

every 30 minutes and any birds are extracted and taken back to the banding office for processing. Each bird is fitted with a metal leg band issued by the United States Geological Survey (USGS). This allows us to track the capture history for every individual bird and perform robust mark-recapture analyses to estimate changes in demographic rates⁵. We also take a suite of morphological and demographic measurements from each bird including sex, age, fat content, breeding state, molt stage, wing length, and body mass. These data allow us to describe the bird community at Rio Mesa as well as monitor the health of individuals as they undergo their yearly migration.

2022

2

2022

This fall was our 12th banding season, representing 12 1/2 years of banding data from Rio Mesa. These data make our station one of the longest-running bird banding operations in Utah and one of only two passerine (songbird) stations currently operating in the state (the other station being our bird banding station in Red Butte Canyon, near Salt Lake City).

Statistics

	2022 Totals
Species Caught	2
Species Banded	68
Total Captures	1,82
Birds Banded	82
Banding Days	22

Participants

In the 2022, our banding team consisted of lead bander [Name] (who [Age] [Years] old) and volunteers [Number] and [Number]. Our volunteers come to Rio Mesa from across the country with varying degrees of experience working with birds. Our station is dedicated to providing educational opportunities to volunteers of all skill levels and by the end, they are highly competent banders.

[Name]
[Age]

, our station [Number] group visitors



Future Directions

The next few years promise to be an exciting time for our ornithological research at Rio Mesa. With additional years of data, our ability to accurately monitor the changes in bird populations and community composition will improve greatly and we will soon be able to estimate migratory arrival and departure dates. These data are especially important now given the accelerating pace of climate change and the ramifications for riparian ecosystems⁹.

We now have a prospective graduate student and an undergraduate working on the data from Rio Mesa. The former is analyzing how age and sex affect the arrival dates of migrants while the latter is investigating how rainfall affects capture rates. We hope that we will be able to take on a new graduate student in 2020 who can focus on the data gathered at Rio Mesa as part of their thesis.

Our work at Rio Mesa will continue to be the only location in Utah producing this kind of valuable data and will be integral in developing conservation regulations in the near future. We also plan to continue our outreach program, bringing several groups to the station. These efforts will help more people understand the necessity of conservation biology, ecology and ornithology research and the importance of ensuring healthy ecosystems.

Literature Cited

1. Şekercioğlu, Ç. H. Promoting community-based bird monitoring in the tropics: Conservation, research, environmental education, capacity-building, and local incomes. *Biol. Conserv.* **151**, 69–73 (2012).
2. Parrish, J. R., Norvell, R. E., Roberts, D., White, H. & Howe, F. P. *Population Monitoring of Neotropical Migratory Birds in Riparian Habitats of Utah*. (2007).
3. Seavy, N. E. *et al.* Why climate change makes riparian restoration more important than ever: Recommendations for practice and research. *Ecol. Restor.* **27**, 330–338 (2009).
4. Desante, D. F. *et al.* MAPS Manual 2016 Protocol. (2016).
5. Ralph, C. J., Geupel, G. R., Pyle, P., Martin, T. E. & DeSante, D. F. Handbook of Field Methods for Monitoring Landbirds. *Director* **144**, 1–41 (1993).
6. Sodhi, N. S., Butler, R., Laurance, W. F. & Gibson, L. Conservation successes at micro-, meso- and macroscales. *Trends Ecol. Evol.* **26**, 585–594 (2011).
7. Newmark, W. D. A 16-year study of forest disturbance and understory bird community structure and composition in Tanzania. *Conserv. Biol.* **20**, 122–134 (2006).
8. Sauer, J. R. *et al.* The North American Breeding Bird Survey, Results and Analysis 1966-2013. Version 01.30.2015. (2014).
9. Niman, R. J., Decamps, H. & Pollock, M. The Role of Riparian Corridors in Maintaining Regional Biodiversity. *Ecol. Appl.* **3**, 209–212 (1993).



