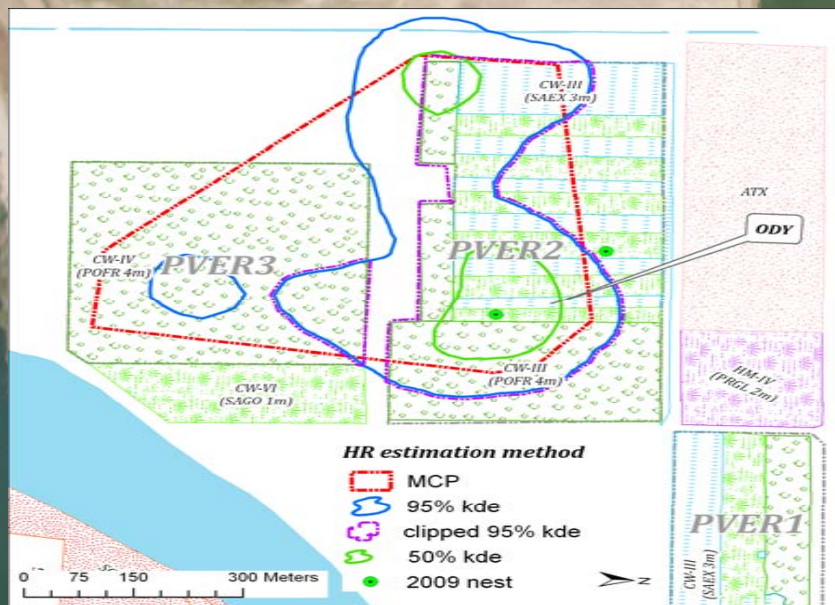


Yellow-billed cuckoo telemetry at LCR restoration sites, 2009



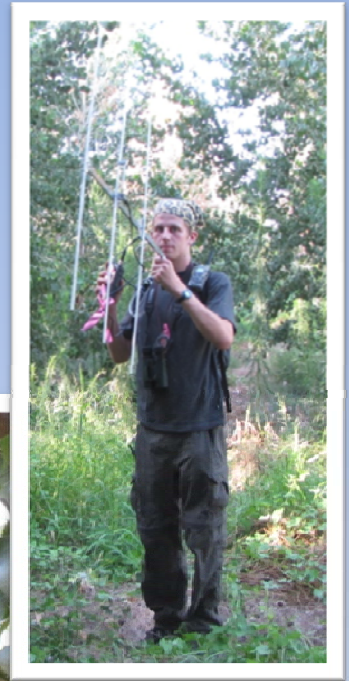
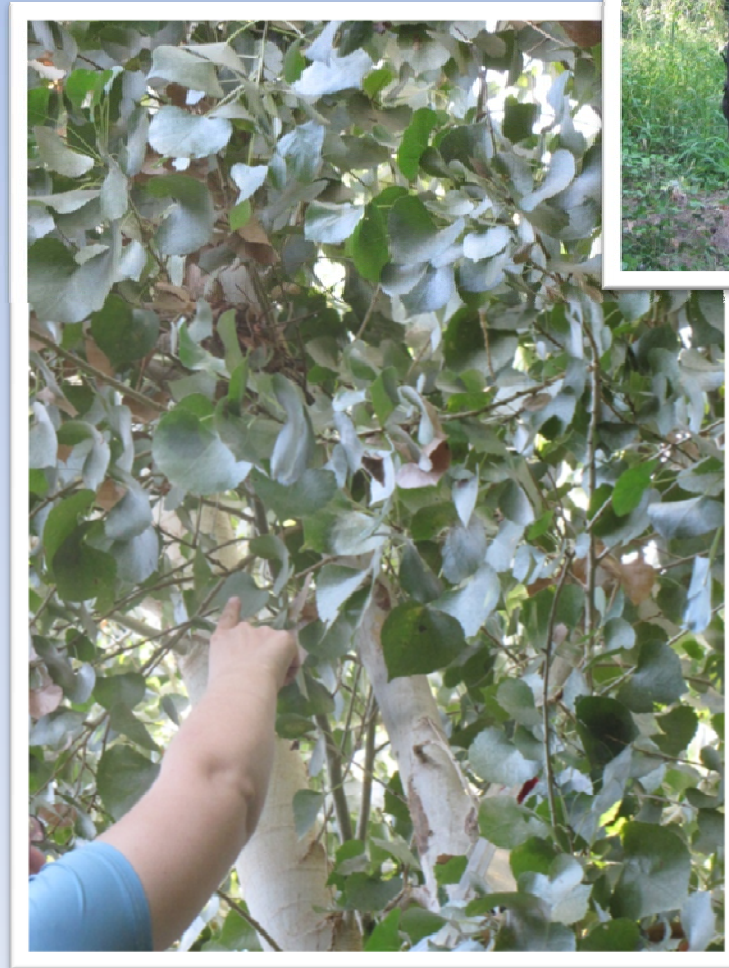
Shannon McNeil,
Diane Tracy,
Eli Rose,
Murrelet Halterman

