

By day 35 foot span already averaged 99% of adult size. Rapid attainment of adult foot size likely reflects the importance of the many tasks the foot performs (e.g., perching, climbing, feeding).

At hatching, bill width was already 49.4% of adult size, although, at day 35, bill width was closer to adult size than length or depth. This was the result of a more rapid development in width before hatching, since the growth rates of all bill dimensions were about the same throughout nestling development. Since bill width was measured at the base of the bill, it is about equivalent to gape width. The rapid increase of gape width in other species (Dunn, *Condor* 77:431-438, 1975; Holcomb, *Nebraska Bird Rev.* 36:22-32, 1968; Holcomb and Twiest, *Ohio J. Sci.* 68:277-284, 1968; Royama, *Ibis* 108:313-347, 1966) has been interpreted (O'Connor, *Ibis* 119:147-166, 1975) as important in increasing parental feeding efficiency because it allows the young to consume larger food items. Young Monk Parakeets are fed by regurgitation. This material was described as a white, milky fluid (Alexandro 1977). Accordingly, the ability to consume large food items may be of little value to nestlings. Since food is provided by the parents in a rather processed form, there would be little advantage in rapid bill growth for the purpose of processing food items. Fledglings, too, are fed by regurgitation, although they soon begin to do some foraging for themselves. Yet, as Portmann (*Proc. 11th Int. Ornithol. Congr.* 138-151, 1955) has shown, as the brain develops early, the skull must develop similarly to accommodate it. Thus, the greater maturity in bill width may simply reflect the need for early skull development.

*Acknowledgments.*—For their contributions throughout the course of this study I wish to thank Thelma Arculin, Peter J. Alexandro, Susan Ford and Charles Wagg. This is a paper of the Journal Series, New Jersey Agricultural Experiment Station, Cook College, Rutgers, The State University of New Jersey, New Brunswick, New Jersey.—DONALD F. CACCAMISE, *Dept. Entomology and Economic Zoology, Rutgers, The State Univ. New Jersey, New Brunswick, New Jersey 08903. Accepted 1 June 1979.*

*Wilson Bull.*, 92(3), 1980, pp. 381-389

**The influence of agriculture on avian communities near Villavicencio, Colombia.**—Destruction of natural vegetation to meet demands for increased agricultural production has restricted the distribution of certain avian species in Colombia, while benefiting others (Olivares, *Smithson. Contrib. Zool.* No. 26:77-87, 1970; Munves, *Auk* 92:307-321, 1975). In regions where a systematic conversion to agriculture is occurring, studies of the avifauna adapted to the altered habitats would have predictive value. Blydenstein (*Ecology* 48:1-15, 1967) described a recent westward extension of the savanna as forests were cleared at the western edge of the Llanos Orientales, implying changes in avian community composition. This paper examines habitat usage by bird species on a representative agricultural area in this region and asks: how do present land-use trends affect species abundance and distribution?

*Study area.*—The western sections of the Department of Meta and the Intendencia of Casanare were formerly covered by a piedmont rain forest which extended eastward from the Andean foothills, gradually merging with the savanna and gallery forests typical of the Colombian Llanos (Bates, *Geogr. Rev.* 38:555-574, 1948). During the last 3 decades, forests have been diminished greatly in the vicinity of Villavicencio, Meta, and the land converted to the production of rice and cattle. Fieldwork was conducted at the Hacienda La Corocora (3°57'N, 73°24'W; elev. 310 m) 35 km SE of Villavicencio. Detailed descriptions of vegetation and climate in this region are given by Bates (1948) and Blydenstein (1967). Annual precip-

itation averages 2600 mm, distributed mostly April through October. Following the clearing of forest, ricefields and pasture now comprise the large majority of the Hacienda's 3500 ha.

*Methods.*—Habitats on the Hacienda were defined and classified as increasing in area, decreasing, or stable, in accordance with observed land-use trends. Each habitat was censused for bird species an average of 1 h per week from 3 December 1976–10 November 1977, and from 12 May–4 August 1978. Permanent and seasonally resident species recorded were classified as to relative abundance in each habitat: (1) common, almost always observed in the habitat, frequently in large numbers; (2) regular, observed on at least 50% of trips to the habitat, but not in large numbers; (3) uncommon, observed on less than 50% of trips; and (4) scarce, observed on only a few occasions. Classifications for seasonal residents reflect periods of peak abundance. Transient species remaining on the study area for less than a week were not included. Assumptions regarding trends in species abundance and distribution are based on observed species-habitat associations.

