Yellow-billed Cuckoo

Studies within the Rio Grande Basin, NM

Albuquerque Area Office and
Denver Technical Service Center

Current Studies on the Rio Grande, NM

Formal Surveys – since 2006 on MRG, and since 2014 on LRG

- Abundance/Distribution/Trends

Habitat Use and Suitability Modeling

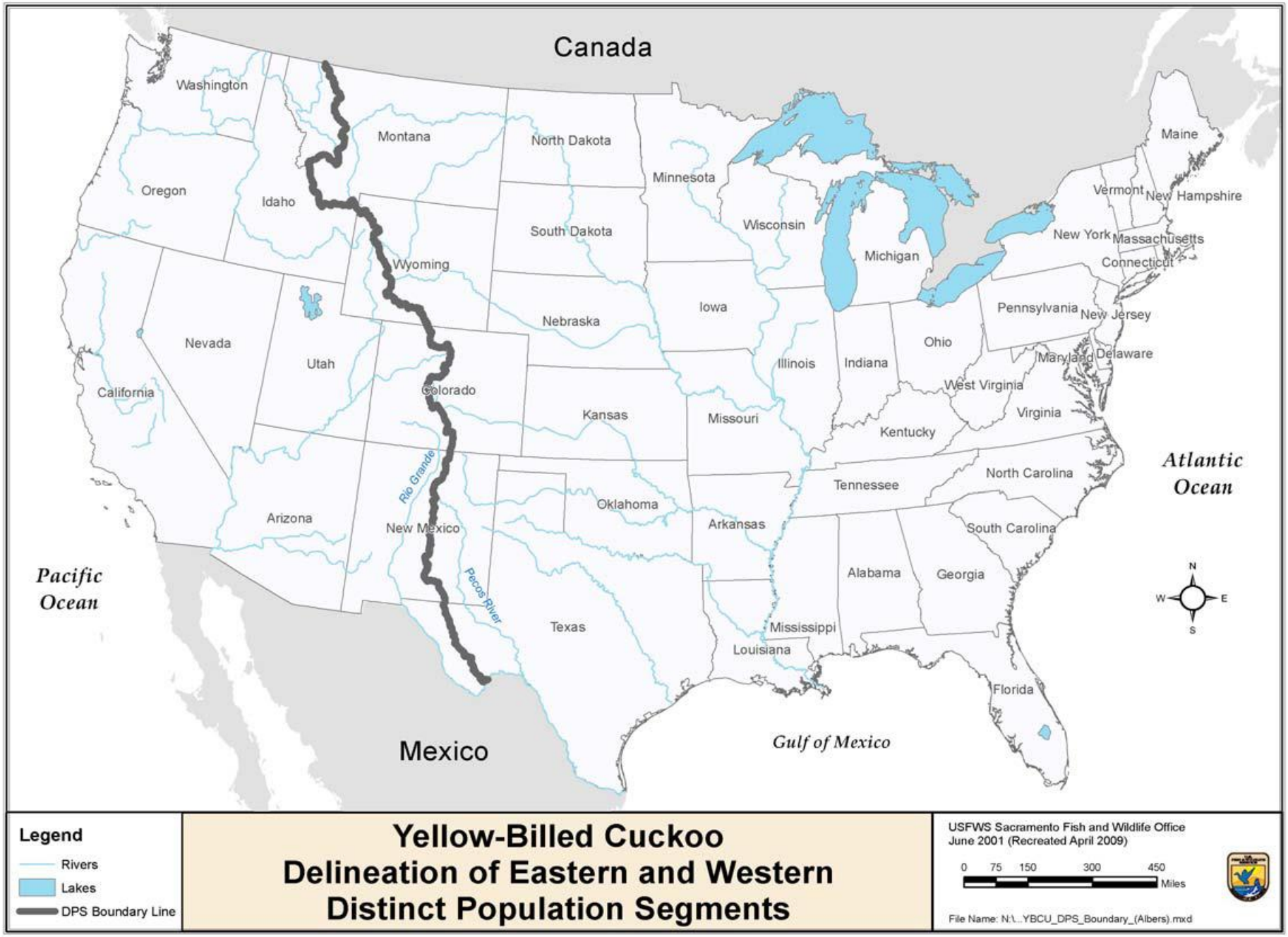
- Habitat Use based on Detection Distribution
- Habitat Use based on "Territory" Center

Geolocation/Migration Study

- Reinitiated on Rio Grande in 2014

Evaluation of current Survey Protocol Techniques

- Detection Rates over survey period, and to each "Kowlp" playback
- Likelihood of response for confirming presence of individuals, and the occupation of known sites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North Carolina
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South Carolina
Pacific Ocean
Pecos River
Alabama
Georgia
Texas
Mississippi
Louisiana
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Yellow-Billed Cuckoo
Delineation of Eastern and Western
Distinct Population Segments
USFWS Sacramento Fish and Wildlife Office
June 2001 (Recreated April 2009)
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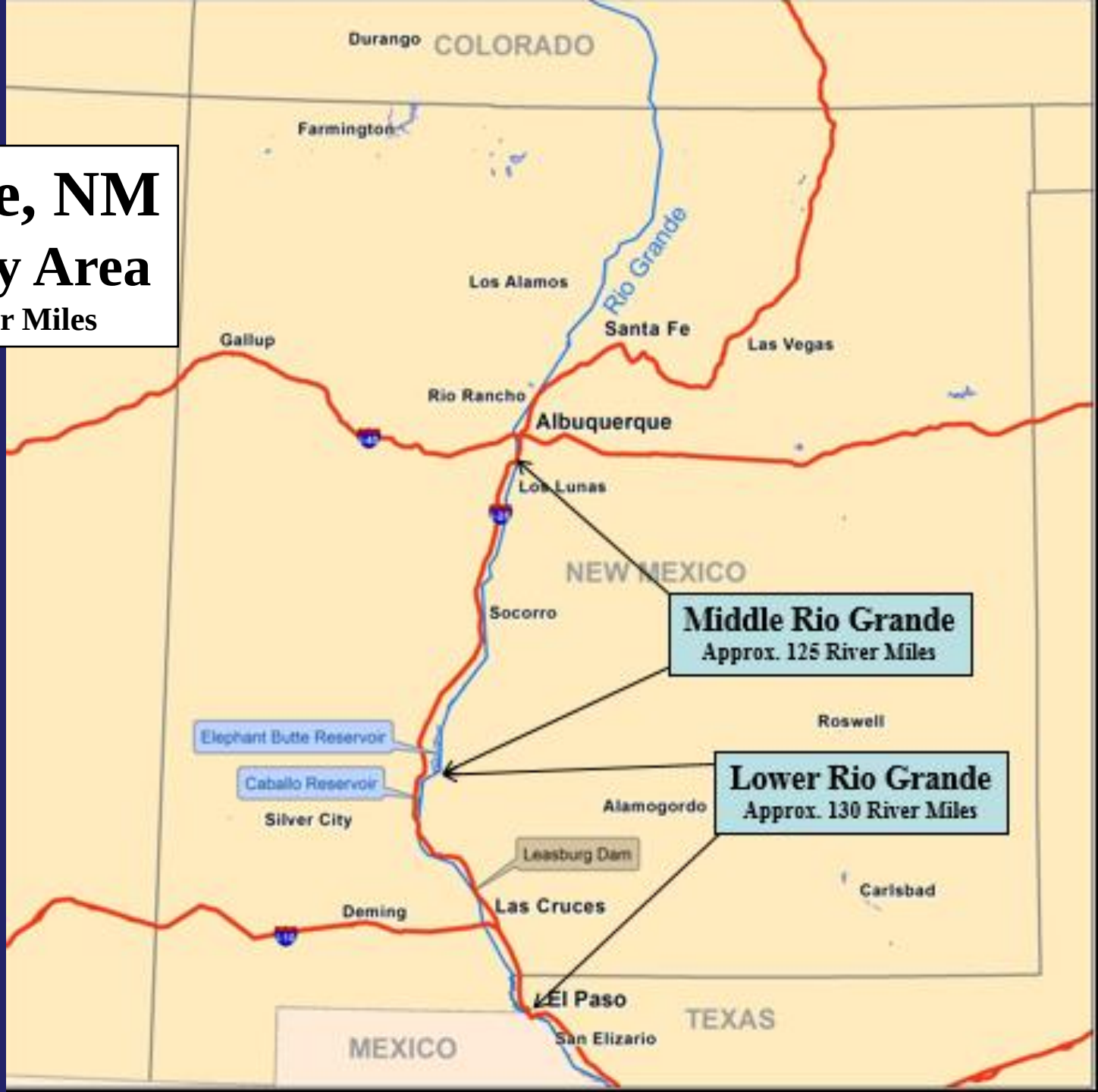
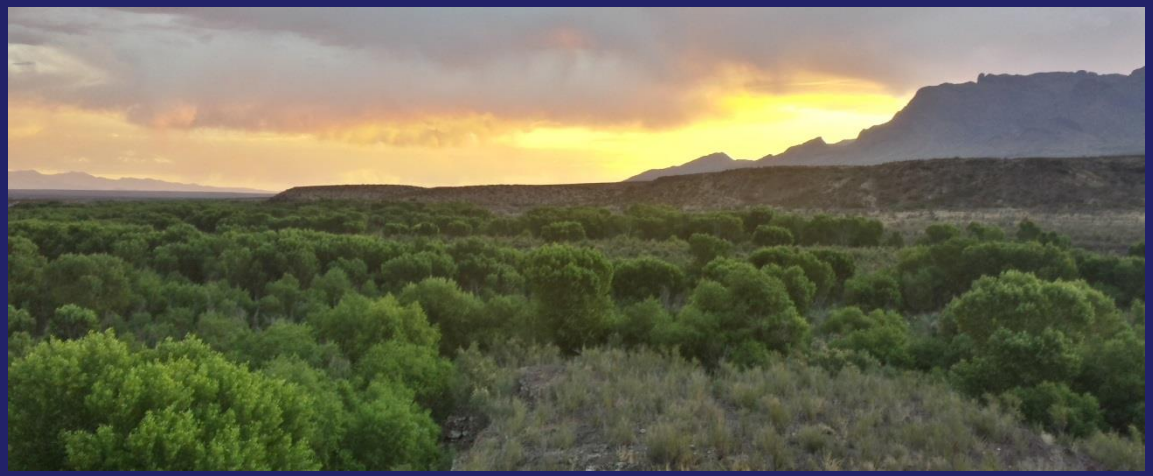
Rio Grande, NM
YBCU Study Area
Approx. 250 River Miles



