



# **BULLETIN**

**OF THE**

## **TEXAS ORNITHOLOGICAL SOCIETY**

**Vol. 45    No. 1-2    December 2012**



**Published by the  
Texas Ornithological Society**

# THE TEXAS ORNITHOLOGICAL SOCIETY

## OFFICERS

**STEVE GROSS**  
PRESIDENT

**JIM HAILEY**  
PRESIDENT-ELECT

**BRYON STONE**  
VICE-PRESIDENT

**DAVID SARKOZI**  
SECRETARY

**SANDI WHEELER**  
TREASURER

**LYNN BARBER**  
PAST-PRESIDENT

**JACK EITNIEAR**  
EDITOR

## MEMBERSHIP

Any person interested in the birds of Texas may become a member of the **Texas Ornithological Society**. Individual membership rates are \$25.00 per year, \$50.00 at the Sustaining level, \$15.00 Student, Family \$35.00, \$400.00 Life and \$500.00 Life w/Spouse. These memberships include print versions of *Texas Birds Annual*, *The Bulletin of the Texas Ornithological Society* and *TOS NEWS*. To become a member send check or money order in U.S. funds with complete name and address to: **Texas Ornithological Society Memberships**, PMB #189, 6338 N. New Braunfels Ave., San Antonio, Texas 78209. Memberships can also be obtained by consulting [www.Texasbirds.org](http://www.Texasbirds.org)

## PUBLICATIONS

*The Bulletin of the Texas Ornithological Society* is an annual<sup>1</sup> journal devoted to the biology and conservation of the birds that occur in Texas and adjacent areas.

*Texas Birds Annual* is published each year and includes new birding areas, recent media, vagrants and noteworthy birds from the previous year, articles on bird conservation issues and species profiles.

*TOS News* is a tri-annual newsletter produced by TOS. Two issues include registration information on TOS meetings and a third includes information promoting membership in the society. An electronic version of the newsletter is available on request.

*Occasional Publication Series* is published on an irregular basis on scientific works too long for publication in the Bulletin. When published it is provided free to all members as an extra benefit of membership during the year of publication.

*Submission to all publications should be e-mailed to: [editor@texasbirds.org](mailto:editor@texasbirds.org)*

**Changes of address and queries about memberships or missing copies: E-mail [TOSmember@texasbirds.org](mailto:TOSmember@texasbirds.org) or submit in writing to the address above.**

## PERMISSION TO COPY

The **Texas Ornithological Society** hereby grants permission to copy articles (in whole or in part) appearing in *The Bulletin of the Texas Ornithological Society (Bulletin)* and *Texas Birds Annual (TBA)* for personal use, or educational and/or personal use, without payment, provided the material reproduced includes the statement “©2011 The Texas Ornithological Society” and contains the full citation, including names of all authors. TOS does not maintain copyright for photographic material therefore does not allow any reproduction of such material without written consent of the photographer. Any use not specifically granted here, and any use of Bulletin or TBA articles or portions thereof for advertising, republication, or commercial uses, requires prior approval from the Editor ([editor@texasbirds.org](mailto:editor@texasbirds.org)).

<sup>1</sup>Starting with Vol. 42 both issues were combined.





Frontispiece. Two subspecies of the Elf Owl, *Micrathene whitneyi*; *M. w. whitneyi* (upper), and *M. w. idonea* (lower). Painted by Mike Ramos from specimens in the Museum of Southwestern Biology, University of New Mexico.

BULLETIN OF THE  
**TEXAS ORNITHOLOGICAL SOCIETY**

**NOTES ON THE ELF OWLS OF TRANS-PECOS TEXAS AND  
ADJACENT COAHUILA AND NEW MEXICO**

Robert W. Dickerman<sup>1</sup> and Andrew B. Johnson

*Museum of Southwestern Biology, University of New Mexico, Albuquerque, New Mexico, 87131*

ABSTRACT.—The history and distribution of Elf Owls (*Micrathene whitneyi*) in western Texas, adjacent northeastern Coahuila, Mexico, and in central and southeastern New Mexico are reviewed based largely on specimen evidence. The range of *Micrathene whitneyi idonea* is extended northward and westward from Hidalgo County in the southern Rio Grande Valley, Texas to Mockingbird Gap at the north end of the San Andres Mountains, Sierra County, New Mexico (a distance of about 1,140 km). This range extension is based on specimens, some of which had been previously identified as *Micrathene whitneyi whitneyi*, as well as on good photographs.

The Elf Owl (*Micrathene whitneyi*) of mainland North America is known from 3 subspecies (AOU 1957): *Micrathene whitneyi whitneyi* (Cooper); type locality (TL): Fort Mojave, Yuma Co., Arizona—southeastern California, southern and western Arizona, northern Sonora, southwestern New Mexico, and the Big Bend region of Texas; *Micrathene whitneyi sanfordi* (Ridgway); TL: Miraflores, Lower California, Cape region of Baja California; and *Micrathene whitneyi idonea* (Ridgway); TL: 8 km from Hidalgo, Hidalgo County, Texas, lower Rio Grande Valley south to the State of Puebla, Mexico. The status of the species in Mexico, except for the extreme northeast, is poorly documented. The nesting ranges are usually described (AOU 1957) or mapped (Henry and Gehlbach 1999) as being disjunct, but they are probably not, and certainly not in the region under study (Fig. 1).

*Micrathene whitneyi whitneyi* was first reported from the Big Bend region of Texas by Quillin (1935), who took a female alive from a nest in the “Lower Juniper Canyon” of the Chisos Mountains of Brewster County, Texas on 21 May 1924.

Sutton took a second specimen (CM 117294; see acknowledgments for museum acronyms) from the Basin of the Chisos Mountains (now Big Bend National Park, BBNP) on 28 April 1935 (Van Tyne and Sutton 1937). Both birds contained an egg about to be laid. Both specimens were identified as *M. w. whitneyi* by H. C. Oberholser.

A specimen in the Sul Ross State University Vertebrate Collection (SRSU 184) was identified as nominate *M. w. whitneyi* by Barlow and Johnson (1967), although identification criteria were not stated. An owl netted 6.4 km S and 4.8 km E of Iraan, Crockett County, Texas on 23 June 1990 was identified as nominate *M. w. whitneyi* and released. Again, identification criteria were not given (Manning and Goetze 1991). La Val (1969) reported taking 2 specimens in nets set for bats in McKittrick Canyon in the pine–oak habitat of Guadalupe Mountain National Park, Culberson County, Texas on 2 and 13 June 1968, respectively.

Elf Owls were found in the Guadalupe Mountains north of Guadalupe National Park by Steve West, who had 2 responses to tapes in Dark Canyon (Fig.

---

<sup>1</sup>E-mail: bobdickm@unm.edu

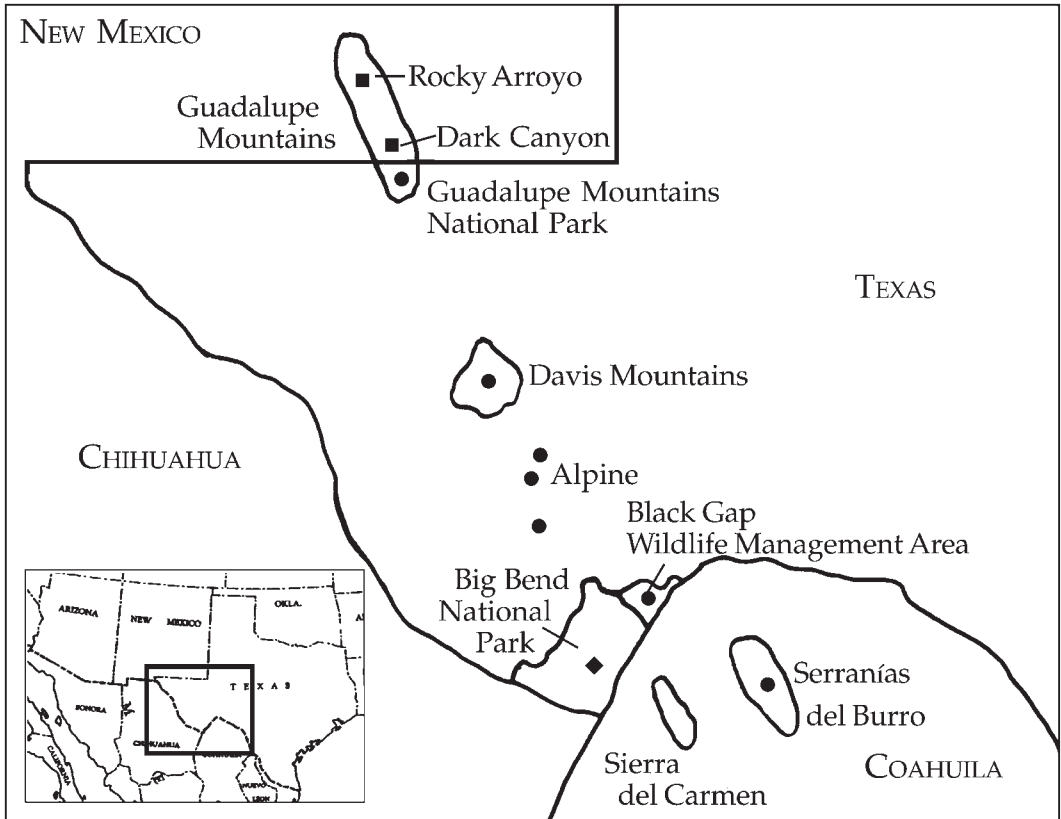


Figure 1. The distribution of specimens of subspecies of Elf Owls in southeastern New Mexico and west Texas, and adjacent Coahuila. ◆ = *M. w. whitneyi*; ● = *M. w. idonea*; ■ = *M. w. (±) idonea (whitneyi × idonea)*.

1), Eddy County. This site is approximately 15 km north-northeast of McKittrick Canyon, at about 1,815 m elevation. Elf Owls were found in nearby Last Chance Canyon by West in June 1998, and adults with 2 young were seen there in July 1999 (Williams 1998, 1999). Dark Canyon is at the lower edge of ponderosa pine (*Pinus ponderosa*) forest, where the pine is mixed with one-seed and alligator junipers (*Juniperus monosperma* and *Juniperus deppeana*, respectively) and gray oak (*Quercus griseus*) on the east slope of the mountains. J. Oldenettel and J. Parmeter heard Elf Owls on 2 May 2001 in a cottonwood (*Populus*

sp.)-lined stretch of Rocky Arroyo, about 1,092 m in elevation and approximately 50 km further to the northeast in Eddy County, New Mexico, which is also on the east slope of the Guadalupe Mountains (Fig. 1).

Elf Owls are known from 2 other areas of central and eastern New Mexico. Stacey (1983) reported them from Water Canyon in the Magdalena Mountains, Socorro Co, where they successfully nested 1 year but, apparently, that population is not present every year. A single specimen of nominate *whitneyi* was taken by J. P. Hubbard at Boone's Draw, northeast of Portales, Roosevelt County, on 3 May 1960.

## METHODS

Specimens in the Sul Ross State University collection, and in other collections, were examined or borrowed (see Appendix) for comparisons with the Museum of Southwestern Biology's (MSB) series of nominate *whitneyi* from Arizona and New Mexico. Borrowed specimens included the paratype of *M. w. idonea* (ANSP41542); the only other spring specimen with full data of *M. w. idonea* available from the lower Rio Grande Valley (TCWC 8125); Laval's specimens (TCWC 7577 and 7578); and the specimens from BBNP (CM 117294, BBNP 4057). The type of *M. w. idonea* (AMNH 80966) had been studied earlier.

Additionally, specimens were collected by the authors from Dark Canyon and Rocky Arroyo in New Mexico and from Black Gap Wildlife Management Area (BGWMA, Fig. 1) and Elephant Mountain Wildlife Management Area in Texas (EMWMA).

Although Saltillo, in southern Coahuila, is outside of the area under study, it must be mentioned that in October 1999, R. W. Dickerman (RWD) saw 7 adults, including 1 taken 2 June 1984 with a nest of chicks on display in the Museo de las Aves in Saltillo; they were collected 11 April to 13 June 1976-1995 in the region of Ramos Arispe, now an industrial suburb of Saltillo. The owls had been found living in the steep walls of narrow "barrancas" and in holes in flowering stalks of *Agave* sp. (Aldegundo Garza de Leon, Director of the Museo, pers. comm.).

In May 2000, RWD visited La Escondida, a cattle ranch in the Serrania de los Burros in northern Coahuila, about 50 km east of Sierra del Carmen where Miller (1955) first reported hearing Elf Owls in Coahuila. Three adult Elf Owls were collected in ponderosa pine-oak habitats; they were deposited in the Museo de las Aves in Saltillo.

Specimens in El Museo de las Aves in Saltillo and those from the Serrania de los Burros were compared with the detailed watercolor of the 2 subspecies, *M. w. whitneyi* and *M. w. idonea*, made by Mike Ramos of Albuquerque using specimens from the MSB (Frontispiece).

## RESULTS

The 2 subspecies are distinguished by the much richer coloration of *whitneyi*; *idonea* essentially lacks the ochraceous markings on the forehead and about the face and chin. The ventral streakings of

*whitneyi* are broader and more diffuse and more richly colored than the narrower, more concentrated streakings of *idonea*. There is a considerable amount of variation within *whitneyi*. Ridgway (1914) and Oberholser (1972) mentioned "brown" and "gray" color phases in *whitneyi*, and Oberholser described them in detail; however, even if the phases exist, *whitneyi* is always more richly colored.

When our review was completed, all specimens from Texas and Coahuila (Appendix), except only the 1935 and the 1968 specimens from BBNP, were identified as *M. w. idonea*! The 1924 specimen taken by Quillin (1935) has not been located, although a photograph of him taken in San Antonio in 1934 with the live bird was provided by Stanley D. Castro (Biological Historian).

Variation among specimens from the Guadalupe Mountains north of Guadalupe National Park must be commented on. The adults collected in Dark Canyon on 21 June 2000 were so pale, when compared to 3 *idonea* collected on 6 April 1999 on the BGWMA, that RWD returned to Dark Canyon on 25 April 2001 and collected an early migrant before the plumage became worn and faded. The April 2001 specimen was as pale as the June 2000 birds, and the possibility existed that a distinct population occurred in the mountains north of the National Park, difficult as that was to accept. However, a fifth specimen taken 22 June 2003 showed definite intermediacy between *whitneyi* and *idonea*, so that idea was abandoned. The 3 birds taken in Rocky Arroyo were all identified as *M. w. idonea* × *whitneyi*.

A photograph of a nesting bird from Mockingbird Gap at the north end of the San Andres, Sierra County, New Mexico (Dickerman et al. 2010) was identified as *idonea*, which extended the range of that subspecies some 1,140 km northwest of the documented range in Starr, Hidalgo and Cameron counties in southern Texas. Whether this is indeed a range expansion (as postulated by Barlow and Johnson 1967, Stacey et al. 1983, Williams 1997, Henry and Gehlbach 1999), or whether it has been overlooked for years is in question. The existence of an incipient subspecies in the Guadalupe Mountains might be an indication of the latter.

## ACKNOWLEDGMENTS

We would like to thank the curators of collections where Elf Owls were studied or borrowed: Academy of Natural Sciences, Philadelphia, Pennsylvania

(ANSP); American Museum of Natural History, New York, New York (AMNH); Big Bend National Park, Texas (BBNP); Carnegie Museum Natural History, Pittsburgh, Pennsylvania (CM); Museo de los Aves, Saltillo, Mexico; Museum of Southwestern Biology, Albuquerque, New Mexico (MSB); San Angelo State (Natural History Collections), San Angelo, Texas (ASNHC); Sul Ross State University Vertebrate Collection, Alpine, Texas (SRSU); Texas Cooperative Wildlife Collection, Texas A&M University, College Station, Texas (TCWC); and the University of Arizona Collection of Birds, Tucson, Arizona (UAZ).

RWD thanks Bonnie McKinney, who shared her knowledge of Elf Owls in BGWMA, and Mike Pittman for permission to collect on the BGWMA and the EMWMA; Roberto and Chavela Sellers for their hospitality at La Escondida; and Aldegundo Garza de Leon for his hospitality in Saltillo.

Specimens in El Museo de las Aves in Saltillo (Fig. 2.) Stanley D. Casto (Biological Historian, Rtd.) provided the historical photograph of R. W. Quillin with the first Elf Owl taken in Trans-Pecos, Texas; Greg Lasley (via Texas Parks and Wildlife Department) provided the color photographs of the bird taken in Big Bend National Park, and Doug Burkett (White Sands Missile Range) kindly provided photographs of the bird and its habitat at Mockingbird Gap. Mike Ramos painted for us what we consider the best-detailed illustration of the species to date (Frontispiece).

Sartor O. Williams III, Steve West, and Jerry Oldenettel provided us with information on the distribution of the species in southeastern New Mexico. The Texas Department of Parks and Wildlife, the New Mexico Department of Game and Fish, and the U. S. Fish and Wildlife Service provided collecting permits.

Finally, we appreciate the efforts of the several reviewers including Frederick R. Gehlbach, Daniel Gibson, and especially John P. Hubbard in reading and commenting on earlier drafts of this paper. J. E. Harden edited the final version, many thanks!

#### LITERATURE CITED

- AMERICAN ORNITHOLOGISTS' UNION (AOU). 1957. Check-list of North American birds, 5th Edition. American Ornithological Union, Baltimore, Maryland.
- BARLOW, J. C., AND R. JOHNSON. 1967. Current status of the Elf Owl in Southwestern United States. *Southwestern Naturalist* 12:331-332.
- DICKERMAN, R. W., A. B. JOHNSON, AND J. D. LIGON. 2010. Elf Owls. *In* *Raptors of New Mexico*. J-L. E. Cartron, Editor, Univ. New Mexico Press, Albuquerque, New Mexico.
- HENRY, S. G. AND F. R. GEHLBACH. 1999. Elf Owl (*Micrathene whitneyi*). *The Birds of North America*. No. 413.
- LA VAL, R. K. 1969. Records of birds from McKittrick Canyon. *Bulletin. Texas Ornithological Society* 3:24.
- MANNING, R. W. AND J. R. GOETZE. 1991. First record of *Micrathene whitneyi whitneyi* east of the Pecos River, Texas. *Texas Journal Science* 43:103-104.
- MILLER, A. H. 1955. The avifauna of the Sierra del Carmen of Coahuila, Mexico. *Condor* 57:154-178.
- OBERHOLSER, H. C. 1972. *Birdlife of Texas*. University of Texas Press, Austin.
- QUILLIN, R. W. 1935. New bird records from Texas. *Auk* 52:324-325.
- STACEY, P., R. D. ARRIGO, T. C. EDWARDS, AND J. N. JOSTE. 1983. Northeastern extension of the breeding range of the Elf Owl in New Mexico. *Southwestern Naturalist* 28:99-100.
- RIDGWAY, R. R. 1914. *Micropallas whitneyi idonea*. birds of North and Middle America. *Bulletin U. S. Natural Museum* 50:807.
- VAN TYNE, J. AND G. M. SUTTON. 1937. The birds of Brewster County, Texas. University Michigan, Museum Zoology, Miscellaneous Publication 37:1-115.
- WILLIAMS, S. O., JR. 1997. New Mexico Region. *Natural Audubon Society Field Notes* 51:1032-1036.
- WILLIAMS, S. O., JR. 1998. New Mexico Region. *Field Notes* 52:487-490.
- WILLIAMS, S. O., JR. 1999. New Mexico Region. *North American Field Notes* 53:418-420.

#### APPENDIX

Specimens of *Micrathene whitneyi* ssp. examined from western Texas and southeastern New Mexico. All specimens are adults. (Museum abbreviations are found in Acknowledgments.)

*M. w. whitneyi*—**TEXAS**: CM 117294. Brewster County, Big Bend National Park, Chisos Mountains, The Basin, 28 April 1935; BBNP 4057. Brewster County, Big Bend National Park, 10 May 1968.

*M. w. idonea*—**TEXAS**: AMNH 80966, Hidalgo County, 5 mi. "from" Hidalgo, 6 April 1889 (Type); ANSP 44542, Cameron County, Brownsville, 14 March 1894 (Paratype); TCWC 8125, Hidalgo County, 5 mi. E of L Joya, 3 April 1969 (Topotype); MSB 20241, Starr County, La Grulla, 9 November 1979 (Topotype); SRSU 127, [Brewster County], Alpine, 23 mi. S Babcock Ranch [no date = prior to 1966]; SRSU 184, [Brewster County] Alpine, 23 mi.



S. Calamity Creek Bridge, 8 May 1966; SRSU 1149, Brewster County, Candelaria, 13 mi. NNE, Musgrove Canyon, Chambers Ranch, 1 August 1985; SRSU 1319, Jeff Davis County, Alpine, 10 mi. N (Hwy. 118), 12 April 1987; SANHC 23199, Brewster County, Alpine, 24 April 1977; MSB 21278, MSB 21279, MSB 21280. Brewster County, Marathon, 20 mi. SSE Black Gap Wildlife Management Area, 7 April 1999; TCWC 7577, TCWC 7588 (alcoholic), Culberson County, Guadalupe Mountain National Park, McKittrick Canyon, 13 June 1968. **NEW MEXICO:** AMNH 853214, Eddy Co., Guadalupe Mountains, Dark Canyon, 21 June 2000; MSB 22625, 22626, Eddy County, Guadalupe Mountains,

Dark Canyon, 21 June 2000; MSB 23199, Eddy County, Guadalupe Mountains, Dark Canyon, 25 April 2001; MSB 23837, Eddy County, Guadalupe Mountains, Dark Canyon, 22 June 2003; MSB 24536, Eddy County, Guadalupe Mountains, Rocky Arroyo, 16 May 2004.

*M. w. whitneyi* × *M. w. adonea*—**NEW MEXICO:** MSB 24820, Eddy County, Guadalupe Mountains, Dark Canyon, 3 May 2003; MSB 24410, Eddy County, Guadalupe Mountains, Dark Canyon, 31 March 2004; MSB 24539, Eddy County, Guadalupe Mountains, Dark Canyon, 3 May 2005; MSB 24535, 24537, Eddy County, Guadalupe Mountains, Rocky Arroyo, 3 May 2005.



Figure 2. Dorsal and ventral views of *Micrathene whitneyi whitneyi* (left two), and *Micrathene whitneyi idonea* (right two). Blue labeled bird is a topotype, taken in fresh plumage, used to show how little difference wear there is over a few months.

# ORDER AND CHAOS: NORTHERN BOBWHITE PRODUCTIVITY AND NEST-HABITAT RELATIONSHIPS IN SOUTH TEXAS

Kyle A. Brazil,<sup>1,2</sup> Leonard A. Brennan,<sup>1,3</sup> Fidel Hernández<sup>1</sup>  
Bart M. Ballard,<sup>1</sup> and Fred C. Bryant<sup>1</sup>

<sup>1</sup>Caesar Kleberg Wildlife Research Institute, Texas A&M University – Kingsville, TX 78363

**ABSTRACT.**—There are few examples in the ornithological literature that link elements of habitat structure with aspects of demography such as annual productivity. We used the Northern Bobwhite (*Colinus virginianus*) to examine relationships between habitat and productivity in South Texas during 2 breeding seasons (May – September) of differing precipitation and heat: 2004, (a relatively wet and cool breeding season where the Palmer Drought Severity Index [Palmer Drought Index hereafter] ranged from +3.0 to +4.0) and 2005 (a relatively hot and dry breeding season where the Palmer Drought Index ranged from -1.9 to -2.9). During 2004 we observed that Northern Bobwhite productivity was strongly correlated with an increasing gradient of bunchgrass availability that provided suitable nesting cover; 67% of the variance in bobwhite productivity was explained using a quadratic function of this habitat variable. However, this orderly relationship collapsed into apparent chaos during the hot and dry 2005 nesting season, despite the presence of adequate nesting cover on the same sites.

The search for links between population productivity of a species and characteristics of its habitat is an important aspect of ornithology. Unfortunately, published studies that document relationships between population performance and habitat factors are relatively rare in the literature. Two of the best examples that link habitat and demography involve Florida Scrub-jays (*Aphelocoma coerulescens*; Breininger et al. 1998) and the Northern Spotted Owl (*Strix occidentalis*; Franklin et al. 2000). Franklin et al. (2000) hypothesized that relationships between the demography of birds and aspects of their habitat could take at least 3 different forms: a linear model, a pseudothreshold model, or a quadratic model; they concluded that the quadratic model seemed to provide the best fit for their data.

We approached this issue with the idea that the Northern Bobwhite (*Colinus virginianus*) would be a model species for examining potential relationships between population productivity and habitat. This *r*-selected species has been studied over a broad geographic range (Guthery 1997, Brennan 1999, Guthery 2002, Guthery and Brennan 2007), and as

such, a vast inventory of natural history information (Hernández et al. 2002) is available for inductive inference. Although Northern Bobwhites have declined drastically across much of its geographic range (Brennan 1991, 1999, Hernandez et al. 2013), it remains relatively abundant across a broad area of South Texas, especially compared to most other regions. In South Texas, the Northern Bobwhite exhibits a wide range of temporal and spatial population productivity (Hernández et al. 2002, Hernández et al. 2007, Tri et al. 2013) across vast expanses of suitable habitat (Fulbright and Bryant 2002).

Numerous studies have attempted to explain the wide variation in annual productivity of Northern Bobwhites in South Texas. These studies have attributed such variation to rainfall (Kiel 1976, Lehmann 1984, Giuliano and Lutz 1993, Hernández et al. 2005, Tri et al. 2013), the interaction of rainfall and temperature (Heffelfinger et al. 1999, Guthery et al. 2002), and the influence of weather along with biotic and abiotic factors such as habitat and soils (Leopold 1945, Rice et al. 1993, Lusk et al. 2002). Nevertheless, despite this effort, a clear relationship

---

<sup>2</sup>E-mail: Leonard.Brennan@tamuk.edu

<sup>3</sup>Current Address: National Bobwhite Conservation Initiative, University of Tennessee Institute of Agriculture, 1400 Independence Ave, Room 3616, Washington, D.C. 20250.

between specific habitat factors and annual population productivity has yet to be established for the Northern Bobwhite in South Texas in particular and elsewhere in general (Guthery and Brennan 2007).

The goal of this study was to gain a first approximation of how Northern Bobwhite productivity varied in relation to a range of habitat conditions in South Texas. Our specific objectives were to: 1) examine relationships between productivity (based on juvenile:adult age ratios) and aspects of nest-habitat structure to determine if any of the 3 approaches described by Franklin et al. (2000) would be applicable to Northern Bobwhites in South Texas, and 2) use these relationships to develop a simple quantitative model that uses habitat data to explain variation in annual population productivity. We hypothesized that there would be a positive relationship between Northern Bobwhite productivity and the availability of nest-habitat structure, and like the findings of Franklin et al., (2000) a quadratic linear relationship would provide the best model fit to explain the variation in such a relationship.

## METHODS

### *Study Area*

We collected Northern Bobwhite productivity and habitat data in the sand sheet region around Premont, Hebronville, Falfurrias, and Encino, Texas in Brooks and Jim Hogg counties (Brazil 2006). Soils ranged from clays to sandy loams that were calcareous to slightly acidic (Gould 1975).

The climate where we conducted the study is subtropical, subhumid-to-semiarid (Norwine and Bingham 1986). Summers (May through September) are usually hot and dry and winters are mild. Mean monthly air temperatures range from 15°C to 29°C during summer. Average annual precipitation is typically less than half the potential evapotranspiration (Norwine and Bingham 1986). Thus, we used the Palmer Drought Severity Index (hereafter Palmer Drought Index) as a combined measure of precipitation, heat, and evapotranspiration to document the differences between the relatively wet breeding season (May – September) 2004 (where the Palmer Drought Index ranged from +3.0 to +4.0) and the relatively dry breeding season of 2005 (where PDSI ranged from -1.9 to -2.9; Palmer [1965], [www.ncdc.noaa.gov/oa/climate/research/drought/palmer-maps](http://www.ncdc.noaa.gov/oa/climate/research/drought/palmer-maps)).

Vegetation in the study area was dominated by *Prosopis-Acacia* species, and bunchgrasses such as seacoast bluestem (*Schizachyrium scoparium* var. *littorale*), brownseed paspalum (*Paspalum plicatulum*), crinkleawn (*Trachypogon secundus*), yellow Indiangrass (*Sorghastrum nutans*), switchgrass (*Panicum virgatum*), and tanglehead (*Heteropogon contortus*) among others (Gould 1975).

### *Data Collection*

We obtained quail wings from hunter-harvested Northern Bobwhites donated by members of the South Texas Quail Associates Program, a group of cooperating ranchers and hunting-lease holders distributed across South Texas (Brazil 2006). A minimum of 300 wings were collected from each of the 9 ranches during each hunting season. We separated wings into 2 age classes, juvenile (hatch-year) and adult (after hatch-year) for the 2004-2005 and 2005-2006 hunting seasons (November through February). We determined age class by examining the primary coverts and the outer 2 primaries (9 and 10) as described by Leopold (1939).

We collected habitat measurements on nine ranches during May through September 2004 and 2005. We compared these habitat data to age ratios derived from the 2004-2005 and 2005-2006 hunter donated wings, respectively. Thus, we assumed that the habitat conditions during the 2004 breeding season (May-September) were responsible for the productivity estimates obtained from the 2004-2005 hunting season, and similarly for the 2005 breeding and hunting seasons (2005-2006).

We chose general locations of vegetative transects with input from managers who showed us where the most birds were harvested on each ranch. We chose this approach to measure habitat variables from areas where the bobwhite age ratio data were acquired (i.e., we sampled vegetation on areas where the most birds were harvested).

We sampled vegetation on all ranches along three 1,000 m transects at each ranch. We sampled vegetation on a circular plot with a 30 m radius every 100 m (center to center), with 10 plots/transect. We subjectively located a random starting point for each transect. From each starting point, we determined the location of the first plot by selecting a random compass bearing, and then selecting a random distance between 0 and 100 m along this bearing. If the trajectory of this bearing went through impenetrable brush or in a direction that

caused the transect to be located beyond the ranch property boundaries, we selected a new random bearing. We placed subsequent plots every 100 m along the bearing. The habitat variables that we measured included modified versions of the disc of vulnerability and cone of vulnerability developed by Kopp et al. (1998), % bare ground (Daubenmire 1959), woody plant density, and bunchgrass density.

The disc of vulnerability is an index of exposure to ground predators (Kopp et al. 1998) that search for Northern Bobwhites and their nests. We used a visual obstruction board, placed at the center of the plot, with the bottom 15 cm painted fluorescent orange to represent the height of a quail to determine the visual obstruction at the point. We recorded visual obscurity at a distance of 12 m (Kopp et al. 1998) along 8 compass radii. We took the reading from the height of a kneeling observer (height = 1 m). We recorded usability for each direction as a 1 (fully usable) if the bottom 15 cm of the visual obstruction board was totally obscured from view, or a 0 (fully unusable) if any part of the bottom 15 cm of the board was visible.

The cone of vulnerability is an index of exposure to aerial predators (Kopp et al. 1998) that attack Northern Bobwhites. We measured the visual obstruction angle (hereafter angle of obstruction) along 8 compass radii. We used a 2-m pole to aim at the top of the vegetation obstruction that created the highest angle of obstruction along each radius. We placed a clinometer on the side of the pole to determine the angle. We used the mean angle to determine the volume of airspace from which a raptor would have an unobstructed path to a bobwhite. We assumed Northern Bobwhites were vulnerable within a radius of 100 m as suggested by Kopp et al. (1998). We used the average angle of obstruction as a general measure of protection from aerial predators. Kopp et al. (1998) measured the cone in used vs. random points on the landscape. We measured the cone of vulnerability from the center of a randomly placed vegetation plot only.

Northern Bobwhites forage directly on bare soil where they obtain seed and insect foods from this substrate and where they are usually protected by some kind of a matrix of herbaceous or low-shrub canopy. We measured bare ground (%) using a 2 × 5 dm sampling frame (Daubenmire 1959). We measured percent bare ground 12 times/plot. We took these at 10, 20, and 30 m within the plot along the 4 cardinal directions.

Woody plant density can serve a number of functions as Northern Bobwhite habitat for escape and/or thermal cover. We recorded the number of suitable woody plants/quadrant of the plot. We defined a suitable woody plant from the standpoint of Northern Bobwhite habitat as a woody plant  $\geq 2$  m in height and  $\geq 2$  m in diameter, with sufficient canopy cover to mitigate high temperatures and enough vegetation at ground level to provide screening cover for escaping or avoiding predators. This is consistent with the model of motte diameter presented in Guthery (1999).