*Results.*—Eight habitats were defined on the Hacienda:

- (1) remnant forest—largely in thin (<200 m) strips along streams;
- (2) morichales—stands of Moriche Palms (*Mauritia*) beside permanent pools of water and slow-moving sections of streams;
- (3) second growth—thick herbaceous growth, large woody shrubs, and small trees, often forming a transition between forest and open areas;
- (4) marshes—shallow standing or slow-moving water with floating and emergent vegetation, increasing considerably in area during the wet season;
- (5) ricefields—lots of 10–90 ha with a layer of water usually less than 10 cm deep;
- (6) early-successional fields—low herbaceous growth invading ricefields following harvest and drainage of water. Fields are grazed by cattle for about 7 months, after which weeds are burned and the lots are returned to rice production. Rice is planted in different lots at different times so that rice and cattle production continue simultaneously. During the grazing stage, the vegetation typifies savanna conditions. At any given time, habitats 5 and 6 combined comprise about 65% of the total study area.
- (7) pasture—short-grass permanent pasture with succession arrested by heavy grazing pressure;

(8) residential areas—buildings and grounds with small gardens, shade and fruit trees.

Habitats 5–8 reflect agricultural land-use and can be considered increasing throughout the region, while 1 and 2 most clearly represent original vegetation decreasing due to development. Habitats 3 and 4 are considered essentially stable. Although the latter areas are frequently cleared to increase the amount of land involved in crop production, the rate of depletion is seemingly balanced by the rapid rate at which these habitats are produced.

Habitat usage and abundance of 159 resident and 40 seasonally resident species are summarized in Table 1.

*Discussion.*—Presumably, species most directly benefited by land alteration would be those whose habitat usage is confined to increasing habitats or both increasing and stable habitats. The 57 resident species (36% of total residents) in this category are characterized by raptors associated with open areas (e.g., vultures, Savanna Hawk, caracaras, Burrowing Owl), doves (e.g., ground-doves, Eared Dove, Pale-vented Pigeon), small finches (e.g., seed-eaters, yellow-finches, Yellow-browed Sparrow), as well as various icterids, flycatchers, hummingbirds and others. Most of these species were recorded principally in early-successional fields; few resident species (e.g., Burrowing Owl, Double-striped Thick-knee, Scaled Dove, Carib Grackle) were primarily supported by pastures or residential areas. No resident species were found exclusively or predominately in ricefields. Relatively few of the species associated with increasing habitats were considered uncommon or scarce, implying rapid niche-exploitation and population expansion by open-area species as these habitats become available.

TABLE 1

HABITAT USAGE AND RELATIVE ABUNDANCE OF 199 SPECIES AT HACIENDA LA COROCORA,  
META, COLOMBIA

| Species  | Habitat usage <sup>a</sup> |   |   |   |   |   |   |   |
|--|----------------------------|---|---|---|---|---|---|---|
|  | 1                          | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| Cinereous Tinamou ( <i>Crypturellus cinereus</i> )         | S <sup>b</sup>             | - | S | - | - | - | - | - |
| Undulated Tinamou ( <i>C. undulatus</i> )                  | -                          | - | S | - | - | - | - | - |
| Anhinga ( <i>Anhinga anhinga</i> )                         | -                          | S | - | - | - | - | - | - |
| White-necked Heron ( <i>Ardea cocoi</i> )                  | -                          | - | - | U | - | - | - | - |
| Great Egret ( <i>Casmerodius albus</i> )*                  | -                          | U | - | C | C | - | - | - |
| Snowy Egret ( <i>Egretta thula</i> )*                      | -                          | - | - | R | R | - | - | - |
| Little Blue Heron ( <i>Florida caerulea</i> )*             | -                          | - | - | U | U | - | - | - |
| Striated Heron ( <i>Butorides striatus</i> )               | -                          | - | - | C | R | - | - | - |
| Cattle Egret ( <i>Bubulcus ibis</i> )**                    | -                          | - | - | C | C | C | C | - |
| Whistling Heron ( <i>Syrigma sibilatrix</i> )*             | -                          | - | - | C | - | - | - | - |
| Capped Heron ( <i>Pilherodius pileatus</i> )               | U                          | U | - | - | - | - | - | - |
| Black-crowned Night-Heron ( <i>Nycticorax nycticorax</i> ) | -                          | - | - | R | - | - | - | - |
| Stripe-backed Bittern ( <i>Ixobrychus involucris</i> )*    | -                          | - | - | R | R | - | - | - |
| Pinnated Bittern ( <i>Botaurus pinnatus</i> )*             | -                          | - | - | U | S | - | - | - |
| Bare-faced Ibis ( <i>Phimosus infuscatus</i> )*            | -                          | - | - | C | C | C | - | - |
| White Ibis ( <i>Eudocimus albus</i> )*                     | -                          | - | - | R | R | - | - | - |
| Scarlet Ibis ( <i>E. ruber</i> )*                          | -                          | - | - | C | C | - | - | - |
| Roseate Spoonbill ( <i>Ajaia ajaja</i> )*                  | -                          | - | - | R | R | - | - | - |
| Fulvous Whistling-Duck ( <i>Dendrocygna bicolor</i> )*     | -                          | - | - | R | - | - | - | - |
| White-faced Whistling-Duck ( <i>D. viduata</i> )*          | -                          | - | - | C | R | - | - | - |
| Black-bellied Whistling-Duck ( <i>D. autumnalis</i> )*     | -                          | - | - | C | U | - | - | - |
| Brazilian Duck ( <i>Amazonetta brasiliensis</i> )*         | -                          | - | - | U | - | - | - | - |
| Masked Duck ( <i>Oxyura dominica</i> )*                    | -                          | - | - | C | - | - | - | - |
| Black Vulture ( <i>Coragyps atratus</i> )                  | -                          | - | C | - | - | C | C | - |
| Turkey Vulture ( <i>Cathartes aura</i> )                   | -                          | - | - | - | - | C | C | - |
| Lesser Yellow-headed Vulture ( <i>C. burrovianus</i> )     | -                          | - | - | - | - | C | C | - |
| White-tailed Kite ( <i>Elanus leucurus</i> )               | C                          | - | C | R | - | C | - | - |
| Pearl Kite ( <i>Gampsonyx swainsonii</i> )                 | -                          | - | S | - | - | - | - | - |
| Plumbeous Kite ( <i>Ictinia plumbea</i> )                  | R                          | - | R | - | - | R | - | - |
| White-tailed Hawk ( <i>Buteo albicaudatus</i> )            | R                          | - | R | - | - | R | - | - |
| Zone-tailed Hawk ( <i>B. albonotatus</i> )                 | -                          | - | - | U | U | - | - | - |
| Roadside Hawk ( <i>B. magirostris</i> )                    | C                          | - | C | - | - | C | - | - |
| Gray Hawk ( <i>B. nitidus</i> )                            | U                          | - | R | - | - | R | - | - |
| Savanna Hawk ( <i>Heterospizias meridionalis</i> )         | -                          | - | - | - | C | C | - | - |
| Laughing Falcon ( <i>Herpetotheres cachinnans</i> )        | S                          | - | - | - | - | - | - | - |
| Black Caracara ( <i>Daptrius ater</i> )                    | U                          | U | - | - | - | - | - | - |
| Yellow-headed Caracara ( <i>Milvago chimachima</i> )       | -                          | - | - | - | C | C | C | - |
| Crested Caracara ( <i>Polyborus plancus</i> )              | -                          | - | - | - | - | C | C | - |
| Bat Falcon ( <i>Falco rufigularis</i> )                    | S                          | - | S | - | - | S | - | - |
| Apomado Falcon ( <i>F. femoralis</i> )                     | -                          | - | - | - | U | U | - | - |
| American Kestrel ( <i>F. sparverius</i> )                  | -                          | - | - | - | - | R | R | - |
| Speckled Chachalaca ( <i>Ortalis guttata</i> )             | U                          | - | - | - | - | - | - | - |

