

Avifauna of the Brickfield Mudflats, Trinidad and Tobago

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ABSTRACT

The coastal mudflats at the southern end of Caroni Swamp, Trinidad, provide feeding and roosting areas for large congregations of resident and migrant seabirds, shorebirds and waders. The birds using the mudflats and their relative abundance are presented, together with bird lists for the surrounding habitats. The species composition on the mudflats is influenced by the habitat, location, and surrounding economic activities. The site meets the criteria for designation as an *Environmentally Sensitive Area*.

INTRODUCTION

The western coast of Trinidad, West Indies, from Port of Spain to San Fernando is characterised by shallow seas and coastal mudflats. These mudflats provide feeding and roosting habitats for large congregations of resident and migrant shorebirds (Morrison and Ross 1989; Chandool 1999) seabirds (Hayes *et al.* 2004), and waders. The area accounts for over 90% of the shorebird population in Trinidad and over 60% of the shorebirds on the shores of the Gulf of Paria (Morrison and Ross 1989). Hayes *et al.* (2004) conclude that the western coast of Trinidad may be the most important over-wintering site for gulls in northern South America. Barrancones Bay at Brickfield is particularly rich in birds and easily accessible. It has become an important stop for visiting birders.

The major wetlands in Trinidad are legally protected, but are threatened by encroaching development, squatting and changes in land use. Illegal hunting persists in both protected and unprotected areas. The Brickfield Village community have initiated plans to protect the birdlife in their area and facilitate birdwatchers.

This study was motivated, in part by their efforts. We hope to support their initiative by documenting the bird species inhabiting the area and determining their relative abundance. We studied the avifauna of the coastal mudflats from Barrancones Bay to the mouth of the Couva River, and explored its relationship with the surrounding habitat and land use.

Description of site

The location of the study area and major features are illustrated in Fig.1. At low tide extensive mudflats are exposed from Barrancones Bay to the Couva River. At high tide the mudflats are generally covered save for the north end of Barrancones Bay. Three sandbars between Waterloo and Orange Valley remain exposed until the tide has reached its peak. These exposed areas serve as roosting sites for seabirds and roosting and feeding sites for shorebirds. The remains of an old jetty (the piles) at Waterloo are favoured by roosting terns. The causeway of the Waterloo Temple and a pier at Orange Valley provide a rocky-shore habitat. There are extensive

