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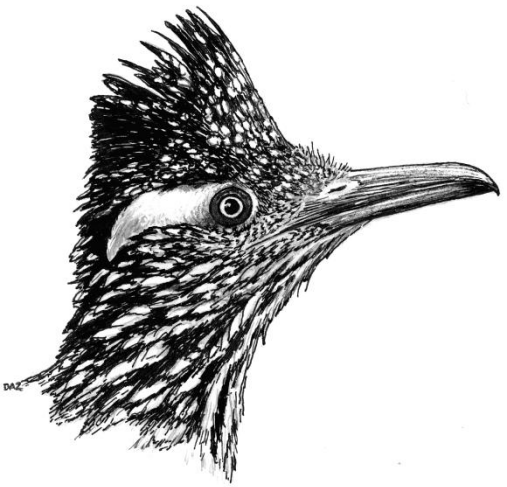

New Mexico Ornithological Society

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A NOTE FROM THE PRESIDENT

I wanted to let you all know that our Challenge with the Thaw Charitable Trust (TCT) has been successful, thanks in large part to the efforts of Jonathan Batkin and with generous support from NMOS and the Lannan Foundation. We were successful in raising more than the required $7,500 to match the challenge that TCT had issued, and the total $15,000 will go in to the Research Grant Fund to continue support for original avian research within New Mexico. This is a great start in our quest for raising a total of $50,000 for the Fund.

I also wanted to make you all aware that the Dale A. Zimmerman limited edition prints are now available for purchase on the NMOS website. There are a total of 10 different pen-and-ink drawings available (individual price $25), and they can be purchased individually, in pre-determined sets of five apiece for $100 or, all 10 prints for $200 (two sets of five). A total of 100 prints have been produced for each of the 10 species. The first 50 prints are reserved in sets of five with the same print number. Individual print sales will start with number 51. These limited edition, archival-quality, signed and numbered prints will grace the wall of your home or office, and will certainly gain in value over the years. Profits generated by the sale of these prints will go into our General Fund for support of the annual meeting and special publications such as the upcoming 4th edition of the ***New Mexico Bird Finding Guide***. A huge "thank-you" to Dale and Marian Zimmerman for their generosity to NMOS for this project, and to past-President Roland Shook who organized and followed through with the preparation and the printing of these wonderful works of art. Please visit the website to view the prints. Keep in mind that the sooner one orders these prints, the lower the number of the print series.

– *Dave Krueper*

NOTES ON A BREEDING POPULATION OF MOUNTAIN PLOVERS ON VERMEJO PARK RANCH, NORTHEASTERN NEW MEXICO

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INTRODUCTION

The Mountain Plover (*Charadrius montanus*; hereafter, plover) is a migratory, terrestrial species of shorebird that breeds primarily within the western Great Plains from Montana through New Mexico (Knopf and Wunder 2006). Although plovers have been observed breeding on a variety of open agricultural, grassland, and shrubland habitat types, this species seems to prefer dry, sparsely vegetated sites, especially those with a history of intensive disturbance by large grazers, like domestic cattle (*Bos taurus*) or American bison (*Bison bison*), or by prairie dogs (*Cynomys* spp.) (Knopf and Miller 1994, Knopf and Wunder 2006). Over the past ten years, the Mountain Plover has twice been considered for federal listing as a threatened species due to widespread population decline and the loss and degradation of breeding, migratory, and wintering habitats; however, in both cases the listing was denied (U.S. Fish and Wildlife Service [USFWS] 2003, 2011). The most recent review of information by the USFWS (2011) estimated a global population of at least 20,000 individuals, and concluded that human impacts on habitat, alone or in combination with climate change, were not likely to result in significant population declines in the foreseeable future.

Within New Mexico, the Mountain Plover is known historically as a widespread breeder in a variety of open, barren or grassland habitats, however, its distribution appears to have contracted over the past century with most recent breeding records limited to the northern half of the state (Hubbard 1978, Sager 1996, Hawks Aloft 2010). The northeastern Plains, in particular, are currently recognized as the plover's stronghold in New Mexico, likely supporting a considerable breeding population (Graul and Webster 1976, Hubbard 1978, Sager 1996, Knopf and Wunder 2006). For example, Sager (1996), during extensive roadside surveys of potential plover breeding habitats throughout the northern half of New Mexico, detected 152 adult plovers of which 101 (66%) were located in the state's 4 most northeastern counties (Colfax, Union, Mora, and Harding). Margulies et al. (2004), focusing on Union County, located 46 nests during the 2004 breeding season and estimated that at least 200 plovers bred in this county alone.

