

A LOFT

**THE JOURNAL OF
HAWKS ALOFT INC.**



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PO Box 10028 • Albuquerque, NM 87184

(505) 828-9455

WWW.HAWKSALOFT.ORG

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Contributors – Cynthia Figueroa-McInteer,
 Tom Mayer
Photographers – Keith Bauer, Craig
 Benkman, Doug Brown, Alan Murphy,
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ON THE FRONT COVER:

Lazuli Bunting has experienced long-term population declines in New Mexico.
 Photo by Alan Murphy.

ON THE BACK COVER:

Golden Eagles hunt on the expansive plains adjacent to the Taos Gorge in northern New Mexico. Image by Tony Thomas

OUR MISSION

Hawks Aloft, Inc. works to conserve indigenous wild birds and their habitats through avian research, conservation education, and cooperation with others.

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From the Director: Conservation in Action

by Gail Garber

Hawks Aloft works to conserve indigenous wild birds through conservation education, avian research, raptor rescue and collaboration with others.

Often, we are asked about our organization, "What do you do?" It is really easy to elaborate on the first three, very straightforward components of our mission. However, collaboration, a more esoteric concept is, perhaps, harder to describe. And, how does that fit into research, rescue, and education?

Over the years, Hawks Aloft has been a leader in developing collaborative, statewide efforts, like the Burrowing Owl Working Group, dedicated to protecting a species under direct threat from development, and the New Mexico Avian Protection Working Group, whose mission is to reduce avian mortalities due to electrocution and collision with power lines. These are just two examples that have had tremendous success in publicizing threats to avian populations and proactively working to improve conditions.

As a non-lobbying group, we provide sound scientific data to land managers so that they can, using study results, make decisions that benefit wildlife while still allowing for human uses, often recreational. Trevor Fetz's feature article in this issue details the declining bird populations in the Corrales bosque, a prime example of the effects of multiple land managers, each operating with different goals and sometimes working on small sections within this reach of riparian forest. When assessed individually, each project might not have much effect, but when evaluated as the sum of all efforts, the significant decline in bird numbers relative to the ongoing land management is deeply troubling. As Dave Krueper, a former US Fish and Wildlife Service biologist, states in reference to the Corrales bosque, "It is death by a thousand cuts." Although you, the reader, are seeing this for the first time, these data and the article summarizing the decline were provided to land managers as soon as it was completed.

In other avian arenas, we actively participate in conservation efforts, largely behind the scenes. We work hand-in-hand with rep-

resentatives from government agencies and other NGOs (non-governmental organizations) in the NM Avian Conservation Partners (NMACP) working group, where we maintain the website (<http://NMPartnersinFlight.org>) and work collaboratively to address avian population threats statewide as well as elsewhere in North American and worldwide. Not only is this information disseminated on the website, we also host biannual statewide meetings to share knowledge among land managers, other conservation organization and interested individuals.

Raptor Rescue was written into our mission statement four years ago. This program has seen exponential growth since that time. We never intended for Hawks Aloft to become a full-scale wildlife rehabilitation organization, but the plan was, and remains, to facilitate the rescue of injured raptors, corvids and roadrunners, ensuring that they are transported to the facility that can best care for them. Our role is essentially the Avian Ambulance and Emergency Room where triage is provided and birds are cared for until such time as they are ready for a larger space for flight and kill training. We host the statewide call center (aka cell phone) that is answered 24/7. When calls come in, a text is dispatched to all the rescuers on the list, who then travel to pick up, and sometimes capture the injured bird, and safely deliver it to our office or another rehab center. We thank the many veterinarians throughout the state that provide free medical care to these birds. Plans are already underway to begin holding advanced rehabilitation training classes for all interested in this worthy effort. This too is a collaborative effort among many, the only way effective change can occur. If you are interested in participating in a future class, please contact our office.

While these collaborative efforts affect positive change for wildlife via habitat conservation, safe utility poles, or direct rescues, there is essentially no funding for any of these actions – other than member donations. We thank those of you who donate to keep programs like these alive! ■

Drainside Vegetation in Corrales Provides Exceptional Avian Habitat, but is in Peril



By Trevor Fetz

In 2004, Hawks Aloft began the Middle Rio Grande Songbird Study (MRGSS) which monitors avian use over a 79-mile stretch of the middle Rio Grande bosque between Rio Rancho and the La Joya Waterfowl Management Area. Currently, we survey 81 transects (averaging 800 meters in length) on lands managed by six different entities, including 22 transects in the Corrales bosque.

During each of the first 10 years of this study, avian density and richness during both winter and summer were higher in the Corrales bosque than areas managed by any of the other five bosque land management entities. But, that advantage began to diminish in 2011 and vanished in 2014, when Corrales fell to second in winter avian density and fifth in winter avian richness. Corrales also fell to third in summer avian richness in 2014. The trends documented in 2014 continued or worsened for Corrales through 2017, as avian use there remained low relative to most other management areas.

Widespread drought resulted in lower bird numbers throughout the MRGSS study area from summer 2010 through winter 2014. But, other management areas within the middle Rio Grande saw recoveries in avian use beginning in summer 2014 that were not documented in Corrales. Vegetation removal in recent years has been a key factor in preventing bird numbers in Corrales from rebounding toward pre-drought levels. The first significant vegetation removal in Corrales occurred in winter 2011 when the west side of the drain (or "clear ditch") north of the Harvey Jones channel was completely cleared, resulting in a significant decrease in avian density (mean number of birds per 100 acres) and richness (total number of species documented at densities ≥ 1.5 individuals per 100 acres) during both summer and winter on the two impacted transects (Tukey-Kramer tests; see Table 1 pg. 18). From 2012 through 2015, restoration and

swale/bank terrace construction by the U.S. Army Corps of Engineers (USACE) resulted in the removal of large amounts of woody vegetation throughout the Corrales bosque. Ideally, upland re-vegetation efforts and the creation of swale and bank terrace habitat by USACE will enhance bird numbers in the future. But, the growth of new vegetation has generally not yet been substantial enough to begin supporting increased numbers of birds. Additionally, sporadic thinning efforts by New Mexico Department of Forestry (NMDF) crews, apparently at the request of the Village of Corrales, occurred primarily within USACE project areas during late 2016 and early 2017. This thinning appeared to

See **Drainside Vegetation** page 18 ▶



Top: The difference in habitat quality along the Corrales drain in areas with understory vegetation on the west edge and without vegetation on the west edge is obvious.

Photos by Trevor Fetz.

Left: Cedar Waxwing is a common winter resident along portions of the Corrales drain with understory vegetation on the west edge, but absent in portions lacking understory vegetation.

Photo by David Powell.

A Long View on Climate Change

By Maggie Grimason



Burrowing Owls represent one of the unknown number of species which may suffer effects of climate change.

Photo by Doug Brown

"I believe that most climate change deniers refuse to see the facts of human impact for one of two reasons: 1) They do not want to change their lifestyle and resent being told they might have to do so, or; 2) They have a vested economic interest in fossil fuels," Steve Cohen, the Executive Director of Columbia University's Earth Institute, wrote in a 2017 op-ed. It's impossible to address a problem while denying it; yet the overwhelming facts are these: the earth is warming, and that change in the earth's composition is human-caused. According to NASA, multiple studies in peer-reviewed scientific journals show that 97 percent or more of climate scientists working today agree on the truth of human-caused climate change. The evidence of this is, perhaps, just as available to our eyes as we glance at the news or the world around us—catastrophic natural disasters, extended drought and heat waves, rising sea levels, and decreasing biodiversity all underline the truth. A global one degree Celsius increase in temperature reiterates it.

Already, with just this small uptick in temperature, impacts have been observable in every ecosystem on the planet and the changes to life on Earth have been broad. It's no longer just about polar bears in the far north—it's about everything, including us. "Heat injury is now the biggest natural killer of humans on the globe," Dr. Blair Wolf, a professor of biology at the University of New Mexico in Albuquerque said, and the National Institute of Health confirmed—a statistic that emphasizes the issue's importance, even if you don't care about glaciers or obscure animal species. While humans worldwide are dying of heat, animals of every stripe are being displaced, and 2016 has the dismal notoriety of being the year in which the first animal—the Bramble Cay melomys, a highly specialized Australian rodent—was confirmed extinct due to climate change, when rising ocean waters inundated its tiny coral island.

Due to the fact that the impacts of climate change are observed in all ecosystems on the planet, University of Florida professor Bret Scheffers suggested that by proxy, "It's reasonable to suggest that most species on Earth have been impacted by climate change in some way or another."

What this means for avian life has been varied—Professor Wolf's research points to the direct impacts of increased heat that includes mass die-offs of birds in Australia. In Wolf's paper, authored with Andrew McKechnie and Phil Hockey, titled "The Heat is On," they write, "extreme weather events have the potential to cause major bird mortalities." The authors describe the aftermath of a heatwave in Western Australia in 2010, saying, "pictures ... show scenes of complete devastation, with the dead and dying birds carpeting the ground." With temperatures reaching well over 45 degrees Celsius in India, similar events have taken place in that part of the world.

"We're on a trajectory that could put us three to six degrees hotter than we are now in many places," Wolf explained from his office at UNM. What that means is that these events that have been so devastating to other parts of the world could fast make their way to the Southwest. "By 2100, or even 2050, Arizona and New Mexico may be in a condition of permanent mega-drought," he posited. "That's the kind of drought that displaced Native peoples from the Four Corners area in the years 1200-1400 AD." For birds, according to Wolf, this means, "it's hotter, the physiological demands are greater, and all these things feed into different aspects of a bird's reproductive cycle that effect survival and reproductive success."

Locally, research conducted by Wolf and graduate students in the UNM biology department has observed the impact of environmental changes on Burrowing Owls and Loggerhead Shrikes. A long-running study spearheaded by Kirsten K. Cruz-McDonnell looked at Burrowing Owls at Kirtland Air Force Base in areas that were not subject to mitigation. Over the course of 16 years, the study found that breeding populations declined 98.1%, from 52 pairs to just 1, largely due to drought and environmental temperature increase. These factors, Wolf elaborated, "effected adult body size ... The adults' body mass declined during drought years, and their nestling sizes declined, and their reproductive success fell pretty radically, and that's related to heat, which is also related to food availability." In a separate study led by Corrie Borgman with support from Dr. Wolf, it was discovered that Loggerhead Shrike populations were undergoing a different change—while populations remained relatively stable, nest predation soared. "Nests were failing because they were being predated," Wolf unpacked, "so we think this is probably due to warmer temperatures and lack of food for predator species." These are just two instances in which the effects of climate change are already surfacing in our local ecosystem, making the notion of a changing planet hit close to home.

See **Climate Change** page 15 ▶

Hawks Aloft Galapagos Tour 2017

By Tom Mayer

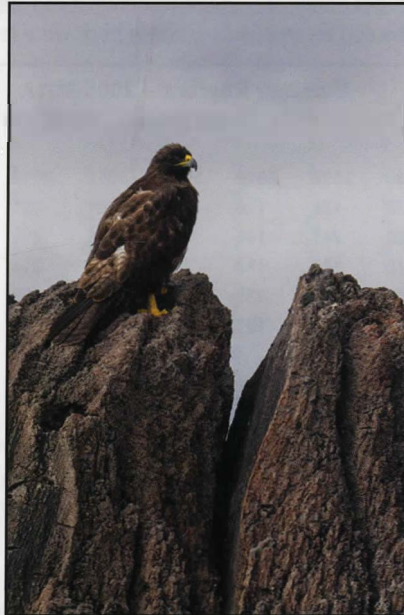
Charles Darwin spent only a few weeks there in 1835, and took another 24 years to fully develop his theory of evolution by natural selection, but the Galapagos Islands of Ecuador are known as the inspiration for one of the most influential ideas in human history. In recent decades, the unique fauna and flora of this remote, volcanic archipelago have made the Galapagos a living laboratory for the study of species adaptation and a premier nature travel destination.

In July, we journeyed to Ecuador to join a tour benefitting Hawks Aloft offered by Wildside Nature Tours. Kevin Loughlin of Wildside led us on a multi-faceted trip of discovery, which included the Andean cloud forest, a comprehensive immersion in the islands, and a chance to explore a bit of the culture and cuisine of Quito.

After meeting in Quito for dinner and introductions, we headed over a 13,500 foot pass into the Amazon Basin for a day of birding at the renowned Guango Lodge in the Andean cloud forest. Kevin gave us a disquieting suggestion to hope for cold rain, as this is when the birds are most active. The weather cooperated. Led by local guide Rudy Gelis, a day at the feeders and trails of the lodge brought us many breathtaking sightings including Sword-billed Hummingbird, Long-tailed Sylph, the rare Red-hooded Tanager, a Torrent Duck, and many other local specialties.

The next day we flew to the Galapagos, where we boarded our boat, the 16-passenger yacht San Jose, for our eight day cruise. Our days were packed; as Kevin advised: "You can sleep when you get home." The entire archipelago is a National Park, and visitation to the islands is tightly controlled to protect and preserve the unique flora and fauna. We visited ten islands: Baltra, Santa Cruz, Genovesa, South Plaza, Santa Fe, San Cristobal, Española, Floreana, Santiago, and Bartolome. Each offered different habitats, species of birds and land animals, and vegetation types. Each day saw us participating in many different activities, including a drive to highland locations on the larger islands, birding on the beach, hiking to inland birding spots, snorkeling along the rocky coast, a panga (zodiac) cruise searching for penguins or into a mangrove lagoon, or just relaxing on the boat. We would return to the boat by dusk for dinner, and usually an early bedtime, while cruising to the next location overnight.

The boat was comfortable, well-equipped, with a friendly and very helpful crew, who kept us fed and watered, and took care of every need.



(Above left) Sword-billed Hummingbird.

Photo by Rob Stambaugh.

(Above) Short-eared Owl. Photo by Gail Garber.

(Left) Galapagos Hawk. Photo by Frank Dobrushken.

Our Galapagos guide, Pedro Guaycha, guided us on our daily excursions and shared his extensive knowledge of the geography, geology, biology, and history of the Galapagos. Kevin is an expert photographer and assisted us with meeting the unique challenges of nature photography. No matter the skill, experience, or gear, his aim was to help us all capture the best images possible.

The unique wildlife, flora, and landscapes are what brought us to the islands. Of course, all of us had seen nature films and read articles about the Galapagos for most of our lives, but the thrill and fascination of experiencing the islands firsthand was overwhelming. Giant tortoises in the moist highlands of Santa Cruz and San Cristobal islands! Marine iguanas sunning themselves on the rocks! Land iguanas and lava lizards! Sea lions lounging at our feet on the beach! Waved Albatross performing their mating ritual! Blue-footed Booby's spectacular dives! Finches and mockingbirds adapted to different habitats and islands! Penguins at the equator! Magnificent Frigatebirds' aerial piracy! Flamingos! Colorful Sally Lightfoot crabs! Myriad seabirds and shorebirds! Snorkeling with sea lions, sharks, green turtles, spotted eagle rays, and thousands of colorful fish and other sea creatures! Giant tree-size prickly pear cactus, ghostly palo santo trees, lava cactus, Galapagos cotton, and other endemic plants! Bizarre lava flows, spatter cones, towering cliffs, pristine beaches, and stunning vistas! Exclamation points everywhere! Everyone had a favorite experience or sighting, but every aspect of the Galapagos was exciting and interesting in its own way.

