

Bonderman Field Station at Rio Mesa

2021 Bird Banding Report



Cover Photos, clockwise from top left: Steller's Jay, Lucy's Warbler, Ash-throated Flycatcher, Blue Grosbeak, Loggerhead Shrike, American Tree Sparrow; center photo is a Blue-winged Warbler. All captured and banded during spring or fall 2021 at the Rio Mesa banding station. Pictures taken by Kyle Kittelberger and Blaine Carnes.

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Station Overview

Station Lifetime Banding Totals

Species Observed	189
Species Caught	130
Species Banded	121
Total Captures	18,279
Birds Banded	14,466
Total Recaptures	3,133
Banding Days	1,094

Our Mission

The primary purpose of our project is to understand the ecology and migratory patterns of the bird community at the Bonderman Field Station at Rio Mesa using mist-netting and bird banding. We capture and band birds to gain valuable insights into population size, community structure, the timing of migration, and how avian groups are responding to anthropogenic threats. We are also dedicated to outreach and education. Birds are an exceptional flagship group to help instill interest in conservation and the environment¹ and every year we welcome hundreds of visitors to our station where people from all walks of life can receive hands-on education about nature, ecology, ornithology and conservation.

Bonderman Field Station at Rio Mesa

Rio Mesa represents an ideal location to conduct ornithological research. Riparian zones, like Rio Mesa's Dolores River, comprise a disproportionately important habitat in the arid Intermountain West. Birds, in particular, depend heavily on this delicate environment, and riparian zones serve as critical migratory corridors for birds moving through an otherwise harsh area². Riparian zones are also under severe threat from climate change³. With the growing threat of global change we, more than ever, need a detailed understanding of the ecology of riparian habitats and the organisms that depend on them.



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*Bonderman Field
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Our Research

Our station follows standard protocol developed by the Monitoring Avian Productivity and Survivorship program (MAPS)⁴. We operate sixteen 12 x 2.5 meter mist-nets that are opened 30 minutes before sunrise and remain open for six hours. Nets are open 10 out of every 12 days from early April to early June, and mid August to early November. Nets are checked 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 mass⁶. 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.

2021

This spring and fall were respectively our 19th and 20th banding season, representing 10 ½ years of banding data from Rio Mesa. These data make our station the longest-running bird banding operation in Utah and one of only two consistent passerine (songbird) stations currently operating in the state (the other station being our bird banding station in Red Butte Canyon, near Salt Lake City). For the spring we banded from April 3 through June 7, and the fall lasted from August 15 through November 3.

Statistics

Spring 2021 Totals

Species Caught	50
Species Banded	48
Total Captures	612
Birds Banded	494
Banding Days	56

This spring started out quite slow, with daily banding totals in the single digits for a majority of the days for about the first month. This slow start to the season may be a result of all of the bird mortality during fall 2020, with the low numbers at the start of the season possibly emblematic of birds having suffered a big decline. However, by the end of the first weekend in May, numbers drastically jumped to 30+ birds, representative of normal springs.

Some notable captures this spring included our first Blue-winged Warbler, a fourth state record for Utah; multiple Lucy's Warblers; our second Least Flycatcher; our fourth Red-breasted Nuthatch; an Indigo Bunting; and a Sharp-shinned Hawk. We also had many recaptures of birds banded in 2016 and 2017, as well as more recent years.



Statistics

Fall 2021 Totals

Species Caught	46
Species Banded	43
Total Captures	610
Birds Banded	498
Banding Days	66

This fall was a somewhat slow season for us, with about half the number of birds captured and banded this season compared to the previous fall. The slowness to this fall could be a result of the less severe wildfire season this year, with fewer birds potentially being pushed further east to avoid smoke and burning land⁷. This fall also saw more rain in the region than last year, which likely caused birds to be less concentrated in riparian areas.⁸

Our most notable captures this spring included our first Steller's Jay banded at Rio Mesa, our third American Tree Sparrow, and a very late Lucy's Warbler (only our 2nd record from the fall and first from September).

Participants

In the spring, our banding team consisted of lead bander Megan Miller (who also banded for us in fall 2020) and volunteers Kara Beer and Becca Buschaus. Nikolas Orton and Brandy Bowmaster also assisted at times during this season, and Kyle Kittelberger helped Megan out by overseeing some of the banding days. In the fall, our banding team consisted of lead bander Blaine Cairnes and volunteers Brandy Bowmaster and Ellie Resendiz; undergrad Reily Shields also visited a couple times to help. 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.