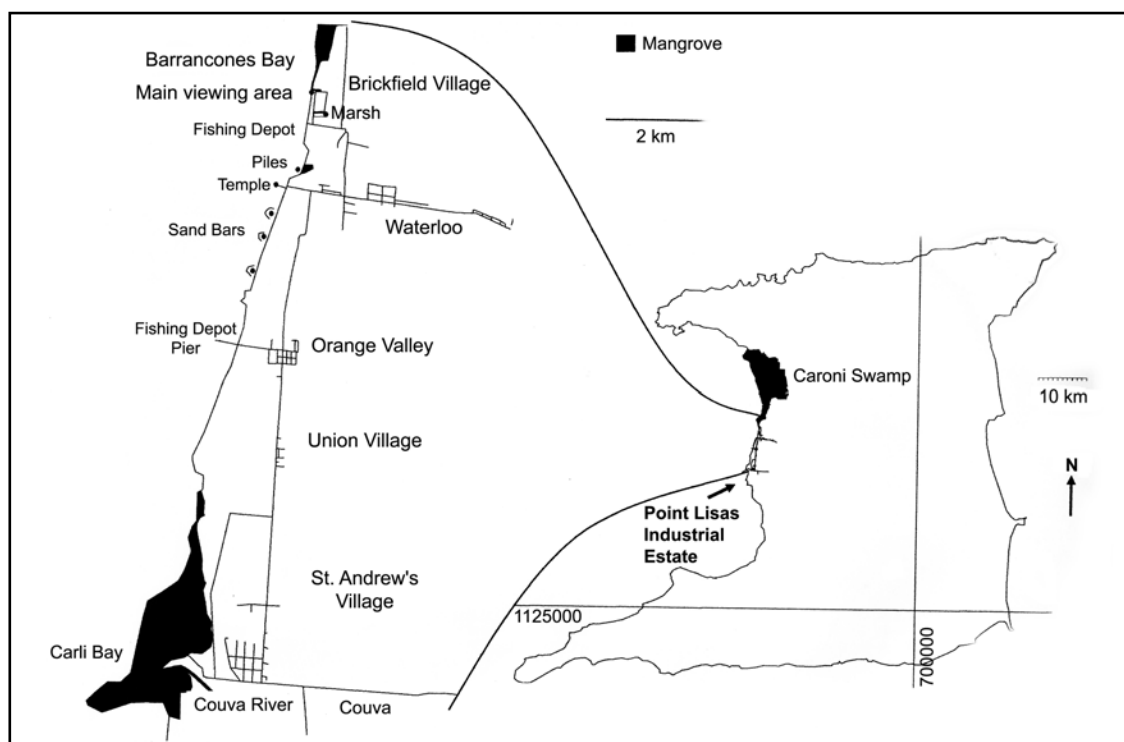


Fig. 1. Map of study area

mangroves surrounding the Couva River mouth and north of Barrancones Bay, which is the southern end of the Caroni Swamp Mangrove. Smaller patches of mangrove occur at Waterloo and Union Village. An abandoned shrimp farming facility at Brickfield serves as a small freshwater marsh. Areas of grass, scrub and small trees occur along ditches, around industrial development, in abandoned sugarcane fields and along the road to Carli Bay. Adding to the diversity of habitat are residential areas with fruit bearing trees.

Economic activity in the area includes fishing and sugarcane cultivation and there is a major industrial park at Point Lisas to the south. There are fishing depots at Brickfield and Orange Valley and small congregations of boats at Waterloo and Carli Bay. Sugarcane production is declined after 2003.

METHODS

The Brickfield mudflats were visited on 48 occasions from 1990-2003 by GW and on 57 occasions between 1999-2002 by MK. Visits were of variable duration from 10 minutes to two hours. Longer visits were usually at low tide, 07.00-09.00 h or 16.00-18.00 h. During visits by GW an attempt was made to record all species present on the mudflats, shoreline or perched on boats. Both observers recorded any unusual species or particularly large numbers of individuals. Visits by MK usually included a visit to the freshwater

marsh. Telescopes and binoculars were used for species identification and counting (GW- Nikon Fieldscope and Celestron 8x42 binoculars, MK- Kowa 32x scope and Leica 10x42 Binoculars). In addition, shorter visits were made to the Couva River mouth, Orange Valley, the sandbars south of the temple and the piles at Waterloo to observe seabirds. During this period, all species observed in the Waterloo residential area were recorded. Nomenclature follows that of the American Ornithologists Union (1998).

RESULTS

Species found associated with the coastal mudflats in the study area are listed in Table 1, together with two indicators of relative abundance – frequency of observation and highest numbers recorded. Sixty-nine species were associated with this habitat, the major families being Ardeidae, 8 species; Charadriidae, 7 species; Scolopacidae, 19 species and Laridae, 14 species. With respect to status, 37 species are non-breeding migrants, 33 of which breed in continental North America. Rare migrants and vagrants number 11 species. The tally of 69 includes 38 common or abundant species, 13 uncommon, 2 local, 5 scarce and 11 rare or accidental.

