BREEDING BIRD SURVEYS AT THE GALVAN RANCH, WEBB COUNTY, TEXAS

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Final Report,
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Drawing of White-collared Seedeater
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EXECUTIVE SUMMARY

- Presented within is a summary of the results of two projects funded by the Ed Rachal Foundation: "A Survey of Bird Use of Freshwater Ponds at the Galvan Ranch" and "Survey of Breeding Birds Along the Rio Grande at the Galvan Ranch".

- From March-July, 1997, 164 unlimited distance, 20-minute point counts were conducted to determine bird species richness. At 31 stock ponds, 87 point counts were conducted, and at 14 riparian areas along the Rio Grande, 77 counts were conducted.

- Results from these surveys documented the occurrence of birds rarely found in the United States, placing the Galvan Ranch in an enviable position for ecotourism. With proper marketing, the Galvan Ranch could attain a place of national prominence among this country's 63 million birdwatchers.

- Many tropical species (which are highly prized by birdwatchers) were detected breeding on the Galvan Ranch. Of greatest importance was the presence of the White-collared Seedeater (*Sporophila torqueola*) and Red-billed Pigeon (*Columba flavirostris*). Both of these tropical species are very rare in the U.S., yet they were sighted regularly on the Galvan Ranch.

- Other very rare birds documented on the Galvan Ranch, but for which occurrence was limited, included the Gray-crowned Yellowthroat (*Geothlypis poliocephala*), Muscovy Duck (*Cairina moschata*), and Masked Duck (*Nomonyx dominicus*).

- Of the total number of tropical species, 14 were at or beyond the known limits of their ranges.
- Results from this study indicate that:

    - Stock ponds with irregular shapes or gently sloping shorelines had more species present than those with rectangular basins and steep banks. Also, ponds close to the Rio Grande (< 12 km) had larger numbers of species than did ponds farther away. Pond size and species richness were not related. To maximize the value of stock ponds for birds, ponds should be constructed near the Rio Grande (< 12 km away), and their shorelines should be, at least partially, irregularly shaped or with gently sloping sides.

    - Although the stock ponds had larger total numbers of bird species, the Rio Grande

sites had more tropical species than did the stock pond sites. Among the river sites, the Espada Creek area supported the greatest number of tropical bird species. For the greatest chance of seeing rare and/or tropical species, birders should visit the area of the confluence of the Rio Grande and Espada Creek.

INTRODUCTION

The richest avifauna within the United States exists in Texas, where approximately 600 bird species have been documented (Haynie 1996). South Texas is especially renowned among birdwatchers because of its incredible variety of bird species, many of which are tropical and reach their northern limits in southern Texas. Historically, efforts to preserve and study the avifauna in south Texas have been restricted to federal wildlife areas and state lands in the area known as the lower Rio Grande Valley, a region extending from the Gulf of Mexico inland to the International Falcon Reservoir (Fig. 1). Even prior to the establishment of refuges, early scientific expeditions in southern Texas focused on the lower Rio Grande Valley and the coast (Merrill 1878; Sennett 1878; Pearson 1921). Upriver of the International Falcon Reservoir, nearly all lands remain in private ownership. Consequently, because of lack of public lands and lack of access to private lands, the distributions, abundances, and basic ecology of bird species occurring in the region of the Rio Grande Valley between International Falcon Reservoir and Del Rio (a distance of approximately 350 km) remain virtually unstudied.

Because neither birdwatchers nor biologists have had access to this region of Texas, the area between Laredo and Del Rio has received no economic benefits from birding ecotourism. Throughout the United States, the economic return from this form of tourism is substantial and continually increasing. In 1996, the U.S. Department of the Interior and the U.S. Bureau of the Census reported that wildlife watchers spent $31 billion in the United States (1997). Visitors to Santa Ana National Wildlife Refuge, a popular birding destination in the lower Rio Grande Valley of southern Texas, were responsible for spending $14 million in Hidalgo County (Fig. 1) alone (Kerlinger 1994). Private landowners and ranchers in south Texas have the opportunity to offer birdwatchers, youth groups, and other eco-tourists a remote outdoor experience away from the heavily populated lower Rio Grande Valley. The King and Kenedy Ranches in southern Texas have already successfully begun offering bird tours.

