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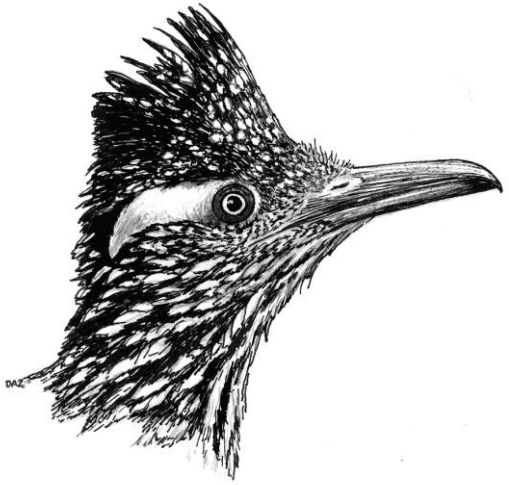

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# FIRST NEW MEXICO RECORD OF THE RUFOUS-CAPPED WARBLER (*BASILEUTERUS RUFIFRONS*) WITH COMMENTS ON THE AVIFAUNA OF GUADALUPE CANYON

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**Abstract**.—We discuss the first New Mexico record of Rufous-capped Warbler (*Basileuters rufifrons*), a bird present in Guadalupe Canyon, Hidalgo County, in January and February 2009. We include a review of the status of this species in the adjacent regions of Arizona, Texas, and Sonora. Recent changes in the avifauna of Guadalupe Canyon are discussed briefly with an emphasis on primarily Mexican species.

Since it was first recorded north of the US/Mexican border in Starr County Texas in 1973, the Rufous-capped Warbler *(Basileuterus rufifrons*) has become an increasingly regular vagrant to the border regions of Texas and Arizona, and there are now approximately 40 records from those two states. However, the proliferation of records from Texas and Arizona was for many years not accompanied by any New Mexico records. The first New Mexico record of Rufous-capped Warbler did not come until 2 January 2009, when an individual was located in Guadalupe Canyon, Hidalgo County, in the extreme southwestern corner of the state. This article provides details of this first state record, reviews the status of the species in regions adjacent to New Mexico, and presents a brief discussion on recent changes in the avifauna of Guadalupe Canyon and the occurrence of various Mexican vagrants there.

## SITE HISTORY AND DESCRIPTION

Guadalupe Canyon supports an avifauna typical of riparian areas of southeastern Arizona and northeastern Sonora that is unique within New Mexico. It is the only location in the state where Violet-crowned

Hummingbird (*Amazilia violiceps*), Northern Beardless-Tyrannulet (*Camptostoma imberbe*), and (until quite recently) Thick-billed Kingbird (*Tyrannus crassirostris*) can be found regularly during summer. The canyon has long been known as a site where a number of bird species that are scarce north of the Mexican border have been recorded (Ligon 1961). Particularly noteworthy past records include the first US record of Buff-collared Nightjar (*Caprimulgus ridgwayi*) (Johnston and Hardy 1959), the first US record of Thick-billed Kingbird (Levy 1959), and the first US nesting record of Violet-crowned Hummingbird (Zimmerman and Levy 1960). Two recent additions to the New Mexico state list - Berylline Hummingbird (*Amazilia beryllina*) in May 1993 (Williams 1993) and Black-capped Gnatcatcher (*Polioptila nigriceps*) in June 2006 (Williams 2007a) - came from Guadalupe Canyon.

Guadalupe Canyon runs downhill from northeast to southwest, starting in extreme southwestern New Mexico and clipping the southeast corner of Arizona before continuing into Sonora. The creek in the canyon often contains water, but is frequently dry during summer. The narrow riparian corridor that is of most interest ornithologically begins at a ranch in New Mexico, runs approximately 3 km to the Arizona border, and continues another 5 km before crossing into Mexico. This riparian corridor is dominated by cottonwoods (*Populus* sp.) and in some places by Arizona sycamores (*Platanus wrightii*). On both sides the riparian woodlands are bordered by usually rather steep slopes with many cliffs and rocky outcroppings, the vegetation including abundant junipers (*Juniperus* sp.) as well as dense growth of mesquite (*Prosopsis* sp.) and other xeric vegetation. A dirt road runs along the entire length of the riparian corridor within the US. In the early 1990s the property owners closed the canyon to most vehicles to promote habitat conservation, so access to the New Mexico portion of the canyon involves parking at a locked gate near the international border and hiking 5 km through Arizona to the state line. The section of the canyon within New Mexico lies at an elevation of approximately 1300 m.

## DISCOVERY AND SUBSEQUENT OBSERVATIONS

On 2 January 2009 Parmeter (hereafter JEP) visited Guadalupe Canyon along with William F. Wittman and A. Lane Leckman to search

for two pairs of Black-capped Gnatcatchers that had been located and photographed the previous week by Baumann (hereafter MJB), Cole J. Wolf, and Nicholas D. Pederson. Shortly after 10:00 (MST), while walking out of the canyon approximately one km downstream from the ranch, JEP saw a small, wren-like bird fly across the road about 0.5 m above the ground and land in brush within the riparian corridor. The bright yellow throat and breast, rufous crown, and white supercillium were noted, and he informed the others present that the bird was a Rufous-capped Warbler. After this viewing, which lasted no longer than five seconds, the bird promptly disappeared without being seen by the others. After approximately five minutes of unsuccessful searching, Wittman played the song of a Rufous-capped Warbler on a DVD player, and the bird responded immediately, flying into view and beginning to sing sporadically. All three birders then observed the bird intermittently over the next 5-10 min as it continued to sing occasionally and sometimes perched in small bare trees up to about 3 m above the ground. The observers then built two small rock cairns to mark the location and continued out of the canyon.