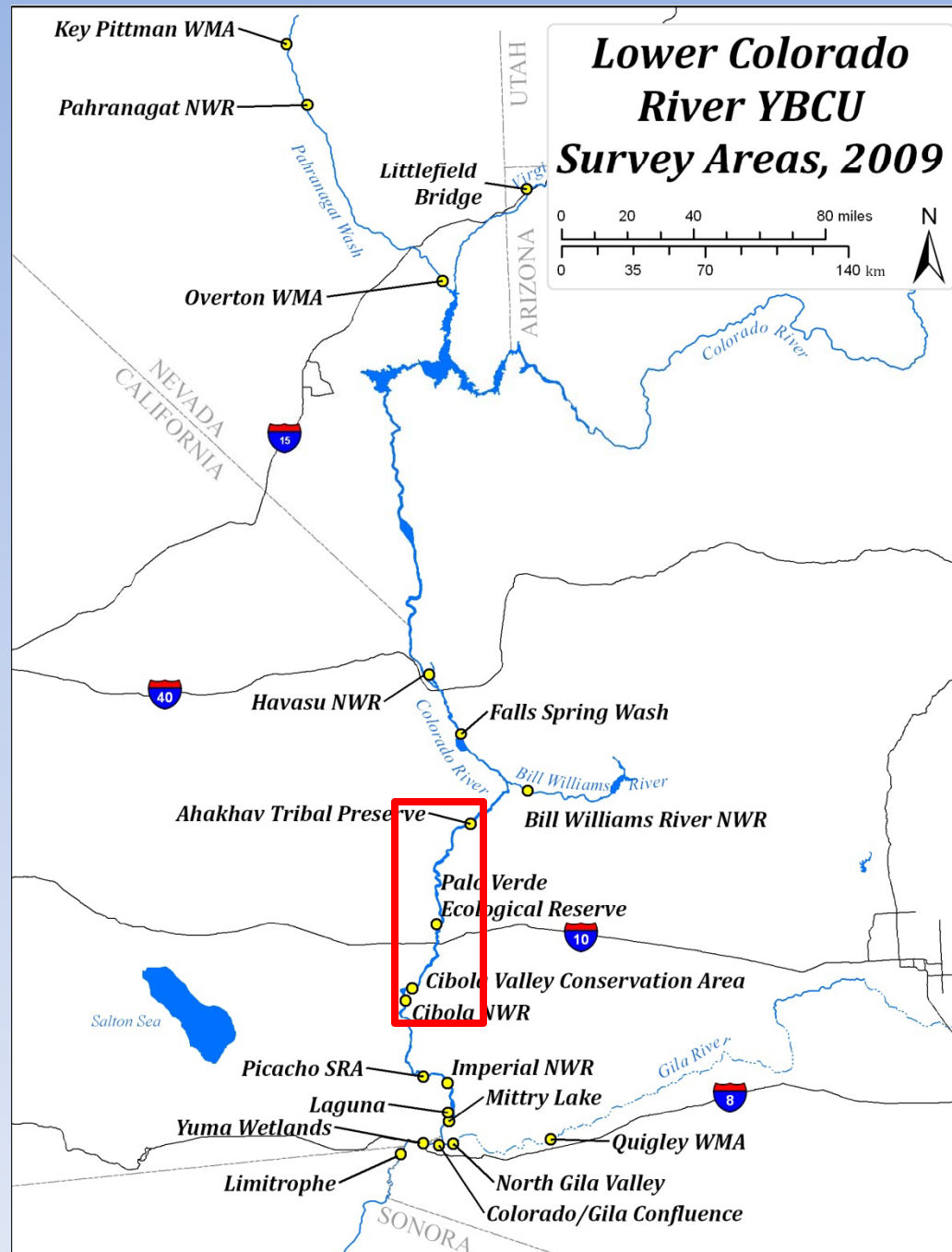


Southern Sierra Research Station
Research for Conservation of Biological Diversity

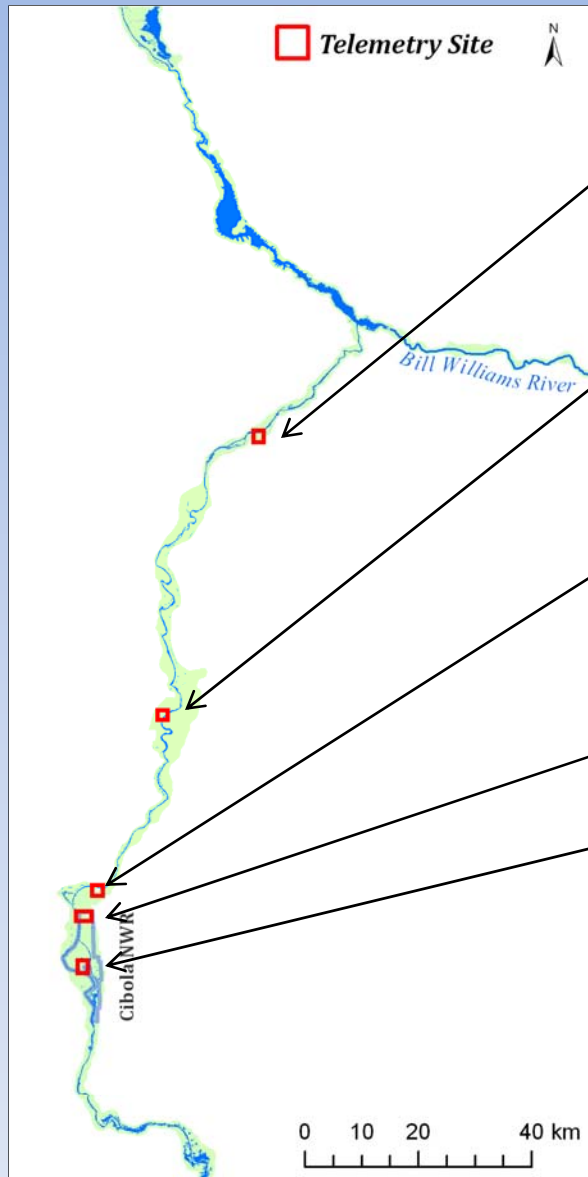
Why radio-track cuckoos?

- *Cuckoos are cryptic*
- *shows us how they are using restoration (habitat creation)*
- *determine home ranges (size, shape, structure)*
- *locate nests*
- *guide future habitat restoration projects*



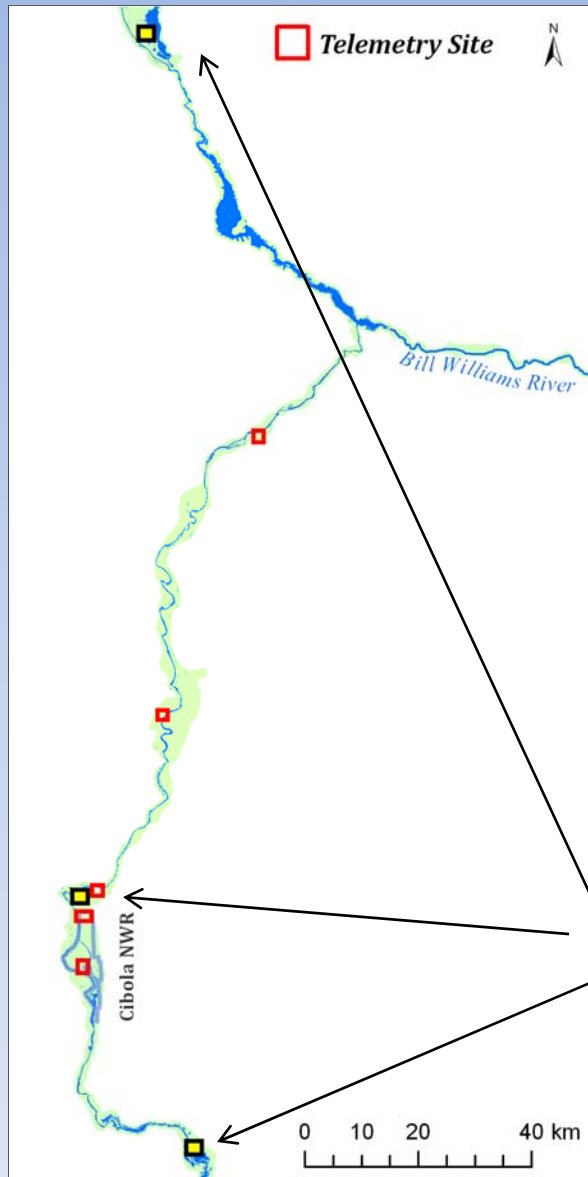


Five ybcu telemetry sites



- Ahakhav Tribal Preserve (CRIT), 53 ha
- Palo Verde Ecological Reserve (Phase 2), 49 ha
- Cibola Valley Conservation Area (Phase 1), 58 ha
- Cibola NWR - Nature Trail, 59 ha
- Cibola NWR - Perry Marsh (Island unit), 62 ha*