Despite the recent interest in this species, and its status as a species of greatest conservation need in New Mexico (New Mexico Department of Game and Fish 2006), little detailed information has been published concerning the nesting ecology of

Mountain Plovers in northeastern New Mexico. A primary reason for this lack of information may be the prevalence of private lands in this region, which has limited research efforts. In 2009 and 2010, I studied a population of Mountain Plovers breeding within a large, shortgrass prairie pasture on the private Vermejo Park Ranch (VPR) in Colfax County, northeastern New Mexico. Plovers have been present on this site since at least the late 1990's (D. Long, Turner Endangered Species Fund, pers. comm.); however recent management efforts that have expanded the coverage of black-tailed prairie dog (*Cynomys ludovicianus*) colonies on the site also appear to have benefitted plovers. Although it is not always the case, in some regions, particularly those supporting mixed- or tallgrass prairie, the distribution of plovers is closely tied to prairie dog colonies (Knowles et al. 1982, Olson-Edge and Edge 1987, Childers and Dinsmore 2008). In the shortgrass prairie of northeastern New Mexico, livestock grazing is likely sufficient to maintain the short vegetation height and ample bare soil that this species requires; in fact, of 20 sites at which Sager (1996) detected plovers breeding in Colfax and Union counties during his 1995 survey, only 1 consisted of an active prairie dog colony. Current research on VPR, however, suggests that prairie dog activities create habitat conditions that plovers readily use and may even prefer; based on surveys of 12 paired transects comparing bird abundance on prairie dog colonies to nearby, uncolonized prairie habitats, plovers were common on colonies (mean = 0.91 individuals detected per 600 m transect) but rarely detected on uncolonized prairie (mean = 0.04 individuals detected per 600 m transect; C. Goguen, unpubl. data). My specific objectives for this paper are to estimate size of the Mountain Plover population currently breeding on VPR, and to provide general breeding ecology information for this population.

STUDY AREA

I studied Mountain Plovers from May-early July 2009 and 2010 within a 16,190 ha prairie pasture on the 233,603 ha Vermejo Park Ranch. VPR extends mostly across the Sangre de Cristo Mountains of western Colfax and eastern Taos counties, New Mexico. Although most of the VPR consists of mixed-conifer forests typical of higher elevations (>2,200 m), the study pasture was located at lower elevations (1,800 - 2,100 m) on the southeastern edge of the ranch within Colfax County, just east of the town of Cimarron. Habitat in the pasture consisted primarily of shortgrass prairie dominated by blue grama (*Bouteloua gracilis*) interspersed with various other grasses, forbs, dwarf shrubs, and cacti, particularly fringed sage (*Artemisia frigida*), broom snakeweed (*Gutierrezia sarothrae*), winterfat (*Eurotia lanata*), prickly-pear cactus (*Opuntia* spp.), and cane cholla (*Cylindropuntia imbricata*). The pasture also contained large areas dominated by woody shrubs, mostly green rabbitbrush (*Chrysothamnus viscidiflorus*) and four-winged saltbush (*Atriplex canescens*), and was transected by several stream systems supporting narrow strips of woody riparian habitat.

Since the late 1990's, management efforts on the ranch have focused on ecosystem restoration with the goal of restoring natural biodiversity. During the study, between 520 and 640 adult American bison and calves were rotated among allotments within

the pasture such that some areas were actively grazed during the plover breeding season. Further, due to on-going restoration efforts, >45 black-tailed prairie dog colonies ranging from <1 ha to over 500 ha were widely distributed through the pasture. Based on maps of colony boundaries made during each winter, prairie dog colonies covered ~2,800 ha in spring 2009, and ~3,200 ha in spring 2010.