TABLE 1  
CONTINUED

| Species  | Habitat usage <sup>a</sup> |   |   |   |   |   |   |   |
|--|----------------------------|---|---|---|---|---|---|---|
|  | 1                          | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| Crested Bobwhite ( <i>Colinus cristatus</i> )                  | -                          | - | - | - | - | C | - | - |
| Hoatzin ( <i>Opisthocomus hoazin</i> )                         | R                          | R | - | - | - | - | - | - |
| Spotted Rail ( <i>Rallus maculatus</i> )*                      | -                          | - | - | U | - | - | - | - |
| Gray-necked Wood-Rail ( <i>Aramides cajanea</i> )              | U                          | - | - | - | - | - | - | - |
| Ash-throated Crake ( <i>Porzana albicollis</i> )*              | -                          | - | - | R | - | - | - | - |
| Yellow-breasted Crake ( <i>P. flaviventer</i> )*               | -                          | - | - | R | - | - | - | - |
| Gray-breasted Crake ( <i>Laterallus exilis</i> )*              | -                          | - | - | S | S | - | - | - |
| Purple Gallinule ( <i>Porphyryla martinica</i> )**             | -                          | - | - | C | C | - | - | - |
| Azure Gallinule ( <i>P. flavirostris</i> )*                    | -                          | - | - | C | R | - | - | - |
| Wattled Jacana ( <i>Jacana jacana</i> )                        | -                          | - | - | C | C | - | - | - |
| Southern Lapwing ( <i>Vanellus chilensis</i> )**               | -                          | - | - | R | R | C | C | - |
| Pied Lapwing ( <i>Hoploxypterus cayanus</i> )*                 | -                          | - | - | U | - | - | - | - |
| Collared Plover ( <i>Charadrius collaris</i> )*                | -                          | - | - | R | - | - | - | - |
| Solitary Sandpiper ( <i>Tringa solitaria</i> )*                | -                          | - | - | C | C | - | - | - |
| Lesser Yellowlegs ( <i>T. flavipes</i> )*                      | -                          | - | - | C | C | - | - | - |
| Greater Yellowlegs ( <i>T. melanoleuca</i> )*                  | -                          | - | - | C | C | - | - | - |
| Spotted Sandpiper ( <i>Actitis macularia</i> )*                | -                          | - | - | C | C | - | - | - |
| Buff-breasted Sandpiper<br>( <i>Tryngites subruficollis</i> )* | -                          | - | - | - | - | - | C | - |
| Common Snipe ( <i>Gallinago gallinago</i> )*                   | -                          | - | - | C | R | - | - | - |
| Common Stilt ( <i>Himantopus himantopus</i> )*                 | -                          | - | - | C | C | - | - | - |
| Double-striped Thick-knee ( <i>Burhinus bistriatus</i> )       | -                          | - | - | - | - | - | U | - |
| Large-billed Tern ( <i>Phaetusa simplex</i> )                  | -                          | - | - | S | - | - | - | - |
| Yellow-billed Tern ( <i>Sterna superciliaris</i> )             | -                          | - | - | S | - | - | - | - |
| Pale-vented Pigeon ( <i>Columba cayennensis</i> )              | -                          | - | R | - | - | R | - | - |
| Rock Dove ( <i>C. livia</i> )                                  | -                          | - | - | - | - | - | - | C |
| Eared Dove ( <i>Zenaida auriculata</i> )                       | -                          | - | - | - | - | C | - | - |
| Plain-breasted Ground-Dove ( <i>Columbina minuta</i> )         | -                          | - | - | - | - | C | - | C |
| Ruddy Ground-Dove ( <i>C. talpacoti</i> )                      | -                          | - | - | - | - | C | - | - |
| Blue Ground-Dove ( <i>Claravis pretiosa</i> )                  | S                          | - | S | - | - | - | - | - |
| Scaled Dove ( <i>Scardafella squammata</i> )                   | -                          | - | - | - | - | - | - | R |
| White-tipped Dove ( <i>Leptotila verreauxi</i> )               | U                          | - | U | - | - | - | - | - |
| Red-bellied Macaw ( <i>Ara manilata</i> )                      | -                          | C | - | - | - | - | - | - |
| Brown-throated Parakeet ( <i>Aratinga pertinax</i> )           | -                          | - | C | - | - | - | - | - |
| Spectacled Parrolet ( <i>Forpus conspicillatus</i> )           | -                          | - | C | - | - | - | - | - |
| Yellow-headed Parrot ( <i>Amazona ochrocephala</i> )           | U                          | - | U | - | - | - | - | - |
| Orange-winged Parrot ( <i>A. amazonica</i> )                   | U                          | - | U | - | - | - | - | - |
| Mealy Parrot ( <i>A. farinosa</i> )                            | S                          | - | S | - | - | - | - | - |
| Yellow-billed Cuckoo ( <i>Coccyzus americanus</i> )*           | -                          | - | S | - | - | - | - | - |
| Dark-billed Cuckoo ( <i>C. melacoryphus</i> )                  | -                          | - | S | - | - | - | - | - |
| Squirrel Cuckoo ( <i>Piaya cayana</i> )                        | R                          | - | R | - | - | - | - | - |
| Little Cuckoo ( <i>P. minuta</i> )                             | U                          | U | U | - | - | - | - | - |
| Smooth-billed Ani ( <i>Crotophaga ani</i> )                    | -                          | - | C | - | C | C | C | - |

