Status of Marsh Birds in the Colorado River and Ciénega de Santa Clara, Baja California and Sonora, México

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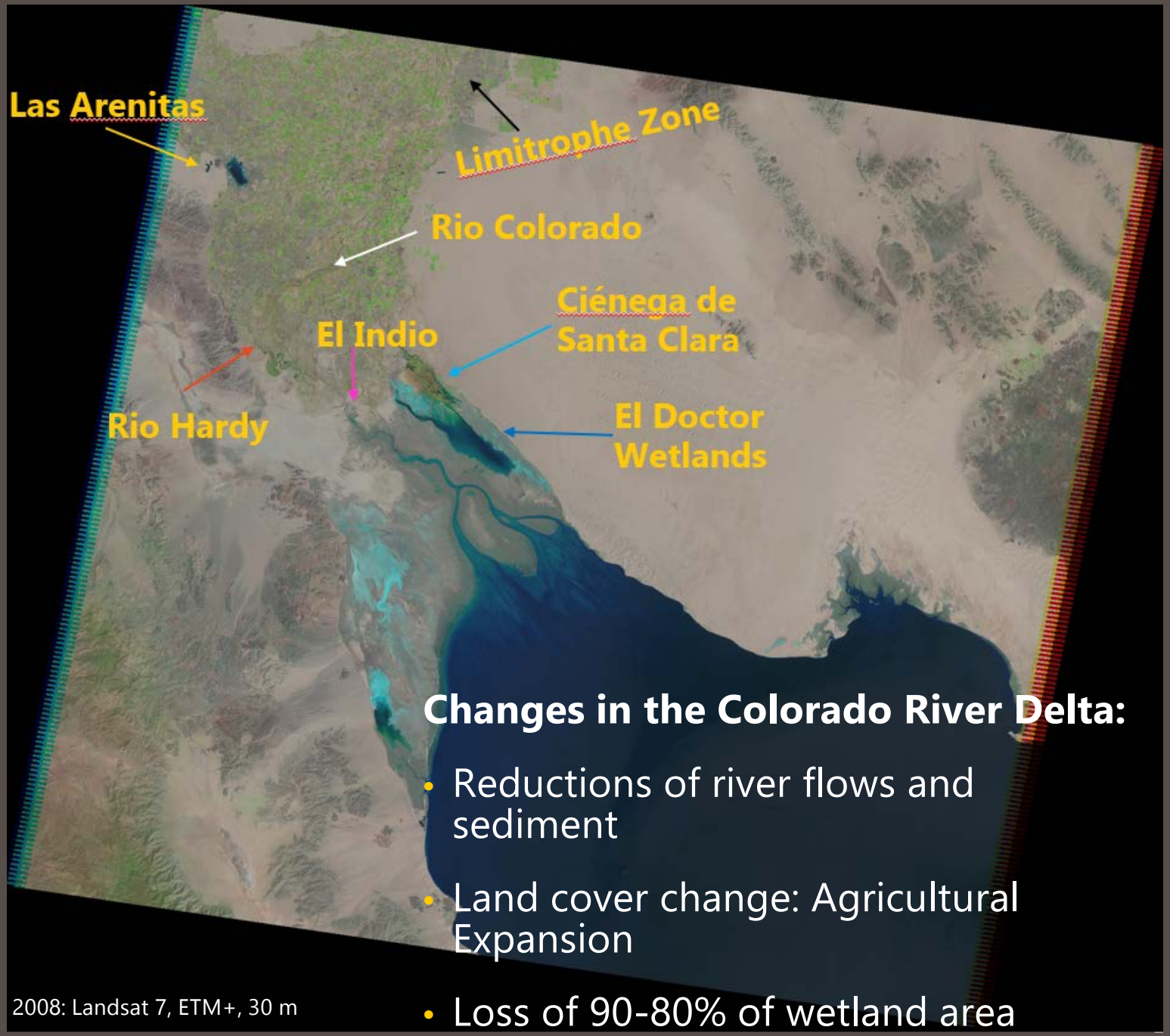


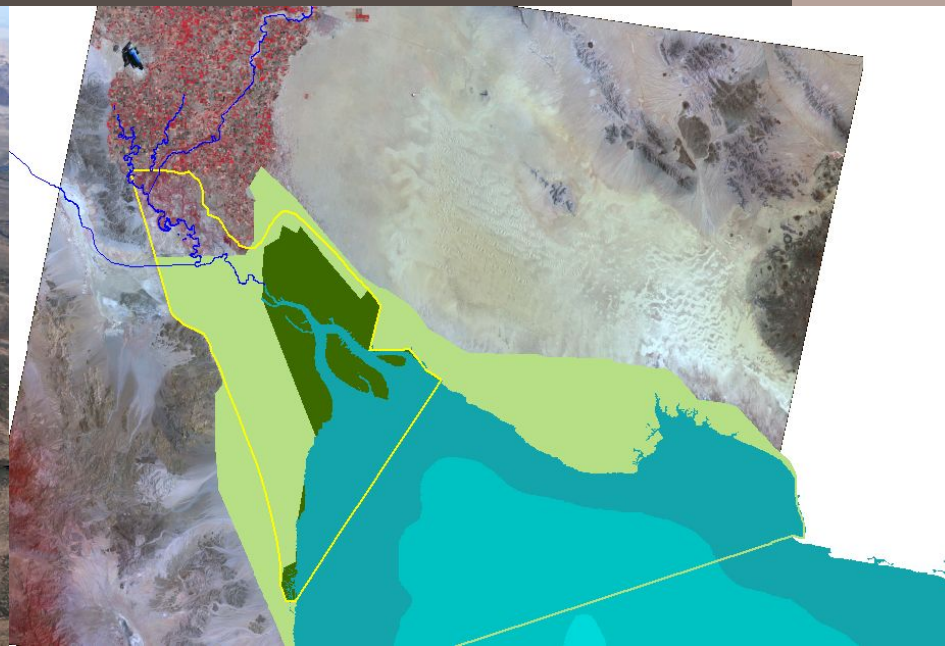
Changes in the Colorado River Delta:

- Reductions of river flows and sediment
- Land cover change: Agricultural Expansion
- Loss of 90-80% of wetland area

2008: Landsat 7, ETM+, 30 m

Colorado River Wetlands: resilient ecosystems of conservation value

- 2 RAMSAR sites
- UNESCO Man and the Biosphere
- Site in the Western Hemisphere Shorebird Reserve Network (WHSRN)
- International Important Bird Area (IBA)
- NAWCA Priority wetland



