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SECOND RECORD OF AN AMERICAN WOODCOCK (*SCOLOPAX MINOR*) BREEDING ON THE EDWARDS PLATEAU

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ABSTRACT.—The American Woodcock (*Scolopax minor*) may be more common and widespread as a breeder in Texas than current records indicate. Despite numerous observations outside of accepted wintering and spring migratory periods, few well-documented breeding records exist outside of the Pineywoods. On 10 March 2005, we observed an adult with chick at Fort Hood, Bell County. We obtained photographs of their habitat, as well as of the chick. We observed the woodcocks in a shin oak (*Quercus sinuata*) thicket with ample leaf litter on the ground. This observation is the second and only recent woodcock nesting record for the Edwards Plateau.

American Woodcocks (*Scolopax minor*) are considered rare, regular breeders in the eastern third of Texas, particularly in the Pineywoods, where they nest during January through April (Keppie and Whiting 1994, Lockwood and Freeman 2004). However, their breeding status west of the Pineywoods remains enigmatic due

Figure 1. American Woodcock (*Scolopax minor*) chick sitting in a leaf-filled depression within a shin oak (*Quercus sinuata*) thicket at Fort Hood, Bell County, TX. Photo credit: David A. Cimprich.

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to a paucity of well-documented breeding records. At least in part, this lack of breeding records likely relates to difficulty in finding woodcock in their typically dense woodland habitat due to their cryptic plumage and their generally nocturnal and secretive habits (Keppie and Whiting 1994, Lockwood and Freeman 2004).

Regardless, multiple observations for woodcock outside of accepted spring migration dates (i.e., after early March; Lockwood and Freeman 2004) exist west of the Pineywoods. These observations suggest that woodcock might breed, at least occasionally, in the Post Oak Savannah and Blackland Prairies west to the eastern edge of the Edwards Plateau. However, little evidence of breeding exists for these regions. Within the Post Oak Savannah and Blackland Prairies, three nests were found in Brazos County during February and March 1959 (Davis 1961). Adults with chicks were observed in Brazos County in March 1979 (Williams 1979) and in Gonzales County in April 1998 (Sexton et al. 1998). In March 1986, a cat captured a woodcock chick in eastern Travis County (Lasley and Sexton 1986). Supposedly, this latter observation was the second confirmed breeding record for Travis County; however, we were unable to obtain details on the first confirmed breeding record for the county. Finally, although the exact location is disputed, a nest found in Comal or Hays counties in January 1888 is the only confirmed woodcock breeding record for the Edwards Plateau (Oberholser 1974, Lockwood 2001).

We documented the second and only recent instance of woodcock breeding on the Edwards Plateau on 10 March 2005, when we found an adult with a chick at Fort Hood, Bell County. We flushed the adult from within upland habitat, specifically a dense shin oak (*Quercus sinuata*) thicket with a few scattered Ashe juniper (*Juniperus ashei*) and Texas red oak (*Q. buckleyi*). The heights of the shin oaks generally exceeded 2 m. Upon closer inspection of the thicket, we found a chick in a shallow, leaf-filled depression which had a diameter of approximately 46 cm (Figure 1). Although woodcock do nest in such depressions (Keppie and Whiting 1994), we believe this depression was a convenient hiding place rather than the actual nest.

Bottomland, stream banks, and, generally, moist and shadowy areas are often envisioned as woodcock habitat (e.g., Oberholser 1974). However, in actuality, woodcock nesting habitat varies more, including shrublands, uplands, and well-drained sites (Keppie and Whiting 1994); habitats found throughout central Texas. Further search of such habitats during January through April could result in additional woodcock nesting records west of the Pineywoods. Such records would serve to further elucidate the breeding status of this species outside of its traditional Pineywoods breeding range in Texas.

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FOOD FOR EARLY SUCCESSION BIRDS: RELATIONSHIPS AMONG ARTHROPODS, SHRUB VEGETATION, AND SOIL

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ABSTRACT.—During spring and early summer, shrub- and herbaceous-level vegetation provides nesting and foraging habitat for many shrub-habitat birds. We examined relationships among arthropod biomass and abundance, foliage leaf surface area and weight, vegetation ground cover, soil characteristics, relative humidity, and temperature to evaluate what factors may influence arthropod food resources for birds. Relative humidity was inversely associated with arthropod biomass; as humidity increased biomass decreased (r = -0.44, P = 0.004). We failed to detect any relationships between deciduous foliage (surface area and weight) and arthropod biomass or abundance. However, both arthropod abundance (r = 0.30, P = 0.06) and biomass (r = 0.39, P = 0.01) were positively associated with the percentage of herbaceous ground cover. Arthropod abundance also appeared to be positively associated with the percentage of clay in the soil and negatively associated with the percentage of sand. Herbaceous layer vegetation (forbs and grasses) is known to be positively associated with fire frequency suggesting a possible foraging benefit for birds during spring in habitats that are frequently burned. Management of early and late succession pine forest habitat to produce and maintain a healthy herbaceous layer will likely support more arthropods and provide quality foraging habitat for birds.

Many foliage-gleaning birds are dependent on arthropods as food, particularly during spring and early summer (Berthold 1976, Lewke 1982). In late summer and fall, bird use of plant materials such as fruits generally increases (Baird 1980). Many species of birds breed in early successional habitats created by timber harvesting (Conner and Adkisson 1975, Dickson et al. 1995). Such habitat typically has an abundance of both herbaceous and shrub-level vegetation. Recent research suggests that herbaceous ground cover, which is associated with frequent fire in the south, may be more important for the production of arthropod biomass and abundance than shrub leaf surface area (Hess and James 1998, James et al. 2001, Collins et al. 2002).

We explored the relationships among soil characteristics, vegetation, and arthropods in a 3-year-old pine plantation with deciduous and pine foliage that was present in early successional vegetation in Nacogdoches County, eastern Texas, during June 1982. If soil nutrients were a determinant of leaf nutritional quality, sites with better soil nutrients should produce higher arthropod abundance and biomass. We examine possible relationships between weather, vegetation, and soil characteristics and arthropod biomass and abundance.

STUDY SITE

We selected a 3-year-old loblolly pine *(Pinus taeda)* plantation (20 ha) with pine, deciduous, and herbaceous foliage from ground level to about 1.5 m high on the Angelina National Forest (31° 15′ N, 94° 15′ W) in eastern Texas. The plantation had patchy foliage and ranged from xeric, sandy hilltops to mesic sites along intermittent streams. Loblolly pine, shortleaf pine (*Pinus echinata*), post oak (*Quercus stellata*), winged sumac *(Rhus copallina),* smooth sumac *(R. glabra*), and sweetgum (*Liquidambar styraciflua*) were the dominant woody plants in the young pine plantation.

METHODS

Arthropod biomass and abundance were estimated by sampling 40 rectangular volumes of foliage (1 x 1 x 10 m) with a 38-cm-diameter insect sweep net. The sampled rectangular volumes (our sample unit) were

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at least 20 m apart to avoid violating independence of observation. Twenty net sweeps were made of the foliage within each of these rectangular volumes between 0830 and 1130 DST from 22 June to 21 July 1982, and captured arthropods were placed in a kill-jar with chloroform. Arthropods in these samples were identified to taxonomic order and oven dried at 85° C for 48 h (to constant weight) and weighed on an analytical balance. Relative humidity was measured with a sling psychrometer and ambient air temperature recorded immediately after arthropods were sampled. Percent ground cover of herbaceous dicots (forbs) and monocots (grasses) was estimated by viewing downward through a 4 cm diameter x 13 cm long hollow PVC tube at three points systematically placed on the 10-m-long rectangle. A soil auger was used to collect a soil sample to a depth of 15 cm for each rectangle at the three points where ground cover was estimated and the samples from each of these three points combined and mixed in a soil sample bag. Soil samples were analyzed for pH, texture, and chemical properties at the Stephen F. Austin State University Department of Agriculture Soil Science Laboratory.

All foliage within each of the 1 x 1 x 10 m rectangular volume ($n = 40$) where arthropods had been sampled was identified to species, clipped with hand pruning shears, and placed in a separate, large plastic bag for each rectangle and transported back to the laboratory. In the laboratory each leaf was run through a Licor area meter (LI-3000) with a conveyor belt three times, and then averaged to measure total leaf surface area for each rectangular volume. Foliage from each sample unit was then oven dried to constant weight at 85° C to obtain a measure of foliar biomass for each rectangular volume. Foliar surface area and dry weight biomass were divided by 10 to obtain a measure per cubic meter. All variables were evaluated for normality (Kolmogorov-Smirnov one sample test, $P < 0.05$) and transformed with an arcsine transformation, if necessary, and descriptive statistics were calculated (Table 1). Relationships among variables were examined using Pearson correlations. Multiple linear regressions (forward stepwise) were used to determine what subsets of variables were the best predictors of arthropod biomass and abundance.

Table 1. Descriptive statistics for arthropod, foliage, micro climate, and soil characteristics in early succession shrub-level vegetation ($n = 40$) in eastern Texas.