TABLE 1  
CONTINUED

| Species   | Habitat usage <sup>a</sup> |   |   |   |   |   |   |   |
|---|----------------------------|---|---|---|---|---|---|---|
|   | 1                          | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| Striped Cuckoo ( <i>Tapera naevia</i> )                           | -                          | - | R | - | - | R | - | - |
| Barn Owl ( <i>Tyto alba</i> )                                     | -                          | - | - | - | U | R | R | - |
| Tropical Screech-Owl ( <i>Otus choliba</i> )                      | R                          | - | R | - | - | - | - | R |
| Burrowing Owl ( <i>Speotyto cunicularia</i> )                     | -                          | - | - | - | - | - | R | - |
| Striped Owl ( <i>Rhinoptynx clamator</i> )                        | -                          | - | S | - | - | - | - | - |
| Great Potoo ( <i>Nyctibius grandis</i> )                          | S                          | - | - | - | - | - | - | - |
| Common Potoo ( <i>N. griseus</i> )                                | R                          | R | - | - | - | - | - | - |
| Lesser Nighthawk ( <i>Chordeiles acutipennis</i> )                | -                          | - | C | - | - | C | C | - |
| Nacunda Nighthawk ( <i>Podager nacunda</i> )                      | -                          | - | - | - | - | C | C | - |
| Pauraque ( <i>Nyctidromus albicollis</i> )                        | -                          | - | - | - | - | C | C | - |
| Spot-tailed Nightjar ( <i>Caprimulgus maculicaudus</i> )          | -                          | - | S | - | - | - | - | - |
| White-collared Swift ( <i>Streptoprocne zonaris</i> )             | C                          | C | C | R | - | C | R | C |
| Short-tailed Swift ( <i>Chaetura brachyura</i> )                  | C                          | C | C | - | - | - | - | - |
| Fork-tailed Palm-Swift ( <i>Reinarda squamata</i> )               | -                          | C | - | - | - | - | - | - |
| Rufous-breasted Hermit ( <i>Glaucis hirsuta</i> )                 | -                          | - | U | - | - | U | - | - |
| Long-tailed Hermit ( <i>Phaethornis superciliosus</i> )           | -                          | - | R | - | - | R | - | - |
| Littler Hermit ( <i>P. longuemareus</i> )                         | -                          | - | S | - | - | S | - | - |
| Black-throated Mango<br>( <i>Anthracothorax nigricollis</i> )     | -                          | U | - | U | - | - | - | U |
| White-tailed Goldenthrout ( <i>Polytmus guainumbi</i> )           | -                          | - | - | C | - | R | - | - |
| Ringed Kingfisher ( <i>Ceryle torquata</i> )                      | -                          | - | - | S | - | - | - | - |
| Green Kingfisher ( <i>Chloroceryle americana</i> )                | -                          | - | - | U | - | - | - | - |
| Pygmy Kingfisher ( <i>C. aenea</i> )                              | -                          | - | - | S | - | - | - | - |
| Blue-crowned Motmot ( <i>Momotus momota</i> )                     | S                          | - | - | - | - | - | - | - |
| Russet-throated Puffbird ( <i>Hypnelus ruficollis</i> )           | -                          | - | U | - | - | - | - | - |
| Swallow-wing ( <i>Chelidoptera tenebrosa</i> )                    | -                          | - | S | - | - | - | - | - |
| Chestnut-eared Araçari<br>( <i>Pteroglossus castanotis</i> )      | R                          | - | - | - | - | - | - | - |
| Scaled Piculet ( <i>Picumnus squamulatus</i> )                    | -                          | - | C | - | - | - | - | - |
| Spot-breasted Woodpecker<br>( <i>Chrysoptilus punctigula</i> )    | R                          | - | R | - | - | - | - | - |
| Lineated Woodpecker ( <i>Dryocopus lineatus</i> )                 | R                          | - | R | - | - | - | - | - |
| Yellow-tufted Woodpecker<br>( <i>Melanerpes cruentatus</i> )      | U                          | - | - | - | - | - | - | - |
| Little Woodpecker ( <i>Veniliornis passerinus</i> )               | U                          | - | U | - | - | - | - | - |
| Crimson-crested Woodpecker<br>( <i>Campephilus melanoleucos</i> ) | S                          | - | - | - | - | - | - | - |
| Straight-billed Woodcreeper<br>( <i>Xiphorhynchus picus</i> )     | U                          | - | - | - | - | - | - | - |
| Pale-breasted Spinetail ( <i>Synallaxis albescens</i> )           | -                          | - | - | R | - | C | - | - |