YBCU Survey Protocol Overview

SURVEY RESULTS BASED ON …..

- Four Surveys from June 15th to August 15th
- Surveys 12 days apart
- Surveys conducted from predawn to 11:00 am
- Broadcast a series of 5 "kowlp" calls with one minute between calls
- Call/playback every 100 meters – 300 meters if YBCU detected
- Conduct surveys from within habitat, but can be conducted from edge when patch is < 200m in width
- Full coverage of all suitable or marginally suitable habitat
- Surveys conducted concurrent with SWFL surveys – when possible



SURVEY DETECTION

1) A detection is simply the documented presence of a YBCU at a given point at any time during the breeding season.

2) Multiple detections within a patch, over the course of the breeding season may be comprised of one or more individuals.

3) Multiple detections during the same survey are unique individuals.

CURRENT RULES FOR DELINEATING TERRITORIES

1) A YBCU territory MUST have a minimum of two detections over the entire 4 survey period – otherwise the detections are not considered as part of a territory, but rather as "random/floater" detections.

2) More than three YBCU detections in an area <300 m suggests multiple territories.

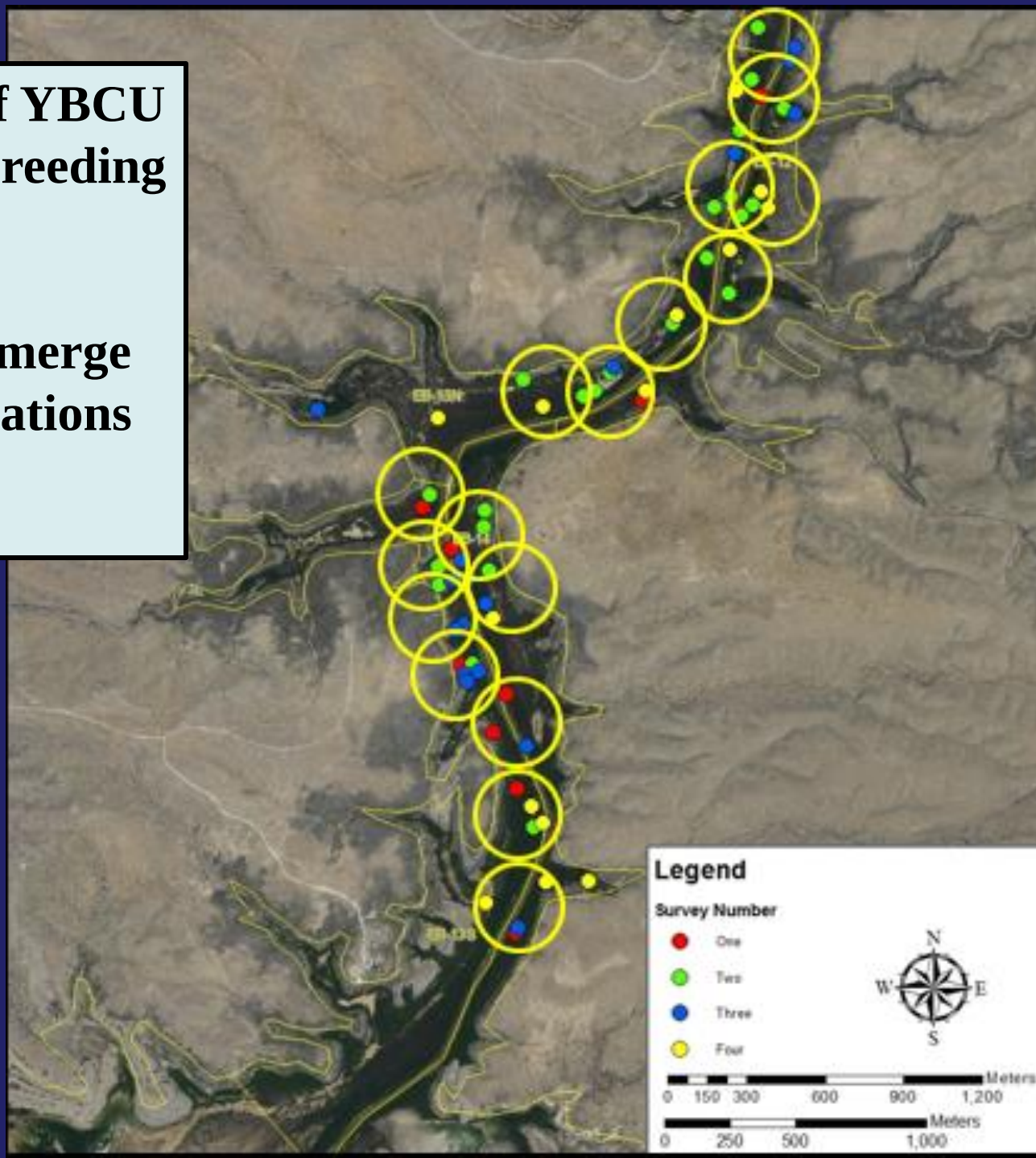
3) YBCU territories can overlap - natural "breaks" between detection clusters, regardless of distance, should be considered when delineating territories.

4) YBCU clumping patterns need to be evaluated based on the number and proximity of detections during individual survey periods.

5) "Best biological opinion" should prevail when delineating and estimating YBCU territories

Note the clumping of YBCU detections over the breeding season.

Patterns begin to emerge and territory estimations are possible.



