THE FERRUGINOUS PYGMY-OWL IN SOUTH TEXAS

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THE NUMBERS AND DISTRIBUTION of the Ferruginous Pygmy-Owl (*Glaucidium brasilianum*) in Texas have long presented an enigma. During the latter half of the 20th century, records have consisted only of occasional individuals or small groups of birds from two general areas: the Rio Grande floodplain below Falcon Dam, and along US Highway 77 north of the Lower Rio Grande Valley. There have been only casual indications of nearby concentrations large enough to serve as a recruitment base for the species either north or south of the Rio Grande. However, recent records in Kenedy, Brooks, and adjacent south Texas counties strongly indicate the presence of a significant and viable population of Ferruginous Pygmy-Owls.

Oberholser (1974) summarized all pre-1972 Ferruginous Pygmy-Owl records in Texas. He considered it "rare" following the clearing of "90 percent of the mesquite-ebony woodlands of the Rio Grande delta," but asserted that prior to clearing activities, "between 1920 and 1945," the species was present "in fairly good numbers." Oberholser also reported "a small, apparently nesting, population recently discovered in Kenedy Co., King Ranch, Norias Division (Sept.–Dec. 1968, Mar.–Apr. 1969, B.A. Fall)" (1973). Since 1972 Ferruginous Pygmy-Owls have been reported almost annually from the Rio Grande floodplain from below Falcon Dam to Santa Ana National Wildlife Refuge in Starr and Hidalgo Counties. Fred C. Webster, Jr. (1976) reported one at Rancho Santa Margarita in late February 1976, and John Arvin found four there on May 1, 1976. Arvin reported "only one pair below Falcon Dam" in 1981 (Webster 1981). Arvin (1982) found one on the Mexican bank below Falcon Dam April 26, 1982, but wrote that they had "failed to return this spring" to below Falcon Dam on the United States side of the Rio Grande. In 1984, Greg W. Lasley and Chuck Sexton reported "a pair... was seen and heard regularly at its familiar haunts below Falcon Dam in April and May" (Lasley and Sexton 1984). In 1985 they reported a pair below Falcon Dam in spring (and asked birders to refrain from using taped calls); birds at Santa Ana National Wildlife Refuge on April 5 and May 1 represented the "first refuge records in many years;" and one bird calling July 12 at Bentsen-Rio Grande Valley State Park (Lasley and Sexton 1985). In 1989, Lasley and Sexton reported "up to 10...remained all season below Falcon Dam, where they were seen regularly;" Mike and Rose Farmer "confirmed at least four adults (one pair nesting)" in early May 1989; and there were unconfirmed reports of as many as seven individuals in the area (Lasley and Sexton 1989). One or more Ferruginous Pygmy-Owls have been reported below Falcon Dam each spring from 1990 through 1993. Arvin (pers. comm.), who has actively birded "deep south Texas" for more than 30 years, believes the floodplain population could support up to "10 pairs at the maximum." These data suggest that there

Ferruginous Pygmy-Owl perched on live oak in Kenedy County.

was a growing number of Ferruginous Pygmy-Owls in the Rio Grande Valley during the 1980s, but they might just as easily reflect the results of more intense searching for the species.

Scattered sightings of Ferruginous Pygmy-Owls have also persisted along US Highway 77 between Raymondville (Willacy County) and Sarita (Kenedy County) north of the Lower Rio Grande Valley's developed agricultural area. A. W. O'Neil (pers. comm.) discovered the earliest birds ("a total of five pygmy owls") at the picnic site in an oak motte along US 77 "just north of Norias," April 4, 1974; "I found these owls there on several occasions for about two years and then they stopped." One Ferruginous Pygmy-Owl was reported in a roadside oak motte "several miles n. of Norias" by Arvin in 1975 (Webster 1975); Peter Reisz (pers. comm.) found one at a roadside picnic site at Armstrong on February 26, 1976; and one was found and photographed in February 1983 in the highway one mile north of Raymondville (Blomberg 1989).