In June, 1996, biologists from the U.S. Geological Survey (Biological Resources Division) and Texas A&M University-Corpus Christi submitted a joint proposal to the Ed Rachal Foundation to survey breeding birds at the

Figure 1

73 stock ponds on the Galvan Ranch. The proposal was funded, and the task of locating and classifying all stock ponds was begun in July, 1996. Our presence on the ranch soon allowed us to recognize that the Rio Grande habitat offered a different, and possibly even more important, assemblage of breeding birds than did the pond habitats. In February, 1997, we proposed a second project, to be conducted simultaneously with the pond project. The second project, which was also funded, would survey the Rio Grande and Espada Creek for breeding birds. Surveys for both projects were conducted during the spring and summer of 1997. Because sources of water are vital to wildlife in south Texas and attract birds, the survey locations chosen (31 of the 73 stock tanks and 14 stations along the approximately 5.7 km stretch of river) allowed us to document the breeding birds present on the Galvan Ranch during 1997.

The objectives of both projects were to:

1) Conduct surveys of breeding birds and spring migrants.

2) Determine bird and habitat associations.

3) Document occurrence of south Texas "specialty" species (tropical species heavily sought by birdwatchers), and develop a checklist of all bird species observed on the Galvan Ranch.

4) Make management recommendations relative to eco-tourism endeavors.

DESCRIPTION OF STUDY AREA

The 28,000 ha Galvan Ranch (27° 53' N, 99° 54' W), approximately 60 km upriver of Laredo, in Webb County, Texas (Fig. 1), includes uplands of Tamaulipan thornscrub, dominated by honey mesquite (*Prosopis glandulosa*), blackbrush (*Acacia rigidula*), whitebrush (*Aloysia gratissima*), cenizo (*Leucophyllum frutescens*), creosotebush (*Larrea tridentata*), guajillo (*Acacia berlandieri*), lotebush (*Ziziphus obtusifolia*), and prickly pear (*Opuntia engelmannii*). Approximately 5.7 km of the Galvan Ranch border the Rio Grande, where the narrow riparian corridor is mostly giant reed (*Arundo donax*) with smaller patches of common reed (*Phragmites australis*). The reed habitat is bordered by grasses and scattered forbs; the predominant grass is buffelgrass (*Cenchrus ciliaris*). Open stands of mature trees, mostly honey mesquite, black willow (*Salix nigra*), and sugar hackberry (*Celtis laevigata*) are present on the upland edge of the riparian corridor. Espada Creek, a deep canyon with flowing water, enters the Rio Grande at the southwestern boundary of the ranch. Dominant vegetation within the canyon is mature mixed woods, including Mexican ash (*Fraxinus berlandieriana*), sugar hackberry, honey mesquite, and granjeno (*Celtis pallida*). The Rio Grande along the Galvan Ranch is bordered by different habitats, which meet approximately midway along the ranch boundary. The habitats of the northwestern half of the river include woods, deep canyons and arroyos (including Espada Creek), steep rocky bluffs in some places, and adjacent uplands of Tamaulipan thornscrub. In contrast, the southeastern half of the river features less topographical relief, more expanses of giant cane, and is bordered by upland mesquite savannah. Widely distributed throughout the Galvan Ranch are 73 stock ponds. Dominant woody species at the stock ponds are honey mesquite, huisache (*Acacia minuta*), and retama (*Parkinsonia aculeata*). At many ponds, 1-3 mature black willows tower above the rest of the canopy.

The Galvan Ranch occurs within the ecological region known as the Tamaulipan Biotic Province (Blair 1950). In the Tamaulipan Biotic Province of southern Texas, geography and climate interact, resulting in the overlap of ranges of temperate and tropical birds. Great numbers of Neotropical migrants are concentrated by the funneling effect of the western rim of the Gulf of Mexico. Because of the high daily mean temperatures of a subtropical climate and the unique diversity of vegetation (including western desert, northern, and tropical plants), many tropical bird species occurring widely in Mexico and Central America reach their northern limits of distribution in southern Texas (Oberholser 1974).