Least Bittern

American Bittern

Virginia Rail

Yuma Ridgway's Rail

Sora

California Black Rail

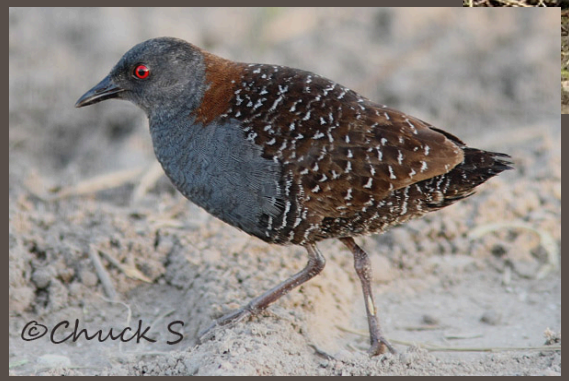
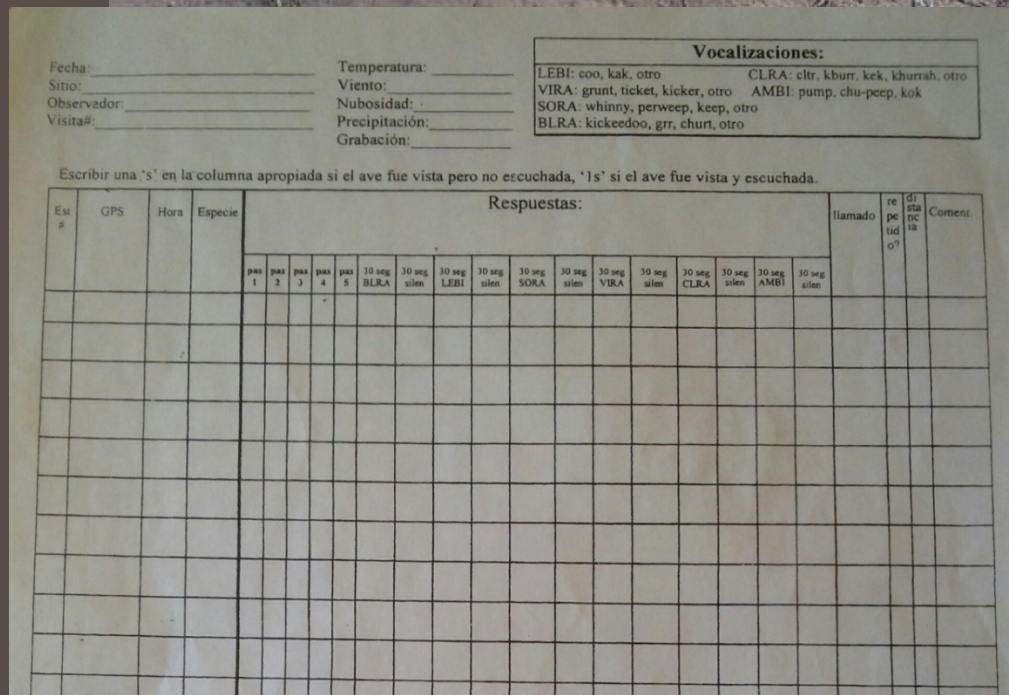


Photo: Francisco Zamora

Marsh Bird Survey Protocol

- Standardized Protocol for Monitoring Marshbirds in North America: Call-broadcast survey
- 2 times a year: March & May
- Based on statistical power analysis to detect trends >3% per year
- 17 years of data: 1999-2016 for RIRA and BLRA
- 14 years of data: LEBI, SORA, AMBI, VIRA, > 2003



Fecha:
Sitio:
Observador:
Visita#:

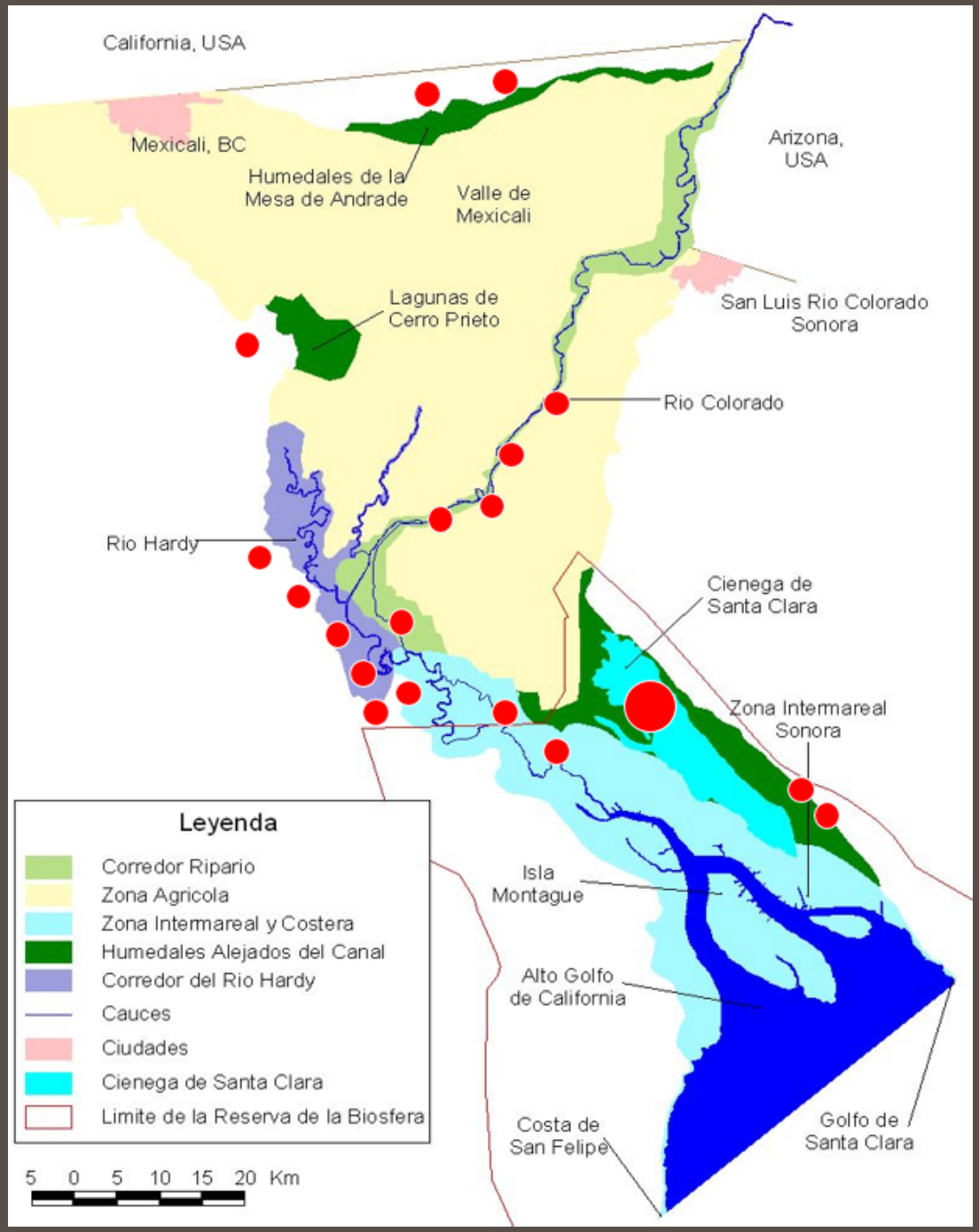
Temperatura:
Viento:
Nubosidad:
Precipitación:
Grabación:

Vocalizaciones:

LEBI: coo, kak, otro
CLRA: cltr, kburr, kek, khurrah, otro
VIRA: grunt, ticket, kicker, otro
AMBI: pump, chu-peep, kok
SORA: whinny, perweep, keep, otro
BLRA: kickeedoo, grr, churt, otro

Escribir una 's' en la columna apropiada si el ave fue vista pero no escuchada, '1s' si el ave fue vista y escuchada.

Est #	GPS	Hora	Especie	Respuestas:																		llamado	repetido?	distancia	Coment.
				pas 1	pas 2	pas 3	pas 4	pas 5	30 seg BLRA	30 seg silen	30 seg LEBI	30 seg silen	30 seg SORA	30 seg silen	30 seg VIRA	30 seg silen	30 seg CLRA	30 seg silen	30 seg AMBI	30 seg silen					

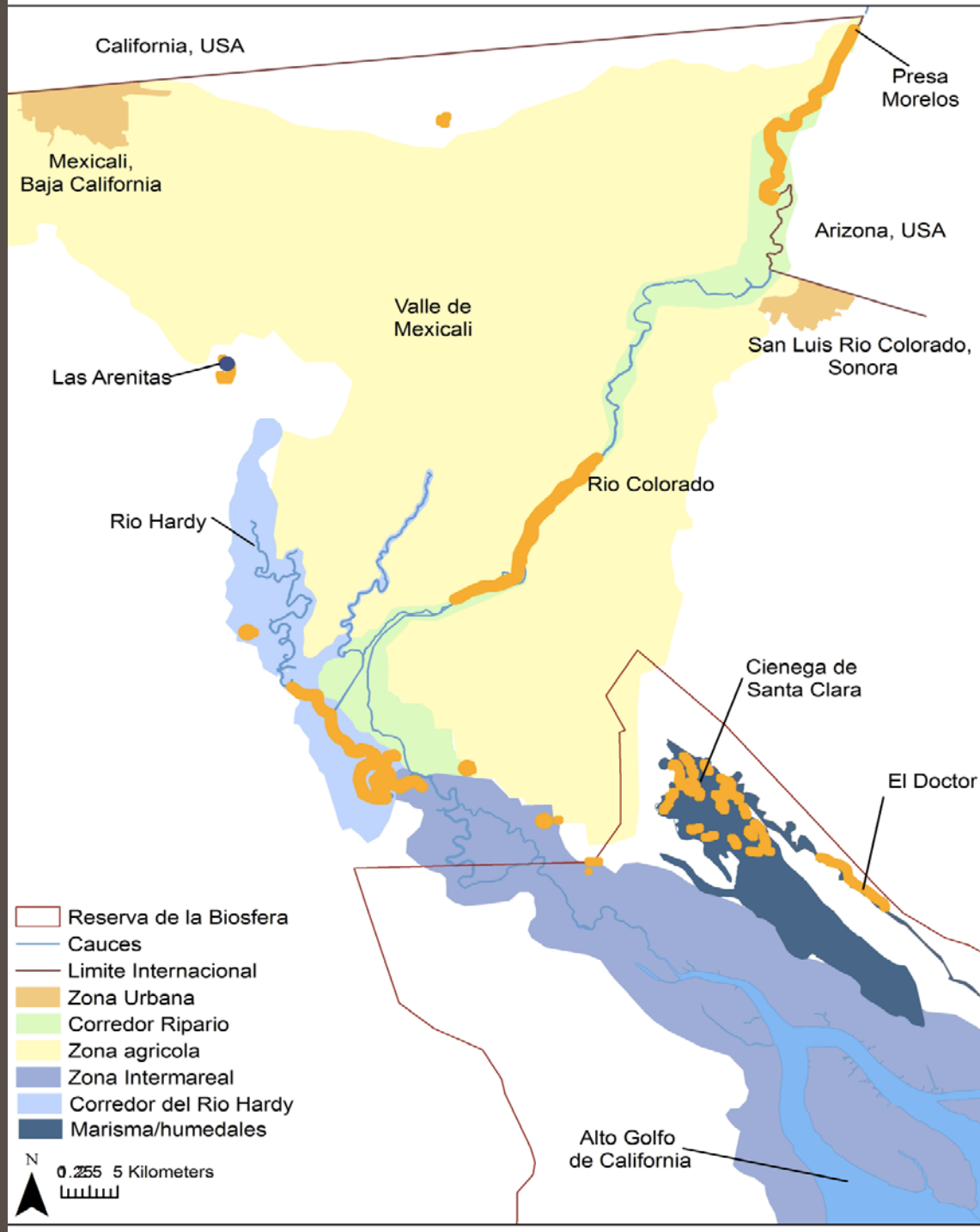


Protocol before 2010

- 250 survey points
- 30 transects in 6 wetland areas
- Each transect with 5-10 points
- 15 transects in the Cienega de Santa Clara

556 survey points in 8 Routes

1. Ciénega de Santa Clara = 130
2. Colorado River = 96
3. Hardy River = 169
4. Limitrophe Zone = 100
5. Andrade Mesa = 6
6. Las Arenitas = 16
7. El Indio Lagoon = 5
8. El Doctor Wetlands = 36