On the afternoon of 3 January Wolf, Pederson, and Jonathan P. Batkin relocated and photographed the bird approximately 200 m downstream from where it was seen on the 2 January (Figure 1). A search of approximately five hours on 4 January by these three observers and two others failed to relocate the bird, but it was found again on 9 January by MJB, Raymond A. VanBuskirk, and William A. Talbot. The bird was next seen by approximately eight observers on 17 January, and reports continued through 12 February. Most observations were in the period from late morning to early afternoon, and all were in the same general area. The area the bird frequented is approximately 1.5 km east of Arizona and 3 km north of Mexico.

## DESCRIPTION

While the Rufous-capped Warbler is distinctive enough that confusion with other species is unlikely, it is still worthwhile to provide a detailed description based on the available photos and the field observations of various observers. Many of the key features mentioned below are visible in Figure 1.

FIGURE 1. Rufous-capped Warbler in Guadalupe Canyon, Hidalgo County, New Mexico on 3 January 2009 (photo by Cole J. Wolf).

The bird was approximately 5-6 inches (12.7-15.2 cm) long with a slender build and a relatively long tail. The tail was constantly cocked upwards, giving the bird its wren-like silhouette. The legs and feet were flesh-colored. The bill was black, quite short, and rather heavy for a warbler, reminiscent of the bill of a small vireo, with a noticeably decurved culmen. The crown and auricular area were bright rufous, the rufous of the crown extending forward to the top of the base of the bill. The crown and auricular patch were separated by a bold, pure white supercillium. The lores and a short narrow line posterior to the eye were black. The throat and breast were unmarked bright yellow, similar to a Yellow-breasted Chat (*Icteria virens*). The yellow throat and rufous auricular patch were separated by a white malar line; Figure 1 shows that

this white extended across the chin below the base of the bill. At the rear of the neck the bird showed a dull grayish rectangular area, extending up behind the auricular patch. The upperparts - back, wings, and upper tail - were uniformly dull greenish-olive without wingbars or other markings. The belly was off-white and was sharply demarcated from the yellow breast. The undertail coverts were clean white.

**Vocalizations**.—As noted above, the bird sang intermittently on 2 January in response to a Rufous-capped Warbler song on a DVD player. The song given was a trill consisting of an estimated 10-15 chip notes. The song accelerated towards the end and rose somewhat in pitch. The bird also gave single chip notes occasionally, and indeed on 2 January Wittman heard the bird chip just before playing the DVD. The chip notes given were of moderate loudness and at least one such note reminded JEP of the chip note of a Northern Cardinal (*Cardinalis cardinalis*).

**Behavior**.—The most obvious consistent feature of the bird's behavior was the persistent tail-cocking, with the tail held at various angles between horizontal and vertical. The bird was quite active. It tended to stay within a few feet of the ground and was often difficult to observe. The bird was observed at least twice on canyon slopes well uphill from the riparian corridor, and based on the difficulty that most observers had in relocating the bird - on 9 and 17 January the birders present looked for at least three hours before finding the bird, and on 4 January those who missed it searched for five hours - it is highly likely that it spent much time on the slopes, descending to the riparian corridor only occasionally and for brief periods. The bird was often silent.

## STATUS

The New Mexico Rufous-capped Warbler record can be placed in context by considering the status of the species in the adjacent regions of Arizona, Texas, and Sonora.

**Arizona**.—The Rufous-capped Warbler was first recorded in Arizona on 9 May 1977 when a singing male was found in Cave Creek Canyon in the Chiricahua Mountains (Monson and Phillips 1981). A female was seen at the same location in July and an abandoned nest with

four eggs was collected on 1 August. The species was seen again in Cave Creek Canyon on 8 April 1978 (Monson and Phillips 1981). Since then there have been at least 13 additional records from southeast Arizona (M. Stevenson, pers. comm..), ranging as far west as the Pajaritos Mountains (Sycamore Canyon) in Santa Cruz County, north to the Santa Rita (Florida Canyon) and Whetstone (French Joe Canyon) mountains, and including records from the Huachuca Mountains and additional records from the Chiricahuas. A bird in lower Sycamore Canyon 16 March to June 1993 may or may not have wintered locally. The first definite winter record was of a bird along the San Pedro River at Hereford, Cochise County 4-30 December 1998. More recently, the species has wintered in French Joe Canyon, where at least one bird was present more or less continuously from 1 November 1999 to 27 June 2004, in Sycamore Canyon 6 December 2005 to 6 July 2006, and in Florida Canyon, where up to three were present beginning 19 December 2008. There is also a 30 November 2002 record from Paradise in the Chiricahuas. Nesting was documented in French Joe Canyon in 2001, 2002, and 2003. Records appear to be on the increase. After the records from Cave Creek Canyon in the late 1970s, the species was not recorded again until 1993, but there were approximately six records in the 1990s. Since 2002, there have been at least eight records.