METHODS

To estimate VPR plover population size, I used an area search technique (Verner 1985) on 44 prairie dog colonies totaling 2,672 ha in 2009, and 43 colonies totaling 2,581 ha in 2010. During mornings (~0545-1200), 1 to 3 observers systematically searched each colony on foot walking routes separated by about 100 m, back and forth through the entire colony, stopping regularly to scan with binoculars. Plover locations and behaviors were recorded on colony maps for population estimates and to guide future nest searching efforts. At a minimum, each colony was completely searched 3 times each year, once during each of the following intervals: 15-31 May, 1-15 June, and 16-30 June. Many colonies were also at least partially searched opportunistically up to 5 additional times when colonies were visited for nest searching or habitat sampling. For each year, I estimated the number of breeding individuals for each colony as the maximum number of adult plovers detected during a single day's search before 16 June. I only included visits before 16 June to minimize risk of including large young in the totals, and to avoid inflating estimates with post-breeding aggregations; plovers begin forming post-breeding flocks in mid-June (Graul 1975; See RESULTS below). Total VPR plover population size for each year was estimated by summing the maximum counts for all colonies.

On colonies at which plovers were detected, I observed plover behavior and attempted to determine breeding status by monitoring adults from a distance via binoculars. During these observations, I recorded evidence of courtship or copulation, or in some cases was able to confirm breeding when an adult led me to its nest or joined its mobile young. Upon finding a nest, I recorded a detailed description of its surroundings and marked its position with a GPS unit to allow relocation. I typically re-checked nests about once per week and only walked in on a nest if an adult was not observed in the vicinity. This prevented me from determining final fate of some nests, but minimized the potential negative impacts of my presence on plover nesting success. When a nest was determined to be empty, I examined the nest site to look for evidence of nest fate; successful nests typically contain tiny eggshell fragments from pipping, whereas depredated nests are often completely empty (Margulies et al. 2004). In all cases, I also searched the general area for the presence of an adult with young. When I located nests during egg-laying, or when I was able to estimate a hatching date to within 4 days, I back-calculated clutch initiation dates (the date the first egg was laid) assuming a 29-day incubation period, and an egg-laying rate of 1 egg every 48 hours (Graul 1975).

RESULTS

I found evidence of plover breeding (i.e., active nests, dependent young, or adults engaged in territorial or courtship behavior) on 14 prairie dog colonies in 2009 and 13 colonies in 2010. In both years, colonies with breeding evidence were significantly larger, on average, than those without breeding evidence (Table 1). Plovers were absent, however, from 4 large (>90 ha) colonies in 2009 and 3 large colonies in 2010 suggesting that other colony characteristics were also likely important.

TABLE 1. Size comparison of black-tailed prairie dog (*Cynomys ludovicianus*) colonies with and without Mountain Plover *(Charadrius montanus*) breeding evidence on Vermejo Park Ranch, Colfax County, New Mexico, 2009 and 2010.

Year	Breeding Evidence?	*n*[a]	Mean area (ha) ± SE[b]	Range (ha)
2009	YES	14	132.0 ± 38.0	4.9 – 483.0
	NO	30	27.5 ± 7.7	0.8 – 161.7
2010	YES	13	135.7 ± 31.1	4.5 – 430.0
	NO	30	27.2 ± 6.3	1.2 – 136.0

[a] Number of prairie dog colonies

[b] Based on t-tests, mean area of colonies with breeding evidence was greater than those without in both years: 2009, t = -3.41, 13 df, $P = 0.0047$; 2010, t = -2.70, 14 df, $P = 0.017$

Overall, the maximum number of adult plovers detected per occupied colony ranged from 1 to 7 in 2009, and 2 to 6 in 2010. When totaled over all colonies, I estimated a breeding population size of 45 plovers in 2009 and 51 in 2010. This equates to 1.68 (2009) to 1.98 (2010) plovers/km^2 of surveyed prairie dog colonies, or 2.44 (2009) to 2.89 (2010) plovers/km^2 when including just occupied colonies.

Over both years, the single-day greatest number of adult-sized plovers detected on one colony was 10 on a 184 ha colony on 21 June 2010. This count included 9 adult-sized birds loosely congregated at the western edge of the colony. Although this group included 1 adult with associated young, I suspect that it largely consisted of a "fall flock" made up of post-breeding adults and, potentially, older young-of-the year (Graul 1975). The highest adult count in 4 searches of this colony prior to this date in 2010 had been 5.

