

## New Behavioral, Ecological, and Biogeographic Data on the Avifauna of Rennell, Solomon Islands<sup>1</sup>

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**ABSTRACT:** During an expedition to Rennell, Solomon Islands, from 20 to 30 June 1997, we collected specimen and observational data that add to our understanding of this island's unique avifauna. We observed three species previously unrecorded on Rennell: a putative caprimulgid species, the Tree Martin (*Hirundo nigricans*), and the Black-faced Cuckoo-shrike (*Coracina novaehollandiae*), suggesting that further research will add to the known Rennell avifauna. In combination with previous work, our specimen data suggest that many Rennell-ese land birds have prolonged breeding seasons typical of those of birds of lowland tropical regions. Our observations indicate that two species, the Great Cormorant (*Phalacrocorax carbo*) and the Singing Starling (*Aplonis cantoroides*), have colonized Rennell and increased in abundance over the past several decades. Reported initially as vagrants, the population establishment and increases of these two species portend the importance of vagrant species on islands subjected to increased human disturbance.

RENNELL ISLAND LIES 168 km south of the main chain of the Solomon Islands (Figure 1). The avifauna of this large (676 km<sup>2</sup>) uplifted coralline limestone island is indisputably distinct. Of 37 breeding land and freshwater bird species, five species and nine subspecies are endemic, and six additional subspecies are endemic to Rennell and nearby Bellona (a smaller raised limestone island 24 km northwest of Rennell). Ren-

nell's avifauna is depauperate, having about 50% of the species richness of a comparably sized island in the main chain of the Solomons (Diamond and Mayr 1976). Systematic affinities suggest that dispersal of species to Rennell may have occurred directly from Vanuatu, New Caledonia, and Australia in addition to the main chain of the Solomons (Diamond 1984).

Rennell's birds are known largely from analysis of external characters from study skins plus observations during infrequent research expeditions. Initial scientific exploration by Stanley and Hogbin in 1927 was followed with two visits by the Whitney South Seas Expedition in 1928 and 1930 (Mayr 1931, Mayr and Hamlin 1931), additional work by Bradley and Wolff (1956), and more recently Wolff (1973) and Diamond (1984). Most expeditions to Rennell have occurred from August to November, with one trip in May 1930, and four days in June–July 1933. Unfortunately, specimens collected in the 1920s through 1950s typically lack the extensive data that give modern specimens so much value, such as weight, soft part colors, molt, gonad size and condition (to determine

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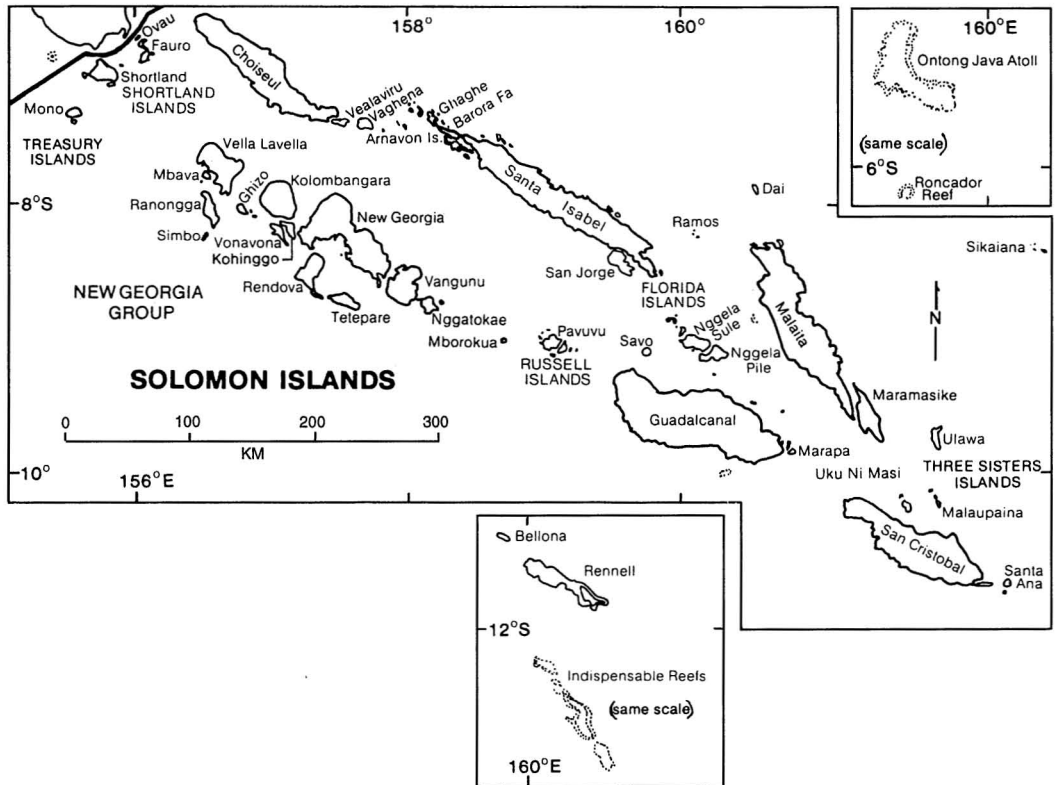