Northern Bobwhites prefer to use clumps of bunchgrasses as a nesting substrate (Lehmann 1984). We therefore recorded the number of suitable bunchgrass clumps in four, 2-m belt transects along the 4 cardinal directions. We made no attempt to classify bunchgrass clumps by species. Our emphasis instead was in regard to suitable structure. F. Hernández (unpublished data) documented average dimensions of bunchgrass clumps used for bobwhite nesting in South Texas as 25 cm × 25 cm. Therefore, we used this measurement to define the minimum size of a suitable bunchgrass nesting clump. See Brazil (2000) for additional details about sampling and data collection

#### *Data Analysis*

After plotting habitat variables in relation to annual estimates of productivity, we performed a series of regression analyses using SAS (SAS Version 9.1, 2003). We explored which type of regression model (i.e., simple linear, quadratic, etc.) to examine and which one, if any, best explained the variation in productivity in relation to habitat.

## RESULTS

Northern Bobwhite productivity, based on juvenile:adult age ratios in the 2004-2005 hunting bag, was positively correlated with suitable nest clump density during summer 2004 ( $r^2 = 0.67$ , Fig. 1a). We found that fitting a 3<sup>rd</sup> order quadratic function resulted in the highest  $r^2$  values for these data. Productivity in 2004 ranged from 2.27:1.0 to 4.51:1.0 juvenile:adult ratios, and generally increased with increasing nest clump density up to approximately 920 suitable nesting clumps/ha (372/ac), where a threshold appeared to be reached and productivity declined (Fig. 1a). There was a weak negative correlation between the density of woody cover and productivity ( $y = -0.0033x +$

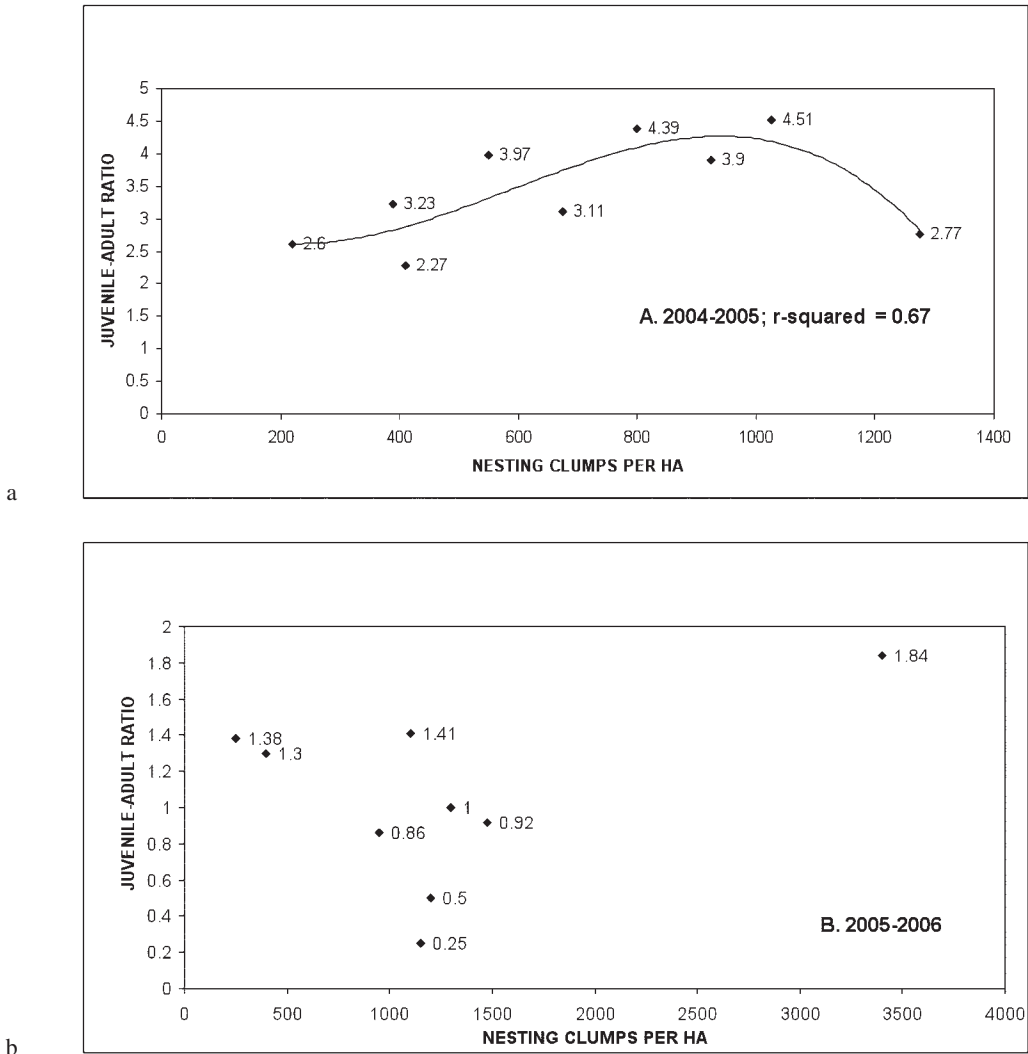


Figure 1. A. Relationship of suitable bunchgrass nesting clump density (number/ha) measured in South Texas in May-September 2004 to productivity (juveniles:adult) obtained from hunter-harvest sample (a) in 2004-2005 hunting season, (b) 2005-2006 hunting season. Note: a regression model was not fitted to 2005 data because it was not biologically relevant.

4.4107,  $r^2 = 0.24$ ) and angle of obstruction and productivity ( $y = -0.0815x + 5.9211$ ,  $r^2 = 0.33$ ). There was no predictable relationship between disc of vulnerability and productivity ( $r^2 = 0.04$ ) or % bare ground and productivity ( $r^2 = 0.07$ ).

Age ratios from hunter-harvest data from all 9 study sites decreased during the second year (2005-2006, mean juvenile:adult ratio = 1.05) compared to 2004-2005 (where mean juvenile:adult ratio = 3.41). During the 2005 breeding season, there was no biologically relevant relationship, other than a

seemingly chaotic one (thus we did not fit a model to the data) between suitable nest clump density and productivity (Fig 1b), nor were there significant relationships between productivity and any of the other habitat variables sampled during 2005 such as woody cover density and productivity ( $r^2 = 0.001$ ) or angle of obstruction and productivity ( $r^2 = 0.02$ ).

## DISCUSSION

We designed this project as a first approximation of how Northern Bobwhite productivity might be

related to a range of habitat conditions in South Texas. The positive relationship between suitable bunchgrass density and productivity of bobwhites that we observed in 2004 was similar to the quadratic function model posed by Franklin et al. (2000) that also explained how habitat covariates influence demographics of Northern Spotted Owls. Thus, our research hypothesis that there would be a positive relationship between nest-habitat structure (i.e., bunch grass clump density) and productivity, and that the model of this relationship would be best explained by a quadratic function was supported. However, this relationship was not upheld by our Northern Bobwhite data from the 2005 breeding season. Apparently the wide variation in South Texas rainfall from one year to the next overwhelmed the influence of available nest habitat on annual productivity. The relatively predictable, ordered pattern that we observed in the 2004 breeding season turned to a chaotic one during 2005.

During 2004, a year of above average rainfall, an increasing gradient of suitable bunchgrass nesting clumps explained more than two-thirds of the variation in productivity. Areas with relatively high bunchgrass densities are positively related to productivity of Northern Bobwhites during years with sufficient precipitation—up to a point—after which productivity seems to decline. A possible reason for the leveling off and decline in productivity in areas with extremely thick bunchgrasses during 2004 is probably related to loss of usable space (Guthery 1997) due to inaccessibility of the area for Northern Bobwhite adults and broods. This was apparently the threshold where habitat structure probably became too thick at ground level to provide usable space for Northern Bobwhites. Guthery's (1986) recommendation of  $\geq 618$  clumps/ha (250/ac) is on the low end of the usable range of suitable bunchgrass nesting clump density indicated by our study.

South Texas entered a period of below average precipitation in 2005. Despite low precipitation, bunchgrass densities were higher on most sites in 2005 than 2004, mostly due to under-grazing by livestock, yet there was a complete departure from the predictable relationship between nest clump density and productivity that we observed in the 2004 data. These results are consistent with the observations by Hernández et al. (2005) that nearly 100% of Northern Bobwhite hens in the breeding population nested during years of above-average precipitation, but only about 50-60% of the hens nested during periods of below-average precipitation.

Evidently, during the relatively wet 2004 breeding season, Northern Bobwhites were able to capitalize on the presence of widespread and suitable nesting cover on at least a subset of the ranches we studied. In contrast, during the hot and dry 2005 breeding season, the relatively low proportion of breeding hens were not able to use the complete range of available nesting habitat in a predictable and consistent manner. Thus, development of a generalized mathematical model that can predict the relationship between annual Northern Bobwhite productivity and elements of its habitat remains elusive (Guthery and Brennan 2007), especially for years when drought or near-drought conditions persist. The rapidity with which relationships between Northern Bobwhite productivity veered between order (2004) and apparent chaos (2005) lends credence to Lehmann's (1984:3) assertion that Northern Bobwhites in South Texas persist in an "Unstable Utopia". Such extreme variation of nesting productivity from one year to the next, points to the critical need for managers to maintain nesting-habitat for Northern Bobwhites even during drought years so that productivity can be maximized when precipitation finally returns.

#### ACKNOWLEDGMENTS

The following people are thanked by KAB for their help and support: Janice Brazil, Max Brazil and Estel "Buck" Brazil. Financial assistance was provided to KAB by the Richard M. Kleberg, Jr. Center for Quail Research, South Texas Quail Associates Program, South Texas Chapter of Quail Coalition, the Houston Safari Club, and the Fort Worth Sportsmen's Club. Jason LaRue and Marie Cline helped as summer technicians; Erin Wehland and Joseph Sands also assisted in the field. Students in The Texas A&M University – Kingsville Chapter of The Wildlife Society, fellow graduate students, and Tina Martin-Nims helped sort quail wings in 2004 and 2005. E. Redeker helped with preparation of maps and GIS resources. We are indebted to the ranch owners, lessees, and managers who allowed access to their properties. We thank the following managers for their guidance and assistance: Marc Bartoskewitz, Ronnie Howard, Will Naylor, Bart DuPont, David Grall, Bill Davis, and Davey Miguera. This is publication number 13-107 from the Caesar Kleberg Wildlife Research Institute. Leonard Brennan was supported by the C. C. Charlie Winn Endowed Chair and F. Hernandez was supported by the Alfred Glassell Jr. Endowed Professorship in the Richard M. Kleberg, Jr. Center for Quail Research.

## LITERATURE CITED

- BRAZIL, K. A. 2006. Northern Bobwhite productivity and habitat relationships in South Texas. Thesis. Texas A&M University-Kingsville, Kingsville.
- BREININGER, D. R., V. L. LARSON, B. W. DUNCAN, AND R. B. SMITH. 1998. Linking habitat suitability to demographic success in Florida scrub-jays. *Wildlife Society Bulletin* 26:118-128.
- BRENNAN, L. A. 1991. How can we reverse the Northern Bobwhite population decline? *Wildlife Society Bulletin* 19:544-555.
- BRENNAN, L. A. 1999. Northern Bobwhite. (*Colinus virginianus*) *The Birds of North America*. No. 397.
- DAUBENMIRE, R. 1959. A canopy coverage method of vegetation analysis. *Northwest Science* 33:43-65.
- FRANKLIN, A. B., D. R. ANDERSON, R. J. GUTIÉRREZ, AND K. P. BURNHAM. 2000. Climate, habitat quality, and fitness in northern spotted owl populations in northwestern California. *Ecological Monographs* 70:539-590.
- FULBRIGHT, T. E. AND F. C. BRYANT. 2002. The last great habitat. Caesar Kleberg Wildlife Research Institute, Kingsville.
- GIULIANO, W. M. AND R. S. LUTZ. 1993. Quail and rain: what's the relationship? *Proceedings of the National Quail Symposium* 3:64-68.
- GOULD, F. W. 1975. Texas plants—a checklist and ecological summary. Texas A&M University, Agricultural Experiment Station, College Station.
- GUTHERY, F. S. 1986. Beef, brush, and bobwhites: quail management in cattle country. Caesar Kleberg Wildlife Research Institute Press, Texas A&I University, Kingsville.
- GUTHERY, F. S. 1997. A philosophy of habitat management for Northern Bobwhites. *Journal of Wildlife Management* 61:291-301.
- GUTHERY, F. S. 1999. Slack in the configuration of habitat patches for Northern Bobwhites. *Journal of Wildlife Management* 63:245-250.
- GUTHERY, F. S. 2002. The technology of bobwhite management. Iowa State Press, Ames, Iowa, USA.
- GUTHERY, F. S. AND L. A. BRENNAN. 2007. The science of quail management and the management of quail science. Pages 407-420 in L. A. Brennan, Editor. *Texas quails: ecology and management*. Texas A&M University Press, College Station.
- GUTHERY, F. S., J. J. LUSK, D. R. SYNATZSKE, J. GALLAGHER, S. J. DEMASO, R. R. GEORGE, AND M. J. PETERSON. 2002. Weather and age ratios of Northern Bobwhites in South Texas. *Proceedings of the National Quail Symposium* 5:99-105.
- HEFFELFINGER, J. R., F. S. GUTHERY, R. J. OLDING, C. L. COCHRAN, AND C. M. McMULLEN. 1999. Influence of precipitation timing and summer temperatures on reproduction of Gambel's quail. *Journal of Wildlife Management* 63:154-161.
- HERNÁNDEZ, F., L. A. BRENNAN, S. J. DEMASO, J. P. SANDS, AND D. B. WESTER. 2013. On reversing the Northern Bobwhite population decline: twenty years later. *Wildlife Society Bulletin*, 37:000-000. In Press.
- HERNÁNDEZ, F., F. S. GUTHERY, AND W. P. KUVLESKY. 2002. The legacy of bobwhite research in South Texas. *Journal of Wildlife Management* 66:1-18.
- HERNÁNDEZ, F., J. A. ARREDONDO, F. C. BRYANT, L. A. BRENNAN, AND R. L. BINGHAM. 2005. Influence of precipitation on demographics of Northern Bobwhites in southern Texas. *Wildlife Society Bulletin* 33:1071-1079.
- HERNÁNDEZ, F., R. M. PEREZ, AND F. S. GUTHERY. 2007. Bobwhites on the South Texas plains. Pages 273-298 in L. A. Brennan, Editor. *Texas quails: ecology and management*. Texas A&M University Press, College Station.
- KIEL, W. H. 1976. Bobwhite quail population characteristics and management implications in south Texas. *Transactions of the North American Wildlife and Natural Resources Conference* 41:407-420.
- KOPP, S. D., F. S. GUTHERY, N. D. FORRESTER, AND W. E. COHEN. 1998. Habitat selection modeling for Northern Bobwhites on subtropical rangeland. *Journal of Wildlife Management* 62:884-895.
- LEHMANN, V. W. 1984. Bobwhites in the Rio Grande Plain of Texas. Texas A&M University Press, College Station.
- LEOPOLD, A. S. 1939. Age determination in quail. *Journal of Wildlife Management* 3:261-265.
- LEOPOLD, A. S. 1945. Sex and age ratios among bobwhite quail in southern Missouri. *Journal of Wildlife Management* 9:30-34.
- LUSK, J. J., F. S. GUTHERY, R. R. GEORGE, M. J. PETERSON, AND S. J. DEMASO. 2002. Relative abundance of bobwhites in relation to weather and land use. *Journal of Wildlife Management* 66:1040-1051.
- NORWINE, J. AND R. BINGHAM. 1986. Frequency and severity of drought in South Texas: 1900-1983. Pages 1-17 in R. D. Brown, editor. *Livestock and wildlife management during drought*. Caesar Kleberg Wildlife Research Institute, Kingsville, Texas.
- PALMER, W. C. 1965. Meteorological drought. Research Paper No. 45. U.S. Weather Bureau, Washington, D.C.
- RICE, S. M., F. S. GUTHERY, G. S. SPEARS, S. J. DEMASO, AND B. H. KOERTH. 1993. A precipitation-habitat model for Northern Bobwhites on semiarid rangeland. *Journal of Wildlife Management* 57:92-102.
- SAS INSTITUTE 2003. Version 9.1. SAS Institute, Cary, North Carolina.
- TRI, A. N., J. P. SANDS, M. C. BUELOW, D. WILLIFORD, E. M. WEHLAND, J. A. LARSON, K. BRAZIL, J. B. HARDIN, F. HERNANDEZ AND L. A. BRENNAN. 2013. Impacts of weather on Northern Bobwhite sex ratios, body mass, and annual production in South Texas. *Journal of Wildlife Management* 77:579-586. In Press.

# EVALUATION OF CAPTURE TECHNIQUES FOR LONG-BILLED CURLEWS WINTERING IN TEXAS

Marc C. Woodin<sup>1,2,3</sup>, Mary Kay Skoruppa<sup>1,4</sup>, Jeremy W. Edwardson<sup>1,5</sup>, and Jane E. Austin<sup>6</sup>

<sup>1</sup> U.S. Geological Survey, Columbia Environmental Research Center, Texas Gulf Coast Field Research Station, Corpus Christi, TX 78412-5838

<sup>6</sup> U.S. Geological Survey, Northern Prairie Wildlife Research Center, Jamestown, ND 58401

**ABSTRACT.**—The Texas coast harbors the largest, eastern-most populations of Long-billed Curlews (*Numenius americanus*) in North America; however, very little is known about their migration and wintering ecology. Curlews are readily captured on their breeding grounds, but experience with capturing the species during the non-breeding season is extremely limited. We assessed the efficacy of 6 capture techniques for Long-billed Curlews in winter: 1) modified noose ropes, 2) remotely controlled bow net, 3) Coda Netgun, 4) Super Talon net gun, 5) Hawkseye whoosh net, and 6) cast net. The Coda Netgun had the highest rate of captures per unit of effort (CPUE = 0.31; 4 curlew captures/13 d of trapping effort), followed by bow net (CPUE = 0.17; 1 capture/6 d of effort), whoosh net (CPUE = 0.14; 1 capture/7 d of effort), and noose ropes (CPUE = 0.07; 1 capture/15 d of effort). No curlews were captured using the Super Talon net gun or a cast net (3 d and 1 d of effort, respectively). Multiple capture techniques should be readily available for maximum flexibility in matching capture methods with neophobic curlews that often unpredictably change preferred feeding locations among extremely different habitat types.

The Long-billed Curlew (*Numenius americanus*), the largest shorebird species in North America (Fig. 1), once ranged widely across grasslands of the United States, but its distribution has contracted dramatically in the eastern half of North America (Dugger and Dugger 2002). This change is attributed primarily to excessive harvest from past market hunting and loss of grasslands in the breeding range (Dugger and Dugger 2002, Fellows and Jones 2009). The Texas coast now harbors the largest, eastern-most populations of wintering Long-billed Curlews in North America (Dugger and Dugger 2002). The species has been designated as a bird of conservation concern and focal species by the U.S. Fish and Wildlife Service (2008), a species of concern by several states, and a highly imperiled species in the U.S. Shorebird Conservation Plan.

Canada has a variety of designations as well, including species of special concern and blue listed. Uncertainties abound about curlew population affiliations among winter, migration, and breeding areas, as well as factors limiting curlew populations (Dugger and Dugger, 2002).

Investigations of the winter and migration ecology of Long-billed Curlews in the Central Flyway are almost unknown, aside from 1 study of birds wintering in arid, inland grasslands of Nuevo León, Mexico (Olalla-Kerstupp 2010). Furthermore, little is known of the winter ecology, migration pathways, and breeding ground affiliations of curlews wintering in coastal Texas (Fig. 2), considered 1 of the main wintering areas for Long-billed Curlews in North America (Dugger and Dugger 2002). Acquisition of these types of

<sup>2</sup>Present Address: Aythya Environmental, 145 Montclair Dr., Corpus Christi, TX 78412

<sup>3</sup>E-mail: marc.woodin@gmail.com

<sup>4</sup>Present Address: Athene Environmental, 5376 Paloma Tr., Robstown, TX 78380

<sup>5</sup> Present Address: Texas A&M University-Kingsville, Caesar Kleberg Wildlife Research Institute, Kingsville, TX 78363





Figure 1. Foraging Long-billed Curlew.

data will be facilitated greatly by capture and marking of birds on the winter range, followed by re-sighting reports of birds to which bands, tags, or radios have been attached.

Studies involving movements and migration of breeding adults and young birds have proliferated because breeding Long-billed Curlews are caught readily on the nest (e.g., Redmond and Jenni 1982, Dugger and Dugger 2002). However, far more uncertainty remains about the effectiveness of capture methodologies for curlews on their winter range, a circumstance which continues to inhibit studies of their winter movements and migration patterns. The purpose of our study was to assess the efficacy of various techniques for the capture of Long-billed Curlews on the wintering grounds.

#### METHODS

Our study was conducted in Refugio, Nueces, and Kleberg counties in the Gulf Coast Prairies and Marshes Ecoregion of Texas (Texas Parks and Wildlife Department 2005, modified from Gould et al. 1960). We conducted our evaluation of techniques in 3 habitat types: barrier island beach, urban and suburban mowed grassland, and harvested agricultural fields. Beach habitat (forebeach/surf and back beach, with associated coppice dunes) on Padre Island was

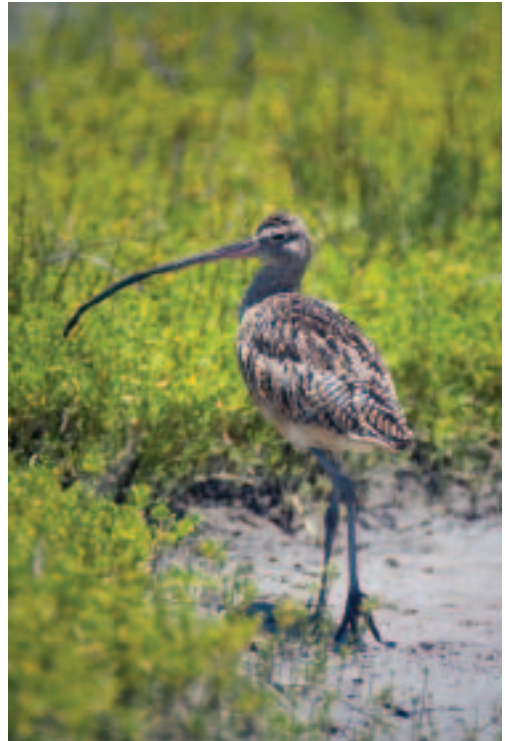


Figure 2. Long-billed Curlew in Texas coastal marsh.

characterized by washed up mats of brown alga (*Sargassum* spp.), beach debris, and sparse vegetation, including morning glory (*Ipomoea pes-caprae* and *I. stolonifera*) and coastal panicgrass (*Panicum amarum*). On gulf beaches, Long-billed Curlews occurred as lone individuals, never in small flocks.

Long-billed Curlews also occurred in open residential neighborhoods, undeveloped commercial property lots, city parks, golf courses, and other mowed grasslands, many of which received regular human use. Curlews found in open spaces in urbanized areas generally occurred in small foraging flocks of about 6-24 birds, although we rarely encountered 1 or 2 individuals. These urban and suburban areas were often small (< 1 ha) areas with few or no trees, and ranged from sparsely vegetated mixes of forbs and grasses to monotypic stands of exotic grasses. Grass height rarely exceeded 15 cm.

We also encountered Long-billed Curlews in agricultural landscapes, characterized by fallow, tilled fields (mostly unvegetated, but some with stubble) and narrow strips of mowed grass along roads, trails, and drainage ditches. We typically found curlews in agricultural areas in very loosely organized flocks of  $\leq$  12-15 birds.

Curlews also can occur in salt marsh and saline lake habitats, sometimes in concentrations of hundreds of birds, but we did not attempt extensive capture efforts in these habitats because of limited camouflage opportunities, high potential for human disturbance, and access limitations. We did not attempt captures at nocturnal roost sites to avoid disturbance to communally roosting curlews and to minimize risk of injury to densely clustered birds.

We evaluated 6 capture techniques: 1) modified noose ropes, 2) remotely controlled bow net, 3) Coda Netgun, 4) Super Talon net gun, 5) Hawkseye whoosh net, and 6) cast net. We considered, but rejected for several reasons, evaluation of mist nets, walk-in traps, drop nets, and rocket nets. We also evaluated the use of curlew decoys and bait (earthworms and giant mealworms) for capture efficiency. Capture teams for all 6 techniques consisted of 2-3 individuals. All techniques were approved by the Animal Care and Use Committee (U.S. Geological Survey, Northern Prairie Wildlife Research Center). Federal and state permits for trapping, handling, and banding of Long-billed Curlews were obtained from the Bird Banding Lab (U.S. Geological Survey) and Texas Parks and Wildlife Department.

### Noose Ropes

Mehl et al. (2003) successfully used leg-hold noose mats to capture wintering shorebirds, and Olalla-Kerstupp (2010) captured wintering Long-billed Curlews in Mexico using similar noose carpets. We used noose carpets modified by attaching nooses made of monofilament (5.4 kg test, low visibility green) along camouflage-colored nylon ropes 2-3.5 m long. Nooses were 8-18 cm in circumference and spaced about 4 cm apart along ropes. Lead fishing weights (454 g) were attached to each end of a rope.

We herded curlews (Hicklin et al. 1989) after we placed noose ropes in fields perpendicular to foraging curlews' projected paths. In general, we placed noose ropes about 20-30 m ahead of where we considered the foraging routes for curlews to be; we used multiple noose ropes to increase the probability of snagging a curlew's foot. For example, ropes sometimes were arranged in a 2  $\times$  2 pattern, with 2 noose ropes placed linearly, their ends about 10-15 cm apart, while the other 2 noose ropes were arranged similarly, but about 1 m behind the first 2 ropes. A successful capture required a noose to close tightly around the toe or foot as a bird moved forward. The weights at the ends of the rope prevented the bird from flying away until it could be secured safely in hand.

We improved the noose rope design by gluing 5-cm sections of clear plastic drinking straws at the base of nooses to keep them upright, thereby increasing the likelihood of ensnaring a curlew in a noose. However, curlews approaching an array of noose ropes frequently changed direction and walked around the ends of the noose ropes. Sometimes curlews would hop or fly over noose ropes, only to resume foraging a short distance (1-2 m) on the other side, indicating that the birds were detecting and avoiding the ropes and nooses. To counter this problem, we painted the straws a sandy color to camouflage their appearance and scattered grass clippings or sand over and/or alongside the rope, further decreasing the visibility of the noose ropes. We eventually used noose ropes only in fields with sufficient thatch and/or grass to conceal the noose rope outlines (Fig. 3). We also limited the use of noose ropes to cloudy or overcast days. Even after these modifications in our use of noose ropes, curlews often walked directly over noose ropes they encountered while foraging. We used noose ropes 15 d in attempts to capture Long-billed Curlews.

### Bow Net

The bow net (Northwoods Limited, Rainier, WA) was a 152-cm diameter nylon net mounted on a circular, folding aluminum frame. Open bow nets (forming a half-circle) were staked to the ground (Fig. 4) and activated to close by a crew member using a battery-operated remote trigger from a distance of about 30-50 m. Curlews were neophobic to newly placed bow nets, so we installed a dummy bow net (permanently secured in the open position) at the foraging site for up to 3 wk to habituate curlews to its presence. We also baited the dummy bow net with about 2 dozen earthworms or giant mealworms when curlews were foraging nearby. When curlews began to associate with the baited dummy bow net, we replaced it with a baited, remotely controlled bow net. We used bow nets 6 d in attempts to capture Long-billed Curlews.

### Coda Netgun

The Coda Netgun (Coda Enterprises, Inc., Mesa, AZ) has been used successfully to capture shorebirds (Mittelhauser et al. 2006), wading birds (Herring et al. 2008), and waterfowl (Mechlin and



Figure 3. Noose ropes set in projected path of Long-billed Curlews foraging in an undeveloped lot within municipal limits, Corpus Christi, TX. Concealment of noose ropes and filaments was aided by use of thatch.



Figure 4. View of bow net rigged for release by remote control unit. For successful capture, a curlew must be located within the other half of the circular configuration of the trap, formed when the trap is sprung. To minimize injury to curlews, care must be taken to avoid springing the trap shut when birds could be pinned beneath the outer metal frame.

Shaiffer 1980). The Coda Netgun (Fig. 5) uses blank rifle cartridges (light load, .308 caliber) to propel a square 4 m  $\times$  4 m nylon net (tensile strength 18-36 kg; mesh size 7 cm  $\times$  7 cm) and 4 stainless steel weights (227 g each, one at each corner) over the bird(s).

The Coda Netgun can be successful, but there is a chance of injury or mortality to birds struck by a net weight. Mittelhauser et al. (2006) reported that 7 of 216 Purple Sandpipers (*Calidris maritima*) (3%) captured with the Coda Netgun were killed and 6 (3%) were injured. Mittelhauser et al. (2006) captured birds by shooting the net at large flocks of sandpipers in flight, thereby endangering birds located near the trajectory of the net's weighted corners. In our study, Long-billed Curlews tended to forage widely in small, loose groups, which reduced the chance of injury from the net. Furthermore, individual birds frequently separated from other birds in the flock. We targeted those birds with the Coda Netgun when they were within



Figure 5. Coda Netgun and operator. This method of capture was the most successful technique we evaluated, but it also had most potential for disturbance, because of loud discharge.

the optimal range, which was 5-15 m distance and 0-10 m above the ground (Herring et al. 2008). We shot the Coda Netgun in a variety of ways, including pursuing the target while on foot, hiding behind objects, from an elevated platform, inside a slow-moving vehicle, and from a sitting position in the bed of a slow-moving pickup truck. In stationary situations, an assistant herded the curlews toward the shooter's concealed location. We used the Coda Netgun 13 d in attempts to capture Long-billed Curlews.

#### *Super Talon Net Gun*

The Super Talon net gun (hereafter referred to as Talon) (Advanced Weapons Technology, Inc., La Quinta, CA) is a hand-held net gun that used compressed CO<sub>2</sub> cartridges to launch a circular net. The net was 4.8 m in diameter and launched at a speed of about 5 m/sec. The Talon was used on foot or from a vehicle (Fig. 6) in the same manner as the Coda Netgun. We used the Super Talon net gun for 3 d in attempts to capture Long-billed Curlews.

#### *Whoosh Net*

The whoosh net (Hawkseye Nets, Virginia Beach, VA) was a 7.6 m × 4.8 m net with a mesh size of 6 cm × 6 cm. The whoosh net was propelled by bungee cords released under tension by an observer holding a long trigger line. The release activated the net, which was propelled very quickly from the ground outward at a 45° angle along two 2.5-m guide poles (Fig. 7). We placed the whoosh net in



Figure 6. Super Talon net gun and operator. This method of capture was far less of a disturbance than the Coda Netgun when discharged, but it was underpowered, resulting in a reduced effective range.

fields with foraging curlews. We used the herding technique to push curlews toward the whoosh net to increase the chances of a bird entering the target zone. The probability of success with a whoosh net



Figure 7. Whoosh net used in an open lot, Corpus Christi, TX. Among the capture methods we evaluated, this method probably has the most potential for trapping  $\geq 1$  bird per attempt, because of the large net area.

increased if it was placed where foraging curlews were forced to concentrate as they funneled through a bottleneck created by habitat edges (e.g., unmowed grass or other dense cover) or other obstacles. We also arranged leafy tree trimmings along each side of the whoosh net to form a barrier or drift fence, forcing curlews to enter the target area of the whoosh net. This technique worked best with 3 people, 2 to gently drive birds toward the net (to prevent them from walking around the net and drift fences), and a third person about 25-30 m away from the net to pull the trigger line when 1 or more birds entered the target area. We used the whoosh net 7 d in attempts to capture Long-billed Curlews.

#### *Cast Net*

The cast net was a hand-held circular net (2.4-m diameter) with numerous small weights attached to the perimeter. We evaluated cast nets due to our ability to approach foraging curlews in urban environments to within very short distances. Many flocks of wintering Long-billed Curlews were habituated to human presence and tolerated close approaches by humans; this was especially true

in city parks, open spaces around churches and schools, or in undeveloped residential lots where walkers and joggers shared the space with wintering Long-billed Curlews. A person carrying the cast net advanced slowly toward curlews and indirectly (in an erratic, zigzag pattern) toward a foraging or resting curlew. The person quickly cast the net toward the bird when within casting distance (about 4 m away). We used a cast net for 1 d in attempts to capture Long-billed Curlews.