**Texas**.—As noted above, the first Texas and US record of Rufous-capped Warbler came from the Lower Rio Grande Valley in Starr County, where one bird was below Falcon Dam on 10 February 1973. Since then there have been 24 additional records scattered throughout the year (Peterson and Zimmer 1998; Lockwood and Freeman 2004; M. Lockwood, pers. comm.). There are eight records from the Big Bend area (Brewster County) and six from Val Verde County to the east of Big Bend, making a total of 14 records from the Trans-Pecos Region of Texas. Further east and south along the Rio Grande, there is a record from Webb County as well as the Starr County record. To the north on the Edwards Plateau there are records from Travis, Uvalde (3), Frio, Bexar, Kendall, and Medina counties. An outlying record comes from the Central Coast in Nueces County. The Webb County record is of two birds collected 17 and 19 May 1980 (Arnold 1980); as noted above, these have been identified as belonging to the northeastern most subspecies *jouyi*. Texas winter records come from Brewster, Val Verde

(2), Bexar, Starr, Kendall, Frio, and Nueces counties. The species may have bred in Webb County in 1980 (Arnold 1980). As in Arizona records have been on the increase, with three in the 1970s, three in the1980s, ten in the1990s, and nine from 2000 onwards.

**Sonora**.—The Rufous-capped Warbler is a common to fairly common resident of mountains and foothills in the southern two thirds of eastern Sonora (Russell and Monson 1998). The habitat description given by Russell and Monson—"dry, rocky situations at the edges of canyon bottoms, where riparian plants give way to those of dry hillsides"—is an excellent description of the habitat occupied by the bird in Guadalupe Canyon. Of particular note are records of this species well to the north of the range described above from Arroyo Cajon Bonito in extreme northeastern Sonora. One singing male was found there 13 September 1975, and four singing birds were observed there on 14 May 1976 (Russell and Monson 1998). Arroyo Cajon Bonito lies within approximately 15 km of Guadalupe Canyon, and is thus the closet location to Guadalupe Canyon where the Rufous-capped Warbler has been recorded previously (some records from the Chiricahuas may have been just as close to New Mexico). Russell and Monson state that as of 1998 the species had not been found at Arroyo Cajon Bonito since 1976. However, birding coverage is extremely limited in northern Mexico so the occasional presence of the species there in subsequent years is probably difficult to rule out. More recently, surveys in north central Sonora have found Rufous-capped Warblers at three locations within the Rio Concepcion drainage and one location within the Rio Sonora drainage, all within 125 km of the Arizona border (Flesch 2008). The author noted that this likely indicates that the Rufous-capped Warbler is expanding its range in northern Sonora, but Flesch did not cover areas as far east as Arroyo Cajon Bonita so its current status there is uncertain.

## DISCUSSION

The Rufous-capped Warbler is resident from northern Mexico to northern South America and eight subspecies have been described. As delineated by Clements (2007), these subspecies and their ranges are as follows:

*B. r. caudatus*, northwestern Mexico from Sonora to Durango
*B. r. dugesi*, western Mexico from Sinaloa to Guerrero and Oaxaca
*B. r. jouyi*, northeastern Mexico from Nuevo Leon to Veracruz
*B. r. rufifrons*, mountains of southern Mexico (Puebla) to Guatemala
*B. r. salvini*, southern Mexico (southern Veracruz) to Belize and northern Guatemala
*B. r. delattrii*, southeast Chiapas to the highlands of Costa Rica
*B. r. mesochrysus*, Costa Rica and Panama to northern Columbia and western Venezuela
*B. r. actuosus*, Coiba Island off the Pacific coast of Panama

Based on differences in plumage, structure, and voice, some authorities (e.g. Howell and Webb 1995, Ridgely 1981) consider the last three subspecies to be a distinct species, the "Chestnut-capped Warbler" (*Basileuterus delattrii*). However, this distinction is not recognized by the American Ornithologists' Union (AOU 1983), and we follow the convention of treating all eight forms as conspecific.

The subspecies of the New Mexico bird cannot be determined without a specimen. However, certain subspecies can be ruled out based on the bird's plumage, particularly the whitish belly and undertail coverts. The three subspecies forming the Chestnut-capped Warbler complex—*delattrii*, *mesochrysus*, and *actuosus*—have entirely bright yellow underparts, and can be ruled out. *Salvini* also has much more extensively yellow underparts than the northern forms. The New Mexico bird may thus be *caudatus*, *dugesi*, *jouyi*, or *rufifrons*; plumage and structural differences among these populations are minor and relative (Dunn and Garrett 1997). Of these forms, *caudatus* is the most likely source of records from Arizona and southwest New Mexico based on geographic arguments, but there is no specimen evidence to confirm this. The only two U.S. specimens come from south Texas and have been identified as *jouyi* (Arnold 1980), as would be expected on geographical grounds for vagrants to that area.

Given the previous occurrences of Rufous-capped Warbler in the Chiricahua Mountains and at Arroyo Cajon Bonita, as well as the recent increase in the number of records from Arizona and Texas, the eventual appearance of this species in the New Mexico bootheel was almost expected. Guadalupe Canyon provides habitat similar to that occupied

by this species within Sonora and at the Arizona locations where it has occurred.