Five *ybcu* telemetry sites



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- (Havasupai NWR Beal, CVCA3, Imperial NWR - no luck)

How to catch a cuckoo

1. *Locate a responsive cuckoo (e.g. do a survey, pay attention to birds flying towards you)*
2. *Set up a canopy net near bird's location (ideally, vegetation height = net height (approx. 10 m for quad-stacked))*
3. *Play cuckoo calls on either side of net, and...*





Voila



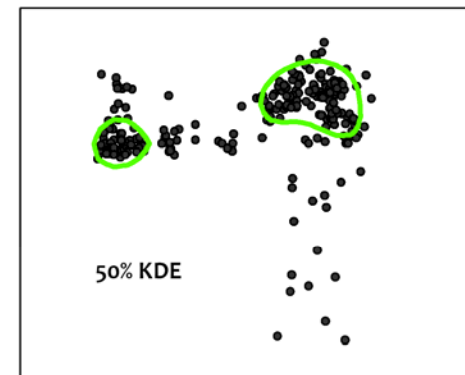
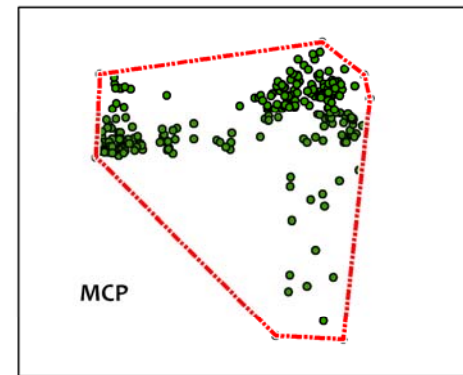
Methods

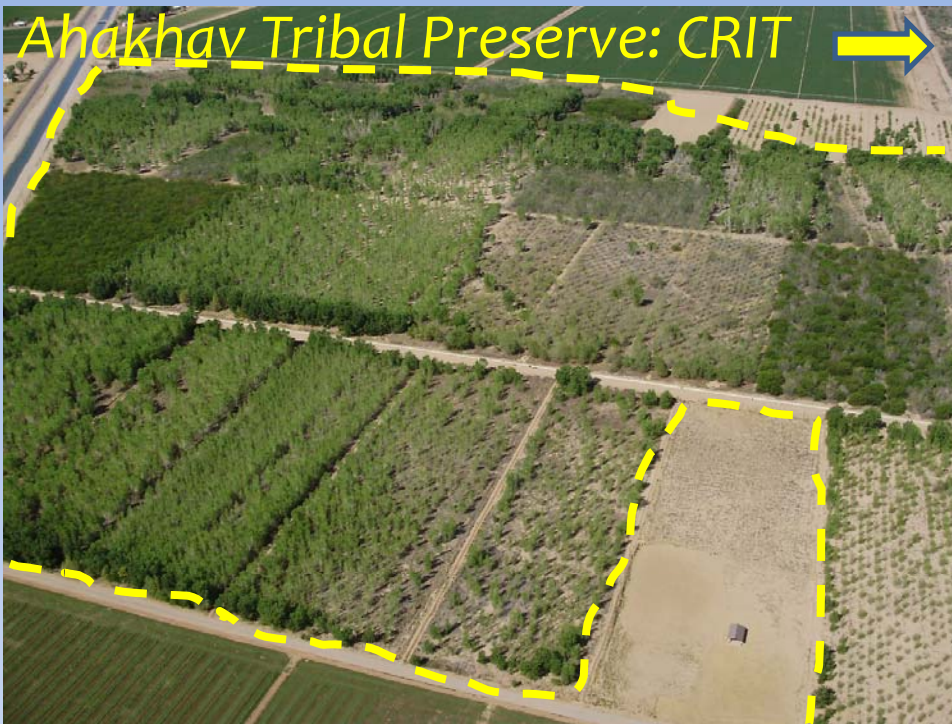
- Birds were caught between June 30 and August 3 (9 total)
- A Holohil transmitter was either attached to tail feathers or glued to the back
- 6 birds were followed for 5-18 days, until either the bird left the site or dropped its transmitter



