Avian Use in the Middle Rio Grande Bosque, 2004-2018

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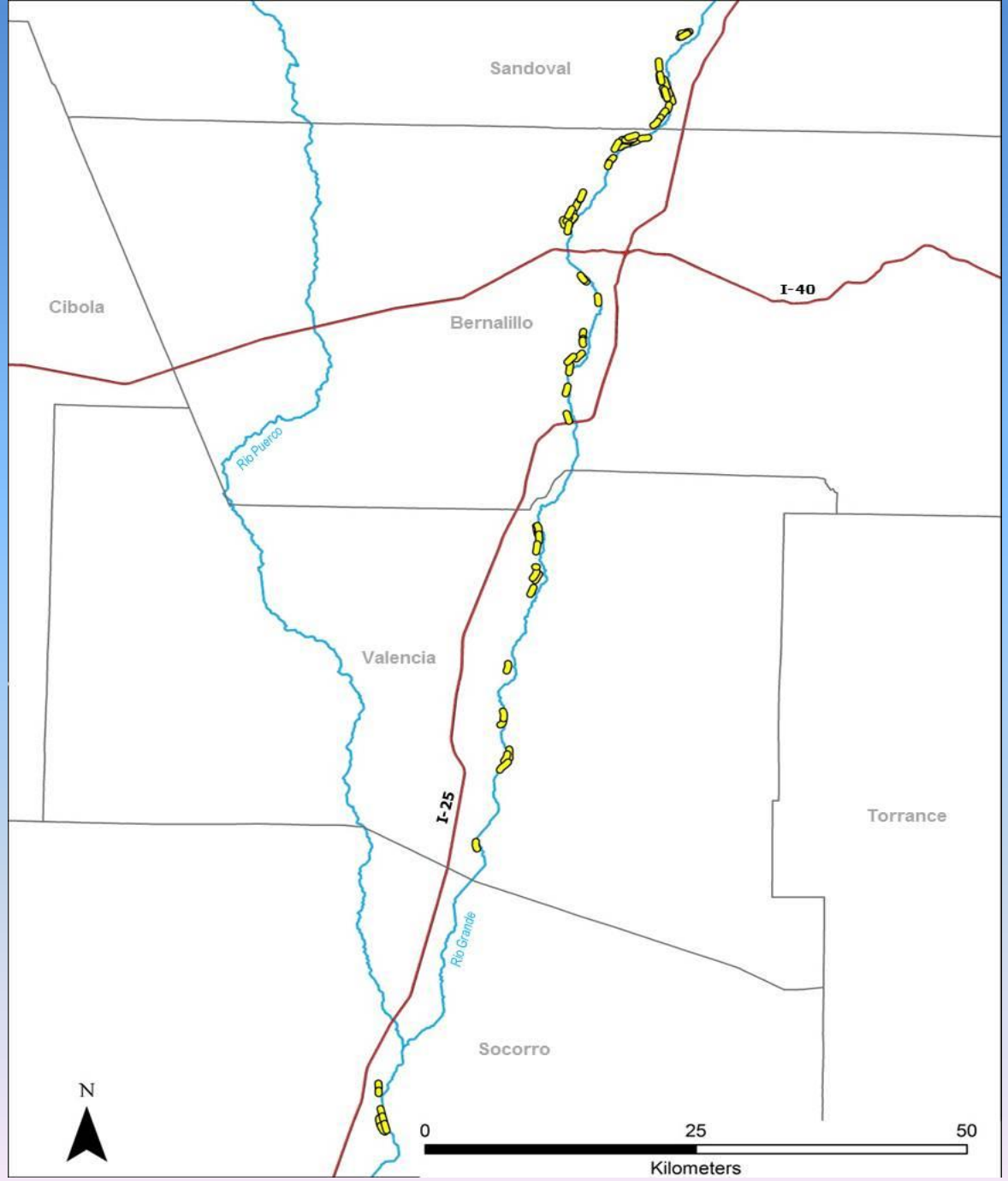
Conservation Education, Avian Research, Raptor Rescue & Collaboration with Others