#### *Decoys and Bait*

Hunters in the 19th and early 20th centuries thought Long-billed Curlews were wary, but decoys easily brought birds into shooting range (Wickersham 1902, Forbush 1916, Oring 2006). We used curlew decoys (Knutson's Recreational Sales, Inc., Brooklyn, MI) in combination with noose ropes, bow net, and whoosh net to attract or provide confidence to Long-billed Curlews near a trap. We placed 1 or more decoys near a trap and noted any reaction to decoys by Long-billed Curlews. We also used earthworms and giant mealworms in combination with noose ropes and bow nets to attract curlews to a trap.

#### *Measure for Evaluation of Capture Methods*

We chose to use number of birds captured per day of capture effort to standardize an evaluation measure among the 6 capture methods. We defined day of capture effort as 1 day when we used any of the 3 passive methods (i.e., noose ropes or bow or whoosh nets) or the 3 active pursuit methods (Coda Netgun, Super Talon net gun, or cast net) in attempts to capture curlews. We chose this measure (rather than number of captures per triggered or thrown net or discharged net gun) for several reasons. First, it could be used to compare all 6 capture methods despite their very dissimilar field methodologies. Secondly, the neophobia exhibited by curlews toward bow and whoosh nets required a lengthy time for birds to habituate, which was not an issue with other capture methods. Also, curlews exhibited highly variable tolerance in different habitats toward humans on foot or in vehicles; they were especially tolerant of people and cars in urban and residential areas. Finally, different social organization by curlews among their foraging habitats (i.e., single birds along gulf beaches and flocks in urban settings and agricultural areas) created different likelihoods of capture across multiple habitats, while also posing distinctly different challenges.

## RESULTS

We captured 7 Long-billed Curlews during winter 2010–2011 (Fig. 8). Four of 6 capture techniques were used successfully in capturing at least 1 curlew each: Coda Netgun (4), noose ropes (1), bow net (1), and whoosh net (1). Of the 4 successful capture techniques, the Coda Netgun had the highest rate of captures per unit of effort (CPUE) (0.31; 4 curlew captures/13 d of trapping effort). The bow net and whoosh net had capture rates of 0.17 (1 capture/6 d of effort) and 0.14 (1 capture/7 d of effort), respectively. The noose ropes were the least efficient of 4 successful techniques, with a capture rate of 0.07 (1 capture/15 d of effort). However, the use of noose ropes was undergoing continual modification in our study. No curlews were captured using the Talon (3 d of effort) or cast net (1 d of effort).

We captured 4 curlews with the Coda Netgun using a vehicle as a blind. The vehicle was stationary during 1 capture, when the curlew walked within range of the Coda Netgun without herding. In the other 3 instances, the vehicle was driven slowly alongside curlews to bring a curlew within range of the Coda Netgun. The curlews moved slowly away

from the road with the approach of a vehicle, but in some cases, 1 or more remained within range of the Coda Netgun. Although we made many attempts at herding curlews toward a shooter in a parked vehicle, the curlews usually avoided the vehicle, and such efforts were never successful in capturing a bird.

Deployment of noose ropes resulted in the capture of 1 Long-billed Curlew. Several other curlews were nearly captured, as well, but they escaped when the noose ropes failed to hold them.

We captured 1 curlew using a bow net baited with giant mealworms. This capture was the result of approximately 3 wk of preparation (prior to the capture event) designed to lure curlews to the trap. Herding curlews in the direction of the bow net was sometimes helpful. We had to carefully orchestrate the timing of bait placement with movements of foraging curlews so they discovered the bait before other bird species; Killdeer (*Charadrius vociferous*) and meadowlarks (*Sturnella* spp.) were especially troublesome as bait thieves. Baiting had to be repeated at least twice for the curlews to recognize that food was available at the bow net. One curlew was observed defending the bow net from conspecifics; Killdeer also were observed defending the bait at a bow net against conspecifics. Once the armed bow net replaced the dummy net over the bait, we captured a curlew quickly (within 10–15 min). However, later attempts to repeat the capture technique failed, probably because a period of 2 wk had elapsed before we again attempted to lure birds to the bow net. Several near captures of other curlews occurred.

We made several attempts to capture curlews with a whoosh net, but we caught only 1. The successful capture occurred at an installed net left in place overnight. When curlews arrived to forage the next day, only 5–10 min of preparation was needed to capture the bird. In other efforts, we were not successful in herding curlews into the target area of the net, or our disturbance during assembling the whoosh net (set-up time of about 30 min) caused curlews feeding in the area to relocate elsewhere.

We tested the Talon multiple times in urban environments and on the beach. It was fired from a slow-moving vehicle, approaching the bird on foot, and once from a natural blind. Although this type of net gun was smaller and quieter than the Coda Netgun, we failed to capture a curlew with it because of its weak power, short range, and limited accuracy in windy conditions.



Figure 8. Long-billed Curlew being handled after successful capture.

Attempts to capture curlews with a cast net quickly demonstrated its limitations. Despite several close approaches and accurate and rapid throws, the curlew always flew away before the cast net could reach it. Even birds that appeared to be resting were wary enough to easily escape this trap.

Results for the use of decoys varied, but in general, the birds initially were attracted to decoys and would land 10-15 m from them. However, after spending a few sec in the company of a decoy, the curlews became alarmed and left. Since the objective of the decoys in the capture evaluation was not only to attract the curlews to a site, but also to give them confidence around the traps, the decoys proved to be ineffective for our needs.

None of the 7 Long-billed Curlews captured during this project were injured or killed. No individual appeared to suffer from capture myopathy, and all were released successfully via a “soft” release from a holding box (Fig. 9). Six of 7 were sighted after their release foraging with other curlews, and the 1 that was not re-sighted was the last captured of the season, and close to the time curlews were departing the region. No curlews were injured during any of the failed capture attempts.

## DISCUSSION

We successfully captured Long-billed Curlews in winter without injury or evidence of capture myopathy using a variety of techniques. The Coda Netgun proved the most useful technique overall, and it was most efficient in capturing birds in urban settings and on the beach (Fig. 10). Advantages of the Coda Netgun are: 1) it does not require time-consuming preparatory efforts at a particular site and 2) it is more adaptable to a variety of habitats or situations where birds can be approached by vehicle or on foot to within 15 m. An important aspect to successfully capturing a bird with the Coda Netgun is the careful loading of the net into the basket to ensure that the net opens fully each time it is fired. The greatest limitation to the Coda Netgun in capturing wintering Long-billed Curlews was noise. When discharged, the Coda Netgun sounds identical to a rifle (and is similar in appearance to a shotgun), therefore giving a false, and potentially alarming, perception to the public. Coordination with landowners, neighborhood residents, and local law enforcement was necessary prior to most trapping trips, and many opportunities to capture a curlew



Figure 9. Release of Long-billed Curlew after capture and banding.



Figure 10. Field crew with Long-billed Curlew captured using the Coda Netgun on the beach at Padre Island National Seashore, TX.

were not attempted due to the presence of curlews in locations too sensitive to use this device.

Application of other techniques was made relatively inefficient by the neophobic responses of Long-billed Curlews to the introduction of novel items to their foraging areas. Neophobic reactions by curlews to noose ropes, nets, and traps of all types meant that these capture techniques had to be accompanied by patience and a trial-and-error approach. Our experiences indicated that these capture methods must be used when time at sites is not tightly constricted, so that biologists can adapt the available capture methodologies to local circumstances, habitats, and curlew behavior.

Although curlews can be captured using noose ropes or mats, as demonstrated by Olalla-Kerstupp (2010) and this study, we did not approach the exceptional levels of success reported by Mehl et al. (2003) in using noose mats to capture Snowy Plovers (*Charadrius nivosus*) and several other species of small-bodied shorebirds. Wintering Long-billed Curlews often avoided the noose ropes despite attempts to camouflage and conceal the rope and monofilament. When a curlew did walk over a

noose rope, the curlews' toes rarely caught a noose, or the noose did not close quickly or efficiently enough to capture the bird. However, the use of straws to hold monofilament nooses more erect, so the nooses were about the height of the bird's breast (Gratto-Trevor 2004), increased the effectiveness of the nooses. The effectiveness of noose ropes in capturing neophobic Long-billed Curlews can be enhanced by limiting their deployment to completely overcast days in fields with sufficient thatch and/or grass to conceal noose rope outlines.

Olalla-Kerstupp (2010) captured 5 wintering Long-billed Curlews in 5 d using noose mats in Mexico. Her level of success may have been higher than in our study because limited water sources in northeastern Mexico likely resulted in higher concentrations of curlews, as well as more concentrated capture efforts, than was possible in South Texas. If noose ropes or mats are considered for future capture efforts, it is important to understand that they are time-consuming to construct, difficult to transport, susceptible to malfunction, and their efficacy will vary with substrate conditions.

Bow nets are traditionally used with live vertebrate bait to capture raptors (e.g., Bryan 1988, Barclay 2008) but have also been used to capture Long-billed Curlews and other birds on their nests (e.g., Salyer 1962, Redmond and Jenni 1982). Whoosh nets have been successfully used to capture Common Redshanks (*Tringa totanus*) in Europe (Cresswell et al. 2007). Success of these techniques for capturing wintering curlews depended on placement in the field and ability to attract or move curlews to the net. Baiting can improve success, but decoys did not prove useful in attracting birds into nets. If a trapper can spend several consecutive days at a location, the effectiveness of these methods may increase as birds gradually become accustomed to novel items in their environment. The lower capture rates for bow and whoosh nets, compared to the Coda Netgun, show that these 2 passive methods require a larger investment of time, strategic placement within a foraging area, and a substantial supply of bait in order to be successful. Trapping in a dense patch of preferred natural foods in a particular habitat (e.g., crabs and shrimp in intertidal areas) may improve effectiveness. Moreover, landowner permission is often necessary, and equipment is put at risk of theft or vandalism when leaving nets and poles in place for several days.

In general, we found the Talon under-powered, with too short a range to be effective in most situations. In addition, it performed poorly in



windy conditions on gulf beaches. However, with modifications, such as adding heavier weights and increasing propulsion, this technique may be made more effective for capturing Long-billed Curlews. Even without these modifications, the Talon may still be successful at close range (approximately 3-5 m), in little or no wind, and with wintering Long-billed Curlews that have become habituated to humans, vehicles, or blinds in urban and suburban environments. We found no publications that reported use of this tool for wildlife, although the company notes its use for a variety of species.

The ability to choose from several capture techniques that match the variety of habitats presented by foraging curlews is paramount for maximizing capture success for this species during winter. Our success with 4 of the 6 capture methods evaluated in our study indicates that multiple techniques may warrant further investigation and refinement for application in particular circumstances.

#### ACKNOWLEDGMENTS

The authors thank the staff at the Lower Rio Grande Valley National Wildlife Refuge, Padre Island National Seashore, Naval Air Station-Corpus Christi of the U.S. Department of Defense, and the Coastal Bend Bays & Estuaries Program, Inc., for access to properties and logistical support for this project. We also thank the many private landowners who graciously allowed us access to their properties.

The authors are heavily indebted to Dr. Roger Pigott, DVM, who graciously gave his time to consult with us on care and handling of large-bodied birds and advised us on remedial measures in case we encountered muscle myopathy in captured curlews. This research benefitted from many volunteers who helped in the field. Assistance with field equipment and techniques was provided by Caesar Kleberg Wildlife Research Institute. Additional scientific expertise and technical advice were provided by Dave Blankinship, Tom Langschieid, Brent Ortego, David Hailey, Clint Jeske, David Newstead, Gene Blacklock, Sonia Najera, Martin Hagne, Brad Strobel, and Jonathan Moczygemba. The authors are indebted to Suzanne Fellows and Marsha Sovada for commenting on earlier drafts. We are indebted to Liz Smith for the photographs in Figures 1 and 2 and to Clint Jeske for the photographs in Figures 5, 9, and 10. This project was funded by the Science Support Program of the U.S. Geological Survey. Any use of trade, product, or firm names is for descriptive

purposes only and does not imply endorsement by the U.S. Government.

#### LITERATURE CITED

- BARCLAY, J. H. 2008. A technique for nighttime trapping of Burrowing Owls with a bow net. *Journal of Raptor Research* 42:142–148.
- BRYAN, J. R. 1988. Radio controlled bow-net for American Kestrels. *North American Bird Bander* 13:30–32.
- CRESSWELL, W., J. LIND, J. L. QUINN, J. MINDERMAN, AND D. P. WHITFIELD. 2007. Ringing or colour-banding does not increase predation mortality in redshanks *Tringa tetanus*. *Journal of Avian Biology* 38:309–316.
- DUGGER, B. D. AND K. M. DUGGER. 2002. Long-billed Curlew (*Numenius americanus*). *The Birds of North America*. No. 628.
- FELLOWS, S. D. AND S. L. JONES. 2009. Status assessment and conservation action plan for the Long-Billed Curlew (*Numenius americanus*). Biological Technical Publication FWS/BTP-06012-2009, U.S. Fish and Wildlife Service, Washington, D.C.
- FORBUSH, E. H. 1916. A history of the game-birds, wild-fowl, and shore birds of Massachusetts and adjacent states, 2<sup>nd</sup> Edition. Massachusetts State Board of Agriculture, Boston.
- GOULD, F. W., G. O. HOFFMAN, AND C. A. RECHENTHIN. 1960. Vegetational areas of Texas. Texas Agricultural Experiment Station Leaflet Number 492, Texas A&M University, College Station.
- GRATTO-TREVOR, C. L. 2004. The North American banders manual for banding shorebirds (Charadriiformes, suborder Charadrii). The North American Banding Council, Point Reyes Station, CA.
- HERRING, G., D. E. GAWLIK, AND J. M. BEERENS. 2008. Evaluating two new methods for capturing large wetland birds. *Journal of Field Ornithology* 79:102–110.
- HICKLIN, P. W., R. G. HOUNSELL, AND G. H. FINNEY. 1989. Fundy pull trap: a new method of capturing shorebirds. *Journal of Field Ornithology* 60:94–101.
- MECHLIN, L. M. AND C. W. SHAIFFER. 1980. Net-firing gun for capturing breeding waterfowl. *Journal of Wildlife Management* 44:895–896.
- MEHL, K. R., K. L. DRAKE, G. W. PAGE, P. M. SANZENBACHER, S. M. HAIG, AND J. E. THOMPSON. 2003. Capture of breeding and wintering shorebirds with leg-hold noose-mats. *Journal of Field Ornithology* 74:401–405.
- MITTELHAUSER, G. H., L. TUDOR, AND B. CONNERY. 2006. Distribution and ecology of purple sandpipers wintering in the Acadia National Park region, Maine 2001–2004. Technical Report NPS/NER/NRTR-2006/048, National Park Service, Boston, Massachusetts.
- OLALLA-KERSTUPP, A. 2010. Local and migratory movements, habitat use and threats of the Long-billed Curlew (*Numenius americanus*) in the Chihuahuan Desert, Mexico. PhD Dissertation. Universidad

- Autónoma de Nuevo León, San Nicolás de los Garza, Nuevo León, Mexico.
- ORING, L. 2006. Long-billed Curlew symposium. Wader Study Group Bulletin 109:30.
- REDMOND, R. L. AND D. A. JENNI. 1982. Natal philopatry and breeding area fidelity of Long-Billed Curlews (*Numenius americanus*): patterns and evolutionary consequences. Behavioral Ecology and Sociobiology 10:277–279.
- SALYER, J. W. 1962. A bow-net trap for ducks. Journal of Wildlife Management 26:219–221.
- TEXAS PARKS AND WILDLIFE DEPARTMENT. 2005. Texas Wildlife Action Plan, Comprehensive Wildlife Conservation Strategy, Texas Parks and Wildlife Department. [http://www.tpwd.state.tx.us/publications/pwdpubs/pwd\\_pl\\_w7000\\_1187a/](http://www.tpwd.state.tx.us/publications/pwdpubs/pwd_pl_w7000_1187a/) (accessed 10 December 2012).
- U.S. FISH AND WILDLIFE SERVICE. 2008. Birds of Conservation Concern 2008. U.S. Department of the Interior, Fish and Wildlife Service, Division of Migratory Bird Management. <http://www.fws.gov/migratorybirds/NewReportsPublications/SpecialTopics/BCC2008/pdf> (accessed 10 December 2012).
- WICKERSHAM, C. W. 1902. Sickle-billed Curlew. Auk 19:353–356.

# HIGH DIVERSITY OF INVASIVE PASSERIDS AT A PARK IN SOUTHEAST TEXAS

Daniel M. Brooks<sup>1</sup> and Greg Page<sup>2</sup>

<sup>1</sup>*Houston Museum of Natural Science, Department of Vertebrate Zoology, 5555 Hermann Park Drive, Houston, Texas 77030-1799*  
<sup>2</sup>*7850 FM 1960 E #1402, Humble, TX 77346*

**ABSTRACT.** —We report high diversity of invasive Passerids in Bear Creek Park, Harris County, Texas, including the Orange Bishop (*Euplectes franciscanus*), Pin-tailed Whydah (*Vidua macroura*), Orange-cheeked Waxbill (*Estrilda melpoda*), Zebra Finch (*Taeniopygia guttata*), Bronze Mannikin (*Lonchura cucullata*) and Nutmeg Mannikin (*Lonchura punctulata*). All but the Zebra Finch probably result from imports of invasive populations into Puerto Rico for the pet trade. Only the Nutmeg Mannikin and perhaps the Orange Bishop will potentially become established long-term; while the Bronze Mannikin appears to be breeding, its overall abundance is much lower. Whydahs require specific hosts for nesting, Zebra Finches appear too domesticated to survive in nature, and Orange-cheeked Waxbills likely require a warmer winter climate to persist over time. This Passerids community is perhaps structured by size assortment (diminishing chance of similar-sized species being able to coexist), but detailed ecomorphological analyses await study specimens from the region. Similarly, coexistence studies between Nutmeg Mannikins and Orange Bishops await further elucidation of these species' niches.

Three different models predict ecological and evolutionary forces that mold avian communities (Brooks 1998): 1) Size Adjustment—evolutionary shifts in morphological characteristics that species undergo to minimize competition (Case and Sidell 1983), 2) Size Assortment—the diminishing chance of similar-sized species being able to coexist (Case and Sidell 1983), and 3) Species Packing—community diversity may be enhanced by inserting species within established ecomorphological space, reducing the average distance between species niche size or increasing niche overlap (MacArthur 1972).

Self-colonizing island Passerids communities are structured by size adjustment (character displacement), such as the case of Galapagos finches (Grant 1968). Human-introduced island Passerids communities are structured by size assortment as seen in Hawaii (Moulton and Pimm 1986), similar to the force driving naturally evolved Passerids communities on tropical mainlands in the Paraguayan Chaco (Brooks 2003).

In 1878 Alfred Russell Wallace noted animal life is, on the whole, far more abundant and varied within the tropics than in any other part of the globe, first

highlighting the inverse relationship between species richness and latitude. The position of Texas in the subtropics permits more species of birds than any other state in the nation. The chance for invasive Passerids to occur in species rich guilds (functionally associated units of organisms) is limited however, as the number of invasive species is often limited in a given region (Brooks 2009). Herein we document a case of several species of Passerids occurring in Bear Creek Park, Harris County, Texas and discuss the implications and potential outcomes of this event.

## METHODS

In June 2008 a citizen-science study, the Texas Invasive Bird Project, was initiated to target 6 avian species invading the state. A questionnaire (hmns.org/files/invasivebirds.doc) was circulated among multiple bird watchers to provide unbiased data as citizen-scientists. Through this forum, Greg Page's (hereafter GP) data alerted Daniel Brooks (DMB) of the high diversity of Passerids recorded at Bear Creek Park, just west of Houston (Fig. 1).

Unless otherwise noted all birds were observed by GP, who monitored the area 2-3 times/wk for 3 h

<sup>1</sup>E-mail: dbrooks@hmns.org

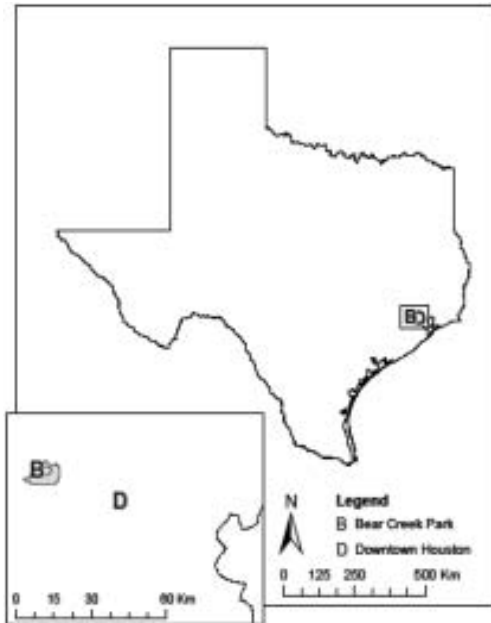


Figure 1. Map depicting location of Bear Creek Park, west of downtown Houston.

in the morning between March 2010–October 2012. Invasive Passeridss were observed 27–29 September and 1 and 8 October 2010, 12 January and 21 March 2011, and 20 October 2012. GP observed birds during morning walks near the golf course (29° 49' 25.75" N, 95° 38' 12.92" W) at ~ 0800 h, with the exception of the whydah which was seen at ~ 1100 h next to a creek by the first bridge on the Equestrian Trail. DMB identified many birds from photos or video clips submitted by GP (Figs. 1–4) and other observers (see Acknowledgments). Species accounts are provided below, and include additional regional documentation when available.

## SPECIES ACCOUNTS

### *Orange Bishop (Euplectes franciscanus)*

On 27 September 2010 a flock of 8 bishops was observed for 15 min with 2 Orange-cheeked Waxbills in 1 m high weeds next to woods at the edge of the golf course. The birds were observed on the ground eating seeds and perched in trees preening. This was likely the same flock seen on 1 October with 2 Nutmeg Mannikins in addition to the bishops and waxbills.

On 21 March 2011, a single female was observed for 5 min with a Zebra Finch in an open area with

recently mowed grass at the edge of the woods across the street from the golf course. The 2 birds first perched in a tree then both flew to the ground before flying out of the area.

On 11 November 2012, a single bishop was observed resting in a tree and preening for 10 min by Harry Forbes. This bird was associated with  $\geq 15$  Bronze Mannikins that were observed for 90 min in a clearing surrounded by small trees bordering a golf course with lots of seedy plants covering the ground.

Over 50 reports for this species were sent to DMB between June 2008–March 2013 as part of the Texas Invasive Bird Project. Bishops prefer overgrown weedy fields with masting seed heads ~ 3 m in height. Such habitat is ephemeral, as it is rarely permitted to remain dense for very long before being developed for real estate interest. Consequently this may reflect the limited number of reports for this species when compared to the Nutmeg Manikin (see below). Bishops will also occupy ponds and river banks with high densities of reeds, which is similar to the preferred habitat of this species in sub-Saharan Africa (D. Brooks unpubl. data). There were other reports from Bear Creek Park, perhaps the same birds. Most of the reports were from west Houston in appropriate habitat paralleling Beltway 8, as well as other areas around Houston, Bryan/College Station, and Austin. Since ca. 2010 the birds began to move away from their preferred habitat with increasing regularity to attend feeders, which will likely result in more reports in the future.

### *Pin-tailed Whydah (Vidua macroura)*

On 12 January 2011, a solitary male in eclipse plumage (dark facial markings) was observed for 10 min. The habitat was recently mowed grass with some clover and dead leaves and surrounded by woods. The bird flew into a tree 5 m above the ground when GP got too close, but returned to the ground after 2 min to resume foraging. Similar to behavior of this species in sub-Saharan Africa (D. Brooks unpubl. data), the whydah scratched in the dirt with both feet like a towhee; after closer examination of photos, it was apparently eating small ants (Fig. 2) and possibly small seeds.

On 4 November 2011, a solitary male transitioning out of breeding plumage (still had a long tail) was observed by Michael Rinehold at Bear Creek Park approximately 17 m south of the Brandt Dr. and Sullins Way intersection on the west



Figure 2. Male Pin-tailed Whydah (*Vidua macroura*) in eclipsed plumage eating ants. Photographed at Bear Creek Park by Greg Page.

side of the road. The bird was first seen at 08:40 h and seen intermittently until 10:40 h (~ 20 min total observation). The habitat was urban parkland and the bird was in 5 cm high St. Augustine grass foraging on small seeds with a flock of Chipping Sparrows (*Spizella passerina*), which the whydah frequently tried unsuccessfully to displace. Although 11 months later, it is possible this was the same bird seen by GP (see above), as it was < 5 km from the first bridge on the equestrian trail.

On 11 April 2012, a third whydah was observed in Tomball by David Martin at 1500 h. This bird was approximately 50 km north of Bear Creek Park and could not have been the same bird as mentioned above since it was a female.

On 20 and 23 February 2013 an eclipsed male whydah was observed in west Houston by Bernice Hotman at her feeder hosting > 25 Nutmeg Mannikins. This bird was < 15 km southeast of Bear Creek Park; while it is possible it was the same bird observed in November 2011, it was at least 15 months later.

A single bird from Bryan was reported in 1998, as well as a male in transitional plumage in Austin on 21 May 2008 by Isaac Sanchez.

#### *Orange-cheeked Waxbill (Estrilda melpoda)*

On 27 September 2010, as mentioned above, 2 waxbills were observed for 15 min with a flock of 8 orange bishops in 1 m high weeds next to woods at the edge of the golf course. The birds were observed on the ground eating seeds and perched in trees preening. An attempt was made to relocate the birds the following 2 days (28-29 September) but only a single bird was seen, which was photographed and identified as a sub-adult Orange-cheeked Waxbill (Fig. 3). However, what was likely the same original flock of bishops and waxbills was seen again on 1 and 8 October with the addition of 2 Nutmeg Mannikins.

Fred Collins reported seeing an escaped waxbill as early as 1963 in east Houston in a weedy wooded corner of Diez Park. Other reports indicate waxbills were seen in Austin as early as 9 September 1995 (R.



Figure 3. Juvenile Orange-cheeked Waxbill (*Estrilda melpoda*) photographed at Bear Creek Park by Greg Page.

Fergus), and in Houston with 1-2 birds at El Franco Lee Park 12 and 21 August, and 11 Nov 2011 (S. Lorenz and M. Westelev); 2 birds (presumably a pair) in Katy near Buffalo Bayou where it intersects South Mason Road on 10 September 2011 at a water feature (B. Parker); and more recently 2 birds at Addicks Reservoir on 6 April 2012 (K. Poetzl). Habitat reported by John Berner at El Franco Lee was 3 m high cane and 0.7 m grassy slope at Addicks, with both sites near the marshy edge of a slope banked pond, so not inundated. El Franco Lee Park is > 50 km southeast of Bear Creek Park, suggesting these were different populations of waxbills. The sites in Addicks and Katy are < 10 km east and west of the Bear Creek Park border respectively, although the time span ranges 1-1.5 years from the sighting at Bear Creek Park.

Bob Honig and Marie Asscherik reported waxbills during the Buffalo Bayou Christmas Bird Count (14 observers total) at 2 locations in Memorial Park on 30 December 2012. Three adult birds were seen near the big pond on the east side of the Houston Arboretum and Nature Center (HANC) singing and foraging low on grass seeds before flying away. A second group

of 2 adults was seen in a high-grassy/brushy power line corridor immediately west of the railroad tracks between Memorial Drive and Interstate 10 (~1 km east of Loop 610), associating with American Goldfinches (*Carduelis tristis*) and 5 Nutmeg Mannikins. On the following day (31 December) Candy McNamee and John Berner reported 3 adults at 0800 h in ~0.6-1 m high grass at the HANC pond site, foraging on dry grass seeds with American Goldfinches, Swamp (*Melospiza georgiana*) and Song Sparrows (*M. melodia*). The second site had 5 adults at 0915 h in ~1 m high grass between the path and railroad tracks, foraging on dry grass seeds.

On 12 January 2013, Jason Bonilla reported 2 adult birds (presumably a pair) in Woodland Park (Houston, Harris Co.), foraging about 1 m off the ground on a bushy vine in the wooded area near Little White Oak Bayou. Although Memorial and Woodland Parks are < 15 km from the eastern border of Bear Creek Park, the time span is > 2 years, suggesting these are a different population of waxbills than those observed at Bear Creek Park.

#### *Zebra Finch (Taeniopygia guttata)*

On 21 March 2011 as previously mentioned, a grey pied (captive-bred mutation) Zebra Finch was observed for 5 min with a single female bishop in an open area with recently mowed grass at the edge of the woods across the street from the golf course. The 2 birds first perched in a tree then both flew to the ground before flying out of the area. As evidenced from the photograph (Fig. 4), this bird was stressed and unhealthy and likely did not survive more than a couple of days after the photograph was taken.

#### *Bronze Mannikin (Lonchura cucullata)*

On 2 January 2012, a flock of ~16 adult and juvenile mannikins was observed by Ken Hartman at Bear Creek Park on the Equestrian Trail head. At least 2 were adult Bronze Mannikins but all were difficult to distinguish. The birds were observed intermittently for ~15 min total. The habitat was urban parkland, a transition between 4 cm high St. Augustine grass and dead leaves along the edge of a woodland tract.

On the morning of 15 October 2012, Nina Rach observed a flock of 7 (2 adults, 5 juveniles) Bronze Mannikins immediately east of the intersection of Golbow and Bear Creek Drive, just north of the equestrian trail parking area. This observation of adults with juveniles suggested breeding activity.



Figure 4. Grey pied Zebra Finch (*Taeniopygia guttata*) in stressed condition photographed at Bear Creek Park by Greg Page.



Figure 5. Bronze Mannikin (*Lonchura cucullata*) photographed at Bear Creek Park by Greg Page.

The birds were stripping seeds from grasses and preening in low scrubby trees. Presumably the same flock of birds was observed by John Berner the following day (8-10 birds at midday), on 20 October by GP (8 birds at 0830 h, Fig. 5), and 11 November by Harry Forbes ( $\geq 15$  birds with a single orange bishop 0900-1030 h). GP noted the birds flew in a tight flock and landed in a tree right in front of him, where they commenced preening and hopping along branches, moving further back in the trees until they were out of view (total observation time  $\sim 5$  min). The flock was in close contact the entire time, and the tree they landed in was within a cluster of trees and brush ( $\sim 20$  m x 35 m) that was straddled by a small grassy area on one side and the golf course on the other. A road and more extensive woods with a small creek were on the far side of the grassy area. HF observed the single bishop resting in a tree and preening for 10 min of the 90 min observation period of mannikins, which alternated between resting, preening, and eating grass seeds. It is possible this flock was of the same group reported above by Hartman in January.

A singleton was reported by Tina Mathis in late May 2012 in the 9400 block of Beechnut St. at a feeder hosting a very large resident flock of Nutmeg Mannikins. Jim Sigmund reported a second feeder hosting Nutmeg Mannikins in Cypress with at least nine Bronze Mannikins (including at least one subadult, suggesting breeding) visiting in early March 2013. These two sites are  $< 15$  km southeast and northwest, respectively, of Bear Creek Park borders and may represent individuals originating from the same population.

#### *Nutmeg Mannikin (L. punctulata)*

On 1 October 2010, as reported above, two Nutmeg Mannikins were seen near the golf course with 2 waxbills and a flock of bishops. The mannikins were not seen in this flock of birds on 27 or 28 September however.

Over 150 reports for this species were sent to DMB from June 2008-March 2013 as part of the Texas Invasive Bird Project. Nutmeg Mannikins preferred weedy fields and detention ponds. There were other reports from the region, most of which were from west Houston in appropriate habitat parallel to Beltway 8, as well as other areas around Houston and Austin. Mannikins frequently attend feeders, which is likely the main reason there were more reports for this species than for any other invasive bird in Texas (D. Brooks unpubl. data).

## DISCUSSION

With the exception of the Zebra Finch, all of the species were invasive to Puerto Rico (ebird.org, accessed on 9 May 2012) and were frequently wholesaled to U.S. pet suppliers (Fred Collins pers. comm.). The Zebra Finch is widely domesticated and bred for the U.S. pet industry and is perhaps the most abundant species of companion bird (Susan Clubb in litt.).