Several shorebirds appear to favour the areas of mud at the mangrove edge, either because of availability of food, or for protection from the sun or predators. The raptors observed, Yellow-

Table 1. Birds associated with tidal mudflats from Orange Valley- Brickfield 1996-2003: their relative abundance and status in Trinidad.

| Family | Species | Days seen /48 | Highest count | Status and abundance | |
|-------------------|---|------------------|---------------|----------------------|----|
| Pelicanidae | Brown Pelican, <i>Pelicanus occidentalis</i> | 32 | 592 | R | A |
| Phalacrocoracidae | Neotropic Cormorant, <i>Phalacrocorax brasilianus</i> | 17 | 100s | VS | C |
| Fregatidae | Magnificent Frigatebird, <i>Fregata magnificens</i> | 48 | 10 | R | C |
| Ardeidae | Great Blue Heron, <i>Ardea herodias</i> | 17 | 6 | VN | U |
| | Great Egret, <i>Ardea alba</i> | 32 | 30 | BD | C |
| | Snowy Egret, <i>Egretta thula</i> | 42 | 87 | BV | A |
| | Little Blue Heron, <i>Egretta caerulea</i> | 42 | 253 | BV | A |
| | Tricoloured Heron, <i>Egretta tricolor</i> | 18 | 20 | BV | C |
| | Striated Heron, <i>Butorides striatus</i> | 9 | 1 | BV | A |
| | Black-crowned Night-heron, <i>Nycticorax nycticorax</i> | 10 | 13 | R | C |
| | Yellow-crowned Night-heron, <i>Nyctanassa violacea</i> | 21 | 77 | R | C |
| Threskiornithidae | Scarlet Ibis, <i>Eudocimus ruber</i> | 31 | 106 | BV | L |
| Ciconiidae | Wood Stork, <i>Mycteria americana</i> | 1 | 1 | M | R |
| | Maguari Stork, <i>Ciconia maguari</i> | 1 | 1 | M | R |
| Cathartidae | Black Vulture, <i>Coragyps atratus</i> | 15 | 50 | R | A |
| Phoenicopteridae | Greater Flamingo, <i>Phoenicopterus ruber</i> | 4 | 4 | M | R |
| Anatidae | Blue-winged Teal, <i>Anas discors</i> | 3 | 8 | VN | C |
| Pandionidae | Osprey, <i>Pandion haliaetus</i> | 20 | 6 | VN | C |
| Accipitridae | Long-winged Harrier, <i>Circus biffoni</i> | 2 | 2 | R | Sc |
| | Rufous Crab-hawk, <i>Buteogallus aequinoctialis</i> | 1 | 1 | R | Sc |
| | Common Black Hawk, <i>Buteogallus anthracinus</i> | 2 | 2 | R | U |
| Falconidae | Yellow-headed Caracara, <i>Milvago chimachima</i> | 4 | 2 | R | C |
| | Merlin, <i>Falco columbarius</i> | 1 | 1 | VN | U |
| | Peregrine Falcon, <i>Falco peregrinus</i> | 1 | 1 | VN | U |
| Rallidae | Clapper Rail, <i>Rallus longirostris</i> | 5 | 2 | R | L |
| | Common Moorhen, <i>Gallinula chloropus</i> | 1 | 4 | R | C |
| Charadriidae | Southern Lapwing, <i>Vanellus chilensis</i> | 25 | 100 | R | C |
| | Black-bellied Plover, <i>Pluvialis squatarola</i> | 29 | 50 | VN | C |
| | American Golden Plover, <i>Pluvialis dominica</i> | 3 | 10 | VN | U |
| | Collared Plover, <i>Charadrius collaris</i> | 22 | 37 | BD | C |
| | Wilson's Plover, <i>Charadrius wilsonia</i> | 7 | 4 | VN | U |
| Hematopodidae | Semipalmated Plover, <i>Charadrius semipalmatus</i> | 34 | 109 | VN | C |
| | American Oystercatcher, <i>Haematopus palliatus</i> | 4 | 2 | M | R |
| Recurvirostridae | Black-necked Stilt, <i>Himantopus mexicanus</i> | 12 | 31 | BD | C |
| Scolopacidae | Greater Yellowlegs, <i>Tringa melanoleuca</i> | 15 | 22 | VN | C |
| | Lesser Yellowlegs, <i>Tringa flavipes</i> | 22 | 65 | VN | A |
| | Solitary Sandpiper, <i>Tringa solitaria</i> | 2 | 1 | VN | C |