MRGSS Background

- Survey protocol based on Middle Rio Grande Biological Survey (Hink and Ohmart 1984)
- Habitat classifications based on Hink and Ohmart community and structure (C/S) types
- Avian walking transect surveys began in winter 2004
- 81 transects between Rio Rancho and La Joya WMA

MRGSS Study Area



MRGSS Survey Methods

- Seasons: Winter (December-February), Summer (June-August)
- Transects surveyed 3 times/month (9 times/season)
- Distance bins (m): <5, 5-15, 16-30, 31-45, 46-60, 61-80, 81-122
- Avian density and richness calculations based on detections w/in 30 m of transect line

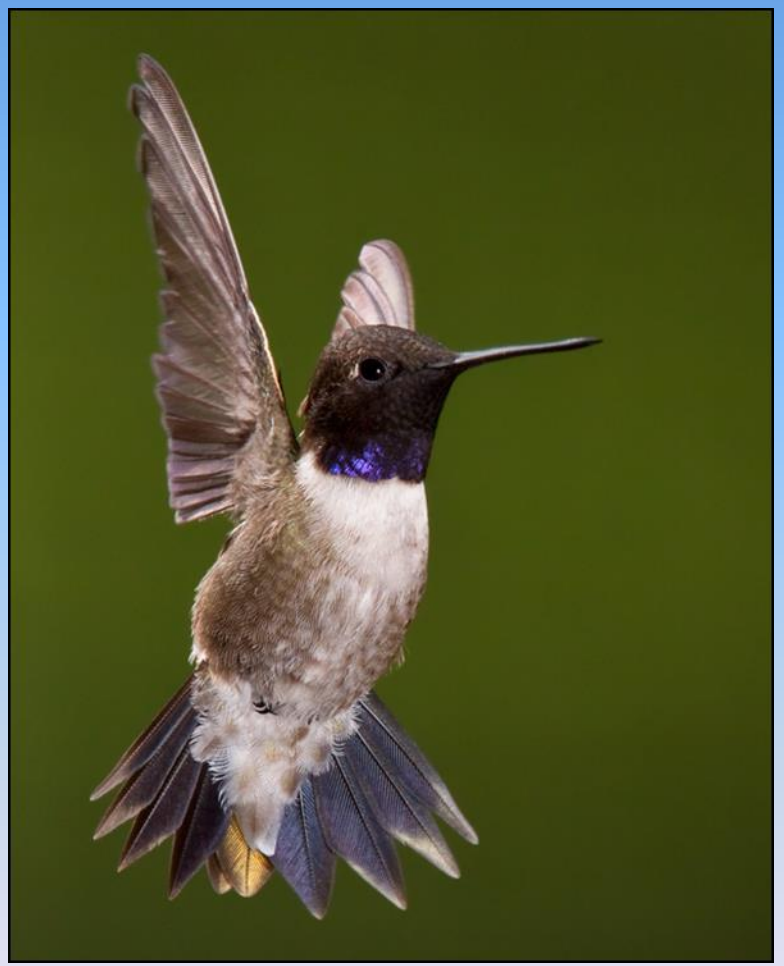
Key Factors Influencing Avian Use

- Long-term, Exceptional Drought

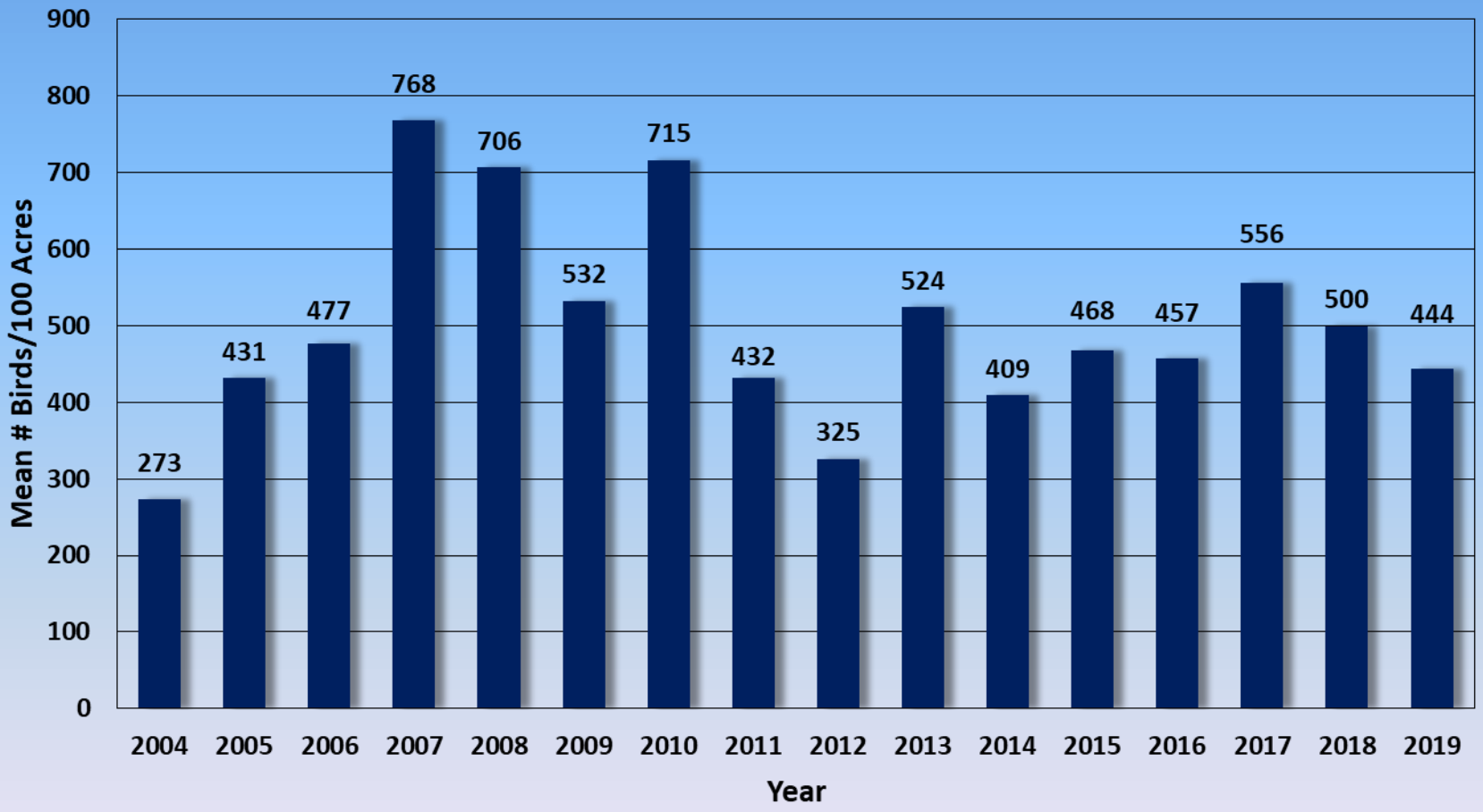
  -September 2010-August 2013 2nd driest 36 month period on record

- Catastrophic Wildfire
- Restoration Work (USACE)
- Thinning/Clearing
- Increased Human Use
- Factors Outside the Bosque