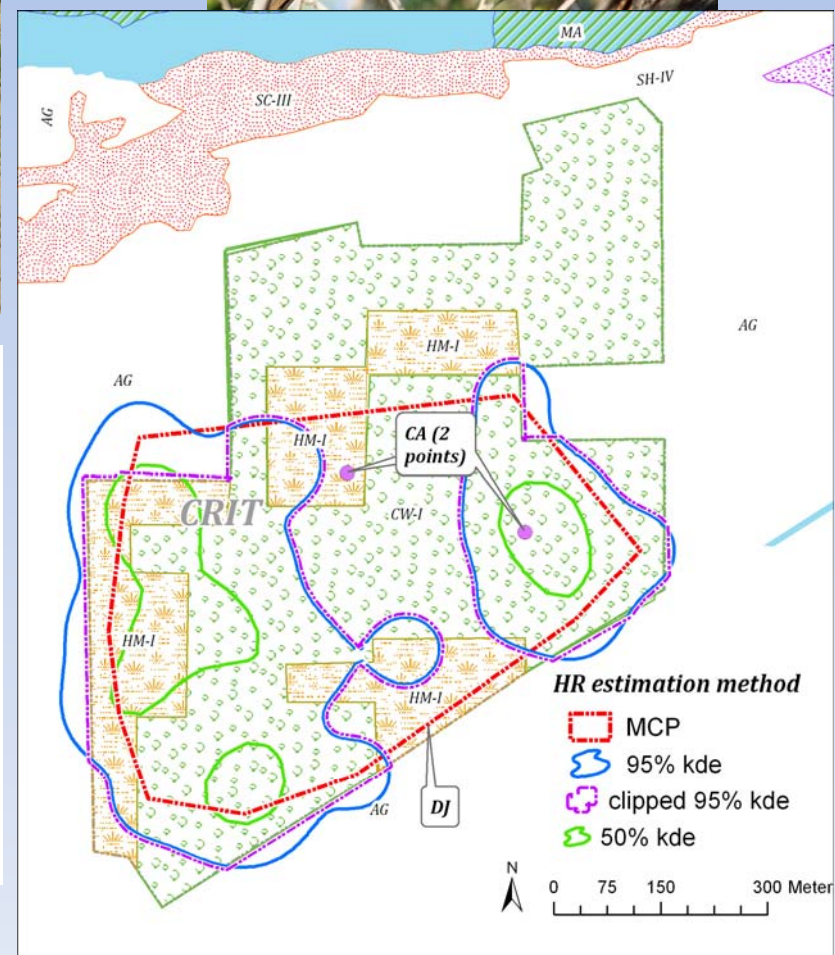
Home range estimation

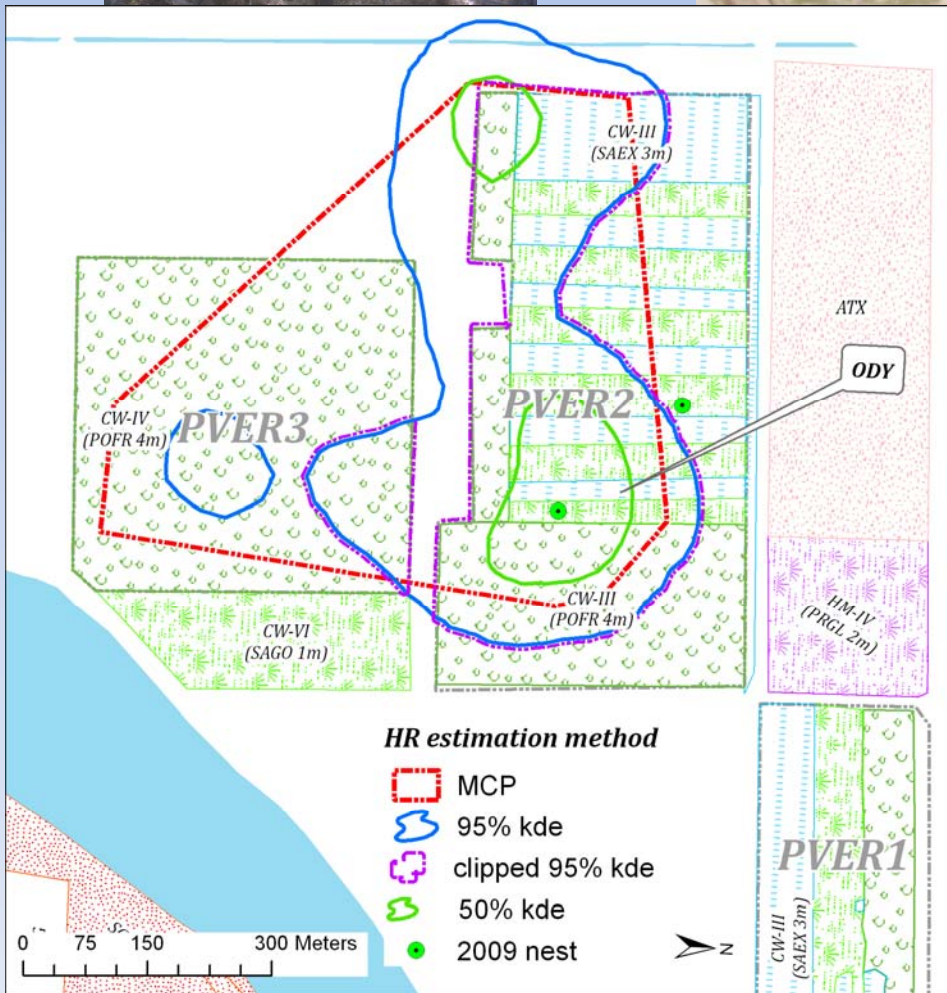
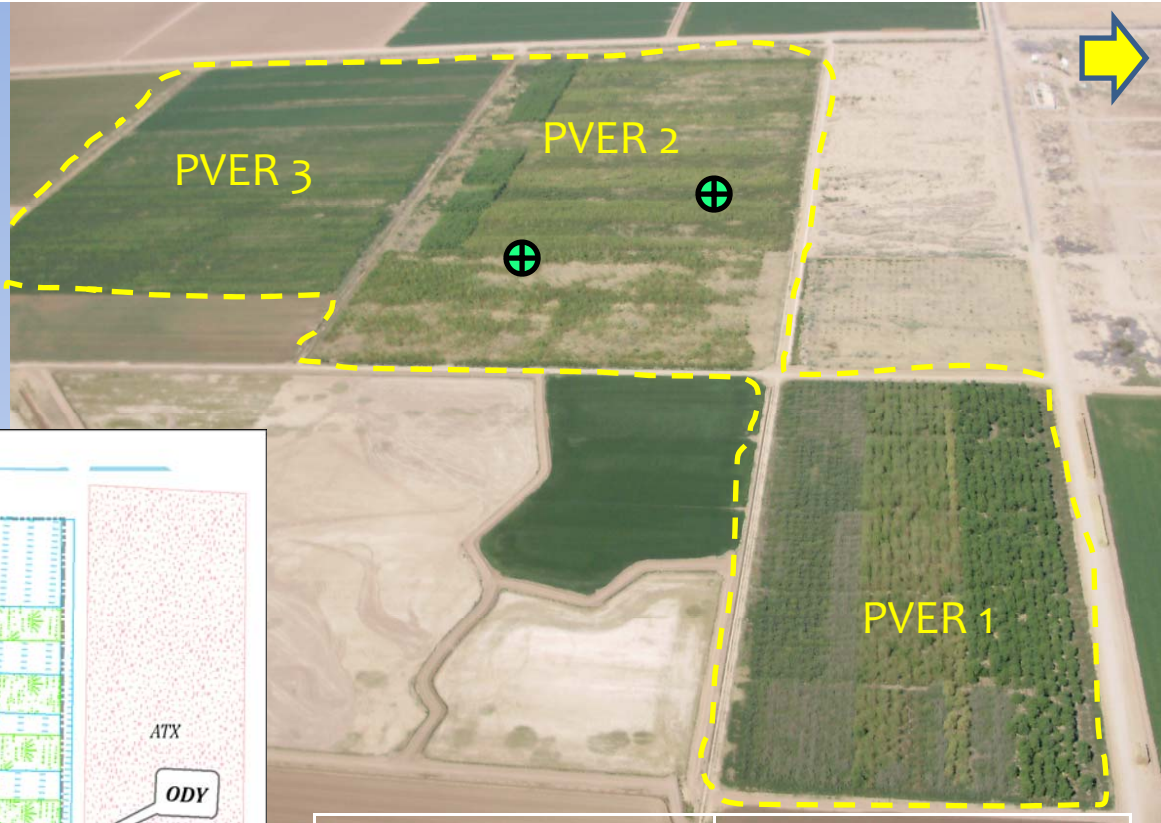
- Hawth's Tools (www.spatial ecology.com) used to estimate HR
- Minimum Convex Polygon (MCP) (Mohr 1947): completely enclose all data points by connecting the outer locations in such a way as to create a convex polygon.
- Kernel Density Estimates (KDE): smallest area covering x% of all data points
- 95% KDE, 50% KDE
- "Clipped 95% KDE" – 95% KDE with AG removed