FIGURE 1. The Solomon Islands.

breeding phenology), bursa and skull ossification (to determine age of specimens), and stomach contents. In addition, tissue preservation (for molecular analyses) was not a common practice until this decade, and only one previous expedition to Rennell (M. C. LeCroy and H. P. Webb in June 1995) preserved tissue samples. Because of these pronounced gaps, the knowledge about Rennell Island birds was enhanced considerably by our specimen data and field observations during 20–30 June 1997.

The most recent and complete treatment of the Rennellese avifauna is by Diamond (1984), based on fieldwork during 5–13 October 1976. Although his observations are extensive, Diamond collected no specimens. To avoid repetition, we provide only a cursory treatment of topics covered more thoroughly by Diamond. Following the species accounts, we address how our results com-

pare with those of Diamond and others, highlight the most striking differences and their significance, and comment on changes in Rennell's avifauna over the past half century.

#### *Study Area and Methods*

On 20 June 1997, we flew from Guadalcanal to Hatagua Airstrip at Tinggoa Village, near the west end of Rennell (Figure 2), arriving at 0830 hours. We spent 24 hr near the airstrip observing birds and passed the night at Mendana Resthouse (MR) at the west end of the airstrip. On 21 June we departed for Lake Te Nggano, the largest lake in the South Pacific. The 8-hr tractor journey included frequent stops, when we made additional observations. We arrived at the lake several hours after dark. A 45-min canoe ride took us to the Tahamatangi Resthouse (TR),

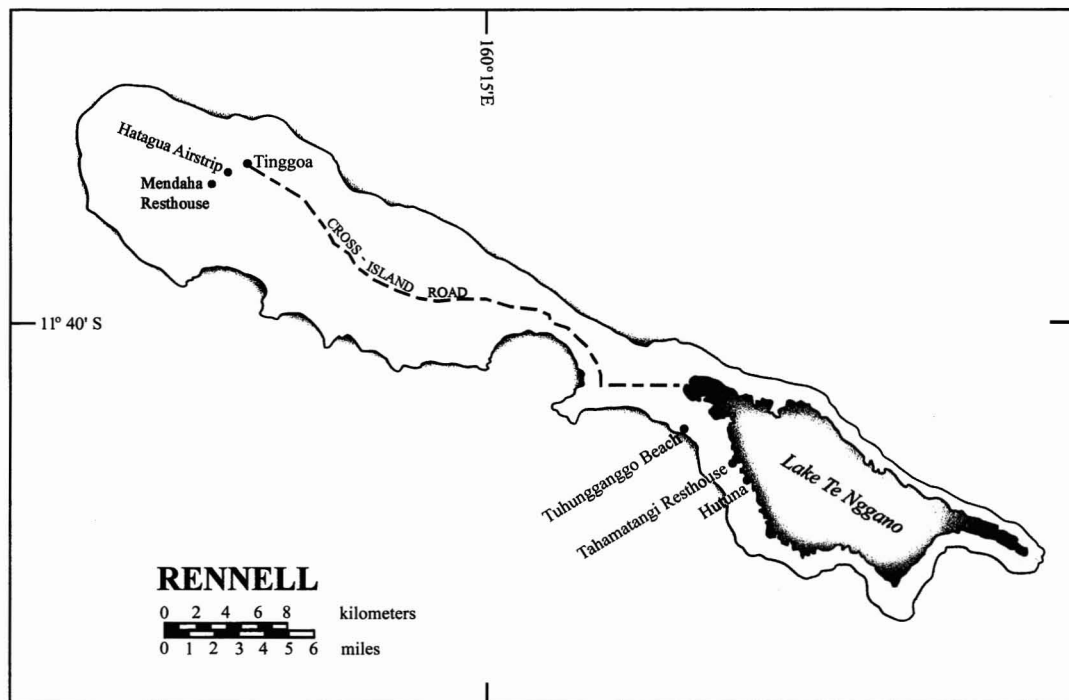


FIGURE 2. Rennell Island, showing localities mentioned in text.

near Hutuna Village on the west shore of the lake. TR served as our base from 22 to 28 June. Most of our observations and specimen collections were within a 2-km radius of TR (see locality specifics below). We made day trips to mature forest and Tuhungganggo Beach on 24–26 June. On 28 June we departed TR, crossed the lake again, and returned by tractor to the airstrip. Again we stayed at MR, observing birds along the trail west of the airstrip on the afternoon of 28 June and morning of 29 June. We departed for Guadalcanal at midday on 29 June.

