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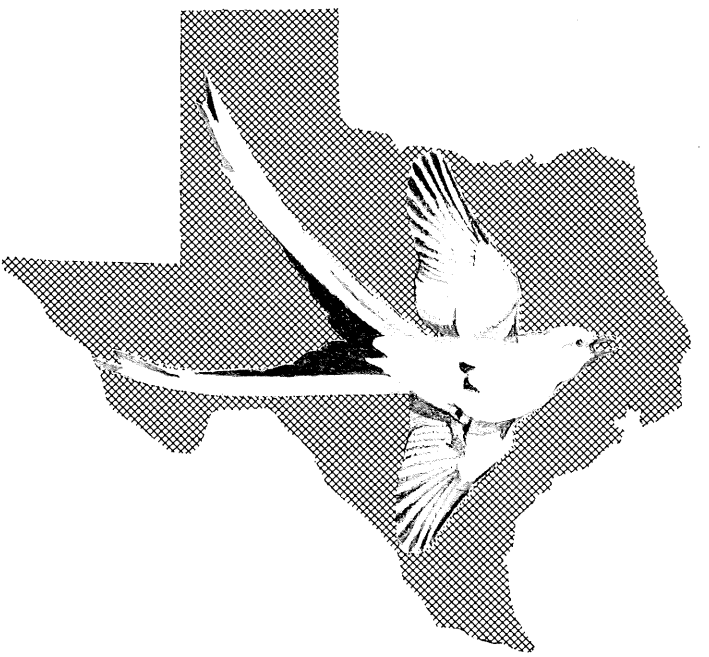

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BULLETIN OF THE

TEXAS ORNITHOLOGICAL SOCIETY

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Contents

Texas Bird Records Committee Report for 1994

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This report contains the decisions of the Texas Bird Records Committee (hereafter "TBRC" or "committee") of the Texas Ornithological Society reached during 1994. For information on previous actions of the TBRC, see Arnold (1984, 1985), Lasley (1988, 1989, 1990, 1991), and Haynie (1992a, 1992b, 1993). The committee requests and reviews documentation on any record of a TBRC Review List species (see end of report) as well as any record of any species if requested to do so by a member of the TBRC. The TBRC reached a final decision on 153 records during 1994: 102 records of 50 species were accepted and 51 records of 36 species were not accepted, an acceptance rate of 67% for this report. There were 192 observers who submitted documentation (to the TBRC or to other entities) that was reviewed by the committee during 1994.

This report does not add any new species to the official Texas state list. However, during 1994, the committee did accept a sight record of Crescent-chested Warbler. This previously unrecorded species constituted a new addition to the Presumptive Species List. Therefore, while the official Texas state list at the end of 1994 remained at 590 species in good standing, the addition of Crescent-chested Warbler brought the official Presumptive Species List to 5 species. At least two records which will complete circulation through the TBRC in 1995 will represent new Texas species.

The TBRC solicits reports of any species on the Review List as well as any species not previously accepted for Texas. The committee desires written descriptions as well as photographs, video, and audio recordings if available. If anyone has information concerning a Review List species but is unsure how to submit that information please contact any member of the TBRC or contact the committee secretary, Greg Lasley, 305 Loganberry Court, Austin, Texas 78745-6527. For guidelines on preparing rare bird documentation, readers are encouraged to consult "How to Document Rare Birds" (Dittmann and Lasley 1992).

The records in this report are arranged taxonomically following *The AOU Checklist of North American Birds* (AOU 1983) as currently supplemented. A number in parentheses after the species name represents the total number of accepted records in Texas for that species at the end of 1994. In instances where birds were known to return from previous years, this number will be followed by a slash and a second number. The second number denotes the total number of accepted records if returnees are excluded. The number (s) will be listed for all species which appear on Review List A as currently amended (see end of report). Within each species the records are listed chronologically. All observers who submitted written documentation or photos of accepted records are listed by initials. If known, the initials of those who discovered a particular bird are in **boldface** but only if the discoverers submitted a description. There has been no attempt to list all observers who saw a particular bird. The TBRC file number of each

accepted record will follow the observers' initials. This number consists of the year the record was originally submitted to the committee followed by a dash then a number. If photos or video recordings are on file with the TBRC, the Texas Photo Record File (TPRF) (Texas A&M University) number is also given. If an audio recording of the bird is on file with the TBRC, the Texas Bird Sounds Library (TBSL) (Sam Houston State University) number is also given. Specimen records are denoted with an asterisk (*) followed by the institution where the specimen is housed and the catalog number if available. The information in each account is usually based on the information provided in the original submitted documentation; however, in some cases this information has been supplemented with a full range of dates the bird(s) was present if that information was made available to the TBRC later. All locations in *italics* are counties.

TBRC Membership.—Members of the TBRC during 1994 who participated in decisions listed in this report are: John Arvin, Chair, Keith Arnold, Academician, Greg Lasley, Secretary, Carl Haynie, Martin Reid, Chuck Sexton, David Wolf, Gail Diane Yovanovich, and Barry Zimmer. During 1994, Martin Reid, who had been appointed one year before to fill the unexpired term of Bret Whitney, was elected to his first full three-year term, while Carl Haynie was elected to his second full term. Both the Academician and Secretary were re-elected.

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Acknowledgments.—The TBRC is very grateful to the many contributors listed above, without whom this report would not be possible. The committee would also like to offer our sincere thanks to the following consultants who provided the TBRC with expert opinion, advice, or other information concerning records reviewed during 1994: Kelly Bryan, Roger Clapp, Bill Clark, Kimball Garrett, Dean Keddy-Hector, Dave Lee, Guy McCaskie, and Chuck Sexton. The author would especially like to thank Greg Lasley for reviewing a draft of this article.

Additional Abbreviations.—*AB* = *American Birds* magazine; *AFN* = *Audubon Field Notes*; BBNP = Big Bend National Park; GMNP = Guadalupe Mountains National Park; NWR = National Wildlife Refuge; SNA = State Natural Area; SP = State Park; TCWC = Texas Cooperative Wildlife Collection (Texas A&M University).

Accepted Records

Red-throated Loon (*Gavia stellata*) (22). Three were on Lake Murvaul, *Panola* on 27 December 1992 (**KN**; 1993-82). Up to three were photographed on Lake Texoma, *Grayson* during their stay 8 January–14 March 1993 (**HG**; 1993-81, TPRF #1122). One was photographed on Lake Balmorhea, *Reeves* during its stay 26 November 1993–25 April 1994 (**KB**, GL, GDY, JG, CS, JBu; 1993-150, TPRF #1202). One was on Imperial Reservoir, *Pecos* on 4 December 1993 (**CH**; 1994-8).

Pacific Loon (*Gavia pacifica*) (42). One was at Goose Island SP, *Aransas* on 27 February 1993 (**DW**, JF; 1993-47). One was photographed on Braunig Lake, *Bexar* on 6 November 1993 (**WS**; 1993-138, TPRF #1176). One was on Lake O' the Pines, *Marion* from 13–14 November 1993 (**GLu**, **DBr**; 1993-147).

Yellow-billed Loon (*Gavia adamsii*) (3). One first-winter bird was photographed on Lake Balmorhea during its stay 25 November–10 December 1993 before being found dead the afternoon of 10 December 1993 (**JWS**, **GK**, **MP**, DaB, JG, GL, GDY, CS, CH, PG, BN; 1993-149, TPRF #1201, *TCWC #13025). Examination of the specimen revealed the bird suffered from mycotic airsacculitis and pneumonia presumably brought on by a fungal related infection (Arnold). A photograph documenting this first record for the Trans-Pecos was published in *AB* 48: 128.

Red-necked Grebe (*Podiceps grisegena*) (9). One was photographed on Lake Tawakoni, *Van Zandt* during its stay 28 November 1993–5 March 1994 (**RK**, **RR**,

PR, PH, HBl, GL, GH, PB, AV; 1993-155, TPRF #1204). A photograph of this bird was published in *AFN* 48:224.

Sooty Shearwater (*Puffinus griseus*) (9). One was picked up sick on Mustang Island, *Nueces* on 11 June 1993, but it never recovered (**TA**, GL; 1993-107, TPRF #1166, *TCWC #13000). One was found dead on Mustang Island, *Nueces* on 10 October 1993 (**TA**, GL; 1993-140, TPRF #1196, *TCWC #13001).

Manx Shearwater (*Puffinus puffinus*) (5). One exhausted bird was photographed on the beach on Mustang Island, *Nueces* on 21 June 1993 (**WS**, **MC**, AC; 1993-101, TPRF #1170). A photograph of this bird was published in *AB* 47:1125.

Blue-footed Booby (*Sula nebouxii*) (2). One exceedingly cooperative bird was seen and photographed at Lake Lyndon B. Johnson, *Burnet/Llano* by well over 5,000 observers during its long stay there 2 June 1993–6 October 1994 (**MB**, CS, JG, JMu, BF, BSt, J&EM, GDY, GS, AM, JBu, FB, GL, SB, GM; 1993-110, TPRF #1168). The bird, which would often rest on Marge Bryant's diving board in Granite Shoals, eventually left only to reappear at Lake Bastrop, *Bastrop* from 10 December 1994–12 April 1995. Photographs documenting this second record for Texas were published in *AB* 48:128, *AB* 48:161, and several local newspapers. Video was even shown on "The ABC Nightly News with Peter Jennings."

Glossy Ibis (*Plegadis falcinellus*) (35). Two were at Anahuac NWR, *Chambers* on 11 March 1993 (**CM**; 1993-45). One was photographed on West Galveston Island, *Galveston* during its stay 2 April–1 July 1993 (**TF**, **PF**, CS, BSt, BBe; 1993-57, TPRF #1195). One was in south *Jefferson* on 18 April 1993 (**CH**; 1993-67). One was photographed at the Eagle Mountain Fish Hatchery, *Tarrant* during its stay 8–10 May 1993 (**CH**, **TR**; 1993-78, TPRF #1121).

Brant (*Branta bernicla*) (9). One was collected by a hunter in east *Waller* in December 1983, but it wasn't until recently that photographs of the mounted specimen were reviewed by the committee and the record was accepted (**LG**, BHo, GDY; 1993-139; TPRF #1175, *private collection).