Perhaps less anticipated was the appearance of this species in winter. Although there are now multiple winter records from Arizona, these are all relatively recent, and until the late 1990s the Arizona records were heavily concentrated from April to July. That time period corresponds approximately to the period of peak birding activity in southeast Arizona. Recent birding coverage in the New Mexico bootheel has been concentrated heavily in the same months. The occurrence of this bird in January, along with the simultaneous presence of at least two pairs of Black-capped Gnatcatchers, may thus represent a "wake-up call" to New Mexico birders and ornithologists concerning the possibilities of finding Mexican vagrants in the bootheel during winter. At the same time, more winter birding coverage of the bootheel might have been suggested by the occurrence of Mexican vagrants in winter in New Mexico's Rio Grande Valley. For example, New Mexico's first Streak-backed Oriole (*Icterus pustulatus*) was present in Corrales, Sandoval County 9-29 December 2000 (Williams 2007b), and several New Mexico Rufous-backed Robin records come from the Rio Grande Valley in late fall and winter. A number of New Mexico records of Ruddy Ground-Dove (*Columbina talpacoti*) also come from winter, including birds found in Hildalgo County, Grant County, and the Rio Grande Valley.

Compared to southeast Arizona, the New Mexico bootheel suffers both from having less good habitat for Mexican vagrants and from limited public access to what habitat exists. The Animas Mountains and large parts of the Peloncillo Mountains are closed to the public, leaving Guadalupe Canyon and Clanton Canyon in the southern Peloncillos as probably the two premier locations for seeking Mexican vagrants. Since access to the New Mexico portion of Guadalupe Canyon involves a substantial hike through the Arizona portion, birding coverage of the New Mexico portion is limited almost entirely to a small cadre of avid New Mexico birders and ornithologists, along with a handful of resident Arizona birders. Visitors from farther afield are likely to sample only the Arizona portion of the canyon. Even so, the discovery of two first state records in the New Mexico portion of the canyon in the past three years demonstrates the potential of this location and should serve to encourage additional exploration.

While the status of most bird species in Guadalupe Canyon has not changed greatly in the past few decades, there have been a few marked changes. Thick-billed Kingbird, historically uncommon but easily found in the New Mexico portion of the canyon, has gradually declined since the mid-1990s and since 2005 has appeared only sporadically in the New Mexico portion (it still summers regularly in the Arizona portion). The Buff-collared Nightjar has not been found in the New Mexico portion of the canyon since the 1980s (Hubbard 1978; Parmeter et al. 2002), despite a number of nocturnal summer surveys by capable field ornithologists. On the positive side, Gray Hawk, historically rare in the canyon, has recently increased (Williams and Krueper 2008), and several pairs now summer annually in the canyon in both Arizona and New Mexico. The Common Ground-Dove (*Columbina passerina*) has also increased in the canyon since the early to mid-1990s. The Black-capped Gnatcatcher, first noted in the canyon in 2006, may be in the process of becoming resident. Considered together, such changes point to the possibility of additional gradual future changes, perhaps including the discovery of additional vagrants from Mexico.

In closing, it is appropriate to note that at least three species have been reported in Guadalupe Canyon that are not on the list of bird species proven to have occurred in New Mexico. An inactive Rose-throated Becard (*Pachyramphus aglaiae*) nest was found in the Arizona portion of the canyon in 1957 (Monson and Phillips 1981). In addition, three experienced New Mexico birders—Christopher M. Rustay, Michael O. Hilchey, and David J, Krueper—heard (but did not see) a highly probable Rose-throated Becard in the Arizona portion of the canyon within one km of New Mexico on 6-7 August 2006 (D. Krueper, C. Rustay, pers. comm.). Though never fully documented, the Tropical Kingbird (*Tyrannus melancholicus*) has been reported at least twice in the New Mexico portion of the canyon by out-of-state birders since the early 1990s. This species summers regularly at the Slaughter Ranch/San Bernardino National Wildlife Refuge in Cochise County, Arizona (Monson and Phillips 1981; J. Malcolm, pers. comm.; R. Webster, pers. comm.), some 25 km west of New Mexico along the international border. Finally, there is a well-documented recent record of the Rufous-winged Sparrow (*Aimophila carpalis*) from the Arizona portion of the canyon, where Richard Hoyer observed a singing bird approximately 2.5

km from New Mexico on 14 August 2003 (R. Hoyer, pers. comm.). These reports and records suggest that the Rufous-capped Warbler is not likely to be the last interesting ornithological discovery from this location.

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* * *

# SECOND DOCUMENTED NEST OF VARIED BUNTING (*PASSERINA VERSICOLOR*) IN NEW MEXICO

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**Abstract**.—Breeding by the Varied Bunting (*Passerina versicolor*) in New Mexico, a species listed as Threatened in the state, has been little documented. On four occasions between 9 July and 12 August 2008, I collected biological information on an adult pair and their nest in Guadalupe Canyon, Hidalgo County, such as breeding phenology and habitat, and nest and nest site characteristics. This record of nesting by the bunting represents the second reported for New Mexico. Comparisons of my findings to those from the an Arizona study on buntings suggest that nesting habits of New Mexico's western population of Varied Buntings might be similar to populations of the same subspecies (*P. v. dickeyae*) breeding in the adjacent state.

The Varied Bunting (*Passerina versicolor*) is a little desert bunting that occurs primarily in Mexico, but it also can be found breeding in the United States along the southern borders of Texas, New Mexico, and Arizona (Wolfe 1968, AOU 1998, Groschupf and Thompson 1998). Very little information is known about the life history and biology of this species and what is known is primarily derived from study of three breeding populations in Arizona (Wolfe 1968, Groschupf and Thompson 1998).