Mornings at Lake Te Nggano generally began with hazy to partly cloudy skies and strong winds off the lake just south of east at ca. 25 km/hr. Daytime temperatures reached ca. 28°C. Afternoons featured rain squalls off the lake that on several occasions coalesced into heavy rains late in the day. Winds maintained a heavy chop on the lake, which prevented canoe travel to the islets that harbor roosts of aquatic birds. The winds settled and skies became more overcast during our

last two days, when no substantial precipitation occurred.

Much of the fruiting and flowering was confined to various epiphytes, understory plants, scattered trees (e.g., *Ficus* spp., *Vavaya* sp., *Cocos nucifera*), or early successional and edge species, such as *Hibiscus tiliaceus*, *Macaranga harveyana*, and *Pipturus argenteus*. Most of the large canopy trees, such as *Canarium*, *Myristica*, *Callophyllum*, *Homalium*, and *Terminalia*, were not in fruit or flower.

We set up three mist-net lines. Five nets were placed along a transect through secondary forests of various ages, including two nets in recently abandoned (<5 yr) garden plots and three nets in denser, older (10–20 yr) second growth. The canopy was less than 10 m tall in both habitats. Three nets were set up in more mature forest 1 km toward Hutuna from TR. These two lines operated from 22 to 27 June. Three additional nets were set up from 25 to 26 June in tall, mature forest ca. 2 km from Tuhungganggo

Beach. Net captures were supplemented with collection of birds via hunting by Rennellese Mart Taieha. The specimens (skins, skeletons) are housed at the Florida Museum of Natural History (UF), the University of Washington Burke Museum (UWBM), and the Solomon Islands National Museum.

Stomach contents from collected specimens, preserved in isopropyl alcohol, are housed at UF. Stomach contents were identified by A.W.K. using a light microscope. Heart, liver, and muscle tissue were taken from all specimens deposited at UWBM and most specimens deposited at UF. Tissues were minced under sterile conditions and put in kryo tubes with lysis buffer. Field observations were tabulated daily. Species accounts based on cumulative notes and observations by all authors were compiled immediately after leaving Rennell. Terminology for foraging observations follows Remsen and Robinson (1990).

#### SPECIES ACCOUNTS

Species designations primarily follow Mayr (1945), but also incorporate some revisions by Bradley and Wolff (1956), Hadden (1981), and Beehler et al. (1986). English and Rennellese names follow Diamond (1984). Each account is divided into four separate areas on Rennell where we made observations. We define these areas here and refer to them by name only in the species accounts.

**LAKE:** Tahamatangi Resthouse and vicinity, west shore of Lake Te Nggano, 2 km NNW of Hutuna. Observations made between 22 and 28 June from resthouse garden, lakeshore, old gardens, young second-growth forest, and submature forest.

**FOREST AND COAST:** 4.2 km NW of Hutuna. Observations on 24–26 June in mature forest, along cliffs, and from Tuhungganggo Beach.

**ROAD:** Road from Tinggoa to western end of Lake Te Nggano. Observations on afternoons of 21 and 28 June.

**AIRSTRIP:** Hatagua Airstrip at Tinggoa and vicinity. Observations all day 20 June,

morning of 21 June, late afternoon 28 June, and morning of 29 June. We made observations from the airfield, the resthouse and vicinity, and along 1.5 km of road heading west from the airstrip through active and abandoned gardens, secondary forests, and edges of mature forests.

We did no standardized censusing of birds. Measures of relative abundance reflect incidental encounter rates of a species and were assigned according to the following criteria: (1) rare, encountered once or twice at a locality pooling all observers over all days; (2) uncommon, encountered daily or almost daily at a locality, pooling all observers over all days (encounter rate variable); (3) common, encountered regularly by all observers over all days at a locality; (4) abundant, unavoidable fixtures of a given habitat or locality.

*Tachybaptus novaehollandiae rennellianus*. Australian Dabchick. Manusigi.

This species occurs from Java east through New Guinea and Australia to the Solomon Islands, Vanuatu, and New Caledonia; *T. n. rennellianus* is endemic to Lake Te Nggano on Rennell.