Habitat characteristic	Mean	SD	Minimum	Maximum
Arthropod biomass (g)	0.09	0.09	0.003	0.386
Arthropod abundance (#)	18.7	12.2	2.0	55.0
Relative humidity (%)	82.7	9.3	58.0	95.0
Temperature (C°)	29.0	3.2	21.5	35.3
Foliage leaf area (cm^2/m^3)	1415.8	538.7	548.7	3310.3
Foliage weight (g/m^3)	143.1	47.9	66.8	281.1
Herbaceous dicot (%)	36.3	17.0	7.0	75.0
Herbaceous monocot (%)	51.2	16.5	10.0	78.0
Sand (%)	73.9	2.9	68.0	80.0
Silt (%)	11.0	2.2	6.0	16.0
Clay (%)	15.2	1.8	12.0	22.0
Soil pH	5.9	0.2	5.3	6.3
Calcium (ppm)	717.5	229.7	300.0	1400.0
Magnesium (ppm)	72.3	22.4	40.0	80.0
Iron (ppm)	15.2	5.0	6.6	20.0
Manganese (ppm)	5.5	2.1	2.2	10.0
Nitrogen (ppm)	726.3	277.6	77.0	1569.0
Phosphorus (ppm)	2.1	1.3	0.5	6.0

RESULTS AND DISCUSSION

Relative humidity was significantly associated with arthropod biomass but not arthropod abundance (Table 2). As humidity increased, arthropod biomass decreased. This may be a function of arthropod size as small arthropods, which tend to be more common than large ones, may have been more affected by morning dew. Temperature variation (21.5 to 35.3° C) during our sampling period (0830–1130 DST) was not related to arthropod biomass or abundance (Table 2). Our sweep net samples collected 742 arthropods representing 10 taxonomic orders (Table 3). Homopterans, arachnids, and orthopterans were the most frequently captured arthropods in the sweep nets.

Soil texture was correlated with arthropod abundance but not arthropod biomass. Increased percentages of clay and decreasing percentages of sand were associated with increasing arthropod abundance (Table 2). Arthropod abundance was negatively associated with manganese in the soil. We detected no relationship between nitrogen or phosphorus and arthropod abundance or biomass (Table 2).

We did not detect any relationship of woody foliage surface area or biomass with arthropod biomass and abundance (Table 2). We may have been able to detect a relationship had we taken our samples in early spring (late April and May) when new leaves were succulent and tender. By mid June and July, new leaf growth had diminished and the cuticle on existing leaves was hardening. Arthropod measures were not associated with the amount of herbaceous monocots; however, both arthropod biomass and abundance increased as herbaceous dicots in the ground cover increased (Table 2). Our results from an early succession pine plantation are similar to observations in mature pine forests. Hess and James (1998) and James et al. (2001) reported that herbaceous layer vegetation was the most important habitat characteristic affecting arthropod communities foraged on by Red-cockaded Woodpeckers (*Picoides borealis*) in open, mature longleaf pine (*Pinus palustris*) communities in northern Florida. Collins et al. (2002) observed that abundance of herbaceous dicots was positively associated with the abundance and biomass of pine bole arthropod communities in a mature loblolly-shortleaf pine stand in eastern Texas. In mature pine forests, Collins et al. (2002) and James et al. (2001) noted that the arthropods in the herbaceous layer were particularly important as a foraging resource for the endangered Red-cockaded Woodpecker.

In longleaf and loblolly-shortleaf pine communities, fire is the disturbance factor that typically maintains a well-developed herbaceous layer (Platt et al. 1988, Frost 1993, Conner et al. 2001). In the absence of fire, mechanical

Table 2. Pearson correlations (n = 40) among arthropod biomass, arthropod abundance and foliage and soil characteristics in early succession shrub-level vegetation in eastern Texas.

	Arthropod biomass		**Arthropod abundance**	
Habitat characteristic	***r***	***P***	***r***	***P***
Relative humidity (%)	-0.44	0.004	0.10	0.553
Temperature (° C)	0.22	0.173	-0.07	0.654
Foliage leaf area (cm^2/m^3)	0.02	0.915	0.14	0.400
Foliage weight (g/m^3)	0.09	0.575	0.22	0.181
Herbaceous dicot (%)	0.30	0.060	0.39	0.012
Herbaceous monocot (%)	-0.18	0.277	-0.18	0.262
Sand (%)	-0.07	0.690	-0.44	0.004
Silt (%)	0.20	0.227	0.29	0.071
Clay (%)	-0.14	0.404	0.36	0.021
Soil pH	0.21	0.192	-0.24	0.142
Calcium (ppm)	0.01	0.960	-0.05	0.766
Magnesium (ppm)	-0.07	0.670	-0.01	0.984
Iron (ppm)	0.16	0.320	-0.27	0.094
Manganese (ppm)	0.02	0.926	-0.33	0.040
Nitrogen (ppm)	-0.04	0.824	0.00	0.996
Phosphorus (ppm)	-0.24	0.140	0.04	0.803

Table 3. Arthropod orders collected in sweep net samples (n = 20) of shrub and herbaceous-level vegetation at 40 sites a pine plantation during 1984 in eastern Texas.

Taxon	Abundance (#)	Frequency (%)
Arachnida	122	16.44
Coleoptera	18	2.43
Diptera	66	8.89
Hemiptera	22	2.96
Homoptera	319	42.99
Hymenoptera	31	4.18
Lepidoptera	17	2.29
Odonata	3	0.40
Orthoptera	143	19.27
Siphonoptera	1	0.13
Total	742	100.00

control of midstory and understory woody vegetation will help maintain some level of herbaceous vegetation for short time periods (Conner and Rudolph 1991, Conner et al. 2001). Clear-cutting, as observed in the present study, can produce an herbaceous layer that is associated with arthropod abundance and biomass. But, this herbaceous vegetation and the arthropods it provides for birds may be short-lived as the developing pine canopy can quickly close and eliminate sunlight that permits an herbaceous layer to grow (Dickson et al. 1984, 1993).

Our study adds to a growing literature on the positive association of herbaceous-level vegetation with arthropod communities (James et al. 2001, Collins et al. 2002). The importance of arthropods as a foraging resource for birds is well established (Lewke 1982, Ramsay and Houston 2003, Yard et al. 2004). Our results also emphasize the importance of herbaceous layer plants, which are known to be associated with fire, in early succession pine forests. Management activities that promote herbaceous-level vegetation, such as fire, should be an important option for forest managers to consider at all stages of forest succession in southern pine forests.

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Brown-crested Flycatcher. ©Rolf Nussbaumer/VIREO

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BIRD RECORDS OF NOTE FROM FORT HOOD, TEXAS

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ABSTRACT.—Since 1989, bird surveys have been conducted at Fort Hood, Bell and Coryell counties, central Texas. Only some of these data have been reported to bird records compilers for North American Birds and the Texas Ornithological Society. I provide an annotated listing of noteworthy birds (e.g., out-of-season birds, rare or unusual breeders, vagrants) recorded at Fort Hood.

Fort Hood, an active U.S. Army installation located within Bell and Coryell Counties in central Texas, lies within the Lampasas Cut Plains. The Lampasas Cut Plains are characterized by mesa topography with wide valleys that separate uplands (Hartmann and Scranton 1992). Narrow canyons occur along the upland edges. Fort Hood's land area has been estimated at 65% perennial grassland and 31% woodland (U.S. Army Land Condition Trend Analysis Program, unpublished data). At 87,890 ha, Fort Hood likely contains some of the largest expanses of relatively unfragmented grassland, oak-juniper (*Quercus-Juniperus ashei*) woodlands, and shrublands in central Texas. Belton Reservoir, Cowhouse Creek, and numerous other creeks and impoundments provide riparian and wetland habitats. Fort Hood is situated on the northeast edge of the Edwards Plateau at its junction with the Post Oak Savannah and Blackland Prairies (Lockwood and Freeman 2004) and its biodiversity is influenced by both ecoregions.

Research on the endangered Black-capped Vireo (*Vireo atricapilla*) and Golden-cheeked Warbler (D*endorica chrysoparia*) has been conducted at Fort Hood since at least 1987. As part of this research, bird surveys have been conducted. Between 1989 and 1992, the U.S. Army Corps of Engineers Research Lab (CERL; Champaign, Illinois) conducted surveys. Point count surveys were initiated by CERL in 1993. The Nature Conservancy assumed responsibility for point counts in 1997. Over time, point counts have been expanded (i.e., count points have been added).

Beginning in 1994, the Institute for Bird Populations (Point Reyes Station, California) has manned mist-net stations as part of their Monitoring Avian Productivity and Survival (MAPS) project. Additionally, bird records have been opportunistically collected by various field workers and visitors to Fort Hood.

I provide an annotated list of noteworthy birds (e.g., out-of-season birds, unusual breeders, vagrants) recorded at Fort Hood from 1989 through 2004. Particularly recently, some of these data have been provided to bird records compilers for North American Birds and the Texas Ornithological Society. However, much of this data has not previously been reported. If known, I list the county in which the record occurred.

Pied-billed Grebe (*Podilymbus podiceps*): An individual on 28 May 1998 (Coryell) and a pair on Henson

The Great Kiskadee (*Pitangus sulphuratus*) is considered a "vagrant" at Fort Hood. Photo by Fernando Cerra.

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Common Yellowthroats (*Geothlypis trichas*) were heard singing in 2004 suggesting local breeding. Photo by Fernando Cerra.

Lake (Coryell) between 14 June and 7 August 2004 were outside of expected migratory periods (Lockwood 2001) and suggest summering, if not breeding.

Red-necked Grebe (*Podiceps grisegena*): An extremely late individual (Lockwood and Freeman 2004) was observed, most likely on Belton Lake (Bell), on 20 April 1991. Because of the unusually late date and lack of supporting details for this state "Review Species", I consider this sighting hypothetical.

Brown Pelican (*Pelecanus occidentalis*): Individual pelicans routinely wander inland in summer and fall (Lockwood and Freeman 2004), but a flock of approximately 35 over Belton Lake (Bell) on 6 July 2004 was unprecedented.

Least Bittern (*Ixobrychus exilis*): An individual was photographed during spring or summer (before 17 September) 2000. Because the exact date of this sighting is unknown, this individual could have been a migrant, possible breeder, or post-breeding wanderer.

