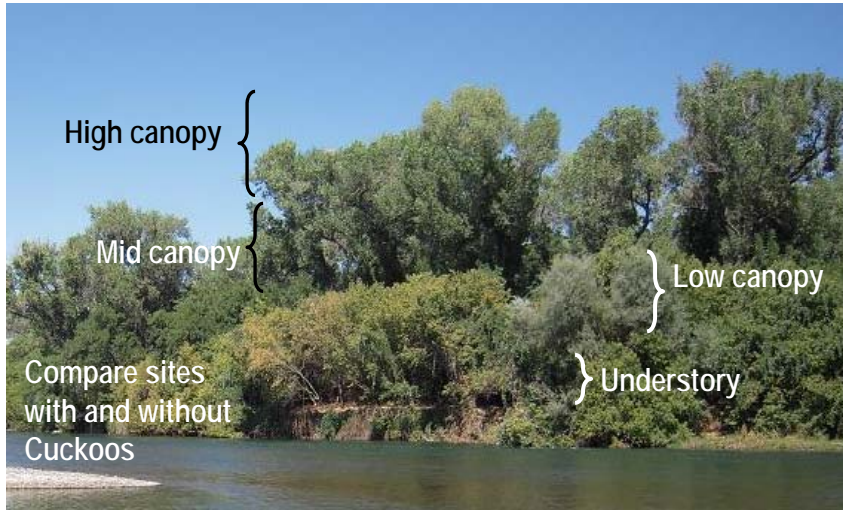


Occupancy estimates

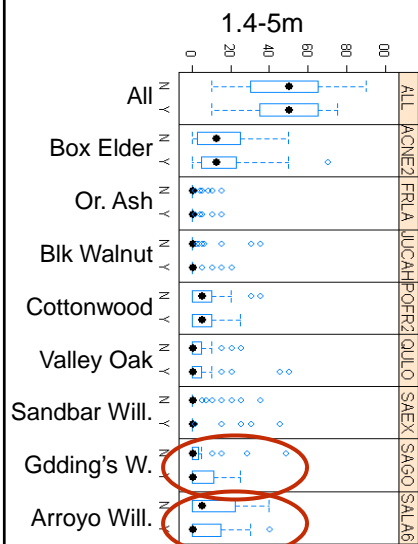
Territory Size

	15
# Potential terr.	371
Naïve # Occupied territories	18
# Empty territories	353
Occupancy estimate (%)	10.3
Occupancy estimate (# terr.)	38.2
Terr. radius circle (m)	218.6

Cuckoo Hideouts – Veg surveys



Tree Cover (%) by Strata

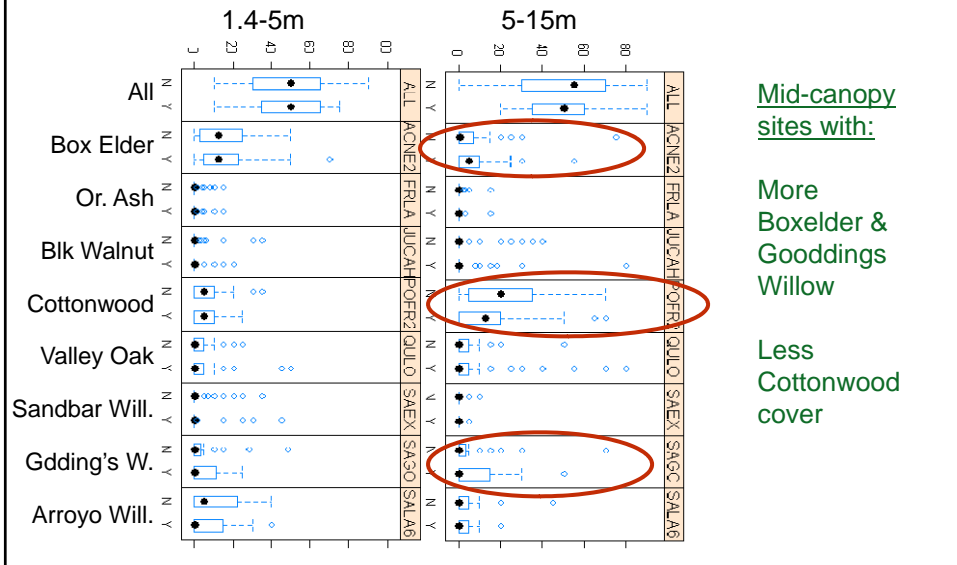


Low-Canopy sites with:

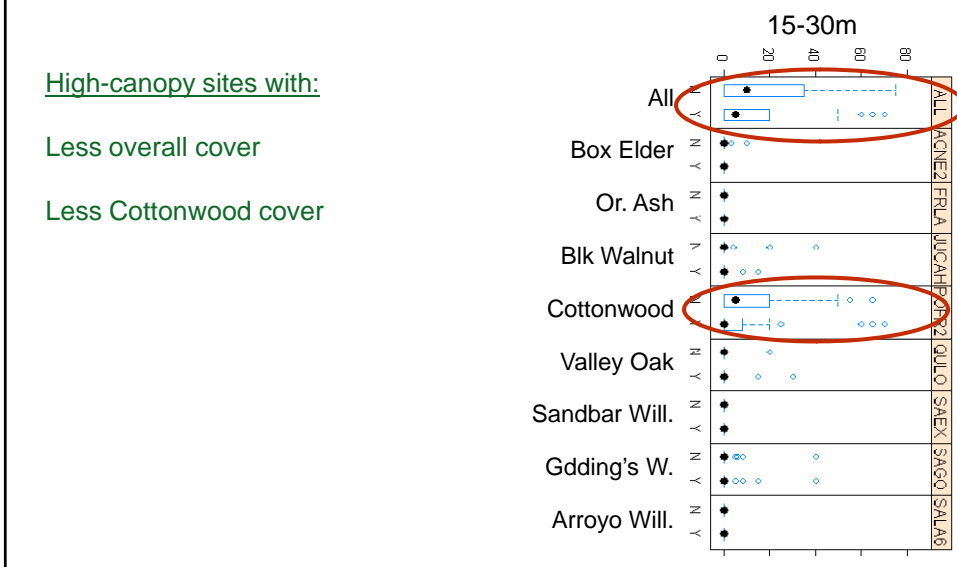
More Gooddings Willow

Less Arroyo Willow

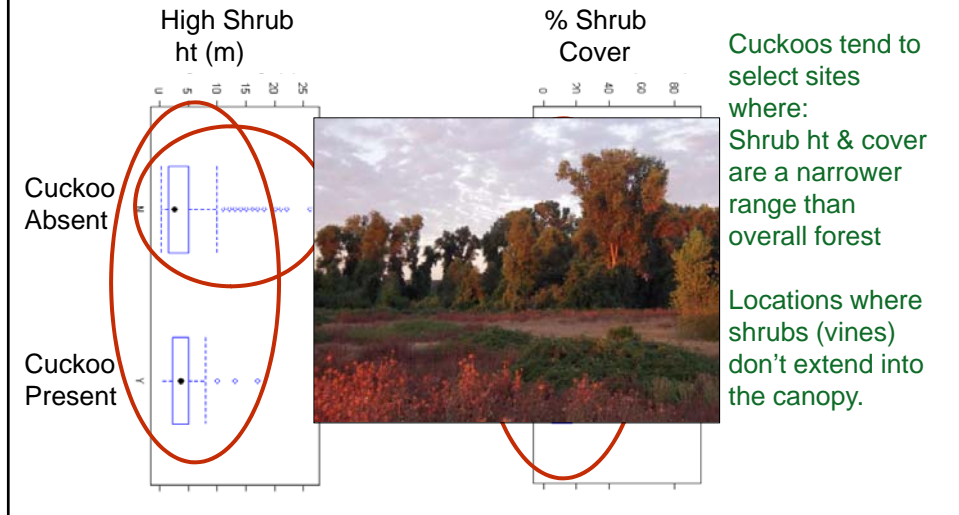
Tree Cover (%) by Strata



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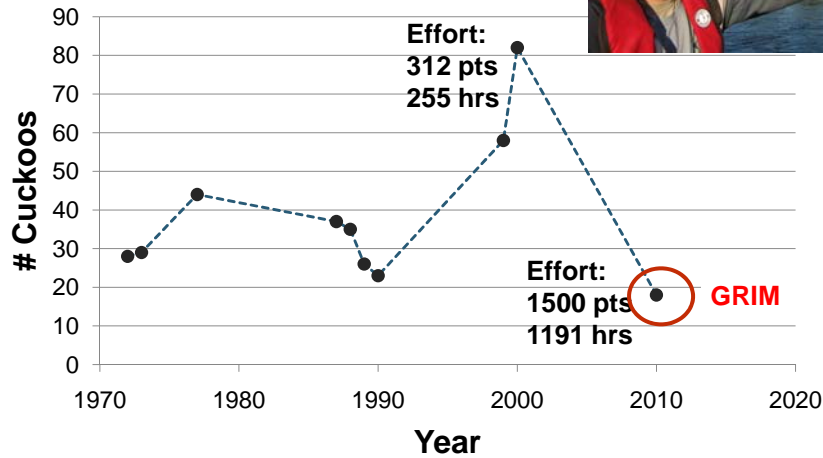
Understory



Previous Surveys

Year	Reported Results	Visits	Citation
1972	28 individ.	1	Gaines 1974
1973	29 individ.	1	Gaines and Laymon 1984
1972-73	44 individ.	1	Gaines and Laymon 1984
1977	44 individ.	1	Gaines and Laymon 1984
1977	29-60 pairs	1	Halterman et al. 2001
1987	18 pairs, 17-19 unmated	3	Halterman et al. 2001
1988	35 pairs	3	Halterman et al. 2001
1989	26 pairs	3	Halterman et al. 2001
1990	23 pairs	3	Halterman et al. 2001
1999	28-32 pairs, 26 unmated	3-4	Halterman et al. 2001
2000	35-40 pairs, 38-42 unmated	3-4	Halterman et al. 2001
2010	18 individ. (naïve est.)	4	This study

Cuckoo trends (not adjusted for effort)



Future Research Needs

- Continue to monitor the Sacramento River population
- Further cross-walk old cuckoo data with new protocol
- Use radio telemetry to determine territory sizes
- Study additional habitat selection cues
 - Prey base?
 - Landscape scale cues?



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J. Hammond, I. Koulouris, M. Rogers,
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