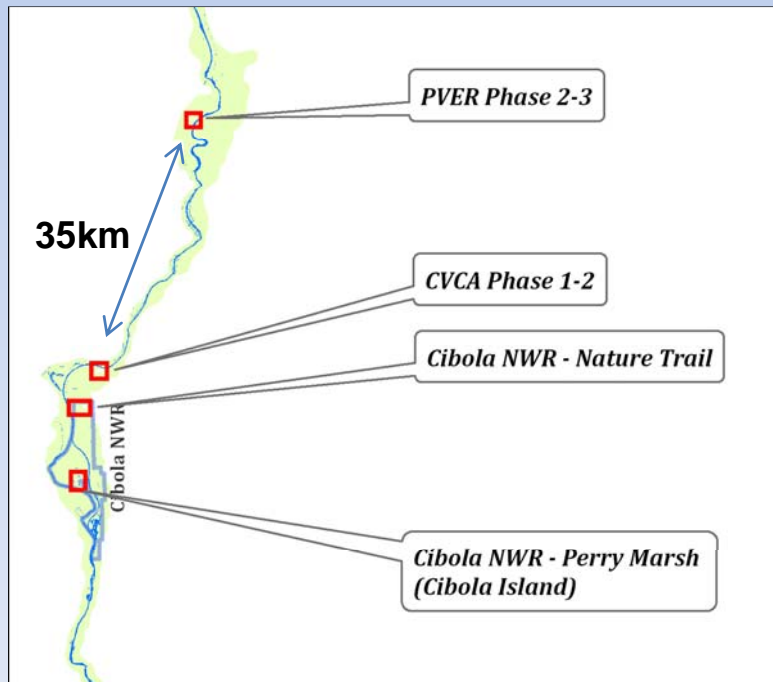


Sex:	Female (CA also female)
Mated:	Unknown
#days data:	5 – bird left area
MCP:	30.4 ha
95% kde:	29.3 ha
Clipped 95% kde:	25.3 ha (CW 72%, HM 27%)
50% kde	6.7 ha (CW 62%, HM 36%)





Sex:	Unknown
Mated:	Mated
Age	exactly 1 year*
#days data:	13 – bird left area
MCP:	29.8 ha
95% kde:	22.2 ha
Clipped 95% kde:	14.9 ha (CW 100%)
50% kde	3.8 ha (CW 100%)

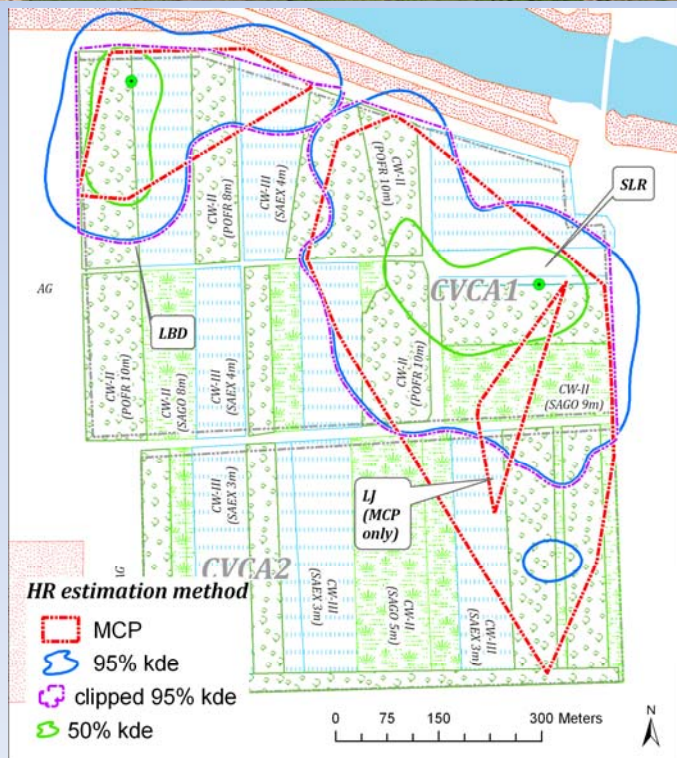


ODY

- Natal site - CVCA1 2008
- Apparent breeding site - PVER2 2009
- Natal dispersal distance = 35 km (1 data point)



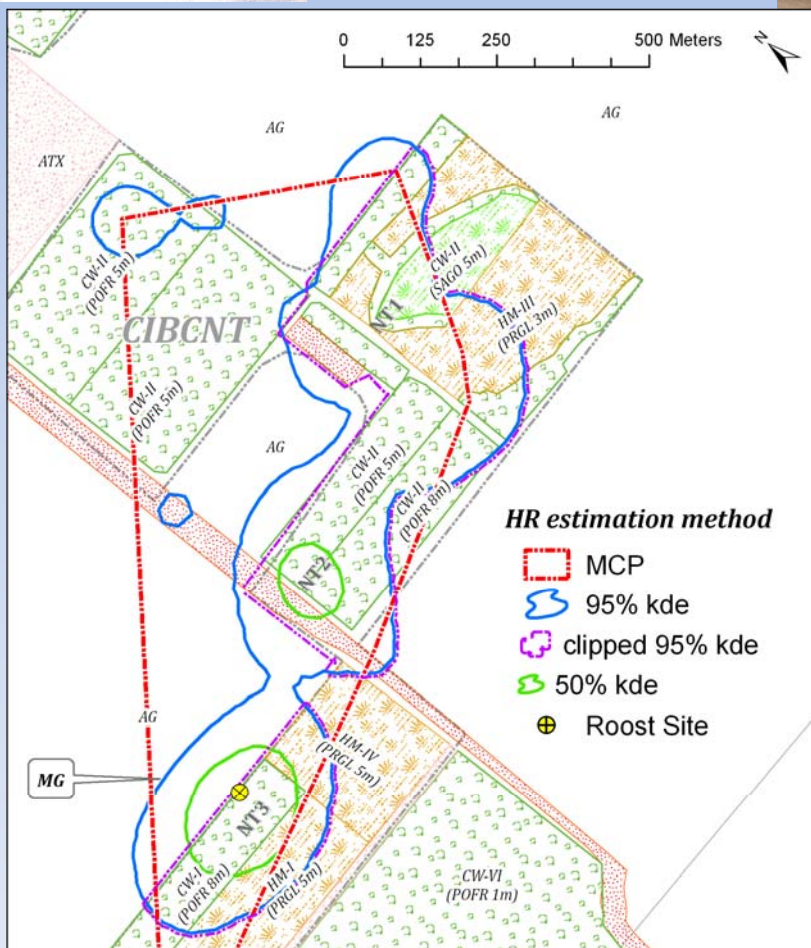
Sex:	Female	Male
Mated:	mated	mated
#days data:	5 – dropped transmitter	18 – dropped transmitter
MCP:	4.4 ha	20.3ha
95% kde:	8.7 ha	17.6 ha
Clipped 95% kde:	6.0 ha, (CW 100%)	16.4 ha
50% kde	2.0 ha (CW 100%)	3.6 ha