The Laredo/Webb County area of Texas, while considered a part of the Rio Grande Valley, is nevertheless sharply distinct in several aspects from the lower reaches of the Valley. Annual rainfall at Laredo averages less than in the lower Rio Grande Valley. Mean annual precipitation between the years 1900-1983 for the Eagle Pass/Cotulla region was about 20.5 inches (52.1 cm), while Brownsville, for the same period, received a mean annual rainfall of about 26.5 inches (67.3 cm) (Norwine and Bingham 1986). Because of this, bird and plant species typical of western deserts are much more prevalent near Laredo. Cattle grazing is the dominant land use along the Rio Grande northwest of Laredo. As a result, this part of Texas, where nearly all lands are in privately owned ranches, contains large expanses of uninterrupted native brushland. Across the border in the adjacent Mexican states of Tamaulipas

and Coahuila, most of the land also remains in native brush. In contrast, most of the native Tamaulipan brushland in the lower Rio Grande Valley in both the U.S. and Mexico has been lost to agriculture (cotton, sorghum, and citrus) and residential/commercial developments (Jahrsdoerfer and Leslie 1988).

METHODS

POND STUDY

From July 1996-January 1997, using aerial maps and GPS coordinates provided to us by other TAMU-CC researchers, we searched the ranch for all known stock tanks. After locating a pond, the physical characteristics, landscape, and flora and fauna were noted. We classified all ponds by three discrete variables: size, shoreline type, and distance to the Rio Grande. Ponds were assigned to one of two size classes, large (2-8 ha) and small (< 2 ha), and to one of two classes of basin shape and shoreline, regular (rectangular with steep slope) and irregular (any deviation from rectangular stock ponds with steep slopes). Ponds were also assigned to one of three groups based on distance from the Rio Grande. Ponds located < 12 km from the river were considered to be near. Those located 12-24 km from the river were classified as intermediate, and those > 24 km away from the Rio Grande were designated as far.

Of the 69 ponds classified (four additional ponds were inaccessible), 31 were randomly chosen to be surveyed for breeding birds (Fig. 2). From March to July, 1997, we conducted 87 unlimited distance (Blondel et al. 1981) point counts at the 31 randomly selected stock ponds on the ranch. Point count locations initially were selected randomly along the shoreline of each pond. Subsequent point counts were conducted at the same locations. Point counts lasted 20 min because of the relatively high probability of encountering rare, tropical species (Karr 1981). We attempted to sample the entire breeding season, since phenological progression could alter species composition of the breeding bird community. The first of three series of point counts at stock ponds was completed during 19-20 March and 10-11 April. The second series was completed over five days within the period of 1-27 May. The third series was completed during 5-6 June and 1-3 July.

Point counts typically began within a few minutes of sunrise, and we initiated the last point count before 10:30 am. Point counts were not initiated during passage of cold fronts, high winds (> 16 km/hr), or in rainfall heavier than a mist (Robbins 1981).

FIGURE 2

We recorded all species seen or heard during point counts at the ponds. Species were assigned to groups based on their known breeding ranges (Howell and Webb 1995, Rappole and Blacklock 1994); the three groups we used were: 1) northern, 2) tropical, and 3) widespread (i.e., breeding in both northern and tropical latitudes). We determined the effect of pond characteristics (i.e., size, shoreline type, and distance of pond from the river) on species richness with a 2 x 2 x 3 analysis of variance (ANOVA, $P < 0.05$).

For every point count conducted, vegetation density was also estimated using two circular plots. One plot was placed at or near the randomly selected point count location along the shoreline, to measure vegetative density within the wetland-upland transition zone. This zone is typically more lush than the upland areas due to the presence of water from the tank. The second plot was placed at least 30 m beyond the edge of the transition zone, but not more than 200 m from the point count location. The second circular plot allowed us to measure the vegetation density of the surrounding landscape habitat. Each plot was laid out using wooden stakes and flagging. The plots were 11.28 m in radius, representing a 0.04 ha (0.1 acre) plot. Each of the four cardinal directions and the center were marked with a flagged stake. We estimated percent canopy and percent ground cover using a densitometer. This was done by walking from the center of the plot in a straight line toward the outer stakes and taking readings (indicating either presence or absence of cover) at regular intervals, for a total of 20 readings for each plot.