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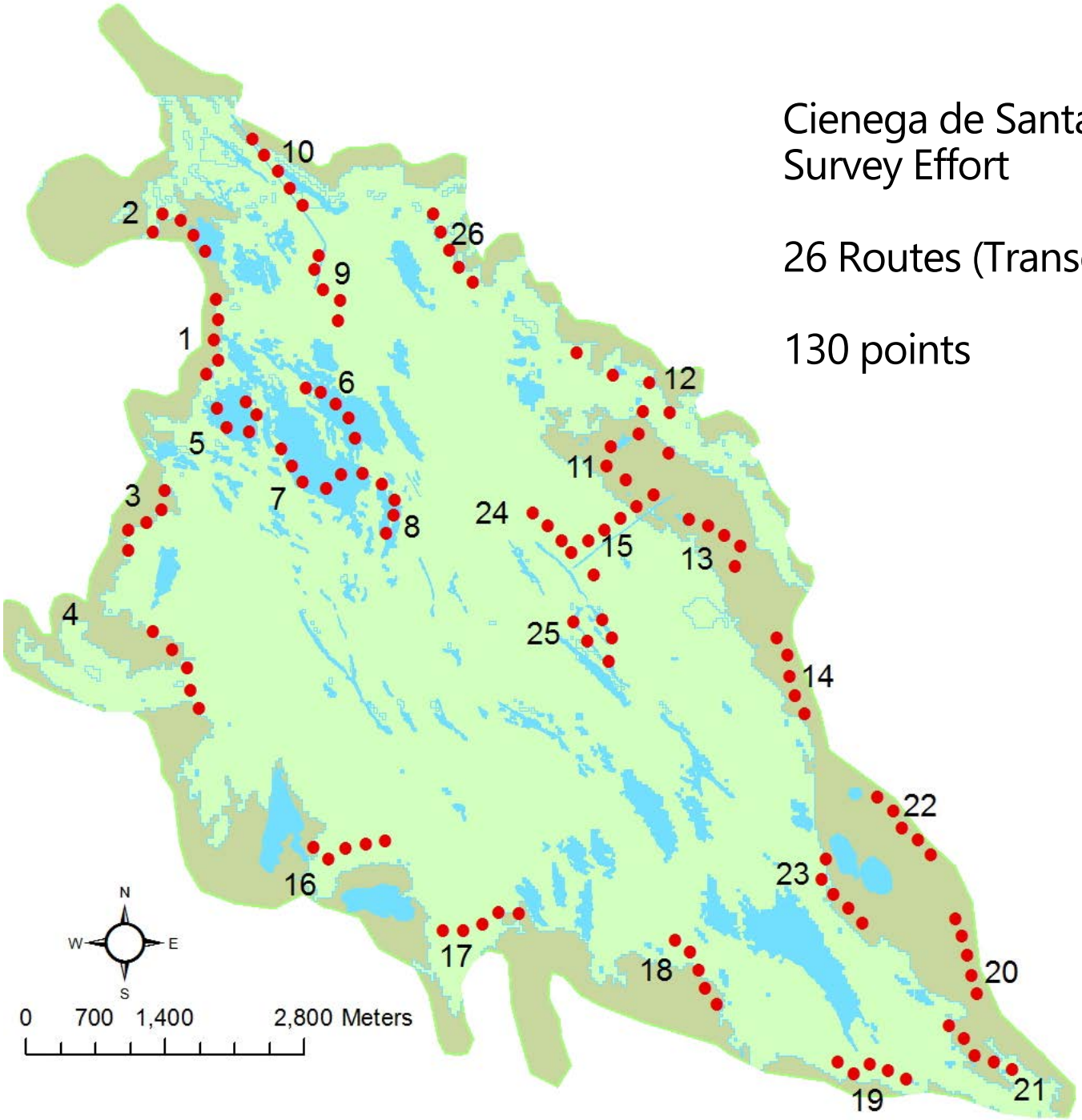
Largest wetland in the Delta (5,800 ha)

Core Zone of the Biosphere Reserve

75% of Yuma Ridgeway's Rails

Water: 90% is agricultural drainage from Wellton and Mohawk valleys in AZ

Yuma Desalting Plant in Arizona



Cienega de Santa Clara
Survey Effort

26 Routes (Transects)

130 points

Cienega de Santa Clara = 130 pts

Limitrophe Zone = 100 points

Andrade Mesa wetlands = 6 points

- High quality bird habitat at the California-Mexico border
- Product of seepage along the All-American Canal
- >3,000 ha of marshlands, in sand dunes
- Critically endangered after the lining of the All-American Canal in 2010

El Doctor wetlands = 36 points

- Maintained by freshwater springs along the Gran Desierto escarpment
- 350 ha of marshlands, mesquite and saltcedar areas
- Core zone of the Upper Gulf of California and Colorado River Delta Biosphere Reserve

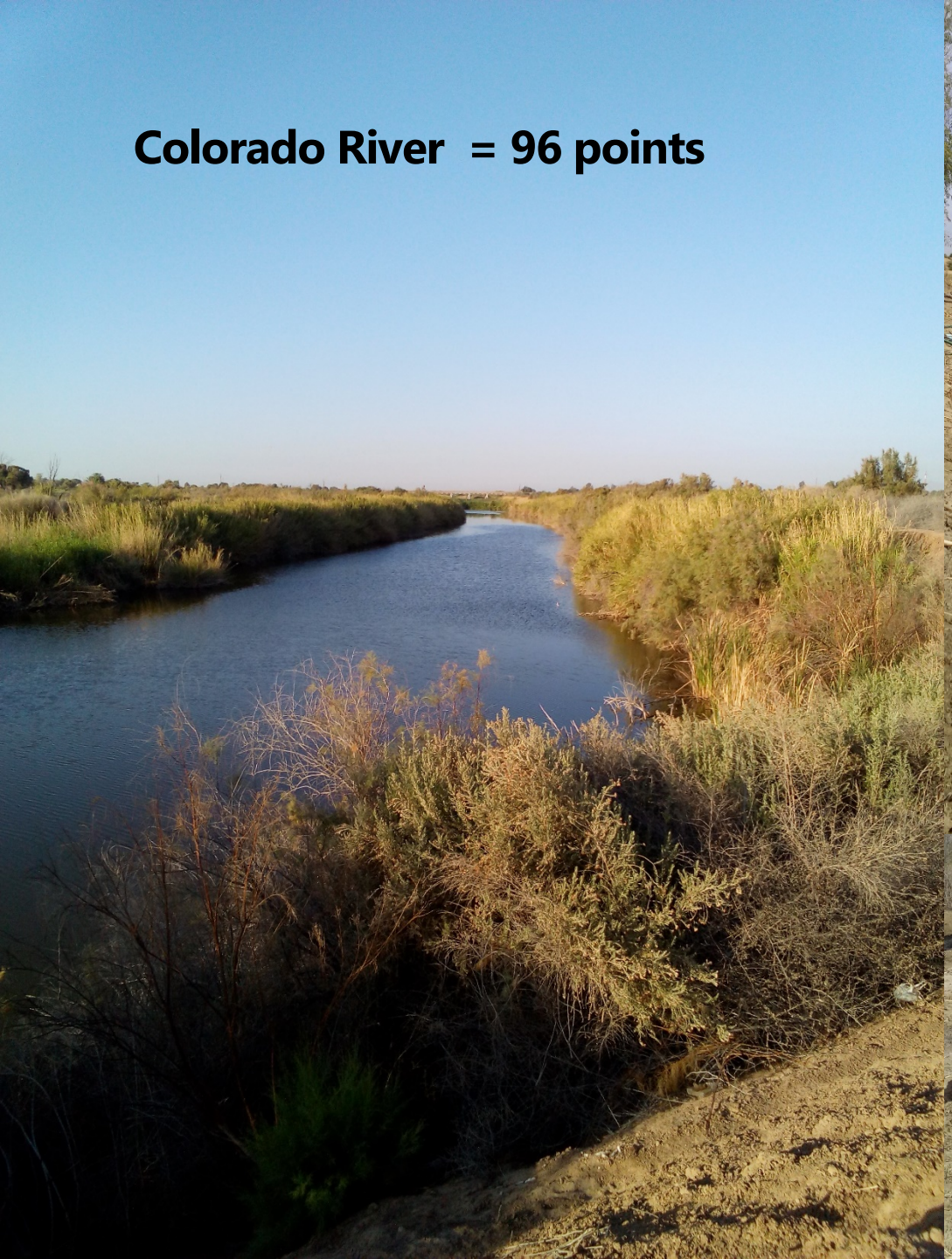
Las Arenitas water treatment plant = 16 pts