Table 1. (Continued). Birds associated with tidal mudflats from Orange Valley- Brockfield 1996-2003: their relative abundance and status in Trinidad.

| Family | Species | Days seen /48 | Highest count | Status and abundance | |
|----------------|---|------------------|---------------|----------------------|----|
| | Willet, <i>Catoptrophorus semipalmatus</i> | 38 | 70 | VN | C |
| | Spotted Sandpiper, <i>Actitis macularia</i> | 28 | 5 | VN | C |
| | Terek Sandpiper, <i>Xenus cinereus</i> | 1* | 1 | M | R |
| | Whimbrel, <i>Numenius phaeopus</i> | 43 | 115 | VN | C |
| | Black-tailed Godwit, <i>Limosa limosa</i> | 1 | 1 | M | R |
| | Marbled Godwit, <i>Limosa fedoa</i> | 9 | 2 | VN | R |
| | Ruddy Turnstone, <i>Arenaria interpres</i> | 28 | 9 | VN | C |
| | Red Knot, <i>Calidris canutus</i> | 19 | 51 | VN | U |
| | Sanderling, <i>Calidris alba</i> | 1 | 1 | VN | U |
| | Semipalmated Sandpiper, <i>Calidris pusilla</i> | 30 | (1000 | VN | A |
| | Western Sandpiper, <i>Calidris mauri</i> | 31 | combined) | VN | A |
| | Least Sandpiper, <i>Calidris minutilla</i> | 8 | 10 | VN | A |
| | White-rumped Sandpiper, <i>Calidris fuscicollis</i> | 4 | 10 | VN | U |
| | Pectoral Sandpiper, <i>Calidris melanotos</i> | 3 | 6 | VN | U |
| | Stilt Sandpiper, <i>Calidris himantopus</i> | 6 | 2 | VN | C |
| | Short-billed Dowitcher, <i>Limnodromus griseus</i> | 28 | 394 | VN | C |
| Stercorariidae | Parasitic Jaeger, <i>Stercorarius parasiticus</i> | 5 | 1 | VN? | Sc |
| Laridae | Laughing Gull, <i>Larus atricilla</i> | 44 | 3000 | BD | A |
| | Franklin's Gull, <i>Larus pipixcan</i> | 1 | 2 | M | R |
| | Common Black-headed Gull, <i>Larus ridibundus</i> | 1 | 2 | M | R |
| | Lesser Black-backed Gull, <i>Larus fuscus</i> | 12 | 5 | VN | U |
| | Kelp Gull, <i>Larus dominicanus</i> | 1 | 1 | M | R |
| | Sabine's Gull, <i>Xema sabini</i> | 1 | 1 | M | R |
| | Gull-billed Tern, <i>Sterna nilotica</i> | 15 | 14 | VN | U |
| | Royal Tern, <i>Sterna maxima</i> | 11 | 150 | VN | C |
| | Sandwich Tern, <i>Sterna sadvicensis</i> | 5 | 1 | VN? | U |
| | Common Tern, <i>Sterna hirundo</i> | 15 | 143 | VN | C |
| | Least Tern, <i>Sterna albifrons</i> | 2 | 11 | VN | Sc |
| | Yellow-billed Tern, <i>Sterna supercilialis</i> | 30 | 149 | VS | C |
| | Large-billed Tern, <i>Phaetusa simplex</i> | 35 | 103 | VS | C |
| | Black Tern, <i>Chlidonias niger</i> | 1 | 2 | M | Sc |
| Rynchopidae | Black Skimmer, <i>Rynchops niger</i> | 41 | 860 | VS | C |

Status - Adapted from French (1991).