It is interesting to note that bishops were observed flocking with every species in this report except for the whydah. While bishops breed in appropriate habitat from southeastern to central Texas, it is uncertain whether they will persist long-term. Most of populations are ephemeral due to the short-lived condition of the dense, tall weedy fields they prefer. However, with increasing numbers at feeders it is possible bishops will become better established with a more permanent food source.

It is doubtful whydahs will ever become established since they are obligate nest parasites of waxbills (*Estrilda*, Fry and Keith 2004), which would necessitate the host being well established, which they are not. Thus it is assumed the whydahs reported herein are wild-caught birds that escaped from an aviary.

The fact that a sub-adult Orange-cheeked Waxbill was identified suggests either this species is breeding in the area or, more likely, a sub-adult bird was released or escaped. While the species is periodically reported and breeding is even possible, it is unlikely this species will become firmly established in the area because they require a warmer climate (Clement et al. 1993, Fry and Keith 2004) and therefore are less likely to survive very cold winters.

Despite their abundance in captivity, the single Zebra Finch was the only evidence of this species in the wild in Texas as of January 2013, and this individual likely did not survive very long after being photographed. Perhaps this highly domesticated species can not adapt well to natural conditions, indicative of the reason for no reports generated. Zebra Finches have never been successful in the wild outside their native habitat (Robin Restall in litt.).

Aside from the more established bishop and Nutmeg Mannikin, Bronze Mannikin was the only species reported to exhibit groups of juveniles, suggesting successful breeding. Nonetheless there are few reports of this species in the state compared to bishops and Nutmeg Mannikins. It is possible that this species will become more broadly distributed like the bishop and Nutmeg Mannikin, but currently



it is not as abundant. However, Bronze Mannikins were seen in more than 1 region, with evidence of breeding over the duration of approximately one year. This is a species to watch for potential colonization, even though it may only be a recent invasive species.

It is likely the Nutmeg Mannikin is already established and based on numbers reported it may be on the verge of a population explosion. Numbers at a given site may reach several hundred individuals (Carter Hood pers. comm.) and they are common at feeders. On a positive note they are passive and not aggressive towards other species at feeders, and utilize a vacant niche space of weedy field and detention ponds as preferred habitat.

Similar to introduced Passerids communities on islands (Moulton and Pimm 1986) and naturally occurring situations on tropical mainlands (Brooks 2003), the community in Bear Creek Park is perhaps also structured by size assortment since only 1 or 2 species are present in high numbers. Rigorous ecomorphological analyses await study specimens collected from the region (Brooks 1998). The parameters permitting Nutmeg Mannikins and Orange Bishops to coexist are likely different habitat preferences. However both species coexist commensally with one-another as well as native species at feeders (D. Brooks unpubl. data) where food resources are often unlimited. Factors permitting co-occurrence awaits future testing as more thorough investigation of these species' niches are available.

#### ACKNOWLEDGMENTS

Kind thanks to Alyssa Conn for creating the map (Figure 1). We are grateful to Marie Asscherik, John Berner, Jason Bonilla, Fred Collins, Harry Forbes, Ken Hartman, Bob Honig, Bernice Hotman, Steve

Lorenz, Candy McNamee, Tina Mathis, Bob Parker, Nina Rach, Michael Rinehold and Jim Sigmund for submitting reports used herein, and thanks to Fred Collins for forwarding on other reports of interest from e-mail exchanges. We are indebted to Jack Eitnrear, Janelle Mikulas and Bob Honig for critically editing the manuscript and making it flow better and to Robin Restall for his comments.

#### LITERATURE CITED

- BROOKS, D. M. 1998. Competition and coexistence in Neotropical birds: a latitudinal comparison. PhD Dissertation, Texas A&M University, College Station.
- BROOKS, D. M. 2003. The role of size assortment in structuring Neotropical bird communities. *Texas Journal of Science* 55:59-74.
- BROOKS, D. M. 2009. Behavioral ecology of a Blue-crowned Conure (*Aratinga acuticaudatus*) in a subtropical urban landscape far from its natural range. *Bulletin of the Texas Ornithological Society* 42:78-82.
- CASE, T. J. AND R. SIDELL. 1983. Pattern and chance in the structure of model and natural communities. *Evolution* 37:832-849.
- CLEMENT, P., A. HARRIS, AND J. DAVIS. 1993. Finches and sparrows: an identification guide. Princeton University Press, Princeton, New Jersey.
- FRY, C. H. AND S. KEITH. 2004. The birds of Africa, Vol. VII. Princeton University Press, Princeton, New Jersey.
- GRANT, P. R. 1968. Bill size, body size, and the ecological adaptations of bird species to competitive situations on islands. *Systematic Zoology* 17:319-333.
- MACARTHUR, R. H. 1972. *Geographical ecology*. Harper and Row, New York, New York.
- MOULTON, M. P. AND S. L. PIMM. 1986. The extent of competition in shaping an introduced avifauna. Pages 80-97 *in* Community ecology. J. Diamond and T. J. Case, Editors. Harper and Row, New York, New York.
- WALLACE, A. R. 1878. *Tropical nature and other essays*. MacMillan, London, England.

**FIRST BREEDING RECORD OF AMERICAN WOODCOCK  
(*SCOLOPAX MINOR*) IN CORYELL COUNTY, TEXAS. COULD THIS  
BE FURTHER EVIDENCE FOR REGULAR WOODCOCK BREEDING  
IN CENTRAL TEXAS?**

Joel A. Kutylowski<sup>1</sup>, Than J. Boves<sup>2</sup>, and David A. Cimprich<sup>3</sup>

<sup>1</sup>187 Nottingham Rd., Deerfield, NH 03037

<sup>2</sup>Department of Natural Resources and Environmental Science, University of Illinois,  
Urbana, IL 61801

<sup>3</sup>Fort Hood Military Reservation, Environmental Division, 4612 Engineer Drive, Room 76,  
Fort Hood, TX 76544.

ABSTRACT. – We observed an adult American Woodcock (*Scolopax minor*) with two 3–4 d old fledglings on Fort Hood in Coryell County, Texas on 6 March 2012. This sighting is the first documented record of the species breeding in Coryell County and the third for the Edwards Plateau. We observed the family group among shin oak (*Quercus sinuata*), Texas red oak (*Quercus buckleyi*) and other woody vegetation hiding within dense leaf litter. Although woodcock populations have been declining in the core of their breeding range, this observation provides further support that the species may be expanding its breeding range in the southwest and breeding may occur more regularly than typically assumed in this region.

The American Woodcock (*Scolopax minor*) is a popular game bird whose populations have declined by ~1.9%/yr over the past 45 years within the core of their historic breeding range, largely because of habitat loss (Cooper and Parker 2011). Despite this precipitous decline in the core, some evidence suggests that the species has been undergoing a peripheral range expansion to the west and southwest (e.g., Smith and Barclay 1978, Kostecke et al. 2006), but little is known about the current breeding status of woodcocks in central Texas where they are typically considered to be extremely rare breeders, if not absent.

We observed an adult woodcock with 2 young fledglings (Fig. 1) on the Fort Hood Military Reservation about 0.75 km west of the junction of Georgetown and Royalty Ridge Roads, Coryell County, Texas (31° 20' 59.4" N, 97° 47' 25.0" W) on 6 March 2012 at 1345 h. We observed the family group on the edge of a small woody vegetative stand (or motte) about 16 m<sup>2</sup> in size. The overstory vegetation within the motte consisted of mature shin oak (*Quercus sinuata*), Texas ash (*Fraxinus texensis*), Texas red oak (*Quercus buckleyi*), and

cedar elm (*Ulmus crassifolia*) with an average tree height of 10 m. The understory was comprised of Texas ash (*Fraxinus texensis*) and cedar elm (*Ulmus crassifolia*) saplings, white honeysuckle (*Lonicera albiflora*), and poison ivy (*Toxicodendron radicans*) with an average height of 1 m. Leaf litter consisting mainly of Texas red oak and shin oak leaves provided a strong cryptic background for the fledglings to hide inconspicuously. The motte was surrounded by a variety of herbaceous ground cover. We discovered the family after the female flushed and relocated approximately 10 m away, while the fledglings remained in the motte, motionless during the duration of the encounter. Based on a bill measurement of 21.4 mm, we believe the fledglings were 3–4 d old (Ammann 1982). Although we did not measure the bill directly, we measured a known portion of the woody debris seen in Fig. 1 as a reference for later measurements of the bill using ImageJ computer software (available from NIH at <http://rsbweb.nih.gov/ij/>). This observation represents, to our knowledge, the first record of woodcock breeding in Coryell County and the second or third record for the Edwards Plateau.

---

<sup>1</sup>E-Mail: Joelkutyloowski@yahoo.com



Figure 1. American woodcock (*Scolopax minor*) fledgling observed on the Fort Hood Military Reservation, Coryell County, TX on 6 March 2012. Photo credit: T.J. Boves.

Previously, direct evidence of breeding was found on the plateau in 1888 (Lockwood 2001), and more recently in 2005 on Fort Hood in Bell County (Kostecke et al. 2006).

Currently, the breeding range of the American Woodcock is considered to extend from Maine to central Manitoba at the northern edge and from central Florida to eastern Texas at the southern edge (Keppie and Whiting 1994). It is unclear whether this observation (as well as the previous one on Fort Hood) is simply an aberration or if it is indicative of a west and southwest expansion of the species' breeding range. Westward expansion of the woodcock's range was first suggested several decades ago (Smith and Barclay 1978), but since that time, few have investigated this possibility thoroughly. Information concerning the woodcock's breeding distribution comes primarily from data collected via singing-ground surveys organized by the United States Fish and Wildlife Service (Sauer et al. 2008). Such surveys are performed only in what

is considered to be the core of the species' range (i.e., eastern and central portion) because of the potential for double-counting migrating and wintering males that originated in the southern portions of the range (Whiting 2006). Thus, a lack of breeding observations from central Texas may simply reflect a lack of effort, and does not necessarily mean that woodcocks do not breed more regularly in this region. Male woodcocks are regularly observed performing courtship displays in central Texas, and several local authorities believe that they do in fact breed more frequently than conventionally assumed (G. Eckrich and R.M. Whiting, pers. comm.). However, other than anecdotal evidence, it is largely unknown if individuals displaying in this area are actively breeding nearby or are simply practicing their displays before migrating farther north (Whiting 2006). Woodcock nests and fledglings, the only definitive evidence of breeding, are challenging to locate, so evaluating the possibility of range expansion will require more

intensive surveys. Extensive areas with the habitat features that the species requires for breeding purposes, specifically a matrix of early successional and mature forest stands, are found on Fort Hood, where both of the recent observations of breeding woodcocks occurred. Appropriate habitat features exist here partly because of military activities, and partly because of the presence of the endangered Black-capped Vireo (*Vireo atricapilla*), a species that also requires management for early successional habitat interspersed with shrub/small trees. Thus, more comprehensive breeding surveys may be worthwhile to determine the potential of Fort Hood, and possibly other locales with appropriate habitat in central Texas, to harbor significant and regular breeding populations of American Woodcock.

#### LITERATURE CITED

- AMMANN, G. A. 1982. Age determination of American Woodcock chicks by bill length. Pp. 22-25 in Woodcock ecology and management. T. J. Dwyer and G. L. Storm, Editors. Wildlife Research Report. 14, U.S. Fish Wildlife Service. Washington, D.C..
- COOPER, T. R. AND K. PARKER. 2011. American woodcock population status, 2011. U.S. Fish and Wildlife Service, Laurel, Maryland.
- KEPPIE, D. M. AND R. M. WHITING, JR. 1994. American Woodcock (*Scolopax minor*). The Birds of North America. No. 100
- KOSTECKE, R. M., D. SPERRY, AND D. A. CIMPRICH. 2006. Second record of an American Woodcock (*Scolopax minor*) breeding on the Edwards Plateau. Bulletin Texas Ornithological Society 39:1-2.
- LOCKWOOD, M. W. 2001. Birds of the Texas Hill Country. University of Texas Press, Austin.
- SAUER, J. R., W. A. LINK, W. L. KENDALL, J. R. KELLEY, AND D. K. NIVEN. 2008. A hierarchical model for estimating change in American Woodcock populations. Journal of Wildlife Management 72:204-214.
- SMITH, R. AND J. S. BARCLAY. 1978. Evidence of westward changes in the range of the American Woodcock. American Birds 22:1122-1127.
- WHITING, R. M., JR. 2006. American Woodcock singing-ground surveys: do they reflect population trends? 10th American Woodcock Symposium. Roscommon, Michigan.

#### ERRATUM

The caption in Figure 2 (map) on page 106 of the paper authored by John Brush titled "The Breeding Birds of Urban South Padre Island) in vol. 44 (1-2):105-107 incorrectly identified the area as Galveston Island. The map and study site was on South Padre Island not Galveston Island. eds.

# TEXAS BIRD RECORDS COMMITTEE REPORT FOR 2011

ERIC CARPENTER<sup>1</sup>

*4710 Canyonwood Drive, Austin, Texas 78735*

The Texas Bird Records Committee (hereafter “TBRC” or “committee”) of the Texas Ornithological Society requests and reviews documentation on any record of a TBRC Review List species (see TBRC web page at <http://texasbirds.org/tbrc/>). Annual reports of the committee’s activities have appeared in the Bulletin of the Texas Ornithological Society since 1984. For more information about the Texas Ornithological Society or the TBRC, please visit [www.texasbirds.org](http://www.texasbirds.org). The committee reached a final decision on 92 records during 2011: 78 records of 39 species were accepted and 14 records of 12 species were not accepted, an acceptance rate of 84.78% for this report. In addition, there was 1 record which was withdrawn by the submitters (Red-breasted Sapsucker, 2010-89). A total of 126 observers submitted documentation (to the TBRC or to other entities) that was reviewed by the committee during 2011.

In 2011, the TBRC did not accept any first state records. Therefore the official Texas State List remained at 636 species in good standing. This total does not include the 4 species on the Presumptive Species List.

In addition to the review of previously undocumented species, any committee member may request that a record of any species be reviewed. The committee requests written descriptions as well as photographs, video, and audio recordings if available. Information concerning a Review List species may be submitted to the committee secretary, Eric Carpenter, 5604 Southwest Pkwy #2222, Austin, Texas 78735 (email: [ecarpe@gmail.com](mailto:ecarpe@gmail.com)). Guidelines for preparing rare bird documentation can be found in Dittmann and Lasley (1992) or at <http://www.greglasley.net/document.html>.

The records in this report are arranged taxonomically following the AOU Check-list of North American Birds (AOU 1998) through the 53th supplement (Chesser et al. 2012). A number in parentheses after the species name represents the total number of accepted records in Texas for

that species at the end of 2011. Species added to the Review List because of population declines or dwindling occurrence in recent years do not have the total number of accepted records denoted as there are many documented records that are not subject to review (e.g., Brown Jay, Tamaulipas Crow, and Evening Grosbeak). All observers who submitted written documentation or photographs of accepted records are acknowledged by initials. If known, the initials of those who discovered a particular bird are in boldface but only if the discoverer(s) submitted supporting documentation. The TBRC file number of each accepted record will follow the observers’ initials. If photographs or video recordings are on file with the TBRC, the Texas Photo Record File (TPRF) (Texas A&M University) number is also given. If an audio recording of the bird is on file with the TBRC, the Texas Bird Sounds Library (TBSL) (Sam Houston State University) number is also given. Specimen records are denoted with an asterisk (\*) followed by the institution where the specimen is housed and the catalog number. The information in each account is usually based on the information provided in the original submitted documentation; however, in some cases this information has been supplemented with a full range of dates the bird was present if that information was made available to the TBRC. All locations in italics are counties. Please note that the county designations of offshore records are used only as a reference to the nearest point of land.

TBRC Membership—Members of the TBRC during 2011 who participated in decisions listed in this report were: Randy Pinkston, Chair; Keith Arnold, Academician; Mark Lockwood, Secretary; Eric Carpenter, Secretary; Tim Fennell, Mary Gustafson, Jim Paton, Martin Reid, Byron Stone, and Ron Weeks. During 2011, Mark Lockwood resigned as Secretary and Eric Carpenter was elected to replace him. Martin Reid was re-elected as a voting member after his first term expired. The Chair and Academician were also re-elected.

---

<sup>1</sup>E-mail: [ecarpe@gmail.com](mailto:ecarpe@gmail.com)

Contributors—John Arvin, Chris Bailey (**CBa**), Becky Baker, Jim Bangma, Lynn Barber, Matthew Baumann (**MBa**), Mikael Behrens, Devin Bosler, Jeff Bouton, Gil Bozeman, Erik Breden, Winnie Burkett, Carol Burlinson, Brad Carlson (**BCa**), Eric Carpenter, Jeff Cheney, Karen Chiasson, Bill Clark (**BCI**), Chuck Clark, Scarlet Colley, Greg Cook, Mel Cooksey, Bob Creglow, David Dauphin, Tripp Davenport, Jim Derington, Jon Dunn (**JD**), Marc Eastman (**MEa**), Maryann Eastman, Gil Eckrich, Robert Epstein, Mark Esparza (**MEs**), Amy Farrell, Terry Ferguson (**TFe**), Shawnee Finnegan, Joe Fischer, Linda Forrest, Ray Forrest, Phyllis Frank, Tony Frank (**TFR**), Brush Freeman, Gary Froehlich, Andres Garcia, Raul Garza, Joseph Gebler, Dave Grise, Steven Gross, John Groves (**JGr**), Mary Gustafson, Martin Hagne, Mitch Heindel, Troy Hibbitts, Carol Hobby, Tom Hobby (**THo**), Petra Hockey, Steve Howell, Mark Hubinger, Huck Hutchens, Al Jibb, Dexter Johnston (**DeJ**), Dan Jones (**DaJ**), Irme Karafiath, Bill Keim, Joseph Kennedy, Gayle King, Marcin Kotjka, Tom Langschied, Greg Lasley, Javier de Leon (**JdL**), Michael Lindsey (**MLi**), Mark Lockwood (**MLo**), Stephan Lorenz, Jason Luscier, Jon McIntyre, Brad McKinney, Darlene Moore, Roy Morris, James Naismith, David Nelson, Bruce Neville, Rick Nirschl, Kyle O’Haver, Brian O’Shea, Carolyn Ohl-Johnson, Jay Packer (**JaP**), Jim Paton (**JiP**), Tom Pendleton, Barrett Pierce, Randy Pinkston, Bob Rasa, Janet Rathjen, Martin Reid (**MaR**), Michael Retter, Roy Rodriguez, Forrest Rowland, Chris Runk, Christopher Rustay, Kelley Sampeck, David Sarkozi, Steven Schafersman, Mark Scheuerman, Benjamin Schwartz (**BSc**), Bruce Sherman (**BSh**), Jim Sinclair, Rex Stanford, Harlan Stewart, Byron Stone (**BSt**), Mary Beth Stowe (**MBS**), Bryan Tarbox, Clay Taylor (**CTa**), Kent Taylor (**KTa**), Kerry Taylor, Samuel Taylor, Carol Thompson (**CTh**), Joe Thompson, Matt VanWallene, Doug Weidemann, Dave Welling (**DaW**), Jana Whittle, David Wolf (**DWo**), Adam Wood (**AdW**), Alan Wormington, John Yochum, Barry Zimmer, Robin Zurovec, Troy Zurovec.

Acknowledgments—The TBRC is very grateful to the many contributors listed above, without whom this report would not be possible. The committee would also like to thank Bill Clark, Alvaro Jaramillo, Osao & Michiaki Ujihara, and Bret Whitney for providing the TBRC with expert opinion concerning records reviewed during 2011.

The author thanks Randy Pinkston and Martin Reid for reviewing previous drafts of this report.

Additional Abbreviations—AOU = American Ornithologists’ Union; NP = National Park; NWR = National Wildlife Refuge; SHS = State Historic Site; SNA = State Natural Area; SP = State Park; TBSL = Texas Bird Sounds Library (Sam Houston State University); TCWC = Texas Cooperative Wildlife Collection (Texas A&M University); WMA = Wildlife Management Area.

#### ACCEPTED RECORDS

**Trumpeter Swan** (*Cygnus buccinator*) (9). 1 at Midland, Midland, from 18-21 February 2011 (SS; 2011-23; TPRF 2943).

**Masked Duck** (*Nomonyx dominicus*) (90). 1 at Attwater NWR, Colorado, on 25 January 2005 (**BCa**; 2011-60; TPRF 2962). Up to 2 at the King Ranch, Kleberg, from 8 March - 30 April 2011 (MG, BK, CTa; 2011-35; TPRF 2949). Up to 3 at Sabal Palm Sanctuary, Cameron, from 22 May - 9 July 2011 (RZ, MBS, JM, RP, THi; 2011-57; TPRF 2960). 1 north of Combes, Cameron, from 19 July - 1 August 2011 (**TZ, RZ, MG**; 2011-74; TPRF 2968).

**Red-necked Grebe** (*Podiceps grisegena*) (23). 1 at Lake Benbrook, Tarrant, from 6-14 February 2011 (**GC, LB, AIW**; 2011-31; TPRF 2945).

**Red-billed Tropicbird** (*Phaethon aethereus*) (13). 1 offshore, 20 miles east of Port Isabel, Cameron, on 16 July 2011 (**EC, DM, TFR, PF, BM, RP**; 2011-72; TPRF 2967).

**Snail Kite** (*Rostrhamus sociabilis*) (4). 1 at El Franco Lee Park, Houston, Harris, on 17 June 2011 (**SL**; 2011-62; TPRF 2964).

**Short-tailed Hawk** (*Buteo brachyurus*) (38). 1 at Santa Ana NWR, Hidalgo, on 11 August 2009 (**MaR**; 2010-69; TPRF 2910).

**Red-necked Stint** (*Calidris ruficollis*) (2). 1 at Bolivar Flats, Galveston, from 26 June - 8 July 2011 (**KT, PH, JK**; 2011-70; TPRF 2966).

**Red Phalarope** (*Phalaropus fulicarius*) (38). 1 at Sal del Rey, LRGV NWR, Hidalgo, from 30-31 October 2010 (**DaJ, MG**; 2010-74; TPRF 2915). 1 at Port Isabel, Cameron, on 15 November 2010 (**SC**; 2010-88; TPRF 2926).

**Black-legged Kittiwake** (*Rissa tridactyla*) (88). 1 at White Rock Lake, Dallas, from 20 November 2010 - 19 January 2011 (**CR**; 2010-75; TPRF 2916). 1 at Belton Lake, Bell, on 20 November 2010 (RP; 2010-79; TPRF 2920). 1 at Lake Livingston, Polk/San Jacinto, from 28 December 2010 - 14 March



With only three previous Texas records of Snail Kite in Texas, this one day wonder in Houston's El Franco Lee Park on 17 June 2011 was a most unexpected mid-summer treat on the Upper Texas Coast. Photo by Stephan Lorenz.

2011 (**DWo**, JR, SG, DS, AdW, CBa; 2011-04; TPRF 2931). 1 at Padre Island Nat'l Seashore, Kenedy, on 4 January 2011 (**PH**; 2011-03). 1 at Galveston, Galveston, from 6-11 January 2011 (**KS**, TFr, PF, MLi, JF; 2011-01; TPRF 2929). 1 at Rollover Pass, Galveston, on 26 March 2011 (**BO**; 2011-33; TPRF 2947).

**Little Gull** (*Hydrocoloeus minutus*) (65). 1 at Hagerman NWR, Grayson, on 29 November 2010 (**DaJ**; 2010-81; TPRF 2922). 1 at Lake Ray Hubbard, Dallas, from 7-23 December 2010 (**CR**; 2010-83). 1 at Southside Water Treatment Plant, Dallas, from 15-16 January 2011 (**BSt**; 2011-05; TPRF 2932). 2 in the area around the Port Aransas jetties, Nueces, from 1 February - 31 March 2011 (**JM**, AdW, MBa, MC, MaR, EB; 2011-18; TPRF 2942). 2 at White Rock Lake, Dallas, from 5-14 March 2011 (**CR**; 2011-34; TPRF 2948). 1 at Sea Rim SP, Jefferson, on 2 April 2011 (**JW**, **HS**; 2011-38; TPRF 2951).

**(Vega) Herring Gull** (*Larus argentatus vegae*) (4). 1 in east Houston, Harris, on 21 February 2007 (**MaR**; 2011-11; TPRF 2936). 1 in northeast Houston, Harris, on 12 February 2008 (**MaR**; 2011-12; TPRF 2937).

**Slaty-backed Gull** (*Larus schistisagus*) (5). 1 in east Houston, Harris, on 21 February 2007 (**MaR**; 2011-07; TPRF 2933).

**Great Black-backed Gull** (*Larus marinus*) (48). 1 in east Houston, Harris, on 21 February 2007 (**MaR**; 2011-13; TPRF 2938). 1 at Port Aransas, Nueces, on 11 November 2010 (**JM**; 2010-66; TPRF 2907). 1 at East Beach, Galveston, from 30 December 2010 - 5 January 2011 (**MaR**; 2010-90; TPRF 2927).

**Thalasseus species** (1). 1 at Bolivar Flats, Galveston, on 15 April 2008 (**MiR**, **BSc**; 2010-84; TPRF 2923). Photos showed a large *Thalasseus*, presumably a Lesser Crested, Elegant or "Cayenne" Tern. The record was accepted at the genus level.



A stunning Red-necked Stint present in the Bolivar Flats area from 26 June to 8 July 2011 was one of the highlights of 2011. Just the second record for Texas, this individual was chased by many but seen by very few. Photo by Kerry Taylor.

**Long-tailed Jaeger** (*Stercorarius longicaudus*) (22). 1 on west Matagorda Bay, Calhoun, on 7 September 2010 (PH; 2010-55).

**Ruddy Ground-Dove** (*Columbina talpacoti*) (21). 1 at Estero Llano Grande SP, Hidalgo, from 10-12 November 2010 (JDu, RS, MaR, DaJ, MS, RR, JBo; 2010-67; TPRF 2908). 2 at Canyon Grande Creek, Maverick, on 7 April 2011 (BF; 2011-45).

**Mangrove Cuckoo** (*Coccyzus minor*) (13). 1 in Brownsville, Cameron, on 1 January 1996 (JGe; 2011-75). 1 at Sabal Palm Sanctuary, Cameron, from 26-30 June 2011 (JA; 2011-69).

**Green Violetear** (*Colibri thalassinus*) (72). 1 near Ratcliff, Houston, from 18-19 September 2010 (BB; 2011-02; TPRF 2930). 1 in Temple, Bell, from 26-28 May 2011 (RP, JC, GE; 2011-55; TPRF 2958). 1 in Ingram, Kerr, from 20-21 June 2011 (ST, EB; 2011-66; TPRF 2965). 1 in Abilene, Taylor, from 8-10 July 2011 (JaP, JT; 2011-76; TPRF 2969).

**Costa's Hummingbird** (*Calypte costae*) (32). A returning bird (same as 2009-99) at Christmas

Mountains, Brewster, from 17 October 2010 - 15 February 2011 (COJ; 2010-60; TPRF 2903).

**Violet-crowned Hummingbird** (*Amazilia violiceps*) (18). 1 in El Paso, El Paso, from 30-31 October 2010 (BZ; 2010-72; TPRF 2913). 1 at the Davis Mountains Resort, Jeff Davis, from 8 November - 21 December 2010 (MEa, ME, MLo; 2010-65; TPRF 2906).

**Tufted Flycatcher** (*Mitrephanes phaeocercus*) (3). 1 at Rio Grande Village in Big Bend Nat'l Park, Brewster, from 21 November 2010 - 4 January 2011 (MV, MLo, RP, DB, BP, MaR, CTh; 2010-76; TPRF 2917).

**Greater Pewee** (*Contopus pertinax*) (23). 1 at McAllen, Hidalgo, from 26 November 2010 - 17 January 2011 (AdW, JM, DB, GL, MaR, BM; 2010-78; TPRF 2919). 1 on the Davis Mountains Preserve in Tobe Canyon, Jeff Davis, on 9 April 2011 (FR; 2011-44; TPRF 2954).

**(Lawrence's) Dusky-capped Flycatcher** (*Myiarchus tuberculifer lawrencei*) (12). 1 at NABA National Butterfly Center, Hidalgo, on 3 December 2010 (MaR, DD; 2010-80; TPRF





A Tufted Flycatcher at Rio Grande Village in Big Bend National Park from 21 November 2010 (here) to 4 January 2011 delighted scores of birders. It was the third Texas record, showing up in the same location and time of year as Texas's first Tufted Flycatcher, some nineteen years earlier. Photo by Matt VanWallene.

2921). 1 at Sabal Palm Sanctuary, Cameron, from 2 January - 1 March 2011 (MEs, BM, AG; 2011-10; TPRF 2935).

**Sulphur-bellied Flycatcher** (*Myiodynastes luteiventris*) (19). 1 at High Island, Galveston, from 25-28 April 2011 (MK; 2011-46; TPRF 2955).

**Fork-tailed Flycatcher** (*Tyrannus savana*) (23). 1 at Galveston Island SP, Galveston, from 29 January - 2 February 2011 (TFr, PF, JR; 2011-15; TPRF 2940). 1 at Pollywog Ponds, Nueces, on 30 April 2011 (BCr; 2011-53; TPRF 2957).

**Black-whiskered Vireo** (*Vireo altiloquus*) (32). 1 at the Port Aransas Birding Center, Nueces, on 10 April 2011 (MK, JM, MBe; 2011-39; TPRF 2952).

**(Russet-backed) Swainson's Thrush** (*Catharus ustulatus ustulatus/oedicus*) (1). 1 in El Paso, El Paso, from 9-10 May 2011 (JiP; 2011-56; TPRF 2959). Swainson's Thrush (olive-backed eastern forms) is a regularly occurring non-review species in Texas but there are no previous documented records of the western Russet-backed subspecies.

**White-throated Thrush** (*Turdus assimilis*) (14). 1 at Estero Llano Grande, Hidalgo, from 29 December 2010 - 27 March 2011 (TD, IK, MaR, BN, DB, BM, MBa, AIW, EB; 2010-91; TPRF 2928). 1 on the King Ranch Norias Division, Kenedy, from 22-23 March 2011 (JS, TL, DeJ; 2011-32; TPRF 2946).

**Rufous-backed Robin** (*Turdus rufopalliatu*)

(17). 1 in the NABA National Butterfly Center & Rio-Bentsen State Park environs, Hidalgo, from 17 November 2010 - 10 March 2011 (DD, JdL, TP; 2010-71; TPRF 2912). 1 at Laguna Atascosa NWR, Cameron, from 21 November 2010 - 30 January 2011 (JM, DB, BM; 2010-77; TPRF 2918). 1 at Ft Inge, Uvalde, Uvalde, on 19 February 2011 (MHe; 2011-25). Originally thought to be different individuals, details for 2011-09 and 2011-24 were merged back into and included as part of record 2010-71 since they all pertained to the same bird.

**Varied Thrush** (*Ixoreus naevius*) (40). 1 at High Island, Galveston, on 2 October 2010 (WB; 2010-70; TPRF 2911). 1 at Lake Palo Duro,

Hansford, on 10 May 2011 (JDe; 2011-58; TPRF 2961).

**Snow Bunting** (*Plectrophenax nivalis*) (8). 1 at Sea Rim SP, Jefferson, on 13 June 2011 (TFe; 2011-61; TPRF 2963).

**Gray-crowned Yellowthroat** (*Geothlypis poliocephala*) (45). 1 at Southmost Preserve, Cameron, on 26 December 2009 (MHa; 2009-108).

**Rufous-capped Warbler** (*Basileuterus rufifrons*) (26). 1 at near Crystal City, Zavala, from 30 October 2010 - 5 January 2011 (BR, BN, AdW; 2010-63; TPRF 2904).

**Yellow-faced Grassquit** (*Tiaris olivaceus*) (4). 1 at Goose Island SP, Aransas, from 30 January - 20 March 2011 (ST, JM, BP, DB, AdW, TD, CRu, BSt, MBa, RP, BN, DN, BM, RE, AIW, EB; 2011-16; TPRF 2941).

**Golden-crowned Sparrow** (*Zonotrichia atricapilla*) (35). 1 at Limpia Crossing, Fort Davis, Jeff Davis, from 5-9 November 2010 (CH, THo, MLo; 2010-64; TPRF 2905).

**Flame-colored Tanager** (*Piranga bidentata*) (9). 1 at McAllen, Hidalgo, on 3 March 2011 (GK, MG; 2011-27; \*TCWC 16153).