| Plain-crowned Spinetail ( <i>S. gujanensis</i> )                  | -                          | - | U | - | - | U | - | - |
| Black-crested Antshrike<br>( <i>Sakesphorus canadensis</i> )      | S                          | - | U | - | - | - | - | - |

TABLE 1  
CONTINUED

| Species   | Habitat usage* |   |   |   |   |   |   |   |
|---|----------------|---|---|---|---|---|---|---|
|   | 1              | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| Barred Antshrike ( <i>Thamnophilus doliatus</i> )                 | R              | - | R | - | - | - | - | - |
| White-bellied Antbird ( <i>Myrmeciza longipes</i> )               | -              | - | U | - | - | - | - | - |
| White-winged Becard<br>( <i>Pachyramphus polychopterus</i> )      | -              | - | U | - | - | - | - | - |
| Black-tailed Tityra ( <i>Tityra cayana</i> )                      | U              | - | - | - | - | - | - | - |
| White-bearded Manakin ( <i>Manacus manacus</i> )                  | S              | - | - | - | - | - | - | - |
| Pied Water-Tyrant ( <i>Fluiccola pica</i> )                       | -              | - | - | C | - | - | - | - |
| White-headed Marsh-Tyrant<br>( <i>Arundinicola leucocephala</i> ) | -              | - | - | C | - | - | - | - |
| Cattle Tyrant ( <i>Machetornis rixosus</i> )                      | -              | - | - | - | - | R | R | - |
| Sirystes ( <i>Sirystes sibilator</i> )                            | S              | - | S | - | - | - | - | - |
| Fork-tailed Flycatcher ( <i>Muscivora tyrannus</i> )              | -              | - | - | - | - | C | - | - |
| Eastern Kingbird ( <i>Tyrannus tyrannus</i> )*                    | -              | - | S | - | - | - | - | - |
| Tropical Kingbird ( <i>T. melancholicus</i> )                     | -              | C | C | - | - | C | - | C |
| Boat-billed Flycatcher ( <i>Megarhynchus pitangua</i> )           | U              | - | U | - | - | - | - | - |
| Streaked Flycatcher ( <i>Myiodynastes maculatus</i> )             | -              | - | U | - | - | - | - | - |
| Rusty-margined Flycatcher<br>( <i>Myiozetetes cayanensis</i> )    | -              | C | C | C | - | C | - | C |
| Social Flycatcher ( <i>M. similis</i> )                           | -              | - | C | - | - | - | - | - |
| Great Kiskadee ( <i>Pitangus sulphuratus</i> )                    | C              | C | C | R | - | R | - | C |
| Lesser Kiskadee ( <i>P. lictor</i> )                              | -              | - | U | - | - | U | - | - |
| Short-crested Flycatcher ( <i>Myiarchus ferox</i> )               | -              | - | S | - | - | - | - | - |
| Brown-crested Flycatcher ( <i>M. tyrannulus</i> )                 | -              | - | R | - | - | U | - | - |
| Dusky-capped Flycatcher ( <i>M. tuberculifer</i> )                | -              | - | R | - | - | U | - | R |
| Yellow-breasted Flycatcher<br>( <i>Tolmomyias flaviventris</i> )  | -              | - | U | - | - | - | - | - |
| Painted Tody-Flycatcher<br>( <i>Todirostrum chrysocrotaphum</i> ) | S              | - | - | - | - | - | - | - |
| Common Tody-Flycatcher ( <i>T. cinereum</i> )                     | R              | - | R | - | - | - | - | - |
| Slate-headed Tody-Flycatcher ( <i>T. sylvia</i> )                 | -              | - | U | - | - | - | - | - |
| Pale-eyed Pygmy-Tyrant ( <i>Atalotriccus pilaris</i> )            | -              | - | S | - | - | - | - | - |
| Yellow-bellied Elaenia ( <i>Elaenia flavogaster</i> )             | -              | - | C | C | - | - | - | - |
| Lesser Elaenia ( <i>E. chiriquensis</i> )                         | -              | - | R | - | - | - | - | - |
| Southern Beardless Tyrannulet<br>( <i>Campostoma obsoletum</i> )  | -              | - | U | - | - | - | - | - |
| Blue-and-white Swallow<br>( <i>Notiochelidon cyanoleuca</i> )*    | -              | - | - | - | C | C | - | - |
| Rough-winged Swallow<br>( <i>Stelgidopteryx ruficollis</i> )      | -              | - | - | U | U | - | - | - |
| Barn Swallow ( <i>Hirundo rustica</i> )*                          | -              | - | C | C | C | C | C | C |
| Violaceous Jay ( <i>Cyanocorax violaceus</i> )                    | U              | - | - | - | - | - | - | - |
| Bicolored Wren ( <i>Campylorhynchus griseus</i> )                 | R              | C | - | - | - | - | - | - |
| Rufous-breasted Wren ( <i>Thryothorus rutilus</i> )               | C              | - | C | - | - | - | - | - |