In New Mexico, the Varied Bunting appears to be a relatively recent addition to the avifauna; the species was not mentioned in Bailey's (1928) *Birds of New Mexico* and was not reported in the state until 1930, when it was 'frequently' seen and heard throughout the week of 20-26 July and four (two males and two females) voucher specimens were collected 20-23 July in Rattlesnake Canyon, Eddy County (Lane 1931). Even with thorough searches in appropriate habitat and season (Ligon

1961), the Varied Bunting was not reported again in New Mexico until 1961, when one or more males were reported 1-30 September from Guadalupe Canyon, Hidalgo County (Hubbard 1978, NMOS 2007). Five decades later, the Varied Bunting continues to summer regularly in both the southeastern (Eddy County) and southwestern (Hidalgo County) parts of the state. The species also has been documented summering regularly in Doña Ana County since the early 1990s (M. Weisenberger, pers. comm.; NMOS 2007). Although there are additional reports of occurrences in Catron, Grant, Luna, Otero, Socorro, and Sierra counties, these are likely of vagrants (NMDGF 2008).

Over its 79-year occurrence in the state, there has been limited evidence of breeding by the Varied Bunting. The first verified breeding dates back to 1972, when a pair with a nest and nestlings were discovered in mid-August in Walnut Canyon, Carlsbad Caverns National Park, Eddy County (Monson 1972, Hubbard 1978, NMOS 2007). Despite frequent sightings of singing males and of co-occurring males and females (Table 1), however, confirmed breeding has been since reported only on four occasions: 1) a pair with fledglings were seen on 26 June 1992 on the San Andres National Wildlife Refuge, Doña Ana County (San Andres National Wildlife Refuge, unpubl. data); 2) a male was observed feeding a juvenile Brown-headed Cowbird (*Molothrus ater*) 18-19 August 1993 in Guadalupe Canyon, Hidalgo County (NMOS 2007); 3) a fledgling was seen with five other individuals on 22 July 2001 south of Guadalupe Canyon, Hidalgo County (NMOSFN 2001); and 4) a pair with fledglings were seen on 15 August 2005 in San Andres Canyon, San Andres Mountains, Doña Ana County (NMOS 2007).

Here, I report the second record of a Varied Bunting nest in New Mexico and compare my findings to those of a study by Groschupf (Groschupf and Thompson 1998) conducted at Chino, Rock Corral, and Montosa canyons in southeastern Arizona in August 1992 and May-September 1993-1995.

## OBSERVATION

While I was completing surveys of state-listed species on land administered by the Bureau of Land Management in Guadalupe Canyon,

TABLE 1. Reports of Varied Buntings (*Passerina versicolor*) suggestive of breeding activity in New Mexico.

| County | Location | Date | Observation |
|---|---|---|---|
| Doña Ana | San Andres National Wildlife Refuge | Jul 1993 [A] | 1 male and 1 female (1 pair?) |
| | San Andres Canyon, San Andres Mountains | May - Jul 2004 [A] | At least one pair |
| | Dripping Springs, Organ Mountains | Jul 2003 [A] | 1 male and 1 female (pair) |
| Eddy | Carlsbad Caverns National Park | | |
| | Unknown Location | Jun - Sep 1962 [A] | Believed to be 1 of nesting pair |
| | Rattlesnake Springs | Jul 1989 [A] | 1 male and 1 female (1 pair?) |
| | Walnut Canyon | Jul 2001 [B, C] | 2 males and 2 females (2 pairs?) and 1 male and 1 female (1 pair?) possibly defending a nest |
| | Rattlesnake Canyon | Jun 2003 [B] | 3 males and 4 females (3 pairs?) |
| | Slaughter Canyon | May 2004 [A] | 1 male and 1 female (pair?) |
| Hidalgo | Guadalupe Canyon | May - Sep 1980-2005 [A, B, D] | Multiple males and females observed, many of which were possible pairs and one of which was observed with food. 1 possible juvenile. |
| | Sycamore Well (Alamo Hueco Mts.) | Jul 1981 [A] | Immature male |
| Grant | Gila Bird Area | Jul 2000 [A] | 1 male and 1 female (1 pair?) |

[A] NMOS (2007)
[B] NMDGF unpubl. data
[C] NMOSFN (2001)
[D] NMOSFN (2002)

Hidalgo County on 9 July 2008, M. Baumann and I found a male-female pair of Varied Buntings. We observed the male of the pair chasing another male, while the female carried nest material to a thicket of vegetation adjacent to a small rocky outcrop (Fig. 1). I searched the area and located the nest at 17:00 (MDT) (latitude 32.350° N, longitude 109.017° W), which was comprised of only a few strands of grass draped across a 3-pronged branch (Fig. 2). I continued to monitor the nest on three more occasions: 10 July (when the nest was almost completely built; Fig. 2), 1 August (when the nest contained four nestlings; Fig. 3), and 12 August 2008 (when the nest no longer contained young). On 12 August 2008, I completed measurements on nest location and vegetation, and I collected the nest, which was donated to the Museum of Southwestern Biology (catalog number MSB 28630). Measurements on nest dimensions were taken in the laboratory after the nest had been collected.