The trip left us all feeling thrilled and stimulated by what we had experienced and learned, giving us a magnified appreciation of the natural world, a slew of new friends, and anticipation of more trips like this one.

Tom Mayer, a long-time volunteer, works with Trevor Fetz on various research projects, where he conducts field work, analyzes data and writes reports. ■

Monitoring Raptor Populations in Central New Mexico — A Citizen Science Study

By Gail Garber, Everett Ogilvie, and Jerry Hobart

This year, Hawks Aloft completed the twenty-third year of raptor surveys in the Rio Grande and Estancia valleys of New Mexico. On the winter surveys, our volunteers recorded a total of 692 raptors, along 462 miles of survey route—approximately 150 raptors per hundred miles. On the summer surveys, 1752 raptors were recorded along 462

miles of survey route, for an average of 372 raptors per hundred miles.

The brainchild of Jerry Hobart and Jim Place, point count surveys for raptors in central New Mexico have been conducted by Hawks Aloft since 1995. The goal of these surveys was to document raptor abundance and species richness during the times of year when these birds were resident in the Rio Grande and Estancia Valleys—

		Summer Raptors – 2008-2017										St. Dev	
		Birds/100 miles											
SPECIES	AREA / YEAR	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Avg	Dev
Turkey Vulture	Belen	120	176	118	154	161	131	94	122	90	173	117	42
	Socorro	163	242	196	198	181	239	140	139	167	125	219	68
	Armendaris Lake	275	185	173	243	190	214	185	192	177	177	212	40
	Armendaris Grassland	105	118	233	68	177	105	100	130	165	115	117	58
	McIntosh	99	178	127	219	104	146	107	119	129	183	144	51
Golden Eagles	Armendaris Lake	3	2	0	3	3	5	3	27	17	0	5	7
	McIntosh	3	2	1	2	0	2	3	1	3	3	1	1
[No other areas have a significant number of Golden Eagles in the summer.]													
Swainson's Hawk	Belen	13	21	19	16	25	29	19	25	29	51	22	13
	Socorro	24	39	19	27	39	29	37	30	56	62	32	21
	Armendaris Lake	0	2	0	5	2	5	12	8	7	2	6	6
	Armendaris Grassland	58	110	58	48	72	73	45	115	43	117	77	27
	McIntosh	77	83	94	131	139	91	128	151	179	229	104	48
Red-tailed Hawk	Belen	4	1	1	1	2	2	2	2	4	3	3	2
	Socorro	0	0	2	2	1	1	2	4	2	1	1	1
	Armendaris Lake	5	5	7	3	2	4	3	5	15	12	6	5
	Armendaris Grassland	5	10	0	3	5	8	0	8	5	2	6	5
	McIntosh	6	7	7	9	4	5	6	3	9	11	6	3
Ferruginous Hawk	McIntosh	15	6	28	6	5	14	17	9	6	17	13	7
[No other areas have a significant number of Ferruginous Hawks in the summer.]													
Prairie Falcon	Armendaris Grassland	5	3	0	0	2	3	3	7	3	0	3	3
	McIntosh	1	2	2	1	1	2	1	2	0	2	1	1
[No other areas have a significant number of Prairie Falcons in the summer.]													
American Kestrel	Belen	34	24	10	11	12	10	24	32	21	59	27	14
	Socorro	70	75	31	32	42	61	56	87	83	153	67	27
	Armendaris Lake	18	22	5	5	5	8	8	62	5	7	11	14
	Armendaris Grassland	33	43	5	3	8	15	8	10	13	12	15	11
	McIntosh	16	9	12	21	29	19	17	38	55	53	23	12
Total Raptors	Belen	202	239	158	200	222	191	156	216	192	344	193	55
	Socorro	264	370	272	272	279	350	261	280	328	390	341	66
	Armendaris Lake	243	237	178	265	205	250	245	330	263	233	255	41
	Armendaris Grassland	317	350	345	142	292	236	165	338	302	308	263	83
	McIntosh	279	335	322	414	331	328	321	346	395	527	340	69

breeding season and winter. Further, the study was designed as a citizen science project in which trained volunteers would conduct all surveys, while Jerry Hobart, also a volunteer, assumed the role of project manager, collecting and compiling the data.

Initially, Jim and Jerry developed a protocol similar to other studies that used avian point counts. During their explorations to locate driving routes, they learned much about rural New Mexico, such as how to negotiate the complex systems of levee roads, as well as accessible roads in ranch country. They spent that first summer traversing agricultural lands and ditch roads in order to hopscotch the patchwork road systems to create drivable 20-mile routes. That year, they set a total of

four transects in the Rio Grande Valley, between Isleta Pueblo on the north and La Joya State Game Refuge on the south.

Designated stops were set at one mile intervals, thus reducing the likelihood of double counting individual birds. Surveys took place once per month from December through February, and again from June through July.

A team of two surveyors, one driver and one data recorder, stopped at each of the points where, using binoculars as well as naked eye detections, they scanned a full 360 degrees within three minutes. Also recorded were raptor behavior (soaring, flapping flight, perched, on the

See **Middle Rio Grande Bosque** page 21 ▶

		Winter Raptors											
		Birds/100 miles											
SPECIES	AREA / YEAR	07-08	08-09	09-10	10-11	11-12	12-13	13-14	14-15	15-16	16-17	Avg	Std. Dev
Bald Eagle	Belen	4	2	4	1	5	2	1	4	2	1	4	3
	Socorro	1	4	4	9	6	2	5	0	2	2	6	5
	Armendaris Lake	0	13	2	2	3	0	0	0	0	0	17	38
	Armendaris Grassland		0	0	0	0	0	0	0	0	0	0	0
	McIntosh	0	0	7	1	0	0	1	1	0	0	1	2
Golden Eagles	Belen	0	0	0	0	0	0	0	1	0	1	0	1
	Socorro	0	0	1	0	0	0	0	1	0	0	1	1
	Armendaris Lake	5	12	5	0	10	8	3	5	7	5	7	4
	Armendaris Grassland		15	13	5	10	13	8	12	0	10	9	4
	McIntosh	5	6	7	10	6	11	11	6	1	2	5	4
Northern Harrier	Belen	6	8	8	8	7	8	4	9	8	8	10	5
	Socorro	16	14	20	21	27	18	18	8	10	10	16	7
	Armendaris Lake	10	2	3	0	3	0	2	8	2	0	6	7
	Armendaris Grassland		12	3	8	8	2	8	5	3	12	6	3
	McIntosh	2	8	6	6	3	6	1	3	6	8	6	3
Red-tailed Hawk	Belen	58	48	55	60	66	67	72	93	66	70	65	10
	Socorro	63	70	56	96	69	58	84	88	65	81	84	16
	Armendaris Lake	35	15	17	5	10	3	20	45	45	20	37	41
	Armendaris Grassland		13	30	8	23	5	10	33	29	27	16	10
	McIntosh	15	24	24	15	44	25	22	17	26	16	20	7
Rough-legged Hawk	Belen	1	1	0	0	0	0	1	1	0	1	0	0
	Socorro	0	0	0	0	1	1	4	1	0	0	1	1
	McIntosh	0	2	6	5	4	7	8	2	6	6	6	3
Ferruginous Hawk	Belen	1	2	1	0	2	2	2	0	2	2	3	2
	Socorro	7	2	4	4	13	4	7	10	6	14	10	4
	Armendaris Lake	0	0	2	0	0	0	0	0	0	0	0	0
	Armendaris Grassland		3	7	2	3	0	0	5	0	5	4	5
	McIntosh	35	47	58	61	46	95	88	69	60	26	52	21
Prairie Falcon	Armendaris Grassland	15	5	0	0	0	10	3	13	10	13	6	6
	McIntosh	1	6	4	6	2	6	3	6	5	2	5	3
American Kestrel	Belen	38	50	37	19	30	26	32	55	60	53	47	12
	Socorro	76	65	22	49	54	45	73	91	86	120	77	22
	Armendaris Lake	2	5	3	0	8	0	5	18	3	8	5	5
	Armendaris Grassland		40	5	5	10	13	5	32	10	18	16	12
	McIntosh	19	27	17	27	24	21	22	31	30	26	24	5
Total Raptors	Belen	134	142	135	112	135	134	146	203	152	163	163	28
	Socorro	203	180	138	217	206	155	212	228	188	256	233	47
	Armendaris Lake	62	68	47	10	43	22	45	118	83	52	98	88
	Armendaris Grassland		122	83	58	63	63	38	113	76	98	76	25
	McIntosh	99	166	177	169	176	219	199	176	176	106	168	37

Wildlife and the Border Wall

By Maggie Grimason

Along the U.S.-Mexican border, stretches of mountains rise to meet the sky across the Chihuahua and Sonoran Deserts. There, unique ecologies have evolved in high altitude “sky islands” and large predators roam unabated. In recent years even jaguars, long thought to be extirpated from the U.S. have been spotted slowly expanding their range into Arizona. And jaguars aren’t the only large mammals that make their home in



these isolated ranges—black bear, mountain lion, Mexican gray wolf, and bighorn sheep also gamble uninhibited back and forth across the border in search of food, water, mates, and territory. In fact, in a recent count by Scientific American, it was found that more than 7,000 plant and animal species make their homes, at least for parts of the year, in the expansive wilderness found in these borderlands.

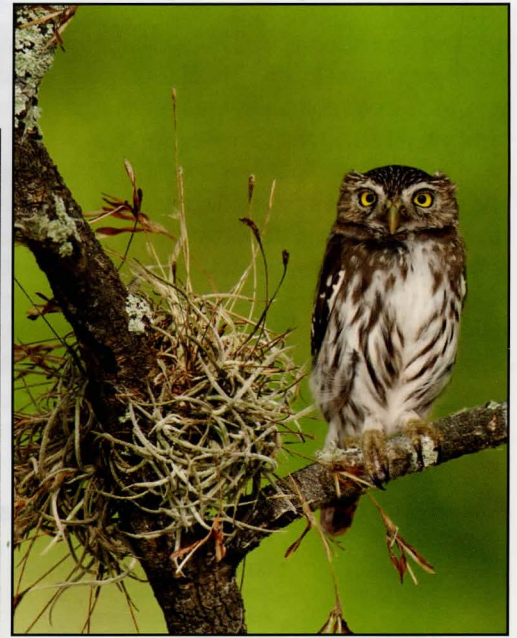
Yet, while this region is vast, good habitat is scarce, and animals need freedom to move in order to sustain their species and perpetuate their (often already diminished) populations. In 2016, a threat beyond the rigors of an already hardscrabble life arose: a campaign promise from now president Donald Trump to build a “big, beautiful wall” to fortify the U.S. border against illegal immigrants. This proposed complete border wall—to run the entirety of the border’s 1,989 miles—is not only a hotly debated political, economic, and human rights issue, but also a profound topic of concern among conservationists.

If constructed, a more expansive border wall (already, under President George W. Bush, portions of the border were fenced) would cut through four wildlife refuges (including the Santa Ana National Wildlife Refuge, a world-renowned bird watching location and migratory stopover in the Rio Grande Valley), several fish hatcheries and protected wetlands, and threaten not just 108 species of migratory bird, but 100 different endangered species of all taxonomies, according to U.S. Fish and Wildlife Service. While what we stand to lose should

give political leaders pause, instead in August of 2017, the Department of Homeland Security announced plans to fast-track construction, setting aside ordinances and laws like the Endangered Species Act, the Migratory Bird Treaty Act, and the Wilderness Act that may slow down the construction project across this vulnerable habitat.

One species that stands to lose out as a result of further partitioning along the border—which is more than anything a symbolic gesture of anti-immigration sentiment—is the small Ferruginous Pygmy Owl, a species now considered threatened in the United States. The species, which is more widespread in Mexico, makes use of both sides of the border as nesting territory. Initial studies of the impact of the border wall on this rarely-sighted owl show that the petite, round-bodied bird will almost never take flight at the height required to clear the proposed border fences, and even avoid roaming into areas where there are large gaps in vegetation, which are common along sites where the wall currently exists.

With so much biodiversity at stake, it is baffling to learn that there is only one species whose movement the border wall has had little effect at impeding—humans. Along the two areas where a border wall was constructed post-9/11, human migrants have both scaled the wall and tunneled under it, a profound articulation of just how ineffective this strategy is when it comes to immigration management. I expressed some concerns about the proposed expansion of the border wall to one of



Species likely affected by an expanded border wall include bighorn sheep and Ferruginous Pygmy Owl.

Photos by Larry Rimer (left) and Alan Murphy.

New Mexico’s senators, Tom Udall, who responded via email, “In my view, meaningful immigration reform will not come through building a wall or mass deportation of undocumented immigrants. New Mexico has a lot at stake in these issues, and immigration reform must be right ... a wall across the entire border would be a symbol that empowers anti-immigrant rhetoric and disrupts our relationship with Mexico.” Udall continued that in his view and many experts’ as well, the wall would not just be ineffective, but come at the cost of over \$16 million per mile in some areas.

What the proposed expansion of the wall boils down to is something simple and intuitive—that barriers to wildlife are bad for wildlife and human resiliency tends to surmount such obstacles given a little time. While the specter of a border wall looms, biodiversity along the border is endangered and threatens to come undone in a trophic cascade that could throw large biomes into human-caused imbalance. With a border wall, the U.S. will make little impact on human migration, but threatens to topple the equilibrium struck over millennia by animals who have been roving these deserts and mountains long before human governments drew a line between them. ■

The History of the Raptor Rescue Program

By Lisa Morgan

The Hawks Aloft Raptor Rescue Program was incorporated as part of our mission in 2013. Since then, the program has seen exponential growth through the leadership of Lisa Morgan, Emiliano Salazar, Jeannine Kinzer, Jim Battaglia and, now, October Greenfield. Lisa, the first manager, established a program that served the whole state of New Mexico, responding to cases of injured, ill and orphaned raptors, corvids, and roadrunners.

At the onset of the program, we added Hawks Aloft to several online databases so that people who needed our assistance could find us. We also made connections with the New Mexico Department of Game and Fish and several veterinarians within the Albuquerque area that gladly offered their services. Soon, we began receiving calls. We determined the need for rescue, conducted the rescue when required, began triage on our intakes, and delivered the birds to our veterinarians for assessment, treatment, and/or surgery. By the end of 2014, 82 birds—mostly raptors but also crows, ravens, and roadrunners, found their way to Hawks Aloft and rehabilitators throughout the state began taking the birds as soon as they were ready to move forward in their various stages of recovery.