TABLE 1  
CONTINUED

| Species  | Habitat usage <sup>a</sup> |   |   |   |   |   |   |   |
|--|----------------------------|---|---|---|---|---|---|---|
|  | 1                          | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| House Wren ( <i>Troglodytes aedon</i> )                          | -                          | - | - | - | - | - | - | R |
| Tropical Mockingbird ( <i>Mimus gilvus</i> )                     | -                          | - | - | - | - | C | - | C |
| Black-capped Mockingthrush<br>( <i>Donacobius atricapillus</i> ) | -                          | - | - | C | - | - | - | - |
| Black-billed Thrush ( <i>Turdus ignobilis</i> )                  | -                          | - | U | - | - | - | - | - |
| Bare-eyed Thrush ( <i>T. nudigenis</i> )                         | U                          | - | U | - | - | - | - | - |
| Yellowish Pipit ( <i>Anthus lutescens</i> )                      | -                          | - | - | - | - | R | - | - |
| Red-eyed Vireo ( <i>Vireo olivaceus</i> )                        | C                          | - | R | - | - | - | - | - |
| Shiny Cowbird ( <i>Molothrus bonariensis</i> )                   | -                          | - | U | R | - | - | - | R |
| Giant Cowbird ( <i>Scaphidura oryzivora</i> )                    | U                          | - | U | - | - | - | - | - |
| Crested Oropendula ( <i>Psarocolius decumanus</i> )              | R                          | C | - | - | - | - | - | - |
| Yellow-rumped Cacique ( <i>Cacicus cela</i> )                    | R                          | - | R | - | - | - | - | - |
| Yellow-billed Cacique ( <i>C. holosericeus</i> )                 | -                          | - | U | - | - | - | - | - |
| Carib Grackle ( <i>Quiscalus lugubris</i> )                      | -                          | - | - | - | - | - | - | U |
| Yellow-hooded Blackbird<br>( <i>Agelaius icterocephalus</i> )    | -                          | - | - | C | C | - | - | - |
| Oriole Blackbird ( <i>Gymnomystax mexicanus</i> )                | -                          | - | C | R | - | C | - | - |
| Red-breasted Blackbird ( <i>Leistes militaris</i> )              | -                          | - | - | - | R | C | C | - |
| Eastern Meadowlark ( <i>Sturnella magna</i> )                    | -                          | - | - | - | - | R | C | - |
| Bobolink ( <i>Dolichonyx oryzivorus</i> )*                       | -                          | - | - | - | C | C | - | - |
| Blackpoll Warbler ( <i>Dendroica striata</i> )*                  | R                          | - | R | - | - | - | - | - |
| Masked Yellowthroat ( <i>Geothlypis aequinoctialis</i> )         | -                          | - | - | C | - | - | - | - |
| Bananaquit ( <i>Coereba flaveola</i> )                           | -                          | - | C | - | - | - | - | C |
| Swallow-tanager ( <i>Tersina viridis</i> )                       | -                          | - | S | - | - | - | - | - |
| Orange-bellied Euphonia ( <i>Euphonia xanthogaster</i> )         | -                          | - | U | - | - | - | - | - |
| Burnished-buff Tanager ( <i>Tangara cayana</i> )                 | -                          | - | C | - | - | - | - | - |
| Blue-gray Tanager ( <i>Thraupis episcopus</i> )                  | C                          | R | C | - | - | - | - | C |
| Palm Tanager ( <i>T. palmarum</i> )                              | C                          | C | - | - | - | - | - | C |
| Silver-beaked Tanager ( <i>Ramphocelus carbo</i> )               | -                          | - | C | - | - | - | - | - |
| White-lined Tanager ( <i>Tachyphonus rufus</i> )                 | -                          | - | U | - | - | U | - | - |
| Magpie Tanager ( <i>Cissopis leveriana</i> )                     | -                          | - | U | - | - | - | - | - |
| Black-faced Tanager ( <i>Schistochlamys melanopsis</i> )         | -                          | - | R | - | - | - | - | - |
| Buff-throated Saltator ( <i>Saltator maximus</i> )               | -                          | - | R | - | - | - | - | - |
| Grayish Saltator ( <i>S. coerulescens</i> )                      | -                          | - | C | - | - | - | - | - |
| Blue-black Grassquit ( <i>Volatinia jacarina</i> )               | -                          | - | - | - | - | C | - | - |
| Gray Seedeater ( <i>Sporophila intermedia</i> )                  | -                          | - | - | - | - | C | - | - |
| Lined Seedeater ( <i>S. lineola</i> )*                           | -                          | - | S | - | - | S | - | - |
| Yellow-bellied Seedeater ( <i>S. nigricollis</i> )*              | -                          | - | S | - | - | S | - | - |
| Ruddy-breasted Seedeater ( <i>S. minuta</i> )                    | -                          | - | - | - | - | C | - | - |
| Large-billed Seed-Finch<br>( <i>Oryzoborus crassirostris</i> )   | -                          | - | - | C | - | - | - | - |
| Lesser Seed-Finch ( <i>O. angolensis</i> )                       | -                          | - | - | U | - | U | - | - |
| Saffron Finch ( <i>Sicalis flaveola</i> )                        | -                          | - | - | - | - | R | - | R |