American Black Duck (*Anas rubripes*) (5). One was collected by a hunter at Smith Point, *Chambers* in December 1991, but it wasn't until recently that the specimen was carefully studied, photographs were reviewed by the committee, and the record was accepted (**BM**, GDY; 1994-15, TPRF #1197, *private collection). Based on research by Yovanovich, two of the previous four "accepted" Texas specimen records have come under suspicion of being *A. rubripes* × *A. platyrhynchos* hybrids or simply misidentified *A. fulvigula.* These records warrant further review by the committee.

Eurasian Wigeon (*Anas penelope*) (15). One adult male was photographed at Fort Hancock, *Hudspeth* on 27 January 1993 (**BZ**; 1993-50, TPRF #1147). One adult male was at Fort Bliss, *El Paso* on 8 May 1993 (**JP**; 1993-98). One male and, possibly, one female were photographed in southeast *Dallas* during their stay 24–29 October 1993 (**EW**, CH, DaB, FB, JMu, J&EM; 1993-137, TPRF #1164).

Barrow's Goldeneye (*Bucephala islandica*) (4/3). One adult male was on Lake O' the Pines, *Marion* from 19–21 November 1993 (SG, J&EM, LB; 1993-146).

Masked Duck (*Oxyura dominica*) (28). Unless otherwise noted, all birds were in "female" plumage. Up to thirty-seven were seen or photographed on the Welder Wildlife Refuge during their stay 8 October 1992–21 August 1993 (**TB**, GL, PP; 1993-62, TPRF #1150). The latter, of which a photograph of four of the birds was published in *AB* 47:275, may have been the largest single gathering of

Masked Ducks ever witnessed in the U.S. Up to two were photographed in Corpus Christi, *Nueces* during their stay 20 December 1992 to 1 January 1993 when one was found dead (**PBe**, MC, AC, HW; 1993-52, TPRF #1162, *TCWC #12926). Up to ten were at McFaddin NWR, *Jefferson* from 2 February–26 May 1993 (**JKr**; 1993-88). One was in Riviera, *Kleberg* on 27 February 1993 (**JGo**; 1993-84). Up to four were photographed in Riviera from 11–14 March 1993 (**CM**, **CCa**, PP; 1993-46, TPRF #1155). Up to five were seen or photographed on the Laureles Division of the King Ranch, *Kleberg* from 12 March–30 April 1993 (**JGo**, MF; 1993-85; TPRF #1138). At least twenty were seen or photographed on the Norias Division of the King Ranch, *Kenedy* from 5 April–5 May 1993 (**BZ**, **JGo**, MF; 1993-79, TPRF #1117). A drake was captured, photographed, and released in Huntsville, *Walker* on 10 June 1993 (**RM**; 1993-103, TPRF #1169). Up to eight were seen or photographed in scattered locations south of Norias, *Kenedy* from 20 September 1993–15 April 1994 (BZ, AR, GDY, ML, SCo, DBe, GM, GL; 1993-142, TPRF #1197).

Aplomado Falcon (*Falco femoralis*). This species is not on Review List A due to problems in distinguishing wild birds from reintroduced birds in the Lower Rio Grande Valley. However, an unbanded adult photographed and videotaped northwest of Marfa, *Presidio* during its stay 2 January–26 May 1992 was accepted as a naturally occurring vagrant for a variety of reasons (**PHa**, MA, BO, CS, GL, HP, MPa, RA, NA, JPa, GM, DR, JD, BR, CR, BLu, WR, KB; 1992-15, TPRF #1154). The bird was found in superb habitat in rather close proximity to a recently discovered wild Aplomado Falcon population in the nearby state of Chihuahua, Mexico. Photographs documenting this record, considered to be the first valid one for the U.S. in over 20 years, were published in *AB* 46:289 and 46:332.

Northern Jacana (*Jacana spinosa*) (19). Two immatures were in Pharr, *Hidalgo* on 2 January 1993 (**MBr**, **AJ**; 1993-134). One adult was near Palmetto SP, *Gonzales* on 25 April 1993 (**BD**; 1993-96). One adult was photographed at Santa Ana NWR, *Hidalgo* during its stay 25 September–16 October 1993 (BZ; 1993-143, TPRF #1198).

Ruff (*Philomachus pugnax*) (18/15). One reeve was photographed near Anahuac NWR, *Chambers* during its stay 18–21 April 1993 (PDH, BBe; 1993-86, TPRF #1158). One juvenal plumaged bird was photographed in El Paso, *El Paso* during its stay 5–11 September 1993 (**DE**, **BN**, BZ; 1993-124, TPRF #1174).

Little Gull (*Larus minutus*) (21/17). One adult was at Cooper Lake, *Delta* on 13 February 1993 (**MW**; 1993-65).

Common Black-headed Gull (*Larus ridibundus*) (6/5). One adult was at Wright Patman Lake, *Bowie* from 2–20 January 1993 (**CMi**, D&DH; 1993-35). One adult was at Baffin Bay, *Kleberg* on 28 February 1993 (**AO**; 1993-38).

Mew Gull (*Larus canus*) (4). One first-winter bird was photographed at Fort Hancock, *Hudspeth* on 26 January 1993 (**BZ**; 1993-49, TPRF #1146).

California Gull (*Larus californicus*) (26). One first-year bird was photographed at Fort Hancock Reservoir, *Hudspeth* on 16 April 1993 (**JD**; 1993-97, TPRF #1165). One second-winter bird was photographed during its stay 27 November–27 December 1993 (**WS**; 1994-10, TPRF #1208).

Thayer's Gull (*Larus thayeri*) (20). One first-winter bird was photographed in east Fort Worth, *Tarrant* during its stay 28 November 1993–3 February 1994 (**CH**, **TR**; 1994-9, TPRF #1195).

Lesser Black-backed Gull (*Larus fuscus*) (62/50). One or two third-winter birds were at the Brownsville City Landfill, *Cameron* on 28 December 1992 (CH; 1993-7). One second-winter bird was at the Brownsville City Landfill on 28 December 1992 (CH; 1993-8). One adult was photographed in Corpus Christi, *Nueces* on 25 January 1993 (**MC, AC**; 1993-53, TPRF #1159). One adult was photographed in *Jefferson* on 16 April 1993 (**GL, GDY**; 1993-60, TPRF #1157). One first-year bird was photographed in *Jefferson* on 18 April 1993 (**CH**; 1993-66, TPRF #1148). The Mustang Island bird, documented since 1983, returned 28 November 1993–April 1994.

Glaucous Gull (*Larus hyperboreus*) (54). One first-year bird was photographed at Port Aransas, *Nueces* during its stay 20–28 February 1993 (**TA**, DW, JF; 1993-51, TPRF #1156). One first-year bird was photographed at Lake Texoma, *Grayson* during its stay 21 March–9 April 1993 (RR, JW, LL, PS; 1993-58, TPRF #1161). One immature (first or second winter) was photographed on Matagorda Island, *Matagorda* during its stay 15–17 April 1993 (**KP**, BSc, PHo, DWy, AD, TS; 1993-75, TPRF #1118).

Great Black-backed Gull (*Larus marinus*) (17/13). One adult was photographed in Corpus Christi, *Nueces* on 31 December 1992 (**AC**; 1993-54, TPRF #1160).

Black-legged Kittiwake (*Rissa tridactyla*) (42). One first-winter bird was in Galveston, *Galveston* from 7–8 December 1990 (**PDH**; 1993-32). One first-winter bird was at Lake Texoma, *Grayson* from 13–22 April 1993 (**JW**; 1993-71). One first-year bird was photographed in *Jefferson* during its stay 24–25 April 1993 (**CH**; 1993-68, TPRF #1151).

Sabine's Gull (*Xema sabini*) (31). Unless otherwise noted, all birds were juvenal plumaged. One was photographed at Boles Lake, *Lubbock* during its stay 25–31 August 1993 (**DC**, MN, DS, CSt, DSt, R&HH; 1993-109, TPRF #1167). One was photographed at Fort Bliss, *El Paso* on 6 September 1993 (**BZ**; 1993-144, TPRF #1199). One was photographed at Lake Grapevine, *Denton/Tarrant* during its stay 30 September–6 October 1993 (**EW**, MP, CH; 1993-125, TPRF #1172). One was photographed at Mitchell Lake, *Bexar* during its stay 20–27 October 1993 (**WS, JMu**, JBu, PG, DaB, GDY; 1993-135, TPRF #1163). One extremely late bird was at Lake Alcoa in Rockdale, *Milam* on 25 November 1993 (**BF**; 1993-151).

Bridled Tern (*Sterna anaethetus*) (10). Between 20 and 25 were seen or photographed 90–100 miles off Galveston, *Galveston* on 1 May 1993 (**CS, GDY, PG**; 1993-93, TPRF #1131).

Northern Pygmy-Owl (*Glaucidium gnoma*) (2). One was seen and heard at Boot Springs, BBNP, *Brewster* on 25 April 1993 (**WR, JR**; 1993-73). While this bird represented only the second accepted Texas record, there remain about a dozen unsubmitted reports since the late 1960s from BBNP and GMNP alone.

Northern Saw-whet Owl (*Aegolius acadicus*) (13). One was captured and photographed at Boot Springs, BBNP, *Brewster* on 22–23 February 1968 (**RW**; 1993-145, TPRF #1200). One was seen and tape recorded near the Tejas campsite, GMNP, *Culberson* from 31 May–2 June 1993 and on 3 July 1993 (**CH, MP**, BSt; 1993-83, TBSL #203-13). Audio analysis software developed by the Cornell Laboratory of Ornithology was used to confirm the recording (Sexton).

Broad-billed Hummingbird (*Cynanthus latirostris*) (16). One adult male was photographed at Fort Davis, *Jeff Davis* during its stay 21–23 May 1993 (KB;

1993-94, TPRF #1129). One immature male was photographed in Midland, *Midland* during its stay 24–27 August 1993 (**D&JM**; 1993-121, TPRF #1173). One male was in Houston, *Harris* on 28 September 1993 (**MAT**; 1993-136). One female was photographed in Buchanan Dam, *Llano* during its stay 22 November 1993–7 April 1994 (**J&BM**, GL, GM; 1993-154, TPRF #1203).

White-eared Hummingbird (*Hylocharis leucotis*) (4). Three birds (1 adult female, 1 juvenile, 1 female/immature) were photographed near Fort Davis, *Jeff Davis* during their stay 20 June–16 August 1993 (**R&CS**, KB, GDY, GL; 1993-95, TPRF #1130). A photograph of one of these birds was published in *AB* 47: 1126.