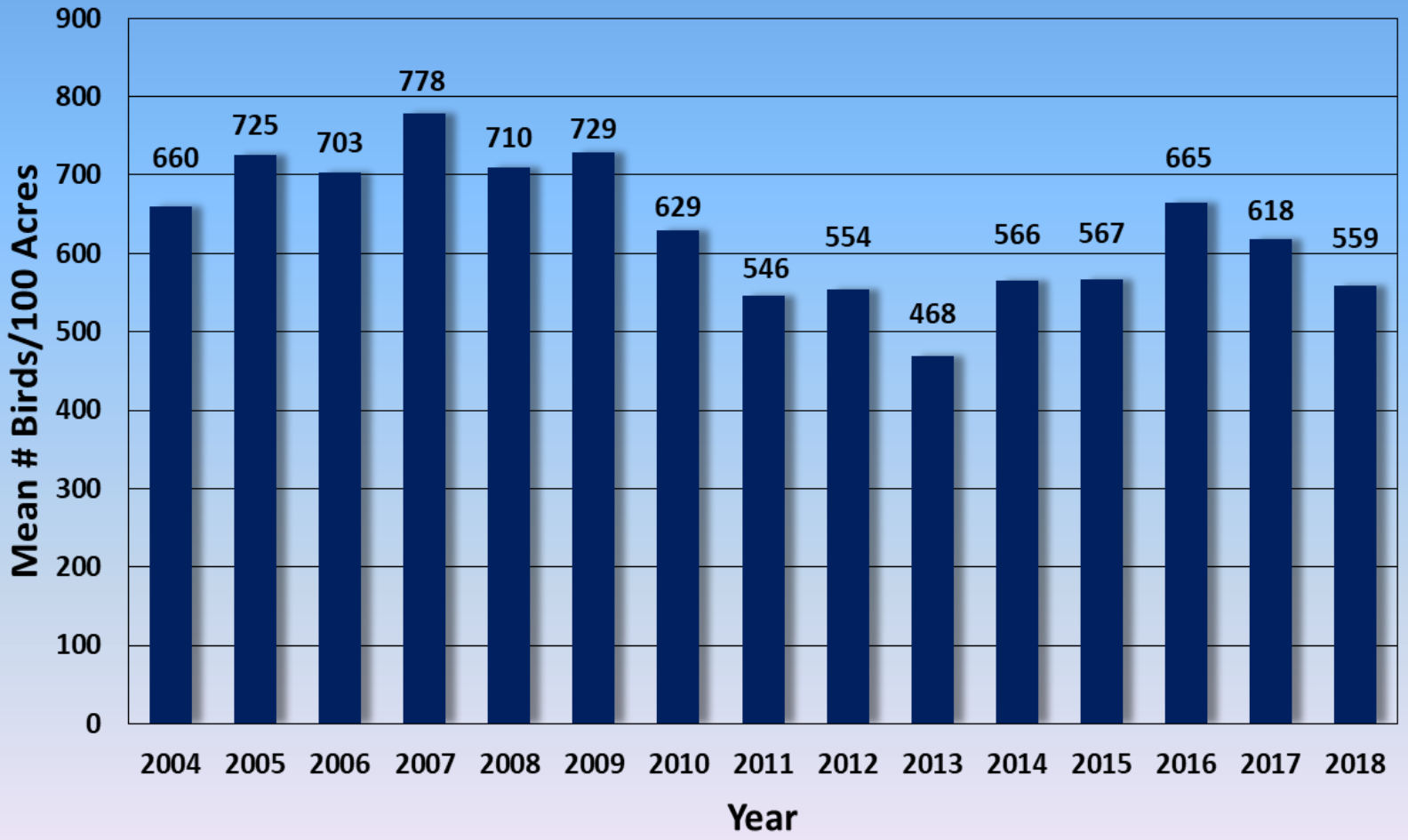
  -Conditions on wintering and breeding grounds



Winter Avian Density by Year (2004-2019)



Summer Avian Density by Year (2004-2018)



Comparison of Avian Density Pre- and Post-Drought

Winter Avian Density

Years		# Birds/100 Acres
2004-10	A	589
2011-19	B	457

Summer Avian Density

Years		# Birds/100 Acres
2004-10	A	706
2011-18	B	569

Cumulative Winter Avian Density by C/S Type (2004-2019)

C/S Type	# Birds/100 Acres
Russian Olive 3	1325
Drain 5	1103
Marsh 5-Open Water	1080
Russian Olive 5	770
Cottonwood/New Mexico Olive 1	759
New Mexico Olive 5	514
Drain 6	497
Burn 2	453
Coyote Willow-Russian Olive 5	364
Cottonwood/Russian Olive 1	326
Cottonwood 2 natural	324
Cottonwood-R. Olive/Coyote Willow 3	320
Cottonwood/Mulberry 1	260
Cottonwood/Coyote Willow 1	204
Salt-Cedar 5	176
Open	126
Cottonwood 2 artificial	90