Using the same circular plots, we also estimated average percent horizontal vegetative density using a density sampling board (a 0.5 m square board made up of 25 10-cm squares painted on the surface in a black and white checkerboard pattern). Horizontal vegetative density was estimated by placing the board at each cardinal point of the plot, then counting the number of squares on the board which were at least 50% obstructed by vegetation when viewed from the center of the plot. Readings from the sampling board were taken at ground level (0-0.5 m), mid-height (about 1 m), and canopy level (about 3 m), then averaged for estimates of horizontal cover at each of the three heights for each plot. Circular plots were left in place throughout the bird surveys so that vegetation density could be measured at each survey period to give an indication of plant growth over the breeding season. Data collected from these plots will be analyzed at a later date to determine bird and brush density correlations.

Other vegetation features were also documented within the plots, including dominant ground cover life forms (grasses/sedges, forbs, woody ground cover, litter, rocks, or bare ground), dominant canopy cover life forms (trees, shrubs, or other), dominant shrub species, and dominant tree species. Dominant aquatic plant species in the stock tanks and a visual check of water clarity were noted.

RIVER STUDY

From April to July, 1997, we conducted 77 unlimited distance (Blondel et al. 1981) point counts during six sampling periods at 14 sites (12 along the Rio Grande and two along Espada Creek). An interval of 20 min for the point counts was chosen because of the high probability of encountering rare tropical species (Karr 1981). Locations for point counts were placed every 500

m along the Rio Grande and Espada Creek. Because of the number of sampling sites and the distance between them, point counts were conducted during two mornings, which we considered one sampling period. We conducted point counts at all 14 sites during the first two sampling periods (24-25 April, 22 and 31 May). Point counts at seven sites were completed on 6 June before inclement weather forced termination of sampling. All 14 sites were visited during each of the last three sampling periods (21-22 June, 4-5 July, and 18-19 July).

The first point counts on each day typically began within a few minutes of sunrise, and we attempted to initiate the last point count within the first four hours after sunrise (before 10:30 am). All but two of the total of 77 point counts during the field season were begun by 10:30 am; the two later counts were initiated before 11:30 am. Point counts were not conducted during frontal passages, high winds (>16 km/hr), or in rainfall heavier than a mist (Robbins 1981).

All species detected during point counts along the Rio Grande and Espada Creek were recorded. Unlike the pond study, numbers of birds by species were also recorded on the river. Because of the importance of White-collared Seedeaters (*Sporophila torqueola*), we also noted numbers of White-collared Seedeaters either seen or heard while traveling between riparian point count locations. In this report, we also use this data to estimate the possible size of the Galvan's White-collared Seedeater population.

We collected no data on vegetation density at locations of point counts along the Rio Grande. However, an analysis of variance ($P < 0.05$) was used to test the effect of the different mix of habitat types along the two halves of the river: northwestern, including Espada Creek and the rocky bluffs associated with thornscrub uplands; and southeastern, including large expanses of giant cane and bordering uplands of grassland and mesquite savannah. Another ANOVA ($P < 0.05$) was used to test the effect of habitat type (river, creek, and pond) on bird species richness for all 45 ranch sites. Both analyses tested effects on total number of all species of birds, and also on number of tropical bird species.

RESULTS

POND STUDY

Data from bird surveys and vegetation cover data are included in Table 1. A total of 114 bird species was detected at the stock ponds (Appendix A). Of the 114 species, 58 (51%) are widely distributed, breeding in both temperate and tropical regions. Nineteen species (17%) breed primarily in the tropics, while 37 species (32%) breed mostly in northern latitudes.

The 3-way ANOVA indicated that size of pond was not related to species richness (F = 0.57, P = 0.46, DF = 1,26). Shoreline type was significantly related to species richness (F = 8.06, P < 0.01, DF = 1,26). More species occurred at ponds with irregular (non-rectangular or gently-sloping) shorelines than at ponds with regular (rectangular basins and steep-sided) shorelines. Distance to the river was also significantly related (F = 5.41, P = 0.01, DF = 2,26) to species richness. Ponds near the Rio Grande supported significantly more species (0 = 17.2) than did ponds intermediate (0 = 13.5 species; P < 0.01) and far (0 = 14.3 species; P = 0.01) from the river. Species richness of intermediate and far ponds did not differ (P = 0.44). The full model, including all three variables, explained 43.5% of the variation in bird species richness at ponds.