Elegant Trogon (*Trogon elegans*) (3). One adult male was along the Pinnacle Trail in BBNP, *Brewster* on 29 April 1993 providing only the third accepted record for Texas (**BV**; 1993-114).

Tufted Flycatcher (*Mitrephanes phaeocercus*) (2). One was videotaped 47 miles west of Fort Stockton, *Pecos* at an I-20 rest stop from 2–6 April 1993 (**JBr**, TJ, KB; 1993-41, TPRF #1149). A photograph documenting this second record for the U.S. was published in *AB* 47:469.

Greater Pewee (*Contopus pertinax*) (4). One was in Boot Canyon, BBNP, *Brewster* on 17 August 1991 (**ML**; 1991-114).

Tropical Kingbird (*Tyrannus melancholicus*) (4). One was at Falcon Dam, *Starr* on 26 June 1991 (**NL**; 1991-91). Several birds, documented since 1991, continued to be present in both Brownsville and Harlingen, *Cameron.*

Fork-tailed Flycatcher (*Tyrannus savana*) (8). One was near Sabine Pass, *Jefferson* on 25 April 1993 (**JDP, BP**; 1993-77).

Rose-throated Becard (*Pachyramphus aglaiae*) (16/13). One female was at Santa Ana NWR, *Hidalgo* from 2 January–18 March 1993 (CM; 1993-36).

Clark's Nutcracker (*Nucifraga columbiana*) (8). One was in the Basin at BBNP, *Brewster* on 1 January 1993 (**ES**, 1993-126).

Clay-colored Robin (*Turdus grayi*) (45/40). One was at Santa Ana NWR, *Hidalgo* from 2–28 January 1993 (**CCa**; 1993-37). One was photographed and tape recorded in McAllen, *Hidalgo* during its stay 26 June–17 July 1993 (**JGo**, GDY; 1993-105, TPRF #1170, TBSL #203–14).

Rufous-backed Robin (*Turdus rufopalliatus*) (3). Two were near Fort Davis, *Jeff Davis* on 9 February 1992 (**SC, BT, JJ**; 1992-25).

Bohemian Waxwing (*Bombycilla garrulus*) (4). One was in Palo Duro Canyon SP, *Randall* on 28 January 1993 (**ME**; 1993-48).

Yellow-green Vireo (*Vireo flavoviridis*) (9/8). One was photographed on the Bolivar Peninsula, *Galveston* on 1 May 1992 (**J&BM**; 1993-42, TPRF #1140). One singing male returned for its second summer to Webberville County Park near Austin, *Travis* where it was again tape recorded and photographed during its stay 3 May–8 September 1993 (**BN, DE**, GL; 1993-76, TPRF #1119, TBSL #203–11).

Black-whiskered Vireo (*Vireo altiloquus*) (10). One was photographed at Packery Channel, *Nueces* during its stay 30 April–1 May 1993 (**MC, AC**; 1993-87, TPRF #1132).

Red-faced Warbler (*Cardellina rubrifrons*) (9). One was along the Pine Canyon Trail at BBNP, *Brewster* on 30 April 1993 (**RMS, RCS**; 1993-106).

Rufous-capped Warbler (*Basileuterus rufifrons*) (9). One was near Corpus

Christi, *Nueces* on 19 December 1992 (**HS, GA**; 1993-55). One was at Dugout Wells, BBNP, *Brewster* on 8 May 1993 (**KK**; 1993-80).

Olive Warbler (*Peucedramus taeniatus*) (2). One was at Blue Creek Ranch, BBNP, *Brewster* on 3 May 1991 (**C&RC, T&CF, B&LE**; 1991-61).

Varied Bunting (*Passerina versicolor*). This species is not a Review List species, but given the locale involved, its review was requested. One was in Amarillo, *Potter* on 5 May 1993 (**RP**; 1993-102).

Henslow's Sparrow (*Ammodramus henslowsii*). This species was recently removed from the Review List as it is now regarded as a regular, yet uncommon and local, winter resident in east and coastal Texas. One to two were 6 miles south of Nacogdoches, *Nacogdoches* from 11–20 December 1992 (**DW, MWo**; 1993-116). At least two were in extreme southern *Panola* on 27 December 1992 (**DW, RT**; 1993-117). Two were in *Harris* on 1 January 1993 (**PDH**; 1993-128). One was at Josey Ranch, *Harris* on 1 January 1993 (**DM, FC**; 1993-129). As many as 10 were singing (!) in a weedy field near Longview, *Rusk* from 9–10 April 1993 (**GLu, JL**; 1993-72). One was 5 miles west of Nacogdoches, *Nacogdoches* on 10 December 1993 (**DW, BGi**; 1994-3). One was 6 miles west of Nacogdoches, *Nacogdoches* on 10 December 1993 (**DW, BGi**; 1994-4). Up to six were 6 miles south of Nacogdoches from 16–18 December 1993 (**DW, MWo**; 1994-5). One was in *Chambers* on 18 December 1993 (**GDY**; 1994-6). Two were in extreme southern *Panola* on 26 December 1993 (**DW, RT**; 1994-14).

Snow Bunting (*Plectrophenax nivalis*) (4). Two were at Lake Balmorhea, *Reeves* on 27 November 1993 (**GDY, BL**; 1994-7).

Accepted Presumptive Species

Crescent-chested Warbler (*Vermivora superciliosa*) (1). One singing adult male was seen in Boot Canyon, BBNP, *Brewster* on 2 June 1993 (**EW, RWo**; 1993-90). Although no photograph was secured to allow the species to be added to the official state list, this was an excellent example of how good contemporaneous notetaking can help substantiate a record. In this case, the observers did not know what they had, nor could they find the bird in their field guide. The record was accepted largely on the basis of the submitted field notes which were taken while the bird was in view.

Unaccepted Records

A number of factors may contribute to a record being denied acceptance. It is quite uncommon for a record to not be accepted because the bird was obviously misidentified. More commonly, a record is denied acceptance because the material submitted to the TBRC was incomplete, insufficient, superficial, or just too vague to properly document the reported occurrence while eliminating *all* other similar species. Also, written documentation or descriptions prepared *entirely from memory* weeks, months, or years after a sighting are seldom voted on favorably. It is important that the simple act of not accepting a particular record should by no means indicate that the TBRC or any of its members necessarily feels the record did not occur as reported. The non-acceptance of any record simply reflects the opinion of the TBRC that the documentation, as submitted, did not meet the rigorous standards appropriate for adding data to the formal historical record. The TBRC makes every effort to be as fair and objective as possible regarding each

record. If the committee is unsure about any particular record, it prefers to err on the conservative side and not accept a good record rather than validate a bad one. All records, whether accepted or not, remain on file and can be re-submitted to the committee if additional substantive material is presented.

Red-throated Loon (*Gavia stellata*). One (1992-49) at Lake Tawakoni, *Rains* on 7 February 1992.

Pacific Loon (*Gavia pacifica*). One (1992-78) at Lake Tawakoni, *Rains* on 12 April and 10 May 1992.

Yellow-billed Loon (*Gavia adamsii*). One (1993-31) at Offat's Bayou, Galveston, *Galveston* on 11 March 1988.

Audubon's Shearwater (*Puffinus lherminieri*). Three (1992-120) off Port Isabel, *Cameron* on 12 September 1992. One (1992-123) off Port Aransas, *Nueces* on 4 October 1992. Five (1993-111) off *Willacy* on 15 August 1993. The committee continues to vote conservatively on purported Audubon's Shearwater records when indisputable features in separating the species from Manx Shearwater are absent in the descriptions.

White-faced Whistling-Duck (*Anas viduata*). One (1993-92) in Corpus Christi, *Nueces* on 20 May 1993 was unaccepted on grounds of questionable origin. With no known records for Mexico and none from the West Indies since 1926, it is believed that this largely South American species may well have escaped from some local waterfowl collection, especially in light of the fact that it is a commonly kept aviary bird.

Trumpeter Swan (*Cygnus buccinator*). One (1993-34) immature in Lewisville, *Denton* from 28 December 1992–27 February 1993. Immature swan identification is complex and, to paraphrase Zimmer, may be one of the most underrated of identification problems in North America today. In final analysis, several committee members believed the photos and reports did not eliminate Tundra Swan, and the record was rejected before reaching the third circulation.

American Black Duck (*Anas rubripes*). Two (1993-153) in west *Harris* on 24 February 1983. One (1993-30) at Anahuac NWR on 22 April 1989. Two (1992-37) at Anahuac NWR, *Chambers* from 23–25 February 1992. Separating this species from our dark Gulf coast form of Mottled Duck or from "Mallard × American Black Duck" hybrids is extremely difficult. There are many overlapping features involved, some of which are mistakenly considered diagnostic in certain references.

Eurasian Wigeon (*Anas penelope*). Eight (1993-130) in Del Rio, *Val Verde* from 31 December 1992–4 January 1993.

Masked Duck (*Oxyura dominica*). One (1992-134) at Brazos Bend SP, *Fort Bend* on 13 March 1990.

Northern Goshawk (*Accipiter gentilis*). One (1993-43) at Palo Duro Canyon SP, *Randall* on 30 December 1992.

Common Black-Hawk (*Buteogallus anthracinus*). One (1992-77) in *Kleberg* from 14–15 April 1992. While not a reviewable species, this record would have represented a first for *Kleberg* and so it's review was requested. Many committee members strongly believed that Harris' Hawk was not eliminated.

Roadside Hawk (*Buteo magnirostris*). One (1993-59) in Salineno, *Starr* on 20

March 1993. One (1993-61) at Bentsen SP, *Hidalgo* from 20 March–mid May 1993. One (1993-44) at Santa Ana NWR, *Hidalgo* on 1 April 1993.

Northern Jacana (*Jacana spinosa*). One (1991-49) at Sea Rim SP, *Jefferson* on 21 April 1991.

Purple Sandpiper (*Calidris maritima*). Two (1993-122) in San Antonio, *Bexar* on 13 September 1993.

Curlew Sandpiper (*Calidris ferruginea*). One (1992-115) in Austin, *Travis* from 14–15 September 1992.

California Gull (*Larus californicus*). One (1992-31) at Lake Balmorhea, *Reeves* from 27–28 January 1992. One (1992-32) in San Angelo, *Tom Green* on 1 February 1992. One (1992-127) in San Antonio, *Bexar* on 25 October 1992.