MG Roost tree

Cibola NWR Nature Trail (CW 57%, HM 34%)

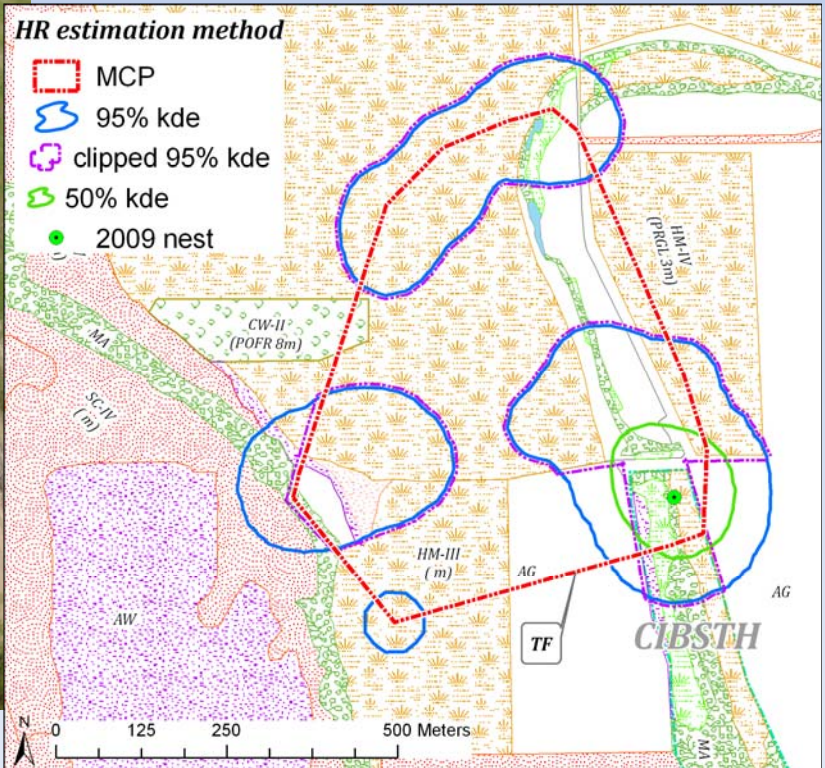


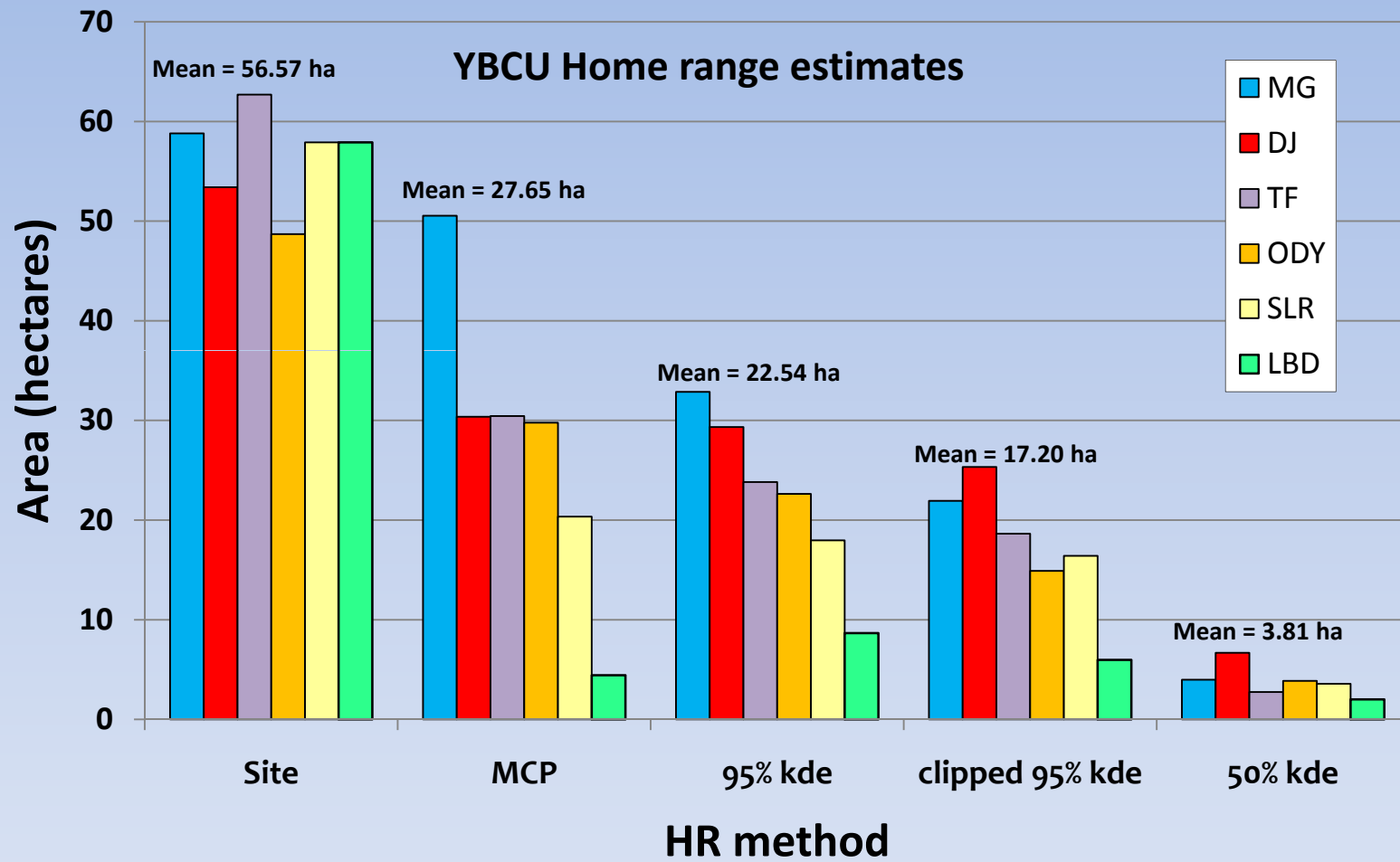
Sex:	Female
Mated:	Unmated, cooed regularly
#days data:	13 – bird left area
MCP:	50.5 ha
95% kde:	32.4 ha (CW 81%, HM 14%, SC 5%)
Clipped 95% kde:	21.9 ha (CW 67%, HM 24%, SC 6%)
50% kde	4.0 ha (CW 100%)