Appendix: Capture rates for all species caught at Rio Mesa from 2011 to 2019. Species with no capture records have only been observed

Species Name	Totals		
	Number Banded	Number Recaught	Number Unbanded
<u>Waterfowl</u>			
Canada Goose			
Mallard			
Blue-winged Teal			
Cinnamon Teal			
Northern Shoveler			
Green-winged Teal			
Common Merganser			
Duck spp.			
<u>Grouse, Quails, and Allies</u>			
Chukar			
Wild Turkey			4
<u>Grebes</u>			
Pied-billed Grebe			
<u>Hérons, Ibis, and Allies</u>			
Great Blue Heron			
Great Egret			
Snowy Egret			
White-faced Ibis			
<u>Vultures, Hawks, and Allies</u>			
Turkey Vulture			
Osprey			
Golden Eagle			
Northern Harrier			
Sharp-shinned Hawk	7		
Cooper's Hawk	1		
Northern Goshawk			
Bald Eagle			
Swainson's Hawk			
Red-tailed Hawk			
Rough-legged Hawk			
<u>Rails, Gallinules, and Allies</u>			
Sora	1		



Sandhill Crane			
<u>Shorebirds</u>			
Killdeer			
Wilson's Snipe			
Spotted Sandpiper	1		
<u>Pigeons and Doves</u>			
Rock Pigeon			
Band-tailed Pigeon			
Eurasian-collared Dove			
White-winged Dove			
Inca Dove	1		
Mourning Dove	20		6
<u>Owls</u>			
Western Screech-Owl	2		
Great Horned Owl			
Northern Saw-whet Owl	2		
<u>Nightjars</u>			
Common Nighthawk			
Common Poorwill	2		
<u>Swifts</u>			
Vaux's Swift			
White-throated Swift	4		4
<u>Hummingbirds</u>			
Costa's Hummingbird			1
Black-chinned Hummingbird			187
Broad-tailed Hummingbird			28
Calliope Hummingbird			10
Rufous Hummingbird			63
Hummingbird spp.			6
<u>Kingfishers</u>			
Belted Kingfisher			
<u>Woodpeckers</u>			
Williamson's Sapsucker	3	2	
Yellow-bellied Sapsucker			
Red-naped Sapsucker	41	1	
Downy Woodpecker	4		
Hairy Woodpecker	2		
Lewis's Woodpecker			
Red-shafted Flicker	25	3	2



<u>Falcons and Caracaras</u>			
American Kestrel	2		
Merlin			
Peregrine Falcon			
Prairie Falcon			
<u>Flycatchers and Allies</u>			
Olive-sided Flycatcher	3		
Western Wood-pewee	114	4	2
Willow Flycatcher	212	12	
Western Flycatcher	5		
Pacific-slope Flycatcher	2	2	
Cordilleran Flycatcher	4		
Yellow-bellied Flycatcher	1		
Hammond's Flycatcher	22		
Dusky Flycatcher	230	29	1
Gray Flycatcher	62	6	
Black Phoebe	3		1
Say's Phoebe	11	2	
Ash-throated Flycatcher	68	12	
Eastern Kingbird	3		
Cassin's Kingbird			
Western Kingbird	12	3	
Flycatcher spp.			
<u>Shrikes</u>			
Loggerhead Shrike	8		
Northern Shrike			
<u>Vireos</u>			
Bell's Vireo		1	
Plumbeous Vireo	19	3	
Cassin's Vireo	19		
Warbling Vireo	259	23	
Gray Vireo	35	9	
Red-eyed Vireo	1		
Vireo spp.			
<u>Crows and Jays</u>			
Pinyon Jay			
Woodhouse's Scrub-jay	27	1	1
Black-billed Magpie			
American Crow			
Common Raven			