Thayer's Gull (*Larus thayeri*). One (1992-130) on Bolivar Flats, *Galveston* from 18–22 April 1983. One (1993-33) in *Galveston* on 26 December 1989. One (1993-70) at Lake Texoma, *Grayson* from 21 March–3 April 1993.

Lesser Black-backed Gull (*Larus fuscus*). One (1993-131) at Bolivar Flats, *Galveston* on 26 December 1992. One (1993-25) at Lake Livingston, *Polk* on 29 December 1992. One (1994-12) at Bolivar Flats on 7 November 1993.

Glaucous Gull (*Larus hyperboreus*). One (1993-39) in Galveston, *Galveston* on 28 February 1982. One (1993-133) in Houston, *Harris* on 19 December 1992.

Great Black-backed Gull (*Larus marinus*). One (1993-132) at Texas City Dike, *Galveston* on 26 December 1992.

Black-legged Kittiwake (*Rissa tridactyla*). One (1992-26) at Lake O' the Pines, *Marion* on 2 February 1992. One (1993-64) in Kingsville, *Kleberg* on 18 February 1993.

Sabine's Gull (*Xema sabini*). One (1993-141) in San Antonio, *Bexar* on 30 September 1993.

Bridled Tern (*Sterna anaethetus*). One (1991-94) at Rollover Pass, *Galveston* on 9 June 1991.

Ruddy Ground-Dove (*Columbina talpacoti*). Two (1992-36) at Bentsen SP, *Hidalgo* on 12 February 1992.

Northern Pygmy-Owl (*Glaucidium gnoma*). Two (1992-93) in the Davis Mountains, *Jeff Davis* on 20 May 1992.

Green Violet-ear (*Colibri thalassinus*). One (1993-108) in Hunt, *Kerr* on 18 July 1993.

Broad-billed Hummingbird (*Cynanthus latirostris*). One (1993-91) in *Comal* from 23–25 April 1993.

Greater Pewee (*Contopus pertinax*). One (1993-123) in BBNP, *Brewster* on 23 April 1993.

Thick-billed Kingbird (*Tyrannus crassirostris*). One (1992-84) on West Galveston Island, *Galveston* on 18 May 1992. While all agreed a major rarity was described, many committee members felt that Gray Kingbird or some other large-billed Carribbean *Tyrannus* had not been sufficiently ruled out by the description.

Rose-throated Becard (*Pachyramphus aglaiae*). One (1991-118) at Bentsen SP, *Hidalgo* on 29 November 1985.

Black-capped Gnatcatcher (*Polioptila nigriceps*). Two (1993-113) in BBNP, *Brewster* on 29 April 1993.

Gray-crowned Yellowthroat (*Geothlypis poliocephala*). One (1992-92) in Arm-

strong, *Kenedy* on 8 May 1992. One (1993-156) at Santa Ana NWR, *Hidalgo* on 7 December 1993.

Red-faced Warbler (*Cardellina rubrifrons*). One (1993-89) at Lost Maples SNA, *Bandera* on 5 June 1993.

Slate-throated Redstart (*Myioborus miniatus*). One (1993-119) in BBNP, *Brewster* on 22 April 1993.

Baird's Sparrow (*Ammodramus bairdii*). Two (1992-158) at Kickapoo Caverns SNA, *Kinney* on 3 and 13 February 1992.

White-winged Crossbill (*Loxia leucoptera*). One (1993-115) in Granbury, *Hood* in April 1993.

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TBRC Review List

The TBRC requests details, including descriptions and photos if possible, of all records of the following species.

Review List A.—Rarities: These species, in general, include birds that have occurred four or fewer times per year anywhere in Texas over a ten-year average. The TBRC requests documentation for review for any new or any previously unsubmitted record of the below species no matter how long ago the record occurred. The TBRC also requests details on any record of a species not yet accepted on the Texas State List.

Red-throated Loon, Pacific Loon, Yellow-billed Loon, Red-necked Grebe, Yellow-nosed Albatross, White-chinned Petrel, Greater Shearwater, Sooty Shearwater, Manx Shearwater, Audubon's Shearwater, Wilson's Storm-Petrel, Leach's Storm-Petrel, Band-rumped Storm-Petrel, Red-billed Tropicbird, Blue-footed Booby, Brown Booby, Red-footed Booby, Glossy Ibis, Jabiru, Greater Flamingo, Trumpeter Swan, Brant, American Black Duck, White-cheeked Pintail, Garganey, Eurasian Wigeon, Harlequin Duck, Barrow's Goldeneye, Masked Duck, Snail Kite, Northern Goshawk, Crane Hawk, Roadside Hawk, Short-tailed Hawk, Paint-billed Crake, Spotted Rail, Double-striped Thick-Knee, Collared Plover, Northern Jacana, Wandering Tattler, Eskimo Curlew, Surfbird, Sharp-tailed Sandpiper, Purple Sandpiper, Curlew Sandpiper, Ruff, Red Phalarope, Long-tailed Jaeger, Little Gull, Common Black-headed Gull, Heermann's Gull, Mew Gull, California Gull, Thayer's Gull, Iceland Gull, Lesser Black-backed Gull, Slaty-backed Gull, Western Gull, Glaucous Gull, Great Black-backed Gull, Black-legged

Kittiwake, Sabine's Gull, Elegant Tern, Bridled Tern, Brown Noddy, Black Noddy, Ruddy Ground-Dove, Mangrove Cuckoo, Snowy Owl, Northern Pygmy-Owl, Mottled Owl, Northern Saw-whet Owl, White-collared Swift, Green Violet-ear, Green-breasted Mango, Broad-billed Hummingbird, White-eared Hummingbird, Violet-crowned Hummingbird, Costa's Hummingbird, Allen's Hummingbird, Elegant Trogon, Lewis' Woodpecker, Ivory-billed Woodpecker (presumed extirpated in Texas), Greenish Elaenia, Tufted Flycatcher, Greater Pewee, Dusky-capped Flycatcher, Sulphur-bellied Flycatcher, Tropical Kingbird, Thick-billed Kingbird, Gray Kingbird, Fork-tailed Flycatcher, Rose-throated Becard, Masked Tityra, Gray-breasted Martin, Clark's Nutcracker, Black-billed Magpie, American Dipper, Clay-colored Robin, White-throated Robin, Rufous-backed Robin, Varied Thrush, Aztec Thrush, Black Catbird, Bohemian Waxwing, Gray Silky-flycatcher, Yellow-green Vireo, Black-whiskered Vireo, Yucatan Vireo, Connecticut Warbler, Gray-crowned Yellowthroat, Red-faced Warbler, Golden-crowned Warbler, Rufous-capped Warbler, Olive Warbler, Crimson-collared Grosbeak, Blue Bunting, Yellow-faced Grassquit, Baird's Sparrow, Golden-crowned Sparrow, Yellow-eyed Junco, Snow Bunting, Shiny Cowbird, Black-vented Oriole, Pine Grosbeak, White-winged Crossbill, Common Redpoll, Lawrence's Goldfinch.

Review List B.—Species under special study by sub-committee of TBRC concerning their distribution and status in Texas: Records of these species will not be formally reviewed by the TBRC (except for winter Swainson's Hawk and Semipalmated Sandpiper records which will be reviewed), but documentation is requested to assist in these studies.

Clark's Grebe, Cory's Shearwater, Muscovy Duck, Common Black-Hawk, Swainson's Hawk (December–January), Aplomado Falcon (reintroduction program in progress), Semipalmated Sandpiper (December–January), Pomarine Jaeger, Parasitic Jaeger, Spotted Owl, Williamson's Sapsucker, Northern Shrike.

Presumptive Species List.—The following is the official TBRC list of species for which written descriptions of sight records have been accepted by the TBRC but the species has not yet met the requirements for full acceptance on the Texas List (specimen, photo, video, or audio recording for at least one record).

White-crowned Pigeon, Berylline Hummingbird, Social Flycatcher, Crescent-chested Warbler, Slate-throated Redstart.

The Effect of Roadway Traffic Noise on Territory Selection by Golden-cheeked Warblers

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ABSTRACT.—Widespread concern that environmental noise produced by humans can negatively affect animal populations is reflected in a growing body of literature. This study evaluates the possible effects of roadway traffic noise on territory selection by the endangered Golden-cheeked Warbler. Seventy-eight listening posts were established randomly in a 212 ha study area in central Texas. Noise exposure at each post was estimated using a noise simulation model based on traffic counts. The presence or absence of warblers at each post was determined by field observations. Data were analyzed to determine if a correlation existed between the estimated noise exposure and the occurrence of warblers at a listening post. Exposure in Leq(h) ranged from 29.7 dB to 58.6 dB. Warblers were detected at 30 of the 78 listening posts. When the 78 posts were divided into high-noise and low-noise groups, there was no significant difference between the occurrence of warblers in the groups. Logistic regression failed to reveal a significant correlation between the occurrence of warblers at listening posts and the exposure to noise. It is concluded that, within the range of noise exposures considered in this study, Golden-cheeked Warblers do not select territories based on exposure to roadway traffic noise.

Introduction

There is widespread concern that environmental noise produced by humans can negatively affect bird populations. The extensive literature on the effects of roadways and roadway traffic noise on wildlife has recently been reviewed by Bowles (1995) and Larkin (1994). Unfortunately, the conclusions are contradictory and it is difficult to make reliable management decisions. For example, Warner (1992) found that when road right-of-ways were managed for grassland passerines, nesting density and daily survival of nests were high. Thus, the proper management of roadways had a positive effect on the success of the birds. In contrast, van der Zande et al. (1980) found that three of the four bird species they studied had higher population densities at increasing distances from roads. More recently, Awbrey (1993) found that California Gnatcatchers sing and behave normally at sites where humans find roadway noise intolerable. Other studies reporting the effects of various types of noise on birds have been reported (Kosin 1958; Stadelman 1958; Cottereau 1978; Kushlan 1979; Niemi and Hanowski 1984; Dwyer and Tanner 1992).

Reported here are the results of an observational study designed to assess the possible effects of roadway traffic noise on territory selection by the male Golden-cheeked Warbler (*Dendroica chrysoparia*) herafter referred to as GCW. The GCW is a small song bird with a highly restricted breeding range. The species is as-

sociated with the occurrence of Ashe juniper (*Juniperus ashei*) from which required nesting material is gathered (Pulich 1976). The birds arrive in Texas in March and depart quietly during the summer months. Little is known about the GCW's winter range but the bird is known to occur in southern Mexico and Guatemala. The species was added to the United States Fish and Wildlife Service's Endangered Species List in late 1990.