**Crimson-collared Grosbeak** (*Rhodothraupis celaeno*) (25). 1 at the Valley Nature Center in Weslaco, Hidalgo, from 12-18 November 2010 (RG, MaR, SF, RR, SH, JBo, DaW; 2010-68; TPRF 2909). 1 at Pharr, Hidalgo, from 15 November 2010 - 11 April 2011 (JM, DoW, BN, JGr, DB, JA, AdW,



Goose Island State Park hosted a mostly obliging Yellow-faced Grassquit from 30 January to 20 March 2011. With the previous three records coming from the Lower Rio Grande Valley, a central coast record was certainly a surprise. Photo by Robert Epstein, 16 February 2011.

MG, MBa, RR; 2010-73; TPRF 2914). 1 at Corpus Christi, Nueces, from 12-23 December 2010 (**KTa**; 2010-86; TPRF 2924). 1 at Estero Llano Grande SP, Hidalgo, from 29 December 2010 - 3 January 2011 (**CC**, **MG**; 2011-36).

**Blue Bunting** (*Cyanocompsa parellina*) (42). 1 at LRGV NWR, Hidalgo, on 4 January 2011 (**MG**; 2011-30). 1 at Santa Ana NWR, Hidalgo, from 15 January - 13 February 2011 (**GF**, **RM**, **MHu**; 2011-14; TPRF 2939). 2 at Bentsen SP, Hidalgo, from 21 January - 15 March 2011 (**GF**, **KC**, **JM**, **MBa**, **RZ**, **MBS**; 2011-08; TPRF 2934). 1 at Rio Grande City, Starr, on 27 January 2011 (**AIW**; 2011-40; TPRF 2953). 1 at Estero Llano Grande SP, Hidalgo, on 9 February 2011 (**HH**, **JY**, **KO**; 2011-19; \*TCWC 16,156). 1 at Corpus Christi, Nueces, from 19-31 March 2011 (**MC**, **CTa**; 2011-37; TPRF 2950). Originally thought to a different individual, details for 2011-20 was merged back into and included as

part of record 2011-08 since it pertained to the same bird.

**Black-vented Oriole** (*Icterus wagleri*) (8). 1 in the Bentsen SP environs, Hidalgo, from 13 December 2010 - 11 March 2011 (**JdL**, **CTh**, **BP**, **MaR**, **RN**, **RP**, **BM**, **DB**, **AdW**, **RF**, **LF**, **MBa**, **BN**, **DN**, **BSh**, **JBa**, **AF**, **AJ**; 2010-87; TPRF 2925). 1 at South Padre Island, Cameron, from 28 April - 6 May 2011 (**BCl**, **EB**, **BM**, **MBS**, **MG**; 2011-47; TPRF 2956).

#### NOT ACCEPTED

A number of factors may contribute to a record being denied acceptance. It is quite uncommon for a record to not be accepted due to a bird being obviously misidentified. More commonly, a record is not accepted because the material submitted was incomplete, insufficient, superficial, or just too vague to properly document the reported occurrence

while eliminating all other similar species. Also, written documentation or descriptions prepared entirely from memory weeks, months, or years after a sighting are seldom voted on favorably. It is important that the simple act of not accepting a particular record should by no means indicate that the TBRC or any of its members feel the record did not occur as reported. The non-acceptance of any record simply reflects the opinion of the TBRC that the documentation, as submitted, did not meet the rigorous standards appropriate for adding data to the formal historical record. The TBRC makes every effort to be as fair and objective as possible regarding each record. If the committee is unsure about any particular record, it prefers to err on the conservative side and not accept a good record rather than validate a bad one. All records, whether accepted or not, remain on file and can be re-submitted to the committee if additional substantive material is presented.

Eurasian Wigeon (*Anas penelope*). 1 at Sherman, Grayson, on 30 November 2010 (2010-82).

Yellow-billed Loon (*Gavia adamsii*). 1 at Nueces Bay, Nueces, on 16 February 2011 (2011-26).

Red-necked Grebe (*Podiceps grisegena*). 1 near Port Aransas, Nueces, on 20 December 2010 (2011-21).

Sooty Shearwater (*Puffinus griseus*). 1 off of Freeport, Brazoria, on 15 June 2011 (2011-68).

Great Frigatebird (*Fregata minor*). 1 at Packery Channel, Nueces, on 18 February 2011 (2011-22).

Brown Booby (*Sula leucogaster*). 1 at Packery Channel, Nueces, on 29 January 2011 (2011-17).

Short-tailed Hawk (*Buteo brachyurus*). 1 at Pollywog Ponds, Nueces, on 20 April 2011 (2011-64).

Spotted Rail (*Pardirallus maculatus*). 1 at the Port Aransas Birding Center, Nueces, from 2-3 May 2011 (2011-48).

Violet-crowned Hummingbird (*Amazilia violiceps*). 1 in Austin, Travis, on 6 May 2011 (2011-49).

Tamaulipas Crow (*Corvus imparatus*). 3 at Sabal Palm Sanctuary, Cameron, on 4 February 2007 (2011-28). 1 at Sabal Palm Sanctuary, Cameron, on 24 February 2009 (2011-29).

Golden-crowned Warbler (*Basileuterus culicivorus*). 1 at Los Fresnos, Cameron, on 10 March 2011 (2011-41).

Slate-throated Redstart (*Myioborus miniatus*). 1 at the Christmas Mountains, Brewster, on 20 April 2011 (2011-43). 1 near Johnson City, Blanco, on 17 May 2011 (2011-51).

#### LITERATURE CITED

- AMERICAN ORNITHOLOGIST' UNION. 1998. Check-list of North American birds, 7th Edition. American Ornithologists' Union, Washington, D. C.
- CHESSER, R. TERRY, R. C. BANKS, F. K. BARKER, C. CICERO, J. L. DUNN, A. W. KRATTER, I. J. LOVETTE, P. C. RASMUSSEN, J. V. REMSEN, JR., J. D. RISING, D. F. STOLTZ, AND K. WINKLER. 2012. Fifty-third supplement to the American Ornithologists' Union Check-list of North American Birds. *Auk* 129:573-588.
- DITTMANN, D. L., AND G. W. LASLEY. 1992. How to document rare birds. *Birding* 24:145-159.

## SHORT COMMUNICATIONS

---

### HUTTON'S VIREO NESTING IN GUADALUPE COUNTY, TEXAS

Jack Eitniewski<sup>1</sup> and Don Schaezler<sup>2</sup>

<sup>1</sup>218 Conway Drive, San Antonio, Texas 78209

<sup>2</sup>Warbler Woods, 19349 Old Wiederstein Rd., Cibolo, Texas

Hutton's Vireo (*Vireo huttoni*) is considered a locally common summer and uncommon winter resident in the Davis and Chisos Mountains of the Trans-Pecos (Lockwood and Freeman 2004). Recent observations indicate that the species is also a low density resident on the Edwards Plateau. This note verifies additional nesting in Guadalupe County expanding the known range in Texas from the Edwards Plateau to disturbed portions of the Blackland Prairie.

#### METHODS AND RESULTS

Hutton's Vireo have been irregular residents at Warbler Woods Bird Sanctuary (29°36' 35.48" N 98° 14' 40.92" W) in Cibolo, Texas since May 2009. For additional details on Warbler Woods Bird Sanctuary see Smith (2011). Several Hutton's Vireos have been continually observed since October 2011 with at least 1 male singing on 7 April (Susan Schaezler per com.). Lora Render photographed (Fig. 1) the vireos constructing a nest in a live oak tree (*Quercus virginiana*) on 1 May 2012. Gil Eckrich, and Eric Runfeldt observed a Brown-headed Cowbird (*Molothrus ater*) inspecting the vireo's nest on 5 May. Don Schaezler noted the presence of 2 cowbird eggs in the nest (Fig. 2) on 10 May. The authors inspected the nest which lacked the cowbird eggs on 11 May 2012. The nest was then removed and donated to the Biodiversity and Teaching Collection at Texas A & M University-College Station.

Nest dimensions included 7.5 cm outside diameter, 6.5 cm height, 4.2 cm inside diameter and 3.5 cm depth. The nest was constructed of lichens, coarse and fine grasses, *Tillandsia* sp. and spider webs attached it to the fork of a branch. The nest

was placed in a branch 4 m from the ground and 6 m from the trunk of a live oak tree.

#### DISCUSSION

Davis (1995) described the Hutton's Vireo nest as a globular hanging cup, usually suspended from forks of horizontal twigs; externally of various combinations of lichens (especially of the genera *Usnea* and *Ramalina*), mosses, plant down (particularly from oaks, sycamores, willows, and cottonwoods), fine grasses, moth and spider cocoons, feathers, pieces of paper and string, small green leaves, and shreds of bark all held together with spider silk; lined with fine grasses and occasionally hair, feathers, or fine shreds of bark. While our nest was smaller overall than those from Oregon, California, and Arizona (Table 1) and lacked string, paper, feathers or hair. It could have been constructed by a young pair with little or no nest construction experience.

Davis (1995) considered the species to be an uncommon host of Brown-headed Cowbird (*Molothrus ater*). Despite this our observation augments that of Loman and Loman (2010) who observed 2 Brown-headed Cowbirds being fed by an adult Hutton's Vireo.

Oberholser (1974) included Trans-Pecos records of Hutton's Vireo from Brewster, Jeff Davis, Culberson and El Paso counties. Lasley and Gee (1991) added northern Real County to the distribution extending the range onto the Edwards Plateau. Subsequently Loman and Loman (2010) observed breeding in Real and Uvalde counties. Lockwood and Freeman (2004) mention a February and March sighting east of the Balcones escarpment in Bastrop County and postulated that the sighting

---

<sup>1</sup>E-mail: jce@cstbinc.org



Figure 1. Hutton's Vireo constructing nest. Photo Lora Render.



Figure 2. Hutton's Vireo nest with two Brown-headed Cowbird eggs. Photo Don Schaezler.

Table 1. Dimensions (cm) of Hutton's Vireo nests in Oregon, California\* and Arizona compared to recent nest discovered in Texas (Davis 1995).

Location	n	Outside diameter	Height	Inside diameter	Depth
Oregon	1	8.3	7.0	5.1	4.4
California	1	7.6	7.0	4.8	4.1
Arizona	6	7.6	7.1	6.0	4.5
Texas	1	7.5	6.5	4.2	3.5

\*Mean value

suggested Hutton's Vireo could be a low density resident on the Edward Plateau. Without providing details Norwine and Kuruvilla (2007) added Bexar County to the known range. This Guadalupe County breeding attempt and sighting of 4 individuals extends the range east of the Edwards Plateau onto suitable habitat on the Blackland Prairie.

#### LITERATURE CITED

- DAVIS, J. N. 1995. Hutton's Vireo (*Vireo huttoni*). The Birds of North America Online: <http://bna.birds.cornell.edu/bna/species/189> (accessed 10 November 2012).
- LASLEY, G. W. AND J. P. GEE. 1991. The first nesting record of the Hutton's Vireo (*Vireo huttoni*) east of the Pecos River, Texas. Bulletin Texas Ornithological Society 24:23-24.
- LOCKWOOD, M. W. AND B. FREEMAN. 2004. The Texas Ornithological Society handbook of Texas birds. Texas A&M University Press. College Station.
- LOMAN, G. Z. AND J. T. LOMAN. 2010. Hutton's Vireo establishment as a breeding species in the Texas Hill Country. Bulletin Texas Ornithological Society 43:67-69.
- NORWINE, J. AND J. KURVILLA. 2007. Rapid range change in South Texas birds: response to climate change. Pp. 137-146 in The changing climate of South Texas 1900-2100: problems and prospects, impacts and implications. J. Norwine and J. Kuruvilla, Editors. Crest-Resaca Texas A & M University Press-Kingsville, Kingsville.
- OBERHOLSER, H.C. 1974. The bird life of Texas (E. B. Kincaid, Jr., Editor) Volume 1, University of Texas Press, Austin.
- SMITH, D. 2011. Warbler Woods comes of age. Texas Birds Annual 7:49-53.

# TWO RECENT ADDITIONS TO THE BREEDING AVIFAUNA OF THE GUADALUPE MOUNTAINS, TEXAS

Mark W. Lockwood<sup>1</sup>

<sup>1</sup>*Natural Resources Program, Texas Parks and Wildlife Department, P.O. Box 1807, Fort Davis, Texas*

First nesting records were established for Gray Flycatcher (*Empidonax wrightii*) and Black-throated Gray Warbler (*Setophaga nigrescens*) during 2 visits to the Dog Canyon area of Guadalupe Mountains National Park, Culberson County in May 2012. The only other known nesting area for Gray Flycatcher in Texas is in the upper elevations of the Davis Mountains. The Black-throated Gray Warbler has been suspected of nesting in the Guadalupe Mountains but had not previously been confirmed.

At least 20 Gray Flycatchers were encountered on 5 May 2012 in the lower portion of Dog Canyon, including many singing males that appeared to be on territory. A female was discovered during a survey of the area building a nest in an alligator juniper (*Juniperus deppeana*). The nest was approximately 2.0 m above the ground near the end of a branch. The nest location was very well concealed due to the extent of leaves on the branch and surrounding branches. The area consisted of an open oak-juniper woodland dominated by chinquapin oak (*Quercus muehlenbergii*), bigtooth maple (*Acer grandidentatum*), alligator juniper, and ponderosa pine (*Pinus ponderosa*). A return to that location on 26 May revealed the female incubating eggs (Fig. 1). Numerous Gray Flycatchers were again encountered with several singing males within the area surveyed 3 wk earlier.

Two male Black-throated Gray Warblers were vociferously singing in the lower portion of Dog Canyon as well during the 5 May visit (Fig. 2). Both birds behaved as if they were on territory and were easily detected through the day. A female was observed with 1 of these birds although no direct interactions were noted. The possibility that these birds were migrants could not be discounted which lead to a follow-up visit on 26 May. Three singing males were encountered during the visit.

The behavior and date lead me to believe that these birds were indeed on territory. I searched for a female in the vicinity of the most vocal male for approximately 2 h. At the end of that search, a female was discovered foraging in a large Alligator Juniper. During the observation the bird went to what appeared to be a nest approximately 6.0 m above the ground in the crown of the juniper. I could see the side of the apparent nest, but could not see the structure well enough to confirm if the bird was sitting on the nest. Black-throated Gray Warblers are known to nest as close as the Sacramento Mountains in southern New Mexico (Hubbard 1978) which is approximately 110 km to the northwest.

The discovery of nesting Gray Flycatchers represents only the second breeding location within the state. A population of Gray Flycatchers was discovered in upper Madera Canyon in the Davis Mountains in 1990 (Lasley and Sexton 1990) and nesting was confirmed in 1991 (Peterson et al. 1991). Subsequent surveys showed the species was common in the oak-juniper woodlands above 1800 m above msl (Bryan and Karges 2003). Newman (1975) suggested that breeding habitat for Gray Flycatcher existed in the Guadalupe Mountains, but this is the first documentation of nesting. The Black-throated Gray Warbler has been suspected of breeding in the Guadalupe Mountains since 1960 when Fred R. Gehlbach observed an apparent juvenile bird on 2 August (Oberholser 1970). This observation does not unequivocally document nesting, but it is strong evidence that the species breeds in at least the Dog Canyon drainage.

Other nesting species of interest found in Dog Canyon were 2 territories of American Robin (*Turdus migratorius*). The males were very vocal and territorial disputes were frequently observed. This species has become increasingly uncommon as a breeding bird in the mountains of the Trans-Pecos

---

<sup>1</sup>E-mail: mark.lockwood@tpwd.state.tx.us



Figure 1. Female Gray Flycatcher incubating eggs at Dog Canyon, Guadalupe Mountains National Park, Culberson County on 25 May 2012. Photograph by Mark W. Lockwood



Figure 2. Territorial male Black-throated Gray Warbler at Dog Canyon, Guadalupe Mountains National Park, Culberson County on 25 May 2012. Photograph by Mark W. Lockwood



over the past decade. One nesting pair of Juniper Titmouse (*Baeolophus ridgwayi*) was also observed. This species' breeding range in Texas is restricted to foothills of the Guadalupe Mountains and the status of the species in Texas is not well understood. The territory of this pair included a portion of the lower Dog Canyon that was on the state line. The pair was observed foraging in both Texas and New Mexico and the nest location was in New Mexico. The nest was in a cavity in the trunk of a small gray oak (*Quercus gresia*). The nest was ~ 0.6 m above the ground and contained nestlings based on the frequent visits to the nest cavity by the adults. A second pair of Juniper Titmice was also observed 900 m north of the state line. Other species observed at nest sites or clearly on territory included the Broad-tailed Hummingbird (*Selasphorus platycercus*), Acorn Woodpecker (*Melanerpes formicivorus*), Western Wood-Pewee (*Contopus sordidulus*), Cordilleran Flycatcher (*Empidonax occidentalis*), Plumbeous Vireo (*Vireo plumbeus*), Violet-green Swallow (*Tachycineta thalassina*), Mountain Chickadee (*Poecile gambeli*), Grace's Warbler (*Setophaga graciae*), Hepatic Tanager (*Piranga flava*), and Western Tanager (*Piranga ludoviciana*).

#### ACKNOWLEDGMENTS

Cliff Shackelford provided comments on a previous version of this paper.

#### LITERATURE CITED

- BRYAN, K. B. AND J. P. KARGES. 2001. Recent bird records in the Davis Mountains. *Texas Birds* 3:40-53.
- HUBBARD, J. P. 1978. Revised check-list of the birds of New Mexico. New Mexico Ornithological Society, Publication No. 6.
- LASLEY, G. W. AND C. SEXTON 1990. Texas Region: summer report. *American Birds* 44:1154-1158.
- NEWMAN, G. A. 1975. Compositional aspects of breeding avifaunas in selected woodlands of the southern Guadalupe Mountains, Texas. Pp. 181-237 in *Biological investigations in the Guadalupe Mountains National Park, Texas*. H. H. Genoways and R. J. Baker, Editors. Proceedings and Transactions Series, National Park Service; No. 4. Washington, D. C.
- OSBERG, H.C. 1974. *The bird life of Texas*. University of Texas Press, Austin.
- PETERSON, J. J., G. W. LASLEY, K. B. BRYAN, AND M. LOCKWOOD. 1991. Additions to the breeding avifauna of the Davis Mountains. *Bulletin Texas Ornithological Society* 24:39-48.

## RECENT NESTING RECORDS OF GREEN KINGFISHER FROM THE BRAZOS RIVER DRAINAGE OF CENTRAL TEXAS

Randy Pinkston<sup>1</sup> and Tim Fennell<sup>2</sup>

<sup>1</sup>3505 Hemlock Court, Temple, TX 76502  
<sup>2</sup>2018 Bent Tree Loop, Round Rock, TX 78681

The Green Kingfisher (*Chloroceryle americana*) in Texas is an uncommon resident from the Edwards Plateau southward to the Lower Rio Grande Valley (Lockwood and Freeman 2004). Nesting occurs from near sea level to 600 m along clear rivers and streams (Oberholser 1974) from the lower Pecos drainage in the west to the Colorado drainages in

the east. Field work with the Texas Breeding Bird Atlas project from 1987-1992 produced evidence of nesting primarily in rivers draining the southwestern Edwards Plateau, chiefly the Devils, Nueces, San Antonio, and Guadalupe, and along the Rio Grande southeast from Val Verde County and locally to the Gulf of Mexico (Tweit 2008). Recent vagrancy

<sup>1</sup>E-mail: drpinkston@sbcglobal.net

includes spring records from Lee and Washington counties (Bert Frenz, pers. comm.) but nesting has not previously been documented from the Brazos River system. Herein we report 2 confirmed nesting records from Brazos River drainages in Williamson and Bell counties.

## METHODS AND RESULTS

### *Nest #1, North San Gabriel River, Williamson County*

A male Green Kingfisher emitting a harsh, buzzing tshzack call was discovered on 21 April 2002 along the North San Gabriel River at Rivery Park in Georgetown, Williamson County, Texas. Five days later a male and female Green Kingfisher were located at the same site. The male appeared agitated and alternated movements between 2 perches, vocalized the tshzack call, as well as a high-pitched twittering call, and arched its back and turned its head and body from side to side.

The male was observed again on 11 May, perched quietly on a branch at the original site. Two kingfishers were seen on the same day ~ 1,600 m upstream from the original site. Later in the afternoon a female kingfisher had assumed the male's perch. A male occupied a burrow (Fig. 1) on the north bank ~ 800 m upstream from IH-35 on a steep bluff (> 10 m high) of clay-rich soil opposite a flat alluvial bar on the south bank. A small alluvial point also jutted from the north side, thereby creating a protected backwater directly below the burrow. A shallow rapid connected this pool with another pool downstream. The burrow opening was oriented downward and concealed by



Figure 1. Green Kingfisher nest location on North San Gabriel River, May 2002. Photo by Tim Fennell.



Figure 2. San Gabriel River burrow entrance. Photo by Tim Fennell.

overhanging branches (Fig. 2). It measured 4-5 cm high by 5-6 cm wide and was placed 75 cm above the flat bank and 90 cm above the water. It was located 30 cm from the water's edge. Three other burrows were discovered nearby on the same bluff, possibly representing previous or multiple nesting attempts. Green Kingfishers have been observed sporadically at this location but nesting has not been documented since 2002.

Vegetation in the immediate vicinity included 1 large eastern cottonwood (*Populus deltoides*) tree, several small sugar hackberry (*Celtis laevigata*) trees, Japanese privet (*Ligustrum japonicum*) trees, and catbrier (*Smilax bona-nox*) thickets.

The kingfisher pair was observed outside and/or upstream from their burrow on 6 occasions between 13 May and 27 May, but no fledging or young birds were observed. A return visit to the site after summer floods on 1 September led to the discovery that a portion of the bank (containing the burrow) had been broken away.

### *Nest #2, Lampasas River, Bell County*

A female Green Kingfisher was discovered and photographed along the south bank of the Lampasas River downstream from Chalk Ridge Falls Park (Stillhouse Hollow Lake) on 18 March 2012. The next day a male Green Kingfisher was found and photographed at the same location. The male kingfisher was seen carrying minnows and holding them in his beak while perching along a relatively restricted segment of the river on 8 April. We suspected possible nesting. The male's behavior caused us to search for a nest burrow, which was eventually identified on the river's steep (north)



Figure 3. Green Kingfisher pair with prey on Lampasas River, Bell County, April 2012. Photos by Eric Runfeldt.



Figure 4. Lampasas River Green Kingfisher nest location. Photo by Randy Pinkston.

bank. The male kingfisher was observed entering and exiting the burrow entrance on 2 occasions that afternoon, each time delivering a 5-8 cm minnow. On 1 occasion the female had departed the burrow at the moment of the male's arrival, so we assumed the pair was feeding young. Multiple observers returned to the site over the following 9 d and observed both Green Kingfishers delivering food items to the burrow (Fig. 3). Both parents were quite wary and avoided approaching the burrow when humans were nearby in plain view. They would perch with minnow in beak for perhaps 5 min before flying to another perch and waiting, or perhaps disappearing from view for several minutes. One observer reported hearing "scolding notes" from the female. Most observers reported the parents along a 2.4 km stretch of the river upstream (west) of the burrow. A pair of Belted Kingfishers (*Megaceryle alcyon*) was simultaneously active along the same stretch of the river, though no interaction between the 2 species was observed. The Green Kingfisher nest had either fledged or been abandoned by 20 April (Gil Eckrich, pers. comm.). A Green Kingfisher(s) with female

plumage was observed along the same river stretch on 7 June and 1 July, but definite confirmation of offspring did not occur.

Prevailing drought conditions were evident at the river on 1 July. The river channel immediately below the burrow was shallow (ankle to mid-shin depth) and roughly 4-5 m wide, connecting both upstream and downstream with much wider and deeper clear pools. The burrow was placed on the steep north bank about 2 m above and 2 m in from the water's edge (Fig. 4). The south river bank consisted of a broad dry gravel bar with scattered lush vegetation. The burrow entrance was oriented downward and concealed by overhanging roots and vines (Fig. 5). It measured 7-8 cm high by 6-7 cm wide and quickly narrowed to a 5 cm circular tunnel. The floor of the entrance had a pair of deep grooves on either side (Fig. 6), presumably from repeated scraping by the kingfishers' feet upon entering. The tunnel was oriented slightly upward and to the left to a maximum depth of 56 cm. Perches were located both upstream and downstream from the burrow. Vegetation in the immediate vicinity included



Figure 5. Parent Green Kingfisher entering Lampasas River burrow. Photo by Eric Runfeldt.



Figure 6. Lampasas River burrow entrance. Photo by Randy Pinkston.

large pecan (*Carya illinoensis*) trees, boxelder (*Acer negundo*) trees, catbrier, and peppervine (*Ampelopsis arborea*).

#### DISCUSSION

Oberholser (1974) noted that the breeding period for the Green Kingfisher in Texas extends from late February through late June with egg dates from 4 March through 29 May. Breeding dates are similar

in a study by Moskoff (2002) with peak egg dates occurring from late March through the end of April and peak hatchling dates from late April through the end of May. Incubation takes 19-21 d and both parents participate in both incubation and brooding/feeding. While no young birds were confirmed here, our dates fall well within these predictions with the Bell County nest being somewhat early. It is likely that the Lampasas River pair was already incubating when first discovered on 18 March and that young had hatched when the burrow was discovered on 8 April.

#### ACKNOWLEDGMENTS

The authors would like to thank Dr. Jim Giocomo of the American Bird Conservancy for his initial recognition that so little is known about Green Kingfisher nesting ecology and suggesting that we write this note. Thanks also to other keen observers of both nests, including Eric Carpenter, Gil Eckrich, Eric Runfeldt, Dr. Chuck Sexton, and Scott Snyder. Thanks also to Grant Critchfield for his assistance with plant identification at the Lampasas River site.

#### LITERATURE CITED

- LOCKWOOD, M. W. AND B. FREEMAN. 2004. The Texas Ornithological Society Handbook of Texas Birds. Texas A & M University Press, College Station.
- OBERHOLSER, H. C. 1974. The bird life of Texas. E. B. Kincaid, Jr., Editor. Vol. I. University of Texas Press, Austin.
- TWEIT, R. C. 2008. The Texas Breeding Bird Atlas. K. A. Arnold and K. L. P. Benson, Editors. Texas A & M University, College Station. Retrieved from: <http://txtbba.tamu.edu>.(July 2012).
- MOSKOFF, W. 2002. Green Kingfisher (*Chloroceryle americana*), The Birds of North America. No. 621. Retrieved from: <http://bna.birds.cornell.edu/bna/species/621>.(July 2012).

# CLAPPER RAIL IMPALEMENT MORTALITY

Bobby J. Schat<sup>1</sup>

*U.S. Fish and Wildlife Service, Florida Panther NWR, 3860 Tollgate Blvd suite 300,  
Naples FL 34114*

Clapper Rails (*Rallus longirostris*) inhabit saline wetlands on East Coast coastal marshes from southern New England (Enser 1992, Veit and Peterson 1993); south to the Florida Keys (American Ornithological Union 1983); west to Texas and Tamaulipas, Mexico (16 km south of mouth of Rio Grande, Banks 1974); on west to the lower Colorado River drainage in Arizona and California (Todd 1986, Rosenberg et al. 1991); and north along the west coast to 2 isolated locations in the west coast salt marshes at San Francisco and San Pablo Bays (American Ornithological Union 1983, Small 1994. Most populations are non-migratory, except the northernmost population (Meanley 1985).

Clapper Rails (*R.l saturatus*) in Louisiana inhabit low tidal salt marshes dominated by cordgrass (*Spartina* sp.) of moderate height and salinity levels exceeding 7,100 pm at low tide and 5,600 ppm at high tide (Meanley 1985). There could be possible temporary changes of distribution of Clapper Rails in wetter months in adjacent intermediate and fresh water marshes. Gulf coast populations tend to feed on fiddler crabs (*Uca* sp, *Sesarma* sp.), periwinkle snails (*Littorina inornata*), and clamworms (*Nereis* sp.) in the saltier habitats. Freshwater events change food availability to grasshoppers and crayfish (*Procambarus* sp.) until the saltwater reestablishes.

Clapper Rails are subject to natural mortality from a variety of natural predators that prey on nests, eggs, and adults.

Populations have also been impacted by the introduction of exotic predators such as red foxes (*Vulpes vulpes*), stray feral felines (*Catus* sp.), feral hogs (*Sus scrofa*) and Norway rats (*Rattus norvegicus*). Feral hogs in coastal marshes may have long-term impacts on populations from the predation on eggs and young, ground disturbances of vegetation, and competition for food sources. Thirteen states on the east and gulf coast allow

harvest of Clapper Rails or locally called marsh hens. Coastal populations in Texas and Louisiana are stable enough to allow liberal bag limits. Even with liberal harvest limits, hunter harvest rates tend to be low. There has been a long-term decline in active rail hunting, and birds are usually taken in low numbers by waterfowl hunters. The exceptionally high tide used to effectively harvest Clapper Rails is unpredictable, resulting in fluctuation of harvest opportunities. Natural catastrophes may cause declines in isolated populations, but they tend to rebound. Where rail habitat is more limited, protection has been granted to localized populations. The Yuma Rail (*Rallus longirostris yumanensis*), the only rail found in fresh water of the lower Colorado River, California Clapper Rail (*Rallus longirostris obsoletus*), and the Light-footed Clapper Rail (*Rallus longirostris levipes*) are subspecies on the federal endangered species list.

There is an unusual cause of mortality associated with the fencing of property boundaries with barb wire in that Clapper Rails are found impaled on barb wire property fences. There seems to be no pattern on time of year or location on the fence. Rails are poor fliers with short erratic body movements and dangling legs. This erratic flight may lead to birds being impaled on barb wire fences on windy days or on escape flights. Clapper Rails, have been observed to fold up and crash on contact in cane (*Phragmites australis*) or cattail (*Typha* sp.) stands during escape flushes. This appears to be the normal escape flight.

I observed impaled rails on a barb wire fence (Figs. 1 and 2) in a saline marsh in southeast Texas several months apart. The height (1.2-1.5 m) and structure (5-6 strands of wire) of fences were similar to the normal cattle enclosures found throughout the county. Both fences appeared to have been in use for several years. I observed a total of 6 fence impalements of Clapper Rails and

---

<sup>1</sup>E-mail: bobby\_schat@fws.gov



Figure 1. Impalement on thigh region of a Clapper Rail on the med-level strand of barb wire fence in southeast Texas (Bobby Schat/USFWS).



Figure 2. Lower breast impalement of a *Clapper* Rail on top strand of a barbed wire fence in southeast Texas.

1 Tricolored Heron (*Egretta tricolor*) during 2006-2008. All birds were impaled below the breast. The level of rail mortality due to barb wire fences is unknown, but as more development pushes into

wetlands, impalement deaths are likely to increase on all rail populations.

An even stranger case of Clapper rail mortality was 1 caught in power lines above the brackish



Figure 3. Rail caught on a power line near Texas Point National Wildlife Refuge Jefferson County, Texas.

marsh along HWY 87 in southeast Texas (Fig. 3). This rail was found 3.7-4.6 m above the ground, with its lower bill between the main cable and a smaller wrapped cable. Utility lines capture may be an isolated case, but an example of the poor abilities of rails to maneuver around aerial obscures. One can only theorize that rails have not had a chance to adapt to the many obscures now in place across marshes.

#### LITERATURE CITED

- AMERICAN ORNITHOLOGISTS' UNION. 1983. Checklist of North American birds. 6th Edition. American Ornithological Union, Washington, D.C.
- BANKS, R. C. 1974. Clapper Rail in Tamaulipas, Mexico. *Wilson Bulletin* 86:76-77.
- EDDLEMAN, W. R. and C. J. CONWAY. 1994. Clapper Rail. Pp 167-179 in *Management of migratory shore and upland game birds in North America*. T. C. Tacha and C. E. Braun, Editors. International Association of Fish and Wildlife Agencies, Washington, D.C.
- ENSER, R. W. 1992. The atlas of breeding birds in Rhode Island. Rhode Island Department of Environmental Management. Providence.
- MEANLEY, B. 1985. The marsh hen: a natural history of the clapper rail of the Atlantic coast salt marsh. Tidewater Publishers, Centerville, Maryland.
- ROSENBERG, K. V., R. D. OHMART, W. C. HUNTER, and B. W. ANDERSON. 1991. Birds of the lower Colorado River Valley. University of Arizona Press, Tucson.
- SMALL, A. 1994. California birds: their status and distribution. Ibis Publishing Company. Vista, California.
- TODD, R. L. 1986. A saltwater marsh hen in Arizona: a history of the Yuma Clapper Rail (*Rallus longirostris yumanensis*). Federal Aid Project W-95-R, Completion Report. Arizona Game and Fish Department, Phoenix.
- VEIT, R. R. and W. R. PETERSON. 1993. Birds of Massachusetts. Massachusetts Audubon Society, Lincoln.