RIVER STUDY

Data from the river bird surveys are included in Table 2. A total of 106 bird species was detected along the river (Appendix A). Of the 106 species, 61 (57.5%) are widely distributed, breeding in both temperate and tropical regions. Twenty-five species (23.5%) breed primarily in the tropics, while 20 species (19%) breed mostly in northern latitudes.

We conducted an ANOVA to test the effect of the two halves of the Rio Grande (northwestern and southeastern) on species richness. There was no significant difference (F = 3.57, P = 0.083, DF = 1,12) in total numbers of bird species between the two portions of the river. For tropical birds, however, there were more species occurring on the northwestern portion of the river (between the rocky bluffs and Espada Creek) than for the southeastern end of the river (F = 33.99, P = 0.0001, DF = 1,12).

TABLE 1

We also compared the three habitat types surveyed on the ranch (river, creek, and pond). Although we detected an overall greater number of species (n = 114) at the ponds than at the river and creek (n = 106), we found that the river and creek habitats harbored more species (0 = 22.7 for creek; 0 = 22.6 for river) per point count than did ponds (0 = 14.7) (F = 38.93, P = 0.0001, DF = 2,42). The river and creek sites also had more tropical species than did the ponds; creek sites had a mean of 7.4 tropical species per point count, river sites had a mean of 6.3 tropical species, and the ponds had a mean of 1.5 tropical species per point count (F = 81.92, P = 0.0001, DF = 2,42).

White-collared Seedeaters were observed most frequently along the Rio Grande in the narrow (ranging from 5-15 m), but dense, fringe of giant reed which borders the river. Seedeaters were detected at 71.6% of the 67 river point counts. Only one of the ten point counts at Espada Creek yielded seedeaters. We detected White-collared Seedeaters at none of the 87 point counts conducted at ponds.

White-collared Seedeaters were detected regularly throughout the breeding season (April-July) and in relatively consistent numbers. Seedeaters were detected at a majority of point counts along the Rio Grande during every survey (58-83% of point counts per survey). The range of total numbers of White-collared Seedeaters detected (including birds both at, and between, point count locations) during a survey period was 11-20. For the 77 point counts along the Rio Grande, the mean number of White-collared Seedeaters detected (per point count) was 1.12 birds.

We did not note sex of individual White-collared Seedeaters during the surveys, although singing males were frequently seen and heard throughout the study. Singing males were often observed in full view on the tops of giant reeds. While we did not look for, or find, nests of White-collared Seedeaters, we did see several birds in July which we considered to be young-of-the-year. We determined this based on the presence of many female-like birds associated with a male, suggesting a family unit.

Since we conducted unlimited distance point counts, we could not generate density estimates of birds. We did not know the distance at which singing males of this species can be detected, although detection threshold distances are available for a few species of songbirds (Emlen and DeJong 1981). Assuming a detection distance of 125 m for singing males (derived from Table 1 in Emlen and DeJong, 1981), we estimated that we detected White-collared Seedeaters within a 250 m length of riparian habitat during point counts. Using the length of the Rio Grande which we sampled (about 5,660 m) and a mean of 1.12 seedeaters per point count (and assuming an evenly distributed population), we estimated that an absolute minimum of 25 White-collared Seedeaters were present.

Table 2. Survey data collected along the Rio Grande (stations 1-12) and Espada Creek (stations 13 and 14). All bird numbers are means calculated from five - six point count surveys at each sampling station.