An important first step in a study of this type is to define what measure is to be used to test the strength of any relationship between roadway noise and the life cycle of the GCW. Many such measures could be conceived. The choice for this study is territory selection by GCWs as measured by the presence or absence of singing males during the breeding season. Data are tested to determine if the distribution of singing male GCWs among randomly selected listening posts is significantly different between low-noise versus high-noise locations. The details of these tests are given in the methods and results sections.

Study Area

The study area for this investigation was Meridian State Park located 83 km northwest of Waco, Texas. The park is situated in the Lampasas Cut Plain natural region of Texas. The flora and fauna are typical of those found along the Balcones Escarpment of the Edwards Plateau. Lake Bosque accounts for about one quarter of the total park area of 203.2 ha. Development (buildings, recreation areas, parking lots, etc.) is mostly near the lake and to the eastern side of the park. The vegetation in the study area is dominated by juniper-oak stands with some riparian habitat along tributaries flowing into Lake Bosque. Mature Ashe juniper occurred throughout the study area at or near all locations where data on GCWs were collected. Soils are characterized as shallow calcareous clays with outcrops of limestone. Elevation in the park averages 300 m above mean sea level. The location is well suited for studying the possible effects of roadway traffic noise on GCWs because it is situated between two all-weather roads that produce moderate traffic noise. Texas State Highway 22 runs along the southeast boundary and FM 1473 is along the northern boundary. Additionally, Park Road 7 winds through the study area primarily on the eastern side (Fig. 1).

Methods

A topographical map of the study area was digitally scanned and loaded into a geographic information system (IDRISI 4.1). A total of 78 randomly selected coordinates were chosen inside the park boundaries (excluding Lake Bosque). These coordinates were designated as listening posts and were the centers of detection areas. It was estimated that field observers could aurally detect GCWs within a range of approximately 150 m under favorable weather conditions. Thus it is assumed that any singing GCW within a circle of a radius of 150 m would be detected. The area contained within this circle is defined as the detection area. A site refers to the listening post surrounded by its associated detection area.

In April and early May of 1994, each listening post was visited once between 800 and 1500 hours. Field work was not conducted during times of high wind or rainy weather. Observers in the field located the coordinates of the listening posts by first using a Trimble GPS receiver to get within the general area of the coordinates and then by examining details of a topographical map of the region to

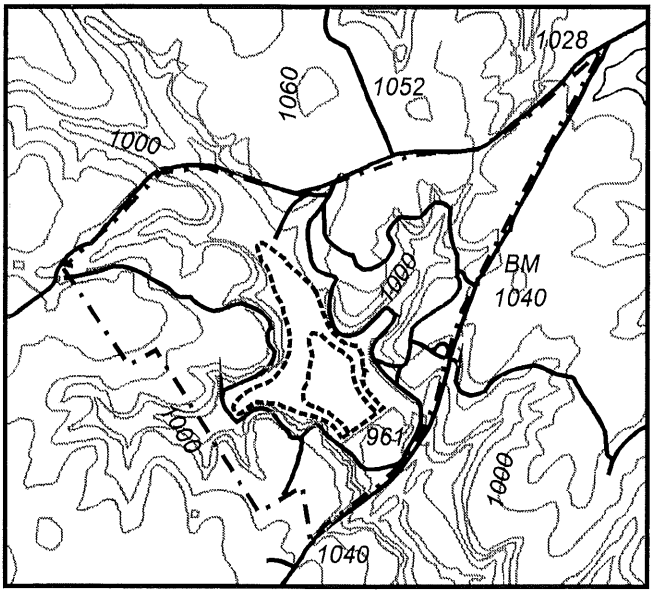

Fig. 1. Topographic map of Meridian State Park, the study area.

fine tune the position. Upon arrival at the listening post, the observers sat quietly for 20 minutes listening and looking for all bird activity. Data were not recorded for the first five minutes after arrival to allow for a settling period. During the remaining 15 minutes, the presence of GCWs either seen or heard was recorded on a field data sheet. If GCWs were heard or seen during the 15 minute recording period, it was assumed that the site was part of an occupied breeding territory. If GCWs were not heard or seen, it was assumed that occupation of the site was unlikely. Observers had extensive experience with GCWs from previous seasons and were familiar with all known vocalizations of this species.

During March of 1994, the Texas Department of Transportation (TxDOT) placed traffic counting instruments across State Highway 22, FM 1473, and at the park entrance in support of this research. This equipment only counted axles of passing vehicles and did not classify traffic as passenger cars, medium trucks, or heavy trucks. However, TxDOT traffic engineers use an empirical relationship to estimate the classes of vehicles that make up the total count in rural areas. Based on consultation from TxDOT engineers, it was estimated that 97% of all traffic was in the passenger vehicle class, 2% was of medium trucks class, and 1% was heavy trucks. The estimate was made that 90% of the traffic occurred during the daylight hours and that traffic on Park Road 7 consisted of only passenger vehicles.

Traffic counters are also buried at the park entrance and are monitored daily by Meridian State Park personnel. Yearly average traffic data collected by park personnel for the months of March, April, May, and June were combined with TxDOT data to arrive at final traffic estimates used in this study. Coordinates describing State Highway 22, FM 1473, and the park roads were determined using IDRISI.

Roadway coordinates, the coordinates of the listening posts, and the traffic count data were entered into the traffic noise prediction model STAMINA 2.0. The average sound level at each listening post in Leq(h) was calculated. The average sound level (equivalent sound level in older references) is the continuous A-weighted sound level that is equivalent, in terms of noise energy content, to the actual fluctuating noise existing at the location over the observation period (Schultz 1982; Thumann and Miller 1986). All sound levels reported here are on the A-weighted scale. Even though the A-weighted scale was developed for humans, it is not unreasonable to use it for birds. Birds' hearing abilities are typical of vertebrates in general; their efficiency and frequency response below 2000 Hz is similar to that of mammals, and their frequency discrimination thresholds are about equal to those for humans (Fay 1988). Therefore, the average A-weighted sound level per hour, Leq(h), is used here as a measure of roadway traffic noise exposure at various points within the study area.

Since the gradient of noise exposure over the distance an observer can hear the warblers can be large when the noise source is nearby, the mean Leq(h) over the detection area was calculated as a derived variable and is referred to as $Leq(h)_{mean}$. Since male GCWs move often within their territories, it is likely that the actual noise exposure is closer to $Leq(h)_{mean}$ and not Leq(h). Average sound level, or Leq(h), refers to sound level at a single point averaged over time. $Leq(h)_{mean}$ refers to Leq(h) averaged over the detection area spatially. Other derived variables used were $Leq(h)_{low}$ defined as the lowest Leq(h) that could be found within the detection area, and L_{10} defined as the A-weighted sound level exceeded 10 percent of the time. $Leq(h)_{low}$ was calculated in order to test the hypothetical situation that GCWs always selected the quietest location within the detection area from which to sing. L_{10} is a useful measure of fluctuations in the noise exposure. Data on the presence or absence of GCWs at each site and the Leq(h) for each listening post along with the derived variables were transferred to the spread sheet of Statistica/QC for Microsoft Windows for analysis.

Independent variables Leq(h), $Leq(h)_{mean}$, $Leq(h)_{low}$, and L_{10} were paired with the dichotomous variable (presence or absence of GCW). For each independent variable, data were ranked in ascending order from lowest to highest noise exposure and the mean value was calculated. All sites with noise exposures less than the mean value were placed in Group I and all sites with noise exposures greater than the mean were placed in Group II. The null hypothesis that *there is no difference in the ratio of occupied sites in Group I and Group II* was evaluated in 2×2 contingency tables using Fisher's Exact test.

Logistic regressions were performed using each independent variable paired with its associated dichotomous variable. In each case, the loss function was maximum likelihood and the estimation method was quasi-Newton. Chi-square values were evaluated to test the significance of the regressions. Logistic regression results in a model that predicts the probability of GCWs occurring at a site as a function of the independent variable (noise exposure).

The power of logistic regression to reveal relationships between noise exposure and the probability of occurrence of GCWs was determined by simulating a large number of data sets with pre-defined correlations between the independent and dependent variable. A noise exposure threshold was assumed to lie between the minimum and maximum noise exposures. In other words, male GCWs were as-

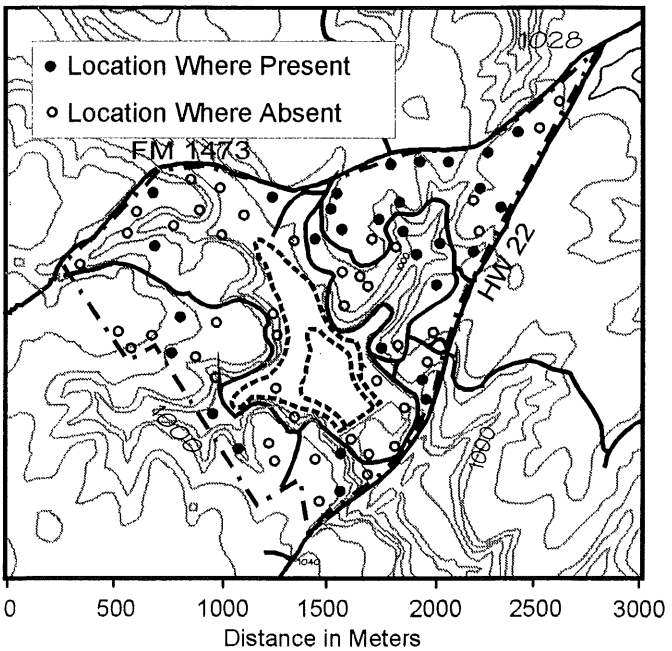

Fig. 2. Relative positions of listening posts and occurrence of GCWs at the sites.

sumed to select territories without regard to noise exposure as long as the exposure did not exceed some threshold. Above the threshold, it was assumed that GCWs completely avoided the sites. One hundred randomly selected data sets were constructed in this way and 100 logistic regressions were performed. The power of the regression was estimated by calculating the ratio of significant to insignificant Chi-square values among the 100 regressions at the 0.05 level. The simulated data sets were weighted so that the number of singing males distributed among the 78 sites were approximately the same as the distribution observed in the field collected data. In other words, the same number GCWs were present regardless of the threshold value.