In 2015, we acquired a dedicated raptor rescue phone as the program continued to grow. Jim Battaglia, a rehabber with several years of experience, joined Hawks Aloft and began taking in many of the cases. Numerous volunteers participated in safe capture classes and began conducting statewide rescues as well as answering the hotline calls. That year, we took in 81 rescues by the year's end.

By 2016, we also began to conduct more mitigation activities throughout the state—primarily for our partners at PNM and American Tower—addressing instances where birds and technology collided. Meanwhile, our raptor rescue and hotline volunteers continued to grow in numbers, taking on a more significant role in the program. We continued to conduct raptor rescue training, coordinate raptor rescue activities, and offered guidance to our volunteers. Our

intakes jumped significantly in 2016, to 102 intakes by the time we tallied the numbers for that year's Aloft.

This year, many of our long-term, competent and dedicated volunteers continued handling rescues and participating in cross-state relays. Sophia Borowsky, Jeannine Kinzer, Arlette Miller, Sue Small, and Anita and Bruce Sisk handled the brunt of the phone responsibilities, while Sophia, Arlette, Chellye Porter, Larry Rimer, Renee Robillard and Mary Smith have conducted numerous rescues. Sophia also has participated in several relays of birds to other rehabilitators statewide. Jeannine Kinzer assumed the role of Raptor Rescue Dispatcher in 2017, ensuring that there is continuous coverage of the raptor rescue phone. Chellye Porter remains our overnight rehabilitator south of Albuquerque when birds come in late at night from the southern part of the

state. As you can see from the attached tables, we continue to surpass each previous year's intake numbers as the Raptor Rescue Program proves itself to be a much needed resource for New Mexico's injured, ill, and orphaned raptors, corvids, and roadrunners.

Like a tiny child that eventually outgrows their need for a protective and nurturing parent, the Raptor Rescue Program has grown into a beautiful and successful adult. Are you interested in joining our team? We would love

See **Raptor Rescue** page 25 ▶

Table 1. Birds Rescued in 2017 vs. 2016

Species	2016	2017
American Kestrel	16	16
American Robin	1	
American Wigeon	1	
Barn Owl	6	5
Common Nighthawk	1	2
Common Raven	1	7
Cooper's Hawk	27	41
Cattle Egret	1	
Flammulated Owl	1	1
Golden Eagle		1
Great Horned Owl	9	20
Greater Roadrunner	6	2
Long-eared Owl	1	
Mallard	1	
Merlin		1
Mexican Spotted Owl		3
Mississippi Kite		1
Northern Harrier	1	
Northern Saw-whet Owl	1	2
Peregrine Falcon	1	
Prairie Falcon	1	1
Red-tailed Hawk	12	10
Sharp-shinned Hawk	1	4
Swainson's Hawk	6	9
Turkey Vulture	3	2
Western Screech Owl	4	8
	102	136

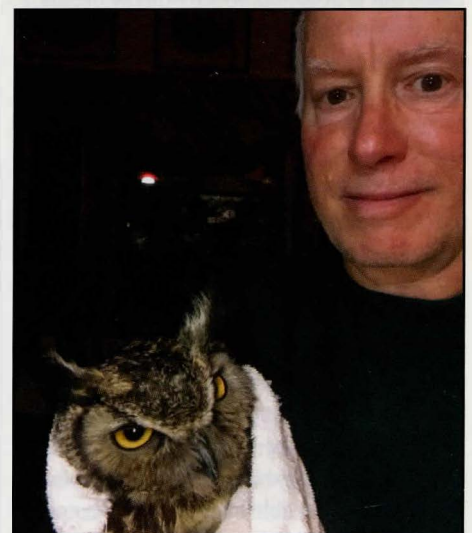
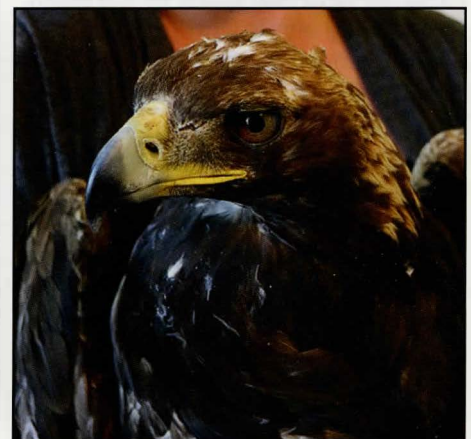


Table 1, left: Hawks Aloft, Inc. bird rescues by species during the 2016 and 2017 rehabilitation years.

Above, top, a rescued Golden Eagle. Above, lower, raptor rescuer Larry Rimer holds an injured Great Horned Owl. Photos by Gail Garber.

Wide Open Spaces: Monitoring Raptors at El Segundo Mine

By Amanda Schluter

For the 11th consecutive year, Hawks Aloft conducted raptor and corvid monitoring in the buffer-zone surrounding El Segundo Coal Mine. Along with the variety of raptors observed, we also encountered vast herds of elk, pronghorn, coyotes, and gray foxes. There was never a dull moment. Some of the memorable highlights including getting bed bugs at the local hotel, flat tires, and even getting the car stuck in deep mud. Despite these trials, the magnificent endless vistas combined with raptors, ravens, and other wildlife made the project a treasure.

El Segundo Mine is located in northwest New Mexico, approximately 36 miles north of Grants. The mine is owned by Elkins Cattle Co. and Fernandez Cattle Co., but is leased and operated by Peabody Energy. The adjacent mine, Lee Ranch, has been active since the 1980s, but El Segundo, which fittingly means "the second" in Spanish, has been in production since 2008. In 2016, El Segundo mine produced 4.9 million tons of coal and generated \$290 million in net income. El Segundo Mine is one of the most productive mines in the southwest because it has a low stripping ratio due to the lack of waste material on the surface of the mine. The coal produced from the mine is supplied to electric utilities and co-ops in the southwestern United States. To evaluate the potential risk to breeding raptors due to mining operations, Peabody is required by the State of New Mexico to conduct annual breeding raptor surveys. These surveys typically begin in March when raptors first exhibit courtship behavior. The earlier we are able to determine the nesting territories, the better! This allows us to account for any nest failures when calculating overall reproductive success. El Segundo is a surface mine, so appropriate nesting surfaces often are lacking in the actual mine permit area. Thus, nests are mostly located on the surrounding rangeland, comprised of grassland with sparse pinyon-juniper stands, desert scrub, and large bluffs that appear almost out of nowhere.



Above, A Red-tailed Hawk soaring near its nest at El Segundo Mine. Right, An adult Ferruginous Hawk bringing prey to young in its nest at El Segundo Mine. Photos by Larry Rimer.

As you might imagine, there are not many desirable nesting areas for raptors in this type of habitat, making suitable nesting substrates a hot commodity. This means that many of the historic nests are used year after year. The majority of the nests are located in the cliff faces of the bluffs, but some are found in junipers and pinyon pines, on powerlines, and even in an abandoned ranch house.

After active nests and territories are documented, sequential visits are scheduled in order to observe nestlings and later, fledglings. It is important for the observer to determine when each of these phases will occur, particularly when the young will fledge. If the nest is visited too soon after the eggs have hatched, the observer will be unable to determine the nestling number because they will be too small to see. If the visits are scheduled too far apart, it is possible to miss fledging and the reproductive success number may then be incorrect. Once the eggs hatch and the young begin to mature, the adults leave the nest for long periods of time, returning briefly to deliver prey



items before flying off again. During this stage, chicks often remain hidden, so it necessary to observe each nest for extended periods of time to get an accurate idea of what is happening.

Common Ravens are the most abundant nesting bird monitored at El Segundo mine. A total of nine Common Raven nests were located and observed to fledging during the 2017 field season. American Kestrels also are frequently observed; however, due to the difficulty of locating and monitoring their cavity nests, their productivity and abundance were likely under-documented relative to what we believe actually occurred. In addition to the Common Ravens and American Kestrels, other raptor nests monitored in 2017 included Ferruginous Hawk, Great Horned Owl, Long-eared Owl, Prairie Falcon, and Red-tailed Hawk. We moni-

— see **El Segundo** page 23 ▶



Living on the Edge: Monitoring Raptors on the Upper Rio Grande Gorge and San Antonio Gorge

By Amanda Schluter

North of Espanola toward Taos, the curvy NM State Road 68 parallels the Rio Grande. You catch glimpses of the river along the way and, at times, it even feels like your car could fall into the river. Sheer cliffs dominate on one side with the river on the other until you reach Pilar, where the river heads north and the highway turns northeasterly toward Taos and the Sangre de Cristo Mountains. From this high elevation plateau, the western view spans 50 miles or more of what appears to be relatively flat lands until San Antonio Mountain rises in the distance. From the road, you would not know that the sharp drop off was caused by a separation in the earth's crust when the North American and Pacific plates moved against one another some twenty-nine million years ago. Driving along the gorge always gives me an eerie feeling because I know there is a drop off, albeit invisible to drivers. I think of the cruel joke it must have played on travelers stumbling upon the vast gorge for the first time, both ancestors of Taos Pueblo Indians and, centuries later, western settlers.

For this year and the next two years, funding dependent, Hawks Aloft will conduct breeding raptor surveys for the Bureau of Land Management at the Rio Grande del Norte National Monument. Species monitored include Golden Eagle, Ferruginous Hawk, Great Horned Owl, Prairie Falcon, Peregrine Falcon, and Red-tailed Hawk. The survey area follows the Rio Grande Gorge starting at Pilar, and continues for 76 km north to the Colorado border. The gorge can be over a mile wide at some points and 240 meters deep with layers of volcanic basalt and ash. At the Colorado state line, the gorge narrows and is not very deep, but as you travel south it widens and deepens. We also monitor nesting raptors at the San Antonio Gorge and the flattish lands between these two areas.



Top left, Volunteer Bob Kipp searches for nesting activity across the San Antonio Gorge. Above, a young Golden Eagle stretching its legs at the Rio Grande Gorge.

Below, a nestling Ferruginous Hawk with a 360° view of its surroundings. Photos by Larry Rimer.



This nesting season, surveyors drove the two-track roads that parallel the gorge on both sides, and walked roadless portions, where most nests are located on cliff ledges of the two gorges. We visited all historic nest sites and also documented new nests. When raptors were observed, their movements were tracked until their likely nest area could be determined. Larger species such as Golden Eagle were relatively easy to track, but the vast expanse of the gorge made it very difficult to find smaller raptors, as they seemed to blend into their rocky surroundings. Once the various raptor species reached the incubation stage, surveys became easier as nest searching gave way to the monitoring of active nests. Subsequent visits were scheduled to coincide with each stage of the breeding process.

Surveys began in mid-March, when the snow was still falling in Taos, and extended through mid-July. The early start enabled us to observe Golden Eagle courtship behavior. In 2017, we documented 19 active raptor nests of a variety of species. Of these, eleven nests successfully fledged young. One of the Red-tailed Hawk pairs failed at an early nesting attempt, but re-nested in a different area, successfully fledging young later in the season. American Kestrels, Burrowing Owls and Swainson's Hawks also were observed within the study area, but no active nests were located for these species in 2017.

We will begin surveys for the 2018 breeding season in late March, with lessons learned from this year and a better understanding of the area. I am hopeful 2018 will result in another successful season monitoring raptors on the Rio Grande del Norte National Monument, and look forward to the magnificent vistas and rugged geology present in the area.

see **Gorge** page 23 ▶

Raptor Monitoring in the Middle Rio Grande Bosque 2004-2017

By Everett Ogilvie and Gail Garber

For 14 years, Hawks Aloft has monitored approximately 70 miles of the Middle Rio Grande bosque from Rio Rancho south to Belen. The data from this effort are important for many reasons, including changing habitat, fire, drought, development, and competing management interests. Our staff and volunteers located and monitored raptor nests from 2004-2017, and maintained a cumulative database of nest locations. Because raptors often re-use the same nests in multiple years, we visited all historic locations each year and added any new nests that were found. Each year, surveyors made a minimum of three visits to previously documented nests with a visit in each of three survey periods: March 15 - April 7, April 8 - 30, and May 1 - 25. During each visit, observers walked through the bosque checking stick nests in the database from previous years and searching for additional, previously undocumented nests. Brief summary results through the 2017 season are presented here, and the complete report will be available on the Hawks Aloft website by year-end.

Cumulatively through 2017, we monitored 970 active nests representing eight species: Cooper's Hawk, Great Horned Owl, Swainson's Hawk, Common Black-Hawk, Common Raven, American Crow, American Kestrel, and Long-eared Owl. An average of 69 nests were active each year.

It is interesting to note that, in the 2004-2016 data analysis, the Rio Rancho bosque, had the highest active nest density 0.06 nests/ha. However, once the 2017 data were incorporated, across all years, nest density is highest in the Middle Rio Grande Conservancy District,

with 0.055 nests/ha, followed very closely by Rio Rancho with 0.053 nests/ha. Corrales and Albuquerque had 0.050 and 0.039 nests/ha respectively. Cooper's Hawk was the most abundant nesting raptor, comprising 72% of active nests. Great Horned Owl, with 18% of active nests, was the second most common nesting raptor. American Kestrel occurred in low numbers throughout the study, with only 27 active nests over all years, primarily because of the difficulty in detections of the cavity nesting species. Active nest percentages and nest fates for all species can be found in Table 1.

Across all 14 years of the study, we monitored 702 active Cooper's Hawk nests. Of these, 581 were successful fledging a total of 1533 young. Of 177 active Great Horned Owl nests, 125 were successful with 243 fledged young. We detected no statistical differences in the number of fledged young year-to-year for either species, indications that the fledgling population is stable.

Swainson's Hawk occurred in low numbers over the course of the study with 23 active

Cooper's Hawks use their long tails like a rudder to steer them through dense vegetation.

Photo by Doug Brown.

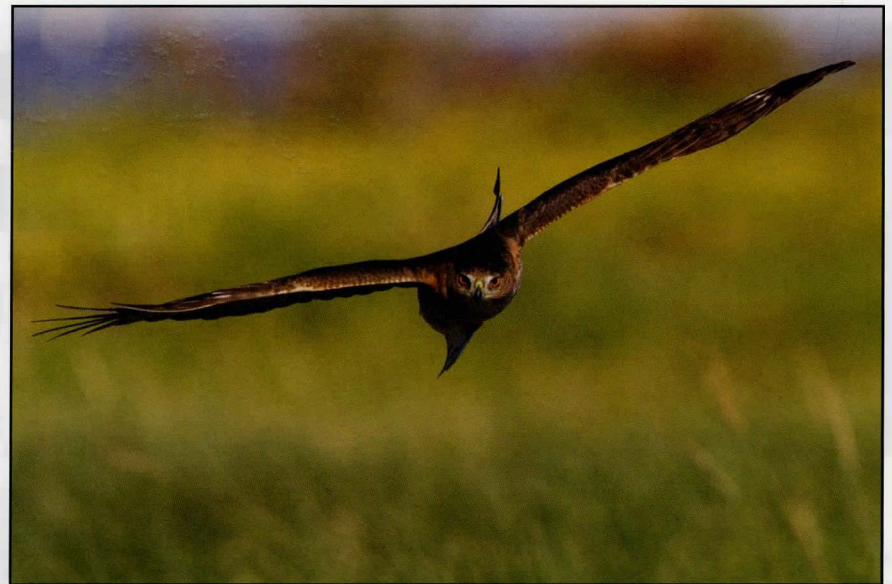
nests, and 19 successful nests producing 33 fledglings.