Sampling Station	Mean # bird species	Mean # W-c. Seedeaters
1	24.7	1.0
2	22.0	1.3
3	22.3	1.3
4	21.3	0.7
5	21.7	1.2
6	20.8	1.2
7	18.2	0.3
8	23.2	1.2
9	25.4	0.8
10	22.0	2.4
11	26.8	0.6
12	25.2	1.6
13	22.2	0.6
14	20.8	0.0

DISCUSSION

POND STUDY

Some species using stock ponds on the Galvan Ranch were beyond the known limits of their breeding ranges; others occurred at the extreme limits of the known breeding ranges. This was especially true of those species which breed primarily in the tropics (Appendix A). Of the 19 tropical species we found using ponds, the occurrence of Black-bellied Whistling Ducks (*Dendrocygna autumnalis*) and Masked Ducks (*Nomonyx dominicus*) represented possible range extensions. In addition, seven other primarily tropical species occurring at stock ponds were at the extreme edge of their known ranges. These species were: White-tipped Dove (*Leptotila verreauxi*), Couch's Kingbird (*Tyrannus couchii*), Great Kiskadee (*Pitangus sulphuratus*), Cave Swallow (*Petrochelidon fulva*), Green Jay (*Cyanocorax yncas*), Varied Bunting (*Passerina versicolor*), and Audubon's Oriole (*Icterus graduacauda*). These discoveries indicate that programs directed at the conservation of rare and/or geographically restricted tropical species in southern Texas should include lands adjoining the Rio Grande upriver of Laredo.

Pond size was the only characteristic which proved to be unrelated to species richness at ponds, perhaps because many ponds were of similar size (i.e., there were few very small or very large ponds). In contrast, Brown and Dinsmore (1986) and Tyser (1983) reported a strong relationship between species richness and marsh area, but they included only water birds and species heavily dependent on wetlands. We included all bird species detected at stock ponds, many of which were terrestrial. Consequently, any positive relationship between number of species of water birds and pond size in our study could be masked by the preponderance of terrestrial bird species using the ponds.

The highly significant relationship of shoreline and species richness was probably a result of habitat provided for shorebirds and ducks by shallow, flooded shorelines (Leschisin et al. 1992). Irregular basin shape may have been important in some instances (Mendall 1958). Where present, shallow areas are intermittently exposed and flooded, and, therefore, function as temporary marshes. High invertebrate production in such areas (Swanson and Meyer 1977) attracts ducks (Murkin and Kadlec 1986, Joyner 1980) and other water birds.

The significant relationship between distance of ponds to the Rio Grande and bird species richness indicates that stock ponds are attractive to some species using the Rio Grande corridor, although this effect decreases at ponds located > 12 km from the river.

RIVER STUDY

As with stock ponds, some species using riparian habitat on the Galvan Ranch were beyond the known limits of their breeding ranges; others occurred at the extreme limits of the known breeding ranges. Of the 25 tropical species we found along the river, the occurrence of Black-bellied Whistling Ducks, Muscovy Ducks (*Cairina moschata*), Red-billed Pigeons (*Columba flavirostris*), Gray-crowned Yellowthroats (*Geothlypis poliocephala*), and White-collared

Seedeaters represented possible range extensions. In addition, seven other tropical species occurring along the river were at the extreme edge of their known ranges. These species were: White-tipped Dove, Ringed Kingfisher (*Ceryle torquata*), Couch's Kingbird, Great Kiskadee, Cave Swallow, Green Jay, and Audubon's Oriole.

Tropical birds occur in significantly greater numbers along the river and creek than at the ponds. Among the 14 riparian sites, tropical species occurred in greater numbers for the western half of the river, probably because of the influence of Espada Creek and other canyons and arroyos of that area. The sharp topographic relief of these drainages provides additional habitat types.

Although our analysis showed that an overall greater number of species was found at the ponds, substantially more bird species were detected per point count on the Rio Grande sites than at pond sites. The overall greater number of species at the ponds is not surprising, considering that 31 diverse and very widespread stock tanks were sampled throughout the ranch, compared to only 14 sites along a 5.7 km stretch of river.

The distribution of White-collared Seedeaters in recent decades in southern Texas generally has been considered as restricted to only a few small areas bordering International Falcon Reservoir in Starr and Zapata Counties (Fig. 1) (Eitniear and Rueckle 1995, Eitniear 1997). Oberholser (1974), however, reported that three White-collared Seedeater specimens were collected in 1948 in Webb County, northwest of Laredo, and Arnold (1980) also collected a White-collared Seedeater in Webb County. Occasionally, White-collared Seedeaters are still sighted in their former Texas range, however, and vagrants have been seen as far afield as Corpus Christi (Fig. 1), about 200 km north of the Rio Grande (Blacklock 1964). Consequently, the occasional reports of seedeaters northwest of Laredo probably were considered as only further evidence of wandering birds.