Results

The calculated noise exposure in Leq(h) ranged from a low of 29.70 dB to a high of 58.60 dB, a span of 28.9 dB. At the noisiest listening post, exposure exceeded 60.4 dB ten percent of the time. Singing male GCWs were detected at 30 of the 78 listening posts and were approximately evenly distributed among the sites. Figure 2 indicates the distribution of listening posts and occurrence of GCWs.

Analysis of Group I sites (low noise) and Group II sites (high noise) in 2 × 2 contingency tables revealed that none of the frequencies deviated significantly from frequencies expected by chance. When Leq(h) is used as the independent variable, 42% of group I sites are occupied and 34% of group II sites are occupied ($p = 0.49$). For $Leq(h)_{low}$, 29% of group I sites are occupied and 48% of group II sites (high-noise sites) are occupied ($p = 0.1$). For L_{10}, 37% of group I sites are occupied and 40% of group II sites are occupied ($p = 0.82$). For $Leq(h)_{mean}$,

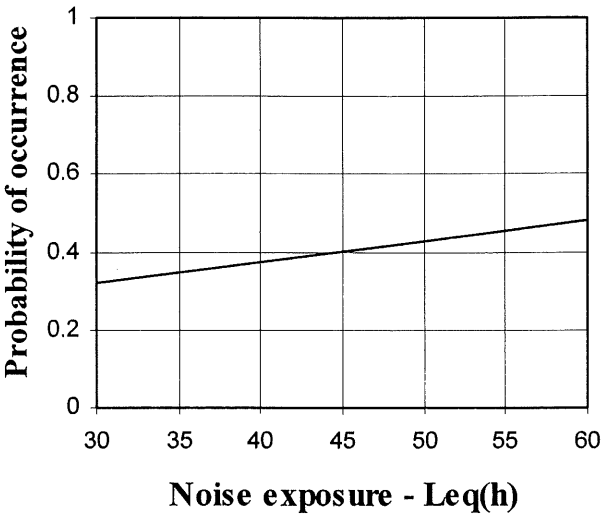

Fig. 3. Probability of occurrence of GCWs regressed against Leq(h).

34% of group I sites are occupied and 42% of group II sites are occupied (p = 0.49).

The logistic regressions of presence/absence data against the independent variables appeared to indicate a higher probability of occupied sites being found in noisier detection areas. For example with Leq(h) as independent variable, the probability of having an occupied site at an exposure level of 29.7 dB is 0.36. If noise exposure is increased to 58.6 dB, the probability of an occupied site increases to 0.41. However, none of the regressions were significant at the 0.05 level regardless of independent variable used. A graphical example is given in Figure 3.

In view of the lack of significance of the logistic regressions, it is important to consider the power of the regression to detect correlations between the variables. To test this, 100 randomly simulated data sets were constructed so that approximately 30 singing males were represented at sites with Leq(h) less 42.76 dB (arbitrarily chosen threshold) and no males selected sites above the threshold. This simulation indicated that 80 out of 100 regressions were significant at the 0.05 level. This means that if a threshold of 42.76 dB had existed in the field collected data, the logistic regression procedure would have detected the threshold with 80% reliability. However, if the threshold is lowered slightly to 40.5 dB, a similar analysis indicates that the regression would detect the threshold with 98% reliability.

Discussion

Based on the indicated range of noise exposure and the occurrence of GCW at listening posts, it is concluded that there is no preference for, or avoidance of, locations within the study area as a function of noise exposure. Evidently, males select territories from which to sing without regard to the level of roadway noise. However, the relationship of any organism to its environment is complex and other factors may influence the long-term survival of GCWs. Only four of many

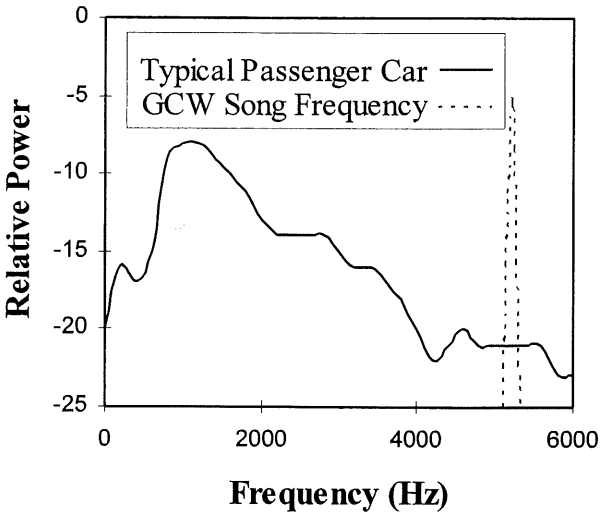

Fig. 4. Relative noise spectrum of a typical passenger car and frequency range of GCW's primary song.

possible measures of the effects of noise on the species has been considered here. Additional studies will be required to determine all the possible short-term and long-term effects of noise on this species. The results of this study must be viewed against the complex backdrop of the extensive acoustical behaviors in birds.

Birds have undergone an extensive and complex adaptive radiation into a wide range of habitats (Brodkorb 1971). Acoustic information transmitted through these habitats plays a crucial role in a variety of avian behaviors including individual and species recognition, mate selection, territorial defense, and song learning (Brooks and Falls 1975; Falls 1963; Kroodsma 1976; Marler 1970; Thorpe 1961).

Experimental work indicates that human hearing thresholds are lower at all frequencies than are the median thresholds for oscines. In comparison with non-oscines, oscines tend to have better sensitivity at high frequencies and worse at low frequencies (Dooling 1982). There is evidence that the most sensitive range of avian hearing corresponds with the highest frequencies contained in the species song (Dooling et al. 1971; Konishi 1970). The primary song type of the GCW averages 5.18 kHz. Roadway traffic noise is composed predominately of low-frequencies (Fig. 4). Even though the birds can probably hear the roadway noise, their acoustic world is focused in a frequency domain removed from the noise. This may explain why GCWs show no aversion to traffic noise at the levels reported in this study. Another possible explanation is that the birds habituate to the roadway noises and carry on normal lives. Some research suggests that all vertebrates habituate easily to moderately noisy environments (Awbrey 1993; Peeke and Herz 1973).

The most extensively studied effect of noise exposure in humans is hearing loss. Sound in humans and birds is transduced by hair cells in the inner ear. Exposure to high noise levels can result in the loss of or damage to these hair cells. Exposure levels high enough to cause hair cell damage are rare in wilderness settings (Bowles 1995) and should not be expected to occur over most of the

breeding range of the GCW. Furthermore, birds are known to regenerate hair cells even after substantial loss induced by exposure to loud noises in laboratory settings (Corwin and Cotaanche 1988).

Masking is defined as the interference of the organism's perception of a sound by noise. Roadway traffic noise may produce a masking effect in the acoustic communications carried on by GCWs. However, it is not unusual for animals to be able to detect signals that are 5 to 10 dB weaker than the noise by taking advantage of binaural cues, internal auditory templates of the signals of interest, and frequency and amplitude tracking (Bowles 1995). Masking is most likely to be problematic in predator avoidance since the sounds of predators are generally not in the most sensitive range of the species hearing. The masking effect of traffic noise for social signals in GCWs is probably minimal owing to the relatively high communication frequencies used by the species and the low-frequency character of typical roadway traffic noise.

Exposure to noise could have an adverse effect on the nesting success of GCWs. If repeated noise events cause flushing from the nest during brooding, or if parental neglect during feeding of the young occurs, then a nest could fail. Productivity declines have been observed in domestic fowl after exposure to noise at levels greater than 85 dB (Belanovskii and Omel'yanenko 1982).

Very long-term effects may be observed in the genetic composition of the GCW population. If certain individuals in the population are more susceptible to disturbance than others, resulting behaviors could be selected for, causing an overall change in the way the birds react to noise and an associated change in fitness (Knight et al. 1987).

These examples of potential effects of noise on GCWs illustrate the complexity of the problems encountered when attempting to address the general question of whether noise has an adverse effect on the species. Increases in energy consumption, loss of sleep, stresses from avoidance responses, cannibalism, changes in habitat use, and changes in courtship and mating have all been suggested as additional ways that noise could adversely effect animals (Bowles 1995).

A number of shortcomings and biases may exist in the study reported here. There is likely to be some error in the coordinates used for the listening posts. These were established by GPS technology and improved by referring to a topographic map. A substantial positioning error is introduced (as high as 100 m) by the government as a safeguard against enemies using the system against the United States. Other errors are associated with heterogeneities in the atmospheric path for the GPS satellites. Differential GPS can correct for these errors but was not used in this study. However, based on close matching with features on topographic maps, it is believed that the positional errors resulting for the methods described were no greater than 10 m. Errors of this order will have a trivial effect on the outcome of the investigation.

The highest exposure level at any of the 78 sites was 58.6 dB. Noise levels can be substantially higher in suburban settings near large cities like San Antonio and Austin. For example, if traffic counts for RM 2222 in Austin are substituted for the traffic levels used in this study, the overall noise exposure at the 78 sites is raised by about 10 dB. If an avoidance threshold exists somewhere above the range of this study, it would not have been detectable. However, roadway noise

present at Meridian State Park represents conditions equal to or louder than conditions present over the vast majority of the breeding range of the GCW.

The results of this study may be skewed by the small sample size. Owing to the limited size of Meridian State Park, establishing more than 78 listening posts was not possible without a large number of overlapping detection areas. The solution would have been to use multiple study areas. A requirement of the study was that relatively large tracts of good GCW habitat be adjacent to highways. Although these conditions do exist within the breeding range of the bird, most potential study areas are located on private property and access is not possible.

A field observer's ability to detect GCWs is prone to the same masking effect described above. It is likely that the detection area was substantially reduced when the listening post was located near a road. At many sites, traffic noise levels limited the time in which the observer could hear GCW song during the 15 minute recording period. Therefore, singing GCWs that may have been occupying noisy sites were more likely to be missed. This would have caused the appearance that noisy sites were being avoided when in fact the sites were occupied. Likewise, it is possible that GCWs become quieter or sing less frequently when exposed to high noise. Again, the effect of this bias would be to under estimate the number of males occupying noises sites. Since the results indicate no difference on occupation rates, it is unlikely that these biases were present in the data.