## COMMON LOON (*GAVIA IMMER*) MORTALITY FROM LEAD WEIGHT INGESTION IN COASTAL TEXAS

Eleanor Stoddart<sup>1</sup> and Daniel M. Brooks<sup>1,2</sup>

<sup>1</sup>*Houston Museum of Natural Science, Department of Vertebrate Zoology, 5555 Hermann Park Drive, Houston, Texas 77030-1799*

A variety of factors can cause avian mortalities, and one that has attracted recent attention is the ingestion of foreign objects. Several species of aquatic piscivorous birds have died from ingesting recreational fishing tackle, including fishing hooks and lead weights (Arnold 1994, Magee and Brooks 2006, Brooks 2009). Brooks (2009) reported a case of a Common Loon (*Gavia immer*) ostensibly dying from lead poisoning due to fishing weight ingestion. Herein we describe a second possible case of a Common Loon dying from lead poisoning due to fishing weight ingestion. Additionally, we compare other cases of Common Loon mortality from the same region to assess potential patterns of environmental hazards.

Houston Museum of Natural Science's (HMNS) Department of Vertebrate Zoology received a Common Loon (HMNS VO 3333, Fig. 1) salvaged on 3 January 2011 from Quintana Beach, Brazoria County. The bird was prepared as a study skin on 15 December 2011 by ES. This adult (skull completely ossified) loon weighed 2.7 kg and had 0 fat content on a scale from 0-7 (0 = complete absence of fat and 7 = full subcutaneous fatty layer).

The salvager, Dana Simon, indicated the bird had suffered from acute lead poisoning, including the diagnostic trait of neon green diarrhea (Michigan Department of Natural Resources 2012). A radiograph verified the presence of a lead weight in the bird's gizzard, so systemic treatment with

<sup>2</sup>E-mail: - dbrooks@hmns.org





Figure 1. Common Loon (*Gavia immer*) specimen HMNS VO 3333, with a close-up of stomach contents (lead fishing weight and pebbles).

CaEDTA and D-penicillamine was initiated. Although plans were made to surgically remove the lead weight, the bird died  $\leq$  48 hs after the radiograph. During specimen preparation, the stomach was dissected and the small, pear-shaped fishing weight (1.5 cm high  $\times$  0.65 cm maximum width) was confirmed (Fig. 1). The stomach also contained 5 small pebbles (largest size: 1 cm  $\times$  1 cm, smallest: 0.8 cm  $\times$  0.7 cm, Fig. 1). The lack of food residue inside the stomach suggested the bird had not eaten for some time prior to death. The neon green urates, lack of appetite and noted emaciation suggested that the cause of death was lead poisoning.

A total of 7 Common Loons (1 male, 3 female, 3 undetermined gender) were salvaged from the Surfside/Quintana Beach region between November 2004 and April 2011 and deposited into the HMNS VO collection (Table 1). The birds were found throughout the year, with 3 during Spring (42%), 2 in Fall (28%) and 1 each (14%) during summer and winter (Fig. 2). All but 1 of these was adults (86%), but only 1 of 7 birds (14%) was in breeding plumage (Table 1). Mean fat content was 0.57 (range = 0-2, mode = 0,  $n = 7$ ) and mean weight was 2.04 kg (range = 1.36-2.95 kg,  $n = 7$ ) for all birds, with a mean of 1.82 kg ( $n = 4$ ) during warmer months and 2.34 kg ( $n = 3$ ) during cooler months.

The Common Loons in the HMNS collection were significantly underweight compared with the standard mean weight of 4.95 kg for this species (Dunning 2008). This is not surprising considering that only 1 of 7 birds (14%) had normal prey remains (crawfish) in its stomach. Two of the birds (28%) died from leg injuries, which are lethal to

Table 1. Parametric data for seven Common Loons in the HMNS VO collection salvaged from the Quintana/Surfside Beach region, Brazoria Co., Texas.

Cat. #	Location	Date	Age	Gender/plumage	wt (kg)	Fat	Stomach contents	Injury
1580	Quintana	9 Nov 2004	Ad / sco	? / non-breeding	1.36	2	5.9 g gravel	broken leg
2075	Surfside	18 Jul 2006	Ad / sco	F / non-breeding	1.58	0		
2076	Surfside	27 May 2007	Ad	F / breeding	2.14	0	0.6 g gravel, ball of lime, lead weight	lead poisoning
2089	Surfside	27 May 2007	Subad / snco	? / non-breeding	1.66	1	empty	
3318	Surfside	27 Nov 2010	Ad / sco	M / non-breeding	2.95	0	0.25 g veg. matter, small pebbles	
3333	Quintana	3 Jan 2011	Ad	? / non-breeding	2.72	1	Lead weight, 5 small pebbles	lead poisoning
3351	Surfside	5 Apr 2011	Ad	F / non-breeding	1.92	0	0.25 g crawfish shells	injured leg

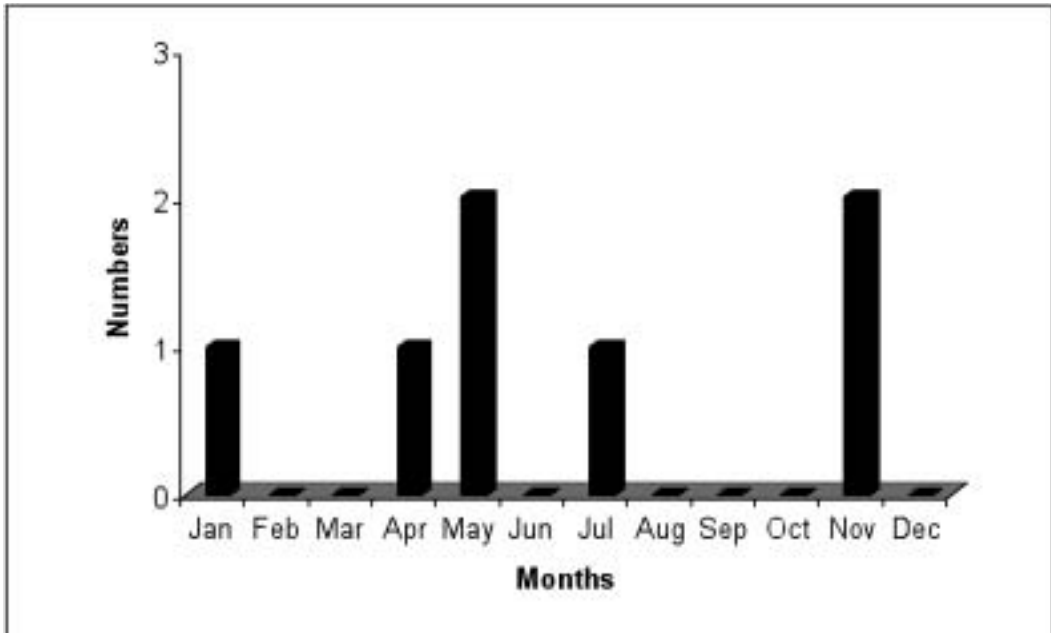


Figure 2. Monthly abundance of Common Loon (*Gavia immer*) specimens in HMNS VO collection salvaged from the Quintana/Surfside Beach region, Brazoria Co., Texas (2004-2011).

piscivorous species such as loons that depend on their legs to dive for fish. Two additional loons (28%) apparently died from lead poisoning due to ingestion of lead weights used for recreational fishing. Nearly one-third of mortalities resulted from poorly managed non-commercial fishing tackle that apparently broke off of a fishing line and was not retrievable.

In New England direct anthropogenic factors accounted for 52% of loon mortalities, with nearly one-half of breeding adults dying due to lead toxicosis from ingested fishing weights (Sidor et al. 2003). Similar rates of lead toxicosis have been found in other loon populations as well (e.g., Pokras et al. 2009). While a solution to this problem is uncertain, careful responsibility for fishing tackle should be considered in light of the number of loons using the Surfside/Quintana area year-round (Fig. 2).

#### ACKNOWLEDGMENTS

Kind thanks to Dana Simon for providing the salvaged specimens, data on cause of death and proof-reading the manuscript.

#### LITERATURE CITED

- ARNOLD, K. A. 1994. First specimens of Clark's Grebe for Texas: an environmental casualty. *Bulletin Texas Ornithological Society* 27:26-28.
- BROOKS, D. M. 2009. A case of a Common Loon (*Gavia immer*) ingesting fishing gear. *Bulletin Texas Ornithological Society* 42:89-90.
- DUNNING, J. B. 2008. *CRC Handbook of Avian Body Masses* (2<sup>nd</sup> edition). CRC Press, Boca Raton, FL.
- MAGEE, M. E AND D. M. BROOKS. 2006. A case of a Magnificent Frigatebird (*Fregata magnificens*) swallowing a fishhook. *Bulletin Texas Ornithological Society* 40:31-32.
- MICHIGAN DEPARTMENT OF NATURAL RESOURCES. 2012. Lead poisoning. [www.michigan.gov/dnr/0,1607,7-153-10370\\_12150\\_12220-26676--,00.html](http://www.michigan.gov/dnr/0,1607,7-153-10370_12150_12220-26676--,00.html).
- POKRAS, M., M. KNEELAND, A. LUDI, E. GOLDEN, A. MAJOR, R. MICONI, AND R. H. POPPENGA. 2009. Lead objects ingested by Common Loons in New England. *Northeastern Naturalist* 16:177-182.
- SIDOR, I. F., M. A. POKRAS, A. R. MAJOR, R. H POPPENGA, K. M. TAYLOR, AND R. M. MICONI. 2003. Mortality of Common Loons in New England 1987 to 2000. *Journal of Wildlife Diseases*. 39:306-315.

# SUCCESSFUL NESTING OF RUDDY DUCKS (*OXYURA JAMAICENSIS*) ON NORTHERN PADRE ISLAND, NUECES COUNTY, TEXAS

Marc C. Woodin<sup>1</sup>

<sup>1</sup>*Aythya Environmental, Corpus Christi, TX 78412*

Ruddy Ducks (*Oxyura jamaicensis*) are common breeding birds of wetlands of the Prairie Pothole Region and Great Basin of interior North America (Bellrose 1976, Brua 2002), but they rarely nest across Texas, including the coast (Oberholser 1974, Tweit 2001). Here I document in Nueces County a further rare successful nesting by Ruddy Ducks in Texas. I periodically observed Ruddy Ducks, including young, at a pond on northern Padre Island, 25 June-15 July 2012. Previous valid sight records for Ruddy Duck ducklings in Texas are 5 June-19 August (Oberholser 1974).

The pond (Fig. 1) was an excavated basin located in a residential development within the city limits of Corpus Christi (27.61° N, 97.23° W). It was encircled by a loop road serving only the local neighborhood, so vehicle traffic was light. Pedestrian traffic was limited to only an occasional recreational walker. The pond was roughly rectangular, with an area of about 0.3 ha, and was fringed by a narrow band of un-mowed vegetation, primarily grasses, sedges, and bulrush. The only dense emergent cover was a stand of tall cattail (*Typha* sp.), approximately 1-3 m wide, which encircled one end of the pond. The presence of cattail is a reliable freshwater indicator. I could detect no evidence of submerged vegetation, and I did not measure the depth or conductivity of the pond.

I first observed a male and a female Ruddy Duck and 1 duckling at the pond on 25 June. The male was in post-breeding plumage and so had lost its rich chestnut color on the backside. The large white cheek patches and dark crown and nape were readily apparent. The bill was mostly dark, but it retained a faint bluish wash. The dark gray on the crown of the female extended unbroken down the facial disk to eye level. The cheeks of the female were a slightly lighter gray. Beneath the eye, the female sported a broad, dark line, briefly interrupted about

midway along its length. The duckling appeared to be out of the downy stage.

While I observed the Ruddy Ducks on 25 June (1850-1920), the female and duckling were loafing and lightly preening near each other in the open water, just outside the outer edge of the emergent cattail. Dense, tall emergent vegetation (including cattail) is the typical nest site for this species (Brua 2002), so the successful Ruddy Duck nest may have been located there. The male was not associated with the female and duckling, as it was located along the edge of the pond, about halfway toward the other end. I did not see the male after this initial sighting of the birds on 25 June 2012.

I next visited the pond on 2 July 2012. During the time I observed the birds (1900-1925), the female was once again in the open water, just along the outer edge of the dense cattail, into which she abruptly disappeared when a Great Egret (*Casmerodius albus*) alighted a few meters away. I also observed 2 Ruddy Duck ducklings, which were slowly swimming near each other at the far end of the pond, seemingly unattached to the female.

I again visited the pond to observe the Ruddy Ducks from 1020-1115 on 15 July 2012. Once again, I saw the female near the stand of emergent cattail, resting and preening. I also saw 1 duckling diving at the far end of the pond. Later during the observation period, I saw a Ruddy Duck duckling, also diving in the open water, but much closer to the female. I was unable to determine whether 1 or 2 ducklings were present on the pond at this time. I last visited the pond mid-day on 1 August 2012, during which time I observed no Ruddy Ducks.

Mean clutch size from multiple studies of this species is generally 7-10 eggs (Brua 2002), and duckling survival has been estimated to be on the order of about 50-75% (Brua 1998, Pelayo 2001).

---

<sup>1</sup>E-Mail: marc.woodin@gmail.com



Figure 1. Location of Ruddy Duck nesting site. Images Wikimedia/USFWS and Google Earth.

The presence of at most 2 ducklings in this brood suggests that predation or some other mortality factor may have limited duckling success for this nesting effort.

Ruddy Ducks are a prominent component of the breeding duck fauna of northern prairie and Great Basin wetlands of North America (Bellrose 1976, Brua 2002). This species also occurs widely in disjunct breeding populations (Brua 2002). The Texas Breeding Bird Atlas shows three distinct geographic clusters within the state (Tweit 2001) where Ruddy Ducks are known to breed, albeit perhaps only intermittently. Many of the 12

confirmed and 30 probable breeding records in the Texas Breeding Bird Atlas occurred in multiple counties throughout the western High Plains (Tweit 2001). A few records of breeding Ruddy Ducks exist for the western reaches of the Rio Grande, especially in El Paso County (Tweit 2001), while the third cluster of records of breeding Ruddy Ducks is in the counties of the lower third of the Texas coast and along the lower Rio Grande (Tweit 2001).

Oberholser (1974), however, reported only a handful of confirmed breeding records of Ruddy Ducks in Texas counties: Tarrant County; Bexar

County; Harris County; Anahuac National Wildlife Refuge, Chambers County; Welder Wildlife Refuge, San Patricio County; and Willacy County. While Lockwood and Freeman (2004) considered the Ruddy Duck to be locally common as a summer resident in El Paso County, they mentioned confirmed breeding by Ruddy Ducks only along resacas in Presidio County, where they noted that “there were many successful nestings” when wetland conditions were favorable.

My observations confirm successful nesting by Ruddy Ducks on northern Padre Island, adding a Nueces County record to the limited numbers of confirmed records of breeding by this species in Texas. Additionally, this report may represent the only confirmed instance of successful nesting by this species on a barrier island.

#### LITERATURE CITED

- BELLROSE, F. C. 1976. Ducks, geese, and swans of North America. Stackpole Books, Harrisburg, Pennsylvania.
- BRUA, R. B. 1998. Factors affecting reproductive success of male and female Ruddy Ducks (*Oxyura jamaicensis*) in southwestern Manitoba, Canada. Dissertation. University of Dayton, Dayton, Ohio.
- BRUA, R. B. 2002. Ruddy Duck (*Oxyura jamaicensis*). The Birds of North America, No. 696.
- LOCKWOOD, M. W., AND B. FREEMAN. 2004. The TOS handbook of Texas birds. Texas A&M University Press, College Station.
- OBERHOLSER, H. C. 1974. The bird life of Texas. (E. B. Kincaid, Jr., Editor). Vol. 1. University of Texas Press, Austin.
- PELAYO, J. T. 2001. Correlates and consequences of egg size variation in wild Ruddy Ducks (*Oxyura jamaicensis*). Thesis. University of Saskatchewan, Saskatoon.
- TWEIT, R. C. 2001. Ruddy Duck. The Texas Breeding Bird Atlas. Texas A & M University System, College Station and Corpus Christi, <http://txbba.tamu.edu> (28 November 2012).

## SECOND RECORD OF OLD NEST REUSE BY NORTHERN CARDINALS

Ray C. Telfair II<sup>1</sup>

<sup>1</sup>11780 South Hill Creek Road, Whitehouse, Texas 75791

Northern Cardinals (*Cardinalis cardinalis*) rarely reuse nests (Wanamaker 1942); and until my report of the reuse of a 2-year old nest platform (Telfair 2010), there was no record of the reuse of an old abandoned nest from previous years (Halkin and Linville 1999).

I found a Northern Cardinal nest in mid-June 2012 constructed on the top of a nest that cardinals had built in 2011. It was located in a Chinese wisteria (*Wisteria sinensis*) vine growing along the wall of the garage at my home in Ennis, 209 N. Preston Street, SE Ellis County, Texas (32°19'37.50"N, 96°37'55.88"W). It was the third nest the birds had built. The first nest was built in mid-April behind

the garage in an eastern red-cedar (*Juniperus virginiana*) sapling; the second nest was built in mid-May in a bridal wreath (*Spiraea prunifolia*) shrub beside the side porch of the house. The 3 nests were located at each apex of a triangle with distances between the nests being: 21 m between nests 1 and 2; 19 m between nests 2 and 3; and, 10 m between nests 1 and 3. Nest heights were: 2, 1.6, and 1.2 m, respectively. All 3 nests were of similar construction and size (~ 12.7 cm outside diameter by 7.6 cm outside height) in comparison to those described earlier in the same area (Telfair 2007).

The first nest contained 3 eggs of which 1 did not hatch; the second nest contained 3 eggs of which all

<sup>1</sup>E-mail: [rtelfair@nctv.com](mailto:rtelfair@nctv.com)

hatched; and the third nest also contained 3 eggs all of which hatched. All chicks were banded.

The third nest was found on the ground beneath its site 1 week after the chicks were banded; so, their fate is not known.

Northern Cardinal nests are not attached to the nest-site vegetation; but, are wedged into position (Halkin and Linville 1999). It appears that the 1-year old nest platform upon which the new nest was built may have been weak and, thus, could not support the weight of the chicks. Thus, the reuse of old nest platforms may be a disadvantage to successful breeding.

#### LITERATURE CITED

- HALKIN, S. L. AND S. U. LINVILLE. 1999. Northern Cardinal (*Cardinalis cardinalis*). The Birds of North America, Number 440.
- TELFAIR, R. C. II. 2007. Adjoining nests of Northern Cardinal. Bulletin of the Texas Ornithological Society 40:36-37.
- TELFAIR, R. C. II. 2010. Reuse of an old nest platform by Northern Cardinals. Bulletin of the Texas Ornithological Society 43:70.
- WANAMAKER, J. F. 1942. A study of the courtship and nesting of the Eastern Cardinal *Richmondia c. cardinalis* (*Linnaeus*). Thesis, Cornell University, Ithaca, New York.

## GREAT-TAILED GRACKLES RETURN TO ABANDONED BREEDING COLONY

Ray C. Telfair II<sup>1</sup>

*11780 South Hill Creek Road, Whitehouse, Texas 75791*

Telfair (2010) reported the 2-year abandonment (2009 and 2010) of a breeding colony of Great-tailed Grackles (*Quiscalus mexicanus*) that had a previous annual re-establishment of about 15 years. It is located in S Ennis, SE Ellis County (32°18'43.49"N, 96°35'56.76"W) in a small landscaped median bordered by elevated Interstate Highway 45 and a turn-off access road which connects to S Kaufman Street (State Highway 75) near its juncture with FM 85 under the highway overpass. A new similar second breeding colony was found in 2010 about 6.3 km of the first colony N Ennis (32°21'41.26"N, 96°37'58.75"W) at the north end of a semicircular median between the overpass of U.S. Highway 75 above the Interstate Highway 45 and the east access loop from U.S. Highway 75 leading N to join Interstate Highway 45.

After the grackles returned to the first colony for reestablishment of nesting in early April of both years, there was an abrupt abandonment of nests in early May, the cause of which I could not determine (e.g., not related to human disturbance, weather,

nest parasites, or fire ants). The second colony was not affected.

The nest site vegetation in the first colony is mostly a dense close-spaced stand of crape myrtle (*Lagerstroemia indica*) shrubs with adjacent close-spaced clusters of yaupon (*Ilex vomitoria*) shrubs and young Shumard's oak (*Quercus shumardii*) trees. The vegetation at the second colony is composed entirely of crape myrtle shrubs of similar size and spacing as in the first colony. Detailed descriptions of the nest-site vegetation and nesting colonies were given by Telfair (2010).

Weather conditions at the times of the first breeding colony abandonment in 2009 and 2010 were normal (Ron Vestal, local National Weather Service Weather Observer, pers. comm./data). In 2011 and 2012, despite the drought, breeding resumed in both grackle colonies and the breeding seasons were successful.

However, in 2011, the crape myrtles in the first, and oldest, colony exhibited signs of stress, probably related to the many years of guano deposition and

<sup>1</sup>E-mail: rtelfair@nctv.com

the drought (the top branches of some plants were dead and the leaves of all plants were withered, but recovered after rain occurred). The plants in the second colony remained in good condition.

In the first colony, in 2011, only 3 nests were built in the 24 yaupons (48 in 2009, 22 in 2010); no nests were in the 6 oaks (21 in 2009, 20 in 2010) and the mean number of nests per plant in the crape myrtles was 3.1 (median = 3.0, range = 1-7); thus, slightly less than in 2010 (mean = 3.7, median = 4.0, range = 1-6), but much less than in 2009 (mean = 7.9, median = 8.0, range = 3-12). The mean number of nests per plant in the second colony was 3.2 (median = 3.0, range = 1-6), about the same as in 2010 (mean = 3.3, median = 3.0, range = 1-8).

The first colony, in 2012, exhibited enhanced deterioration caused by the combination of years of guano deposition and the severe drought of 2011. Although the winter of 2011 and early spring of 2012 were mild and wet, when nesting began, all yaupons were dead; however, 1 plant contained an active nest. Only 11 (38%) of crape myrtles were in good condition, 8 (28%) had only a few living stems with leaves and 10 (34%) were dead and bare. However, all but 3 plants had active nests. The number of nests per plant were: mean = 2.5;

median = 2.0, range = 0-12; thus, fewer than in previous years. Four red mulberry (*Morus rubra*) saplings had grown large enough to contain nests (2, 4, 2, 1, respectively). The 6 Shumard's oaks contained 2, 3, 1, 2, 1, 2 nests, respectively; thus, about half the number in 2009 and 2010).

By 7 July, the colony was still producing fledglings and new clutches. Even the dead bare crape myrtles contained active nests.

The crape myrtles in the second colony were in excellent condition in 2012. The number of nests per plant was: mean = 3.7, median = 3.0, range = 0-6; thus, about the same as in 2010: mean = 3.3, median = 3.0, range = 1-8 and 2011: mean = 3.2, median = 3.0, range = 1-6.

Therefore, whatever caused the first colony abandonment in 2009 and 2010 was not in effect in 2011 or 2012 although there was major deterioration of nest site vegetation as a result of drought.

#### LITERATURE CITED

- TELFAR, R. C. II. 2010. Abandonment of a unique breeding colony of Great-tailed Grackles in north-central Texas. *Bulletin of the Texas Ornithological Society* 43:78-80.

## LEARNED PREY HANDLING OF TEXAS HORNED LIZARDS BY A GREATER ROADRUNNER FROM THE ROLLING PLAINS OF TEXAS

Stephen Kasper<sup>1</sup>

<sup>1</sup>Lake Alan Henry Wildlife Mitigation Area, City of Lubbock, Lubbock, Texas 79457

The Greater Roadrunner (*Geococcyx californianus*) is an opportunistic predator of insects, arthropods, birds, rodents, snakes, and lizards (Hughes 2011). Problematic prey, such as those too large, feathered, venomous, or armored, may be avoided by innate and learned behaviors, or they may be hunted, killed, and ingested by prey-specific handling behaviors (Sherbrooke 1990). Generally, a large prey is repeatedly beaten on

hard substrates and swallowed headfirst and whole (Rylander 2002). The strategy of beating prey disarticulates the skeleton, effectively narrowing and elongating the carcass for subsequent swallowing (Beal and Gillam 1979). However, some prey specific difficulties have been documented in these predation strategies (Sherbrooke 1990, Holte and Houck 2000). The following observation describes 2 unknown learned behaviors for prey handling of

<sup>1</sup>E-mail: skasper@mail.ci.lubbock.tx.us

Texas horned lizards (*Phrynosoma cornutum*) by an individual Greater Roadrunner from the Rolling Plains of Texas.

On 29 July 2001, I observed a Greater Roadrunner by binoculars at ~ 18 m feeding on a lizard at Lake Alan Henry Wildlife Mitigation Area (LAHWMA), ~ 6.5 km N, 15 km E of Justiceburg, Garza County, Texas. While perched on the top edge of a round fiberglass stock tank (3.66 m diameter by 0.61 m high), the roadrunner had the lizard under 1 foot and was pulling the lizard's body with its bill. It then picked the lizard up and dipped the lizard up and down 3 to 4 times in the water. The water level was 6 cm below the tank's rim. The roadrunner returned to holding the lizard under its feet and tearing at the body for about 30 sec, then again dipped the lizard in the water several times. The bird after additional pulling dropped the lizard in the water and retreated into nearby brush. I retrieved the lizard carcass from the water and identified it as a large Texas horned lizard. Remains included the cranium, dorsal integument from the cranium to tail, and one rear leg. The thick dorsal integument appeared to be stripped or scraped of flesh from the cranium to tail. The mandible, all internal organs, and all skeletal-muscular structures (except the one rear leg) were missing, and I inferred them to be consumed.

I collected the body of a second Texas horned lizard from the bottom of the water tank on 5 August. The remains included the cranium and dorsal integument only. This specimen was about 75% the size (based on cranial breadth) of the first *P. cornutum* collected on 29 July. A third Texas horned lizard carcass was found in the waters of the tank on 19 August. The remains included the cranium and shredded dorsal integument. This specimen was approximately the size of the second *P. cornutum* collected on 5 August. I subsequently sieved the debris from the bottom of the tank inclusive of the locations of the 3 previously collected specimens (~ 1.5 m) plus an additional 1.0 m laterally and 1.0 m inward of the tank's edge. Two additional *P. cornutum* craniums were collected within the size range of the first 3 lizards; both were clean with no integument attached. These 2 were found within the span of the first 3 specimens. No other vertebrate skeletal remains were found. By visual inspections of the clear tank water, no additional Texas horned lizard remains were discovered from 2002 to 2011.

Although I observed only 1 predation event, I assumed all 5 of the Texas horned lizards were prey of the same Greater Roadrunner based on site preference and similar conditions of the *P. cornutum* remains. This Greater Roadrunner demonstrated 2 major deviations from the known innate prey handling behaviors of the species. First, the tearing apart and stripping of flesh from vertebrate prey is an unknown behavior for *G. californianus*. The Greater Roadrunner usually kills its vertebrate prey, manipulates it so that the prey is streamlined, and then swallows the prey headfirst and whole. However, a solution to the problem of swallowing a prey with well developed, widely-spaced occipital spines may have been observed.

Sherbrooke (1990) found that when Greater Roadrunners were offered a choice of 2 different species of horned lizards as food, the Texas horned lizards were killed and eaten in 50% of trials; whereas, the smaller round-tailed horned lizard (*Phrynosoma modestum*) with less pronounced spines was killed and eaten in 92% of trials. One bird half-ingested then regurgitated a Texas horned lizard 5 times, re-beating it after each regurgitation, and then finally swallowing the lizard. This bird refused all Texas horned lizards offered in subsequent feeding trials. A second bird had the same experience after 3 bouts of regurgitation. It refused the next Texas horned lizard, consumed 2 more, and then refused a fourth horned lizard. Also, a juvenile Greater Roadrunner choked to death on a large Texas horned lizard (Holte and Houck 2000).

Innate behaviors in birds are known to be modified by operant conditioning (Rylander 2002). The Greater Roadrunner that I observed learned to bypass the problem of the occipital spines during swallowing. It discovered a method for opening the thinner ventral integument and stripped-out the flesh, leaving only the cranium with spines intact and the tough, elastic dorsal integument unconsumed. Although it is speculative to address exactly how this learned behavior was initiated, a possible scenario could be that by probing and puncturing during the action of killing and beating a horned lizard the bird tore open the ventral integument exposing the soft tissues. By operant conditioning (trial-and-error), this individual roadrunner learned to avoid risk-taking during ingestion, which resulted in opportunistic predation of an available and substantial prey.



Other bird species have seemingly adapted methods for reducing the risk of predation in preying upon *P. cornutum*. Swainson's Hawk (*Buteo swainsoni*), Harris's Hawk (*Parabuteo unicinctus*), Turkey Vulture (*Cathartes aura*), and Loggerhead Shrike (*Lanius ludovicianus*) prey on horned lizards (Bednarz 1988, Thomaidis et al. 1989, Espinal et al. 1998, Lazcano et al. 2008). A Red-shouldered Hawk was found dead from an occipital spine penetrating its trachea (Strecker 1908). Loggerhead Shrikes and some Swainson's Hawks exclude the problem of occipital spines. Lazcano et al. (2008) reported Swainson's Hawks fed Texas horned lizards with decapitated heads to chicks in Chihuahua, Mexico. The heads were left in the nest. Loggerhead Shrikes prey on smaller Texas horned lizards, and impale the lizards on plant spines or barbed wire (Espinal et al. 1998). The shrikes will strip and consume the flesh from their larded prey at a later time. This practice may aid in degrading formic acid concentrated in the lizards' digestive tracts (Yosef and Whitman 1992).

A second deviation from the known innate prey handling behavior is food washing or dunking. This behavior has not been previously recognized for the species. Dunking is a behavioral term for the immersion of food items in water and is a rare behavior in free-ranging birds (Morand-Ferron 2005). Only 12 of 31 species of wild birds summarized by Morand-Ferron et al. (2004) used dunking as a food handling method to soften or soak food prior to ingestion. Fifteen species washed their food including 5 species handling vertebrate prey. Dunking food into water may assist in eliminating toxins or soiled elements from food items (Morand-Ferron et al. 2004, Freeman 2008). I suggest that washing may have removed toxic residue or soiled components from the flesh of predated Texas horned lizards. Adult Texas horned lizards almost exclusively feed on harvester ants of the genus *Pogonomyrmex* resulting in a concentrated build-up of formic acid in the digestive tract. In addition, the blood of Texas horned lizards has complex defensive compounds that may be synthesized from their harvester ant prey (Sherbrooke and Middendorf 2004). Captive raised coyotes (*Canis latrans*) regurgitated Texas horned lizard remains and their oral and nasal cavity receptors exhibited adverse effects from blood squirted from the lizard's orbital sinuses (Sherbrooke and Mason 2005). Kit foxes (*Vulpes macrotis*) reacted negatively to the blood of

Texas horned lizards and learned to avoid them as prey (Sherbrooke and Middendorf 2004). The bird that I observed may have been dunking the horned lizard to alleviate the effects of toxicity or bad taste. Although little is known about the Greater Roadrunner's sense of taste (see Hughes 2011), there may be some discrimination of food or prey based on feeding experiences with negative effects to the oral and nasal epithelial linings (operant conditioning).

The original feeding event indicated an experienced behavior, with no hesitation or awkwardness, suggesting that the observed Greater Roadrunner had previously learned the 2 new methods of prey handling. This inference is supported by the discovery of similarly handled remains of 4 additional *P. cornutum* at the same site, 2 of which were after my original observation and 2 that were probably prior to my observation. Rainfall was only 21% of the normal average for the months March through July at LAHWMA. I also observed limited insect prey availability. Greater Roadrunners may refrain from attacking adult Texas horned lizards if other foods are readily available (Sherbrooke 1990). Consequently during a season of limited food choices, the Greater Roadrunner may have been forced by hunger to switch to a prey that would have been avoided during periods with a greater prey base. It learned to strip flesh like a raptor or shrike and overcame an additional secondary problem of toxicity by washing its prey. The behavioral change may have been a trade-off of more handling time and effort in order to consume a larger dangerous prey that is generally avoided. These alterations are novel behaviors and important modifications to the innate prey handling for the species. Dunking is not a species-wide behavior, even in flocking birds, but seems to be learned by only a few individuals (Morand-Ferron et al. 2004). I suggest that this Greater Roadrunner at LAHWMA demonstrated an innovative adaptation from the species' innate prey handling behavior specifically designed for Texas horned lizards and could have possibly involved some complex cognitive processes.