Osprey (*Pandion haliaetus*): Nonbreeding Osprey rarely summer in the eastern third of Texas (Lockwood and Freeman 2004). A pair observed along Bull Branch (Bell) during spring and early summer 1991 were believed to have been breeders based on behavior (e.g., stick carrying). A presumed Osprey nest was found along Bull Branch, but there is no direct evidence that the pair used the nest.

Swallow-tailed Kite (*Elanoides forficatus*): Casual migrants west to the Edwards Plateau (Lockwood and Freeman 2004), a kite on 26 May 1992 was within the species' expected spring migratory period.

Sharp-shinned Hawk (*Accipiter striatus*): A Sharp-shinned on 13 July 2001 (Coryell) is one of the few breeding season records outside of the Pineywoods and Trans-Pecos mountains (Lockwood and Freeman 2004). There are numerous anecdotes of Sharp-shinneds visiting cowbird (*Molothrus ater*) traps during June and July.

Broad-winged Hawk (*Buteo platypterus*): Although rare breeders west to the Edwards Plateau (Lockwood and Freeman 2004), hawks observed 20 June 1995, 20 June 1996, and 26 June 2000 (all Coryell) could have been local breeders. A hawk on 9 November 1993 (Coryell) was unusually late.

Swainson's Hawk (*B. swainsoni*): Swainson's Hawks are irregular in summer outside of the northern Edwards Plateau and on the Blackland Prairies and Post Oak Savannah (Lockwood and Freeman 2004). Anecdotally, Swainson's Hawks are annual summer residents and likely breeders at Fort Hood, but hawks on 17 July 1999 and 10 June 2004 (Coryell) are the only documented records at Fort Hood outside of migratory periods.

Zone-tailed Hawk (*B. albonotatus*): A Zone-tailed on 11 or 14 March 2002 (Bell) was likely a migrant or possibly a wintering bird.

Golden Eagle (*Aquila chrysaetos*): An eagle on 18 August 1993 (Coryell) was extremely early for a fall migrant (Texas Parks and Wildlife 2001, Freeman 2003, Travis Audubon Society 2003). Although the species' breeding range formerly included much of the Edwards Plateau (Lockwood and Freeman 2004), there is no evidence that this eagle was a local breeder.

American Kestrel (*Falco sparverius*): A kestrel on 14 July 1997 (Coryell) was possibly a local breeder as

non-breeders are typically absent from the state during the summer (Lockwood and Freeman 2004), but no direct evidence of nesting was observed.

King Rail (*Rallus elegans*): A rail was heard in a cattail (*Typha*) marsh below Engineer Lake (Bell) on 14 May 2004. Because this rail was only heard and King Rail calls could potentially be confused with the calls of other *Rallus* species, I consider this record hypothetical. King Rails are locally uncommon to rare breeders east of Fort Hood (Central Texas Audubon Society 1997, Freeman 2003), but this rail was likely a migrant as playback of rail calls failed to solicit a response on subsequent visits to the marsh.

Whooping Crane (*Grus americana*): Although within their migratory path (Lockwood and Freeman 2004), there have only been two documented sightings at Fort Hood. Five were observed south of Belton Lake (Bell) in 1987 and a family group (2 adults, 1 juvenile) was observed near North Fort Hood (Coryell) on 11 November 2003.

Spotted Sandpiper (*Actitis macularia*): Spotteds have been found throughout the summer near Fort Hood (Lockwood 2001, Freeman 2003, Travis Audubon Society 2003). A bird at Belton Lake (Bell) on 5 June 2004 was likely a late spring migrant, but could have been summering.

Red Knot (*Calidris canutus*): Four knots, likely at Belton Lake (Bell), on 2 May 1992 represent a rare spring record for the region (Freeman 2003, Travis Audubon Society 2003).

Laughing Gull (*Larus atricilla*): Laughing Gulls are most likely to occur inland in late summer or fall (Lockwood 2001, Lockwood and Freeman 2004). A 10 April 2002 sighting, likely on Belton Lake (Bell), is a rare spring observation of this gull inland.

Common Ground-dove (*Columbina passerina*): Ground-doves are casual north of the southern Edwards Plateau and southern Post Oak Savannah and Blackland Prairies, mostly during fall (Lockwood 2001, Freeman 2003, Travis Audubon Society 2003, Lockwood and Freeman 2004). However, since 1997, an annual average of 38 (range: 2 to 91) detections on point counts during 3 April and 23 July suggest that they summer and likely breed at Fort Hood.

Groove-billed Ani (*Crotophaga sulcirostris*): The ani is a common vagrant (Lockwood and Freeman 2004). Two were found at Fort Hood on 20 May 1992 (Coryell).

Burrowing Owl (*Athene cunicularia*): Burrowing Owls are rare in winter on the Edwards Plateau and Post Oak Savannah and Blackland Prairies (Central Texas Audubon society 1997, Texas Parks and Wildlife 2001, Freeman 2003, Travis Audubon Society 2003). Since 2003, Burrowing Owls have wintered on Fort Hood's West Range (Coryell); being present from 1 November to 3 March.

Long-eared Owl (*Asio otus*): Wintering and migrant Long-eareds have been observed in the Post Oak Savannah and Blackland Prairies through late April (Freeman 2003). A calling Long-eared on 3 May 2000 (Coryell) was likely a lingering winterer.

Common Nighthawk (*Chordeiles minor*): A nighthawk observed within the cantonment (i.e., developed area; Coryell) on 13 December 2004 was late, but not unprecedented for the region (Freeman 2003, Travis Audubon Society 2003).

Common Poorwill (*Phalaenoptilis muttallii*): Winter records of poorwill are rare, but not unexpected for the region (Central Texas Audubon Society 1997, Texas Parks and Wildlife 2001, Freeman 2003, Travis Audubon Society 2003). A dead poorwill was salvaged on 27 November 2002 from Belton Lake Outdoor Recreation Area (Bell). A few days earlier, this poorwill was brought to the Army's Natural Resources Management Branch by a concerned citizen. At the time, the bird was alive, but seemingly in torpor and, thus, was returned to near where it was initially found.

Anna's Hummingbird (*Calypte anna*): Anna's Hummingbirds are sporadic, rare to very rare visitors throughout Texas, particularly in late fall (Lockwood and Freeman 2003). Two (a female and one of unrecorded sex) observed on 13 July 2001 (Coryell) were early for fall migrants, but July records are not unprecedented (Travis Audubon Society 2003).

Broad-tailed Hummingbird (*Selasphorus platycercus*): An individual was observed on 13 April 2002 (Coryell). Although rare in spring on the Edwards Plateau (Lockwood and Freeman 2003), Broad-taileds have previously been recorded during April (Texas Parks and Wildlife 2001, Travis Audubon Society 2003).

Golden-fronted Woodpecker (*Melanerpes aurifrons*): Fort Hood is near the eastern edge of this species' range (Lockwood and Freeman 2004). Thus, Golden-fronteds might be expected to occur regularly on Fort Hood. Indeed, the Twin Lakes Audubon Society (2000) lists the species as occasional year-round in Bell County. However, there have been no recent observations of this species. In 1989, individuals were observed 18, 22, 23 (two individuals), and 29 May, as well as 20 June. In 1990, an individual was observed on 10 July.

In 1991, individuals were observed 9 and 30 May. An individual was found in a cowbird trap (Coryell) during April 1994. The last and most recent sighting was 15 May 2000 (Bell).

Hairy Woodpecker (*Picoides villosus*): Hairys are occasional winter visitors to the Fort Hood area (Central Texas Audubon 1997, Twin Lakes Audubon Society 2000, Travis Audubon Society 2003). Individuals on 21 May 1996 (Bell), 13 June 1996 (Bell-Coryell line), and 2 May 2000 (Bell) were likely lingering winterers or migrants.

Eastern Wood-pewee (*Contopus virens*): Pewees are occasional to uncommon, if local, summer residents and breeders near Fort Hood (Central Texas Audubon Society 1997, Twin Lakes Audubon Society 2000, Texas Parks and Wildlife 2001, Freeman 2003, Travis Audubon Society 2003). During most years, potential locally breeding pewees, many of them singing males, are detected at Fort Hood between 13 May and 31 July.

Acadian Flycacther (*Empidonax virescens*): Acadians are rare to uncommon, if local, summer residents and breeders near Fort Hood (Central Texas Audubon Society 1997, Twin Lakes Audubon Society 2000, Texas Parks and Wildlife 2001, Freeman 2003, Travis Audubon Society 2003). Although not detected annually, Acadians are likely regular at Fort Hood with detections of potential breeders, many singing males, occurring between 21 April and 11 July.

Vermilion Flycatcher (*Pyrocephalus rubinus*): Fort Hood is near the northeastern edge of the Vermilion's breeding range (Lockwood and Freeman 2004). An individual was observed near Pidcoke (Coryell) during May 2002 and has sporadically been observed in that vicinity in subsequent years. Fort Hood's first documented breeding pair was observed on Henson Creek near North Fort Hood (Bell) from 7 April to 2 June 2003. Likely the same pair nested on Henson Creek again from 9 April to 14 June 2004.

Great Kiskadee (*Pitangus sulphuratus*): This species is a common vagrant (Lockwood and Freeman 2004) and one was observed along Table Rock Creek (Coryell) on 3 June 2003.

Plumbeous Vireo (*Vireo plumbeous*): Three individuals on 28 April and one individual on 24 May 1999 (Bell) are among the few records for the region (Freeman 2003, Travis Audubon Society 2003, Lockwood and Freeman 2004).