Operating since 2009, process 40% of waste water from Mexicali

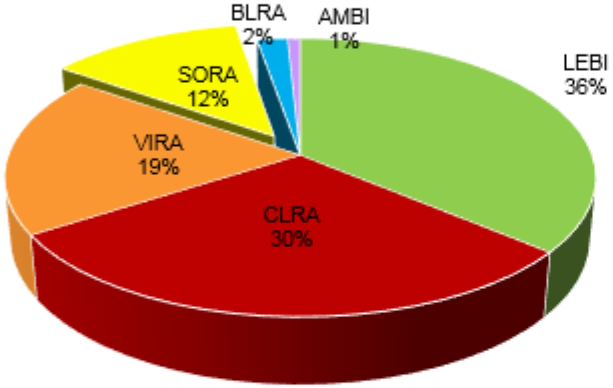
99 Ha of artificial lagoon habitat

30% of effluent: instream flows for the Hardy River (25 cfs or 18K afy)

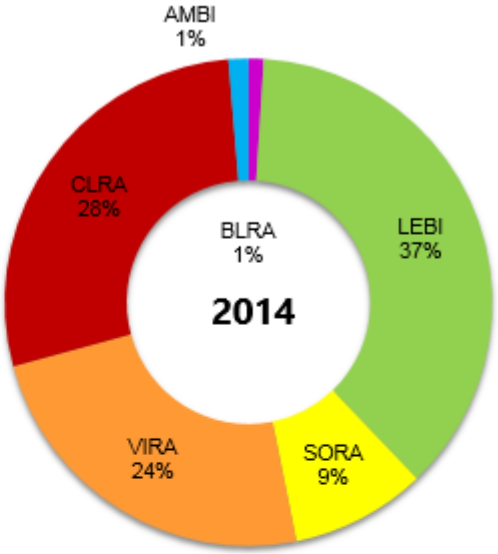
Colorado River = 96 points

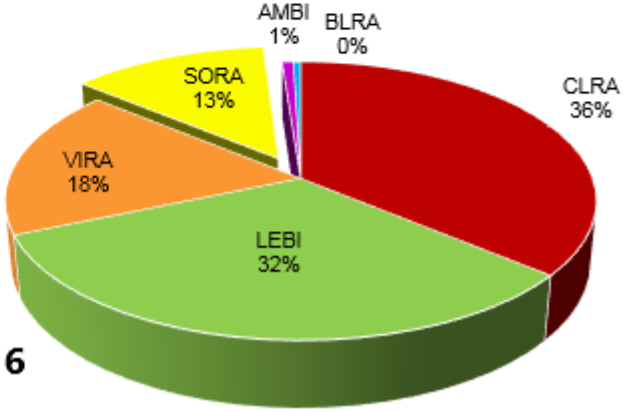


Relative abundance per species



2015



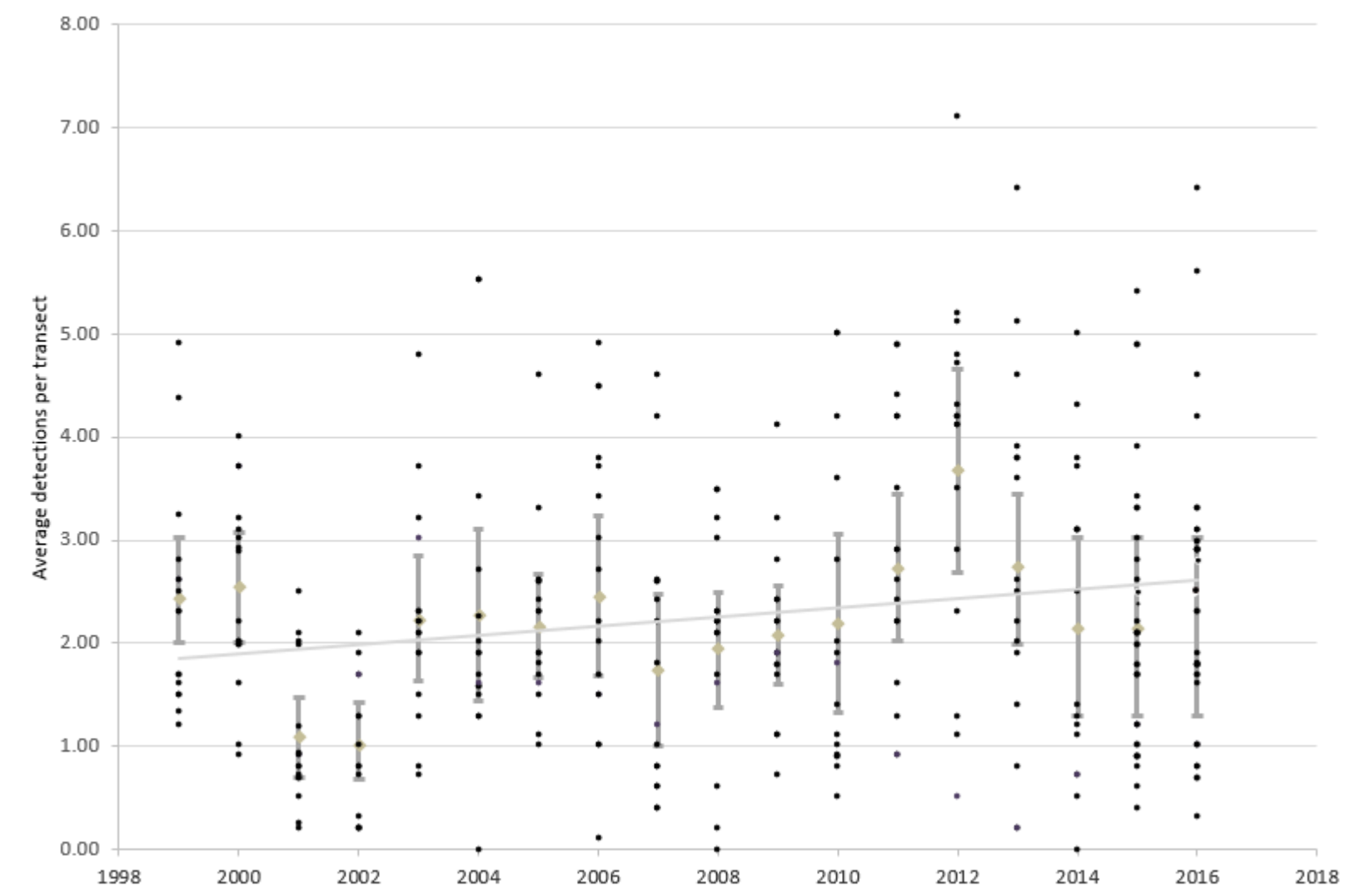


2016

Total detection of Yuma Ridgway's Rails in 8 wetlands of the Colorado River Delta, 2010-2016

Yuma Clapper Rail	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
Cienega de Santa Clara	526	374	939	1120	606	560	648
Colorado River	2	25	11	25	5	21	11
Rio Hardy River	70	60	51	199	134	189	302
Zona Limitrofe	NS	NS	NS	NS	1	0	0
Mesa de Andrade	0	0	5	3	3	6	0
Las Arenitas	0	0	6	5	3	1	0
Laguna El Indio	17	27	42	48	19	34	38
El Doctor Wetlands	1	0	1	6	2	4	5
Total	**616**	**486**	**1055**	**1406**	**673**	**815**	**1004**

Trend of Average detections of Clapper Rail in Ciénega de Santa Clara, from 1999 to 2016



Cienega holds the largest concentration of marsh birds in the delta

CLRA 2015