Over both years, I located 21 plover nests on 9 colonies (8 nests on 5 colonies in 2009, 13 nests on 7 colonies in 2010). Of those nests with confirmed final clutch sizes ($n = 17$), 14 contained 3 eggs and 3 contained 2 eggs (mean = 2.82 eggs). Of 11 nests for which I could establish probable fate, 5 hatched, 3 were depredated, 2 were destroyed by weather events (one nest was apparently flooded by a rainstorm and deserted, the other was destroyed by a major hail storm), and 1 was deserted for unknown reasons. Clutch initiation dates from 9 nests ranged from 25 April to 10 June,

with the 3 earliest clutch initiation dates all occurring in the final week of April. Over both years, I located adults with young on 10 colonies. In 2009, young were first encountered at the start of June (first brood detected on 1 June, which equates to a clutch initiation date of, on, or before 28 April), while in 2010, young were first encountered in the final week of May (first brood detected on 25 May, which equates to an initiation date of, on, or before 22 April). Based on both clutch initiation and young data, plovers appear to initiate first clutches on VPR during the second half of April, and continue with re-nesting attempts into at least mid-June.

DISCUSSION

VPR currently supports a breeding population of at least 50 Mountain Plovers. Although it is possible that this represents an overestimate if individual plovers were moving among clustered colonies and were counted more than once, more likely I believe this number represents a minimum population size for three reasons. First, and most important, plovers can be quite cryptic, especially when tending nests (Plumb et al. 2005). Thus, it is likely that some, if not many, individuals were missed during our searches, particularly on larger colonies. Second, not all colonies were searched each year; ~130 ha of prairie dog colonies went unsearched in 2009, and ~620 ha in 2010. In 2010, I was unable to search one of the largest colonies on the ranch (518 ha) because it was undergoing prairie dog control efforts (this management action was determined necessary by ranch managers on this older colony because the intense grazing activities of prairie dogs in combination with prolonged drought conditions in the area were generating dust storms that were affecting neighboring roads and ranches). In 2009, this colony supported at least 5 plovers. Finally, because plovers are known to regularly use other habitats for breeding besides prairie dog colonies in northeastern New Mexico (Sager 1996), it is possible that additional plovers could have been present off colonies, perhaps in areas that were heavily grazed by bison. Over 3 breeding seasons (2008-2010) of intensive fieldwork in the pasture, however, I observed no evidence of plovers breeding off of colonies.

Basic breeding characteristics of this population, such as clutch size and timing of the egg-laying season, were similar to those observed in a well-studied plover population in northeastern Colorado (Graul 1975). Other recent published observations of plover nests and dependent young in Colfax and Union counties of New Mexico (e.g., Hubbard 1989, Williams and Hubbard 1990, Williams 1994, 2002, 2008) also fell within the seasonal breeding range observed in my study, although these past observations apparently included mostly later season nests and did not well document the start of the plover egg-laying season in mid-April. Although I was able to determine fate of only a small number of nests, the fact that 45% of nests with known fate survived to hatch, and the abundance of dependent young observed during colony searches, suggests that the prairie dog colonies of VPR are productive habitats for plovers. This conclusion must be tempered, however, with the observation that survival of young to independence appears to be a much more important measure of plover reproductive success than hatching rates (Dinsmore et al. 2003); I have no

information about the survival rates of young plovers on VPR. Causes of nest failure on VPR were typical of plover populations elsewhere, mainly weather and predation (Graul 1975, Knopf and Wunder 2006). Graul (1975) also observed nest losses to an early season hailstorm and subsequent flooding, suggesting that these weather events are common challenges faced by breeding plovers. Predation is also a common source of nest loss for most bird species, and potential predators of plover eggs or young that were regularly seen on the grasslands of VPR include coyote (*Canis latrans*), swift fox (*Vulpes velox*), badger (*Taxidea taxus*), thirteen-lined ground squirrel (*Spermophilus tridecemlineatus*), Burrowing Owl (*Athene cunicularia*), Chihuahuan Raven (*Corvus cryptoleucus*), western rattlesnake (*Crotalus viridis*), and bull snake (*Pituophis catenifer*).