In recent years (2011-2017), we monitored ten active Common Black-Hawk nests, with eight successful nests producing nine fledged young.

While we observed Red-tailed Hawks in the bosque, we found no nests in the bosque during the study years.

During the nesting season, corvids are present in low numbers; with 19 active American Crow nests that produced 34 young, and 10 active Common Raven nests that produced 13 young over all years.

Long-eared Owl is very rare in the bosque, with only two active nests throughout the



Nest Fate and Active Percentage of Total Nests by Species					
Species	Successful	Failed	Outcome Undetermined	Total	# Active Percentage of Total Nests
American Crow	11	1	7	19	1.96
American Kestrel	22		5	27	2.78
Common Black-Hawk	8	1	1	10	1.03
Cooper's Hawk	580	94	28	702	72.37
Common Raven	6	3	1	10	1.03
Great Horned Owl	125	25	27	177	18.25
Long-eared Owl	1	1		2	0.21
Swainson's Hawk	19	2	2	23	2.37
Total	772	127	71	970	

See **Rio Grande Bosque** on page 15 ▶

Avian Response to Fire in the Southwest Jemez CFLRP

By Amanda Schluter

My favorite time of day when conducting surveys for the Southwest Jemez CFLRP is the early morning drive into the Valles Caldera, just as the sky transitions from dull gray to brilliant shades of orange and red, and then to daytime blues, watching massive elk herds partly hidden in the fog that rises from the East Fork Jemez River.

There is a peaceful tranquility to everything. Not seeing a single person, you could almost believe you are completely alone in the world.

Since 2012, Hawks Aloft has conducted avian point count surveys for the Southwest Jemez Collaborative Landscape Restoration Project (CFLRP) in the Valles Caldera National Preserve and the Jemez Ranger District of the Santa Fe National Forest.

Taking place on 210,000-acres in the Jemez Mountains, this CFLRP is a multi-agency collaborative effort to reduce fire risk and improve overall forest health. Point count routes take place in a variety of habitats, including ponderosa pine, mixed conifer, riparian, mountain meadow, and grassland. A total of 201 points have been established over the years, including 53 burned points from the 2011 Los Conchas Fire, the 2013 Thompson Ridge Fire, and the 2014 Pino Fire.

In 2017, Hawks Aloft surveyed 11 different point count routes comprising a total of 116 points. Each point was visited once in May, June and July for a total of three surveys per point. Standard, 10-minute point count surveys began within thirty minutes of sunrise and were completed within four hours after sunrise. All birds that were seen or heard were recorded. Some routes required hiking the entirety of the section, while others consisted of driving as close as possible to each point and running, sometimes uphill, to the point, then jumping back in the car and driving to the next point.

At the time this article was written, 2017 data had not been analyzed. Cumulative data from 2012 to 2016 showed overall avian density decreased significantly from 2.09 birds/ha in 2012 to 1.53 birds/ha in



Left, Mountain Chickadee, a common resident of alpine habitats. Photo by Doug Brown.

Above, male and female Mountain Bluebirds are common at the Valles Caldera. Photo by Larry Rimer.

Below left, a Chipping Sparrow in mid-flight. Photo by Alan Murphy



2016 (Turkey-Kramer Test). Cumulatively, the habitat types with the highest avian densities were mixed conifer (2.08 birds/ ha), ponderosa pine burn (2.05 birds/ ha), mixed conifer burn (1.99 birds/ha), riparian (1.82 birds/ha), and ponderosa pine (1.74 birds/ha). The habitat types supporting the greatest species richness were ponderosa pine (73 species), riparian (72 species), mixed conifer, mixed conifer burn (each with 55 species), and ponderosa pine burn (52 species). Overall avian richness varied across years, and was highest in 2014 (84 species) and lowest in 2015 (70 species).

Banco Bonito, located in the southwest section of the Valles Caldera, is an area of particular interest. This area is divided by a dirt road with ponderosa pine forest treated with thinning and prescribed burns to the north, and untreated ponderosa pine forest to the south. Preliminary data show that understory treatment of this ponderosa pine forest may have a net benefit to avian density. But, the impacts on individual species were variable and the appropriateness of treatment may depend on the conservation objectives. In 2017, more points were added in both untreated and treated habitat to more completely evaluate avian use between these two habitats.

From 2012 to 2016, a total of 112 bird species were recorded in the study area, including 44 species of conservation concern, as scored by the New Mexico Avian Conservation Partners (NMACP). Perhaps the most important of these is Grace's Warbler, due to its limited range of pine forests in the southwestern U.S. and its prevalence within the study area. Grace's Warbler was significantly more abundant in unburned ponderosa pine forest than all other habitat types (Tukey-Kramer test), and was virtually absent from burned ponderosa pine forest. Other species of conservation concern that were documented at significantly higher densities in unburned ponderosa pine and/or mixed conifer forest than burned forest of those types included Townsend's Solitaire,

see CFLRP page 29 ▶

Meet the Cassia Crossbill — Before it's Gone

By Trevor Fetz

In the modern age, it is quite unusual for a new species of bird to be discovered in the continental United States. New species are occasionally created by splitting, which occurs when studies reveal a previously-known species to actually be genetically, behaviorally, and reproductively distinct in different parts of its range. For example, in 2016, what we have long known as the Western Scrub-Jay was officially split into two distinct species, California Scrub-Jay on the west coast and Woodhouse's Scrub-Jay in the interior west (the species present in New Mexico). Technically, the Cassia Crossbill (*Loxia sinesciuris*) is a split from the all-encompassing Red Crossbill. But, the Cassia Crossbill was essentially unknown to science until Craig Benkman (my Ph.D. advisor at New Mexico State) discovered it in 1996.

Now at the University of Wyoming, Benkman has devoted his professional career to studying crossbills and is one of the world's authorities on these medium-sized finches. Crossbills are so named because of their unique bill shape. Instead of lining up, their upper and lower bills curve away from each other in opposite directions. What looks like a handicap is actually an evolutionary adaptation that allows crossbills to forage more efficiently. Crossbills primarily feed on seeds from conifer cones, and the evolution of this unusual bill shape allows them to more efficiently pry open cones and extract the seeds inside. Prior to this year, there were officially two species of crossbills found in North America: Red Crossbill and White-winged Crossbill. But, that changed in July when the American Ornithologists Union (AOU) announced the Cassia Crossbill as a distinct species.

The Red Crossbill complex includes 10 different "call types." Each of these call types have slightly different vocalizations and slightly different bill characteristics that provide a foraging advantage on the cones of specific conifers. In general, crossbills are nomadic, wandering widely across the forests of North America looking for cone crops to exploit. When they find the large cone crops they are looking for, they settle in the area for a period of weeks to months, and may initiate breeding at any time of year. This nomadic lifestyle and breeding strategy results in extensive interactions and breeding between call types. But, in 1996, Benkman discovered a resident population of Red Crossbill in the South Hills and Albion Mountains of southern Idaho (hereafter the South Hills). Since that time, Benkman has devoted himself (and most of his grad students) to studying all aspects of this unique crossbill taxa (natural history, behavior, genetics, evolution, etc.).

Originally, Benkman called it the South Hills Crossbill, and it also became known as "Type 9" of the 10 North American Red Crossbill taxa. But, he ultimately decided Cassia Crossbill was a more appropriate name, honoring the county in Idaho to which it is endemic. The South Hills is a small, remote mountain range surrounded by high



Cassia Crossbill female (left) and male foraging on fallen lodgepole pine cones. Photos by Craig Benkman.

desert. As such, there are no squirrels native to the area. In most forests, squirrels are the primary cone predator and conifers develop cone defenses to counteract squirrel predation. But, the subspecies of lodgepole pine native to the South Hills has evolved since the last ice age without the presence of squirrels, but with intense selective pressure from the Cassia Crossbill. The result has been a coevolutionary "arms race" where the pine developed increasingly stronger cone defenses against the crossbill and the crossbill developed an increasingly more efficient bill shape to successfully open the cones.

The impact of this arms race is illustrated when other Red Crossbill taxa (usually Type 2 or Type 5 birds) wander into the South Hills. Although they may stay for a period of weeks or months, their bill designs simply don't allow them to forage efficiently enough on the lodgepole cones to successfully breed. Additionally, hybridization between Cassia Crossbills and other crossbill taxa is very rare. Extensive nest monitoring by Benkman's team revealed that Cassia Crossbills bred within their own species 99.3% of the time—well above the 95% threshold commonly accepted for a taxa to be considered its own species.

The reason the cones are so difficult to pry into is nearly all of the lodgepole pine in the South Hills is serotinous. This means their cones remain tightly sealed by a resinous bond that releases only in extreme heat (i.e. by fire or high temperature). Larger trees house branches covered in cones that may date back 20 years. Over time, the bonds weaken on older cones, creating tiny gaps in the scales that crossbills can pry open. Thus, the pines contain a vast "seed bank" that the crossbill can forage on and, historically, the number of cones that become accessible to crossbills over the course of a year has been gradual and relatively consistent.

But, this seed bank is threatened by climate change. Between the time I was working in the South Hills in 1999-2003 and 2011, the Cassia Crossbill population crashed by about 80% to approximately 1,700 birds. Since then, the population has somewhat rebounded. Yet,

See **Cassia Crossbill** on page 15 ▶

◀ page 14 **Cassia Crossbill**

the strongest correlation to annual crossbill numbers is clusters of days with temperatures greater than 90 degrees. Clusters of 90+ degree days essentially mimic the effect of fire and cause cones to open. This offsets the natural weathering process of the cones that keeps seeds available to the crossbill year-round. Foraging thus becomes easy during summer, but much more difficult during winter. Crossbills that can't access enough seeds during winter will starve.

Ultimately, climate change threatens to drive the Cassia Crossbill to extinction. Due to rising temperatures and decreasing precipitation, models predict lodgepole pine will disappear from southern Idaho by the year 2080. Without their lodgepole partner, the Cassia Crossbill will also disappear. No Cassia Crossbills have ever been detected outside the South Hills. And, if forced to emigrate, it is unlikely the species would be able to sustain itself elsewhere. The specialized bill characteristics that allow Cassia Crossbills to thrive on South Hills lodgepole pine work against them on cones from other places. As experiments conducted by Benkman on captive crossbills have shown, their bills are not designed to efficiently exploit other types of cones, limiting the likelihood they could maintain their viability outside the South Hills. Now that the bird is officially a distinct species, it has immediately become one of the rarest species in the U.S. and is eligible for protection under the Endangered Species Act. But, even if it were ultimately listed as endangered, would and/or could anything be done to preserve their imperiled ecosystem? ■

◀ page 12 **Rio Grande**

study. One of these produced four fledglings in north Corrales. Additional species that were observed in the bosque, but with no nests found include Mississippi Kite, Turkey Vulture, and Barn Owl.

The Middle Rio Grande Bosque Nesting Raptors Study has been funded almost entirely by the US Army Corps of Engineers, with occasional support from the US Fish and Wildlife Service, and more recently by Tetra Tech. We especially want to thank our dedicated team of bosque surveyors who make this possible each year: Charles Cummings, Vicki Dern, Trevor Fetz, Bob Kipp, Maurice Mackey, Arlette Miller, Lisa Morgan, David Parsons, Chellye Porter, Larry Rimer, Renee Robillard, Allison Schacht, Amanda Schuter, Mary Walsh, and Christie Wilcox. ■



*Cooper's Hawks have short rounded wings and long tails to pursue prey in dense vegetation.
Photo by Doug Brown.*

◀ page 4 **Climate Change**

"There are huge threats on all sides," Wolf said. "There is no good news." For birds, this means disruptions to their reproductive cycle, and higher mortality rates as they struggle to live in a world where available water is reduced while the temperature is ratcheting upward. It doesn't matter where you look for the evidence—you will find it. Whether you turn to the Arctic, where ice shelves are being depleted, or to the world's disappearing glaciers, the skyrocketing temperatures in the Middle East and India, or the birds dying in mass numbers in Australia—the proof appears in more and more dramatic ways. "We need to go where the evidence points us. And science is a process by which we evaluate the observational data and come to conclusions, and its many lines of evidence

indicate that the climate is changing," Wolf summarized.

The United States makes up about five percent of the global population, but uses 20 percent of the world's energy. That means that if everyone on Earth lived like an American, we would need more than four planets to support the population. Personal behavior can curb some of the impacts of a changing climate, as can sweeping changes to design and consumption norms—increasing energy efficiency in buildings, requiring all homes in the Sun Belt of the Southwest to use

solar energy as a default, carpooling, biking. Anything that reduces carbon in the atmosphere is a point on the side of positive change. Yet, what will most strongly determine the future for our planet is what happens on a policy level, and that means we, as individuals, also must support representatives who uphold policies that honor our ecology, even if it threatens the status quo. As Dr. Wolf said near the end of our conversation with the conviction of someone who is bearing witness to the matter at hand, "We must have a government that is not critical of science." ■

Climate change will have some unknown effects on many avian species. Near right, Loggerhead Shrike. Photo by Keith Bauer. Far right, Burrowing Owl. Photo by Doug Brown.





Adopt-a-Raptor! A perfect gift for the wildlife lover who has everything!

On staff at Hawks Aloft are 27 permanently injured, non-releasable birds of prey. Some have been injured by an impact with a car, some have collided with powerlines—and one of our corvids, Indigo-the American Crow, was taken from her nest and never given the opportunity to learn how to live in the wild. While some of our Avian Ambassador's injuries are more mysterious, what many of these birds have in common is that they received their injuries as the result of human interference.

Since they cannot live in the wild, Hawks Aloft feeds, houses, and looks after the medical concerns of these resilient birds—but that task is not inexpensive. For example, even the smallest raptors, like an American Kestrel, cost around \$35 just to feed each month. You can support us in our mission to care for these birds through our Adopt-a-Raptor program. When you adopt one of our Avian Ambassadors, your money goes directly toward the food, medical care, and housing of the 27 birds in our care.

When you 'Adopt-a-Raptor' you will receive:

- a card thanking you for your donation
- an 8"x10" photograph of the bird you've selected to sponsor or a stuffed animal with a realistic call of the bird's voice
- a printed copy of your adopted bird's unique story and a biological description of its species
- a one year Hawks Aloft membership (includes a subscription to our annual magazine, *Aloft* and our monthly online newsletter, the HAI Flyer)

Choosing to Adopt-a-Raptor is not only a great gift to our organization—but it makes a great gift to others in your life, too. If you choose to make a raptor adoption a gift to another, we will send the above materials as well as a card appropriate for the occasion, whether it is a birthday or a holiday, simply specify at the time of purchase. In addition, classrooms frequently adopt a raptor and make researching the selected species an ongoing activity. Packages for classrooms vary slightly and include educational materials, as well as a surprise for each child in the class.