The overall impression derived from hours of field work and suggested by this analysis is that GCWs do not select sites from which to sing based on differences in roadway traffic noise exposure. The logistic regressions indicate a modest trend toward selecting sites in noisier areas on the study area, though the regressions are not significant at the chosen level of confidence. If these trends are truly present, they are more likely caused by some habitat preference, and not because GCWs prefer noise. Interestingly, Kroll (1980) suggested that the GCW is a typical "edge species". If he is correct, the suggested trends in this investigation could be simply explained. Roads cause edges in the habitat which could be preferred by GCWs. However, this contention was not formally addressed in this study.

Future research should be done to investigate the possible effects of road noise, or other factors associated with roads and their construction on the population dynamics of the GCW and other avian species. However, it is doubtful that observational studies of this type will ever be able to resolve the subtle effects that may be present. It is crucial that experimental designs be implemented that use artificial noise exposure as treatments. Such studies would allow for the control of the many compounding variables associated with the complex lives of this and other avian species.

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SHORT COMMUNICATIONS

Bird Specimens, Collected by Albert J. Kirn, Which Represent County Records Not Reported in Oberholser's "*The Bird Life of Texas*"

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In 1974, the life-long work of Harry C. Oberholser was finally published. However, Oberholser, in his search for Texas birds, overlooked some specimens, even in collections he examined. As a result, several papers were subsequently published to update county specimen records from these collections (Barr et al. 1975; Bryan and Moldenhauer 1977; Dowler et al. 1978; Gallucci 1979; Gallucci and Scudday 1978). Barr et al. (1975) encouraged others to follow their lead in publishing these county records.

Albert J. Kirn, a Texas field naturalist, collected in various counties in Texas from 1920 until at least 12 September 1950, just a few weeks before his death in October. For several years he was chairman of the Bird Book Committee of the Texas Academy of Science which was attempting to stimulate support for the publication of Oberholser's manuscript of *The Bird Life of Texas.* Kirn and Oberholser corresponded sporadically from 1930 through 1949. This correspondence, now deposited in the Library of Congress, was concerned with the Oberholser manuscript and Kirn's Texas bird records, many of which are cited in the published work. Following is a list of Kirn specimens for which no county record has been cited in the species range map or in the text in *The Bird Life of Texas.*

This listing follows the order and nomenclature of *The A.O.U. Check-list of North American Birds* (1983, 6*th* edition and subsequent supplements). The Oberholser nomenclature follows in parentheses where it differs.

List of Kirn Specimens.

Species	County	Date	Museum or mus. no.
Podilymbus podiceps Pied-billed Grebe	Bexar	04/26/38	HNSM
Phalacrocorax auritus Double-crested Cormorant	Medina	04/30/44	HNSM
Coragyps atratus Black Vulture	Atascosa	09/17/36	HNSM
Parabuteo unicinctus Harris' Hawk	Atascosa	unknown	UMMZ 121741
Buteo swainsoni Swainson's Hawk (*Craxirex swainsoni*)	Atascosa	04/19/24	HNSM

List of Kirn Specimens. Continued.

Species	County	Date	Museum or mus. no.
Buteo regalis Ferruginous Hawk	Atascosa	winter '26	CLMNH 14483
Falco sparverius American Kestrel (*Tinnunculus sparverius*)	Atascosa	01/11/32	WWF 1606
Colinus virginianus Northern Bobwhite	Atascosa	12/28/31	CLMNH 14480
Porzana carolina Sora	Bexar	09/12/50	TCWC 12349 (on loan to HNSM
Fulica americana American Coot	Atascosa	04/29/33	HNSM
Charadrius vociferous Killdeer (*Oxyechus vociferous*)	Atascosa	10/06/24	CLMNH 14481
Recurvirostra americana American Avocet	Oldham	09/13/20	CLMNH 14482
Tringa solitaria Solitary Sandpiper	Atascosa	08/30/34	HNSM
Gallinago gallinago Common Snipe (*Capella gallinago*)	Atascosa	10/03/–	TCWC 12351 (on loan to HNSM)
Zenaida asiatica White-winged Dove (*Melopelia asiatica*)	Atascosa	09/23/23	HNSM
Zenaida macroura Mourning Dove (*Zenaidura macroura*)	Atascosa	10/–/24	CLMNH 14488
Columbina inca Inca Dove (*Scardafella inca*)	Atascosa	09/24/34	UMMZ 125409
Columbina passerina Common Ground Dove (*Columbigallina passerina*)	Atascosa	09/18/34	UMMZ 125431
Geococcyx californianus Greater Roadrunner	Atascosa	01/18/34	HNSM
Chordeiles acutipennis Lesser Nighthawk	Atascosa	05/30/32	CLMNH 14490
Phalaenoptilus nuttallii Common Poorwill	Atascosa	04/17/32	UMMZ 126168
Caprimulgus carolinensis Chuck-will's-widow (*Antrostomus carolinensis*)	Atascosa	04/17/25	HNSM
Pyrocephalus rubinus Vermilion Flycatcher	Bexar	09/24/23	HNSM
Tyrannus forficatus Scissor-tailed Flycatcher (*Muscivora forficata*)	Atascosa	10/18/34	TCWC 12360 (on loan to HNSM)
Corvus brachyrhynchos Common Crow	Atascosa	11/21/36	HNSM
Parus carolinensis Carolina Chickadee	Atascosa	11/29/34	UMMZ 129732
Thryomanes bewickii Bewick's Wren	Atascosa	04/08/35	UMMZ 129893

List of Kirn Specimens. Continued.

Species	County	Date	Museum or mus. no.
Polioptila caerulea Blue-gray Gnatcatcher	Callahan	04/22/26	CIMNH 20028
Bombycilla cedrorum Cedar Waxwing	Bexar	02/05/47	HNSM
Dendroica fusca Blackburnian Warbler	Atascosa	05/08/39	TCWC
Geothlypis trichas Common Yellowthroat	Callahan	04/28/26	CIMNH 21206
Spizella pallida Clay-colored Sparrow	Atascosa	04/28/38	HNSM
Agelaius phoeniceus Red-winged Blackbird	Montague	12/06/20	CIMNH 22968
Euphagus cyanocephalus Brewer's Blackbird	Atascosa	02/07/33	WWF 1823

CIMNH = Cincinnati Museum of Natural History.
CLMNH = Cleveland Museum of Natural History.
HNSM = Heard Natural Science Museum and Wildlife Sanctuary.
TCWC = Texas Cooperative Wildlife Collections, Texas A&M University.
UMMZ = University of Michigan Museum of Zoology.
WWF = Welder Wildlife Foundation.

I wish to thank Mr. and Mrs. Arthur Wiseman for data from Kirn bird skins in the Herbert Brandt Collection at the Cincinnati Museum of Natural History; William W. Baum provided data from Kirn bird skins at the Cleveland Museum of Natural History; Harold Laughlin and Ken Steigman allowed me to copy data from Kirn specimen labels at Heard Natural Science Museum and Wildlife Sanctuary and then checked them for me; Keith Arnold checked Kirn specimens in the Texas Cooperative Wildlife Collection, encouraged me to prepare this paper and made suggestions for its improvement; Robert Storer sent data from Kirn specimens in the Max Peet Collection at the University of Michigan Museum of Zoology; Clarence Cottam (deceased) and Gene Blacklock helped me go through the Roy Quillin Collection at Welder Wildlife Foundation.

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Evidence of Possible Egg Predation by Golden-fronted Woodpeckers

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Golden-fronted Woodpeckers (*Melanerpes aurifrons*) are omnivorous and opportunistic feeders. The list of foods taken includes various adult and larval insects, pecans (*Carya illinoinensis*), acorns (*Quercus* sp.), corn (*Zea mays*), and a wide variety of fruits and berries (Bent 1939, Oberholser 1974). A search of the literature, however, showed no record of nest robbing by Golden-fronted Woodpeckers, a behavior recorded in the closely related Red-bellied Woodpecker (*Melanerpes carolinus,* Brackbill 1969) and Gila Woodpecker (*Melanerpes uropygialis,* Bent 1939). The suggestion by Short (1983) that eggs are a part of the Golden-fronted Woodpecker diet is based on speculation rather than direct evidence.

This paper reports evidence of egg predation by Golden-fronted Woodpeckers in Tom Green County, Texas. Two black and white photographs of a female Golden-fronted Woodpecker at an artificial quail nest stocked with eggs were taken on 9 and 11 April 1995. The nest was located on the ground in a clearing surrounded by mixed mesquite (*Prosopis glandulosa*) brushland. The photographs were taken using an active infrared sensing unit (Trailmaster® Model 1500) with a remotely-triggered 35mm camera programmed with a 2 minute delay. Infrared transmitter and receiver were aligned on either side of the nest, and the camera was mounted in a tree within 1.0–3.0 m above the nest (Hernandez 1995). Anything approaching the nest would break the infrared beam and trigger the camera except during the brief 2 minute delay.

In the first photograph, taken at 1543 hours on 9 April, a female Golden-fronted Woodpecker is perched on the edge of the nest, facing inward towards five clearly visible quail eggs. She is not seen actually consuming any eggs. The next approach to the nest (at 2101 hours, 5 hours and 18 minutes after the previous photograph) was by a common raccoon (*Procyon lotor*) from a direction opposite the camera, and only four eggs remained prior to it reaching the nest. The 2 minute delay would have allowed time for the woodpecker to retrieve one of the eggs, while also reducing the opportunity for another predator to take an egg prior to the appearance of the raccoon.

The second photograph, taken at the same nest site at 1333 hours on 11 April, is also of a female Golden-fronted Woodpecker perched on the edge of the nest. It is not known if this is the same female; however, based upon the territorial nature of this species during the spring months, it is suspected to be. Once more, she is not pictured consuming an egg.

Because of the absence of records in the literature it is assumed that nest robbing is not a frequently used foraging mode for Golden-fronted Woodpeckers. Kujawa (1984) demonstrated that ground foraging is a prevalent foraging mode

for Golden-fronted Woodpeckers from February though April. Evidence presented here suggests that when ground foraging, and the opportunity arises, eggs may be taken.

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Observations on Feeding of Wintering Lesser Scaup in Relation to Physical Structures in Corpus Christi Bay, Texas

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Although general distribution patterns of wintering waterfowl are well-known, factors that dictate habitat use by species are poorly understood (White and James 1978). Moreover, understanding how wintering ducks meet requirements and share resources are important ecological questions with significant conservation implications (Tamisier 1985). Of the four common species of bay ducks (*Aythya* spp.) that winter along the South Texas coast, two favor freshwater areas (Ring-necked Duck *A. collaris* and Canvasbacks *A. valisineria*) and two favor brackish or saline areas (Redhead *A. americana* and Lesser Scaup *A. affinis*) (Bellrose 1980). Greater Scaup (*A. marila*) also occur but are less often seen and presumably use larger saline bays, but they do visit freshwater ponds to drink (Adair 1990).