We believe that the breeding population of White-collared Seedeaters on the Galvan Ranch is probably substantially larger and more stable than the one other seedeater population known to occur in Texas, located about 55 km downriver of Laredo (Eitniear 1997). We also believe the Galvan Ranch population to be larger than the estimated minimum number of 25 individuals for the following reasons. First, since we did not record sex of birds, we did not include a multiplier to account for paired females which were probably present, but which went undetected. We did observe adult females; however, more males were detected than females. Secondly, three of the six sampling trips along the river yielded counts of seedeaters within the range of 17-20 birds. If no more than 25 seedeaters had been present, these detection rates would have been high; we believe such impressive detection rates to be unlikely. We also observed seedeaters across the river in Mexico, some of which were included in point counts. These birds also were using riparian habitat dominated by giant and common reed. The reeds extended along both sides of the Rio Grande, both upriver and downriver of the Galvan Ranch (beyond which we lacked access). Therefore, the seedeaters on the Galvan Ranch may be part of a much larger population extending beyond the ranch. However, extensive reed habitat also occurs along much of the Rio

Grande below International Falcon Reservoir, where seedeaters are rare. Multiple canoe surveys (n = 25) of the river in Starr and Hidalgo Counties during March-November, 1993-97, yielded only one White-collared Seedeater (T. Brush, pers. comm.). This suggests that land use or some other variable may affect seedeater distribution.

CONCLUSIONS AND MANAGEMENT SUGGESTIONS

The results in this report provide guidelines for the Ed Rachal Foundation and other landowners wishing to enhance bird habitats and birdwatching opportunities in this little-studied region of Texas. On the Galvan Ranch, we found that stock tanks provide important bird habitat. Brush and other native vegetation around the tanks should not be cleared, because these plants provide food and cover for nesting birds and other wildlife. For newly constructed tanks, sites should be chosen relatively near (< 12 km) the Rio Grande, if possible. Pond basins should be excavated in a non-rectangular shape, with at least part of the shoreline constructed with a gentle slope to provide seasonally flooded habitat. Construction of stock ponds should be an integral component of avian conservation plans along this segment of the Rio Grande, benefitting both bird conservation and the livestock industry.

The Galvan Ranch has exceptionally rich bird resources along the Rio Grande. Any land use practices in the river pasture should be carefully considered so that the risk of irreversible degradation does not threaten to destroy this and other natural resources along the river. Activities in the river pasture should be kept a safe distance from the river. Biologists with both state and federal agencies are available for free consultation with landowners on ways to best integrate various land use activities with conservation of natural resources.

To see rare or tropical bird species in the greatest numbers on the Galvan Ranch, visitors should be taken primarily to the Rio Grande, near Espada Creek (rather than to the eastern stretches of the river). This area of the river has fairly good access, however, road and trail improvements should be implemented to ensure safety of visitors.

Our breeding bird surveys revealed an exciting assemblage of rare and unexpected species occurring on the Galvan Ranch. The presence of White-collared Seedeaters and Red-billed Pigeons alone promises a future in ecotourism if the Ed Rachal Foundation chooses to pursue it. In addition to these two species, we documented a breeding population of Elf Owls, a tiny owl which also has economic potential, while conducting night bird surveys in 1998 (a separate project funded by the U.S. Fish and Wildlife Service). Furthermore, a pair of Gray-crowned Yellowthroats (apparently breeding) was also observed twice during our river surveys. This species has been considered long extirpated from Texas, which makes its occurrence on the Galvan Ranch even more significant than that of the seedeaters and pigeons.