#### ACKNOWLEDGMENTS

Great appreciation is given to Kent Rylander for prompting me to compile this information and providing many useful suggestions concerning bird behavior in general. I also thank Jim R. Goetze, Clyde Jones, Mark W. Lockwood, Kent Rylander,

and Frederick B. Stangl, Jr. for reviewing an earlier version of the manuscript.

#### LITERATURE CITED

- BEAL, K. G. AND L. D. GILLAM. 1979. On the function of prey beating by roadrunners. *Condor* 81:85-87.
- BEDNARZ, J. C. 1988. A comparative study of the breeding ecology of Harris's and Swainson's Hawks in Southeastern New Mexico. *Condor* 90:311-323.
- ESPINAL, J. A. L., D. CHISZAR, C. HENKE, AND H. M. SMITH. 1998. *Phrynosoma cornutum* (Texas Horned Lizard): predation. *Herpetological Review* 29:168.
- FREEMAN, B. 2008. American Crows separate imported red fire ants from food items using water. *Bulletin Texas Ornithological Society* 41:65-66.
- HOLTE, A. E. AND M. A. HOUCK. 2000. Juvenile Greater Roadrunner (Cuculidae) killed by choking on a Texas horned lizard (Phrynosomatidae). *Southwestern Naturalist* 45:74-76.
- HUGHES, J. M. 2011. Greater Roadrunner (*Geococcyx californianus*). *The Birds of North America*. No. 244.
- LAZCANO, D., B. I. GONZALEZ-GARZA, N. CRUZ-MALDONADO, AND J. I. GONZALEZ-ROJAS. 2008. *Phrynosoma cornutum* (Texas Horned Lizard): predation. *Herpetological Review* 39:90.
- MORAND-FERRON, J. 2005. Dunking behavior in American Crows. *Wilson Bulletin* 117:405-407.
- MORAND-FERRON, J., L. LEFEBVRE, S. M. READER, D. SOL, AND S. ELVIN. 2004. Dunking behaviour in carib grackles. *Animal Behaviour* 68:1267-1274.
- RYLANDER, K. 2002. *The behavior of Texas birds*. University of Texas Press, Austin.
- SHERBROOKE, W. C. 1990. Predatory behavior of captive Greater Roadrunners feeding on horned lizards. *Wilson Bulletin* 102:171-174.
- SHERBROOKE, W. C. AND J. R. MASON. 2005. Sensory modality used by coyotes in responding to antipredator compounds in the blood of Texas horned lizards. *Southwestern Naturalist* 50:216-222.
- SHERBROOKE, W. C. AND G. A. MIDDENDORF, III. 2004. Responses of kit foxes (*Vulpes macrotis*) to antipredator blood-squirting and blood of Texas horned lizards (*Phrynosoma cornutum*). *Copeia* 2004:652-658.
- STRECKER, J. K., JR. 1908. Notes on the breeding habits of *Phrynosoma cornutum* and other Texas lizards. *Proceedings Biological Society Washington* 21:165-170.
- THOMAIDES, C., R. VALDEZ, W. H. REID, AND R. J. RAITT. 1989. Food habits of Turkey Vultures in West Texas. *Journal Raptor Research* 23:42-44.
- YOSEF, R. AND D. W. WHITMAN. 1992. Predator exaptations and defensive adaptations in evolutionary balance: no defense is perfect. *Evolution and Ecology* 6:527-536.

## MELANISTIC RED-HEADED WOODPECKER FROM TEXAS

Mark W. Lockwood<sup>1</sup>

<sup>1</sup>*Natural Resources Program, Texas Parks and Wildlife Department, P.O. Box 1807, Fort Davis, Texas*

A very dark plumaged woodpecker was discovered in western Crosby County, Texas in November 2012. Close examination of the bird on 22 November 2012 revealed a Red-headed Woodpecker (*Melanerpes erythrocephalus*) that could be best described as melanistic. This aberrant plumage condition has been described for a wide variety of bird species, but it is apparently very rare in woodpeckers.

The plumage characteristics of a first-winter Red-headed Woodpecker with a dark brown head with a few red feathers apparent suggested it might have a dark red head upon molting into adult plumage (Fig. 1). The underparts were slate gray becoming slightly lighter on the upper breast. The secondaries were also slate gray contrasting slightly with the black primaries and back which exhibited the black barring that could be discerned in direct

---

<sup>1</sup>E-mail: mark.lockwood@tpwd.state.tx.us



Figure 1. Melanistic first-winter Red-headed Woodpecker near Lorenzo, Crosby County on 22 November 2012. Photograph by Mark W. Lockwood.



Figure 2. Same individual in Figure 1 showing barred gray secondaries and uniform color to body plumage. Photograph by Mark W. Lockwood.

sunlight (Fig. 2). This individual was first noted on 5 November 2012 in a rural homestead surrounded by numerous trees including mature pecans (*Carya illinoensis*) and live oaks (*Quercus virginiana*). These mast producing trees at the homestead provided a sustainable food source for the bird, and it remained in the same area through at least early December 2012. It was observed caching acorns in crevices of various nearby tree as well as within cracks in utility poles in late November. This activity was observed frequently from 22-25 November, suggesting it had stored food items throughout the yard and surrounding utility poles for an extended period.

There are few published accounts of melanism in woodpeckers. Deane (1876) and Gross (1965) included Red-headed Woodpecker within lists of species in which this plumage abnormality had been documented, but there is no indication of the source of this species' inclusion in either case. In addition neither listed other species of *Melanerpes* woodpeckers. There is a specimen of a melanistic Red-headed Woodpecker at the Los Angeles Museum of Natural History (LACM 6304) that exhibits a gray wash over the plumage that is much less extensive than the bird discovered in 2012.

That specimen is an adult collected in Washington County, Pennsylvania on 11 March 1897. There are published reports of a melanistic Pileated Woodpecker (*Dryocopus pileatus*) collected in Georgia (Short 1965) and of a Hairy Woodpecker (*Picoides villosus*) collected in New Mexico (Short 1969). There are recent photographs of melanistic Downy Woodpeckers (*Picoides pubescens*) published on the Internet ranging from a gray wash over the plumage to virtually black.

#### ACKNOWLEDGMENTS

Cliff Shackelford provided comments on a previous version of this note.

#### LITERATURE CITED

- DEANE, R. 1876. Albinism and melanism among North American birds. Bulletin Nuttall Ornithological Club 1:20-24.
- GROSS, A. O. 1965. Melanism in North American birds. Bird-Banding 36:240-242.
- SHORT, L. L. 1965. A melanistic Pileated Woodpecker specimen from Georgia. Wilson Bulletin 77:404-405.
- SHORT, L. 1969. An apparently melanistic Hairy Woodpecker from New Mexico. Bird-Banding 40:145-146.

## NOTES ON THE FOOD HABITS OF A SNOWY OWL WINTERING IN TEXAS

Keith A. Arnold<sup>1,4</sup>, John Hale<sup>2</sup>, and Clifford E. Shackelford<sup>3</sup>

<sup>1</sup>Texas Cooperative Wildlife Collections, Department of Wildlife and Fisheries Sciences, Texas A&M University, College Station, TX 77845

<sup>2</sup>4042 Cody Dr., College Station, TX 77845

<sup>3</sup>Texas Parks and Wildlife Department, 506 Hayter St., Nacogdoches, TX 75965

The Snowy Owl (*Bubo scandiacus*) occurs as a vagrant species in Texas during years when food resources became scarce in the normal wintering areas (Lockwood and Freeman (2004, p.95). Until 2004, the species was reported in Texas through 3 specimens (McLennan, Dallas and Wichita counties) and a bird in Taylor County from 22 March through 2 April 2002 (Lockwood and Freeman 2004). David

Renfro discovered and identified a Snowy Owl at Bayview Marina in Robertson Park on Lake Ray Hubbard in Rockwall County (pers. comm.) on 11 February 2012. Renfro last saw the bird on 19 February. He discovered 3 pellets below the owl's roost, a tall light pole the bird often occupied (Fig. 1). These pellets provide us the first glimpse of prey items for a Snowy Owl during winter in Texas.

<sup>1</sup>E-mail: kbarnold2@gmail.com



Figure 1. The Lake Ray Hubbard Snowy Owl on its usual roost. Photo by David Renfro.

### RESULTS

All 3 pellets consisted substantially of feathers from American Coots (*Fulica americana*); 1 pellet contained a nearly complete leg. All bones recovered and identifiable match this species as well. The presence of 3 furcula and 5 pelvic bones indicate this owl consumed at least 3 American Coots. We found no remains of other prey species in these pellets.

### DISCUSSION

We searched the literature for food habit studies of the Snowy Owl outside of the breeding season. Table 1 summarizes the 30 avian families reported in 6 studies. The authors in 5 of the 6 studies relied on stomach contents, rather than pellets. Eight of the families reported in these studies are aquatic, including 1 report of American Coot Stoner (in Gross 1944). Bent (1938, p. 365) mentions “coot” in a list of food items for this owl. Campbell and MacColl (1978) found ducks and grebes comprised 72.7% of birds taken; they stated that Snowy Owls are capable of taking birds over water. Williams and

Frank (179) examined food habits of non-breeding Snowy Owls in summer during low mammal populations; they found almost no mammals and Ancient Murrelets (*Synthliboramphus antiquus*) comprised 64.8% of prey items. They stated that since many pellets contained nothing but feathers, this suggested waterfowl, puffins, gulls, and other large seabirds may be more important in the diet than indicated by skeletal remains in pellets.

The limited information for the Lake Ray Hubbard owl suggesting it fed heavily on American Coots, is not surprising. The species is a common winter resident on most Texas reservoirs and feeds and loafs along shorelines of these reservoirs. Obviously, the small sample size influences our knowledge of the feeding habits of this owl in Texas. We can only wish that more pellets are saved, should such opportunities arise in the future.

### ACKNOWLEDGMENTS

We applaud David Renfro not only for discovering this amazing bird, but also for his

Table 1. Avian families found in food habit studies of non-breeding Snowy Owls

Family	A*	B	C	D	E	F
Phasianidae	3**	3	3	3	1	–
Odontophoridae	–	–	1	–	–	–
Anatidae	3	1	1	1	2	8
Podicipedidae	1	–	–	–	–	3
Hydrobatidae	–	–	–	–	1	–
Rallidae	–	–	–	1	–	–
Charadriidae	–	–	–	–	–	2
Calidridae	1	–	–	–	2	1
Laridae	–	2	1	–	1	2
Alcidae	2	–	–	–	4	3
Columbidae	1	1	1	1	–	–
Strigidae	–	–	–	–	–	1
Laniidae	1	–	–	–	–	–
Corvidae	–	–	1	–	–	–
Sittidae	1	–	–	–	–	–
Turdidae	1	–	–	–	–	1
Calcariidae	1	1	–	–	2	–
Emberiidae	1	–	1	–	1	–
Icteridae	1	–	–	–	–	1
Passeridae	–	1	–	–	–	–

\*A = Gross, 1944; B = Snyder in Gross, 1944; C = Sutton in Gross, 1944; D = Stoner in Gross, 1944; E = Campbell & MacColl, 1978; F = Williams & Frank, 1979.

\*\* Number of species in each family encountered in this study.

foresight in recovering the three pellets, sharing his observations with us, and furnishing the photograph used in Fig. 1. Toby Hibbitts insured that the pellets reached us for analysis. This is contribution 1443 of the Texas Cooperative Wildlife Collections at Texas A&M University.

#### LITERATURE CITED

- BENT, A. C. 1938. Life histories of North American birds of prey. Part 2. U.S. National Museum Bulletin 170.
- GROSS, A. O. 1944. Food habits of the Snowy Owl. *Auk* 61(1): 1-18.
- CAMPBELL, R. W. AND M. D. MACCOLL. 1978. Winter foods of snowy owls in Southwestern British Columbia. *Journal Wildlife Management* 42(1): 190-192.
- LOCKWOOD, M. W. AND B. FREEMAN. 2004. The Texas Ornithological Society handbook of Texas birds. Texas A&M University Press, College Station.
- WILLIAMS, P. L. AND L. G. FRANK. 1979. Diet of the Snowy Owl in the absence of small mammals. *Condor* 81(2): 213-214.

# ABERRANT PLUMAGE IN TEXAS BIRD SPECIMENS HOUSED IN THE HOUSTON MUSEUM OF NATURAL SCIENCE

Alyssa R. Conn<sup>1</sup> and Daniel M. Brooks<sup>1,2</sup>

<sup>1</sup>*Houston Museum of Natural Science, Department of Vertebrate Zoology,  
5555 Hermann Park Drive, Houston, Texas 77030-1799*

The most frequently occurring structural malformations in birds involve supernumerary limbs, deformed limbs and beaks, and evidence of embryonic conjoined duplication (Pourlis 2011). Functional malformations occur in number and coloration of feathers. These plumage aberrations can be restricted to a single feather, a group of feathers, or the entire body (Pourlis 2011). Albinism is the complete loss of all pigments in plumage and other parts of the body, resulting in birds with white plumage; the coloration becomes darker with increased expression of melanin (Hill 2010). Leucism results from defects in feather pigment cells during development (Cortes-Avizanda et al. 2010); the lack of pigment in part or all of the body is sometimes erroneously designated as albinism or partial albinism (Nogueira and Alves 2011). Birds with atypical white and dark plumage patches or spots gives rise to the terms “pied” or “piebald” (Rosenberg et al. 2006).

Arnold (2001) provided several examples of birds photographed and housed in the Texas Cooperative Wildlife Collection (TCWC, Texas A&M University) with aberrant plumage and cautioned against mistaking such individuals for rarer species (e.g., confusing a piebald House Sparrow [*Passer domesticus*] for a Snow Bunting [*Plectrophenax nivalis*]). Herein we describe 4 different types of plumage aberrations in Texas avian specimens housed in the Houston Museum of Natural Science’s Vertebrate Ornithology (VO) collection. These specimens were determined to be aberrant in plumage by comparing to normal plumaged specimens (Figs. 1-4) and following Tveten (1993) and Alsop (2001).

## SPECIES ACCOUNTS

### *Albino Northern Shoveler (Anas clypeata)*

Although both sexes of Northern Shoveler share a blue speculum, they are otherwise strongly sexually dichromatic. Females have a grey and orange bill and an overall mottled brown plumage; males have a black bill, iridescent green head, white breast and flanks, chestnut sides and belly, white tail feathers, and black on the back and tail coverts.

An albino adult female Northern Shoveler mount (HMNS VO 119; Fig. 1a) is completely white except for 2 brown feathers on the scapulars (Fig. 1b), which is how this specimen was determined to be a female (black in males).

### *Partial leucistic Harris’ Hawk (Parabuteo unicinctus)*

Sexes of Harris’ Hawks are monochromatic, and females are slightly larger than males. Adult plumage is predominantly dark chocolate brown, white rump and tail tip, and rufous-chestnut wing coverts, thighs, and shoulders. Subadults are similar but more drab overall and have streaked underparts.

A ventrally partial leucistic adult female Harris’ Hawk (HMNS VO 3349) was confirmed by comparing this specimen to an adult (HMNS VO 3104) and subadult (TCWC 7706) Harris’ Hawk (Fig. 2). The partial leucistic specimen has large brown and light rufous blotches on the ventral surface; whereas, the adult is a uniform chocolate brown color ventrally and the subadult has vertical white streaks, which are completely lacking in adults.

---

<sup>1</sup>E-Mail: dbrooks@hmns.org



Figure 1a. (L to R) Normal plumaged adult male Northern Shoveler (*Anas clypeata*, HMNS VO 3339), albino adult female (HMNS VO 119), and normal plumaged adult female (HMNS VO 3340).



Figure 1b. Two brown scapular feathers on albino female (HMNS VO 119).

*Complete leucistic Eastern Meadowlarks*  
(*Sturnella magna*)

Eastern Meadowlarks are sexually monochromatic with a white striped crown, predominantly brown upperparts, white outer tail feathers and undertail coverts, black streaks on the

sides and flanks, and a yellow breast and belly with a broad black “V” on the chest.

Two complete leucistic Eastern Meadowlarks, a study skin (HMNS VO 636) and a mount (HMNS VO 637), were determined by comparing the much lighter ventral (Fig. 3a, c) and dorsal (Fig. 3b, c) plumage





Figure 2 (L to R) – Normal subadult Harris' Hawk (*Parabuteo unicinctus*, WFSC 7706), ventrally partial leucistic adult (HMNS VO 3349), and normal adult (HMNS VO 3104).

surfaces to a normal Eastern Meadowlark (HMNS VO 1459). The study specimen is predominantly dull greyish white, with the breast, belly, and chin light yellow; there are also traces of light brown in the crown and collar. The mount is much lighter overall, resembling an albino except for a very light grayish body with the chest a slight tint of yellow.

*Partial piebald Common Grackle (Quiscalus quiscula)*

Adult male Common Grackles are glossy black overall with iridescent purple and dark bronze back, and purplish-blue head, neck, and breast.

An adult male Common Grackle (HMNS VO 1945) with a fully piebald head was determined unique by comparing both ventral (Fig. 4a) and dorsal (Fig. 4b) surfaces of the head to a normal plumaged Common Grackle (HMNS VO 1199). The plumage is still glossy black overall but the head is purplish-blue with scattered white spotting.

#### DISCUSSION

Arnold (2001) provided several examples of species housed in the TCWC, although specimen numbers and descriptions were not provided. These



Figure 3 – Ventral (Fig. 3a) and dorsal (Fig. 3b) surfaces of normal plumaged adult (L) Eastern Meadowlark (*Sturnella magna*, HMNS VO 1459) compared with complete leucistic (R) adult (HMNS VO 636). Mount of very light leucistic Eastern Meadowlark (Fig. 3c, below) mount (HMNS VO 637).



species include albino Northern Mockingbird (*Mimus polyglottos*), Pygmy Nuthatch (*Sitta pygmaea*), Cassin's Sparrow (*Aimophila cassinii*), and Brown-headed Cowbird (*Molothrus ater*); melanistic Red-tailed hawk (*Buteo jamaicensis*); leucistic American Wigeon (*Anas americana*)

Bull. Texas Ornith. Soc. 45(1-2): 2012

and Mottled Duck (*Anas fulvigula*); and piebald American Coot (*Fulica americana*), Northern Mockingbird, Northern Cardinal (*Cardinalis cardinalis*), and Brown-headed Cowbird.

Herein we document 4 additional color aberrations in avian plumages. Although these

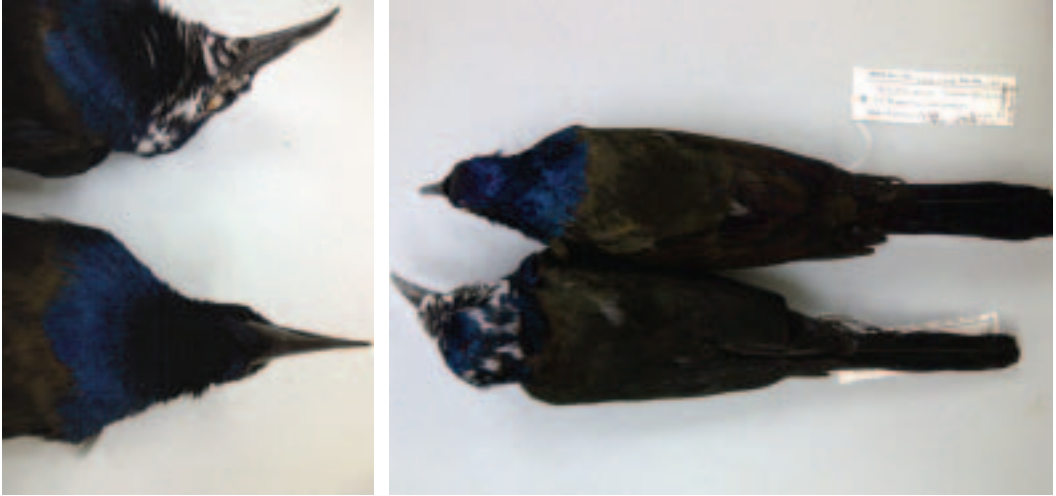


Figure 4 – Ventral head view (Fig. 4a) and dorsal surface (Fig. 4b) of adult male Common Grackle (*Quiscalus quiscula*, HMNS VO 1945) with a fully piebald head (L) compared to a normal plumaged (R) adult male (HMNS VO 1199).

aberrations are caused primarily through genetic defects in melanin, environment and physiology can also be contributing factors.

Bird deformities reflect both the health of avian populations and integrity of habitats (Cuervo and Restrepo 2007). Compared to hidden structural malformations, plumage aberrations are more readily observable to humans (Pourlis 2011). The rarity of aberrant plumage in the wild may be due to shorter life expectancy through intraspecific conflict. Conspicuous plumage can also make individuals more vulnerable to predation or more observable to prey (Alaja and Mikkola 1997). Through the continued study of anomalies like plumage aberrations we can increase our understanding of factors influencing the formation of avian mutations.

#### ACKNOWLEDGMENTS

Thanks to Ben Marks, formerly of Texas A&M University's Texas Cooperative Wildlife Collections, for loaning the subadult Harris' Hawk for comparison. Kind thanks to Keith Arnold, Adrian Castellanos, and Jack Eitniear for their comments and edits.

#### LITERATURE CITED

- ALAJA, A. AND H. MIKKOLA. 1997. Albinism in the Great Gray Owl (*Strix nebulosa*) and other owls. Pages 33-37 in *Biology and conservation of owls of the northern*

hemisphere. J. R. Duncan, D. H. Johnson and T. H. Nicholls, Editors. USDA Forest Service, General Technical Report NC-190, Washington, D.C.

ALSOP, F. J. 2001. *Smithsonian handbooks of Birds of North America*, First Edition. DK Publishing Inc., New York, New York.

ARNOLD, K. A. 2001. Birds of a different feather: not all birds look alike. *Texas Birds* 3:34-36.

CORTES-AVIZANDA, A., O. CEBALLOS, A. URMENTA, AND J. A. DONAZAR. 2010. First case of albinism in Egyptian Vultures. *Journal Raptor Research* 44:328-330.

CUERVO, A. M. AND C. RESTREPO. 2007. Assemblage and population-level consequences of forest fragmentation on bilateral asymmetry in tropical montane birds. *Biological Journal of the Linnean Society* 92:119-133.

HILL, G. E. 2010. *National Geographic bird coloration*. First Edition. National Geographic Society, Washington, D.C.

NOGUERIA, D. M. AND M. A. S. ALVES. 2011. A case of leucism in the Burrowing Owl, *Athene cucularia* (Aves: *Strigiformes*) with confirmation of species identity using cytogenetic analysis. *Zoologica* 8:53-57.

POURLIS, A. F. 2011. Development malformations in avian species: manifestations of unknown or genetic etiology—a review. *Asian Journal of Animal and Veterinary Advances* 6:401-415.

ROSENBERG, K. V., M. LAMMERTINK, K. BRADY, S. BASS, AND U. SETTORINI. 2013. Leucism and Albinism in Birds. Cornell Lab of Ornithology, Ithaca, NY. [www.birds.cornell.edu/ivory/pastsearches/2005\\_2006/stories\\_reports\\_0506/leucism](http://www.birds.cornell.edu/ivory/pastsearches/2005_2006/stories_reports_0506/leucism). Accessed 28 February 2013.

TVETEN, J. K. 1993. *The Birds of Texas*. Shearer Publishing, Fredricksburg, Texas.

# PHOTOGRAPHERS ASKED TO CONTRIBUTE TO TEXASBIRDIMAGES.COM

Jim Peterson<sup>1</sup>

*<sup>1</sup>Past-president, T.O.S. Creator and webmaster of Texasbirdimages.com*

For several decades, the Texas Ornithological Society has collected written observations of bird sightings. The T.O.S. organizational structure has always included regional directors with a clear interest in acquiring reports on bird observations within the state. These written sightings make up part of the backbone of the T.O.S. mission. However, at no time has the mission included the acquisition of photo-documentation as a singular interest. The Texas Bird Records Committee (TBRC) has collected photo-documentation to aid in the evaluation of review species, but there has never been a clear interest or method for acquiring digital images from around the state as part of a viewable, archival database.

With this mission in mind, T.O.S. has now adopted a website with the ability to house thousands of bird images with associated dates and county information. This repository will be an online function that will have both scientific and educational value. The website's address is <http://www.texasbirdimages.com>, and there are currently over 4,000 images accessible online with more being added daily. This website is in no way a substitute for the TBRC review process as those images will still need to be provided to that committee. It does, however, lend itself to the T.O.S. mission of record keeping in other ways.

There are several reasons why such an archival database of images will be useful for the T.O.S. membership. Currently, the T.O.S. system of sightings collection has no organized venue to archive or display photo images of regional rarities. For example, an image of a Sage Thrasher in East Texas is a meaningful photo-record. Someone writing a field guide to the birds of East Texas would likely find this noteworthy, and photo-

documentation is the clearest form of evidence outside of a specimen. Even casual bird enthusiasts might find an interest in viewing the photo-documentation unusual to their region.

Texas is a state with a huge geographical variation. North-central Texas (Region 2), for example, includes species on its western perimeter like Pyrrhuloxia, Canyon Towhee, and Vermilion Flycatcher. On the eastern perimeter of the same region, there are sightings of Brown-headed Nuthatch and even nesting Swainson's Warblers. Photo-documentation is added ammunition in documenting species that wander outside their typical habitat parameters but within their regional boundaries. A Brown-headed Nuthatch would be remarkable in a western county of Region 2, and a photographic record would be a more lasting testament of that sighting than a mention of it in a publication a few months after the fact. Photo-documentation of a Pyrrhuloxia in Dallas County would have the same impact. Simply put, the photo-documentation of unusual bird records should be archived for further reference as evidence of species movement and rare occurrence within state boundaries.

There are other reasons photo-documentation is valuable. Out-of-season reports, like a mid-July Harris Sparrow, make interesting photo-records. Plumage variation, like an unusual race of Merlin, also has value as photo-documentation. Yet images like this are frequently orphaned; they have no place to reside permanently. The written report may go into one of the regional reporting venues, but not the photo-image.

Historically, there have been several reasons why the acquisition of photo documentation of bird records has been an awkward pursuit. The storage of images has had no simple solution in the past.

---

<sup>1</sup>E-mail: [wrenthrush@gmail.c](mailto:wrenthrush@gmail.c)



Least Bittern—Harris Co. Photograph by Gary Seloff.



Swallow-tailed Kite—Dallas Co. Photograph by Darlene Moore.



Vermilion Flycatcher—Throckmorton Co. Photograph by Darlene Moore.



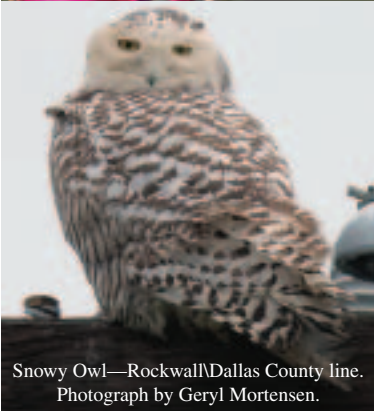
Burrowing Owl—Dallas Co. Photograph by Darlene Moore.



Green Jay—Starr Co. Photograph by Darlene Moore.



Canyon Wren—Young Co. Photograph by Ken Nanney.



Snowy Owl—Rockwall/Dallas County line. Photograph by Geryl Mortensen.



Buff-breasted Sandpiper—Tarrant Co. Photograph by Ken Nanney.

The T.O.S. organization does not own offices or network servers. Much of what T.O.S. does online is at the discretion of host organizations, and server space is limited. Now, free storage at places like Google Sites makes storage almost irrelevant.

Until recently, the other associated problem with images was bandwidth for online viewing. Most of the T.O.S. membership can recall the days of dial-up modems, and there are still some that remain limited in this way. But the more common Internet connectivity is now high-speed DSL or fiber connection. For most, images can be viewed quickly without the long waits associated with dial-up connections.

The single biggest change to online images may be at the user end. Newer digital technology has changed the complexion of bird photography altogether. This website dovetails with the exponentially greater interest and higher volume of bird photography since about 2005. More people now have the ability to capture images without heavy equipment – either on their smartphones or on compact, super-zoom digital cameras. Film is a thing of the past. Photographers simply push digital images to the cloud on one of many free image-hosting websites.

Lightweight digital cameras are on the verge of becoming standard birding equipment. Since collecting specimens with a gun is no longer a common practice even among organizations that have the proper permits, it is likely that the documentation of unusual bird records will rest solely on photo-documentation and the ability to archive it. This is where the collection of bird records stands today. Authors of newer field guides will no longer be seeking old specimens as part of their research. They will be seeking photo images.

While the nature photography community has been growing exponentially, very few of the images taken now are being used for true record

documentation. Many excellent images are simply pushed to personal cloud accounts or left on old hard drives. There has been no way to archive these images for later use even if they have historical relevance. Now at least some photo-documented Texas records will be available in real-time and archived for future reference. Images archived in this way will likely be more easily accessible than any data submitted as written documentation.

At present, images from nearly 100 photographers have been submitted and accepted to [texasbirdimages.com](http://texasbirdimages.com). These images are not in competition artistically. The website is not interested in the “best” picture. [Texasbirdimages](http://texasbirdimages.com) seeks images that effectively show an identifiable species. In addition, specific date and county information is required just as it is with written observations. The intent is to first create a baseline of images in each T.O.S. geographic region. That is, the site will accept the first few images of every species for which it currently has no photo-record. After that, however, [texasbirdimages](http://texasbirdimages.com) will accept only those bird images of rare or uncommon status within the T.O.S. regions. The site will also accept out-of-season records, unusual plumage characteristics, and some balance of male-female images.

Hopefully the new mission of image documentation for T.O.S. will have educational value for the present and provide good observational data as we move further into the 21<sup>st</sup> century. It should find an audience with ornithologists, nature photographers, authors, and bird enthusiasts. The online image repository helps expand the mission of T.O.S. record gathering and provides a new educational venue for all people with an interest in Texas birds.

For information on submitting images, go to <http://www.texasbirdimages.com> and click on the link “About Photo Documentation.”

## BOOK REVIEWS

---

### MEASURING BIRDS:

Vögel Vermessen Eck S, Fiebig J, Fiedler W, Heynen I, Nicolai B, Töpfer T,  
Van den Elzen R, Winkler R, Woog F.

*Edited by the Deutsche Ornithologen-Gesellschaft. Wilhelmshaven: Deutsche Ornithologen-Gesellschaft. 2011. ISBN-13: 9783923757053. \$45 (Buteo Books)*



Few of us have occasion to measure the parts of birds, but when we consider what ornithologists have learned from the thousands of such measurements made throughout the years, we can appreciate the need for careful and consistent measuring techniques.

What have these measurements shown us? To cite a few examples: bill size in raptors and other birds is correlated with prey size; two species of birds with similar feeding habits differ more in bill size and shape where their ranges overlap than where they do not, thus decreasing competition for food; northern populations are larger than southern populations in many species; and in some species wings are longer in migratory populations than in non-migratory populations.

*Measuring Birds: Vögel Vermessen*, written in German and English (in adjacent columns) by a team of mostly German ornithologists, is the most comprehensive reference book of its kind since 1931, when Baldwin, Oberholser and Worley published *Measurements of Birds*. The illustrations are clear and instructive and superbly rendered. They indicate precisely where measurements are taken in all external parts of the body. For example,



Sample of an illustration in *Measuring Birds: Vögel Vermessen*.

bill shape in parrots and gulls requires a different set of points for measuring length.

The topics covered are important for ornithologists in the field as well as the museum. There is a section on measuring fresh as opposed to dried specimens, on measuring live birds, as well as chapters on weight, equipment for measuring, and feather numbering.

The authors claim that they do not intend to establish a standard procedure for measuring birds. They probably appreciate that apart from governments and prestigious organizations (such as the AOU), few people can successfully set a "standard" by suggesting one in a book. Even the thorough and authoritative book by Baldwin, Oberholser, and Worley is infrequently cited in ornithological journals as the standard for measuring birds. On the other hand, perhaps by being published by the Deutsche Ornithologen-Gesellschaft this book may well become the standard reference in the field.