While the coronavirus pandemic is still ongoing, our station did host several visiting groups this spring and fall, including some school groups. It is always a rewarding experience for our banders and volunteers to interact with these visitors and share the banding experience with others. These efforts will help more people understand the necessity of conservation biology, ecology and ornithology research and the importance of ensuring healthy ecosystems.



Future Directions

The next few years promise to be an exciting time for our ornithological research at Rio Mesa. First, 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. Second, we are now beginning to analyze our data, so the next several years will hopefully see multiple papers based on our banding efforts.

Our first paper based on Rio Mesa data is currently in the review process with an ornithology journal. For this study, we are looking at the past decade of fall banding data, with a particular focus on fall 2020, to assess the potential indirect effects of wildfires in western North America on fall bird migration, specifically the total number of captures and bird body condition. This is the one of the only studies of its kind to look at this relationship between wildfires and actively migrating birds. We also introduce an emaciation scale to better assess body condition in stressed birds during migration, based on our experiences with emaciated birds last year, and have tested this scale across both the spring and fall seasons. We aim to later write a paper focusing on this emaciation scale, since this is an important metric that is not traditionally recorded at banding stations across the country.

Additionally, this spring saw a high number of captures of Lucy's Warblers, including of one individual that was first banded 5 years ago. We also captured a surprising bird in September that was molting- this is the latest we have ever captured this species, and only the second time over the past decade that we have captured a Lucy's Warbler during the fall, as it is an early season migrant. We are likely one of the few banding stations in the country that has such banding success with Lucy's Warbler, a species which is actually noted in Handbook to Birds of the World as being a species with future research needs. We therefore aim to write a short paper with demographic and recapture data, among other things, in the near future.

Finally, while not bird related, we are excited to announce the first publication from our lab based on our time in the field at Rio Mesa. In March, a paper was published titled "New regional record of *Brechmorhoga mendax* (Pale-faced Clubskimmer) in eastern Utah, with notes on the species' status in Utah and known northern distribution boundaries" that was written by Kyle Kittelberger based on a sighting of this species last fall at Rio Mesa⁹. This was a very noteworthy and rare observation of a dragonfly species- we subsequently observed and photographed this species again at Rio Mesa this August. This documentation underscores the value of our Rio Mesa field site in studying biodiversity.



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Appendix: Capture details for all species caught at Rio Mesa from 2011 to 2021. Species with no capture records have only been observed.

Species Name	Totals		
	Number Banded	Number Recaptured	Number Unbanded
<u>Waterfowl</u>			
Canada Goose			
Mallard			
Gadwall			
Blue-winged Teal			
Cinnamon Teal			
Northern Shoveler			
Green-winged Teal			
Common Merganser			
<u>Gamebirds</u>			
Chukar			
Wild Turkey			
<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	11		
Cooper's Hawk			
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		
Solitary Sandpiper			
Greater Yellowlegs			
<u>Pigeons and Doves</u>			
Rock Pigeon			
Band-tailed Pigeon			
Eurasian-collared Dove			
White-winged Dove			
Inca Dove	1		
Mourning Dove	24		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			
Black-chinned Hummingbird			199
Broad-tailed Hummingbird			33
Calliope Hummingbird			13
Rufous Hummingbird			64
Hummingbird spp.			6
<u>Kingfishers</u>			
Belted Kingfisher			
<u>Woodpeckers</u>			
Williamson's Sapsucker			
Yellow-bellied Sapsucker			
Red-naped Sapsucker	46	2	
Red-breasted Sapsucker			
Downy Woodpecker	4		1
Hairy Woodpecker	2		
Lewis's Woodpecker			
Red-shafted Flicker	29	3	2
<u>Falcons</u>			



American Kestrel	2		
Merlin			
Peregrine Falcon			
Prairie Falcon			
<u>Tyrannid Flycatchers</u>			
Olive-sided Flycatcher	3		
Western Wood-pewee	125	4	2
Least Flycatcher	2		
Willow Flycatcher	247	12	
Western Flycatcher	5		
Pacific-slope Flycatcher	2	2	
Cordilleran Flycatcher	4		
Yellow-bellied Flycatcher	1		
Hammond's Flycatcher			
Dusky Flycatcher	239	33	1
Gray Flycatcher	64	6	
Black Phoebe	4		1
Say's Phoebe			
Ash-throated Flycatcher	74	12	
Eastern Kingbird	3		
Cassin's Kingbird			
Western Kingbird	12	3	
Empidonax spp.	43	2	2
Flycatcher spp.	7	2	3
<u>Shrikes</u>			
Loggerhead Shrike	9		
Northern Shrike			
<u>Vireos</u>			
Bell's Vireo			
Plumbeous Vireo	19	3	
Cassin's Vireo	19	1	
Warbling Vireo	297	32	
Gray Vireo	41	1	
Red-eyed Vireo	1		
<u>Corvids</u>			
Steller's Jay	1		
Pinyon Jay			
Woodhouse's Scrub-jay	33	1	1
Black-billed Magpie			
American Crow			
Common Raven			