Zona	Registros	%	Por Punto
Cienega	560	**68.71**	4.31
Rio Colorado	21	2.58	0.22
Rio Hardy	189	**23.19**	1.12
Zona Limitrofe	0	0.00	0.00
Mesa de Andrade	6	0.74	1.00
Las Arenitas	1	0.12	0.07
El Indio	34	4.17	6.80
El Doctor	4	0.49	0.11
Total	815	100.00	1.47

LEBI 2015

Zona	Registros	%	Por Punto
Cienega	641	**64.88**	4.93
Rio Colorado	82	8.30	0.85
Rio Hardy	240	**24.29**	1.42
Zona Limitrofe	2	0.20	0.02
Mesa de Andrade	0	0.00	0.00
Las Arenitas	1	0.10	0.07
El Indio	19	1.92	3.80
El Doctor	3	0.30	0.09
Total	988	100.00	1.78

CLRA 2016

Zona	Registros	%	Por Punto
Cienega	648	**64.54**	4.98
Rio Colorado	11	1.10	0.11
Rio Hardy	302	**30.08**	1.79
Zona Limitrofe	0	0.00	0.00
Mesa de Andrade	0	0.00	0.00
Las Arenitas	0	0.00	0.00
El Indio	38	3.78	7.60
El Doctor	5	0.50	0.14
Total	1004	100.00	1.81

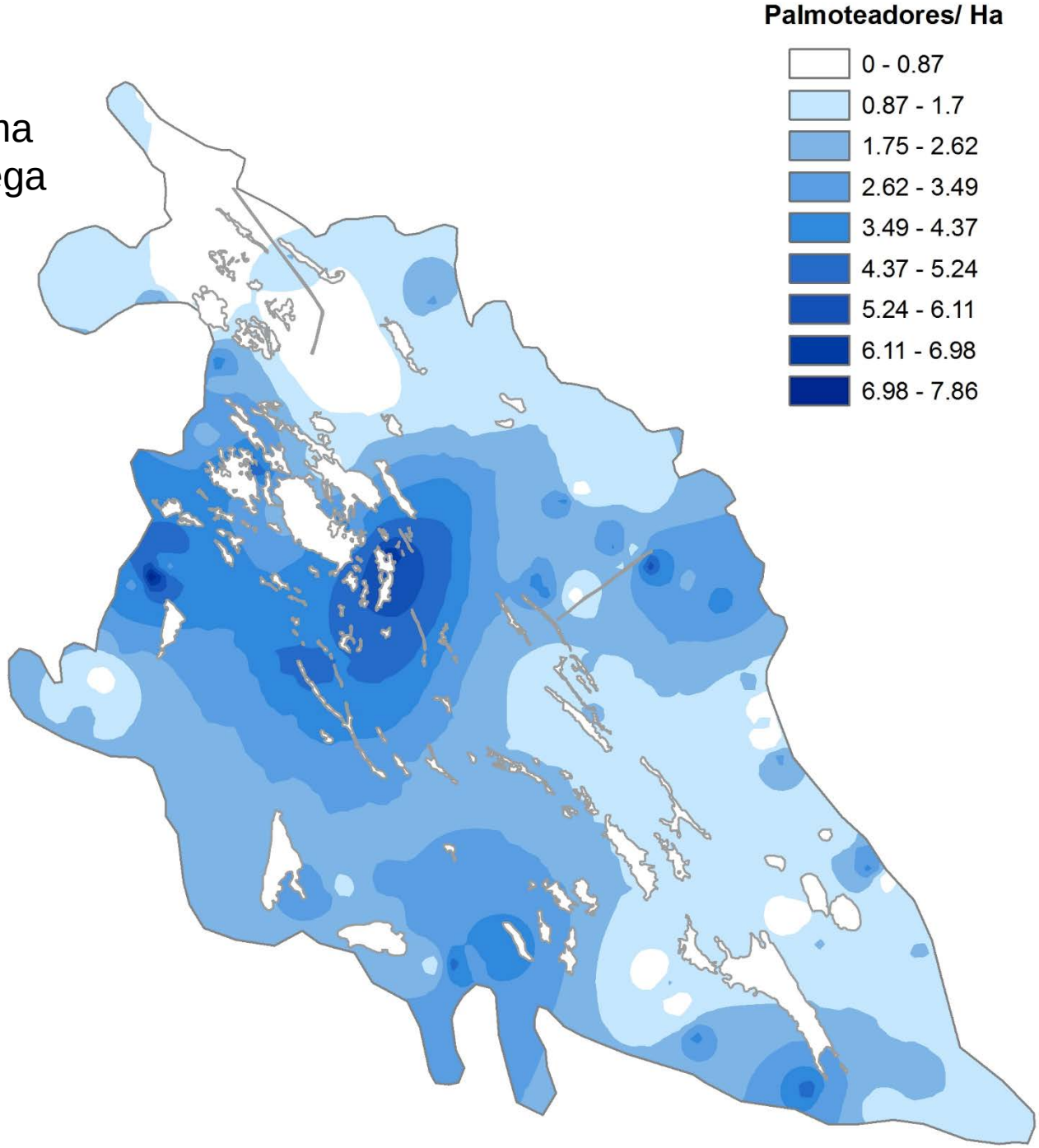
LEBI 2016

Zona	Registros	%	Por Punto
Cienega	499	**55.26**	3.84
Rio Colorado	68	7.53	0.71
Rio Hardy	313	**34.66**	1.85
Zona Limitrofe	2	0.22	0.02
Mesa de Andrade	0	0.00	0.00
Las Arenitas	0	0.00	0.00
El Indio	16	1.77	3.20
El Doctor	5	0.55	0.14
Total	903	100.00	1.62