Participate in the Adopt-a-Raptor-program! Adopt online!
<http://hawkaloft.org/shopping/category/adopt-a-raptor-program/>

Or, use the order form below and mail it with a check payable to Hawks Aloft:

Hawks Aloft, Inc.
 Adopt-a-Raptor Program
 PO Box 10028
 Albuquerque, NM 87184

YES! YES! YES! YES! YES! YES! YES! YES! YES! YES! YES!

I WANT TO ADOPT AN EDUCATIONAL RAPTOR!

Please circle any of the following individual birds or one of the packages:

Western Screech-Owl	\$35	American Kestrel	\$35	Northern Saw-whet Owl	\$35	American Crow	\$35
Merlin	\$50	Cooper's Hawk	\$50	Great Horned Owl	\$60	Barn Owl	\$60
Red-tailed Hawk	\$75	Swainson's Hawk	\$75	Prairie Falcon	\$100	Ferruginous Hawk	\$100
Flammulated Owl	\$100	Rough-legged Hawk	\$100	Spotted Owl	\$100		

**Adopt All
 25 Birds
 \$1000**

Please print: _____ Your Name _____ Name to appear on card if given as a gift

_____ Type of greeting card: required if given as a gift (birthday, holiday, etc.)

_____ Mailing address

_____ Phone

_____ Phone number of the gift recipient, if applicable

_____ If you would like to receive our online Flier, please provide your email and email of the gift recipient, if applicable:

_____ E-mail

_____ Gift recipient E-mail

New Mexico Birder:

By Maggie Grimason

As Mary Bruesch approached retirement she began to wonder how she might spend the free hours that would come with her post-work life, cleared of the many obligations she had shouldered for years as a librarian at the University of New Mexico's Fine Arts Library, where she worked as a music specialist. Fate led her to Hawks Aloft, where she has been a dedicated volunteer for more than two years. These days, Bruesch, a longtime musician (and a 20-year veteran of the Albuquerque Baroque Players, where she played viola da gamba), is carving out a new life as "a musician and citizen scientist," she laughed. At Hawks Aloft, Bruesch now rides along on raptor surveys on the bosque, assists with bird care, and helps out with many education programs. Over coffee, she unpacked how she got her start with our organization, and what she has found so compelling about it.

What sparked your interest in raptors?

I was approaching retirement ... and thinking about all this time I was going to have. My background is in music, and I was playing with a baroque ensemble in town and we would bring in guest artists. One of these guest artists was a baroque bassoonist who was also volunteering with the Indiana Raptor Association. ... [And then] not long before I retired from the Fine arts Library my then-boss got me hooked on watching an eagle cam ... I used to joke that that was why we had dual monitors in our office!

How did you hear about Hawks Aloft?

While I was still working, I was in the break room, and someone had left a copy of Aloft and I thought, "this could be my retirement project."

What did you find interesting about this work?

Everything! Being able to work up-close-and-personal with birds. Initially ... I checked all the boxes for everything that I was even remotely interested in, and the first call back I got was for data entry. ... Doing



Mary Bruesch, Hawks Aloft's 2017 New Mexico Birder, works with our education Great Horned Owl, Aztec. Photo by Gail Garber

Mary Bruesch

that turned out to be useful because a year or two later, I started riding along on raptor surveys, I kind of knew what was going on because of that work.

And what has maintained your interest and kept you excited about your time here?

Just doing my bit for the environment. And teaching is an important piece of that. Selfishly, I also really enjoy being around the birds, even having Jemez fly over my head when I'm cleaning the mews and things like that.

What would you say to someone who is considering volunteering?

I guess I would tell them that there's so many aspects and so many levels that you can work on. Start out doing data entry or riding along on surveys, just get your feet wet ... there's so many ways you can interact with the birds with or without standing in front of a crowd of people ... You get to work where you're excited and comfortable.

What do you now enjoy doing

most about your time spent with Hawks Aloft?

It's a tie between mews cleaning of all things and working in the school programs. I never thought of myself as a teacher, or especially as an elementary school teacher, but I love it. And mews cleaning is just a way to get up close and personal with birds. I think it is a really soul-cleansing experience. You go up there on a really bad day, just despairing at the state of the world, and birds make it better. ■

Hear more about our volunteers' involvement with Hawks Aloft in our video "We Are Hawks Aloft," located on our web site home page: www.hawksaloft.org.

As you can see by reading the articles in each issue of Aloft, vast amounts of work is accomplished by people volunteering their time, skills, and energy. We would not be the same organization without them.

There are opportunities for you to make a difference with Hawks Aloft, too. Please get in touch with us by phone at 505-828-9455.



Chellye Porter

◀ page 3 **Drainside Vegetation**

primarily target Russian olive that had intentionally been retained by USACE during their restoration work to provide a resource for birds and other wildlife, while newly planted vegetation matured. Our long-term data from the bosque has clearly shown that Russian olive (along with cottonwood and New Mexico olive) is one of the three most important plant species for bosque birds. This additional loss of Russian olive plants specifically retained by USACE, especially larger, berry-producing individuals with complex structure desirable for nesting birds, further eliminated viable avian habitat in Corrales. Combined, the massive amount of vegetation removal over the past few years has degraded an untold number of acres in terms of viability for avian (and other wildlife) use and explains the paucity of birds currently using the Corrales bosque relative to most other management areas. In addition to the vegetation removal, there is no substantial woody vegetation on the east side of the drain throughout Corrales, as the Middle Rio Grande Conservancy District (MRGCD) mows both banks of the levee and the east bank of the drain multiple times per year in order to maintain access.

But, all is not lost—yet. For an approximately 3.5-mile long stretch from the Harvey Jones channel south to near Andrews Lane, the Corrales drain/clear ditch retains woody vegetation on its west bank that has largely been unaltered for multiple decades. Although this stretch of vegetation only averages about 15 meters in width, it supports some of the most desirable avian habitat and highest levels of avian use within the entire middle Rio Grande. Three of our six transects surveying drain habitat in Corrales fall within this stretch. We classify this habitat as DR 5, indicating it supports a dense understory. The other three drain transects in Corrales have been cleared to the west of the drain and are classified as DR 6 (sparse or open understory). Although one of these retains some cottonwood canopy over the west edge of the drain, the other two are north of the Harvey Jones channel and, as mentioned above, retain no woody vegetation.

During summer, both cumulative avian density and cumulative avian richness were significantly higher at all three DR 5 transects than at any of the three DR 6 transects (Tukey-Kramer tests; Tables 2 and 3, see pg. 19). Among DR 6 transects, summer avian density at NW08, which incorporates some cottonwood overstory, was significantly higher than the two DR 6 transects lacking any woody vegetation. But, there was no significant difference in avian richness during summer between any of the DR 6 transects. Additionally, cumulative winter avian density and avian richness were both significantly higher at all three DR 5 transects than at any of the three DR 6 transects (Tukey-Kramer tests; Tables 4 and 5 see pg. 27). Among DR 6 transects, winter density was significantly higher at NW08 than NW25 and NW27, but there was no significant difference in winter richness among DR 6 transects. It also is noteworthy that ducks, which are generally in the open drain water, account for a majority of the avian density in DR 6 transects (58% of all winter detections in DR 6). Mallard, the most common duck, accounts for over 48% of all detections in DR 6. In contrast, ducks only account for 27% of all winter detection in DR 5, with Mallard accounting for 17% of total detections.

These data clearly show the importance of maintaining vegetation on the west edge of the drain to the avian community in terms of both density and richness. But, the contrast between drain transects in



Townsend's Warbler is a regular migrant along portions of the Corrales drain with understory vegetation on the west edge, but absent in portions lacking understory vegetation on the west edge. Photo by Keith Bauer.

Corrales with vegetation on the west bank (DR 5) and those without (DR 6) is so stark that statistics are unnecessary—the raw numbers tell the story.

Cumulatively during summer, we documented 98 species at DR 5 transects compared to 59 species at DR 6 transects (i.e. total richness). Similarly during winter, we documented 80 species at DR 5 transects compared to 54 at DR 6 transects. Among the variation in species detections during winter, perhaps most stunning is Yellow-rumped Warbler, for which we have 412 cumulative detections at DR 5 and none at DR 6. Other notable winter species regularly occurring in DR 5 but absent from DR 6 include Cedar Waxwing, White-throated Sparrow, Winter Wren/Pacific Wren, and Lincoln's Sparrow. Winter Wren is a very rare wintering species in central New Mexico, but is regular along Corrales DR 5 transects.

The dense vegetation on the west edge of the drain in Corrales is critical during winter, when it may be the most important habitat for birds within the entire middle Rio Grande. This edge habitat provides vital cover, foraging habitat (including robust Russian olive and New Mexico olive berry crops), and safe access to water for wintering birds. Among the 81 transects we survey, the three DR 5 transects support some of the highest winter avian density (2nd, 4th and 5th) and avian richness (1st, 4th and 5th; Table 6, see pg. 27). Combined into a distinct habitat type, these three transects support the second-highest winter avian density and the highest winter avian richness among the 22

See **Drainside Vegetation** page 19 ▶

Habitat	Winter		Summer	
	Density	Richness	Density	Richness
DR 5	1459	25.8	696	24.1
DR 6	284	7.8	213	9.5

Table 1. Cumulative winter and summer avian density (mean # birds/100 acres) and avian richness (mean # species detected at densities ≥ 1.5 individuals per 100 acres) at NW25 and NW 27 before (DR 5; 2007-2010) and after (DR 6; 2011-2017) clearing of vegetation on the west edge of the drain. In all cases, density and richness were significantly higher before clearing than after clearing (Tukey-Kramer tests).



◀ page 18 **Drainside Vegetation**

bosque habitat types we survey.

Avian use of the DR 5 transects during summer appears more modest, but approximately the nearest 15 meters (from the west edge of the levee road to the east edge of the drain) of our 30 meter wide survey areas on these transects lack any substantial woody vegetation and provide almost no avian detections during our summer surveys. Further, our survey area generally captures less than 50% of the total width of the vegetation swath on the west edge of the drain. If we did survey the entire width of the vegetation, our bird numbers would obviously increase and the summer avian density would likely be the highest of any location in the middle Rio Grande. This west edge vegetation provides critical breeding, foraging, and migration habitat for numerous species.

Although we don't conduct nest searches, we have incidentally documented at least 20 species nesting in the understory vegetation along Corrales DR 5 transects (a number of additional species nest in the associated cottonwood canopy). This compares favorably to the absent understory on DR 6 transects, where, obviously, there is no nesting (although Common Yellowthroat does breed in the annual cattail regrowth in the drain channel itself). Perhaps most important of these breeders are Indigo Bunting and Lazuli Bunting, two closely-related

Pacific Wren (above left) and Winter Wren are rare winter residents in the Middle Rio Grande Valley, but regular along the Corrales drain where dense understory vegetation is present. Indigo Bunting (center) and Lazuli Bunting (right) have experienced long-term population declines in New Mexico due to limited suitable nesting habitat but regularly breed in dense understory vegetation on the west edge of the Corrales drain.

Photos by Alan Murphy.

species that have experienced long-term population declines in New Mexico due to limited suitable nesting habitat. Other avian taxa notably more prevalent during summer in DR 5 habitat versus DR 6 habitat in Corrales include warblers (11 species in DR 5 and no detections of the regularly-occurring Yellow-breasted Chat, Orange-crowned Warbler and Townsend's Warbler in DR 6) and empidonax flycatchers (4 species, including 14 Willow Flycatcher detections vs. a single Gray Flycatcher detection). Despite the limited width of the vegetation, both summer avian density (23rd, 25th and 27th of 81 transects) and richness (22nd, 28th and 33rd of 81 transects) are relatively high (Table 6, see pg. 27). In contrast, the three DR 6 transects that lack understory vegetation on the west edge, support some of the lowest levels of summer avian density (60th, 76th and 77th of 81 transects) and richness (69th, 79th and 80th of 81 transects) within the middle Rio Grande.

Transect	Habitat		# birds/100 acres
NW20	DR 5	A	730
NW22	DR 5	A	700
NW11	DR 5	A	673
NW08	DR 6	B	384
NW27	DR 6	C	222
NW25	DR 6	C	205

Table 2. Cumulative summer avian density (mean # birds/100 acres) by drain transect.

Transect	Habitat		# species
NW22	DR 5	A	26.3
NW20	DR 5	A	25.1
NW11	DR 5	A	24.3
NW08	DR 6	B	16.5
NW27	DR 6	B C	9.9
NW25	DR 6	C	9.1

Table 3. Cumulative summer avian richness (mean # species detected at densities ≥1.5 individuals per 100 acres) by drain transect.

DR 5 transects incorporated substantial understory vegetation on the west edge of the drain. DR 6 transects lacked understory vegetation on the west edge of the drain. For DR 6 transects, data from years before clearing is excluded (i.e. when these transects were also DR 5). Transects not connected by a common letter are significantly different (Tukey-Kramer tests).