Larks			
Horned Lark			
Swallows			
Purple Martin			
Northern Rough-winged Swallow			
Tree Swallow			
Violet-green Swallow	18		
Bank Swallow			
Barn Swallow	1		
Cliff Swallow	2		
Tits			
Black-capped Chickadee	52	23	
Mountain Chickadee	36	8	
Mountain x Black-capped Chickadee	3	1	
Juniper Titmouse	7	1	
Bushtit	37	85	2
Nuthatches and Creepers			
Brown Creeper	3		
Red-breasted Nuthatch	4		
White-breasted Nuthatch			
Wrens			
Bewick's Wren	239	84	14
Rock Wren	21	11	
Canyon Wren	14	1	1
House Wren	97	24	1
Winter Wren	1		
Marsh Wren	48	3	2
Gnatcatchers and Kinglets			
Blue-gray Gnatcatcher	772	163	21
Golden-crowned Kinglet	2		
Ruby-crowned Kinglet	618	99	3
Thrushes			
Mountain Bluebird	2		
Western Bluebird			
Townsend's Solitaire	12	2	
Swainson's Thrush	22	3	1
Hermit Thrush	26	62	3
American Robin	43	19	2
Mimids			
Gray Catbird	51	3	
Northern Mockingbird	22	2	3

Brown Thrasher	1		
Sage Thrasher	62	23	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	3		
Orange-crowned Warbler	341	41	1
Nashville Warbler	44	7	
Virginia's Warbler	119	13	1
Lucy's Warbler	72	75	1
MacGillivray's Warbler	55	57	6
Common Yellowthroat	192	3	2
American Redstart	2	1	
Northern Parula	2		
Magnolia Warbler	1	1	
Blue-winged Warbler	1		
Yellow Warbler	711	116	4
Black-throated Blue Warbler	1	1	
Palm Warbler	1		
Yellow-rumped Warbler	21		1
Yellow-rumped Warbler (Audubon's)	513	29	5
Yellow-rumped Warbler (Myrtle)	23	6	
Yellow-rumped Warbler (MxA)	14		
Black-throated Gray Warbler	13		
Townsend's Warbler			
Wilson's Warbler	1235	126	17
Painted Redstart			
Warbler spp.			1
<u>Yellow-breasted Chat</u>			
Yellow-breasted Chat	71	52	17
<u>New World Sparrows</u>			
Green-tailed Towhee	113	49	
Spotted Towhee	39	173	2
Vesper Sparrow	27		2
American Tree Sparrow	3		
Chipping Sparrow	79	22	

Clay-colored Sparrow	13	6	
Brewer's Sparrow	633	122	15
Lark Sparrow	3	3	
Lark Bunting			
Black-throated Sparrow	47		
Sagebrush Sparrow	66	2	
Savannah Sparrow	3		
Song Sparrow	855	26	17
Lincoln's Sparrow	497	91	15
Grasshopper Sparrow	6		
Fox Sparrow	6		
Dark-eyed Junco	18		2
Dark-eyed Junco (Gray-headed)	8		1
Dark-eyed Junco (Oregon)	354	123	1
Dark-eyed Junco (Pink-sided)	98	34	4
Dark-eyed Junco (Slate-colored)	1	4	
White-throated Sparrow	22	5	1
White-crowned Sparrow (Mountain)	36	21	6
White-crowned Sparrow (Gambel's)	76	276	4
White-crowned Sparrow	318	77	15
Golden-crowned Sparrow	2		
Sparrow spp.	4		2
<u>Cardinals</u>			
Summer Tanager	1		
Western Tanager	284	14	2
Rose-breasted Grosbeak	1		
Black-headed Grosbeak	96	4	2
Blue Grosbeak	8	2	2
Lazuli Bunting	139	29	
Indigo Bunting	7	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			
Great-tailed Grackle			
Brown-headed Cowbird	29	5	1
Hooded Oriole			
Scott's Oriole			

Bullock's Oriole	79	15	1
Finches and Allies			
Black Rosy-Finch			
Cassin's Finch	3		1
House Finch	229	3	13
Pine Siskin	74	2	1
Lesser Goldfinch	63	1	
American Goldfinch	14		
Evening Grosbeak			