Aerial view of Badeño Pasture looking south from Tate Windmill

A large portion of this far south Texas region is comprised of large privately-owned ranches with vegetation patterns characterized by live oak (*Quercus virginiana*) mottes, mesquite (*Prosopis glandulosa*) brushlands, and scattered pastures. The word "motte" (sometimes spelled mott or the Spanish *mota*) is used commonly to indicate an isolated grove of trees; the term is used loosely to apply to woodlands anywhere from less than a half-acre to a few hundred acres in extent. D. S. Correll and M. C. Johnston, in their classic book, *Manual of the Vascular Plants of Texas* (1970), referred to this region as "South Texas Plains" or "Tamaulipan Brushlands." Other typical woody plants of these habitats include granjeño [spiny hackberry] (*Celtis pallida*), clepe [lotewood] (*Ziziphus obtusifolia*), coyotillo (*Karwinskia humboldtiana*), guayacan [soapbush] (*Porlieria angustifolia*), white brush (*Aloysia gratissima*), brasil [bluethorn] (*Condalia hookeri*), bisbirinda [amargosa or goatbush] (*Castela texana*), cenizo (*Leucophyllum* spp.), huisache (*Acacia farnesiana*), catclaw (*A. greggii*), black brush (*A. rigidula*), and guajillo (*A. berlandieri*). Gulf prairie and marsh habitats dominate the eastern edge along the Laguna Madre.

The largest intact tracts of land within Kenedy and Brooks counties are the Norias Division (over 240,000 acres) and the Encino Division (over 105,000 acres) of the famous King Ranch. More than a dozen other privately-owned ranches of over 10,000 acres each are located in the two counties. There is no free public access to these ranches, and all entry is rigorously controlled.

Table 1. Habitat Components-Acreage

Habitat	Norias	Encino	Combined
Live Oak Mottes	35,538 (14.7%)	2,947 (2.8%)	38,485 (11%)
Live Oak-Mesquite	69,143 (28.6%)	7,472 (7.1%)	76,615 (22%)
Mesquite-Grasslands/Pasture	134,175 (55.5%)	91,984 (87.4%)	226,159 (65%)
Other	2,901 (1.2%)	2,842 (2.7%)	5,743 (2%)
	241,757 (100%)	105,245 (100%)	347,002 (100%)

The Present Study

Beginning in 1989 a few persons were given access to the King Ranch properties for the explicit purpose of surveying the bird life. The management of the King Ranch, searching for new attractions to promote tourism, considered the possibility of commercial birding tours of the ranch. Early discussions involved the Kingsville Chamber of Commerce, the Kleberg County Parks and Recreation Department, representatives of several area ranches, Anse Windham, and Jesse Grantham of the National Audubon Society. Following those meetings, Stephen and Janell Kleberg of the King Ranch asked Palmer to organize and lead an effort to survey and provide information about the presence, abundance, and distribution of bird species on the four divisions of the ranch. Wauer was one of the first persons Palmer invited to help carry out the field work, and he eagerly signed on.

Visits to the four divisions—Laureles to the northeast, mostly in Kleberg County; Norias to the southeast, in Kenedy County; Encino to the southwest, in Brooks and Kenedy Counties; and Santa Gertrudis to the northwest, mostly in Kleberg County—began in October 1989. After some preliminary exploration Wauer established transects on the Norias Division, because of its relatively natural character, and set out to attempt to quantify the tract's avian populations. Those transects included one 35-mile-long driving transect (U.S. Fish and Wildlife Service Breeding Bird Survey method 1983), running west to east across the center of the Norias, and two one-mile-long walking transects (modified Emlen method 1977) in Badeño Pasture, in the south-central portion of the Norias.

Ferruginous Pygmy-Owls were evident on Norias from the beginning. Toward the end of the first day's exploration of the division on November 2, 1989, one of the members of the team—Mike Farmer, an employee of the National Audubon Society—located the first Ferruginous Pygmy-Owl by call. His excited, delighted, and delightful response was memorable to all who shared it. We all heard the bird. Subsequent visits brought new findings of Ferruginous Pygmy-Owls every month—indeed almost every visit.

Wauer's transects provided insight into preferred habitats, and additional dawn and dusk surveys produced high counts of 14 Ferruginous Pygmy-Owls February 21– 22, 1990, by Wauer, and 38 Ferruginous Pygmy-Owls March 23, 24, and 25, 1992 by Wauer and Mark Elwonger. Additional records from sites within Kenedy and Willacy counties for 1991 through 1993 were made available by Arvin, Mike Farmer, Jeff Gordon, David Grall, Tom Pincelli, John Trochet, David Wolf, and Barry Zimmer. Additional records from the Encino Division and several other ranches in Brooks County for 1993 were provided by O'Neil and Randy Fugate. All known records were then plotted on 1986 aerial photographs of the area.