## RESULTS AND COMPARATIVE ANALYSES

**Timing**.—Nesting of the Varied Bunting coincides with the first significant summer monsoon rainstorms (Groschupf and Thompson 1998), which typically begin in New Mexico in early July. In poor rainfall years, Varied Bunting nesting can be delayed until onset of summer monsoon rains in mid-August, but in years with exceptionally cool and wet winters and springs, nesting can begin soon after buntings first arrive on territory in May (Corman and Wise-Gervais 2005). According to precipitation data collected in Rucker, Arizona (latitude 31.761° N, longitude 109.349° W), which is located 53.4 km Northwest of the nest at 1737 m in the Chiricahua Mountains, the first significant rains leading into the 2008 monsoon was on 5 July (Western Regional Climate Center, unpubl. data) (Fig. 4). The timing of these monsoonal rains coincides well with the discovery of the nest on 9 July.

**Habitat**.—The nest was located in a thicket of young western soapberry (*Sapindus saponaria* var. *drummondii*) growing under a 9.5-m-tall hackberry (likely netleaf hackberry, *Celtis laevigata* var. *reticulata*) tree and adjacent to a small rocky outcrop (Fig. 1). The nest was not immediately adjacent to the intermittent stream; rather it was 18 m from the water's edge and located where arid shrubs (e.g., mesquite [*Prosopis* sp.] and

catclaw acacia [*Acacia greggii*]) were found in increasing density. The stream, which flowed on all days that the nest was observed, was lined with a few trees such as large Arizona sycamore (*Platanus wrightii*) and ash (*Fraxinus* sp.). There was little vegetation between the stream and nest but a lush groundcover of grasses and forbs. The habitat was typical for the bunting in the United States, where it prefers dense, shrubby vegetation (e.g., netleaf hackberry and thorn brush such as mesquite) associated with relatively arid canyons and desert washes (Wolfe 1968, AOU 1998, Groschupf and Thompson 1998, Corman and Wise-Gervais 2005).

FIGURE 1. Location of Varied Bunting (*Passerine versicolor*) nest discovered on 9 July 2008 in Guadalupe Canyon, Hidalgo County, New Mexico. The nest site is marked by the arrow. (Photograph by H. Walker.)

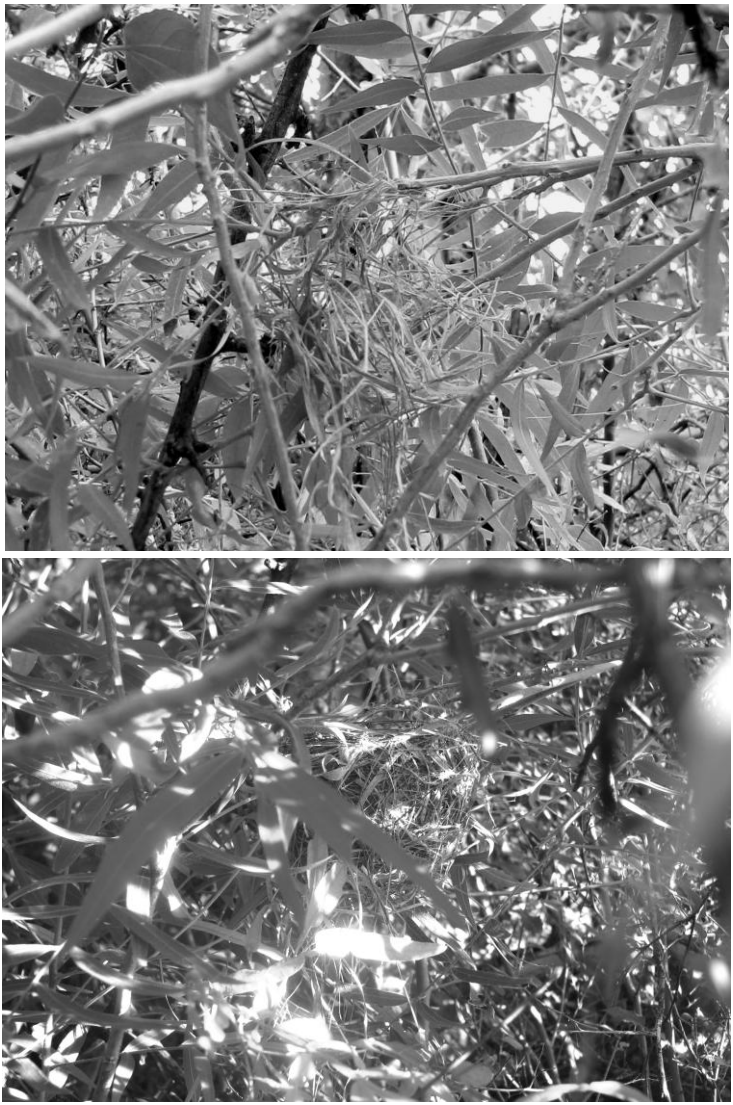

FIGURE 2. Varied Bunting (*Passerine versicolor*) nest in building stage (upper photo) discovered at 17:00 (MDT) on 9 July 2008 and at 11:00 on 10 July 2008 (lower photo) in Guadalupe Canyon, Hidalgo County, New Mexico. (Photographs by H. Walker.)