A final important feature of the VPR plover population is its apparent preference for breeding on prairie dog colonies. Prairie dog activities likely benefit plovers by creating and maintaining habitats with short, sparse vegetation and a high percentage of bare ground (Knopf and Miller 1994). As mentioned previously, however, in the shortgrass habitats of northeastern New Mexico, livestock grazing is often sufficient to create these conditions, and plovers are not dependent on prairie dog colonies in this region (Sager 1996). With no baseline population information it is impossible to say whether plover abundance and distribution has increased on VPR in response to prairie dog re-colonization efforts over the past decade. However, it is difficult to deny that plovers are currently attracted to these colonies for breeding. The large size of individual colonies, and the large overall area of colony coverage on the VPR, are also likely important. The Maxwell National Wildlife Refuge lies just a few km north of the VPR pasture and maintains 3 small prairie dog colonies (each <50 ha), yet plovers are rarely detected at this site with no evidence of breeding (Mehlman 1996; L. Wilkins, former Refuge Manager, pers. comm.). Additional efforts to better identify specific landscape or habitat features of prairie dog colonies that are desirable to plovers may benefit Mountain Plover conservation efforts on the VPR, and could be of value in the management of this species broadly.

ACKNOWLEDGMENTS

I would like to thank the management of Vermejo Park Ranch for allowing me access to the ranch and for logistical support during my research. I also thank Lisa Goguen, Larry Klomps, and Bob Ward for their assistance in plover surveys and nest searching, and Leann Wilkins, former Manager of the Maxwell National Wildlife Refuge for information about plovers and prairie dogs on the refuge. Dustin Long of the Turner Endangered Species Fund deserves special thanks for sharing his prairie dog colony data with me. Three anonymous reviewers greatly improved an earlier draft of this paper. Funding and support for this research was provided by Faculty Research Development Grants to the author through Penn State University-Hazleton. All methods used in this research were approved by the Pennsylvania State University Institutional Animal Care and Use Committee (IACUC # 31039).

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* * *

BRUCE JOLLIFFE HAYWARD (APRIL 13, 1928 – AUGUST 3, 2011)

Bruce J. Hayward, the third president of NMOS (from 1973 to 1978), died at his home in Silver City, New Mexico, on August 3, 2011. Known primarily as a mammalogist, BJ was also a dedicated bird man, and an accomplished vertebrate zoologist in general, indeed, one of that disappearing breed of broadly trained and vastly knowledgeable "old time" naturalists. He eschewed the accelerating trend of over-specialization and the neglect of diverse disciplinary training of biologists, who enter the field knowing more and more about less and less.

I had been part of the New Mexico Western College Biology Department only three years when John Harlan, the chairman, charged me with locating a versatile zoologist to add to our faculty. Upon learning that Bruce Hayward had earned his preliminary degrees at the University of Michigan, under William Henry Burt, and received his Ph.D. studying under E. L. Cockrum at the University of Arizona, I suspected that he might be our man. After meeting him, I knew it. The decision of whom to hire was left to me, and I never regretted recommending Bruce. He began teaching at what is now Western New Mexico University in the fall of 1961, and we worked together for nearly three decades.

Bruce was little interested in being a research biologist but he was a dedicated teacher. No one at our institution worked harder. He never thought of his as an "8 to 5 job," and he spent almost as many nocturnal hours in the Science Building as he did during the day -- preparing specimens, building and curating the mammal and herp collections, and much more. Students were of paramount importance to him. He loved teaching, and thrived on the camaraderie we developed with students in those days. He fully appreciated his and my good fortune of working together doing what we most enjoyed. He once remarked to me, "Dale, we've got the world by the tail here," and in truth we did, for quite a span of years.

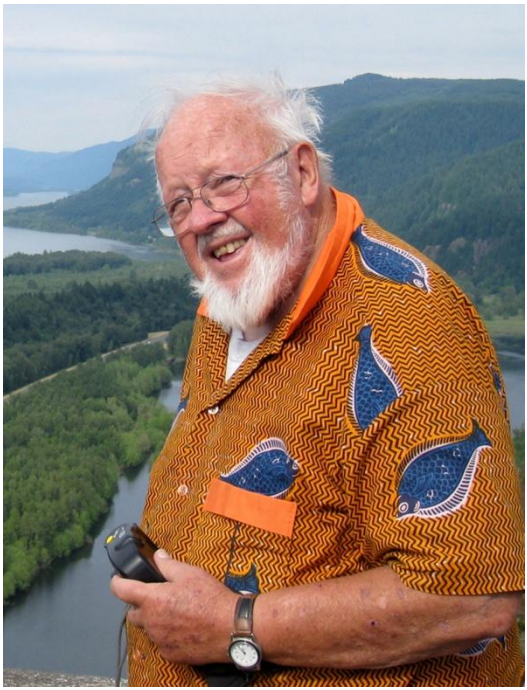
Bruce seemed to be happy in almost any setting, but nowhere more than in the field with students and/or colleagues. He was in his element tending mist nets or setting a rodent trap line on warm desert nights, eating around the campfire with coyotes wailing and grasshopper mice singing nearby. Never did I know him to be more content than during those wonderful times in the Mara or Serengeti where each day we were surrounded by East Africa's vastness and its magnificent megafauna. I introduced Bruce to Africa in 1963, and he, too, became enamored of the continent, returning again and again, to the east, the west, and the south, concentrating on small mammals but delighting in all aspects of its natural history and cultures. And not only Africa; Bruce traveled the world, seeing far more of our planet than most people ever dream of.