Common Raven (*Corvus corax*): Fort Hood is near the northeastern edge of the raven's breeding range (Lockwood and Freeman 2004). Ravens have been observed on 11 April 1996, 6 June 1996, 17 April 2003, and 9 April 2004 (Coryell). Ravens have also been observed on 14 April 1995, 16 April 1996, and 9 April 2004 (Bell). It is unclear whether these individuals are wanderers or possible local breeders. Potential breeding habitat (e.g., cliff faces with ledges) exists on Fort Hood.

Tree Swallow (*Tachycineta bicolor*): Breeding has recently been documented in Bell and McClennan counties (Lockwood and Freeman 2004). Twelve on 13 June 2001 (Coryell), two on 15 June 2001 (Bell), seven on 16 June 2004 (Belton Lake, Bell) suggest that a small breeding population has also become established at Fort Hood.

Tufted Titmouse (*Baeolophus bicolor*): Two Tufteds were mist-netted on 30 July 2000 (Bell). The zone of overlap between Tufted and Black-crested (*B. atricristatus*) titmice occurs in the Post Oak Savannah and Blackland Prairies just to the east of Fort Hood. It is unclear whether the mist-netted birds were pure or hybrids.

Bushtit (*Psaltriparus minimus*): Fort Hood is near the eastern edge of the Bushtit's breeding range (Lockwood and Freeman 2004). The first record of this species for Fort Hood and Bell County was of two birds at West Fort Hood on 21 May 2004. Subsequently, Bushtits were observed at West Fort Hood on 18 and 23 June. Another Bushtit was observed on the East Range (Bell) on 26 August 2004.

Rock Wren (*Salpinctes obsoletus*): A calling wren on 18 April 2002 (Coryell) was likely a lingering winterer or migrant.

Townsend's Solitaire (*Myadestes townsendi*): Solitaires are casual, irruptive winterers throughout the region (Central Texas Audubon Society 1997, Twin Lakes Audubon Society 2000, Freeman 2003, Travis Audubon Society 2003). Fort Hood's only solitaire was observed on 25 March 1997 (Bell).

Gray Catbird (*Dumetella carolinensis*): A catbird on 24 July 1994 might have been summering or an early fall migrant. Summering catbirds have been observed nearby in the Waco area (Central Texas Audubon 1997), but their breeding range is typically further north in Texas (Lockwood and Freeman 2004).

Curve-billed Thrasher (*Toxostoma curvirostre*): Although the Curve-billed's range approaches Fort Hood (Lockwood and Freeman 2004), there are few Curve-billed records for the Fort Hood vicinity (Twin Lakes Audubon Society 2000, Travis Audubon Society 2003). A thrasher captured in a cowbird trap near Heiner Lake (Bell) in April 1991 and a thrasher observed on 24 May 2000 (Bell) are Fort Hood's only records.

Nashville Warbler (*Vermivora ruficapilla*): Although migrant Nashvilles have been observed into June and as

Fort Hood is at the northeastern edge of the Vermilion Flycatcher's (*Pyrocephalus rubinus*) breeding range. Photo by Fernando Cerra.

early as August (Texas Parks and Wildlife 2001, Freeman 2003, Travis Audubon Society 2003), an individual mist-netted on 8 July 1996 (Bell) is unprecedented and may have been either a late spring migrant or early fall migrant.

Northern Parula (*Parula americana*): Breeding parulas disperse in late July (Lockwood and Freeman 2003). Although early, individuals mist-netted on 11 July 1997 and 14 July 2000 (Bell) were likely early migrants.

Pine Warbler (*Dendroica pinus*): Although not unexpected based on their winter range (Lockwood and Freeman 2004), a Pine Warbler on 12 December 2003 (Coryell) was a first for Fort Hood.

Palm Warbler (*D. palmarum*): Although Fort Hood is within the migratory path of this species; an individual at West Fort Hood on 16 April 2004 was a first for Fort Hood and Bell County.

Prothonotary Warbler (*Protonotaria citrea*): Observations of individuals on 1 July 2003 and 28 July 2004 likely represent local breeders that have colonized the willow (*Salix nigra*) woodlands that have developed along Cowhouse Creek (Bell) over the last quarter century.

Louisiana Waterthrush (*Seiurus motacilla*): Waterthrushes are rare summer residents and local breeders near Fort Hood (Twin Lakes Audubon Society 2000, Lockwood 2001, Texas Parks and Wildlife 2001, and Travis Audubon Society 2003). Probable local breeders have been observed at Fort Hood on 18 May 1995, 9 May 1996, 3 July 2003, and 11 May 2004 (Bell).

MacGillivray's Warbler (*Oporornis tolmiei*): A McGillivray's on 21 May 2003 (Coryell) is the only record for Fort Hood and possibly a first county record.

Common Yellowthroat (*Geothlypis trichas*): Isolated breeding occurs throughout Texas (Central Texas Audubon Society 1997, Freeman 2003, Lockwood and Freeman 2004). A series of five detections of one or more singing males during 18 June to 16 July 2003 (Bell-Coryell line) suggests local breeding.

Scarlet Tanager (*Piranga olivacea*): A tanager observed on 19 March 1994 (Coryell) was likely a very early spring migrant. Summer sightings are unusual, but not unprecedented (Lockwood and Freeman 2004). Two individuals observed on 18 June 1990 (Bell) and an individual observed on 14 July 2003 (Coryell) were likely very late spring migrants and a very early fall migrant, respectively.

Canyon Towhee (*Pipilo fuscus*): Fort Hood is near the eastern edge of towhee's range (Lockwood and Freeman 2004). Between 23 April and 6 June 1991, there were nine detections of this species. More recently, two calling towhees were located on 8 April 1998 and one was found in a cowbird trap on 3 February 2000 (Coryell). Although its occurrence at Fort Hood is irregular, observation dates suggest that towhees might occasionally breed at Fort Hood.

Cassin's Sparrow (*Aimophila cassinii*): Cassin's Sparrow distribution near Fort Hood is patchy with the species listed as rare to uncommon in summer (Central Texas Audubon 1997, Twin Lakes Audubon Society 2000, Travis Audubon Society 2003). Occurrence on Fort Hood is sporadic and the species is not detected annually. Annually, there have been zero to 29 reports of Cassin's Sparrows between 3 April and 13 July. Because Cassin's Sparrows arrive on their breeding grounds in late March and early April (Lockwood and Freeman 2004), it is difficult to separate migrants from local breeders; however, based on dates of occurrence, several of the birds detected at Fort Hood were likely local breeders.

Dark-eyed Junco (*Junco hyemalis*): A 'Gray-headed' Junco found on 17 March 2003 was unusual so far east.

Lazuli Bunting (*Passerina amoena*): During the 2003 breeding season, a male Lazuli bred with a female Indigo (*P. cyanea*) bunting at Fort Hood (Kostecke et al. 2004b). Kostecke et al. (2004b) stated that breeding season sightings of male Lazulis and hybridization events were not unprecedented, but they provided few details on previous sightings. Anecdotal evidence of hybridization dates back to 1993, when a Lazuli-Indigo pair was observed with four nestlings (Coryell). Although, breeding Lazulis likely occur before June (Kostecke et al. 2004b), it is difficult to separate out such individuals from migrants, which may be present into late May (Lockwood and Freeman 2004). I considered male Lazulis observed on 15 June 1999 (Bell-Coryell line), 19 June 1999 (Coryell), 17 July 1999 (Coryell), late June or early July 2002, 5 July 2003 (Coryell; possibly with a female Lazuli), and 16 June 2004 to be probable breeders. Hybrid males detected on 6 July 2002 and 1 July 2004 (Coryell) were also probable breeders.

Bobolink (*Dolichonyx oryzivorus*): A male on 26 April 2000 (Bell) is a rare record of this species in the region (Central Texas Audubon Society 1997, Twin Lakes Audubon Society 2000, Travis Audubon Society 2003).

Brewer's Blackbird (*Euphagus cyanocephalus*): Most wintering Brewer's have departed by May (Lockwood and Freeman 2004). Although unusually late, an individual observed on 29 May 1997 (Coryell) was not unprecedented for the region (Travis Audubon Society 2003).

Shiny Cowbird (*Molothrus bonariensis*): Males captured in cowbird traps on 23 May 1990 (Bell) and 12 June 1992 (Coryell) represent the first and second records of this species in Texas (Lockwood and Freeman 2004).

Bronzed Cowbird (*Molothrus aeneus*): The number of Bronzed Cowbirds trapped has increased since the first captures of this species in 1990 (Kostecke et al. 2004a). Captures have occurred March–June. Some of these captures were locally breeding individuals (Kostecke et al. 2004a). A female on 6 May 2004 (Bell), however, is one of the few Fort Hood records of the species outside of a cowbird trap.

Bullock's Oriole (*Icterus bullockii*): Bullock's are considered at least rare, if not more common, migrants near Fort Hood (Central Texas Audubon 1997, Twin Lakes Audubon 2000, Freeman 2003, Travis Audubon Society 2003). However, a female on 13 May 2003 (Bell) is the only documented record of this species at Fort Hood.

Purple Finch (*Carpodacus purpureus*): Wintering Purple Finch typically depart by April (Lockwood and Freeman 2004). If identified correctly, one on 23 April 1991 and two on 29 May 1992 would be very late and extremely late records, respectively.

American Goldfinch (*Carduelis tristis*): Spring migrants may linger into early June (Lockwood and Freeman 2004). American Goldfinches are local summer residents only in northeast Texas and the northeastern Panhandle. However, Fort Hood has summer records of one to three finches on 20 June 1995 (Coryell), 1 July 1996 (Coryell), 18 June 1997 (Coryell), 13 July 1999 (Coryell), 13 July 1999 (Bell), and 16 July 1999 (Coryell). These finches could have been summering, lingering spring migrants, or early fall migrants.