**LAKE:** Common; confined to the lake; up to three adults regularly just offshore from TR, usually in protected water; two adults and an immature seen together around an islet 80 m offshore; no direct foraging observations, but individuals dived regularly in the karst shallows along the lakeshore; no vocalizations or courtship behavior observed.

**FOREST AND COAST, ROAD, AIRSTRIP:** Not recorded.

*Sula leucogaster plotus*. Brown Booby. Rennell name: see Diamond (1984).

This pantropical species occurs widely in the western Pacific.

**LAKE:** Uncommon; groups up to six, always far from shore over open lake.

**FOREST AND COAST:** Four flying 600–700 m offshore beyond the edge of the fringing reef.

**ROAD, AIRSTRIP:** Not recorded.



*Fregata minor minor*. Great Frigatebird. Kataka'ugi, kataha genga.

This nearly pantropical species occurs widely in the western Pacific.

LAKE: Common; suspected roost north of TR; up to 26 together; largest group flying low, north to south over TR with many birds preening and "shake-drying" on the wing after a late morning squall; overall ratio of adult males to females and immatures ca. 1:5.

FOREST AND COAST: Five kettling along the cliff edges above Tuhungganggo Beach; several groups of two to three beyond fringing reef.

ROAD: Not recorded.

AIRSTRIP: Five over road west of airstrip on 28 June.

*Fregata ariel ariel*. Lesser Frigatebird. Kataka (see Diamond 1984).

This pantropical species occurs widely in the western Pacific.

LAKE: Common, although less so than *F. minor*; sex ratio similar to that of *F. minor*; frequently associates with *F. minor*. One female on the wing took a ca. 25-cm *Tilapia* fish from the lake surface, which was dropped and recovered seven times before being swallowed.

FOREST AND COAST, ROAD: Not recorded.

AIRSTRIP: Uncommon; up to five soaring high over the airstrip on 20 and 28 June.

*Phalacrocorax carbo novaehollandiae*. Great Cormorant. Manukitai'ugi.

This nearly cosmopolitan species occurs in Australia and New Guinea (*P. c. novaehollandiae*), but is absent from most of the tropical western Pacific, including elsewhere in the Solomons.

LAKE: Common; groups of up to 17 flying southeast over the lake ca. 500 m from shore; most commonly in groups of one to three; a few birds appeared to have retained juvenile flight and breast feathers; may roost during the day with *P. melanoleucos* but generally farther from shore than *P. melanoleucos*.

FOREST AND COAST, ROAD, AIRSTRIP: Not recorded.

*Specimen Summary and Comments*: One male and one female collected. Guts of both contained exclusively large (190–250 mm) *Tilapia* sp. fish. Female had five fish totaling 370 g, more than 18% of her body weight. No wing or tail molt in either bird. Gonads enlarged. Enlarged testes and ova plus absence of remex or rectrix molt suggest breeding at this time of year. Diamond (1984) first recorded *P. c. novaehollandiae* on Rennell in 1976, describing it as a probable Australian vagrant. Gibbs (1996) stated that Rennell natives reported this cormorant as already breeding on Rennell in 1994. Our data further confirm that this cormorant breeds on Rennell and that its population has increased since the 1970s. The transition from vagrant to resident breeder follows the introduction (in 1957) and subsequent expansion of *Tilapia*, which may be its only food source.

*Phalacrocorax melanoleucos brevicauda*. Little Pied Cormorant. Manukitai (adult), ghaghiabolu (young).

This species occurs from eastern Indonesia through New Guinea and Australia to New Caledonia and New Zealand; *P. m. brevicauda* is endemic to Lake Te Nggano on Rennell.

LAKE: Abundant; probably outnumbered *P. carbo* by 30–100 to 1; roosts of 10 to 150 in trees over water on islets and along the lakeshore; all active nocturnal roosts observed were in living, shoreline *Terminalia* trees; >50% of flying individuals had heavy molt in the secondaries, and birds with primary molt also were observed consistently; increased activity around dusk and dawn; commonly foraged near shore, seldom in water >3 m deep.

FOREST AND COAST, ROAD, AIRSTRIP: Not recorded.

*Specimen Summary and Comments*: Two males and three females collected; all were molting a remex and/or rectrices; no evidence of breeding; stomachs ( $n = 2$ ) contained crustaceans (one with at least 26 shrimp up to 30 mm long, stretched out), gastropods (to

14 mm long), non-*Tilapia* fish, and probable *Tilapia* (one piece 20 mm long). These stomach contents are consistent with those reported by Bradley and Wolff (1958: 89): "small specimens of a fish ... and prawns from lake."

*Egretta sacra sacra*. Pacific Reef-Heron. Kagau (kagau'ugi = dark phase; kagau tea = white phase).