Cibola NWR
Perry Marsh

Sex: probably Male
 Mated: Mated - feeding fledglings
 #days data: 13 – bird left area
 data:
 MCP: 30.4 ha
 95% kde: 23.8 ha
 Clipped 95% kde: 18.6 ha (HM 63%, SH 18%, MA 6%, CW 5%)
 50% kde: 2.7 ha (SH 36%, CW 27%, MA 22%)

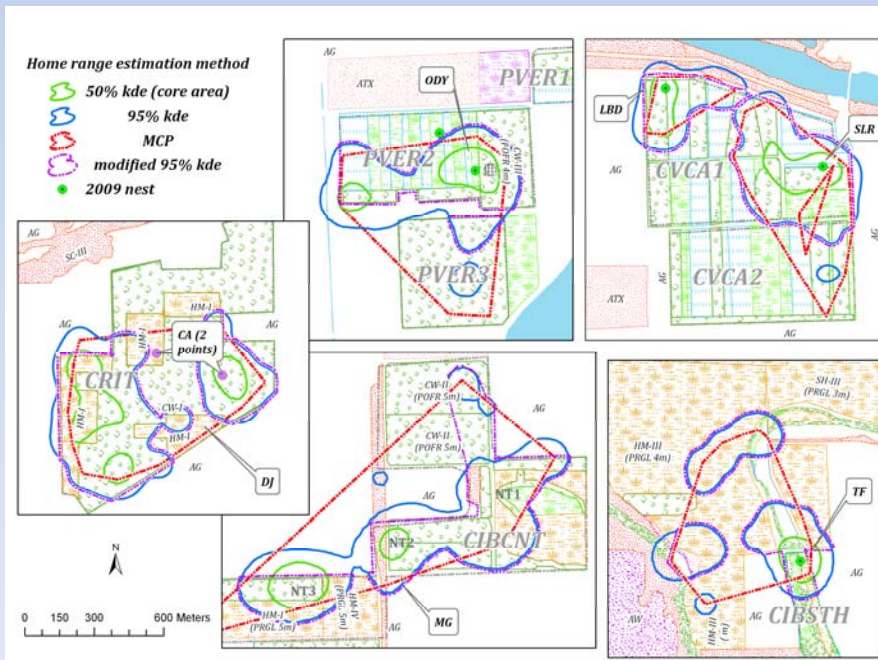






Summary – 2009 findings

- Canopy nets are good for catching cuckoos
- Cuckoos like structural edges – e.g. POFR or SAGO/SAEX
- Home ranges (n=6) variable (mean \approx 20 ha), core areas similarly sized (mean \approx 4 ha)
- 5/6 cuckoos occupied \geq 75% CW; 1/6 dominated by honey mesquite with only 5% CW
- Cuckoos stayed at their chosen site, rather than flying from site to site
- Natal site fidelity was 35 km for 1 cuckoo banded as a nestling



Future directions, possibilities....

- *determine site fidelity, natal and breeding dispersal distances, male vs female*
- *population dynamics (e.g. are there more females than males in isolated habitat patches?)*
- *DNA fingerprinting: genetic population structure (are dispersal distances large enough to avoid inbreeding?)*
- *Stable isotopes*








Acknowledgments

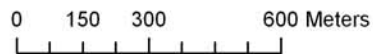
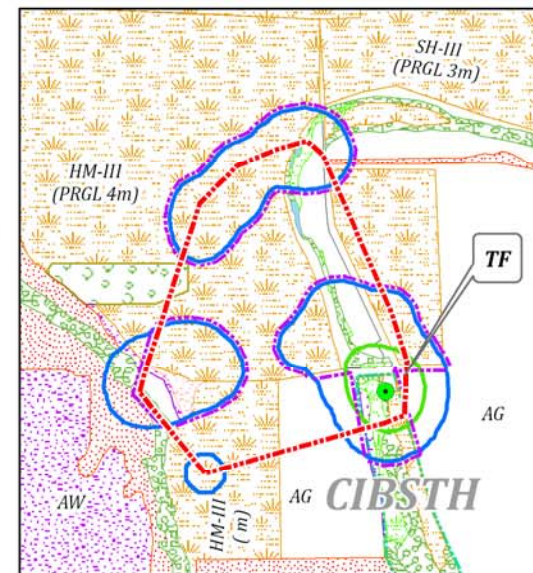
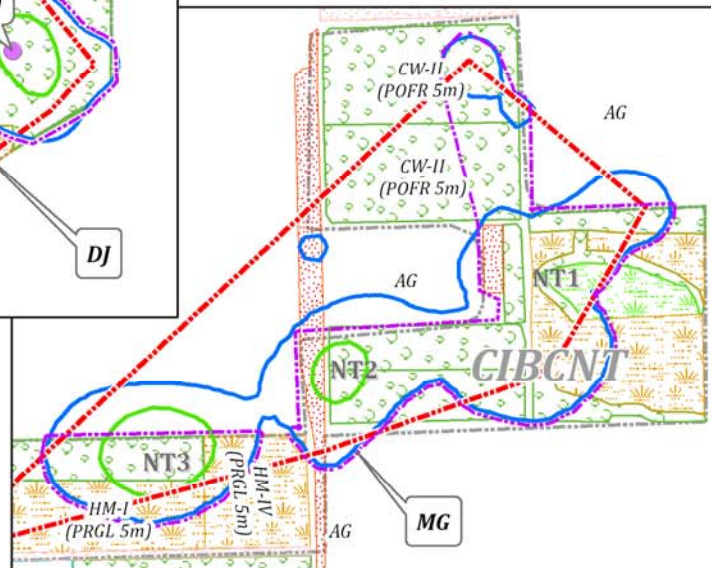
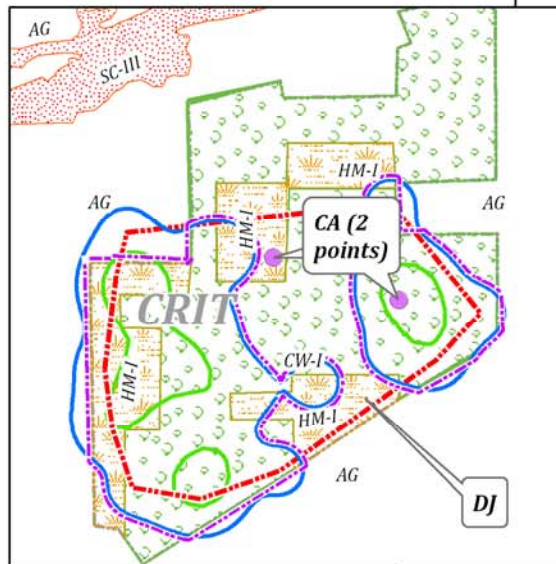
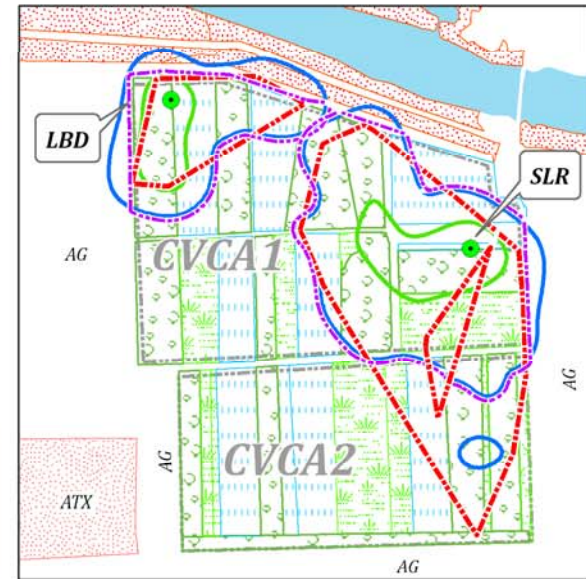
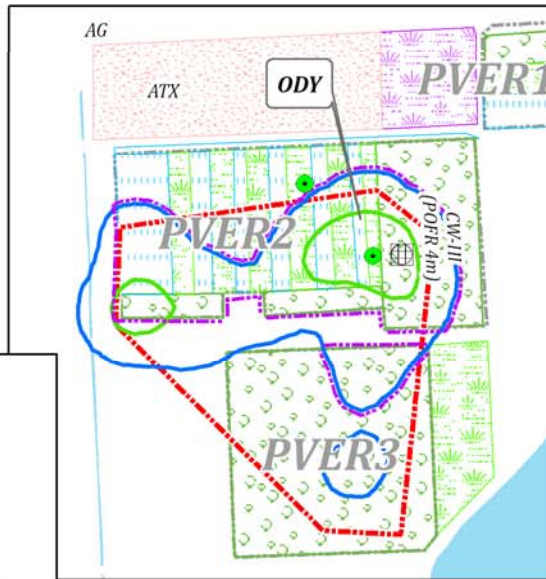
- *Funding provided by USBR MSCP*
- *Reclamation – Barbara Raulston, Joe Kahl*
- *Managers & biologists at these sites*
- *SSRS Field Technicians*
- *Everyone involved in riparian habitat restoration*