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NEW RECORDS OF LEAST GREBE (*TACHYBAPTUS DOMINICUS*) FEEDING ASSOCIATIONS IN TEXAS

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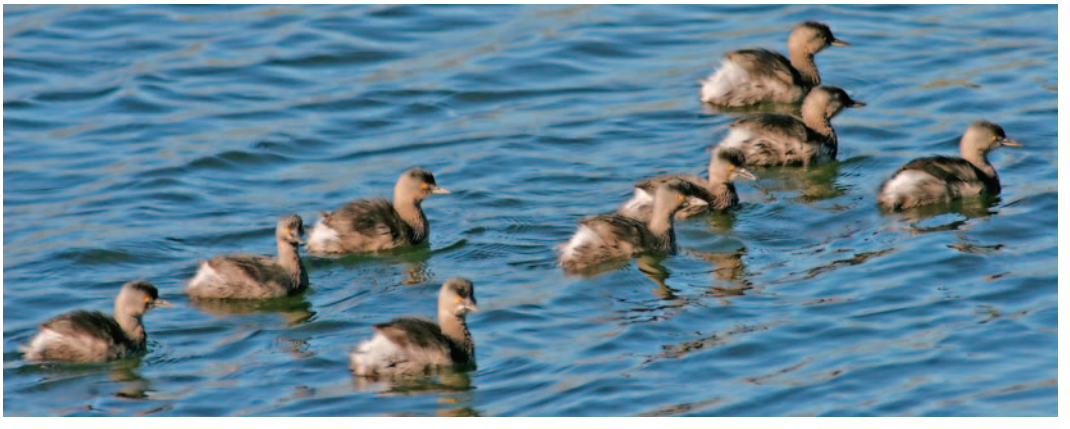
Feeding associations among grebes and species of anatids, grebes, and rallids are apparently common (Storer 1976, Rahmani 1991, Byrkjedal et al. 1997) and have been recorded in the smallest New World grebe, the Least Grebe. This southern Texas resident has been reported to form feeding associations with American Coots (Bent 1919, Palmer 1962), Gallinules (Palmer 1962), Common Moorehens (Bent 1919), Mallards (Paulson 1969), Teals (Palmer 1962), Ruddy Ducks (Palmer 1962), Eared Grebes (Bent 1919), and Pied-billed Grebes (Storer 1976). Based on field observations, I add three species to this list of associations and provide a description of feeding association behavior in this diminutive grebe. These three new records of feeding associations (with Gadwall, Northern Shoveler, and Lesser Scaup) bring the number of species reported in feeding associations with Least Grebes to at least 11.

In the late afternoon of 30 December 2000 at the Sabal Palm Grove Preserve in Brownsville, Cameron County, Texas, observations were made on several species of waterbirds for approximately 30 minutes, including approximately twenty individuals of American Coot (*Fulica americana*), two Lesser Scaup (*Aythya affinis*), approximately twenty individuals of Northern Shoveler (*Anas clypeata*), approximately five individuals of Gadwall (*Anas strepera*), approximately five individuals of Ruddy Duck (*Oxyura jamaicensis*), and six Least Grebes. From the observation blind at the large pond on the preserve, data were recorded on the feeding behavior of six Least Grebes, and they were observed forming feeding associations with four species of waterbirds: Lesser Scaup, Northern Shoveler, Gadwall, and American Coot.

One Least Grebe followed a Lesser Scaup around the pond. As the scaup dove, the Least Grebe would dive nearly simultaneously with the scaup. This synchronization in dives between these birds was observed for several sequential dives, and the grebe dove on every occasion that the scaup dove. The grebe always surfaced first in less than one minute, with the birds emerging about a meter apart. As soon as the grebe surfaced, it began looking for the scaup. Once the scaup surfaced, the grebe swam rapidly towards it, attempting to stay within about 30 cm of the scaup. This sequence of behaviors was observed 10 times over about 15 minutes.

A group of six Northern Shovelers of both sexes and a male Gadwall fed as a group in the shallow water near the shore of the pond adjacent to the observation blind. Water depth there was less than 60 cm, being predominantly less than 30 cm. The water was clear and the bottom was visible, but the foraging of these ducks stirred up the bottom sediment, clouding the water around them. One Least Grebe followed this group for about 25



A flock of Least Grebes in Texas. Photo by Mark Bartosik.

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minutes as it traveled approximately 6 m along the shore feeding, and it continuously dove in around this group for the entire time. Two other Least Grebes also were associated with this group earlier in the observation period. These grebes either dove next to a tipping duck or into the area where the sediment had been thrown up into the water column. When the foraging group moved away from a grebe, the grebe would swim quickly to rejoin them. There were several instances when the grebe's dives were synchronized to the initiation of tipping by one or more shovelers. When the grebes dove accompanying the shoveler's tipping motion, the grebe would sometimes align its body axis subparallel to the shoveler, placing its bill very near the shoveler's bill. However, the grebe was not observed actually taking food out of the shoveler's mouth or otherwise interfering with the duck's feeding, but the grebe was certainly catching food during these dives very near the duck's bill. One shoveler snapped its bill at one of the grebes while it was swimming alongside the shovelers on the surface of the water. A similar reaction by Northern Shovelers to Small Grebes was noted by Siegfried (1971). This was the only antagonistic behavior seen directed towards the grebes. When the male Gadwall split off from the large duck group, one grebe followed it and behaved as described above for the scaup-grebe interaction.

In addition, three Least Grebes (earlier associated with the Northern Shovelers) associated with one another while foraging, but they only synchronized their dives in pairs. A grebe from this group later followed a coot, but the coot did not dive during the observation period. However, the grebe did dive around the coot repeatedly and followed the coot for several minutes. None of the six Least Grebes were observed associating with Ruddy Ducks, though they were present on the pond.

The behaviors described above are very similar to that reported in other grebes. Grebes surfacing before the ducks they are associated with has been reported elsewhere (Paulson 1969, Byrkjedal et al. 1991). In addition, the behavior of swimming toward a duck after it surfaces and maintaining a close association on the water surface has been observed by Paulson (1969) and Rahmani (1991). The behavior described above between Least Grebes and Northern Shovelers is similar to that described for Least Grebes and Mallards (Paulson 1969) and Dabchicks and Northern Shovelers (Siegfried 1971). Rahmani (1991) also reported synchronization between grebe dive initiation and the tipping motion of ducks.

It was clear that the grebes intentionally followed the foraging individuals of various waterbird species and timed their dives to coincide with the feeding of the other species (diving or tipping) or dove into areas where the bottom sediment had been disturbed by the other foraging species. All of the grebes observed on the pond formed feeding associations during the observation period. The grebes did not overtly interfere with the feeding of the other species. The different emergence sites for the grebe-scaup pair suggest that they had different dive paths. These feeding associations were formed in a variety of water depths from shallow near shore (about 30 cm deep) to deep water (greater than 1 meter). Least Grebes associate with birds that have a variety of feeding modes (diving, grasping, and filter-feeding) and diets (plant material, plankton, and invertebrates). The grebes were not observed stealing food from other individuals (though this may have occurred with the shovelers), but they did take advantage of the foraging of the other waterbirds. The feeding of Least Grebes near the bill of feeding Northern Shovelers leaves open the possibility of at least inadvertent kleptoparasitism between these two species.

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EARLY ATTEMPTS TO RAISE AND STOCK GAME BIRDS IN TEXAS

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ABSTRACT.—Game birds were often kept as household pets or in private aviaries in early Texas. Sportsmen sometimes attempted to stock native game birds outside their normal range and, in the case of the Ring-necked Pheasant (*Phasianus colchicus*), to introduce an exotic species. The Scaled Quail (*Callipepla squamata*) taken in Cooke and Fannin counties during 1886 were, most likely, introduced birds or escapees rather than birds native to the area. Accounts of these early attempts at aviculture and stocking are found for the most part in the newspapers, hunting magazines, and archival records of the time.

Birds have always fascinated Texans, and those species with the most favored characteristics were often kept as pets. As early as the 1820s, the Mexicans around Nacogdoches kept Carolina Parakeets (*Conuropsis carolinensis*) as caged birds in their homes (Jackson and Wheat 2000). J. J. Dueler is believed to have established the first public aviary in Texas at San Pedro Springs Park in San Antonio during the early 1870s (Crook 1967:51). Although the identities of the species kept in this aviary are unknown, it is likely that game birds such as the Northern Bobwhite and Scaled Quail were represented. Private citizens also kept game birds as household pets, and sportsmen stocked birds in areas where they did not previously occur. The importation of Ring-necked Pheasants represents the only attempt to establish an exotic species in Texas prior to the 20th century.

WHOOPING CRANE AND WATERFOWL

While working for the United States Fish Commission in December 1876, Ludovic Kumlein (Fig. 1) visited a residence in Austin that had a large enclosure filled with tropical vegetation in which the owner kept "an assortment of the larger water fowl." Among the birds within the enclosure was a magnificent Whooping Crane (*Grus americana*) that had been "raised from the nest." The crane was so tame that it allowed Kumlein to stroke its snow-white plumes "without any show of dissatisfaction" (Kumlein 1877). Whooping cranes were considered during this time to be game birds and delicious eating (Durham 1875).

The claim that the crane had been "raised from the nest" suggests that it had been obtained as an egg or nestling. Most likely the bird was taken in Louisiana or Texas rather than on the breeding grounds in Canada. Supporting this conclusion is the report of J. D. Mitchell that Whooping Cranes nested on the Texas coast during the 1860s and 1870s (Oberholser 1974:286). Wherever the Austin crane might have been obtained, its presence in a private aviary is a striking testimony to the dedication of its owner to obtain and exhibit what would soon become one of the most endangered species in North America.