This species is widespread on coasts and islands in the western tropical and subtropical Pacific.

LAKE: Rare; one dark morph in yard of TR and one light morph flying along shore.

FOREST AND COAST, ROAD, AIRSTRIP: Not recorded.

*Specimen Summary and Comments*: None collected. The single dark-morph individual we observed at an inland locality is consistent with the hypothesis relating color polymorphism in day herons to differential success in prey capture (Rohwer 1989).

*Ixobrychus flavicollis woodfordi*. Black Bittern. Ghou.

This species is widespread from India and Southeast Asia to New Guinea and Australia; *I. f. woodfordi* is endemic to the Solomon Islands.

LAKE, FOREST AND COAST, ROAD: Not recorded.

AIRSTRIP: Uncommon; heard only; heard around MR in the hours before dawn and after dusk; calls similar to those of this species that we heard on Isabel, Solomon Islands.

*Threskiornis molucca pygmaeus*. Sacred Ibis. Taghoa.

This Australasian species has only two subspecies, the widespread nominate form and *T. m. pygmaeus*, which is endemic to Rennell and Bellona. Unknown elsewhere in the Solomons, *T. molucca* forms a super-species with *T. aethiopicus* of Africa and *T. melanocephalus* of India and Southeast Asia.

LAKE: Common; one to three flushed or

encountered on the ground or in trees and snags; found in all terrestrial habitats from gardens to forest; more commonly seen in groups outside of forest; foraged in trash heaps on discarded fruit, coconuts, and insect larvae; also turned palm fronds, likely in search of insects and lizards.

FOREST AND COAST: Uncommon; three on beach; flushed singly in forest on several occasions, usually from perches in subcanopy or disturbed sites.

ROAD: Common; larger groups (3–10 birds) in more disturbed areas; regularly flushed and seen perched at edges or in emergent vegetation in forest; more common and with increased agonistic interactions and calling near settlements.

AIRSTRIP: Common; regularly on and around airstrip in groups of up to 30.

*Specimen Summary and Comments*: One male and one female collected. Stomach of male filled with coconut and insect larvae. Female had no remex or rectrix molt, a shelled egg in oviduct, and a 22 by 21 mm yolky ovum—clear evidence of breeding in June.

*Accipiter faciatu faciatu*. Australian Goshawk. Taba.

The nominate subspecies of this variable species (11 subspecies) occurs in Timor, Australia, Tasmania, and on Rennell and Bellona. Although another subspecies occurs in Vanuatu and New Caledonia (*A. f. vigilax*), the species is not known from elsewhere in the Solomon Islands.

LAKE: Uncommon; in both disturbed and forested (mostly edge) areas; mostly adults, either singly or in pairs; not particularly vocal but heard most days; most noticeable in coconut plantations, where it often perched in coconut palms; one seen flying low over coconut palms, scaring up *Aplonis insularis* and *A. cantoroides*.

FOREST AND COAST: Uncommon; perched in canopy trees.

ROAD: Uncommon; singly or in pairs; often perched in emergent or canopy vegeta-

tion or snags; at least seven seen on trip from lake to Tinggoa.

**AIRSTRIP:** Uncommon; group of three calling, chasing, and moving about in large trees along western edge of airstrip; heard sporadically throughout stay at airstrip.

*Pandion haliaetus melvillensis*. Osprey. Magibae.

The subspecies *melvillensis*, which occurs from the East Indies and the Philippines south to northern Australia, the Solomons, and New Caledonia, is often merged (e.g., Poole 1994) with *P. h. cristatus* of southern Australia and Tasmania.

**LAKE:** Uncommon; single bird each day 23–27 June; two on 28 June; usually carrying large *Tilapia* (length 20–25 cm); not seen perched.

**ROAD:** Single bird perched on cliff edge above Kanggava Bay.

**FOREST AND COAST, AIRSTRIP:** Not recorded.

*Porphyrio porphyrio samoensis*. Purple Swamphen. Kagae (adult), beka (black juvenile).

This highly variable species is widespread from Africa to southeastern Asia, the Philippines, Australia, New Zealand, and western Oceania. Ripley (1977) united the many named subspecies from western Oceania as *P. p. samoensis*. We agree that the birds from Rennell resemble those from islands east of the Solomons, although a specimen we took on Isabel is larger than the Rennell specimens (918 versus 765, 812 g; all adult males) and differs in plumage as well.

**LAKE:** Common; on ground, usually in disturbed or lakeshore habitats; most commonly in pairs; one pair of adults with adult-sized juvenile (all black with yellowish olive bill); pair of adults on a mass of floating vegetation (putative nest) on shoreline; much more vocal than on more easterly Pacific islands (D.W.S., pers. obs.).