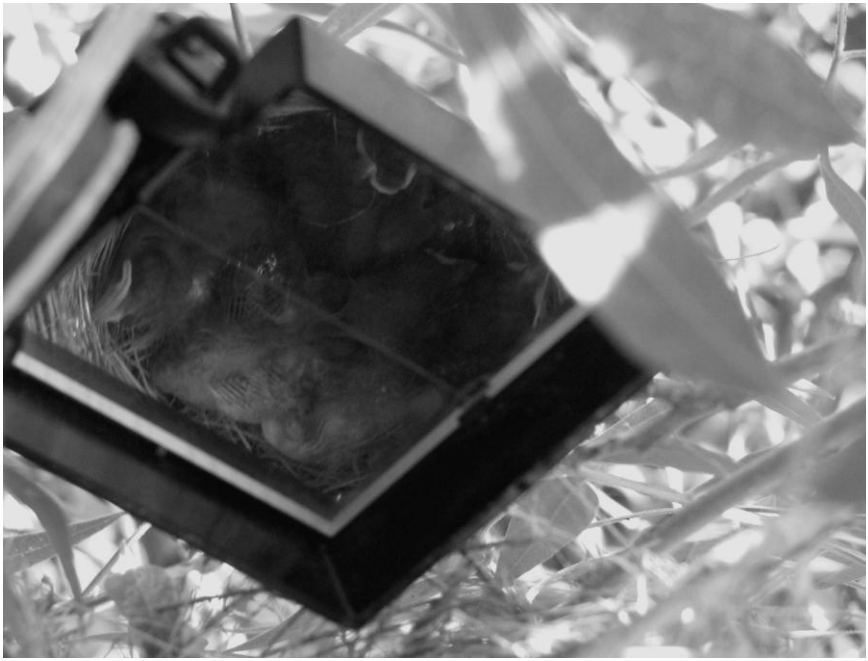

FIGURE 3. Varied Bunting (*Passerine versicolor*) nest (reflected in a compass mirror) with four nestlings on 1 August 2008 in Guadalupe Canyon, Hidalgo County, New Mexico. (Photograph by H. Walker.)

**Nest site characteristics**.—The nest was a cup that hung from three small supporting branches 0.6 m up in a 1.9-m-tall western soapberry (Fig. 2). It was located 1.2 m from the foliage edge and was concealed by western soapberry and/or hackberry on all sides. The placement of the nest on flexible branches that is shaded from above by adjacent branches is similar to that reported by Groschupf and Thompson (1998). In addition, the location of the nest was similar to nests in Arizona, which were built 0.7-1.27 m above ground near the outer edge of 1.5 to 2.5-m-high thorny shrubs (Groschupf and Thompson 1998).

**Nest dimensions**.—As it is likely that the nest successfully fledged young, the dimensions reflect a nest that expanded in response to the

growth of the nestlings. All nest measurements were comparable to those reported by Groschupf and Thompson (1998) (Table 2).

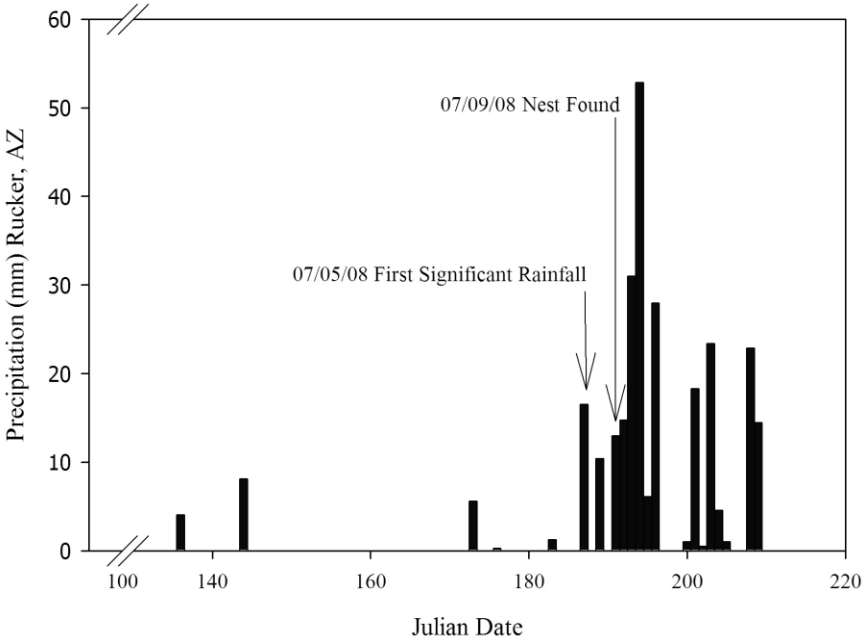


FIGURE 4. Total daily precipitation (mm) at a weather station at Rucker, Arizona from 1 April 2008 (Julian Date 92) to 31 July 2008 (Julian Date 213). The first summer day when significant rainfall fell was on 5 July 2008 and the Varied Bunting (*Passerine versicolor*) nest was found on 9 July 2008 in Guadalupe Canyon, Hidalgo County, New Mexico.

**Nest-building**.—Within the approximately 20 min of observation from about 16:40-17:00 on 9 July, I saw the female twice bring nest material to the nest site while the male perched on guard nearby. This observed division of labor among the sexes is congruent with Groschupf and Thompson's (1998) presumption that only the female builds the nest.