Abundance/Distribution/Trends

Lower Rio Grande

– First Formal Comprehensive Surveys in 2014

- Small population within the delta of Caballo Reservoir
  29 YBCU detections comprising 8 territories
- Few detections immediately upstream of Leasburg Diversion Dam
  8 YBCU detections comprising 2 territories

Middle Rio Grande

– First Formal Comprehensive Surveys in 2006 – Incidental data from 1998

- 2014 Results = 301 detections comprising 91 territories

San Marcial/Elephant Butte Reservoir

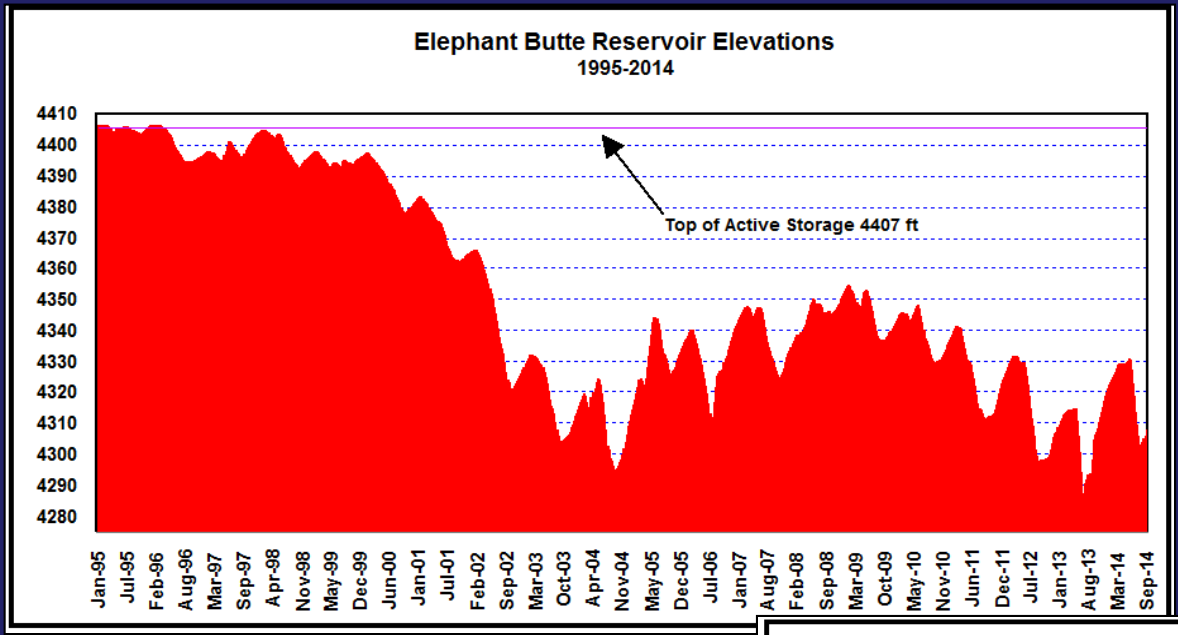
In 2014, approximately 190 detections/61 terrritories.

Delta of Elephant Butte Reservoir - 161 detections/49 territories

Possibly single largest population within the Western Population?

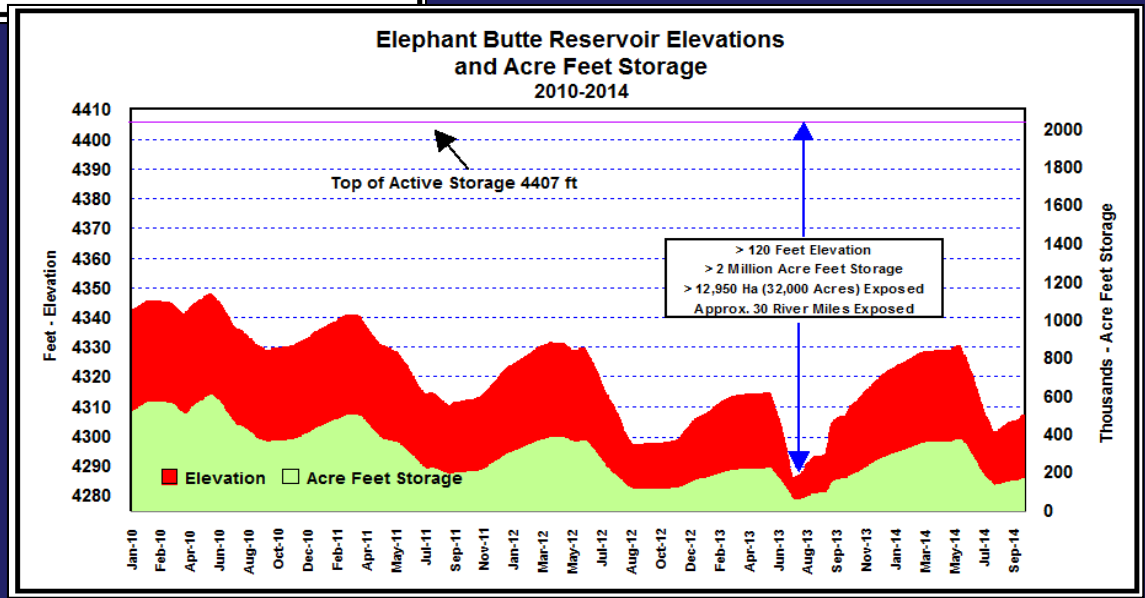
Abundance/Distribution/Trends

Elephant Butte Reservoir Elevations 1995-2014



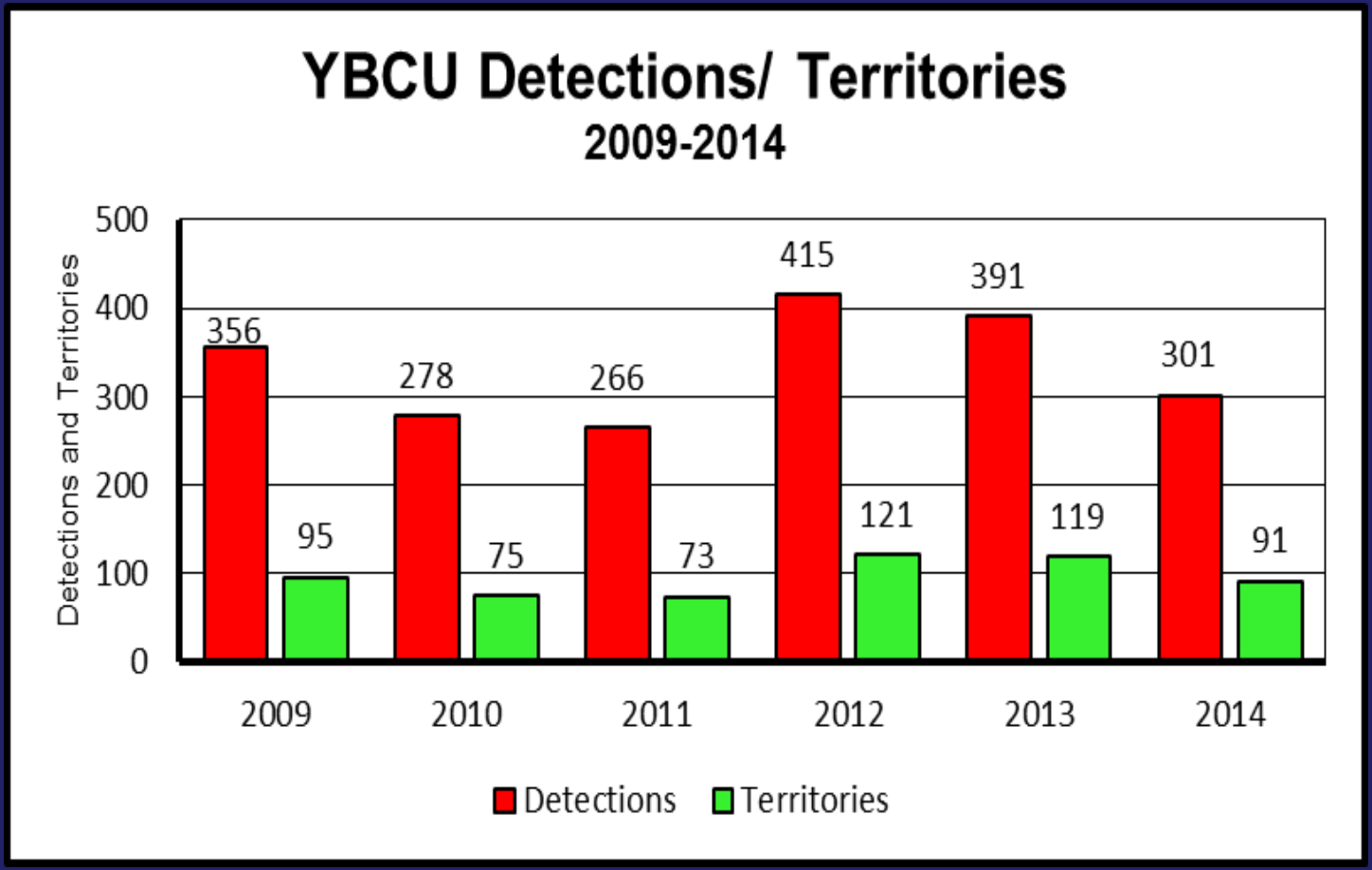
Jan 1995 to June 2013 ….