**FOREST AND COAST, ROAD, AIRSTRIP:** Not recorded.

*Specimen Summary and Comments:* Three males collected. Two had enlarged testes, suggesting a breeding season that includes early June; the third had small testes and remnants of juvenile plumage. The conspicuous nature of this bird on Rennell (relative to more easterly islands) likely reflects that *P. p. samoensis* is not extensively hunted.

*Pluvialis [dominica] fulva*. Pacific Golden Plover. Sibiu.

This species breeds in northern Siberia and northwestern Alaska, and winters in Australasia and Oceania.

**LAKE, FOREST AND COAST, ROAD:** Not recorded.

**AIRSTRIP:** Single bird in very worn basic plumage on airstrip on 20–21 and 28–29 June; this bird undoubtedly was oversummering.

*Sterna sumatrana sumatrana*. Black-naped Tern. Gopite.

The nominate subspecies inhabits Southeast Asia and Indonesia through much of the tropical western Pacific, including Rennell; *S. s. matthewsi* occurs in the western Indian Ocean.

**LAKE:** Uncommon; usually in pairs, most often in flight at intermediate distance from the lakeshore.

**FOREST AND COAST:** Uncommon; three flying beyond the fringing reef on 24 June; five here on 26 June.

**ROAD, AIRSTRIP:** Not recorded.

*Sterna bergii cristata*. Greater Crested Tern. Taga.

This species is widespread in the tropical and subtropical Indian Ocean (four subspecies) and in the tropical Pacific (*S. b. cristata*).

**LAKE:** Rare; one bird flying over lake on 28 June.

**FOREST AND COAST, ROAD, AIRSTRIP:** Not recorded.

*Anous stolidus pileatus*. Brown Noddy. Ngongo.

This species is pantropical; *A. s. pileatus* breeds through most of the tropical Pacific and Indian Oceans.

FOREST AND COAST: A flock of 24 flying near a group of long-nosed spinner dolphins (*Stenella longirostris*) just beyond the fringing reef on 24 June.

LAKE, ROAD, AIRSTRIP: Not recorded.

*Ptilinopus richardsii cyanopterus*. Pink-spotted Fruit-Dove. Higi.

This species is endemic to the Solomon Islands. The nominate subspecies is restricted to two small islands in the eastern Solomons (Ugi and Santa Ana); *P. r. cyanopterus* is endemic to Rennell and Bellona.

LAKE: Common; associated with fruiting trees; largest groups 8–10; calls ubiquitous; two-part “see-saw” call heard early in morning chorus and occasionally through the night; usually moved about as singles, pairs, and sometimes threes, but up to 10 in and near fruiting trees and roosts; ate *Ficus* fruits at mid heights (ca. 15 m), without using acrobatic maneuvers; at fruiting trees commonly associated with *Aplonis* spp., *Coracina lineata*, and *C. novaehollandiae*.

FOREST AND COAST: Abundant; usually in canopy; two roosts of three to six in stunted canopy on top of pinnacled limestone ridges; fed with *Aplonis* spp. and *Coracina lineata* in *Fagraea* subcanopy; both short and long calls given throughout the day; only short call heard at roosts; twice observed tearing pieces of flesh from *Fagraea* fruits; also seen ingesting *Ficus* fruits.

ROAD: Abundant; primarily perched in canopy at road edge or flying at canopy level; generally in pairs to groups of six, but one group of ca. 30 flushed.

AIRSTRIP: Common; behavioral observations similar to those in other localities.

*Specimen Summary and Comments*: One male and one female collected. Female is a young bird (fleshy bursa, undifferentiated ovary) with extensive molt in remex and rec-

trices; adult male also molting. Large *Ficus* sp. fruit (18 mm diameter), fruit pulp, and seeds in stomach and crop of both specimens. Breeding has been reported in November (Bradley and Wolff 1958). The heavy molt in both specimens suggests either that *Ptilinopus* does not breed during June or that breeding is asynchronous.

*Ducula pacifica pacifica*. Pacific Pigeon. Gupe.

This species is widespread from islands peripheral to New Guinea and the western Bismarcks, the Louisiade Islands, and islands peripheral to the main Solomon chain (Ndai, Rennell, Santa Cruz) east to the Cook Islands. Geographic variation is poorly understood.

LAKE: Uncommon; usually in canopy in disturbed habitats around TR and vicinity; group of eight roosting in a snag at treefall gap after heavy rains; only vocalization noted was a single “female growl” (D.W.S., pers. obs. [described as descending or flat “br-r-r” by Diamond 1984]); overall much less conspicuous than *Ptilinopus*; relative abundance of *Ptilinopus* : *Ducula* ca. 20:1, suggesting that *Ducula* may be hunted.