The assembled records fall within an area roughly oblong in shape, oriented northwest by southeast, approximately 65 miles long by 35 miles wide, and encompassing about 1800 square miles. The area extends from six miles west of Port Mansfield (along State Highway 186) in Willacy County, to approximately 20 miles southwest of Falfurrias in Brooks County, and north to Fulfurrias and Sarita, almost reaching Los Olmos Creek and Baffin Bay in both Brooks and Kenedy Counties.

Six rather distinct habitats exist within the 1800 square miles: live oak mottes with sparse ground-cover; mixed live oak -mesquite woodlands;

mesquite savannah, cleared pastures, coastal prairie, and dune fields. Also included are man-made structures (stockponds, roads, buildings, and oil and gas well pads). The more obvious habitats—live oak mottes; live oak-mesquite woodlands; mesquite savannah; pastures and prairie; and other—were then traced onto mylar sheets superimposed on the aerial photographs. More recent (1989) U.S. Department of Agriculture aerial photographs of part of the region and personal aerial reconnaissance by Windham (pilot) and Wauer and were used to validate current habitat types. Total acreages for the four key habitats were then calculated by placing squared screen under the mylar and tabulating the number of squares for each (Table 1). Live oak mottes were identified by their very dark to black images; mature live oak-mesquite woodlands appear dark gray or mottled; mesquite savanna and coastal prairie appeared spotted or dull gray.

Based on the 116 actual, non-redundant Ferruginous Pygmy-Owl records (sightings, songs, photographs, and videotape), we found that maximum numbers were located in mature mixed live oak-mesquite habitats, moderate numbers were located in tall live oak mottes, and lower numbers were found in mesquite savanna or along fencerows. No Ferruginous Pygmy-Owls were found in open pasture or coastal prairie habitats or within low-growing live oak mottes that occur along coastal fringes.

The highest density of Ferruginous Pygmy-Owls documented was 35 individuals—representing an estimated 25 pairs—along a nine-mile stretch of roadway through mature mixed live oak-mesquite woodland in the Badeño Pasture area of the Norias. An additional 12 individuals—an estimated 10 pairs—were located along four miles of roadway in the southeastern portion of Badeño Pasture, an area of mixed habitat with both tall live oak mottes and live oak-mesquite woodlands. Additionally, five individuals—estimated to represent five pairs—were recorded along four miles of roadway through mesquite savanna habitat in the Tate Pasture, west of the Badeño Pasture.

It is exceptionally difficult to census Ferruginous Pygmy-Owls, owing in part to the nature of the vegetation, which varies from nearly impenetrable thickets with dense, thorny undergrowth to easily-penetrated groves with little or no woody undergrowth. Vocalization behavior of the species in south Texas can also be daunting: The optimum period for calling is limited to dusk and dawn and to January through March; the lack of vocalization does not necessarily establish the absence of birds.

In order to reach a rough estimate of abundance, at least for Badeño Pasture, we calculated that a pair of Ferruginous Pygmy-Owls occurred every 0.360-mile (0.130 sq mi) or 83.2 acres in mixed live oak-mesquite habitat. In live oak mottes, a pair of Ferruginous Pygmy-Owls occurred every 0.400-mile (0.16 sq mi) or 102.4 acres. The combined results of 35 pairs in 13 miles produced a pair every 0.371-mile (0.137 sq mi) or one pair for each 88 acres. On the adjacent mesquite savanna in the Tate Pasture, one pair of Ferruginous Pygmy-Owls occurred every 0.800-mile (0.640 sq mi) or 410 acres. The Badeño Pasture contains 12,024 acres, 9354 of them covered with live oak mottes and live oak-mesquite woodlands; the Ferruginous Pygmy-Owl numbers in those habitats, therefore, should total 106 pairs. It also contains 2092 acres of mesquite savanna, which should contain an additional five pairs of Ferruginous Pygmy-Owls, producing an estimated total of 111 pairs of Ferruginous Pygmy-Owls for the Badeño Pasture alone.