Abundance - field experience of authors.

| | | | |
|-------|--|----|---|
| R | Resident species without significant movement | A | Abundant; widespread and usually in some numbers in suitable habitat. |
| BD | Species that breed locally and migrate or disperse to the mainland (sometimes only partially) | C | Common, usually seen in suitable habitat. |
| BV | Resident breeding species whose numbers are augmented by migrants from continental N & S America | L | Locally distributed in restricted habitat; but may be not uncommon there. |
| V N/S | Non-breeding visitor from continental North or South America | U | Uncommon; occasionally seen in suitable habitat in small numbers or singly. |
| M | Rare migrants and vagrants | Sc | Scarce; very few records in a year. |
| | | R | Rare or accidental. |

headed Caracara, Peregrine Falcon and Merlin and have been seen hunting over the mudflats, and the Long-winged Harrier, Common Black Hawk and Rufous Crab Hawk, have spooked the mudflat birds as they fly over.

A roost of Snowy, Great and Cattle Egrets occurs between Brickfield and Waterloo. In May 2003 this roost included 831 Cattle Egrets, 44 Snowy Egrets and 14 Great Egrets. Roosts of Brown Pelicans occur in the mangrove north of Brickfield, south of Orange Valley and at Carli Bay.

A further 95 species, not associated with mudflats, were observed within the immediate area. The predominant habitat in which the species were observed is shown in Table 2. The distinction between "residential" and "open trees, scrub and grasses" is subtle but important. The open scrub along canals and in abandoned sugarcane land provides little food for nectivorous

or frugivorous birds. Such species rely on residential gardens. Species common in both habitats are classed with the open trees, scrubs and grasses. Of the 95 species observed 34 were found in the open trees, scrub and grasses and 29 associated with the residential areas. Ten species were associated with mangrove, mainly at the northern end of Brickfield. The small marsh at the shrimp farm, together with a few drainage canals, provide habitat for nine marsh birds and five species are associated with open waterways. The presence of such species as White-necked Jacobin, Long-billed Starthroat and Red-legged Honeycreeper, well outside of their normal habitat, reflects possible migration to Venezuela (French 2000). The Red-bellied Macaws were observed on five occasions in 1994, 1997 and 1999 with 75 birds seen on one occasion. The birds were presumably attracted to the Royal Palms, *Roystonea oleracea*, but they are well outside of their normal range.

Table 2 Birds observed around Brickfield to Orange Valley not associated with coastal mudflats, 1996-2003.