Cumulative Winter Avian Richness by C/S Type (2004-2019)

C/S Type						# Species/Transect
Drain 5	A					23.4
Russian Olive 3	A	B				23.1
Marsh 5-Open Water	A	B				21.0
Cottonwood/New Mexico Olive 1	A	B				20.8
New Mexico Olive 5		B	C	D		17.6
Russian Olive 5			C			17.6
Burn 2		B	C	D		17.4
Cottonwood/Coyote Willow 1			C	D		16.7
Cottonwood/Mulberry 1		B	C	D	E	16.3
Cottonwood 2 natural			C	D		15.1
Coyote Willow-Russian Olive 5			C	D	E	15.0
Cottonwood-R. Olive/Coyote Willow 3			C	D	E	14.8
Cottonwood/Russian Olive 1				D	E	14.3
Drain 6					E	12.5
Salt-Cedar 5						F 9.0
Cottonwood 2 artificial						F 8.7
Open						F 7.3

Cumulative Summer Avian Density by C/S Type (2004-2018)

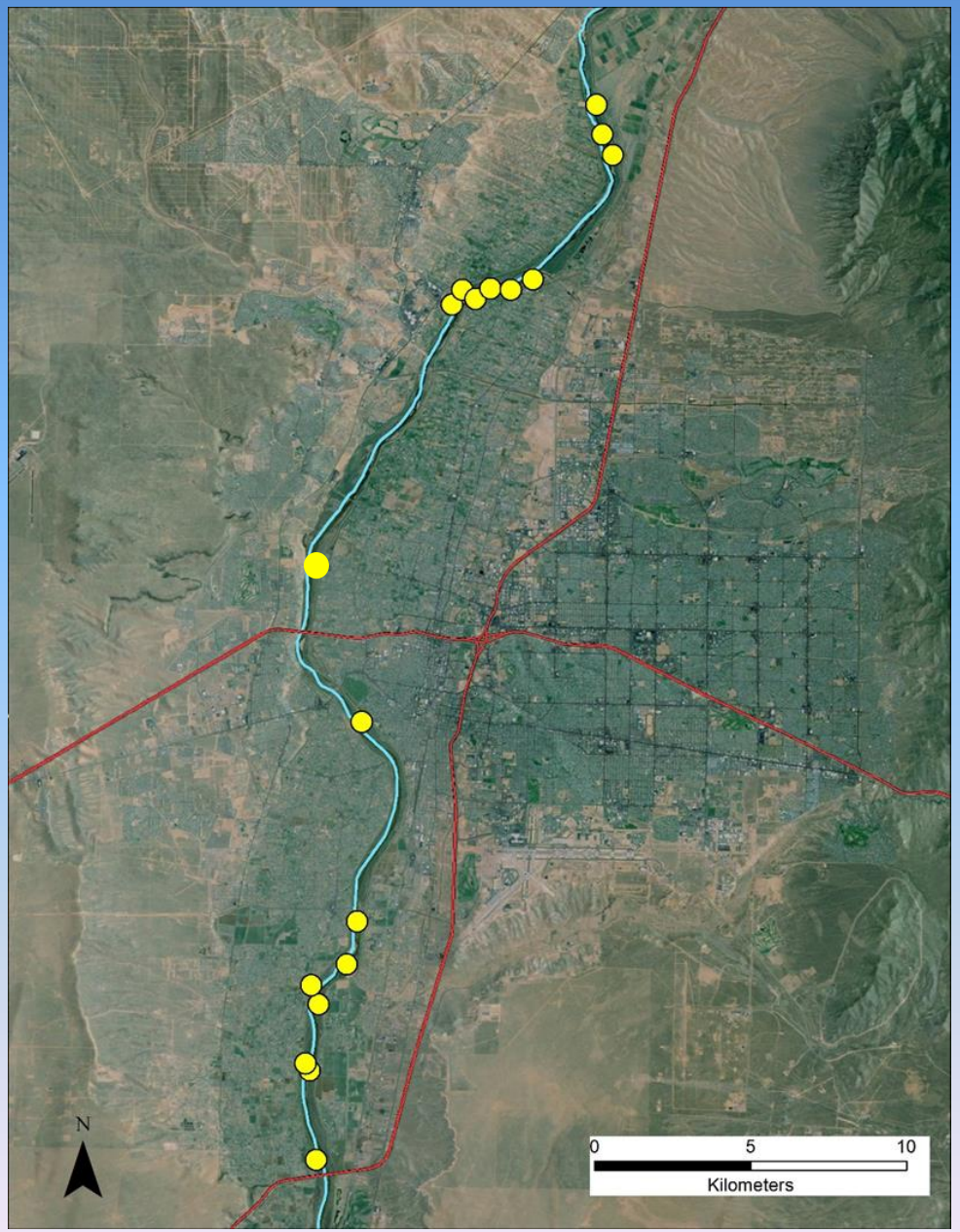
C/S Type	# Birds/100 Acres
Marsh 5-Open Water	1343
New Mexico Olive 5	1134
Russian Olive 3	1030
Cottonwood/New Mexico Olive 1	974
Russian Olive 5	882
Coyote Willow-Russian Olive 5	764
Cottonwood-R. Olive/Coyote Willow 3	750
Cottonwood/Russian Olive 1	692
Drain 5	672
Cottonwood/Coyote Willow 1	635
Cottonwood/Mulberry 1	598
Cottonwood 2 natural	531
Burn 2	508
Drain 6	394
Cottonwood 2 artificial	326
Salt-Cedar 5	211
Open	170