These estimates suggest a much larger number for the total Ferruginous Pygmy-Owls in the entire Norias Division. Correlations of habitats and sightings on the Encino Division suggest a rather smaller population there. Anecdotal evidence for the presence of the species in similar habitats elsewhere within the 1800 square mile area described earlier is consonant with what was observed on the Norias. The estimated territory size for a pair of Ferruginous Pygmy-Owls—88 acres—seems reasonable for optimum habitats such as occur in Badeño Pasture, but that figure cannot be applied to the entire 1800 square mile area. If, however, one assumes the average territorial requirements for a pair of Ferruginous Pygmy-Owls on optimum habitats elsewhere to be twice that large, *i.e.*, 176 acres, and divides the total acreage of live oak mottes and live oak-mesquite woodlands within the 1800 square-mile area by that figure, the result would be an estimated grand total of 654 pairs of Ferruginous Pygmy-Owls in Kenedy, Brooks and Willacy counties; this number does not include any additional pairs that might occupy the areas of mesquite savanna and the fencerows. Additional birds found nesting within the "optimum habitats" of the Norias Division included, but were not limited to, White-tipped Dove (*Leptotila verreauxi*), Common Pauraque (*Nyctidromus albicollis*), Buff-bellied Hummingbird (*Amazilia yucatanensis*), Northern Beardless-Tyrannulet (*Camptostoma imberbe*), Green Jay (*Cyanocorax yncas*), Long-billed Thrasher (*Toxostoma longirostre*), Tropical Parula (*Parula pitiayumi*), Olive Sparrow (*Arremonops rufivirgatus*), and Audubon's Oriole (*Icterus graduacauda*).

The south Texas Ferruginous Pygmy-Owls constitute not only the northeastern-most population, but also the only known viable population of the species in the United States. It is likely that the Kenedy and Brooks county birds serve as the recruitment base for the much smaller population of Ferruginous Pygmy-Owls regularly reported from the Rio Grande Valley below Falcon Dam.

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Records from northern Mexico are limited to few and widely-scattered locations in Nuevo Leon and Tamaulipas. Except for a "regular" population near Cerralvo, Nuevo Leon, about 45 miles west of Falcon Dam (Arvin, pers. comm.), none appears to represent an adequate recruitment base. The distance between Ferruginous Pygmy-Owl sites in Brooks County and Falcon Dam is about 75 miles; Badeño Pasture lies about 45 miles north of the Rio Grande and 90 miles from Falcon Dam.

From a historical perspective, the best evidence suggests that the distribution of major habitat types has changed very little on the Norias Division in the last 100 years. Some clearing has been done for improved pasturage; several wells, cattle pens, and stock ponds have been constructed, and a few roads and hunting camp facilities have been introduced. But on the whole, those changes have been modest. Comparing the present distribution of live oaks to what is depicted on a 1884 map of the area (Cooke 1884), then part of Cameron County, remarkably little change has occurred in more than a century. The areas covered with extensive oak woodlands as well as the locations of most isolated mottes, remain largely unaltered.

However, evidence of earlier transformation from prairie to oak motte habitat does exist. Johnson (1963) wrote:

> Residents of the Norias Division of the King Ranch report that live oak has invaded the loose sand prairies to a considerable extent. Live oak mottes were formerly much more restricted. Property lines of original Spanish and Mexican land grants were often laid out from one conspicuous motte to another. Now the mottes are so profuse and interconnected that naming them would be impossible.

It appears that oak mottes increased significantly between the latter part of the 1700s until the mid-1800s due to the introduction of livestock that reduced native grasses that had suppressed the growth of young live oaks. According to V. W. Lehman (1969), sheep and goats were "established on the lower Rio Grande between 1748 and 1755," and soon were introduced to ranches to the north. Although livestock numbers were undoubtedly reduced during the Mexican-American War, after the 1848 Treaty of Guadaupe Hidalgo officially ended hostilities between the United States and Mexico, sheep and cattle were again introduced into the "South Texas Plains."

During the last century, the most significant habitat changes have occurred outside the south Texas live oak-mesquite woodlands and farther south along the Rio Grande in Cameron, Hidalgo, and Starr counties, as earlier described by Oberholser (1974). Changes in the ranch land habitats of Kenedy and Brooks Counties have been relatively limited, suggesting that rancher landowners, at least in south Texas, are being good land stewards. This has in turn made possible the large and apparently thriving population of Ferruginous Pygmy-Owls in the area.

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