<u>Larks</u>			
Horned Lark			
<u>Martins and Swallows</u>			
Northern Rough-winged Swallow			
Tree Swallow			
Violet-green Swallow	18		
Bank Swallow			
Barn Swallow	1		
Cliff Swallow	2		
Swallow spp.			
<u>Chickadees and Allies</u>			
Black-capped Chickadee	55	9	
Mountain Chickadee	14	2	
Juniper Titmouse	7	1	
Bushtit	269	64	17
<u>Nuthatches and Creepers</u>			
Brown Creeper	3		
Red-breasted Nuthatch	1		
White-breasted Nuthatch			
<u>Wrens</u>			
Bewick's Wren	227	75	13
Rock Wren	20	11	
Canyon Wren	14	9	1
House Wren	81	18	1
Winter Wren	1		
Marsh Wren	40		2
<u>Gnatcatchers and Kinglets</u>			
Blue-gray Gnatcatcher	745	140	19
Golden-crowned Kinglet	2		
Ruby-crowned Kinglet	548	90	30
<u>Thrushes</u>			
Mountain Bluebird	2		
Western Bluebird			
Townsend's Solitaire	12	2	
Swainson's Thrush	22	3	1
Hermit Thrush	233	57	3
American Robin	37	19	2
<u>Mockingbirds and Thrashers</u>			
Gray Catbird	45	3	



Northern Mockingbird	9	1	
Brown Thrasher	1		
Sage Thrasher	41	14	1
<u>Starlings and Mynas</u>			
European Starling			
<u>Wagtails and Pipits</u>			
American Pipit			
<u>Waxwings and Dippers</u>			
Cedar Waxwing	3		
American Dipper			
<u>Wood Warblers</u>			
Northern Waterthrush	28		
Orange-crowned Warbler	299	37	1
Nashville Warbler	34	2	
Virginia's Warbler	97	11	
Lucy's Warbler	60	70	1
MacGillivray's Warbler	431	43	6
Common Yellowthroat	179	3	2
American Redstart	2	1	
Northern Parula	2		
Magnolia Warbler	1	1	
Yellow Warbler	617	105	2
Black-throated Blue Warbler	1	1	
Palm Warbler	1		
Yellow-rumped Warbler	21		1
Yellow-rumped Warbler (Audubon's)	534	29	5
Yellow-rumped Warbler (Myrtle)	23	6	
Yellow-rumped Warbler (MxA)	7		
Black-throated Gray Warbler	13		
Townsend's Warbler			
Wilson's Warbler	1092	86	16
Yellow-breasted Chat	625	465	15
Warbler spp.			1
<u>Sparrows</u>			
Green-tailed Towhee	96	38	
Spotted Towhee	345	159	20
Vesper Sparrow	25		2
American Tree Sparrow	2		
Chipping Sparrow	77	22	
Clay-colored Sparrow	12	6	



Brewer's Sparrow	603	100	14
Lark Sparrow	28	3	
Lark Bunting			
Black-throated Sparrow	45		
Sagebrush Sparrow	55	2	
Savannah Sparrow	2		
Song Sparrow	658	205	15
Lincoln's Sparrow	393	71	12
Grasshopper Sparrow	6		
Fox Sparrow	4		
Dark-eyed Junco	13		2
Dark-eyed Junco (Gray-headed)	8		1
Dark-eyed Junco (Oregon)	325	121	10
Dark-eyed Junco (Pink-sided)	81	33	4
Dark-eyed Junco (Slate-colored)	8	4	
White-throated Sparrow	21	5	1
White-crowned Sparrow (Mountain)	254	16	5
White-crowned Sparrow (Gambel's)	542	227	34
Golden-crowned Sparrow	1		
House Sparrow			
Sparrow spp.	3		2
<u>Cardinals</u>			
Summer Tanager	1		
Western Tanager			
Rose-breasted Grosbeak	1		
Black-headed Grosbeak	91	4	2
Blue Grosbeak	69	12	2
Lazuli Bunting	130	27	
Indigo Bunting	6	1	
Painted Bunting			1
<u>Orioles and Blackbirds</u>			
Red-winged Blackbird	1		
Western Meadowlark	3		
Yellow-headed Blackbird	1		
Brewer's Blackbird			
Common Grackle			
Brown-headed Cowbird	29	5	1
Hooded Oriole	2		
Scott's Oriole			
Bullock's Oriole	72	15	1



<u>Finches and Allies</u>			
Cassin's Finch	3		1
House Finch	202	26	11
Pine Siskin	56	1	1
Lesser Goldfinch	61	1	
American Goldfinch	14		
Evening Grosbeak			