FOREST AND COAST: Common; both male-type calls (single-note calls including ones similar to calls 1 and 2 described by Diamond 1984) and female-type calls heard regularly from canopy; usually perched singly or in pairs.

ROAD: Common; usually perched singly or in pairs on high, exposed branches.

AIRSTRIP: Uncommon; heard (only female call) along road west of airstrip.

*Comments*: A single nest record and stomach content analysis from Bradley and Wolff (1958) suggest that *D. p. pacifica* has a diet and breeding phenology similar to those of *Ptilinopus richardsii*. Our observations on Rennell agree with survey data from Tonga that indicate that *D. pacifica* increases in abundance with increasing forest maturity (Steadman 1998, Steadman and Freifeld 1998).

*Macropygia mackinlayi arossi*. Mackinlay's Cuckoo-Dove. Katogua.

This species is found from the Bismarck Archipelago east through the Solomon Islands to Vanuatu; *M. m. arossi* is endemic to the Solomons.

LAKE, FOREST AND COAST: Not recorded.

ROAD: Uncommon; most often in disturbed areas near mature forest; seen singly or in pairs and heard along road; voice as described by Diamond (1984).

AIRSTRIPE: Common; usually in pairs; in scrub, patchy forest, or forest.

*Gallicolumba beccarii solomonensis*. Gray-throated Ground-Dove. Tuu.

This species occurs in New Guinea, the Admiralty Islands, the Bismarck Archipelago, and the Solomon Islands; *G. b. solomonensis* is confined to the Solomons (Rennell, Gower, Guadalcanal, San Cristobal, Santa Ana).

LAKE, FOREST AND COAST, ROAD: Not recorded.

AIRSTRIPE: Rare; heard twice (a low repeated "whooo-ooop" at 1730 and 1750 hours) in tall secondary forest along road west of airstrip on 28 June.

*Lorius chlorocercus*. Yellow-bibbed Lory. Sibigi.

This monotypic species is endemic to the eastern Solomon Islands (Rennell, Savo, Malaita, Guadalcanal, San Cristobal, Ugi).

LAKE: Uncommon; singles or, more commonly, in pairs; in forest usually within or above canopy; pairs seen "nuzzling" on exposed branches on several occasions; often seen foraging in coconut flowers.

FOREST AND COAST, ROAD: Not recorded.

AIRSTRIPE: One pair on 21 June.

*Specimen Summary and Comments*: One adult female collected in coconut palm. Stomach contents include banana seeds, fruit pulp, eight lepidopteran pupae ca. 10 mm long, and a beetle mandible. Ovary regressed with minute follicles. Molt in remex.

*Micropsitta finschii finschii*. Finsch's Pigmy-Parrot. Ghinei.

This species is found in the Bismarck Archipelago (*M. f. viridifrons*) and the Solomon Islands (four subspecies, including *M. f. finschii* on Rennell, Ugi, and San Cristobal).

LAKE: Uncommon; consistently encountered (mostly heard) only in submature forest; one netted in understory of disturbed forest; rare in second growth; never recorded in gardens or open areas.

FOREST AND COAST: Common, vocalizations nearly ubiquitous; generally two to three birds; sometimes loosely associated with *Gerygone flavolateralis*; wide-ranging vertically but most often in middle story to subcanopy (8–20 m); gave short and long calls regularly ("zeet" notes) when flying.

ROAD: Not recorded.

AIRSTRIPE: Uncommon; in taller scrub and forest.

*Foraging Observations* ( $n = 7$ ): Crept along larger limbs or trunks (6 to > 30 cm diameter) like a nuthatch (*Sitta* spp.), from 4 to 15 m up. Hang-up, hang-down, and hang-sideways maneuvers (see Remsen and Robinson 1990) prevalent. Used spike-tipped rectrices for bracing. Scraped bill along bark surface, often where there were white lichens. Mostly quiet when foraging.

*Specimen Summary and Comments*: One adult male collected. No remex or rectrix molt. Creamy white organic mush in stomach. Bradley and Wolff (1958) reported stomach contents of crushed seeds, or perhaps remnants of fungi.

*Geoffroyus heteroclitus hyacinthus*. Singing Parrot. Ghisua.

*Geoffroyus h. heteroclitus* is found in the Bismarck Archipelago and main chain of the Solomons; *G. h. hyacinthus* is endemic to Rennell.

LAKE: Uncommon; usually in groups of two or three; more frequently in mature forest; not seen in coconut plantations or garden areas; usually flying over disturbed areas

around lake; several times spooked from canopy where two or three perched silently.