Bill Williams River NWR



Home range estimation method

-  50% kde (core area)
-  95% kde
-  MCP
-  modified 95% kde
-  2009 nest



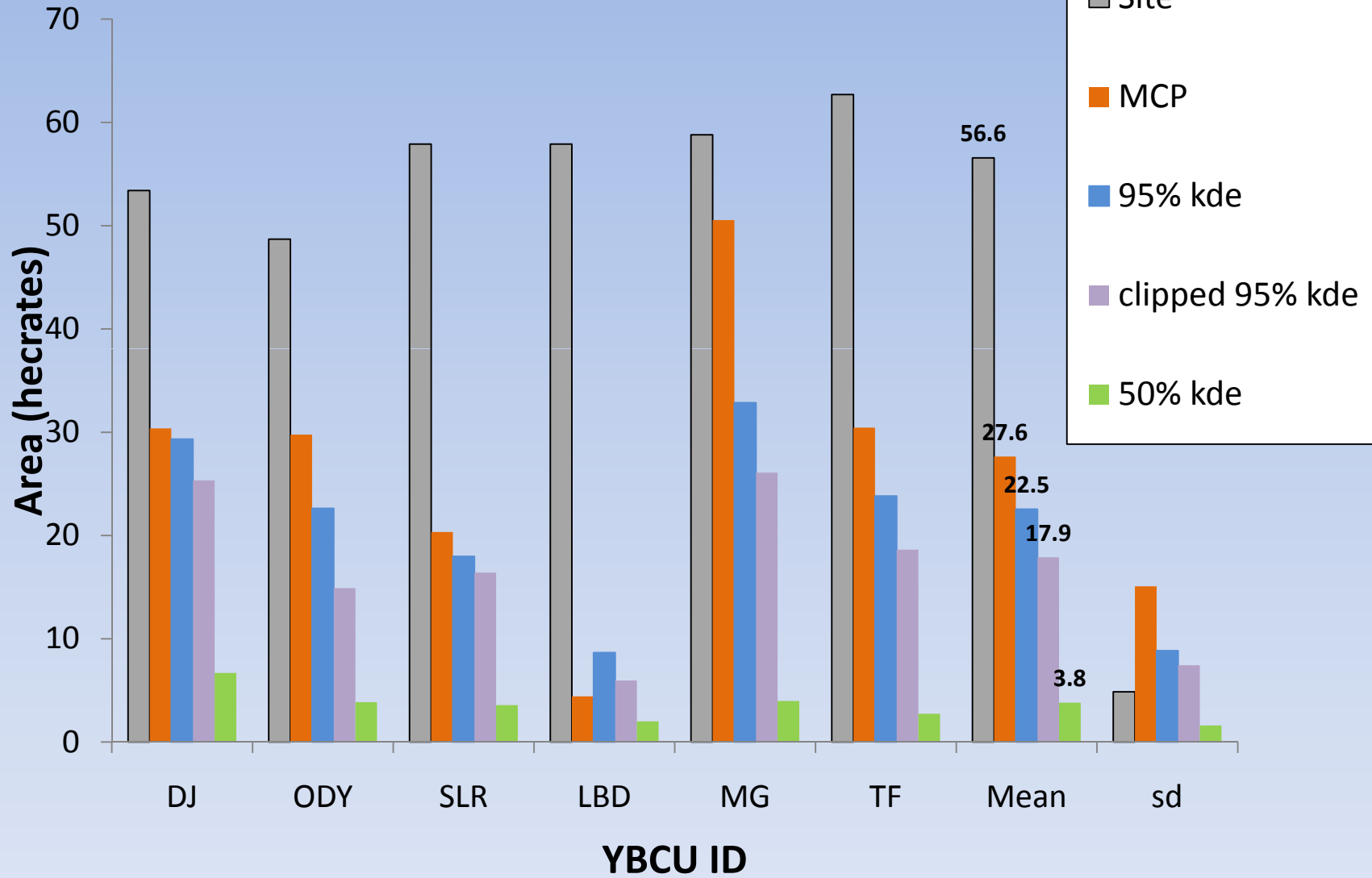
Imperial NWR cuckoo habitat



3 ha of CW-I



YBCU Home range estimates



	SITE	Clipped 95% kde	50% kde
CRIT	CW-II to VI 75% HM III 25%		
PVER2	CW II 35% CW III 62% CW-I 3%		
CVCA1	CW-II 54% CW-III 36%		
Nature Trail	CW-I 10% CW-II 46% HM-III to IV 34% SC-IV 4%		
Perry Marsh	CW-I 1.4% CW-II 3% HM-III 44% HM-IV 10.5% MA 4.5% SH-III 8% SC-IV 5% AG 20%		