* 120 ft. decrease in elevation
* 30 River Miles Exposed
* 32,000 acres of exposed pool
* 2 Million Acre ft of storage

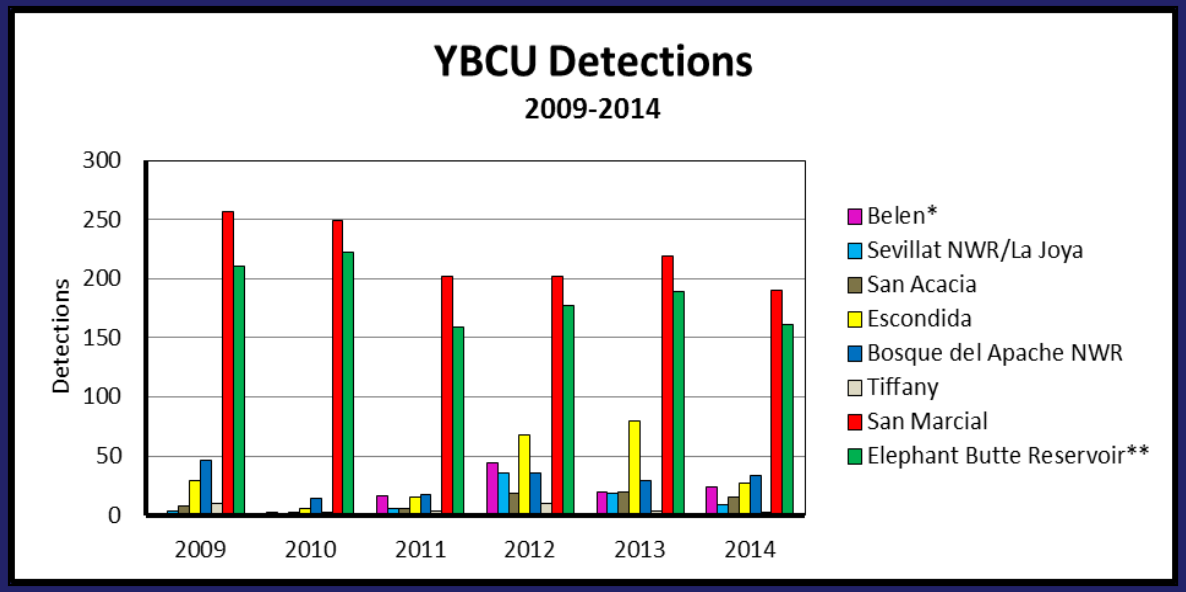


Abundance/Distribution/Trends

Consistent survey effort since 2009 – 6 years of directly comparable data for most of MRG