| Family | Species | Predominant habitat in which observed |
|----------------|---|---------------------------------------|
| Podicipedidae | Least Grebe, <i>Tachybaptus dominicus</i> | Freshwater marsh |
| Pelicaniformes | Brown Booby, <i>Sula leucogaster</i> | Marine |
| Ardeidae | Pinnated Bittern, <i>Botarus pinnatus</i> | Freshwater marsh |
| | Stripe-backed Bittern, <i>Ixobrychus involucris</i> | Freshwater marsh |
| | Cocoi Heron, <i>Ardea cocoi</i> | Freshwater marsh |
| | Cattle Egret, <i>Bubulcus ibis</i> | Open trees, scrub & grasses |
| Accipitridae | Grey-headed Kite, <i>Leptodon cayanensis</i> | Open trees, scrub & grasses |
| | Pearl Kite, <i>Gampsonyx swainsonii</i> | Residential |
| | Grey Hawk, <i>Asturina nitida</i> | Residential |
| | Short-tailed Hawk, <i>Buteo brachyurus</i> | Open trees, scrub & grasses |
| | Zone-tailed Hawk, <i>Buteo albonotatus</i> | Open trees, scrub & grasses |
| Rallidae | Grey-necked Wood-rail, <i>Aramides cajanea</i> | Mangrove |
| | Sora, <i>Porzana carolina</i> | Freshwater marsh |
| | Yellow-breasted Crake, <i>Porzana flaviventer</i> | Freshwater marsh |
| | Purple Gallinule, <i>Porphyula martinica</i> | Freshwater marsh |
| | Common Moorhen, <i>Gallinula chloropus</i> | Freshwater marsh |
| Aramidae | Limpkin, <i>Aramus guarauna</i> | Open trees, scrub & grasses |
| Jacaniidae | Wattled Jacana, <i>Jacana jacana</i> | Freshwater marsh |
| Scolopacidae | Common Snipe, <i>Gallinago gallinago</i> | Open trees, scrub & grasses |
| Columbidae | Pale-vented Pigeon, <i>Columba cayennensis</i> | Open trees, scrub & grasses |
| | Eared Dove, <i>Zenaida auriculata</i> | Open trees, scrub & grasses |
| | Common Grounddove, <i>Columbina passerina</i> | Open trees, scrub & grasses |
| | Ruddy Grounddove, <i>Columbina talpacoti</i> | Open trees, scrub & grasses |
| Psittacidae | Red-bellied Macaw, <i>Ara manilata</i> | Residential |
| | Green-rumped Parrotlet, <i>Forpus passerinus</i> | Open trees, scrub & grasses |
| | Yellow-crowned Parrot, <i>Amazona ochrocephala</i> | Residential |
| Cuculidae | Striped Cuckoo, <i>Tapera naevia</i> | Open trees, scrub & grasses |
| | Greater Ani, <i>Crotophaga major</i> | Mangrove |
| | Smooth-billed Ani, <i>Crotophaga ani</i> | Open trees, scrub & grasses |
| Tytonidae | Barn owl, <i>Tyto alba</i> | Open trees, scrub & grasses |
| Strigidae | Tropical Screech-owl, <i>Otus choliba</i> | Residential |
| | Ferruginous Pygmy-owl, <i>Glaucidium brasilianum</i> | Residential |
| Caprimulgidae | Lesser Nighthawk, <i>Chordeiles acutipennis</i> | Open trees, scrub & grasses |
| | Nacunda Nighthawk, <i>Podager nacunda</i> | Open trees, scrub & grasses |
| Apodidae | Short-tailed Swift, <i>Chaetura brachyura</i> | Arial forager |
| | Fork-tailed Palm-swift, <i>Reinarda squamata</i> | Open trees, scrub & grasses |
| Trochilidae | White-necked Jacobin, <i>Florisuga mellivora</i> | Residential |
| | Green-throated Mango, <i>Anthracothorax viridigula</i> | Residential |
| | Black-throated Mango, <i>Anthracothorax nigricollis</i> | Residential |
| | Ruby-topaz Hummingbird, <i>Chrysolampis mosquitos</i> | Residential |
| | Blue-chinned Sapphire, <i>Chlorestes notatus</i> | Residential |
| | White-chested Emerald, <i>Amazilia chionopectus</i> | Residential |
| | Copper-rumped Hummingbird, <i>Amazilia tobaci</i> | Residential |
| | Long-billed Starthroat, <i>Heliomaster longirostris</i> | Residential |
| Alcedinidae | Ringed Kingfisher, <i>Ceryle torquata</i> | Waterways |
| | Green Kingfisher, <i>Chloroceryle americana</i> | Waterways |
| Galbulidae | Rufous-tailed Jacamar, <i>Gulbula ruficauda</i> | Residential |
| Furnariidae | Pale-breasted Spinetail, <i>Synallaxis albescens</i> | Open trees, scrub & grasses |
| | Yellow-chinned Spinetail, <i>Certhiaxis cinnamomea</i> | Open trees, scrub & grasses |
| | Black-crested Antshrike, <i>Sakesphorus canadensis</i> | Mangrove |
| | Barred Antshrike, <i>Thamnophilus doliatus</i> | Open trees, scrub & grasses |
| Tyrannidae | Southern-beardless Tyrannulet, <i>Camptostoma obsoletum</i> | Residential |
| | Yellow-bellied Elaenia, <i>Elaenia flavogaster</i> | Open trees, scrub & grasses |
| | Northern Scrub Flycatcher, <i>Sublegatus arenarum</i> | Mangrove |
| | Yellow-breasted Flycatcher, <i>Tolmomyias flaviventris</i> | Mangrove |
| | Brown-crested Flycatcher, <i>Myiarchus tyrannulus</i> | Mangrove |
| | Pied Water-tyrant, <i>Fluvicola pica</i> | Waterways |
| | White-headed Marsh-tyrant, <i>Arundinicola leucocephala</i> | Waterways |
| | Great Kiskadee, <i>Pitangus sulphuratus</i> | Open trees, scrub & grasses |
| | Boat-billed Flycatcher, <i>Megarynychus pitangua</i> | Residential |
| | Tropical Kingbird, <i>Tyrannus melancholicus</i> | Open trees, scrub & grasses |
| | Grey Kingbird, <i>Tyrannus dominicensis</i> | Open trees, scrub & grasses |
| | Fork-tailed Flycatcher, <i>Tyrannus savana</i> | Open trees, scrub & grasses |
| Vireonidae | Rufous-browed Peppershrike, <i>Cyclarhis gujanensis</i> | Open trees, scrub & grasses |
| Hirundinidae | Grey-breasted Martin, <i>Progne chalybea</i> | Arial forager |
| | White-winged Swallow, <i>Tachycineta albiventer</i> | Waterways |
| | Blue and White Swallow, <i>Pygochelidon cyanoleuca</i> | Arial forager |
| | Bank Swallow, <i>Riparia riparia</i> | Arial forager |