The birds and other natural resources found on the Galvan Ranch are valuable assets. Nature tours are a very attractive form of income for landowners because birders and other "eco-tourists" respect the land and the property rights of the landowner. This form of visitation also is compatible with white-tailed deer hunting arrangements, because bird tours are generally conducted in the spring, long after hunting season is over. The birding tourist has little, if any, impact on the property visited. By simply seeing and accurately identifying birds, a birder has accomplished his/her goal of adding one or more species to his/her "life list" of birds. The incentive of adding as many birds to this list as possible motivates birders to travel all over the world. This is why thousands of birders travel to Texas every year, for here they are able to add

many new birds (which occur nowhere else in the United States) to their lists. The Galvan Ranch, therefore, must advertise the birds which are not found elsewhere in Texas, in order to be competitive with the other ranches already profiting from eco-tourism. For example, eco-tourists visit the King and Kenedy Ranches to add three new bird species to their lists: the Ferruginous Pygmy Owl, Northern Beardless Tyrannulet, and the Tropical Parula. These three bird species are very difficult to find anywhere else but on the King and Kenedy Ranches. The Galvan Ranch can offer at least two rare species not easily found anywhere else: the White-collared Seedeater and Red-billed Pigeon. To market the Galvan Ranch for tourism, these two species should be advertised, along with the other specialty birds present (such as Mexican Duck, Elf Owl, Green Kingfisher, Ringed Kingfisher, Green Jay and Audubon's Oriole). The Gray-crowned Yellowthroat, Masked Duck, and Muscovy Duck are all also very significant for the ranch, though their presence was quite limited during our surveys. While the foundation probably cannot guarantee a visitor of seeing these three species, it can at least offer the possibility of a sighting.

In addition to harboring White-collared Seedeaters and Red-billed Pigeons, both of which may be resident (occurring there year-around), the Galvan Ranch also has three other competitive advantages in attracting tourists over the lower Rio Grande Valley and coastal birding areas:

1) In addition to the specialty birds of the Valley, the Galvan Ranch supports several western species of birds. The presence of western species adds an interesting diversity to the bird assemblage of the area. These include species such as the Scaled Quail and Black-throated Sparrow.
2) The ranch is located next to relatively undeveloped Mexican habitat and neighboring ranch land, which undoubtedly help sustain bird populations. Habitat loss and development along the lower reaches of the Rio Grande have almost certainly contributed to the decline of many specialty species of birds in the Valley.
3) The Galvan Ranch can offer out-of-state visitors an opportunity to experience a large Texas ranch. Demand for an authentic "Texas" experience is high. The Galvan Ranch is also very scenic. The view from the bluffs which overlook the Rio Grande on the ranch is awe-inspiring and has tremendous appeal to almost everyone.

Most popular birding destinations maintain a bird species checklist which is made available to visitors. The Galvan Ranch checklist in this report (Appendix B) can be modified into an attractively designed brochure, and used as both a marketing tool by the foundation and as a birding tool by visitors to the Galvan. Because new species will undoubtedly be added to the ranch's checklist, the list must be updated periodically.

SUGGESTIONS FOR FUTURE STUDIES

In order to successfully manage property for wildlife, research is necessary. This is especially true for the non-game bird resources on the Galvan Ranch, because almost nothing is known about the habitat requirements (and other factors for survival) for these birds in this region of Texas. Further research on the Galvan Ranch would allow the Foundation and other landowners in Webb County to understand how to protect, and possibly increase, the populations of rare birds in their area. State, federal, and other professional wildlife managers in Texas could also benefit from additional research on the Galvan Ranch, by applying knowledge gained on the ranch to answer questions pertinent to other areas (i.e., why do some tropical species occur in greater numbers in Webb County than in the lower Rio Grande Valley?). Below are a few suggestions for future avian research studies on the Galvan Ranch and other areas in south Texas:

- The effects of various land use practices (e.g., grazing and agriculture) on tropical birds within the Tamaulipan Biotic Province of Texas
- Cowbird parasitism on orioles and other bird species in the western Rio Grande Plains
- The importance of arroyos and creeks as travel corridors for dispersing tropical bird species in south Texas
- Habitat use and distribution of Red-billed Pigeons along the Rio Grande upriver of Laredo, Texas
- Habitat use and distribution of White-collared Seedeaters along the Rio Grande upriver of Laredo, Texas
- Wintering bird surveys of brushland, grassland, and riparian habitats of the Galvan Ranch
- Additional breeding bird surveys on the Galvan Ranch for a multi-year perspective

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