QUAIL, PRAIRIE CHICKEN, AND WILD TURKEY

Gambel's Quail (*Callipepla gambelii*).—In 1849 the United States Army opened a road between San Antonio and El Paso. Travelers returning from El Paso soon brought reports of a quail different from the bobwhites found in Central Texas. Early in 1857, Hugh Haynie, a sportsman from Austin, obtained two pairs of these birds from the vicinity of El Paso. These so-called "Mexican Quail" had "three large black feathers, spreading out at the upper extremity [of their heads] . . . forming the most beautiful plume." This plume identifies them as Gambel's Quail. Haynie intended to release the birds and their progeny around Austin during the spring of 1858. However, after several months in captivity the birds had not laid eggs and were "still as wild as when taken from their native woods" (Anon. 1857). Haynie's attempt to introduce Gambel's Quail into Central Texas ended in failure, and he soon left Austin to take a job in New York City (Anon. 1859).

In 1883, a pair of Gambel's Quail, obtained in New Mexico, was presented to "a lady" living at Franklin in Robertson County. The birds were at first very wild but eventually became quite tame, and although maintained in a healthy condition for over a year, they made no effort to breed (Nemo 1884). The "lady" who owned the

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Figure 1. **Ludovic Kumlein** (1853–1902). Naturalist [later known as Ludwig Kumlein] who reported a Whooping Crane at Austin that may have been collected from a breeding colony on the Texas coast. Photograph from the Ruthven Deane Collection, Library of Congress.

birds apparently kept them as pets and had no intention of releasing them into the wild. This example, however, indicates that birds were sometimes captured and transported to locations far distant from their native range.

Scaled Quail (*Callipepla squamata*).—On 25 December 1886, G. H. Ragsdale observed a dozen caged Scaled Quail at Gainesville in Cooke County. The birds were reportedly obtained from near Dimmitt in Castro County and, although they had laid in captivity, they kept their eggs "kicked all over the coop" (Ragsdale n.d.). The ownership and intended use of these imported birds is not recorded. However, the fact that the birds laid in confinement suggests that they had been obtained months earlier and that the owner had attempted to produce progeny.

A single, free-ranging Scaled Quail was collected in Cooke County on 26 February 1886 (Ragsdale n.d.). This is the only record of the species being taken in Cooke County, and is often cited as evidence that Scaled Quail were resident in the area during the 1880s (Oberholser 1974, Pulich 1988). The importation of Scaled Quail from Castro County into Cooke County during the mid-1880s calls into question the origin of this important historical specimen. Was it obtained from a native or an introduced population? Were Scaled Quail ever resident in Cooke County?

Scaled Quail may also have been released in Fannin County during the mid-1880s. In 1886, H. F. Peters, station observer at Bonham for the Mississippi Valley Migration Study, reported that two Scaled Quail, from a covey of about a dozen birds, had been taken about one-half mile from his home in Bonham during December 1885. Inquiries of the "country people" by Peters revealed that quail of this type had never before been seen in the area (Peters 1886). The fact that Scaled Quail had not been seen in Fannin County before 1885, nor reported since, suggests that the two birds collected at Bonham were either escapees from a local aviary or introduced by local sportsmen. This conclusion is also supported by the occurrence of the birds near the city limits of Bonham rather than in a more remote part of the county.

The increase of Scaled Quail in Foard County during the 1880s and early 1890s was supplemented by an

early introduction. In 1881, the nearest Scaled Quail were found about 50 miles west of Foard County but in the following years, they began to appear in the area and by 1893 were considered to be "not rare." James Witherspoon released one covey of Scaled Quail in Foard County prior to 1893, but was of the opinion that the general increase of birds was not the result of his introduction (Ragsdale 1893).

Northern Bobwhite (*Colinus virginianus*).—Bobwhites were routinely trapped in early Texas and sold door-to-door or in the local markets (Casto 1983). The price of live birds was relatively cheap. In 1883, quail caught in traps were selling from 60 cents to $1.00 per dozen at Victoria (Anon. 1883). Stocking was used to replenish local populations during periods of decline and to introduce birds into areas where they did not previously occur. From the late 1880s through the early 1900s, bobwhites from Texas and locations in the south were shipped to the northern states to restock areas depleted by over-shooting. These efforts were for the most part unsuccessful (Hornaday 1913:328).

Northern Bobwhite may not have originally been found on some of the offshore islands. During the early 1890s, [Robert] Wynne Andrews, general passenger agent of the San Antonio and Aransas Pass Railroad, stocked what may have been the first quail on St. Joseph's Island. A visit to the island during 1895 found the birds "doing well and multiplying at a gratifying rate" (Anon. 1895). By 1897, it was reported that the quail were "fairly taking the island" (Anon. 1897). In addition, "several thousand" bobwhites presumably obtained from northern Mexico were released on the island during the 1920s by Muller E. Bogle, an importer located in San Antonio (Bogle 1938:17). Bogle later achieved widespread notoriety when he was convicted of the interstate transport of quail in violation of the Migratory Bird Treaty (Editor 1933).

Attwater's Greater Prairie-Chicken (*Tympanuchus cupido attwateri*).—Wynne Andrews released prairie chickens on St. Joseph's Island at the same time [early 1890s] that it was stocked with Northern Bobwhites. In 1895, both the prairie chickens and bobwhites were "doing well and multiplying at a gratifying rate" (Anon. 1895).

The release of bobwhites and prairie chickens on St. Joseph's Island was presumably an effort by the San Antonio and Aransas Pass Railroad to entice sportsmen to visit the Texas coast. Rockport was such a popular destination that during the fall of 1893 the woods were said to be "filled to overflowing" with hunters (Anon. 1893). The transport of these hunters, their camping equipment and dogs, as well as the return shipment of

Figure 2. **August 'Gus' Critzler** (1858–1905). San Antonio sportsman who released Ring-necked Pheasants into Kendall County during 1898. Sketch by Rick Phillips from a photograph in the *San Antonio Daily Express*, 5 May 1905.

Figure 3. **Henry Eeles Dresser** (1838–1915). British ornithologist who published observations on the alleged hybridization of the Plain Chachalaca and domestic chicken in southern Texas. Photograph from the Ruthven Deane Collection, Library of Congress.

game was a significant source of income for the railroad. In 1892, the San Antonio and Aransas Pass Railroad became part of the Southern Pacific Railroad Company that continued, over the next several years, to promote hunting along the Louisiana and Texas coast (Anon. 1905, Hedge and Dawson 1983).

Wild Turkey (*Meleagris gallopavo*).—In September 1886, Nathaniel Alston Taylor, an author, newspaper journalist, and amateur naturalist from Abilene, wrote the editor of *Forest and Stream* that he wished to exchange eggs of a wild hen and a gobbler with anyone who might be interested. The purpose of the proposed exchange was to co-mingle wild and domesticated turkeys and then, through cross breeding, to improve the fitness of the domestic birds. Taylor further related that he had once observed a flock of turkeys that had been hatched from eggs of wild birds and raised by domesticated parents. Although at first extremely wild, these turkeys eventually became fairly tame "feeding out of the hand and walking boldly into the house as if they owned it." However, wild turkeys did not socialize or breed with tame birds and, as they grew older, spent more time away from the farmyard before finally returning to the wild. In spite of the negative outcome of this experiment, Taylor believed that "nearly all of the domesticated turkeys of Western Texas [were] derived recently from the wild stock (Taylor 1886)."

RING-NECKED PHEASANT

In early 1896, August 'Gus' Critzer (Fig. 2), a jeweler and sportsman from San Antonio, obtained a pair of Ring-necked Pheasants (*Phasianus colchicus*) from W. L. Gardner in Norwalk, Oregon. The pair produced 15 eggs during the spring of 1896 thus convincing Critzer that the species could be successfully introduced into Texas. His plan was to incubate 50 eggs under bantam hens and to purchase an additional 50 birds from Oregon. A total of 100 birds was to be released during the spring of 1897 at the head of the Medina River, Walton's Ranch [Bexar County?], and at Sam Allyn's place on St. Joseph's Island (Anon. 1896).

Convinced of the feasibility and ultimate success of his project, Critzer and his friends contacted legislators

in Austin with the request that a law be passed protecting pheasants prior to their release. This request was granted and a section was included in the 1897 game law that protected Mongolian and English Pheasants for five years (Gammel 1898).

Critzer's original plan was soon modified. No birds were released in 1897, and it was not until March 1898 that the first release was made. Instead of 100 birds being released at three locations, a single release of 25 birds was made "in the mountains" about 20 miles from Comfort in Kendall County. Whether the actual release site was in Kendall County or adjacent Kerr County is unknown. Critzer and San Antonio businessman Albert Steves personally supervised release of the birds during the first week in March 1898 (Anon. 1898). Sportsmen outside of Texas were informed of this release by a notice in *Forest and Stream*, a leading sports magazine published in New York City (Hough 1898).

Critzer was not the only person interested in stocking pheasants in central Texas. Working independently, two men from New Braunfels, Messrs. Wagenfuehr and Simon, obtained 15 birds to be released at an undisclosed location in Comal County (Anon. 1897, 1898). There are no details as to when, or even if this release occurred.

It was "confidently believed" by all parties that birds released near Comfort and in Comal County would soon increase to a number that would support a bountiful harvest. However, this expectation did not materialize and, discouraged by failure, over 20 years would pass before additional releases of pheasants would be attempted in Texas (Lehman n.d.).