Abundance/Distribution/Trends

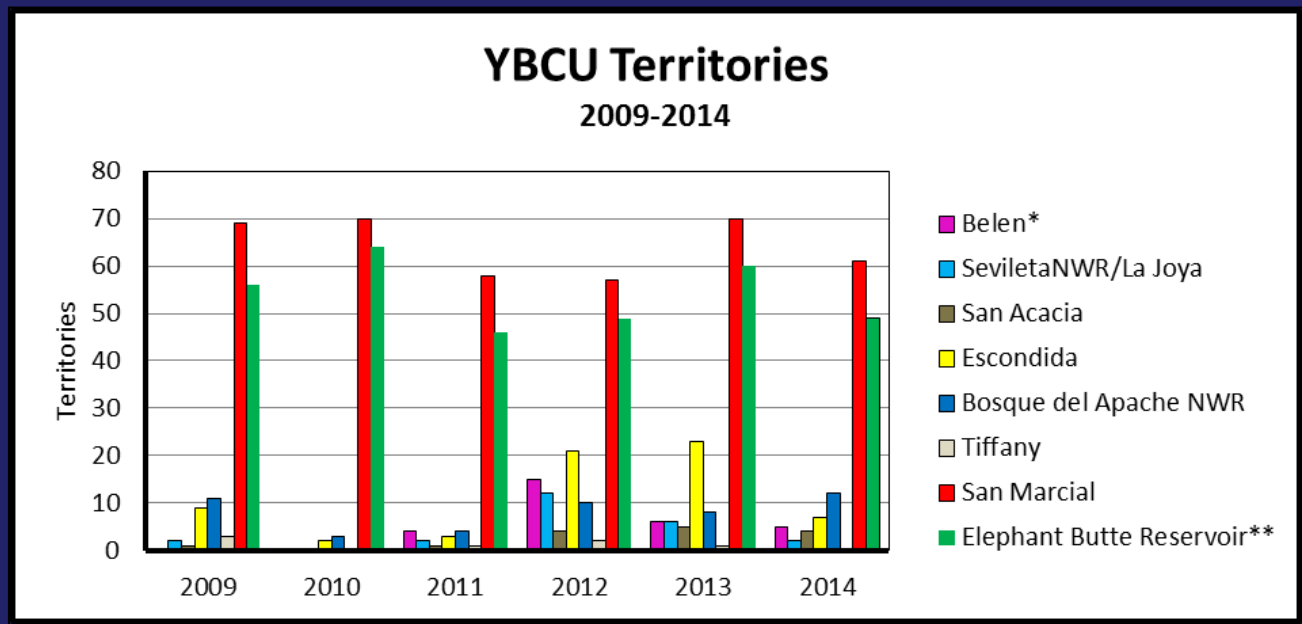


San Marcial Reach

2014

63% of all Detections, and

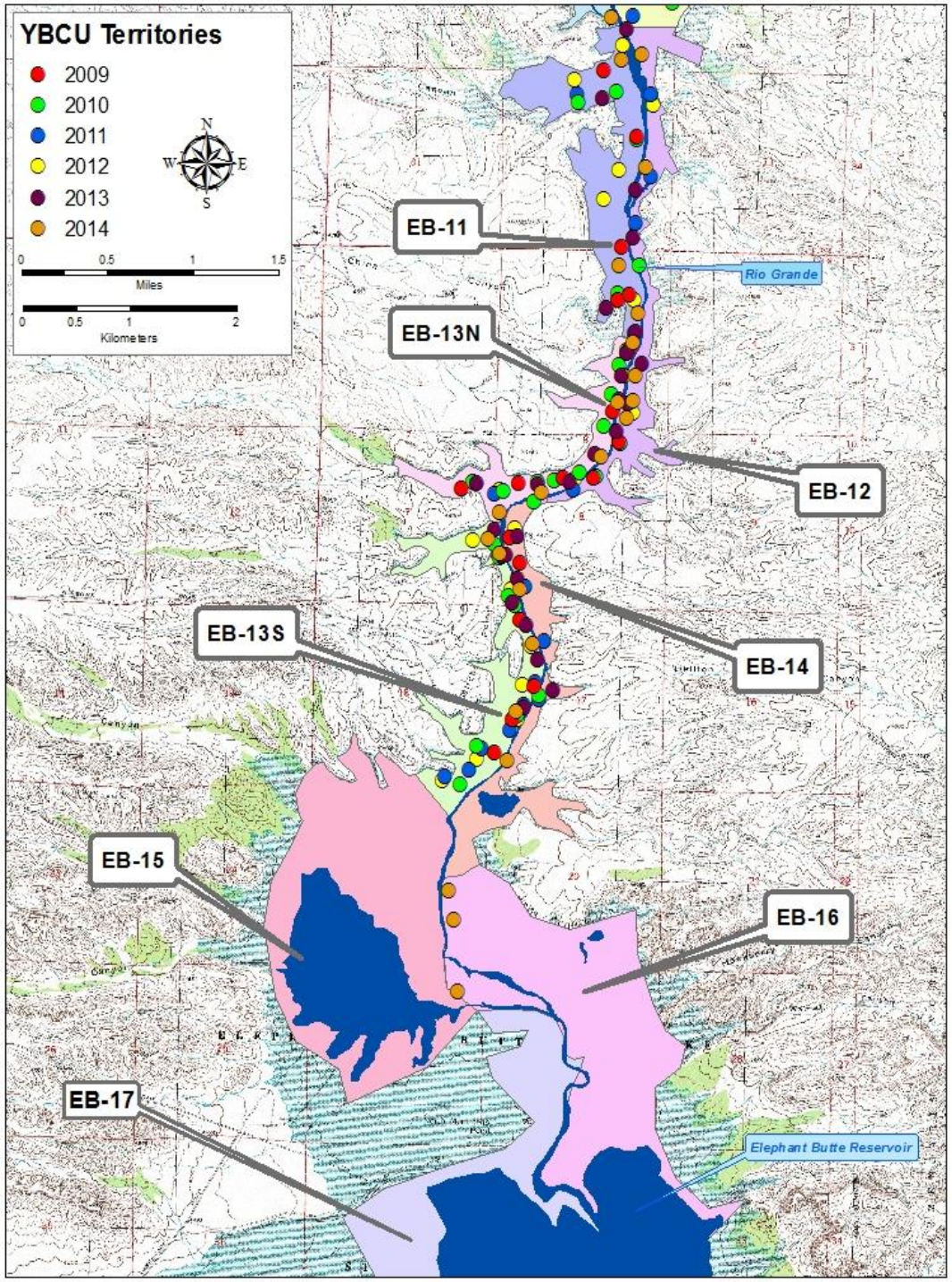
67% of all Territories



YBCU Territories within the "Narrows" of Elephant Butte Reservoir

Greatest density within the Rio Grande Study Area

2009-2014



Habitat Use and Suitability Modeling

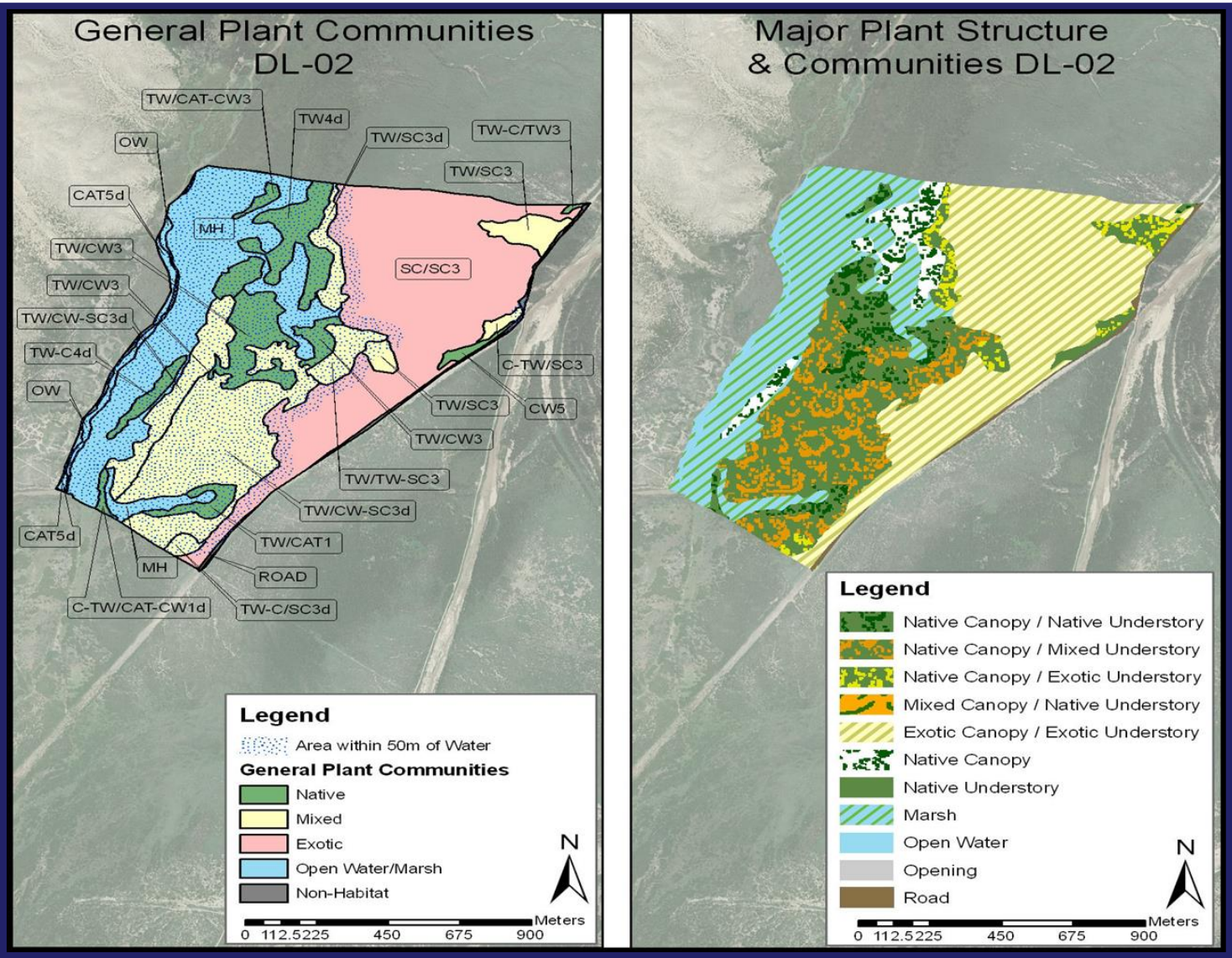
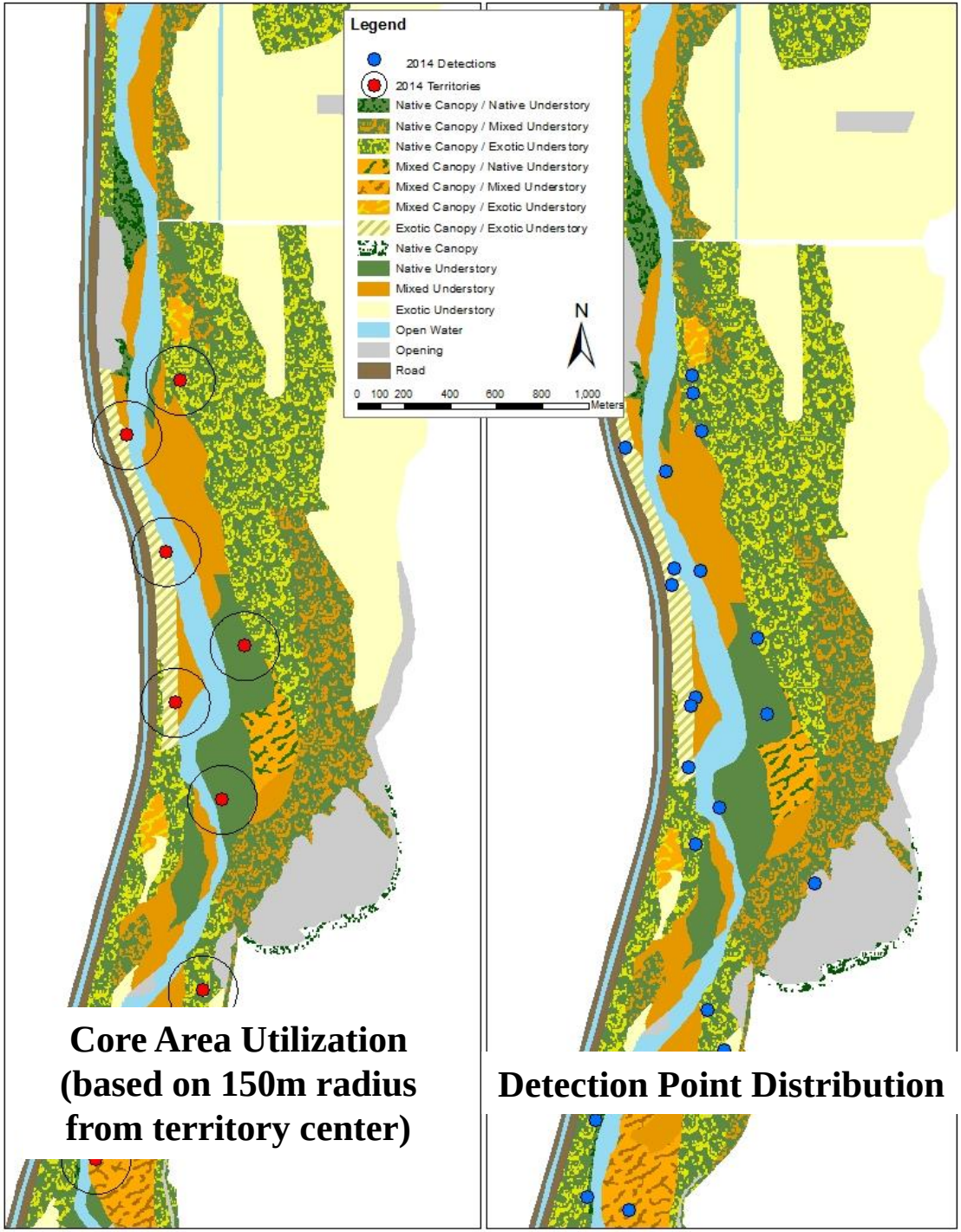