Table 2 (Continued). Birds observed around Brickfield to Orange Valley not associated with coastal mudflats, 1996-2003.

| Family | Species | Predominant habitat in which observed |
|---------------|---|---------------------------------------|
| | Barn Swallow, <i>Hirundo rustica</i> | Arial forager |
| Troglodytidae | House Wren, <i>Troglodytes aedon</i> | Residential |
| Mimidae | Tropical Mockingbird, <i>Mimus gilvus</i> | Open trees, scrub & grasses |
| Parulidae | Yellow Warbler, <i>Dendroica petechia</i> | Mangrove and residential |
| | American Redstart, <i>Setophaga ruticilla</i> | Mangrove |
| | Northern Waterthrush, <i>Seiurus noveboracensis</i> | Mangrove |
| | Masked Yellowthroat, <i>Geothlypis aequinoctialis</i> | Open trees, scrub & grasses |
| Coerebidae | Bananaquit, <i>Coereba flaveola</i> | Residential |
| Thraupidae | Bicoloured Conebill, <i>Conirostrum bicolor</i> | Mangrove |
| | White-lined Tanager, <i>Tachyphonus rufus</i> | Residential |
| | Summer Tanager, <i>Piranga rubra</i> | Residential |
| | Blue-grey Tanager, <i>Thraupis episcopus</i> | Residential |
| | Palm Tanager, <i>Thraupis palmarum</i> | Residential |
| | Trinidad Euphonia, <i>Euphonia trinitatis</i> | Residential |
| | Red-legged Honeycreeper, <i>Cyanerpes cyaneus</i> | Residential |
| Fringillidae | Blue-black Grassquit, <i>Volatinia jacarina</i> | Open trees, scrub & grasses |
| | Saffron Finch, <i>Sicalis flaveola</i> | Residential |
| | Red-capped Cardinal, <i>Paroaria gularis</i> | Open trees, scrub & grasses |
| | Greyish Saltator, <i>Saltator coerulescens</i> | Open trees, scrub & grasses |
| | Dickcissel, <i>Spiza americana</i> | Residential |
| Icteridae | Red-breasted Blackbird, <i>Sturnella militaris</i> | Open trees, scrub & grasses |
| | Yellow-hooded Blackbird, <i>Agelaius icterocephalus</i> | Open trees, scrub & grasses |
| | Carib Grackle, <i>Quiscalus lugubris</i> | Open trees, scrub & grasses |
| | Shiny Cowbird, <i>Molothrus bonariensis</i> | Open trees, scrub & grasses |
| | Giant Cowbird, <i>Molothrus oryzivora</i> | Residential |
| | Yellow Oriole, <i>Icterus nigrogularis</i> | Residential |
| | Crested Oropendola, <i>Psarocolius decumanus</i> | Residential |