TABLE 1  
CONTINUED

| Species   | Habitat usage <sup>a</sup> |    |    |    |    |    |    |    |
|---|----------------------------|----|----|----|----|----|----|----|
|   | 1                          | 2  | 3  | 4  | 5  | 6  | 7  | 8  |
| Grassland Yellow-Finch ( <i>S. luteola</i> )                  | -                          | -  | -  | -  | -  | R  | -  | -  |
| Black-striped Sparrow ( <i>Arremonops conirostris</i> )       | -                          | -  | R  | -  | -  | -  | -  | -  |
| Yellow-browed Sparrow ( <i>Myospiza aurifrons</i> )           | -                          | -  | -  | -  | -  | C  | -  | -  |
| Wedge-tailed Grass-Finch<br>( <i>Emberizoides herbicola</i> ) | -                          | -  | -  | -  | -  | R  | -  | -  |
| Total species   | 53                         | 19 | 88 | 60 | 36 | 62 | 21 | 19 |
| Species unique to habitat                                     | 13                         | 3  | 33 | 21 | 0  | 11 | 3  | 4  |

<sup>a</sup> 1 = Remnant forest, 2 = morichales, 3 = second growth, 4 = marshes, 5 = ricefields, 6 = early-successional fields, 7 = pasture, 8 = residential areas.

<sup>b</sup> C = Common, R = Regular, U = Uncommon, S = Scarce—as defined in text.

\* Seasonal resident.

\*\* Mostly seasonal, with small numbers resident all year.

Twenty-two species (14% of total residents) were confined to decreasing habitats and should be the most negatively affected by habitat change. These include species requiring large trees for cavity nest-sites (e.g., Chestnut-eared Araçari, woodpeckers, Straight-billed Woodcreeper, Black-tailed Tityra), large branches for cover or nesting (Speckled Chachalaca, potoos, Crested Oropendula) and wooded streams or pools (Capped Heron, Hoatzin, Gray-necked Wood-Rail). Although few species use morichales, at least 2 (Red-bellied Macaw, Fork-tailed Palm-Swift) apparently require stands of palm trees for nesting. The extent to which forests might limit the abundance of certain species most closely associated with other habitats is uncertain. An additional 48 species (30% of total residents) use decreasing habitats to some degree, many of which undoubtedly depend upon factors such as the availability of cavity nest-sites (e.g., parrots) or forest-edge perches (e.g., Bat Falcon, kites).