The extremely high levels of avian use during winter and summer in this drain edge vegetation illustrate the importance of its retention and the critical value it has for wintering, breeding, and migrating birds. We hoped that management at the MRGCD and the upper governmental levels in the Village of Corrales would recognize this importance and take pride in maintaining such a productive stretch of land. Sadly, this does not appear to be the case. We lack a full understanding of the politics involved, but it has become obvious that the village of Corrales and

See **Drainside Vegetation** page 27 ▶

Our Christmas Miracle: Jemez, the Mexican Spotted Owl

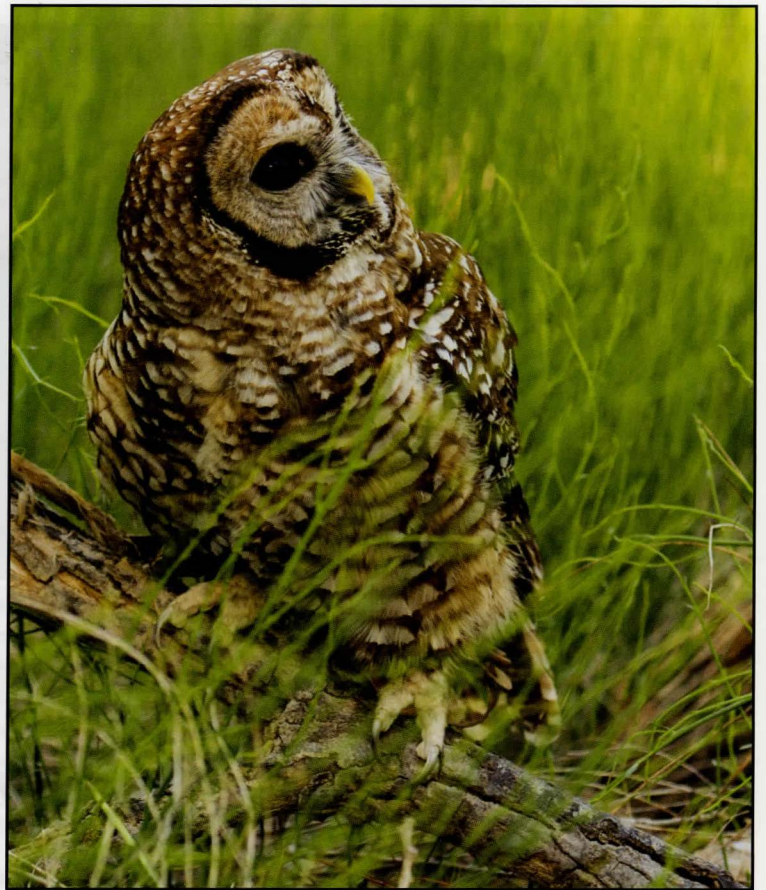
By Gail Garber

December 18, 2016: It was the worst of nights, with sideways blowing heavy snow—not a fit night to be out for man or beast. And that was the Albuquerque weather; it was far worse in the northern mountains. Finishing up his work day at Los Alamos National Laboratories, Victor Mitchell decided to stop by Wendy’s for a burger before starting his long drive home. The snow was already piling up in the high country and drifting into generous mounds, when Victor spied what appeared to be feathers sticking out of snow a drift between Los Alamos and Pueblo canyons on the mesa top. He stopped to investigate, discovering a medium-sized owl, cold, and with severe head trauma, but not quite dead. Wrapping it carefully in his winter jacket; he placed it in the back seat of his truck and began the two hour drive to Albuquerque. About halfway to his destination, Victor looked in the backseat to see the owl was perched atop his lunchbox, which startled him. Meanwhile, his wife, Rachel, began looking for someone who could take the injured bird. Late that night, Victor dropped off the owl at Petroglyph Animal Hospital.

Dr. Kariana Atkinson, who has extensive wildlife rehabilitation experience, was working that night, and she began triage, providing fluids and pain medications, giving the mostly comatose bird a medical exam, and placing her into an incubator. One eye had been blown out and might need treatment later, but the head trauma and emaciation were the greatest concerns for this critically injured owl. It wasn’t clear if she would survive for 48 hours, let alone recover enough to withstand surgery. Somehow, the information Victor left with the front desk did not make it to the medical staff.

We received a call from Petroglyph the next morning and Lisa picked up the bird. She began nursing the owl that, by now had no history as to where it had come from and who might have been the rescuer. There was no end to the worrying about this bird, a Mexican Spotted Owl—a very rare bird, indeed, with an estimated U.S. population of 2,106 owls and very low numbers in Mexico, making it a federally listed threatened species. These owls can be found in forested mountains and canyons from southern Utah and Colorado to the mountains of Arizona, New Mexico, West Texas, and even into the mountains of northern and central Mexico.

In New Mexico, these owls might be found in old growth forest with mature trees that create high, closed canopies, are shaded and cool during the heat of summer, with cliff and tree cavities suitable for nesting. The distribution of all North American Spotted Owls, including the Northern and California subspecies, correlates with the distribution of forest land that has been protected from destruction and logging. Logging and the threat of catastrophic wildfire are the greatest threats to their populations.



*“Jemez” completely surprised us with her recovery from critical injuries and is now an ambassador in our wildlife education programs.
Photo by Larry Rimer*

Spotted owls are sedentary in their habitats, remaining in one territory unless harsh winters and heavy snows force them to move downslope in mountainous regions, which may be the cause of this immature Spotted Owl’s excursion to the relative lowlands of Los Alamos where she met up with an automobile for the first time in her young life.

Day by day, with ups and downs, it wasn’t clear if she would survive. Finally, one week later, on December 24, she turned the corner and it appeared that she might survive the head trauma. With no information about her, I posted a photo on Facebook with the little information we had. To my surprise, we got an almost immediate response from the rescuers, Victor and Rachel Mitchell, and we were able to piece together part of her story. In January, Dr. Atkinson performed surgery to remove the damaged eye, which the owl handled well. It was clear that, as a recently fledged youngster, she would not be releasable, so once she recovered from all of her injuries, we applied for permits to keep her for our education program.

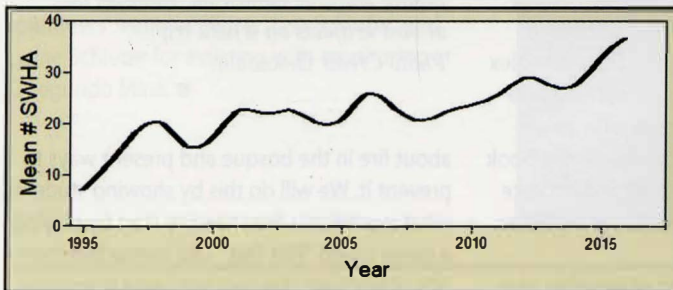
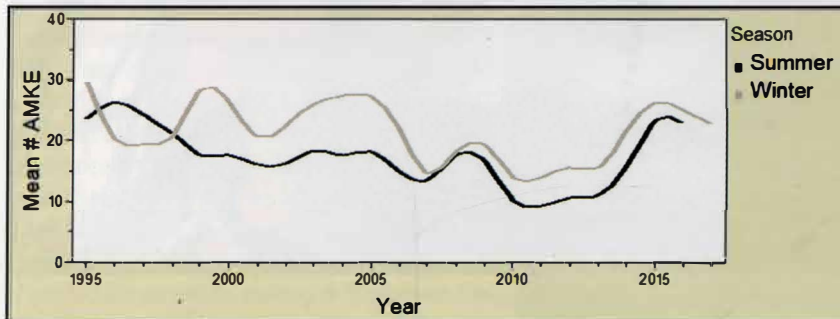
Jemez, her new name in reference to the mountains where she was born, was our Christmas miracle of 2016 – we didn’t think she would survive at all. Now, you might meet her at one of our education programs, particularly the “All About Owls” lecture. ■

page 7 Raptor Survey

ground, etc.), the direction and distance of the bird from the point, the habitat at the point, and the weather conditions for that survey. Species detected between points were incidentally recorded.

In the 22 years since the study began, routes have been added to better document raptor use over an expanded study area and some routes have been discontinued due to accessibility issues, leaving a total of ten current survey routes: six in the Rio Grande Valley between Isleta Pueblo south to Bosque del Apache National Wildlife Refuge, and four in the Estancia Valley and on Armendaris Ranch.

A total of 32 raptor species have been observed over the 22 years; however, only seven summer and eight winter residents were detected at high enough levels to allow for analysis. The ten most common



Figures 1 & 2 show long-term population variations for American Kestrels and Swainson's Hawks in the study areas. At right, three citizen scientists scan for raptors.

Photo by Donna Royer.

species detected, in decreasing order of abundance, were Turkey Vulture (summer only), American Kestrel, Swainson's Hawk (summer only), Red-tailed Hawk, Ferruginous Hawk, Northern Harrier, Bald Eagle (winter only), Golden Eagle, Prairie Falcon, and Rough-legged Hawk (winter only).

Across all years and the study area as a whole, population trends have generally remained stable for the ten most common species. But, there have been several anomalous and/or statistically significant trends documented at the individual route level for species such as American Kestrel, Red-tailed Hawk, and Ferruginous Hawk. We lack the space to address these route-level changes in this article. But, our complete report, which will go into much greater detail, will be available on the Hawks Aloft website by year's end. Here, we present trends documented across the entire study area for American Kestrel and Swainson's Hawk.

Across the survey area, American Kestrel numbers fluctuated substantially among years during both summer and winter (see Figure 1). Although there were no statistically significant changes at the study wide level, overall trends were influenced by significant changes on specific survey routes. From 1995-1999, when only a limited number of routes were surveyed, kestrel trends varied widely between summer and winter. From 2000-2017, kestrel trends were generally consistent among seasons, and fluctuations largely followed climatic trends, with lower numbers detected during drought years. Most notably, kestrel numbers sharply decreased during the severe drought years of 2010-2013. Beginning in 2014, kestrel numbers rose during both seasons as drought conditions subsided.

Swainson's Hawk has shown a steady increase in total annual detections since the study began in 1995 (see Figure 2). Present in North America during the breeding season, most of the world population winters on the grasslands of South America. This trend may be due, in part, to international efforts to control pesticide use in Argentina that began in 1996. The American Bird Conservancy reports that since pesticide control efforts began, Swainson's Hawk numbers rebounded following a significant decline in the early 1990s due to accidental poisoning in the Argentinian grasslands from the pesticide



Monocrotophos, an organophosphate. Our data supported that trend. Over the course of this study, a total of 91 volunteers have conducted surveys, evidence of the value of citizen science contributions to low- or no-budget projects like these, where average citizens with an interest in the study subject become intimately involved with the long-term study. We sincerely thank all of the volunteers who have contributed over the 22 years of this study. We recognize the limitations of these types of studies, particularly the increase in variables that might affect some outcomes.

Jerry Hobart has managed this project and also conducted surveys since its inception, with all surveys accomplished entirely through the time, expertise and vehicle miles (10560 total) of numerous volunteers. Other long-term surveyors include Chuck Brandt, Ed Chappelle, Gil Clarke, Pat Folsom, Gail Garber, Roger Grimshaw, Les Hawkins, Jerry Hobart, Bonnie Long, Larry Rimer, Donna Royer, Sami Sanborn, Martin Schelble, Dianne Schlies, Sei Tokuda, and Steve Youtsey. ■

Conservation Education at Hawks Aloft

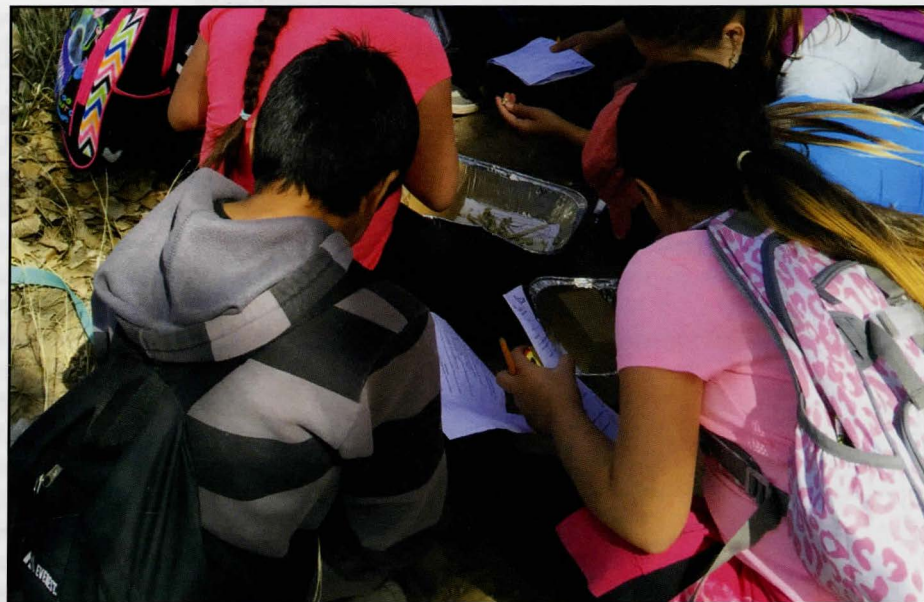
By Julia Davis

Our education programs at Hawks Aloft are placed under the umbrella term "conservation education," meaning that they address important environmental issues, specifically those caused by humans that impact avian life. These issues include different land uses, fire ecology, water quality, and the effects of gunshot wounds and electrical shock, among many other topics. Programs are placed into five main categories: adult education, outreach booths, Birds of Prey, Reading with Raptors, and Living with the Landscape, and all feature our live "Avian Ambassadors." We carefully select each lesson based on the needs and desires of each partner and their constituents, but our programming finds its greatest breadth in our Living with the Landscape (LWL) program, a year-long learning initiative offered to low-income elementary schools.

LWL's specific goals are to provide quality educational enrichment experiences to underserved youth in our community, encouraging change in attitude in both students and teachers, and developing confidence in educators to continue that work after the LWL program concludes. This immersive program is rewarding to organize each year. Students who participate are often city dwellers in low-income neighborhoods, where enrichment programs aren't always available. The stars of each lesson are our permanently injured, live birds of prey, dubbed Avian Ambassadors. LWL students form deep connections with the live birds presented to them in class. The presence of these hawks, owls, and falcons excites the children and helps them learn about environmental conservation. By sharing the unique histories of the live birds, and how each sustained their injury, we can address a host of important conservation topics with students.

How We Choose the Perfect Lesson

We get creative with LWL since we are in these schools for the entire school year, and each classroom sees us multiple times. As we pick the topics to cover for each grade, we try to focus on issues unique to the Southwest that suit grade level education standards in New Mexico. Water conservation is almost always part of the program. There is an activity book dedicated to water issues called Project WET, initiated in 1995 with the mission to



"reach children, parents, teachers, and community members of the world with water education that promotes awareness of water and empowers community action to solve complex water issues." This book and its teachings are part of an international effort to raise awareness about water and its use. We use this book to inspire activities that illustrate and educate on the water cycle, macroinvertebrate studies, and watersheds.

Migration is a natural and observable phenomenon that is powerful in the classroom. A frequently used lesson is called "Migration Migraine," adapted from the Project WILD Curriculum (PWC). PWC was developed in 1983 with a goal to foster action towards wildlife and natural resources. The guide is broken down into three sections: Ecological Knowledge; Social and Political Knowledge; and Sustaining Fish and Wildlife Populations. Each lesson can be modified to fill a whole week of learning, or abbreviated into a quick 20 minute experience.

Using old favorites is great, but we also like to develop new lessons to improve our overall curriculum. One topic we like to discuss with older learners is forest fire and its ecology. The city of Albuquerque grew up around the Rio Grande where wildfires can be a risk for animals and people. Developing lessons that raise awareness about this issue and ways to prevent it is important. I have been working on a new lesson that will help raise awareness

Living with the Landscape students look at bird artifacts on a field trip.
Photo Credit Unknown.

about fire in the bosque and present ways to prevent it. We will do this by showing students what ingredients fires need to start by playing a game called "Fire Tag." Our interactive methods of teaching this concept came from three different curriculum books—the two mentioned above, and another from Project Learning Tree.

Project Learning Tree (PLT) "uses trees and forests as windows on the world to increase students' understanding of the environment and actions they can take to conserve it." What I like most about this curriculum and its accompanying online resources are its commitment to service-learning. This project introduces hands-on service activities children and communities can do to take ownership of their school grounds or other public spaces. Our conservation projects and field trips tie in well with the PLT activities since both are experiential, practical means of reiterating important conservation methods.