DISCUSSION

This study provides a quantitative assessment of the birds on the tidal mudflats at Brickfield and a list of birds observed in the surrounding areas. This study reaffirms the importance of the area to the shorebirds and seabirds of Trinidad. The presence of species apparently *en route* to Venezuela (French 2000) demonstrate that residential areas can provide valuable habitat and food plants for far ranging species.

The diversity of shorebirds, waders and seabirds in the study area appears to be influenced by the nature of the habitat, its location and by fishing activities. Shorebirds feed and roost on the extensive mudflats, herons feed on the mudflats and roost in the mangrove. The mangroves of the adjacent Caroni Swamp serve as a habitat for mangrove-dependent passerines. Small shrimp trawlers (stone drags) operate in this area and discard the by-catch at sea. These trawlers are usually accompanied by gulls, terns and pelicans. The seabirds roost on the mudflats and contribute nutrients via their faeces.

The bird community observed in this study is comparable to that of the Port of Spain Sewage Ponds (White 2000) but without the freshwater species. Other studies, for which comparable data are available (Cuffy 2002; Gochfeld 2002; White *et al.* Unpublished) are inland and include freshwater marsh and scrub inhabiting species. Black-bellied Plover, Willet, Whimbrel and Western Sandpiper, appear to prefer saline conditions. They are abundant at Brickfield but rare at the Caroni Rice Project (White *et al.* unpublished). At the Port of Spain Sewage Ponds they were restricted to brackish areas along canal edges (White 2000). In contrast, American Golden Plover, Upland Sandpiper, Least Sandpiper, Stilt Sandpiper and Buff-breasted Sandpiper, are better represented in the freshwater conditions at the Caroni Rice Project (White *et al.* unpublished) than at Brickfield.

The area from Orange Valley to Brickfield is particularly

important to local populations of Whimbrel, Western Sandpiper, Laughing Gull, Royal Tern, Yellow-billed Tern, Large-billed Tern and Black Skimmer. The concentration of birds and their accessibility make it attractive to birdwatchers. Consequently many rare species have been observed, including Wood Stork, Maguari Stork, Caribbean Flamingo, American Oystercatcher, Terek Sandpiper, Black-tailed Godwit, Franklin's Gull, Kelp Gull and Sabines Gull. Indeed the Maguari Stork (Trinidad and Tobago Rare Bird Committee, unpublished record), Franklin's Gull (McNair *et al.* 2002) and Kelp Gull (Hayes *et al.* 2000) were all first records for Trinidad and the Terek Sandpiper (Taylor 2001), and Black-tailed Godwit (Hayes and Kenefick 2002) were first records for South America.

Of the mudflat species recorded in this study, none are considered *Endangered*, and only one species, the Scarlet Ibis, is listed as *Vulnerable* in Trinidad as defined in Schedule 4 of the Conservation of Wildlife Act of 1999 (Anon. 1999). However, the site meets many of the criteria set out under the *Environmentally Sensitive Areas Rules 2001* (Schedule II). It is a good representation of a naturally occurring system. It is regarded by the scientific community as having significant value in non-destructive research. It has high potential for fostering environmental awareness, appreciation or education. It is high in aesthetic value. It performs an integral role in the functioning of a wider ecosystem, and is of specific value as a habitat for animals at a critical stage of their biological cycle. Designation of the site as an *Environmentally Sensitive Area* will assist efforts to keep the area attractive for birds and persons who enjoy watching them.

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ones. He advocated active management of habitats, whether natural or not, and he encouraged the integration of surrounding communities into these efforts.

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