Ricefields supported very few resident species, but provided the preferred habitat for most of the seasonally resident herons, ibis, rails and shorebirds. Most of the migrants recorded were wetlands species which breed either in North America (shorebirds) or other regions of Colombia and occur commonly in ricefields, mainly between November and June. The majority occupied early-stage ricefields (until about 10 weeks following germination), although a few (bitterns, gallinules, Bobolink) were most often found in maturing ricefields. According to local farmers, Purple Gallinules have increased considerably in abundance coincident with the overall increase in ricefield area. This species occupied the study area throughout the wet season (with some individuals remaining all year) and was the only bird to nest commonly in the rice. Little is known regarding the movements of migratory species in Colombia, and many of the Hacienda's seasonally resident species have seldom been reported from the Villavicencio region (Meyer de Schauensee, *Caldasia* 5:251-1214, 1948-52). Since large expanses of ricefields are a fairly recent development in the Llanos Orientales, and offer excellent habitat to numerous migrants, it is possible that some of these species may be extending their ranges in response to this creation of favorable habitat.

Among the agricultural practices which benefit certain species, the alternation of rice and cattle culture on plots of land is clearly the most important. This process maintains large sections of savanna vegetation in a region where the amount of rainfall would induce the regrowth of forest if succession were allowed to proceed. The effect of this practice is shown



by the relatively large proportion of species associated with the early-successional field habitat. The rice stage supports large numbers of seasonally resident species. Forests occupy a small area of the Hacienda, but were used to some extent by about one-third of the resident species observed. The comparatively low usage of pastures and residential areas indicates that creating these habitats by clearing forests greatly decreases species richness on a given area. Of the 60 species recorded in decreasing habitats, 32 (53%) were considered either uncommon or scarce, further underscoring the importance of forest conservation in contributing to avian community composition in this region.

This survey was conducted during a study of avian agricultural damage, sponsored by the Colombian Agricultural Institute (ICA). I am grateful for the assistance of La Corocora Ltda., D. Valencia G., D. Leal and E. Barriga B.—WALLACE D. MCKAY (deceased), *Smithsonian-Peace Corps Environmental Program, U.S. Embassy, Bogotá, Colombia. Accepted 20 Apr. 1979.*

*Wilson Bull.*, 92(3), 1980, pp. 389–393

**Three more probable hybrids of *Larus hyperboreus* and *L. argentatus*.**—Although widespread hybridization between Glaucous (*Larus hyperboreus*) and herring (*L. argentatus*) gulls has taken place in Iceland and Eurasia (Ingolfsson, Ibis 112:340–362, 1970), there are few reports of its presumed natural occurrence in North America (Jehl and Frohling, Auk 82:498–500, 1965; Ingolfsson 1970; Jehl, Calif. Birds 2:27–32, 1971). Smith (Ornithol. Monogr. no. 4, 1966) was able to induce hybridization by experimental manipulation of eye-ring color and wing-tip pattern.

Of the 3 new presumed hybrids, 1 was found by Arthur Clark, Arthur Schaffner and me on 7 November 1976, on the Niagara River near its mouth off Niagara-on-the-Lake, Ontario. We collected it (BSNS 7057) on 13 November 1976. The other 2 were secured by Richard Poulin in Ontario at the Ottawa dump in Gloucester Township on 23 November 1974 (NMC 61982), and at Beare Road dump, Dunbarton, Ontario Co. (now Durham RM), on 25 October 1975 (NMC 65619). The Niagara bird was probably in its second year, the Ontario specimens in first-year plumage. All 3 birds in most measurements are intermediate between Glaucous and Herring gulls (Table 1). The Niagara specimen is quite whitish, but has dark markings on wings and tail, unlike any plumage of Glaucous Gull. The Ontario birds are generally brownish and white and markedly paler overall than Herring Gulls of corresponding age.

The Niagara River specimen's plumage is not worn. The head, neck and under-parts are white with medium to dark brown streaks on crown, nape, sides of neck and throat; the lower breast and belly are tinged pale brown with some darker brown markings, and undertail coverts are barred with medium brown. Mantle is whitish with scattered tan, medium brown and gray feathers (Pallid Neutral Gray of Ridgway, Color standards and color nomenclature, 1912) are evident, especially on scapulars and back. Outer 5 primaries are Hair Brown on outer vane, paler on inner with "tongues" of white on inner vane of primaries 6 to 9. Primary shafts are buffy-white and there is a narrow, whitish, approximately 15 mm-long area on the outer vane of each 10th primary about 17 mm from the tip. Outer webs of secondaries are also Hair Brown, some slightly mottled with whitish, the inner webs paler brown, except for proximal ones which are whitish peripherally. Terminal half of tail is Hair Brown blending into mottled pale brown on white and then to white. Bill was pale whitish, the terminal third black. Iris was pale brownish-gray, the orbital ring whitish-gray, and the legs and feet flesh color. All soft part colors were noted immediately after collecting.

In general coloration our specimen resembles a probable *L. hyperboreus* × *L. argentatus* hybrid (AMNH 468816) collected by Jehl and Frohling (1965) in New Jersey except that ours