When we introduce our organization at booths or school programs, we summarize the Hawks Aloft mission by explaining the focus of our organization in three main areas: Avian

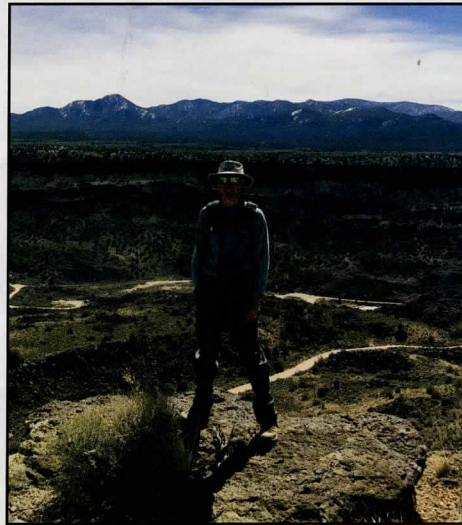
See **Conservation Education** page 23 ▶

◀ page 10 **Raptor Survey**

tored all known nests throughout their occupancy to determine if the nest failed or successfully fledged offspring.

Different raptors begin nesting at different times of year. Golden Eagles and Great Horned Owls begin nesting very early, around mid-March, so it is important to begin early in the season to document any possible nest failures. This practice also allows us to observe other raptor species setting up their territories. Although Golden Eagles were observed flying in the area, none were found nesting in the buffer-zone surrounding the mine. Burrowing Owl territories were observed in the huge prairie dog towns located on the ranch, but we were unable to determine whether any nesting occurred. By the end of June, the majority of the raptor and raven nests had fledged, except for some American Kestrel and Prairie Falcon nests. When the last nest fledges at El Segundo Mine, our fieldwork is complete for the season.

With another successful season of monitoring raptors at El Segundo Mine complete, we've put our binoculars and spotting scopes away, waiting for 2018 to start the process all over again. We thank Chad Gaines, Myron Newman and Manuel Lopez from Peabody Energy for being the points of contact for surveyors working at El Segundo Coal Mine. We also would like to send a special thanks to volunteers Jeannine Kinzer, Lisa Schluter, and Lynne Schluter for assisting with monitoring at El Segundo Mine. ■



"I was lucky to be able to spend time working closely with the folks from Hawks Aloft on this project. The time spent hiking and observing all the wildlife in the area is something I will never forget. We had a great team of individuals that were dedicated to the project; and that made it so enjoyable and memorable."

-Jeannine Kinzer, volunteer

Larry Rimer, at the edge of the Rio Grande gorge, where he spent weeks searching for nesting raptors.

Photo by Amanda Schluter

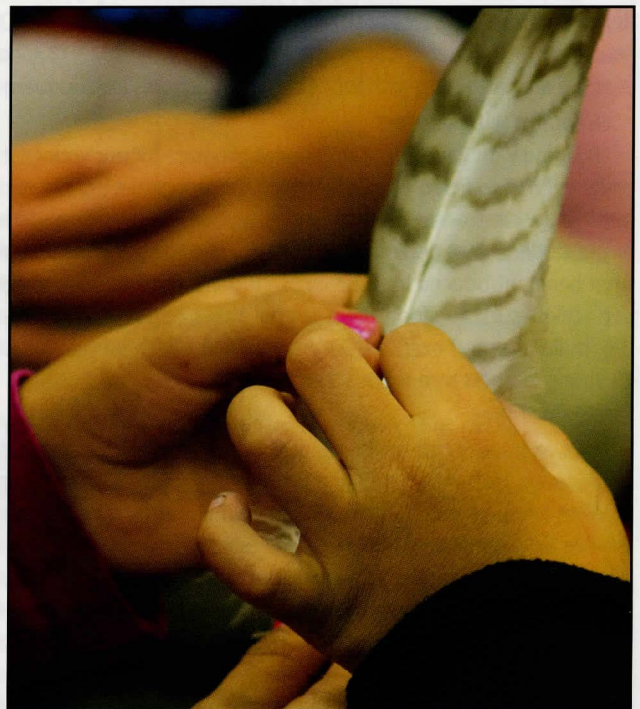
◀ page 22 **Conservation Education**

Research, Conservation Education, and Raptor Rescue. Conservation Education is the way we reach the general public through our five main categories. School programs—especially the multiple visit LWL—make up the bulk of our public contacts each year. This program alone reaches approximately 3,000 to 6,000 individuals throughout every school year. Providing this enrichment to underserved youth in our community is why we continue to raise funds, offer the program, and evolve our lessons.

Funders for LWL

All classroom visits, field trips, and supplies for conservation projects were supported by donations from PNM Resources, the Larry and Anna B. Harris Foundation, Chevron Corporation, and private individuals. Field trips were made possible through the collaboration of Valle de Oro National

Wildlife Refuge and Albuquerque Open Space. This year, we will be busy implementing LWL at four local Albuquerque Schools: Belair, Lowell, Matheson Park, and Mountain View. We hope to continue the program in the 2018–2019 school year. Any support you can provide to this program will be greatly appreciated, not only by us, but by the students who receive the opportunity to learn about the environment around them through the experience of the Living with the Landscape program. ■



Hawks Aloft Education Programs

An integral part of Hawks Aloft's mission is to reach learners of all ages with our message of conservation of New Mexico's wild spaces and the birds that inhabit them. We approach this element of our mission through several kinds of educational programs: Living with the Landscape, Reading with Raptors, Birds of Prey, adult education programs, and community outreach booths. The details of each of these programs are outlined below.



Left, Julia Davis, our Education Coordinator, teaches students about watersheds.

Photo credit unknown.

Below, Team Hawks Aloft at the Monte Vista, CO Crane Fest.

Left to right: Larry Rimer, Julia Davis, Dagny Cosby, Chellye Porter, Chuck Brandt, Ava Gutierrez, Liz Roberts, Allison Schacht, and Amanda Schluter.

Living with the Landscape

Living with the Landscape is Hawks Aloft's flagship program—a grant-funded, comprehensive year-long learning opportunity offered free-of-charge to Title 1 elementary schools in the Albuquerque area. Every classroom in each of the schools selected receives at least two visits from Hawks Aloft educators and several of our live, non-releasable raptors. The program emphasizes work with fourth and fifth grade students. With these classes, our staff help students develop and implement a conservation project, as well as organize a visit to a local natural area. In addition, near the end of the school year, we host a family conservation night at the school during which time students, their families, and their siblings are invited to interact further with Hawks Aloft staff, share what they've learned with their community, and have their questions answered in a relaxed setting. In the 2016-17 school year we also delivered these programs to several schools in and around Silver City, reaching 3,540 students and teachers in total. For the 2017-18 school year, we are partnering with four elementary schools in Albuquerque.

Reading with Raptors

Reading with Raptors is a single-visit program for our youngest students in Pre-K to first grade. In this program, educators bring one or two birds to the classroom and read an age appropriate, bird-themed book to the students that draws a specific connection to the birds they meet. After being introduced to these birds, students participate in an interactive activity such as a food chain puppet show, bird artifact discovery, or the "build-a-raptor" exercise. During the 2016-17 school year we reached 23 young learners throughout New Mexico.

Birds of Prey

Our versatile, single-visit Birds of Prey program can be adapted to grade levels 1-12 and altered to address many topics. This program involves learning about Hawks Aloft and what we do, meeting some of the live, non-releasable birds of prey in our care, learning what biological adaptations define a raptor, general bird facts, and, last but not least, ways in which students can help make a positive difference for birds and the local environment. During the 2016-17 school year we presented this lesson across New Mexico and reached 3,489 students. We had the opportunity to travel with our program throughout New Mexico with



visits to Ruidoso and Gallup. In 2017-18 we hope to continue to expand the reach of this program.

Our single visit Birds of Prey and Reading with Raptors programs are frequently requested throughout the school year. When funds are available, these programs are offered at reduced prices for low-income schools.

Adult Education Programs

Adult education programs offered through Hawks Aloft include a variety of adult continuing education and corporate programs. Continuing education programs cover a wide variety of topics. Popular themes include "Life and Times of New Mexico Raptors," "Raptor Identification," and "All About Owls." Each program includes live, non-releasable birds of prey and a slideshow presentation that provides more detail about each species' natural history, coupled with the individual history of a live bird presented.

Corporate programs are offered to utility linemen and other professional groups that benefit from increased awareness and understanding of bird behavior and the legalities around them. These programs inform employees about the rules and regulations that govern corporate and government agencies, as well as provide guidelines on how to safely handle injured or abandoned wildlife.

Throughout the year we also offer enrichment classes to our volun-

See **Education Programs** page 25 ▶

◀ page 24 **Education Programs**

teers, mainly in the form of raptor handling training, where interested volunteers can meet with Hawks Aloft staff to learn the basics of, and practice working directly with, our permanently injured, non-releasable "Avian Ambassadors." During the 2016-17 year we reached 1,288 participants through our adult education efforts.

Community Outreach Booths

Hawks Aloft is strongly invested in our community. As such, we are often invited to events throughout New Mexico and neighboring states. Our booths are designed to engage non-captive audiences of all ages and incorporate kid friendly activities along with educational materials for adults and older youth. Through these activities and an introduction to what we do at Hawks Aloft, community outreach booths aim to encourage individuals in the community to make positive choices for the environment and to conserve New Mexico's unique natural heritage. All of this work could not be done without the help of our spectacular volunteers. We reached 13,976 participants during our visits to communities in New Mexico, Arizona, and Colorado.

Program Funding

We are grateful for all the contributions we currently receive to support our many educational programs. If you are interested in donating to our education programs please contact us for more information.

Program Fees

\$150 For programs within the Albuquerque Metro Area, and 1 or 2 consecutive programs at the same location on the same day. Additional programs cost \$75 each.

\$300 (Plus mileage \$0.56/mile) For locations more than 50 miles from Hawks Aloft. Same program structure as above.

\$300 For outreach booth events within the Albuquerque area or \$300 PLUS mileage (\$0.56/mile) for outreach booth events more than 50 miles away.

Living with the Landscape is entirely grant funded and free of charge to participating schools. We accept applications for this program each year in April and May. If you are a Title 1 School, please ask about our program discounts. ■

◀ page 9 **Raptor Rescue**

to hear from you, and we provide training, too. Contact our office at 505-828-9455.

A special thank you to everyone who participated in this program throughout 2017. These volunteers included Charles Cummings, Bill Houston, Maggie Grimason, Kaitlyn King, Jeannine Kinzer, Dean Klassy, Toni Klassy, Arlette Miller, Michael Montroy, Beth Nelson, Chellye Porter, Larry Rimer, Emiliano Salazar, Allison Schacht, Amanda Schluter, Bruce Sisk, Sue Small, and Mary Smith in Albuquerque, and Anthony Bailey, Ashley Gumea, Diane Moore, Francisco Resenda, Frank Wilson, Joanne Dahringer, John Douglas, Mairon Fisher, Mona Trempe, Robert Kraimer, Rebecca Kraimer, and Shelly Armitage in Las Cruces. ■



Fledglings fostered by the two adult American Kestrels at the Chappelle facility.

Photo by Mary Chappelle.

Table 2. Summary and Outcomes of Intakes by the Hawks Aloft Raptor Rescue Team During the 2017 Rehabilitation Year (Sept. 1 2016-Aug. 31, 2017)

Reason for Capture	# of Birds	Intake Outcomes	# of Birds
Impact Injuries (Car, Window, Etc.)	62	Transferred*	41
Predator Attack	6	Released	23
Failure to Thrive	6	Euthanized Within 24 Hours	17
Fell from Nest	8	Died Within 24 Hours**	15
Gunshot	5	Euthanized ***	13
Human Interference	15	Died In Care	10
Illness (WNV, Trichomonas, Lymphoma, Avian Pox)	9	DOA	12
Electrocution	3	Currently Rehabilitating	1
Congenital Defect	1	Permanent Placement	4
Barbed Wire	3		
Other	6		
Unknown	4		
Fell Down Chimney	1		
Mitigation	7		
Totals	136	Totals	136

* Transfers to other rehabilitation facilities generally occur after the patient is stable enough to begin preparation for release.

**Generally, birds that died within 24 hours of arrival would have perished with or without care.

*** Birds that were not euthanized on arrival were guarded cases that had been assessed by veterinarians and were placed in rehabilitative care in hope of recovery.

Other: Fell in water tank, Stricture to both legs, Crop too full to fly, Habituated, Ruptured crop, Held illegally

Hawks Aloft Quilt Retreat – Food, Friends, and

By Cynthia Figueroa-McInteer

What big event happens after the winter holidays are over? The Super Bowl, right? Yes, but not for me. I get ready for the Hawks Aloft quilt retreat. I'm coming up on my fifth or sixth year and starting to lose count. I pack up at least two sewing machines, groceries, and wine, and head toward the Jemez Mountains. After stopping in Jemez Springs, I make my way to Gail's cozy, and a little bit funky cabin, nestled in a ponderosa forest just north of Soda Dam. You would never guess that this is where the magic happens.

Twelve friends, and usually four or five dogs, convene for a weekend of quilting, cooking, eating, and laughing.

On Friday, the living room is transformed into a sewing studio. Furniture is moved, a fabric cutting station and several tables for sewing machines are set up, and then the magic begins. Master quilter, and internationally-known designer and quilt instructor, Gail Garber, reveals the year's design that day. Then, our work is all about cutting and getting fabric ready for the small army of volunteers, a group comprised of novice and experienced quilters alike. On day two, Gail gives instruction on how the quilt will come together. Design elements typically include paper foundation pieced blocks that vary in difficulty. This process involves sewing fabric on paper templates, sewing on the printed line, folding, and trimming. The result is a very accurate pieced quilt block. Most quilt blocks are made by volunteers who only sew once a year. More complex sewing is done by experienced quilters who share Gail's talent for the art. By lunch time sewing machines are humming, blocks are laid out on the downstairs bed, and the design starts to emerge. By late afternoon, people are sewing faster, and the inevitable happens—something isn't quite right or there is barely enough fabric, but issues are resolved and the pace continues as major portions of the quilt top come together. As dinner time approaches, machines stop one by one, and paper is removed from the back of assembled quilt blocks until the floor is covered with a



thick layer of paper scraps turned to confetti. I'm usually one of the last people sewing. With strained eyes and a sore back from a day of intense activity, final quadrants are sewed together. Voila! What started as piles of fabric and paper patterns transforms into a stunning composition of color that pays homage to nature, as in this year's design that focuses on the beautiful Sandhill Crane.

At this point, when the quilt has come together, we clap and cheer and marvel at what we did together, a bunch of friends, who love birds and quilts.

The last day is all about cleaning up, eating breakfast, and gathering for a group photo. On Monday, when people say, "Did you watch the Super Bowl?" I say, "No, I helped make a quilt. By the way, who won?" ■

The 2017 Hawks Aloft Raffle Quilt will be won by some lucky person this December. Get your raffle tickets now and share with a friend or get them to buy their own! Your purchase of tickets helps support the Hawks Aloft mission.