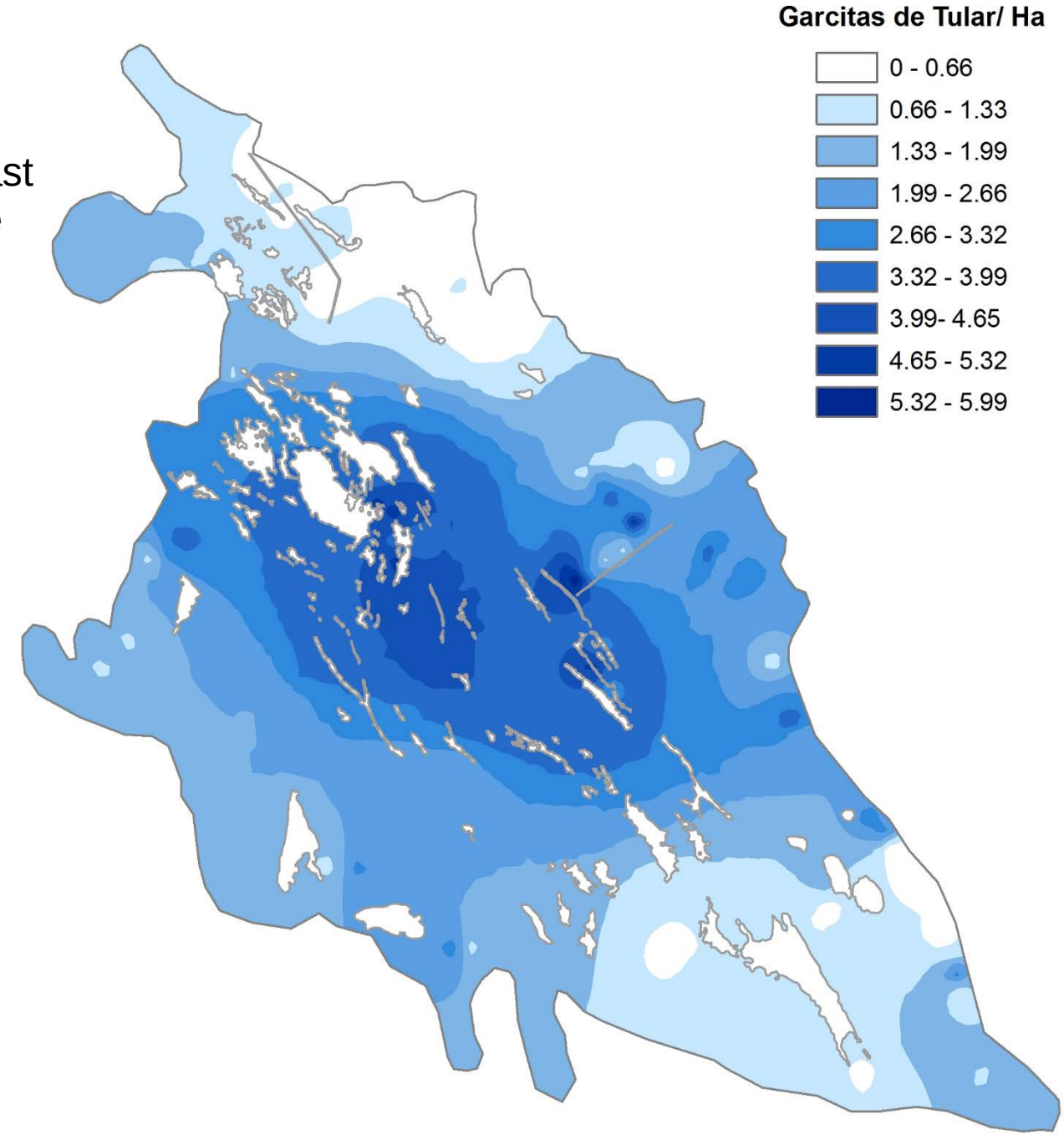
Population estimates of Yuma Clapper Rail in Ciénega de Santa Clara, obtained with density estimation models based on distance, from 2010 to 2016

	Density	Abundance	95% Confidence Interval	
Year	**Rails/Ha**	**Individuals**	**Lower Limit**	**Upper Limit**
2010	0.94	5,438	4,229	6,993
2011	1.49	8,642	7,714	9,686
2012	1.15	6,681	5,707	7,812
2013	1.09	6,322	4,525	8,120
2014	0.82	4,756	4,002	5,626
2015	1.03	5,945	5,104	6,492
2016	1.09	6,304	5,585	7,117