PLAIN CHACHALACA

Plain Chachalaca (*Ortalis vetula*).—The Plain Chachalaca has been semi-domesticated in northern Mexico and southern Texas since the earliest of times. Col. George McCall found chachalacas intermingling with chickens in the gardens around Mexican homes during the 1850s. McCall was told that chachalacas frequently interbred with the common fowl but, since he did not see any recognizable hybrids, he was unable to verify the claim (Cassin 1856).

The English ornithologist Henry Dresser (Fig. 3) also investigated the alleged breeding between chachalacas and chickens during his visit in 1863–1864 to Matamoros and southern Texas. After careful inquiry, Dresser learned from Mexicans that chachalacas were often bred with domestic chickens to produce a mule-bird for cock fighting. The cross was always between male chachalaca and female chicken. Although skeptical of this intergeneric cross [*Ortalis* x *Gallus*], Dresser claimed to have seen what he believed to be a hybrid bird in a Matamoros cockpit. In addition, a young male chachalaca that Dresser kept as a pet consorted freely with poultry and was seen " . . . making amorous advances toward hens" (Dresser 1866, Casto 1973). George Sennett also heard of this alleged hybridization when he visited the Lower Rio Grande Valley in 1877. Sennett, however, was skeptical and noted that he " . . . saw no proof, but it [hybridization] is accepted as true by everyone in the region" (Sennett 1878).

Austin Paul Smith had no doubts that hybridization occurred between the two species. Smith found wild chachalacas to be uncommon in the Lower Rio Grande Valley during 1908, and those few birds that were brought to market were mostly hatched under a domestic chicken. According to Smith, there were " . . . more domesticated chachalacas, varying in degrees of intermixture than wild ones . . . and the resultant hybrids surprise no one by their variety" (Smith 1910). Subsequent investigations have failed to verify these observations, and it is now believed that hybridization does not occur (Bent 1963).

Chachalacas were occasionally captured and transported to regions far distant from their normal range. A military family living at Fort Clark near Bracketville, Texas, during 1889 had a pet chachalaca that roamed freely throughout the house and enjoyed having its head scratched and back rubbed. During winter the bird was housed in a large outdoor cage covered with canvas to protect it from cold wind. A description and accompanying sketch of this unique bird was published in the hunting magazine *American Field* (B. 1889).

The practice of keeping chachalacas as household pets apparently continued well into the 20th century. 'Choc', a chachalaca owned by a ranch family in South Texas, was so loved that its antics inspired the publication of a children's book describing the interactions of the bird and its owners (Alexander 1969).

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SHORT COMMUNICATIONS

PAINTED BUNTING KILLED BY BULLFROG

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The Painted Bunting (*Passerina ciris*) is considered a common to uncommon resident throughout most of Texas (Lockwood and Freeman 2004). Predators of adult buntings are likely similar to those of other small, woodland birds eg. snakes and ants (Formicidae: Hymenoptera) (Parmelee 1959).

On 06 August 2004 while watching birds at a water feature I observed a bullfrog (*Rana catesbeiana*) jump up in the air and catch an incoming adult male Painted Bunting. Searching for the bird it was soon located nearby as it had not been consumed by the frog. The observation was made in Guadalupe County (29° 36′ 37″ N 98° 14′ 30″ W).

According to Graves and Anderson (1987) the bullfrog is an opportunistic feeder with major dietary components including insects, snails, crayfish, fish, frogs, tadpoles, reptiles, and occasionally small mammals and birds. Previous documentation of frogs predating birds include an Eastern Phoebe (*Sayornis phoebe*) (Anderson 1965), Rufous Hummingbird (*Selasphorus rufus*) (Ider 1993, Monroe 1957), Ruby throated Hummingbird (*Archilochus colubris*) (Bent 1940), Cedar Waxwing (*Bombycilla cedrorum*) (Sealy 1994) and a Red-breasted Nuthatch (*Sitta canadensis*) (Jim Stevenson pers. com.). A Neotropical green frog (*Rana vaillanti*) was reported to contain Hooded Warblers (*Wilsonia citrina*) in its stomach (Vogt et al. 1993), and Skutch (1960), and Lunk (1962) report that Northern Rough-winged Swallow (*Stelgidopteryx serripennis*) young and/or adults are predated on by various toads and frogs.

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Painted Bunting *Passerina ciris*. Photo by Greg Lasley.

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THE DIET OF THE CRIMSON-COLLARED GROSBEAK IN TEXAS

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The Crimson-collared Grosbeak (*Rhodothraupis celaeno*) is a blackish grosbeak with a dark red collar and underparts (except throat and chest). Females and immature birds have yellowish-green replacing the red (Peterson and Chalif 1973). The grosbeak is endemic to the Atlantic coastal region of Mexico and is considered a casual winter visitor to the Lower Rio Grande Valley (Howell and Webb 1995; Lockwood and Freeman 2004). Its' life history and ecological requirements are poorly documented (Eitniear and Aragon 2000, Sutton et al. 1950, Sutton 1950).

From 20 November 2004- 26 March 2005 Crimson-collared Grosbeaks were observed at feeding stations located in Pharr, Hidalgo country (26°.19′ N 98°.19′ W) and from 02 November 2004–27 April 2005 in Weslaco, Hidalgo county (26°.14′ N 97°.98′ W). Observers of these grosbeaks provided notes on foraging behavior to the author. All documentation were either confirmed by photographic images (on file at the Texas Cooperative Wildlife Collection) or through consultation with a botanist familiar with the plants of the region.

Table 1 summarizes dietary information collected. Previously published information includes Eitniear and Aragon (2000) who observed the species to feed on oranges, and Sutton (1950) who observed the grosbeak to tear and consume shrubby nightshade (*Solanum verbascifolium*). In addition, Bjelland and Ray (1977) collected a road kill specimen in an area adjacent to an orange grove near Huejutla, Hidalgo, Mexico. Presumably the gros-

Crimson-collared Grosbeak (*Rhodthraupis celaeno*) feeding on cranberries at the Audubon property in Weslaco, Texas. Photo by Michael Carlson.

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beaks were feeding on oranges but it was never verified. Field observers, in Mexico, have anecdotally noted the species to feed on mangos (*Mangifera indica*), loquat (*Eriobotria japonica*), chaca (*Busera simaruba*) (Will Carter, Michael Delesantro, pers. com.) and chinaberry (*Melia azedarach*) (E. Enkerlin, pers.com., Eitniear and Aragon 2000).

Of 12 species of plants the bird was observed to consume it fed on the fruit of six exclusively (50%), the leaves of three (30%) and the leaves and fruits of three (30%). While the consumption of cultivated fruit may represent opportunistic "pulp-predation" (Snow and Snow 1988) feeding on native plant fruits may indicate that the species is not exclusively a folivore.

Table 1. Vegetation consumed by Crimson-collared Grosbeaks in Texas.

Common name	Scientific name	Plant Part Consumed	Observer
Potato Tree	*Solanum erianthum*	Leaves and fruit	S. King[1], P. Howard[2], D. Brown[2]
Sugarberry	*Celtis laevigata*	Leaves	S. King[1], B. McKinney[2], J. Rathjen[2]
Brazilian Bluewood	*Condalia hookeri*	Leaves and fruit	S. King[1]
Negrito /Fiddlewood	*Citharexylum berlandieri*	Fruit	S. King[1], W. Carter[2]
Chile piquin	*Capsicum annuum*	Leaves and fruit	S. King[1]
Talayote	*Cynanchum racemosum*	Leaves	S. King[1]
Cranberries	*Vaccinium macrocarpon*	Fruit	M. Carlson[2]
Grapefruit	*Citrus paradisi*	Fruit	J. Donaldson[2], C. Edwards[2]
Anaqua tree	*Ehretia anacua*	Leaves	S. Young[2]
Orange	*Citrus sinensis*	Fruit	D. Roberts[2]
Snake-eye	*Phaulothamnus spinescens*	Fruit	K. King,[1], R. Lehman[1]
Apple	*Malus domestic*	Fruit	S. King[1]

[1] Personal observation
[2] Photographic documentation

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NORTHERN MOCKINGBIRD NESTING BENEATH CHIMNEY RAIN GUARD

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The Northern Mockingbird (*Mimus polyglottos*) usually nests in shrubs and trees, occasionally on eaves and rafters, and on one occasion, in a hole in a tree; nest heights generally 1–3 m ranging from 0.5 to 19 m (Derrickson and Breitwisch 1992). Apparently, there are no reports of this species nesting on a chimney.

On June 20, 2005, I found a Northern Mockingbird nest on my chimney (Fig. 1). It contained 4 eggs and a newly hatched chick. The nest was built on the hardware cloth screen covering the flue, beneath the metal rain guard that was 15 cm above the chimney top. The position of the nest was somewhat central, but near the east, thus affording shade during the mid to late afternoon. Height of the nest was about 6 m from the ground. The chimney is offset from the apex of the roof of the single story building.

The chimney is 1.0 m at the shortest height above the roof and 1.32 m at the longest height. It is 1.22 m long by 0.76 m wide.

On June 27, all 5 chicks were banded. Their size and movements made them very visible and sometime during the next week they disappeared. For many years, Northern Mockingbirds have nested in the surrounding shrubbery. Occasionally, chicks have been killed and eaten by red imported fire ants (*Solenopsis invecta*) and eggs and chicks have been eaten by Texas rat snakes (*Elaphe obsoleta lindheimeri*). In 2004, a second brood was lost to ants and in early spring, 2005, the first brood was eaten by a juvenile snake. I was unable to locate another brood, until I found the one on the chimney. While making a roof inspection in late 2004, I discovered remnants of a nest on the same chimney site described above. However, most of the nest was not intact; so, I was not able to identify it.