2017 quilters, l-r, back row, Rick Deshler, Ed Chappelle; standing, Barb Deshler, Mary Chappelle, Chellye Porter; sitting, Cynthia Figueroa-McInteer, Sami Sanborn, Gail Garber, Allison Schacht, Steve Elkins, Liz Roberts and Julia Davis. Our pets l-r, Leyla, the late Gabby, and Laney Boo.



MRGCD are endeavoring to clear this last stretch of drainside vegetation. It appears that only the efforts of concerned citizens are currently delaying this removal. MRGCD and Corrales personnel have provided several reasons for the proposed vegetation removal, none of which attempt to preserve essential riparian vegetation along the drain, or adequately explain the need to remove additional vegetation.

The overriding reason for removal would be to reduce the risk of wildfire. We fully recognize the value of minimizing fire danger through fuel load reduction. But, in some places such action is not appropriate. The ecological importance of the existing drainside vegetation in Corrales makes it unique among increasingly rare bosque habitats. We feel strongly that any potential benefit in fire risk reduction in this area would be modest and certainly not worth the cost in terms of loss of irreplaceable habitat, the corresponding losses of birds (and other wildlife), and aesthetic value. The strip of vegetation in question is already buffered to the east from the bosque proper by the approximately 25 meter wide, regularly maintained levee road, slopes, and drain. The strip is also buffered to the west by two lanes of service road and an irrigation ditch. Further, all bosque fires in the Albuquerque metro area since at least 2003 have been human caused (USACE 2007 & HAI unpublished data), and most of these fires were intentionally started. Given the heavy human recreational use along this stretch it is unlikely that someone wanting to start a fire would do so on the west bank of the drain. The (continual) removal of drainside vegetation north of the Harvey Jones channel, the establishment of fuel breaks by the Corrales Fire Department, restoration work by USACE, and sporadic thinning by NMDF crews has already altered hundreds of acres.

Sound land management practices dictate a balance between minimizing fire risk and maintaining viable habitat. In the Corrales drainside situation, however, the stakes are high in terms of potential habitat loss and negative impact on the avian community. We hope that the powers that be in the MRGCD and the Village of Corrales will come to see that removing the longstanding understory vegetation along the west bank

Transect	Habitat		# birds/100 acres
NW22	DR 5	A	1273
NW20	DR 5	A	1138
NW11	DR 5	A	1111
NW08	DR 6	B	683
NW25	DR 6	C	353
NW27	DR 6	C	214

Table 4. Cumulative winter avian density (mean # birds/100 acres) by drain transect.

DR 5 transects incorporated substantial understory vegetation on the west edge of the drain. DR 6 transects lacked understory vegetation on the west edge of the drain. For DR 6 transects, data from years before clearing is excluded (i.e. when these transects were also DR 5). Transects not connected by a common letter are significantly different (Tukey-Kramer test).

Transect	Habitat		# species
NW22	DR 5	A	27.2
NW11	DR 5	A B	23.2
NW20	DR 5	B	22.8
NW08	DR 6	C	12.3
NW27	DR 6	C	8.5
NW25	DR 6	C	7.8

Table 5. Cumulative winter avian richness (mean # species detected at densities ≥ 1.5 individuals per 100 acres) by drain transect.

Transect	Habitat	Winter density	Winter richness	Summer density	Summer richness
NW22	DR 5	2nd	1st	25th	22nd
NW20	DR 5	4th	5th	23rd	28th
NW11	DR 5	5th	4th	27th	33rd
NW08	DR 6	20th	63rd	60th	69th
NW25	DR 6	46th	75th	76th	80th
NW27	DR 6	62nd	73rd	77th	79th

Table 6. Cumulative rankings of Corrales drain transects out of 81 total transects surveyed in the middle Rio Grande bosque for winter avian density, winter avian richness, summer avian density and summer avian richness. DR 5 transects incorporated substantial understory vegetation on the west edge of the drain. DR 6 transects lacked understory vegetation on the west edge of the drain.

of the drain would be detrimental and instead turn their efforts to habitat restoration in the already cleared reaches. We encourage the citizens of Corrales to become involved and educated about conservation issues within their local community, and work to protect this important strip of the Corrales bosque. ■

Willow Flycatcher is annually documented as a migrant in dense understory vegetation along the west edge of the Corrales drain, but has not been documented in areas lacking understory vegetation. Photo by Alan Murphy.



Quilt Raffle 2016 To Benefit Conservation Education in NM

\$1.00 each / 6 for \$5.00 Drawing December 2, 2017

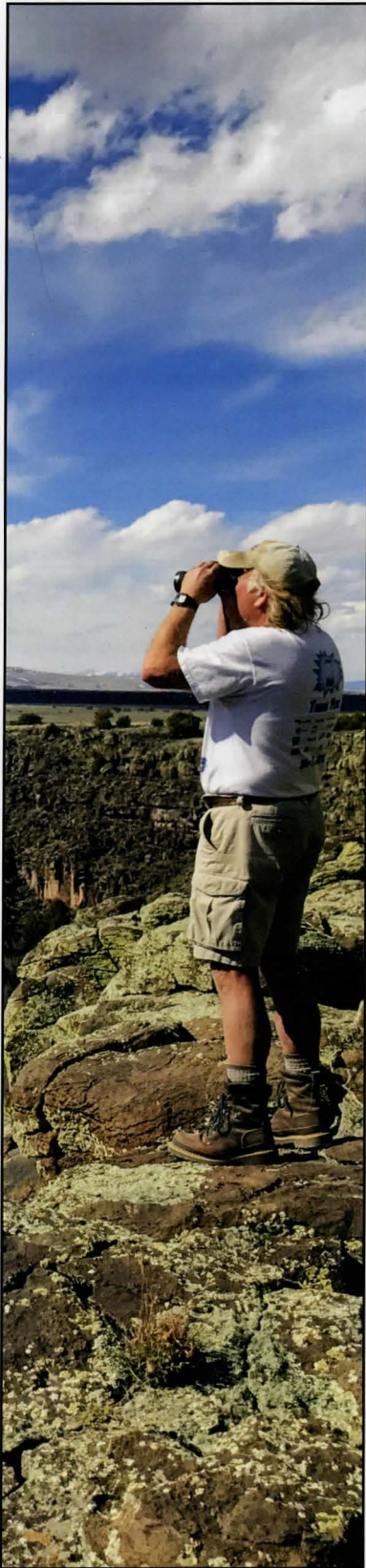
Please indicate quantity of tickets ____.

Name _____ Phone _____

Address _____

City _____ State _____ Zip _____

Mail the order form with check (please don't mail cash) to:
**Hawks Aloft, PO Box 10028,
 Albuquerque, NM 87184**



Bob Kipp, searching for nesting raptors on the Rio Grande Gorge. Image by Larry Rimer.

**Hawks Aloft, Inc.
2016 Financial Report**

	<u>2016</u>	<u>2015</u>
Income		
<i>Contracts and Grants</i>		
Government Contracts	\$ 274,328.01	\$ 250,223.00
Private Contracts & Grants	\$ 92,096.59	\$ 76,284.00
Education Program & Grants	\$ 12,220.00	\$ 20,539.00
<i>Total Contracts and Grants</i>	\$ 378,644.60	\$ 347,046.00
<i>Donations</i>		
Cash	\$ 81,359.12	\$ 26,286.00
Raffle Ticket Sales	\$ 2,715.00	\$ 3,288.00
Non-Cash	\$ 2,747.61	\$ 4,834.00
Capital Campaign	\$ 29,768.50	\$ -
<i>Total Donations</i>	\$ 116,590.23	\$ 34,408.00
<i>Operations/Sales</i>	\$ 16,587.80	\$ 17,020.00
<i>NM Avian Protection</i>	\$ 10,000.00	\$ -
Total Income	\$ 521,822.63	\$ 398,474.00
<i>Cost of Goods Sold</i>	\$ 715.35	\$ 1,781.00
Gross Profit	\$ 521,107.28	\$ 396,693.00
Expenses		
<i>Payroll</i>		
Research	\$ 141,939.02	\$ 134,872.00
Education/Outreach	\$ 69,209.23	\$ 57,019.00
Administration	\$ 49,736.67	\$ 30,745.00
Raptor Rescue	\$ 14,791.36	\$ 16,752.00
Membership Services*	\$ 17,186.93	\$ 6,611.00
Fundraising	\$ 5,842.03	\$ 15,360.00
<i>Total Payroll</i>	\$ 298,705.25	\$ 261,359.00
<i>Bird Care</i>	\$ 21,522.79	\$ 16,995.00
<i>Facilities & Utilities</i>	\$ 21,836.49	\$ 21,139.00
<i>Office</i>	\$ 8,545.98	\$ 9,698.00
<i>Other**</i>	\$ 23,190.81	\$ 20,495.00
<i>Professional Services (Research)</i>	\$ 70,659.59	\$ 16,968.00
<i>Transportation/Travel</i>	\$ 24,698.93	\$ 28,089.00
Total Expenses	\$ 469,159.84	\$ 374,743.00
Net Income	\$ 51,947.44	\$ 21,950.00

*Includes online newsletter, Aloft, member events, etc.

**Includes business meals, conferences, fundraising, etc.

4 page 13 CFLRP

Pygmy Nuthatch, Mountain Chickadee, and Steller's Jay. Conversely, Chipping Sparrow, Mountain Bluebird, and Western Bluebird are species of conservation concern that were significantly more abundant in burned forest types than unburned forest types.

The variation in avian response to fire illustrates the complexity of the avian community and the difficulties with managing forest ecosystems relative to fire. Although the first five years of data have been revealing, longer term data collection will more thoroughly doc-

ument and reliably evaluate avian trends and response to wild fire at both the community and species levels. Along with the interesting responses in the data and the pleasure of exploring the Jemez Mountains, the experience of working on the Jemez CFLRP was a real joy. We thank Bob Parmenter from the National Park Service and Susan Harrelson from the U.S. Forest Service for their assistance in this project.

Savannah Sparrow, another resident species in the Jemez CFLRP. Photo by Alan Murphy



Join Our Growing Membership

Hawks Aloft, Inc., is a nonprofit, 501(c)3 organization based in Albuquerque, New Mexico. We work to conserve indigenous wild birds and their habitats through avian research, rescue, conservation, education, and cooperation with other organizations.

Membership funds help us provide the highest quality housing, food, and medical care to our group of 27 avian ambassadors. These permanently injured, non-releasable birds visit classrooms and attend events throughout the state, educating the public and students about birds and their habitats. We believe that conservation education, especially of young people, is vital to our future.

Your donations also make it possible for us to rescue birds, including raptors and corvids, through our Raptor Rescue Hotline. Because our network of volunteers is extensive, we rescue birds throughout the state and transport them to the appropriate medical facility and/or wildlife rehabilitator.



*Swainson's Hawk on the wing.
Photo by Larry Rimer*

Besides education and rescue, we perform research on a variety of different bird species. This research yields information to support sound land management decisions—essential when situations arise that might disturb bird habitats. Additionally, we cooperate with other organizations to boost our efficacy and to support community awareness of conservation efforts and issues.

Join our growing membership, and you will provide funding that is essential to our conservation efforts. Remember, we can't do it without you!

YES, I WANT TO JOIN HAWKS ALOFT!

MEMBER BENEFITS INCLUDE:

- A SUBSCRIPTION TO THE HAI FLIER, OUR MONTHLY E-NEWSLETTER FILLED WITH CURRENT NEWS AND UPDATES
- A SUBSCRIPTION TO *ALOFT*, THE ANNUAL JOURNAL OF HAWKS ALOFT
- INVITATIONS TO SPECIAL EVENTS AND FIELD TRIPS
- DISCOUNTS ON SELECTED HAWKS ALOFT MERCHANDISE
- DISCOUNTS AT WILD BIRDS UNLIMITED (WITH YOUR HAWKS ALOFT MEMBERSHIP CARD)
- MEMBERS WHO DONATE AT THE COOPER'S HAWK LEVEL OR HIGHER WILL RECEIVE EARLY INVITATIONS VIA E-MAIL TO EXCLUSIVE SPECIAL EVENTS!

BUT MOST IMPORTANTLY, AS A MEMBER YOU WILL RECEIVE THE SATISFACTION OF KNOWING THAT YOU ARE SUPPORTING AVIAN CONSERVATION, RESEARCH, RESCUE, AND EDUCATION—BECAUSE THAT IS YOUR MISSION TOO!

PLEASE JOIN TODAY!

Membership is very reasonably priced:

- | | | | | | |
|--|---------|---|-------|--------------------------------------|-------|
| <input type="checkbox"/> Golden Eagle | \$1,000 | <input type="checkbox"/> Ferruginous Hawk | \$500 | <input type="checkbox"/> Spotted Owl | \$250 |
| <input type="checkbox"/> Red-tailed Hawk | \$150 | <input type="checkbox"/> Cooper's Hawk | \$100 | <input type="checkbox"/> Family | \$75 |
| <input type="checkbox"/> Individual | \$45 | <input type="checkbox"/> Student/Senior | \$25 | | |

Please help support our conservation, research, and educational efforts with a tax-deductible contribution.

MEMBERSHIPS ARE FOR ONE YEAR AND THE RENEWAL CYCLE IS INDIVIDUAL, BASED ON THE DATE OF YOUR INITIAL MEMBERSHIP CONTRIBUTION. ALL CONTRIBUTIONS ARE TAX DEDUCTIBLE.

CORPORATE MEMBERSHIPS ARE ALSO AVAILABLE.

NAME: _____

ADDRESS: _____

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PLEASE MAKE CHECKS PAYABLE TO HAWKS ALOFT, INC., AND USE THE ENCLOSED ENVELOPE TO SEND YOUR PAYMENT.

- Please contact me about volunteer opportunities

Thank You to All the Volunteers Who Make Hawks Aloft a Success!

Corporate, Foundation & Government Agencies

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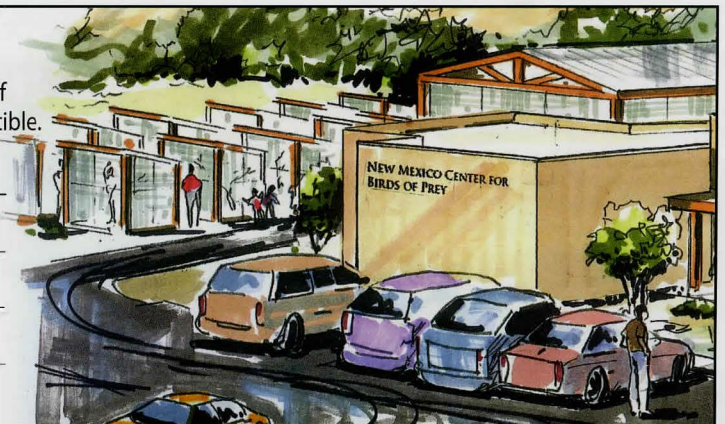
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Golden Eagles hunt on the expansive plains adjacent to the Taos Gorge in northern New Mexico. Image by Tony Thomas



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