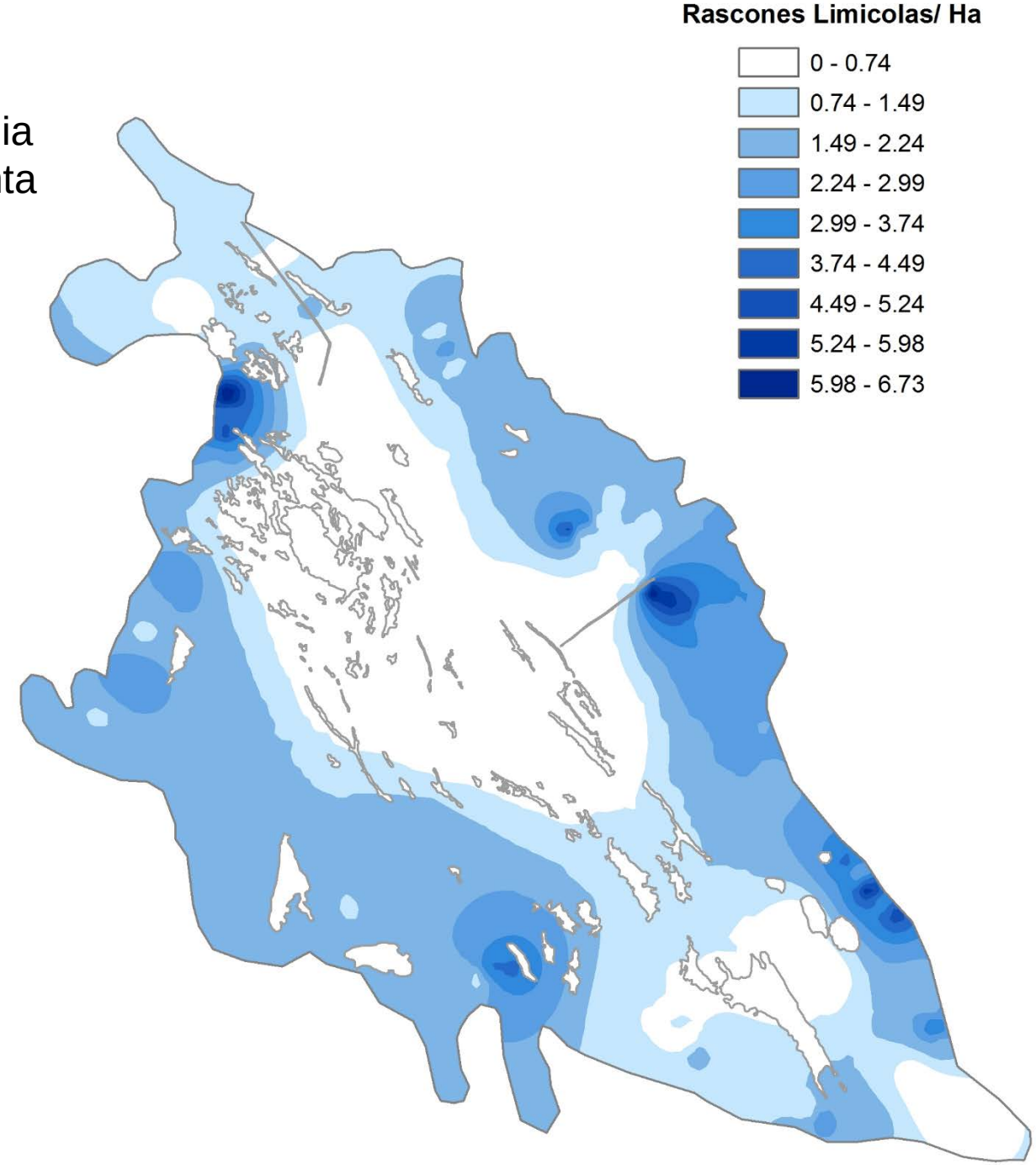
Density distribution of Yuma Clapper Rails in the Cienega de Santa Clara in 2014



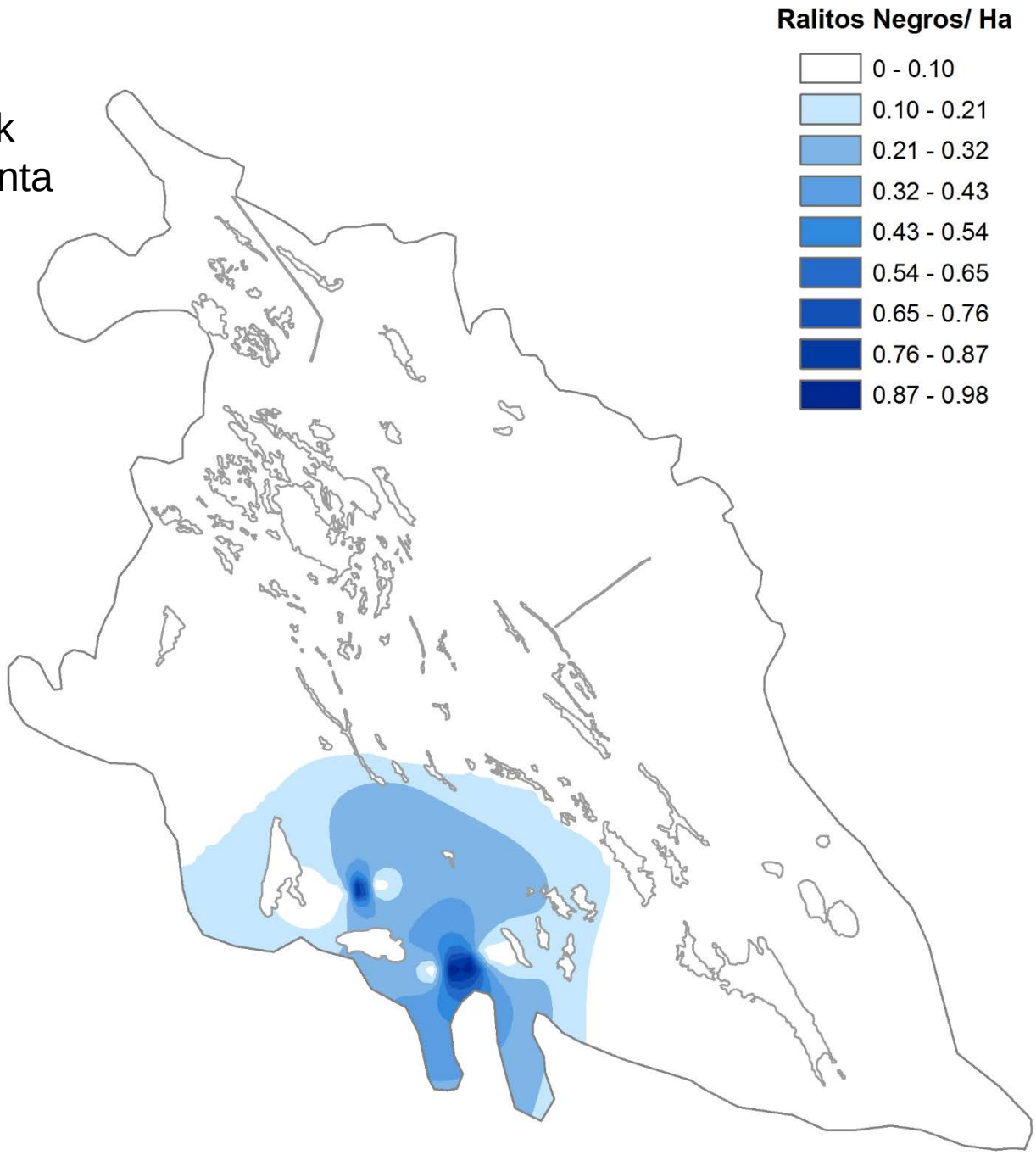
Density distribution of Least Bitterns in the Cienega de Santa Clara in 2014



Density distribution of Virginia Rails in the Cienega de Santa Clara in 2014



Density distribution of Black Rails in the Cienega de Santa Clara in 2014



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Ej. Luis Encinas Johnson

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