Cumulative Summer Avian Richness by C/S Type (2004-2018)

C/S Type						# Species/Transect
Cottonwood/Coyote Willow 1	A					29.9
Coyote Willow-Russian Olive 5	A					29.5
Russian Olive 3	A					29.1
Cottonwood/New Mexico Olive 1	A					28.2
New Mexico Olive 5	A	B				28.2
Cottonwood/Mulberry 1	A	B				27.8
Marsh 5-Open Water	A	B				27.6
Burn 2	A	B	C			26.8
Cottonwood-R. Olive/Coyote Willow 3	A	B	C			25.9
Cottonwood/Russian Olive 1	A	B				25.9
Drain 5		B	C			24.4
Russian Olive 5		B	C			24.3
Cottonwood 2 natural			C			22.5
Cottonwood 2 artificial				D		16.7
Drain 6				D		16.4
Salt-Cedar 5				D		16.0
Open					E	11.0

USACE Restoration Sites

- 22 Transects
- 14 incorporate water features
- 8 primarily upland bosque



USACE Site 5C (SE37) Pre-restoration

USACE Site 5C (SE37) Post-restoration

Winter Avian Use at 17 USACE Restoration Sites, 2011-2019

Winter Avian Density

Treatment Type		# Birds/100 Acres
Post-restoration	A	370
Pre-restoration	B	316

Winter Avian Richness

Treatment Type		# Species/Transect
Post-restoration	A	18.6
Pre-restoration	B	15.7

Summer Avian Use at 17 USACE Restoration Sites, 2011-2018

Summer Avian Density

Treatment Type		# Birds/100 Acres
Post-restoration	A	530
Pre-restoration	A	522

Summer Avian Richness

Treatment Type			# Species/Transect
Post-restoration	A		29.6
Pre-restoration		B	26.2

Summary

- Long-term drought in the early 2010's had a significantly negative impact on year-round avian use in the bosque
- Avian use is highest in dense C/S types comprised of native vegetation (especially New Mexico olive and cottonwood) and/or with a substantial Russian olive component, and dense vegetation adjacent to standing water (Drain 5, Marsh 5)
- Russian olive is heavily exploited by birds year-round, with mature, berry-producing individuals being particularly valuable for nesting and foraging; importance likely to increase as bosque adapts to drier conditions with climate change

Acknowledgements

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