Cuisine was an important aspect of Bruce's travels; food never was far from his mind, even in the field (where he customarily saved all carcasses of skinned mice and other critters for his emblematic "varmint stew.") When abroad, he also appreciated native dress, and samples of exotic garb would accompany him home where they were worn often. Diverse headgear from foreign and domestic junkets was featured regularly. One never knew quite what to expect. One yuletide season, a pair of felt

antlers adorned his chapeau as he made his usual holiday rounds. Now, alas, there will be no more such visits, or of those lengthy, uninhibited, shockingly unedited, yet wonderfully revealing Christmas missives that summarized Bruce's invariably eventful year.

If a single word could have described the man, that word was 'jolly'; it conveys his intrinsic good nature and pronounced *joie de vivre*. He exuded friendliness. I knew him well for over half a century, and I never knowingly met a person who truly disliked him. Of course, there were disgruntled students along the way who failed to meet his demanding standards, but even those poor performers respected him. I remember one of our university presidents referring to him as "a good soul," and he was all of that. Although generally easy-going, he could be stubborn, often exasperating, at times irascible, but always lovable. And risibility defined his being; the hearty, infectious laugh was a trademark. It's fitting that among his expressed "last wishes" there be no funeral, no memorial, but a gathering of friends simply to "tell Hayward stories, and laugh."

– *Dale Zimmerman*



Bruce Jolliffe Hayward (April 13, 1928 - August 3, 2011)
Columbia River Gorge, Oregon, June 25, 2011 (*Photograph by Paul Packard*)

* * *

MEMBERSHIP DUES REMINDER

If you have not already paid your 2012 NMOS membership dues, please take a moment to do so now. You can now pay NMOS membership dues and donate to the NMOS on Paypal. You do not need to have a Paypal account and they accept any major credit card. The link to Paypal can be found on the NMOS web site (www.nmbirds.org).

* * *

SAVE THE DATE: NMOS 2012 MEETING

The 50th Annual meeting of the New Mexico Ornithological Society will be held on March 31, 2012, at the Best Western Rio Grande Inn, Albuquerque, New Mexico. Details will be posted on the NMOS web site and in the Bulletin as they become available.

* * *

NEW MEXICO ORNITHOLOGICAL SOCIETY

— Founded 1962 —

The New Mexico Ornithological Society was organized to gather and disseminate accurate information concerning the bird life of New Mexico; to promote interest in and appreciation of the value of birds, both aesthetic and economic, to further effective conservation of the state's avifauna; to facilitate opportunity for acquaintance and fellowship among those interested in birds and nature; and to issue publications as a means of furthering these ends.

Membership and Subscriptions: Membership in the New Mexico Ornithological Society is open to anyone with an interest in birds. Memberships are for a calendar year and annual dues are payable 1 January. Dues are: Regular Membership $20; Family $30; Student $10; Supporting $50; Life $500. Address for the New Mexico Ornithological Society: Post Office Box 3068, Albuquerque, NM 87190-3068.

NMOS BULLETIN

The *Bulletin* is published quarterly; subscription is by membership in NMOS. The *Bulletin* serves two primary purposes: (1) to publish articles of scientific merit concerning the distribution, abundance, status, behavior, and ecology of the avifauna of New Mexico and its contiguous regions; and (2) to publish news and announcements deemed of interest to the New Mexico ornithological community.

NMOS members are encouraged to submit articles and news. Articles received are subject to review and editing. Published articles are noted in major abstracting services. Please submit articles in double-spaced electronic format, such as a Microsoft Word document, by e-mail to the Editor (see inside front cover). Refer to recent issues of the *Bulletin* for examples of style. News items may be submitted to the Editor by way of e-mail.

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