The chimney nest site provides a location with good protection from fire ants and snakes. However, because of its high visibility, the chicks would have been subject to avian predation. Indeed, after their disappearance, an Eastern Screech-Owl (*Otus asio*) was heard calling during pre-dawn from a nearby tree line along the back-yard fence. In past years, after fledging, during July and August, when common elderberries *(Sambucus nigra* var. *canadensis*) are ripe in my shrubbery, adults and juvenile mockingbirds would spend much time eating berries. However, in 2005, only adults and juveniles of another brood (not banded) were seen.

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Figure 1. Close up view of the position of a Northern Mockingbird nest beneath the metal rain guard of a chimney (photo courtesy of Timothy J. Bister).

TEXAS ORNITHOLOGICAL SOCIETY SCIENCE SESSION 14 APRIL 2005 WESLACO, TX

IMPACT OF A LEVEL 1 HURRICANE ON NESTING BALD EAGLES IN TEXAS

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Hurricane Claudette passed through Texas coastal counties during July 2003 as a level 1 hurricane. Bald Eagle (*Haliaetus leucocephalus*) nesting data from 8 counties that were not impacted by the hurricane were compared to 7 counties that were. Noticeable hurricane impacts were mostly knocking down nests and tall trees that potentially would serve as nests in the future. Eagles in this part of Texas typically replace nests at 4 year intervals. Thus, about 25% of the nests are normally replaced each year. Seven nests in the 7 counties within the path of the hurricane were known to have been destroyed by the storm and all were rebuilt during the following fall when nesting commenced. The 8 adjoining non-impacted counties had 14 nesting attempts fledge 22 eagles before the hurricane in 2003 and 16 nesting attempts and fledge 32 eagles after the hurricane in 2004. The 7 impacted counties had 19 nesting attempts before the hurricane fledge 31 eagles in 2003, and 20 nesting attempts fledge 33 eagles after the hurricane in 2004. Short term lost of nests was the only noted impact.

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EFFECTS OF HYDROLOGY AND URBANIZATION ON THE ABUNDANCE AND DISTRIBUTION OF SHOREBIRDS ON THE ELLA BARNES WETLAND, OSO BAY, CORPUS CHRISTI, TEXAS

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Unvegetated tidal flats are normally highly productive wetlands that are irregularly inundated with seawater. Tidal flats in the Texas Coastal Bend region are important for many Western Hemisphere shorebirds migrating between breeding and wintering habitat. As the population of coastal areas increases, portions of these stopover areas become surrounded by urban settings. In the 1930s a large portion of the Oso Bay watershed was converted to agriculture and since then has been increasingly urbanized within the city limits of Corpus Christi. Previous studies conducted in lower Oso Bay in 1985–1986, 1991–1992, and 2002–2003 determined shorebird abundance and habitat use in several areas along Ward Island located near the confluence of Corpus Christi Bay. The purpose of this study also was to determine shorebird abundance and habitat distribution in the Ella Barnes Wetland. The study area is located in upper Oso Bay between the main bay and a major stormwater channel. Additional surface water is released into the watershed via municipal and industrial effluents. Birds were censused using 15-minute point counts every 7–10 days from February 2004 to February 2005. Water levels and shorebird abundance, location, and activity were recorded. Thirteen species of shorebirds (n= 1122) were observed throughout the total study period, compared to 26 (n = 34,822) , 25 (n= 7254), and 28 (n = 16,942) in the other tidal flat studies, respectively. Small shorebirds and Klldeer (*Charadrius vociferous*) were most abundant in this study, whereas small shorebirds and dowitchers (*Limnodromus* spp.) were more predominant in the previous studies. Results of the Bray-Curtis Cluster Analysis show the most similarities in studies conducted at the same sites (1991–1992 and 2002–2003) while the Ella Barnes wetland study had the least. Shorebird use of Ella Barnes wetland is considerably less, which may be due to its position in the watershed and hydrologic alterations. Location and evaluation of remaining tidal flats in the Oso Bay area is recommended.

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DISTRIBUTION AND NUMBERS OF WINTERING MOUNTAIN PLOVER IN TEXAS

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Oberholser, in 1965 had winter records of Mountain Plover (*Charadrius montanus*) in 21 Texas counties. By the end of 2003, wintering Mountain Plover had been recorded in 32 Texas counties. During the 1965 through 2003 period many researchers noted that Mountain Plover were modifying their nest site preference for cultivated fields. A quick glance at the eleven new counties added during that time to winter sightings shows that the new winter records were also occurrences in cultivated fields. With that knowledge, I began in 2004 checking other counties with large cultivated fields. Other observers have contributed in the search and we have added eight new counties this winter to the winter sighting records of Mountain Plover in Texas. Not only have we refined the winter distribution in Texas, we have discovered a new wintering region with enough birds to move Texas from a distant third place, to second place, behind only California in the number of wintering Mountain Plover. In this paper I will briefly go over the various Texas Mountain Plover wintering sites and suggest some rough estimates of the number individual Mountain Plover in each.

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TEXAS EBIRD: AN INVITATION TO MONITOR AND INVENTORY TEXAS BIRDLIFE

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Texas eBird, sponsored by the World Birding Center, Cornell Lab of Ornithology, and National Audubon Society, is a free, interactive on-line checklist website designed for users to enter and store bird sightings in a central database, track personal records, and share observations with other birders and scientists. Our knowledge of annual distribution, abundance, and movement patterns of Texas birds is incomplete. The public are encouraged to become "citizen scientists" by submitting observations to this repository of bird records. Texas eBird is a significant educational, conservation, and research tool that will allow us to better understand the birdlife of Texas and archive data for future generations to access. In addition to providing convenient querying capabilities and excellent graphing tools for results, this site also contains news updates and articles related to Texas birds. As a clone of Cornell's eBird Project, the Texas eBird database is linked to the larger storehouse of bird information gathered by both national and international users. By participating in Texas eBird, users will not only benefit from the ability to organize, search, and track their personal bird records, but conservationists, researchers, educators, and ornithologists will use this collected data to help fill in the gaps in our knowledge about Texas birds.

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RADAR AND ACOUSTIC AVIAN RIS K ASSESSMENT STUDIES AT THE PROPOSED PEÑASCAL WIND FARM

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The Peñascal Wind Farm is being planned for the northeastern corner of Kenedy County, Texas. The first phase of the project may involve as many as 200 large wind turbines standing nearly 120 meters (393 ft) tall. This development will be the first Texas coastal wind farm to be constructed. The history of wind farms suggests that birds do

occasionally strike wind turbines and mortality averages about one bird per turbine per year. However, little is known about the possible interactions between wind farms and birds along the Texas Coast. The Center for Bioacoustics at Texas A&M University-Corpus Christi, along with researchers at Texas A&M University-Kingsville, is surveying the property to determine the special and temporal patterns of bird activity in the wind resource area. Surveys methods include radar and acoustic studies and preliminary results from these specialized sensors will be presented.

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GREEN PARAKEETS IN SOUTH TEXAS AND NORTHEASTERN MEXICO

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Green Parakeets (*Aratinga holochlora*) established themselves in the Lower Rio Grande Valley of Texas in the late 1980s and 1990s. These birds nest, forage and roost mainly in urban/suburban habitats. The establishment of diverse, year-round food resources, many of native or near-native tree species, may be crucial in supporting Green Parakeets in the Valley. Urban Green Parakeets also occur in Monterrey, Nuevo Leon, and Laredo, Texas. Green Parakeets have not been seen in recent decades on the lower Rio Corona, a traditional breeding site, but they still occur in the upper Rio Corona and in other canyons near Ciudad Victoria, Mexico. Green Parakeets still occur in the Rio Sabinas valley of southwestern Tamaulipas. Numbers may have declined somewhat since the early 1990s, but trends are unclear and perhaps confused by short-term responses to changing food abundance. Preliminary data suggest that cave nesting sites may be particularly important to remaining Green Parakeets in northeastern Mexico.

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FIELD IDENTIFICATION OF COOPER'S AND SHARP-SHINNED HAWKS.

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Separation of these two hawks is one of, if not the, toughest raptor ID problem in North America. This PowerPoint presentation will cover the field marks that will serve to identify them when seen well, both in flight and perched. The talk will feature many photos of both species, often in comparison, as well as diagrams to emphasize the relevant field marks, which include differences in plumage characters, lengths of tails, extension of head and neck, relative length of tail feathers, and position of the wrists.

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TEXAS BREEDING BIRD SURVEY

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The U. S. Breeding Bird Survey (BBS) is a highly standardized 24.5 mile survey randomly located along public roads throughout Texas, and is used to monitor population trends and estimate densities of breeding birds in Texas by ecoregion. The survey started in Texas in 1967. It was coordinated by Warren Pulich until 1993 and was taken over by me with periodic assistance from co-coordinators.

BBS volunteers work primarily anonymously. They get very little recognition, but produce the data on which many conservation organizations depend. Their common theme is that they love counting birds and are concerned about their status. 417 birders have conducted the 195 BBS routes in Texas since its beginning. Kenneth Seyffert has conducted the most surveys in TX by running BBS routes 149 times. Other noteworthy surveyors are Francis Williams conducting 74, James Middleton 65, Richard Albert 63, Brent Ortego 61, Charles Crabtree, Jr., 59, Peggy Accord & Kenneth Nanney 58, and Andrew O'Neil 54.

The survey tracks 151 species very well state-wide. 24 of these are significantly increasing in numbers and 38 are significantly declining. Greatest rates of significant declines are found in grassland, scrub and woodland habitats, neotropical migrants, and open cup & ground or lower nesters.

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