Groschupf and Thompson (1998) report that there is no information on nest construction, particularly on the time of day when building is conducted and the length of time needed to complete the nest. Here, nest building was first observed at 17:00 on 9 July (Fig. 2) and, based on the condition of the nest, it appeared that nest building had begun within the previous few hours. Observation of the nest being almost complete at approximately 11:00 the next day (Fig. 2) indicates that 1) nest construction continued during the remaining daylight hours on 9 July and in the morning hours of 10 July, and 2) the pair took 2-3 days to complete nest construction.

TABLE 2. Dimensions of a Varied Bunting (*Passerina versicolor*) nest found in Guadalupe Canyon, Hidalgo County, New Mexico on 9 July 2008 compared to those of nests monitored by Groschupf (Groschupf and Thompson 1998) at Chino, Rock Corral, and Montosa canyons in southeastern Arizona in August 1992 and May-September 1993-1995.

| **Nest Measurement** | **Guadalupe Canyon (mm)** | **Reported Range (mm) (mean ± SD)** |
|---|---|---|
| Inside Depth | 45.5 | 36-45 (39.56 ± 3.05) |
| Outside Depth | 70 | 55-90 (63.87 ± 11.52) |
| Outside Diameter | | |
| Axis 1 | 65 | 65-82 (74.06 ± 5.17) |
| Axis 2 | 85 | |
| Inside Diameter | | |
| Axis 1 | 59 | 43-63 (50.78 ± 2.92) |
| Axis 2 | 42 | |

**Nest composition**.—Nest composition was not analyzed. The outside of the nest did, however, consist of course blades of grass, similar to nests in Arizona (Groschupf and Thompson 1998).

**Clutch size**.—I did not monitor the nest during incubation, but it is likely that four eggs were laid due to the fact that four nestlings were observed on 1 August (Fig. 3) and no unhatched eggs were found in the

nest on 12 August. A clutch of four eggs is the most commonly reported clutch size (Groschupf and Thompson 1998).

**Disposal of eggshells**.—Similar to as in Arizona (Groschupf and Thompson 1998), no broken eggshells were found in the nest when it was collected on 12 August.

**Feeding**.—During 30 min of observation from 07:50 to 08:20 on 1 August, I watched the female feed (food composition undeterminable) the nestlings three times while the male perched on guard nearby. Groschupf and Thompson (1998) report that the female initially feeds young for the first 3-4 days after hatching and then the male begins to also feed nestlings by day 4 or 5. The young were an estimated 3 days old on 1 August (K. Groschupf, pers. comm; Fig. 3) and, presumably, the male had not begun to feed the nestlings.

**Brooding**.—I flushed the female off of the nest upon approach at 0750 hrs on 1 August and she returned to brood at about 0820 hrs. The male never visited the nest from 07:50 to 08:20. This observation is consistent with Groschupf and Thompson (1998) assertion that only the female broods.

**Nest sanitation**.—On both 1 August and 12 August, the nest was clean and there were no signs of defecation on the nest rim. The female is known to dispose of fecal sacs a distance from the nest as a method of keeping the nest clean (Groschupf and Thompson 1998).

**Nest outcome**.—It is likely that the nest successfully fledged young. The young were an estimated 3 days old when observed on 1 August (K. Groschupf, pers. comm.; Fig. 3) and would have fledged around 8-10 August when approximately 10-12 days old (Groschupf and Thompson 1998). When I visited the nest on 12 August, neither the adults nor the young were detected. However, the nest was intact and the inner diameter appeared to be expanded as the result of supporting large nestlings, suggesting that the nestlings grew to a large stage and were not depredated. Nevertheless, depredation, such as by a snake, cannot be discounted.

## DISCUSSION AND CONSERVATION IMPLICATIONS

On 9 July 2008, I found the second Varied Bunting nest for New Mexico. On that day and three other occasions in the subsequent 34

days, I collected biological information on the nest, such as breeding phenology and habitat, and nest and nest site characteristics. Because no biological information accompanied the report of the first nest discovered in the state (Monson 1972), comparisons could not be made between the first and second nests. Data reported in this paper were, however, found to be similar to those collected on nests studied in Arizona by Groschupf (Groschupf and Thompson 1998).

The dearth of information on populations of Varied Bunting breeding in New Mexico poses a management challenge. Due to its small population sizes, its restricted range, and loss of its required breeding habitat to land conversion, burning, clearing, excessive grazing, and reduced water tables, the Varied Bunting was listed as threatened in New Mexico in 1975 (NMDGF 2008). There is some evidence that the Varied Bunting's range might be expanding in certain parts of the United States (Groschupf and Thompson 1998)—on 1 June 2005, a male was found as far afield as Siesta Key, Florida (Woolfenden and Van Deventer 2006). However, it is unknown what factors influence such expansions and how they are countered by local population declines, such as those that occurred in Brownsville, Texas (Wolfe 1968). In order for management agencies, such as the New Mexico Department of Game and Fish, to make solid conservation recommendations and take well-informed, proactive conservation action to protect the Varied Bunting and its habitat, a better understanding of its distribution and life history requirements in the state is essential. Specifically, more basic biological information, such as breeding habitat requirements and breeding phenology, is needed, as well as information on its population distribution, population densities, and population trends, and which factors influence these populational parameters. It is also critical to ascertain whether aspects of the Varied Bunting's life history differ between New Mexico's eastern (*P. v. versicolor*) and western (*P. v. dickeyae*) populations.

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Sivinski confirmed plant identifications. Kathleen Groschupf verified age of nestlings from the photograph taken on 1 August 2008.

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