—Kent Rylander, *Texas Tech University:  
Junction Campus*

# BULLETIN OF THE TEXAS ORNITHOLOGICAL SOCIETY

## GUIDELINES FOR AUTHORS

### SUBMISSION

For initial submission, e-mail one copy of the manuscript and photographs/illustrations<sup>1</sup> to editor@texasbirds.org (alternate e-mail jackeditnear@yahoo.com) or mail to Jack C. Eitnear, 218 Conway Drive, San Antonio, Texas 78209-1716. If you do not have access to the internet mail a DVD or CD containing a word processor version (MS WORD 1997-2003 preferred or OpenOffice 3.0) of the manuscript with all figures and tables, as separate documents

*Submission Categories.*—Manuscripts may be submitted as a Major Article or Short Communication. Major Articles generally are longer papers that are >5,000 character count including literature cited and figure captions, and excluding tables, figures, and spaces between characters. Manuscripts <5,000 characters in length including literature cited and figure captions, and excluding tables, figures, and spaces between characters will be considered Short Communications. Major articles must include an Abstract. The Editor may move a paper from one category to another at his discretion.

*Multi-authored Submissions.*—All authors should have contributed in a significant manner to designing and performing the research, writing the manuscript, and reading and approving the manuscript prior to submission.

*Non-U.S. Submissions.*—Authors whose native language is not English should ensure that colleagues fluent in English have critically reviewed their manuscript before submission.

### GENERAL INSTRUCTIONS

**(Carefully read and follow these instructions before submitting your manuscript. Papers that do not conform to these guidelines will be returned.)**

Prepare manuscripts on 8.5 X 11 inch format with 1-inch margins. Double-space all text, including literature cited, figure captions, and tables. Insert page numbers top right beginning on the second page. Use a font size of at least 11 point. Consult a recent issue of the journal for correct format and style as you prepare your manuscript.

Write in the active voice whenever possible. Use U.S. English and spelling. Use *italics* instead of underlining (i. e., scientific names, third-level headings, and standard statistical symbols). Use Roman typeface (**not boldface**) throughout the manuscript.

Common and scientific names of bird species that occur in North and Middle America should follow the AOU *Check-list of North American Birds* (1998, 7th ed., and its supplements in *The Auk*; <http://aou.org.whsites.net/checklist/index>). Names for other bird species should follow an appropriate standard (cite standard used). Use subspecific identification and list taxonomic authorities only when relevant. Give the scientific name at first mention of a species in the abstract and in the body of the paper. Capitalize common names of birds except when referred to as a group (i. e., Northern Cardinal, Golden-cheeked and Yellow warblers, vireos). Do not italicize family names.

The common names of other organisms are lower case except for proper names (i. e., yellow pine, Ashe juniper, Texas kangaroo rat).

Cite each figure and table in the text. Sequence tables and figures in the order cited. Use “figure” only outside of parentheses; otherwise, use “Fig.” if singular, “Figs.” if plural (i. e., Fig. 1, Figs. 2–3). To cite figures or tables from another work, write figure, fig., or table in lowercase (i. e., figure 2 in Jones 1980; Jones 1980:fig. 2; Jones 1987: table 5).

Use the following abbreviations: d (day), wk (week), mon (month), yr (year), sec (second), min (minute), h (hour); report temperature as °C (i. e., 15° C). In text months should be abbreviated (Jan, Feb, Mar, Apr, etc.) in figures and tables. Define and write out acronyms and abbreviations the first time they appear in text; abbreviate thereafter: “Second-year (SY) birds . . . We found SY birds in large numbers.”

**Present all measurements in metric units.** Use continental dating (i. e., 15 August 2007), the 24-hour clock (i. e., 0500, 1230), and local standard time. Specify time as Standard Time (i. e., CST for Central

---

<sup>1</sup>Due to file restrictions by most e-mail systems we ask that you contact the editor regarding the best means to provide graphic support.



Standard Time) at first reference to time of day. **Study site location(s) should be identified by latitude and longitude.** Present latitude and longitude with one space between each element (i. e., 28° 07' N, 114° 31' W). If latitude and longitude are not available indicate the distance and direction from the nearest permanent location. Abbreviate and capitalize direction (i. e., north = N, southwest = SW, or 5 km W Abilene, Taylor County [but Taylor and Bexar counties]). Also capitalize regions such as South Texas or Southwest United States.

*Numbers.*—The conventions presented here revise what has often been called the “Scientific Number Style (SNS)”. The SNS generally used words for 1-digit whole numbers (i.e., 9 = nine) and numerals for larger numbers (i.e., ten =10), a distinction that may be confusing and arbitrary. The revised SNS treats numbers more consistently by extending the use of numerals to most single-digit whole numbers that were previously expressed as words. This style allows all quantities to be expressed in a single manner, and because numerals have greater visual distinctiveness than words, it increases the profile of quantities in running text. The objective of emphasizing quantity with numerals is further facilitated by the use of words for numbers appearing in a context that is only secondarily quantitative, i.e., when a number’s quantitative function has been subordinated to an essentially nonquantitative meaning or the number is used idiomatically. In these cases, use words to express numbers (i.e., the sixty-four-dollar question). However, the numbers zero and one present additional challenges. For these numbers, applying consistent logic (numerals for quantities and words otherwise) often increases tedium in making decisions about correct usage and creates an inconsistent appearance, primarily because “one” has a variety of functions and readers might not quickly grasp the logic. For example, “one” can be used in ways in which quantity is irrelevant: as a personal pronoun or synonym for “you” (i.e., “one must never forget that”) or as an indefinite pronoun (“this one is preferred”). The usage of the numeral in these cases would possibly be confusing to a reader. “Zero” and “one” are also used in ways that are more like figures of speech than precise quantifications (i.e., “in one or both of the ...”, “in any one year”, “a zero-tolerance policy”). In addition the numeral “1” can be easily confused with the letters “l” and “I”, particularly in running text, and the value “0” can be confused with the letter “O” or “o” used to designate a variable. Therefore simplicity and consistent appearance have been given priority for these 2 numbers.

*Cardinal Numbers.*—quantitative elements in scientific writing are of paramount importance because they lead the way to the findings. Use numerals rather than words to express whole and decimal numbers in text tables and figures. This practice increases their visibility and distinctiveness and emphasizes their enumerative function.

2 hypotheses      5 birds      65 trees      0.5 mm      5 times      8 samples

Also use numerals to designate mathematical relationships.

6:1      at 200X magnification      5-fold not five-fold

Use words in to represent numbers in 4 categories of exceptions:

- (1) If a number begins a sentence, title, or heading, spell out the number or reword the sentence so the number appears elsewhere in the sentence.

Five eggs were in the nest, but the typical clutch size is 12.

The nest contained 5 eggs, but the typical clutch size is 12.

- (2) When 2 numbers are adjacent, spell out the first number and leave the second as a numeral or reword the sentence.

The sample area was divided into four 5 ha plots.

I divided my sample area into 4 plots containing 5 ha.

- (3) For most general uses, spell out zero and one.

one of the species      was one of the most important      on the one hand  
values approaching zero      one peak at 12-14 m, the other at 25-28 m.

However, express the whole numbers zero and one as numerals when they are directly connected to a unit of measure or a calculated value.

1 week      1 m      a mean of 0      1-digit numbers      when  $z = 0$

Similarly, express zero and one as numerals when part of a series or closely linked to other numbers.

1 of 4 species      between 0 and 5      of these, 4 samples were... 1 sample was... and 8 samples

- (4) When a number is used idiomatically or within a figure of speech.

the one and only reason      a thousand and one possibilities      comparing one to the other  
the two of them      one or two of these      an extra week or two of growth.

### *Ordinal Numbers*

Ordinal numbers usually convey rank order, not quantity. Rather than expressing how many, ordinals often describe what, which, or sequence. Ordinals are more prose oriented than quantitative within the text and it is less important to express ordinal numbers as numerals.

- 1) Spell out single-digit ordinals used as adjectives or adverbs.  
the third chick hatched      first discovered      a third washings      for the seventh time
- 2) The numeric form of 2-digit ordinals is less confusing, so express larger ordinals as numerals.  
the 20<sup>th</sup> century      for a 15<sup>th</sup> time      the 10<sup>th</sup> replication      the 50<sup>th</sup> flock
- 3) Express single digit ordinals numerically if in a series linked with double-digit ordinals.  
The 5<sup>th</sup>, 6<sup>th</sup>, 10<sup>th</sup>, and 20<sup>th</sup> hypotheses were tested or We tested hypotheses 5, 6, 10, and 20

### *Zeros before Decimals.*

For numbers less than 1.0, always use an initial zero before the decimal point.

0.05 not .05      P = 0.05 not P = .05

### *Numbers Combined with Units of Measure*

- 1) Use a single space to separate a number and a subsequent alphabetic symbol  
235 g      1240 h      8 mm
- 2) Generally close up a number and a non alphabetic symbol whether it precedes or follows the number.  
45° for angles      45 °C for temperature      ±9      35±      <5 but P < 0.001
- 3) Geographic coordinate designation for latitude and longitude have a space between each unit.  
35° 44' 77" N
- 4) If the number and associated symbol or unit start a sentence, spell out the number and associated factor.  
Twenty-five percent of nests

### *Numeric Ranges, Dimensions, Series, and Placement of Units*

- 1) When expressing a range of numbers in text, use the word to or through to connect the numbers. Alternatively, an en dash, which means to may be used but only between 2 numbers that are not interrupted by words, mathematical operators, or symbols.  
Yielded -0.3 to +1.2 differences not -0.3+1.2 differences      5 July to 20 July or 5-20 July not 5 July-20 July  
1-12 m not 1 m – 12 m
- 2) When the word from precedes a range, do not substitute the en dash for to.  
From 3 to 4 nests not from 3-4 nests
- 3) The en dash represents only the word “to”, when between precedes a range, use “and” between the numbers.  
between 5 and 18 March not between 5-18 March
- 4) When the range includes numbers of several digits, do not omit the leading digits from the second number in the range.  
between 2001 and 2012 not between 2001 and 12 nor 2001-12      1587-1612 m not 1587-12 m
- 5) A range of numbers and the accompanying unit can be expressed with a single unit symbol after the second number of the range, except when the symbol must be closed up to the number (i.e., percent symbol) or the unit symbol may be presented with both numbers of the range.  
5 to 12 cm or 5 cm to 12 cm      5 to 10 °C or 5 °C to 10 °C      20% to 30% or 20-30% not 20 to 30%
- 6) If a range begins a sentence, spell out the first number and present the second as a numeral; however if a nonalphabetic symbol (%), write out both units.  
Twelve to 15 ha not twelve to fifteen ha      Ten percent to 20 percent of samples not Ten percent to 20% of samples
- 7) To prevent misunderstanding, avoid using “by” before a range; this may imply an amount change from an original value, rather than a range of values.  
growth increased 0.5 to 0.8 g/d (a range) or growth increased 0.5-0.8 g/d not growth increased by 0.5-0.8 g/d
- 8) To prevent a wrong conclusion by a reader, do not express 2 numbers preceded by words like “increase”, “decrease”, or “change”. A range may be intended but the reader may conclude the first value as an initial value and the second as a new value.

increased from 2 cm/wk to 5 cm/ wk (Was the increase 2-5 cm or was the increase 3 cm?)

When changes are from one range to a new range, en dashes within each range is a better statement.

increased from 10-20 m to 15-30 m

- 9) For dimensions, use a mathematical symbol (not a lower case “x”) or the word “by” to separate the measurements.

5 X 10 X 20 cm      5 cm X 10 cm X 20 cm      5 by 10 by 20 cm

- 10) For a series of numbers, present the unit after the last numeral only, except if the unit symbol must be set close to the number.

5, 8, 12, and 20 m      diameters of 6 and 8 mm      12%, 15%, and 25%      categories of <2, 2-4, and >6 km

### *Descriptive Statistics*

Variables are often reported in the text: the units and variability term should be unambiguous.

mean (SD) = 20% (2) or Mean of 20% (SD 2)      mean of 32 m (SD 5.3) not mean of 32 ± 5.3 m

mean of 5 g (SD ± 0.33)      mean (SE) = 25 m (0.24)

## MANUSCRIPT

Assemble a manuscript for Major Articles in this sequence: title page, abstract, text (introduction, methods, results, and discussion), acknowledgments, literature cited, tables, figure captions, and figures. Short Communications need not be subdivided into sections (optional).

*Title Page.*—At top of page place running head for Major Article: author(s) name(s) in upper- and lowercase italics followed by shortened version of title (=45 characters) in caps and Roman type. The running head for Short Communications is RRH: SHORT COMMUNICATIONS.

Put title in all caps for a Major Article and a Short Communication. Follow with author name(s) with the first letter of the first name, middle initial and last name as a cap and all other letters in lower case.

Addresses of author(s) should be in italics and arranged from first to last at the time of the study. The current address (if different from above) of each author (first to last), any special essential information (i. e., deceased), and the corresponding author and e-mail address should be in a footnote. Use two-letter postal codes (i. e., TX) for U.S. states and Canadian provinces. Spell out countries except USA. Consult a recent issue if in doubt.

*Abstract.*—Heading should be caps, indented, and followed by a period, three dashes, and the first sentence of the abstract (ABSTRACT.—Text . . .). Only Major Articles have an abstract.

*Text.*—Text, except for headings, should be left justified. Indent each paragraph with a 0.5-inch tab. Text should begin immediately after the abstract.

Up to three levels of headings may be used. First level: centered, all caps (includes METHODS, RESULTS, DISCUSSION, ACKNOWLEDGMENTS, and LITERATURE CITED). There is no heading for the Introduction. Second level: flush left, indent, capitalize initial letter of significant words and italicize all words. Third level: flush left, indent, capitalize the initial letter of each word, followed by a period, three dashes, and then the text. In Major Articles, use headers in this sequence: First level, third level, and then second level (if needed). *Keep headings to a minimum.* Major Articles typically contain all first-level headings. Short Communications may or may not have these headings, depending on the topic and length of paper. Typical headings under Methods may include “Study Area” and “Statistical Analyses.” Consult a recent issue for examples.

## METHOD

*Study Species, Locations, and Recordings*

Study Species, Locations, and Recordings.---

Each reference cited in text must be listed in Literature Cited section and vice versa. The exception is unpublished materials, which occur only in the text. Cite literature in text as follows:

- One author: Jones (1989) or (Smith 1989).
- Two authors: Jones and Smith (1989) or (Jones and Smith 1989)
- Three or more authors: Smith et al. (1989) or (Smith et al. 1989)

- Manuscripts accepted for publication but not published: Smith (in press), (Jones in press) or Jones (1998) if date known. “In Press” citations must be accepted for publication, with the name of journal or publisher included.
- Unpublished materials, including those in preparation, submitted, and in review:
  - (1) By submitting author(s) use initials: (JTB unpubl. data), (JTB pers. obs.),
  - (2) By non-submitting author(s): (J. T. Jones unpubl. data), (J. T. Jones and J. C. Smith pers. obs.), or J. T. Jones (pers. comm.). Do not use (J. T. Jones et al. unpubl. data); cite as (J. T. Jones unpubl. data).
- Within parentheses, order citations by date: (Jones 1989, Smith 1992, Franklin et al. 1996), (Franklin 1980; Jones 1983, 1990; Smith and Black 1984), (Delgado 1988a, b, c; Smith 2000).
- When citing a direct quote, insert the page number of the quote after the year: (Beck 1983:77).

*Acknowledgments.*—For individuals, use first, middle (initial) and last name (i. e., John T. Smith); abbreviate professional titles and institutions from individuals. Accepted manuscripts should acknowledge peer reviewers, if known. PLEASE INCLUDE COMPLETE FIRST NAME. THIS IS DIFFERENT THAN MOST JOURNALS

*Literature Cited.*—**Verify all entries against original sources**, especially journal titles, volume and page numbers, accents, diacritical marks, and spelling in languages other than English.

Cite references in alphabetical order by first, second, third, etc., authors’ surnames and then by date. References by a single author precede multi-authored works by the same first author, regardless of date. List works by the same author(s) in chronological order, beginning with earliest date of publication. If a cited author has two works in same year, place in alphabetical order by first significant word in title; these works should be lettered consecutively (i. e., 2006a, 2006b). Write author names in upper case (i. e., SMITH, J. T. AND D. L. JONES, .....FRANKLIN, B. J., T. S. JEFFERSON, AND H. H. SMITH). Insert a period and space after each initial of an author’s name.

**Journal titles and place names should be written out in full and not abbreviated;** do not use abbreviations for state, Editor, edition, number, Technical Coordinator, volume, version, but do abbreviate Incorporated (Inc.). Do not indicate the state in literature cited for books or technical papers or reports when the state is obvious (i. e., Texas A&M Press, College Station.). Do not add USA after states of the United States but indicate country for publications outside the United States. Cite papers from Current Ornithology, Studies in Avian Biology, and International Ornithological Congresses as journal articles. The following are examples of how article should be referenced in the Literature Cited section of a manuscript.

## BIRDS OF NORTH AMERICA

(Hard copy version) GRZYBOWSKI, J. A. 1995. Black-capped Vireo (*Vireo atricapillus*). The Birds of North America, No. 181.

(Electronic version) *See Internet Sources*

## BOOKS, CHAPTERS, THESES, DISSERTATIONS:

AMERICAN ORNITHOLOGISTS’ UNION. 1998. Check-list Check-list of North American birds, 7<sup>th</sup> Edition. American Ornithologists’ Union, Washington, D.C.

OBERHOLSER, H. C. 1938. The bird life of Louisiana. Bulletin 28. Louisiana Department of Conservation, New Orleans.

MENGE, R. M. 1965. The birds of Kentucky. Ornithological Monographs 3.

BENNETT, P. M. AND I. P. F. OWENS. 2002. Evolutionary ecology of birds: life histories, mating systems, and extinction. Oxford University Press, New York, New York.

BENT, A. C. 1926. Jabiru. Pages 66–72 in Life histories of North American marsh birds. U.S. National Museum Bulletin, Number 135. [Reprinted 1963, Dover Publications, New York, New York].

OBERHOLSER, H. C. 1974. The bird life of Texas. (E. B. Kincaid, Jr., Editor). Volume 1 (or 2 please specify) University of Texas Press, Austin.

GALLUCCI, T. L. 1978. The biological and taxonomic status of the White-winged Doves of the Big Bend of Texas. Thesis. Sul Ross State University, Alpine, Texas.

SMALL, M. 2007. Flow alteration of the Lower Rio Grande and White-winged Dove range expansion. Dissertation. Texas State University, San Marcos.

- KEAR, J. 1970. The adaptive radiation of parental care in waterfowl. Pages 357–392 in *Social behavior in birds and mammals* (J. H. Crook, Editor). Academic Press, London, United Kingdom.
- SNOW, D. W. 2001. Family Momotidae (motmots). Pages 264–285 in *Handbook of the birds of the world, Volume 6: mousebirds to hornbills* (J. del Hoyo, A. Elliot, and J. Sargatal, Editors). Lynx Edicions, Barcelona, Spain.
- SPSS INSTITUTE, INC. 2005. SPSS for Windows, version 13. SPSS Institute, Inc., Chicago, Illinois.
- ZAR, J. H. 1996. *Biostatistical analysis*, 3<sup>rd</sup> Edition. Prentice Hall, Upper Saddle River, New Jersey.

#### GOVERNMENT PUBLICATIONS:

- BURNS, R. M. AND B. H. HONKALA (Technical Coordinators). 1990. *Silvics of North America, Volume 1: conifers, and Volume 2: hardwoods*. Agriculture Handbook, USDA Forest Service, Washington, D.C.
- FRANZREB, K. E. 1990. Endangered and threatened wildlife and plants—determination of threatened status for the Northern Spotted Owl: final rule. *Federal Register* 55:26114–26194.
- HUFF, M. H., K. A. BETINGER, H. L. FERFUSON, M. J. BROWN, AND B. ALTMAN. 2000. A habitat-based point-count protocol for terrestrial birds, emphasizing Washington and Oregon. General Technical Report PNW-501, USDA Forest Service, Portland, Oregon.

#### JOURNAL, TRANSACTIONS AND PROCEEDINGS ARTICLES

- BRAUN, C. E., D. R. STEVENS, K. M. GIESEN, AND C. P. MELCHER. 1991. Elk, White-tailed Ptarmigan and willow relationships: a management dilemma in Rocky Mountain National Park. *Transactions of the North American Wildlife and Natural Resources Conference* 56:74–85.
- MACLEAN, G. L. 1976. Arid-zone ornithology in Africa and South America. *Proceedings of the International Ornithological Congress* 16:468–480.
- TAYLOR, J. S., K. E. CHURCH, AND D. H. RUSCH. 1999. Microhabitat selection by nesting and brood-rearing Northern Bobwhite in Kansas. *Journal of Wildlife Management* 63:686–6994.
- JOHNSON, C. M. AND G. A. BALDASSARRE. 1988. Aspects of the wintering ecology of Piping Plovers in coastal Alabama. *Wilson Bulletin* 100:214–223.
- PARRISH, J. D. 2000. Behavioral, energetic, and conservation implications of foraging plasticity during migration. *Studies in Avian Biology* 20:53–70.

#### INTERNET SOURCES

- DAVIS, J. N. 1995. Hutton's Vireo (*Vireo huttoni*). The Birds of North America Online: <http://bna.birds.cornell.edu/bna/species/189> (accessed 10 November 2012).
- SAUER, J. R., J. E. HINES, AND J. FALLOWN. 2003. The North American Breeding Bird Survey, results and analysis 1966–2003, version 2003.1. USGS Patuxent Wildlife Research Center, Laurel, Maryland. [www.mbr-pwrc.usgs.gov/bbs/bbs.html](http://www.mbr-pwrc.usgs.gov/bbs/bbs.html) (accessed 5 May 2004).
- WRIGHT, E. 2003. Ecological site description: sandy. Pages 1–5 in USDA, Natural Resources Conservation Service. Site ID: Ro77XC055NM. <http://esis.sc.egov.usda.gov/>.
- PITMAN, N. C. A. 2006. An overview of the Los Amigos watershed, Madre de Dios, southeastern Peru. September 2006 version of an unpublished report available from the author at [npitman@amazonconservation.org](mailto:npitman@amazonconservation.org)

#### IN PRESS CITATIONS

##### Date unknown:

- MILLER, M. R., J. P. FLESKES, J. Y. TAKEKAWA, D. C. ORTHMEYER, M. L. CASAZZA, AND W. M. PERRY. In Press. Spring migration of Northern Pintails from California's Central Valley wintering area tracked with satellite telemetry: routes, timing, and destinations. *Canadian Journal of Zoology*.

##### Date known:

- DECANDIDO, R., R. O. BIERREGAARD, JR., M.S. MARTELL, AND K. L. BILDSTEIN. 2006. Evidence of nighttime migration by Osprey (*Pandion haliaetus*) in eastern North America and Western Europe. *Journal of Raptor Research*. In Press.

##### Date and volume number known:

- POLING, T. D. AND S. E. HAYSLETTE. 2006. Dietary overlap and foraging competition between Mourning Doves and Eurasian Collared-Doves. *Journal of Wildlife Management* 70:In *Tables and Appendices*.—Each table and appendix must start on a new page and contain a title caption that is intelligible without recourse to the text. Titles usually indicate who, what, where and when. Kroodsma

(2000; Auk 117:1081–1083) provides suggestions to improve table and figure captions. Tables/appendices should supplement, not duplicate, material in the text or figures. Indent and double-space captions, beginning with Table 1 (if only one appendix is included, label as Appendix). Indicate footnotes by lower case superscript letters.

Develop tables/appendices with your word processor's table format, not a tab-delimited format. Do not use vertical lines in tables/appendices. Include horizontal lines above and below the box head, and at end of table/appendix. Use the same font type and size as in text. Consult a recent issue for style and format.

*Figures.*—Type captions in paragraph form on a page separate from and preceding the figures. Indent and double-space captions, beginning with Fig. 1. Do not include symbols (lines, dots, triangles, etc.) in figure captions; either label them in a figure key or refer to them by name in the caption. Consult a recent issue for style and format.

Use a consistent font and style throughout; sans serif typeface is required (i. e., Arial, Helvetica, Univers). Do not use boldface font for figure keys and axis labels. Capitalize first word of figure keys and axis labels; all other words are lower case except proper nouns. Handwritten or typed symbols are not acceptable.

Routine illustrations are black-and-white half-tones (photographs), drawings, or graphs and color photographs. Copies of halftone figures and plates must be of good quality (final figures must be at least 300 dpi). Figures in the Bulletin are virtually identical to those submitted (little degradation occurs, but flaws will show). Thus, illustrations should be prepared to professional standards. Drawings should be on good-quality paper and allow for about 20% reduction. Do not submit originals larger than 8.5 X 11 inches in size, unless impractical to do otherwise. Illustrations should be prepared for one- or two-column width, keeping in mind dimensions of a page in the Bulletin. When possible, try to group closely related illustrations as panels in a single figure. In the initial submission of an article, figures should be submitted separate from the manuscript on computer disk. **Preference for submission of graphic support is by PDF or TIFF.** Photographs should be at least 1.5 MB in size for clear reproduction.

*Maps.*—Use Google maps ONLY as a last resort! Authors should use one of a number of cartographical software packages (Arcmap, Geocart, Ortelius). Maps should contain either an embedded key with a caption (as a separate WORD attachment)

*Proofs, Reprints, and Page Charges.*—Authors will receive page proofs (electronic PDF) for approval. Corrections must be returned via e-mail, fax, or courier to the Editorial Office within two weeks. Authors should not expect to make major modifications to their work at this stage. Authors should keep the Editor informed of e-mail address changes, so that proofs will not be delayed. The Bulletin requests that authors bear part or all of the cost of publishing their papers when grant, institutional, or personal funds are available for the purpose. **A minimum contribution of \$35.00 a page is recommended.** Authors who do not have access to publication funds may request a waiver of this payment. Authors will receive a PDF copy of their paper to serve as a reprint for distribution to colleagues.

**Tips for improving your manuscript (aka. common omissions from past authors).**

- Always include running head and page number.
- Insert corresponding author's e-mail address at bottom of the first page with superscript referencing his/her name in author line.
- Note author's names are in upper case in Literature Cited section.
- Spell out complete names in Acknowledgment section.
- Avoid repetition of pronouns, nouns and verbs within the same sentence and/or paragraph (i. e., try not to start EVERY sentence with "We observed.....").
- Note the BNA accounts are available BOTH as hard copies and online documents. Be sure you cite the one you consulted.

If you have questions, contact the Editor (E-mail editor@texasbirds.org).

Jack C. Eitnien, Editor

John T. Baccus, Associate Editor

Rev. 05-Oct-2007

Rev. 01-Sept-2009

Rev. 01 Dec-2010

Rev. 01 Dec-2013

**Texas Ornithological Society**  
**OCCASIONAL PUBLICATION SERIES**

**Special — All Occasional Publications \$5.00 includes postage and handling  
PDF copies (when available) \$3.00**



**The Early History of Ornithology in Texas**

Stanley D. Casto  
Occasional Publication No. 4, 2002  
6 line drawings, 24 pages



**Records Accepted by the Texas Birds Records Committee  
(1987–2003)**

Mark W. Lockwood, John Arvin, Keith Arnold, Kelly Bryan, Jim Paton,  
Petra Hockey, Mel Cooksey, Brad McKinney, and Randy Pinkston.  
Occasional Publication No. 5, 2003  
8 color photos, 64 pages PDF Available



**Historic and Current Distribution and Abundance of White-winged  
Doves (*Zenaida Asiatica*) in the United States**

Michael F. Small, John T. Baccus, and T. Wayne Schwertner  
Occasional Publication No. 6, 2006  
6 color photos, 24 pages PDF Available



**Response of Golden-cheeked Warblers (*Dendroica chrysoparia*) to  
wildfires at Fort Hood, Texas**

John T. Baccus, Maria E. Tolle, and John D. Cornelius  
Occasional Publication No. 7, 2007  
8 color photos, 37 pages PDF Available

Make checks payable to "Texas Ornithological Society".  
Forward to: TOS Scientific Publications, 218 Conway Drive, San Antonio, Texas 78209-1716  
E-mail: editor@texashirds.org Tel. 210-828-5306

## CONTENTS

### MAJOR ARTICLES

NOTES ON THE ELF OWLS OF TRANS-PECOS, TEXAS AND ADJACENT COAHUILA AND NEW MEXICO. <i>Robert W. Dickerman and Andrew B. Johnson</i> .....	1
ORDER AND CHAOS: NORTHERN BOBWHITE PRODUCTIVITY AND NEST-HABITAT RELATIONSHIPS IN SOUTH TEXAS <i>Kyle A. Brazil, Leonard A. Brennan, Fidel Hernández, Bart M. Ballard, and Fred C. Bryant</i> .....	6
EVALUATION OF CAPTURE TECHNIQUES FOR LONG-BILLED CURLEWS WINTERING IN TEXAS <i>Mark C. Woodin, Mary Kay Skoruppa, Jeremy W. Edwardson, and Jane E. Austin</i> .....	12
HIGH DIVERSITY OF INVASIVE PASSERIDS AT A PARK IN SOUTHEAST TEXAS <i>Daniel M. Brooks and Greg Page</i> .....	23
FIRST BREEDING RECORD OF AMERICAN WOODCOCK ( <i>SCOLOPAX MINOR</i> ) IN CORYELL COUNTY, TEXAS; COULD THIS BE FURTHER EVIDENCE FOR REGULAR WOODCOCK BREEDING IN CENTRAL TEXAS? <i>Joel A. Kutylowski, Than J. Boves, and David A. Cimprich</i> .....	30
TEXAS BIRD RECORDS COMMITTEE REPORT FOR 2011 <i>Eric Carpenter</i> .....	33

### SHORT COMMUNICATIONS

HUTTON'S VIREO NESTING IN GUADALUPE COUNTY, TEXAS <i>Jack Eitniew and Don Schaezler</i> .....	40
TWO RECENT ADDITIONS TO THE BREEDING AVIFAUNA OF THE GUADALUPE MOUNTAINS, TEXAS <i>Mark W. Lockwood</i> .....	43
RECENT NESTING RECORDS OF GREEN KINGFISHER FROM THE BRAZOS RIVER DRAINAGE OF CENTRAL TEXAS <i>Randy Pinkston and Tim Fennell</i> .....	45
CLAPPER RAIL IMPALEMENT MORTALITY <i>Bobby Schat</i> .....	50
COMMON LOON ( <i>GAVIA IMMER</i> ) MORTALITY FROM LEAD WEIGHT INGESTION IN COASTAL TEXAS <i>Eleanor Stoddard and Daniel M. Brooks</i> .....	52
SUCCESSFUL NESTING OF RUDDY DUCKS ( <i>OXYURA JAMAICENSIS</i> ) ON NORTHERN PADRE ISLAND, NUECES COUNTY, TEXAS <i>Marc Woodin</i> .....	55
SECOND RECORD OF OLD NEST REUSE BY NORTHERN CARDINALS <i>Ray C. Telfair II</i> .....	57
GREAT-TAILED GRACKLES RETURN TO ABANDONED BREEDING COLONY <i>Ray C. Telfair II</i> .....	58
LEARNED PREY HANDLING OF TEXAS HORNED LIZARDS BY A GREATER ROADRUNNER FROM THE ROLLING PLAINS OF TEXAS <i>Stephen Kasper</i> .....	59
MELANISTIC RED-HEADED WOODPECKER FROM TEXAS <i>Mark W. Lockwood</i> .....	62
NOTES ON THE FOOD HABITS OF A SNOWY OWL WINTERING IN TEXAS <i>Keith A. Arnold, John Hale, and Clifford E. Shackelford</i> .....	64
ABERRANT PLUMAGE IN TEXAS BIRD SPECIMENS HOUSED IN THE HOUSTON MUSEUM OF NATURAL SCIENCE <i>Alyssa R. Conn and Daniel M. Brooks</i> .....	67
PHOTOGRAPHERS ASKED TO CONTRIBUTE TO TEXASBIRDIMAGES.COM <i>Jim Peterson</i> .....	72

### BOOK REVIEW

MEASURING BIRDS: VÖGEL VERMESSEN <i>Kent Rylander</i> .....	75
AUTHOR GUIDELINES <i>Jack Clinton Eitniew and John T. Baccus</i> .....	76



**BULLETIN OF THE TEXAS ORNITHOLOGICAL SOCIETY**

**Vol. 45 No. 1-2 December 2012**