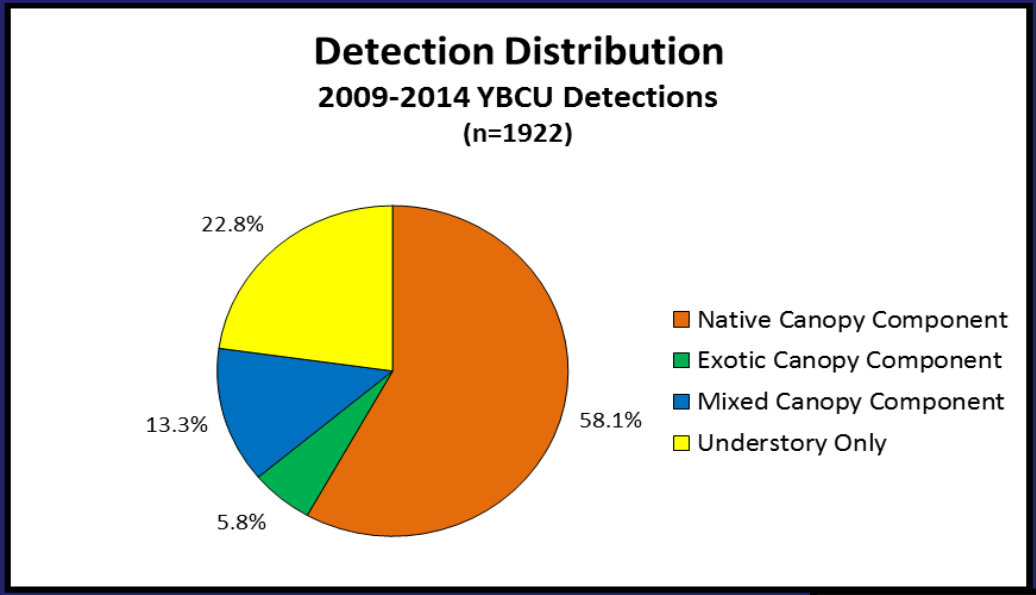
Illustration showing methods used to quantify habitat use based on YBCU Detections and Territories.



Core Area Utilization (based on 150m radius from territory center)

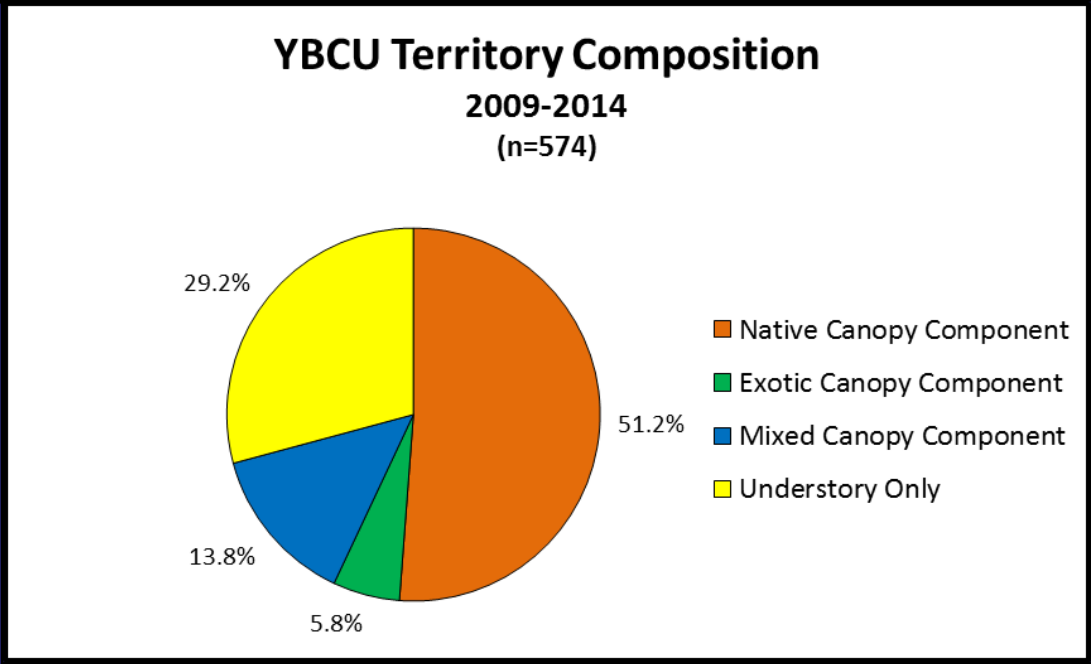
Detection Point Distribution

Habitat Use and Suitability Modeling

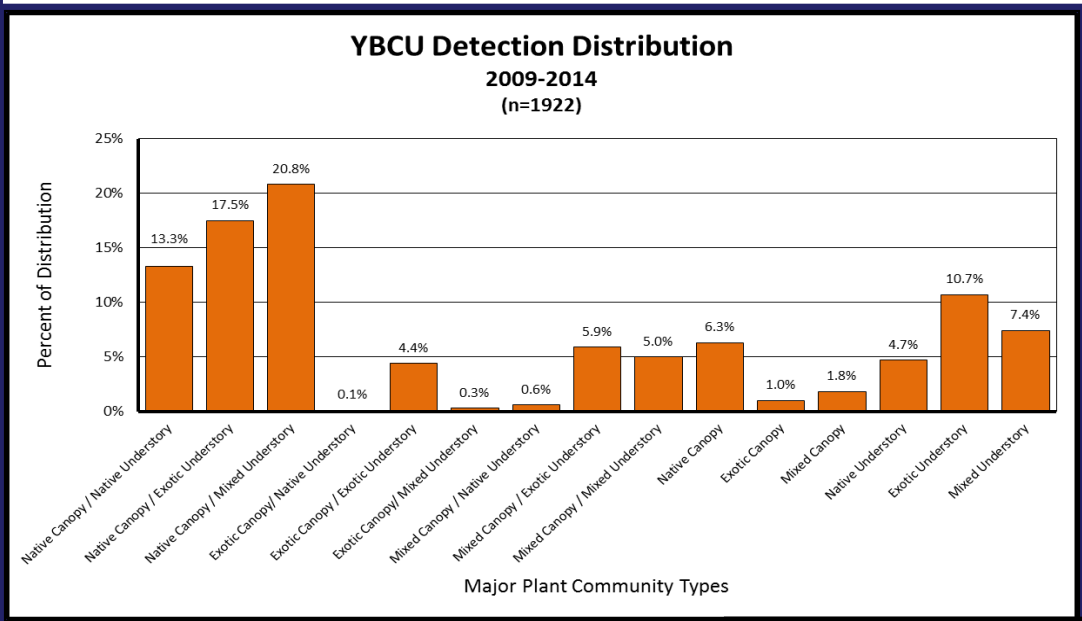


Nearly 60% of all YBCU detections since 2009 have been in areas with a native canopy component

Approximately 50% of YBCU core use areas had a native canopy component



Habitat Use and Suitability Modeling



Native Canopy with an understory component accounted for 52% of all detections.

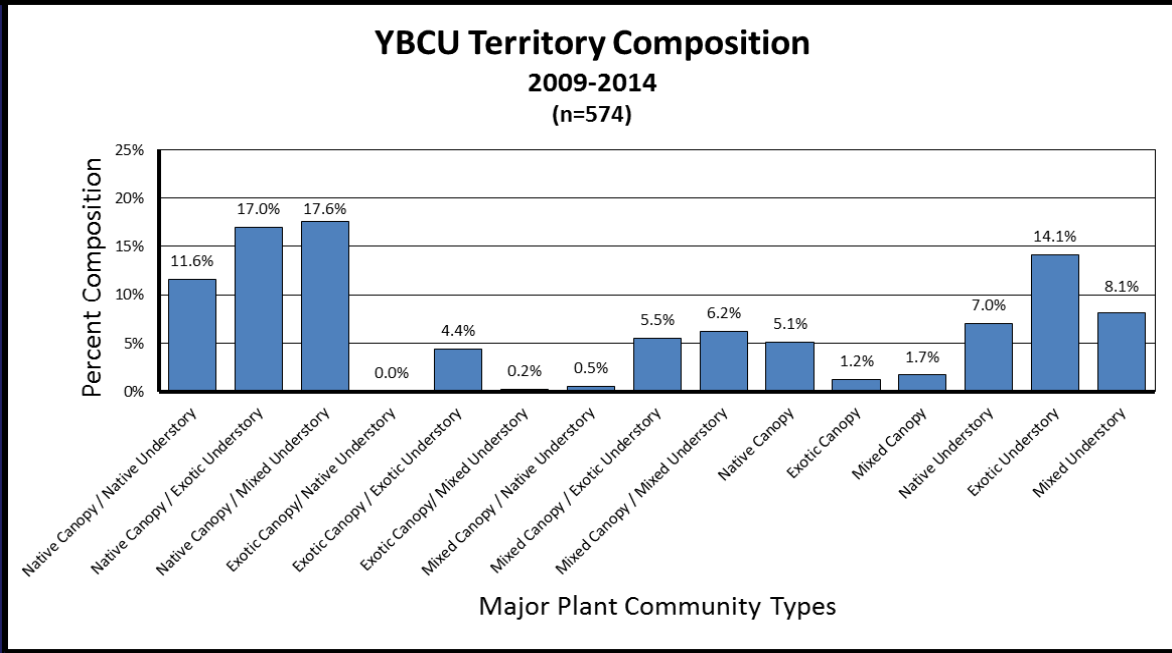
Native Canopy without an understory accounted for only 6% of all detections.