Lesser Scaup often winter in small groups along the bays of the Coastal Bend, and occur commonly near piers and other constructed intrusions in water <1 m deep where few other ducks occur. Whether this observed pattern is real or an artifact of road access to such structures (and therefore observation sites) is uncertain. Such distribution could be a result of wind protection or food concentrations. Observations made during winter 1994–95 from an elevated observation site along Corpus Christi Bay suggest that their distribution is strongly related to

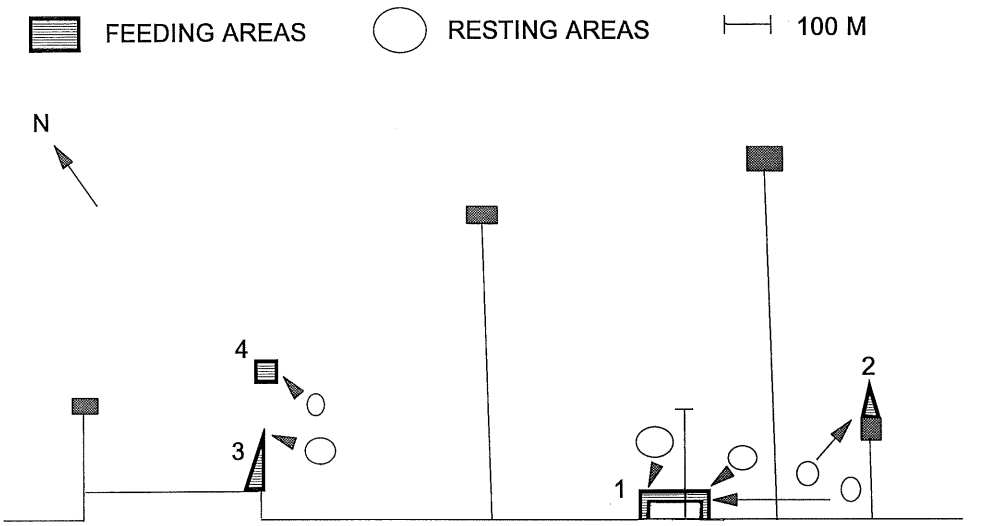

Fig. 1. Diagram showing spatial arrangement of piers, feeding areas, and major resting sites. Feeding sites were: Enclosure (#1), South Point (#2), North Point (#3), and Platform (#4). Arrows indicate the usual relationship between feeding and resting areas. All structures were partially exposed at very low tide.

underwater structures. Five fishing/observation piers and four underwater structures were visible at the study site (Fig. 1): an enclosure built of boulders (hereafter = enclosure), the base of an old pier platform (platform) made of pilings and concrete footings, and large concrete and stone rubble that formed two small projections into the bay (north and south points). All were partially exposed at low tide. Salinity averages 27 parts-per-thousand (Armstrong 1987), and common marine rocky shore invertebrates (Britton and Morton 1989) are visible on pilings and rocks. Epiphytic algae is common on structures, but the bay substrate is bare silt and sand.

Lesser Scaup arrived in early- to mid-December, 1994, and were present daily through mid-April, 1995. From late December to early March, numbers typically varied from 13 to 18 and reached a maximum of 48 in early March. Numbers varied somewhat more thereafter, but 8 to 12 were present on most days. That some groups were fairly stable was indicated by relatively constant numbers with the same sex ratio and identifiable immature plumages. Only once did a Redhead remain with the Lesser Scaup for a few hours, but feeding was not observed. Other ducks observed in the area were Red-breasted Merganser (*Mergus serrator*) and Bufflehead (*Bucephala albeola*), but they fed independently of scaup and remained only briefly.

Foods of scaup wintering in saline water typically are invertebrates, but seeds and other plant materials dominate in freshwater areas (Afton et al. 1991; Bellrose 1980). Lesser scaup feed on soft substrates by lateral movements of the partially open bill, but also grab larger prey in water (Tome and Wrubleski 1988). Feeding by two methods was observed among the rim of boulders of the enclosure, both of which suggest foraging on animal prey of a size that could be grabbed and swallowed easily. When the tide was very low during late January and early

February and the rocky substrate was partially exposed, scaup fed at the surface by head-under probing in crevices between the rocks. In comparison, several domesticated Mallards (*Anas platyrhynchos*) at the site strained in the epiphytic algae with only the bill underwater. When the tide was high, scaup fed by diving over the same or similar sites, typically remaining underwater for 2 to 14 seconds ($\bar{x}$ = 6.9, Range = 2–14, SE = 0.36, n = 70). The water was so shallow that water-boiling from foot action often was evident, and when the water was clear, scaup could be seen diving down between boulders or into holes in concrete structures.

All flock activities took place in a very narrow zone from ca 25 m to 130 m from shore in water <1 m deep. Flock synchrony was common in feeding, swimming, and resting. In December through March, scaup usually fed together on the enclosure rim, and moved from the feeding site as a group to open water 20 m or more from the structure, where they preened and rested in open water. By mid-March, the flock was larger but more dispersed as groups of 2 to 5 scaup selected alternate feeding sites. All favored one of the other three submerged structures (platform and north and south points), near which they also rested between feeding bouts (Fig. 1). Lesser Scaup rarely flew from loafing to feeding sites, but swam as far as 600 m to reach the northernmost feeding sites. Diving did not occur at resting areas or within the enclosure, presumably because mud substrates in open water contained fewer or less-suitable prey items.

The enclosure rim formed the center of flock activities for feeding and, through March, overnight resting. Birds seemed to return to the edge of this site late in the day and the flock increased to its daily maximum. That they spent part or all of the night there is suggested by observations of birds reflected in moonlight or pier lights 2 hr or more after sunset. Although scaup sometimes rested within the enclosure when the tide was high, most gatherings were outside in open water, regardless of wave action. Because the structure was underwater at high tide, it provided no wave protection. In fact, the structure often caused waves to break and water was more turbulent there than elsewhere. This did not deter scaup from diving at these sites, suggesting that quiet water was not the reason for use of the area. However, in early April when winds of over 30 km/hr were common, the flock often rested both day and night behind the shortest but most southerly pier that provided better wind protection from waves that often overtopped them.

Feeding occurred in bouts throughout the day, but continued into darkness and was observed in morning twilight. Observations on a similar species (Tufted Duck *A. fuligula*) wintering in Switzerland (Pedroli 1982) and of migrant Lesser Scaup along the Mississippi River (Thornberg 1973) showed mainly nocturnal feeding resulting from daytime disturbance. Diurnal rest and nocturnal feeding also were noted in dabbling ducks wintering in France by Tamisier (1979) who viewed flock activities in relation to habitat as "functional units." He noted that similar numbers of ducks occurred in daytime rest and social gatherings, and that they dispersed to nocturnal feeding sites. Subsequently, they returned to the daytime habitat that provided predator protection as well as a focal area for courtship. In Corpus Christi Bay, it was the feeding area that seemed to be the core area for the flock. Open-water areas were unlimited, but served only for preening, bathing, and sleeping.

Lesser Scaup also winter in large flocks on large bays (Bellrose 1980), but

shoreline use has been observed in the Coastal Bend for many years, and may be related to invertebrate habitat provided by such underwater structures. Because of minimal human use of these piers and the shallowness of the water, disturbance was not a problem at this site, but boats and shoreline activities could influence scaup use in many areas. Birds adapted to minor human disturbances quickly, and rested at some distance from piers where only rarely they were forced to leave feeding or resting areas.

We suggest that underwater structures provided a food resource not available in open-bay bottoms. Because of the silt and sand shoreline, it has been postulated that the entire northwestern shoreline of the Gulf of Mexico lacked a hard-shore biota until jetties and other rock structures were built (Britton and Morton 1989). Rocky-shore habitats typically are populated by mobile marine invertebrates, and obviously such pioneering also occurs on smaller structures in smaller bays. Such activity seems essential to explain how these structures could provide food for even a small flock of Lesser Scaup for 4 months. Detailed study of this relationship would require analyses of both foods used and foods available in various bay habitats.

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Opportunistic Predation by a Broad-winged Hawk on a Southern Flying Squirrel

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Broad-winged Hawks (*Buteo platypterus*) take a wide variety of prey, including numerous small mammal species (Rusch and Doerr 1972; Fitch 1974; Mosher and Matray 1974; Rosenfield et al. 1984; and Toland 1986). Flying squirrels (*Glaucomys* spp.) are probably not regular prey of diurnal raptors due to the squirrel's nocturnal habits (Davis 1974); however, some overlap in raptor and squirrel activity may occur at dawn and dusk. Mosher and Matray (1974) reported a northern flying squirrel (*G. sabrinus*) brought to a Broad-winged Hawk nest in the Central Adirondacks in New York. Rosenfield et al. (1984) also give an account of a flying squirrel (not identified to species) being brought to a Broad-winged Hawk nest in Lincoln County, Wisconsin. No accounts of Broad-winged Hawks preying on southern flying squirrels (*G. volans*) have ever been documented.

While climbing Red-cockaded Woodpecker (*Picoides borealis*) cavity trees in the Angelina National Forest in eastern Texas (31°15′N, 94°15′W), we witnessed human induced opportunistic predation by a Broad-winged Hawk on a southern flying squirrel. The incident occurred at approximately 1000 hours on 12 April 1991 in a longleaf pine (*Pinus palustris*) stand where we were examining cavities for occupants. RRS was climbing a tree that had two cavities at approximately 9 and 12 m above the ground. The climb required us to use four 3-m interlocking Swedish climbing ladders. As a ladder section was being put into place, two flying squirrels flushed from the lower cavity and climbed to and entered the upper cavity. At this time, an adult Broad-winged Hawk flew in and perched in a tree approximately 40 m from the cavity tree, apparently attracted by the movements of the squirrels. When RRS placed the fourth ladder section on the tree one flying squirrel flushed from the upper cavity. The hawk immediately flew from its perch and caught the squirrel in the tree's crown only 4 m above the climber's head. It then flew off out of sight with its prey.

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NOTES AND NEWS

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