Exotic Canopy w/understory <5%

Native Canopy with an understory component comprised 46% of YBCU core use area.

Native Canopy without an understory comprised only 5% of the core use area.

Exotic Canopy w/understory <5% of core use area



EXAMPLES OF HABITAT ALONG THE RIO GRANDE

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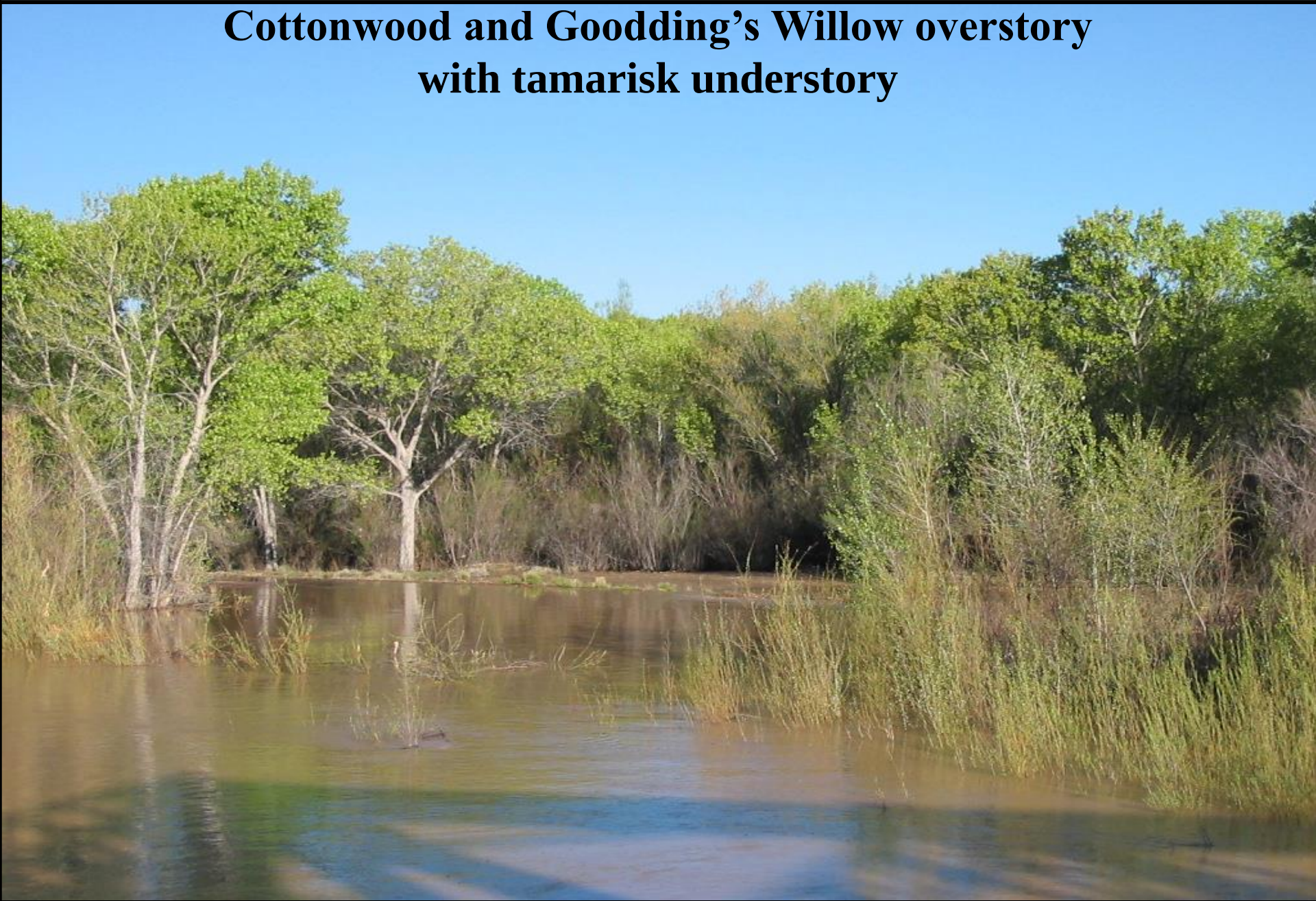
Cottonwood and Goodding's Willow overstory with tamarisk understory



EXAMPLES OF HABITAT ALONG THE RIO GRANDE

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EXAMPLE OF HABITAT ALONG PORTIONS OF THE LOWER RIO GRANDE

Geolocation/Migration Study

Rio Grande – 2014

Continuation of 2009-2010 Study

Nine cuckoos captured and outfitted with geolocators.

- **Eight with 1.8 gram Migrate Technology Units w/out VHF beacons**
- **One with 3.1 gram Lotek/Biotrack GPS Pinpoint 50 w/VHF beacon**

Evaluation of Survey Protocol

	Percentage of Detections Observed per Survey Period			
	Survey 1	**Survey 2**	**Survey 3**	**Survey 4**
2009 (n=356)	24% (n=86)	30% (n=107)	26% (n=92)	20% (n=71)
2010 (n=278)	19% (n=52)	30% (n=83)	30% (n=83)	21% (n=60)
2011 (n=266)	15% (n=39)	27% (n=72)	29% (n=77)	29% (n=78)
2012 (n=415)	17% (n=72)	29% (n=120)	30% (n=126)	23% (n=97)
2013 (n=391)	21% (n=84)	24% (n=92)	32% (n=127)	23% (n=88)
2014 (n=301)	27% (n=82)	25% (n=75)	29% (n=86)	19% (n=58)
2009-2014 (n=2,007)	**21% (n=415)**	**27% (n=549)**	**29% (n=591)**	**23% (n=452)**

Message: Number of Detections are slightly higher during Survey Periods 2 and 3 (i.e. late-June to late-July).
Surveys conducted between mid-June and mid-August seem appropriate for the Rio Grande.

Evaluation of Survey Protocol

Percentage of Detections After Playback Number							
	Detections prior to playback	Detections using playback	Playback number				
			1	2	3	4	5
2009 (n=356)	127	229	47% (n=108)	24% (n=55)	20% (n=46)	5% (n=11)	4% (n=9)
2010 (n=278)	82	196	47% (n=92)	23% (n=45)	21% (n=42)	6% (n=11)	3% (n=6)
2011 (n=266)	87	179	32% (n=58)	27% (n=48)	17% (n=30)	10% (n=18)	14% (n=25)
2012 (n=415)	131	284	39% (n=110)	24% (n=69)	18% (n=52)	12% (n=35)	6% (n=18)
2013 (n=391)	117	274	36% (n=98)	19% (n=53)	20% (n=55)	10% (n=28)	15% (n=40)
2014 (n=301)	92	209	36% (n=75)	32% (n=67)	14% (n=30)	11% (n=22)	7% (n=15)
TOTALS (n=2,007)	**636 (32% of Total)**	**1,371 (68% of Total)**	**40% (n=541)**	**25% (n=337)**	**19% (n=255)**	**9% (n=125)**	**8% (n=113)**

32% of detections made prior to playback

<u>Message</u>: Spend at least a minute listening prior to playback!

75% of all detections during "Listening" period and first two playbacks

<u>Message</u>: YBCUs are vocal and responsive during the breeding season.

Evaluation of Survey Protocol

Based on Migration Study Netting Observations/Captures

15 Stations with a confirmed presence of 28 YBCUs were used in the test.

Presumed "Known" population

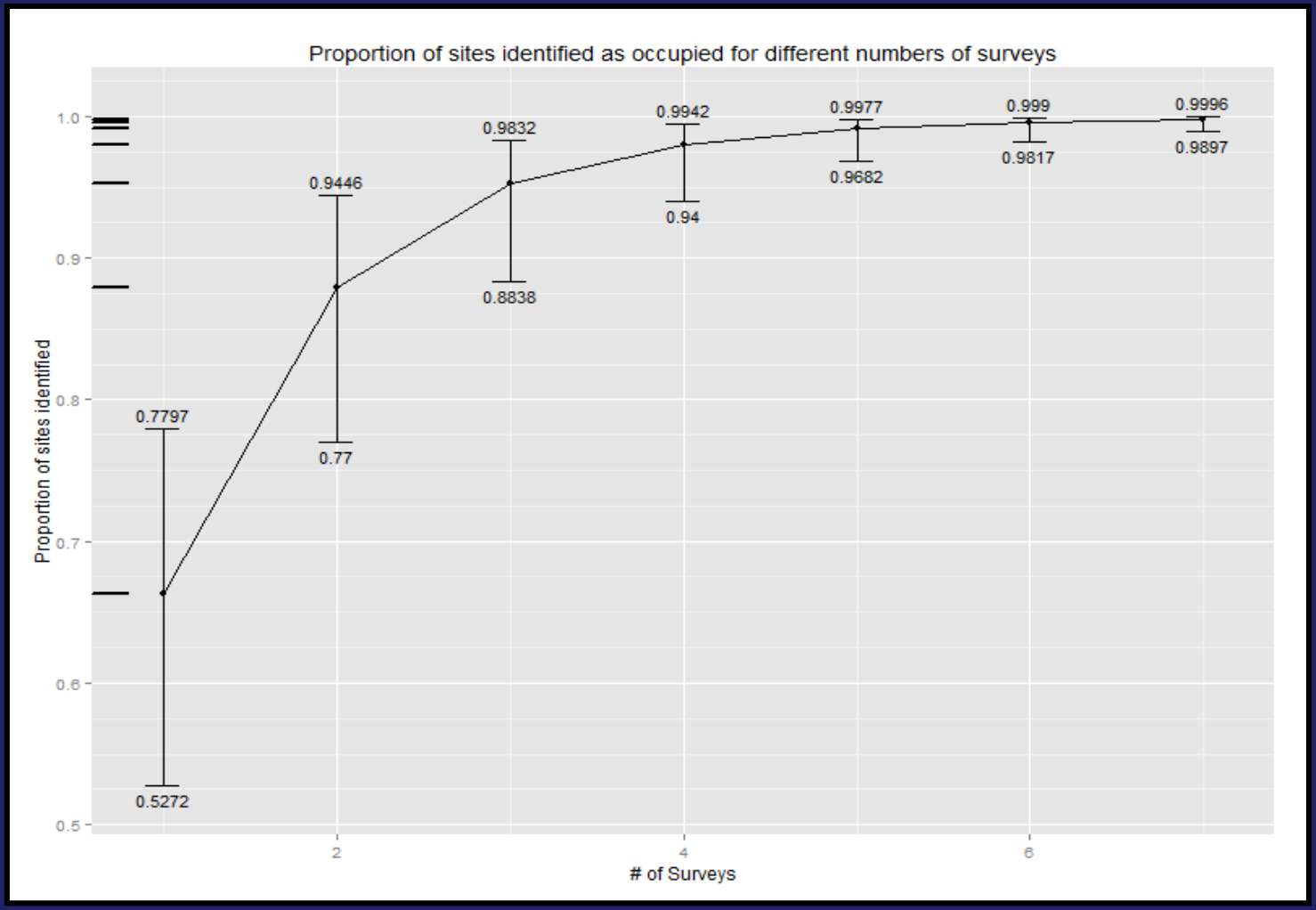
On 7/21/14 - Moore "surveyed" 11 stations, playing a series of 5 "kowlp" calls.
*Detected 12 of 21 YBCUs (57.1%) and found them at 8 of 11 Stations (72.7%)

On 7/25/14 - Carstensen "surveyed" all 15 stations, playing a series of 5 "kowlp" calls.
*Detected 10 of 28 YBCUs (35.7%) and found them at 9 of 15 Stations (60.0%)

Assumed constant response rate throughout the breeding season

Statistical analysis was conducted to determine the proportion of individual YBCUs, and the proportion of stations where YBCUs would be detected during 1-7 surveys in which a series of 5 "kowlp" calls were played.

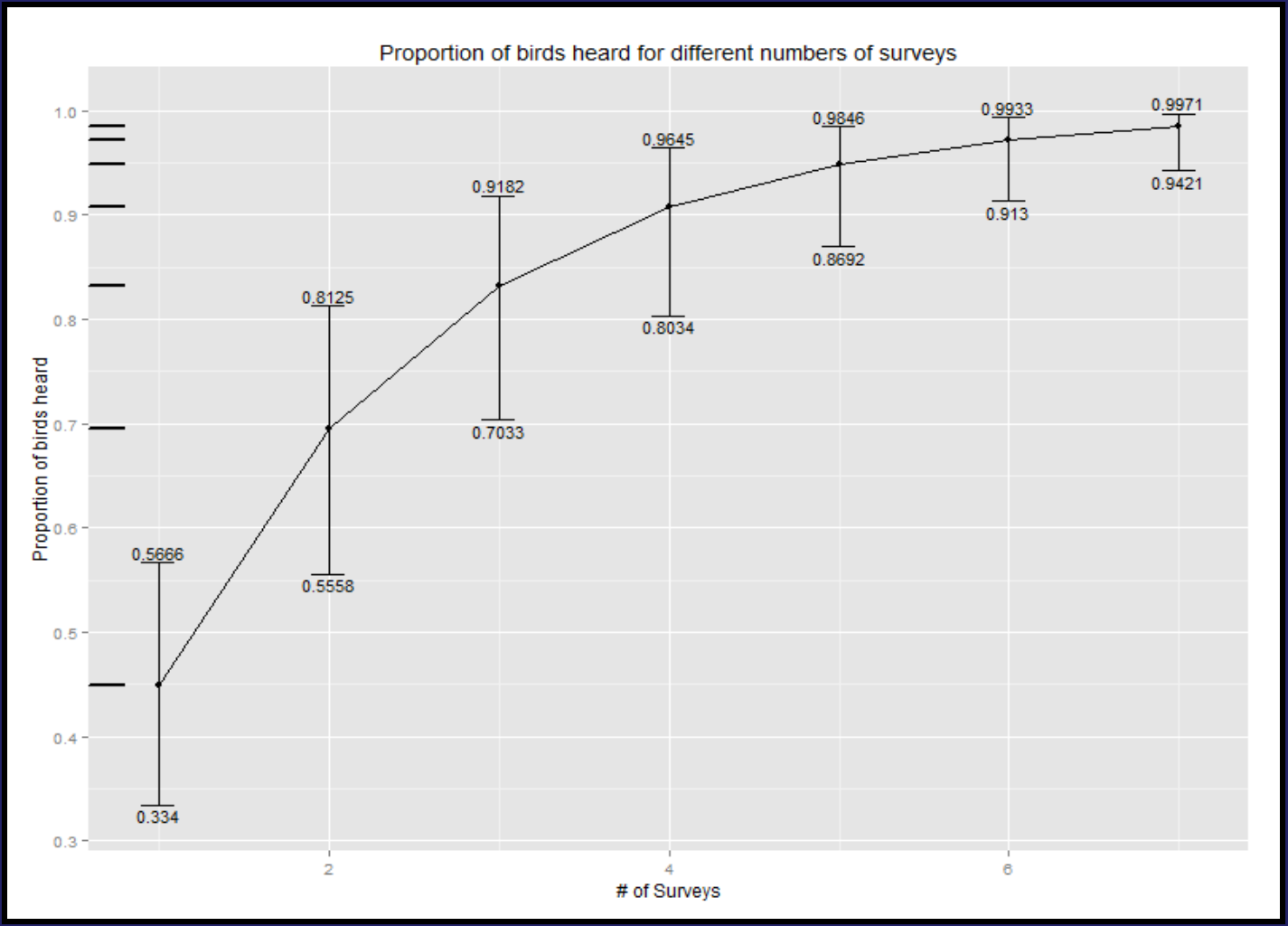
Evaluation of Survey Protocol



After 4 surveys, YBCUs would be detected at approximately 98% of occupied locations (ranging from 94-99%).

Presence/Absence may be the most important <u>Management</u> consideration.

Evaluation of Survey Protocol



After 4 surveys, approximately 90% of all YBCUs would be detected (ranging from 80-96%).

Number of individuals may be the most important <u>Biological</u> consideration.

Evaluation of Survey Protocol

PECOS YBCU SURVEY RESPONSE EVALUATION

Using "Kowlp" broadcast sequence of 5 calls at 12 Stations where 24 YBCUs were presumed present.

Detected YBCUs at 6 of 12 Stations = 50% (Stats = approx. 94% w/four surveys)
Detected 8 of 24 known YBCUs = 33% (Stats= approx. 80% w/four surveys)

Current version of the Survey Protocol appears to be effective, and efficient within the Rio Grande, NM