**FOREST AND COAST:** Common; always in or above canopy; largest group (three) flew into canopy tree and "disappeared" but purring calls could be heard; flight high and direct; flight calls include a loud series (three to four) of musical "kee'-ur" notes (first syllable higher pitched) mixed with more nasal notes; one descended in an arching glide with wings in dihedral, reminiscent of rock dove (*Columba livia*) display flight.

**ROAD:** Common; usually flying and calling in groups of three or four; generally flew at canopy level in tight formation; one silent pair observed for several minutes on emergent snag, female perched above silent male excavating a large knot or old termitarium on a rotten branch stub.

**AIRSTRIP:** Common; groups of up to eight flying over and near airstrip.

*Chrysococcyx lucidus harterti*. Shining Bronze-Cuckoo. Tangione or manutangione.

This subspecies is an endemic resident on Rennell and Bellona. Other resident populations of *C. lucidus* occur in New Caledonia, the Loyalty Islands, Vanuatu, and the Santa Cruz Islands. The widespread populations of *C. l. lucidus* are migratory, breeding in Australia and New Zealand and wintering in the Lesser Sundas, New Guinea, the Bismarcks, and main islands in the Solomons.

**LAKE:** Uncommon; heard much more often than seen; recorded in subcanopy of *Hibiscus* thicket (two birds), low in shrubs in an old garden, and in forest.

**FOREST AND COAST:** Common; singles or pairs in understory to subcanopy of mature forest; often associated with mixed flocks of *Clytorhynchus hamlini*, *Gerygone flavolateralis*, and other passerines.

**ROAD:** Rare; one in exposed canopy of large tree at old garden edge.

**AIRSTRIP:** Common; groups of one to three in most habitats near airstrip, most fre-

quent in understory; a trio of birds noisily chased one another in young secondary scrub and gave a caroling, garbled "chur-chur-chur" and more usually downslurred "pe-urrrr" calls; one of these three adopted a begging posture with wings fanned out from body.

**Foraging Observations** ( $n = 2$ ): Sally strikes to leaves 5–6 m up in dense middle-story.

Caprimulgid species (unidentified)

**LAKE:** Rare; one flushed from forest floor at dusk by D.W.S. near nets in submature forest on 22 June; no vocalizations heard.

**FOREST AND COAST, AIRSTRIP:** Not recorded.

**ROAD:** Eleven different birds flushed from road or flying over road after dark (1900–2100 hours) on 21 June between Lavanggu Village and Lake Te Nggano; all seen with aid of tractor headlights.

**Comments:** No species of caprimulgid has been reported previously from Rennell. The birds we observed might be the White-throated Nightjar (*Eurostopodus mysticallis*). Two factors support this identification: no white was seen in the wings or tail, and this species is resident on many main-chain islands of the Solomons as well as mainland Australia.

*Collocalia vanikorensis lugubris*. Vanikoro Swiftlet. Pekapeka.

This widespread and variable species (14 subspecies recognized by Chantler and Driessens 1995) is found in the Philippines, Sulawesi, the northern Moluccas, New Guinea, the Bismarck Archipelago, the Solomon Islands, Vanuatu, and much of Micronesia (Pratt et al. 1987: 218); *C. v. lugubris* occurs throughout the Solomons.

**LAKE:** Abundant; foraging in amorphous groups of up to 50; usually from near ground level to 60+ m above ground; never seen higher than 100 m above ground; over lakeshore, open gardens and living areas, plantations, old gardens, and forest; not particu-



larly vocal although occasionally heard scolding during chases; lower flight during and after rains; not conspicuously paired.

**FOREST AND COAST:** Abundant; ca. 300 in swirling masses along cliff edge above Tuhungganggo Beach; numerous birds entering and exiting a gap in the forest near a presumed cave entrance, emitting a typical apodid chatter; commonly heard near another cave in primary forest but erratically encountered within forest; one netted at forest cave entrance.

**ROAD:** Abundant; ubiquitous along road; flying from ground to treetops but rarely seen above canopy.

**AIRSTRIP:** Abundant; behavioral observations as at other localities.

*Specimen Summary and Comments:* One adult male and one adult female collected. The male's testes were minute. The female had a granular ovary with no enlarged follicles. The stomach of the male contained small insect parts. As noted above, *C. vanikorensis* was abundant at all localities visited and clearly more common than *C. esculenta* (see below). Diamond (1984) observed that *C. esculenta* was slightly more common. This discrepancy suggests that *C. vanikorensis*, which favors more open and disturbed habitats (Beehler et al. 1986; C.E.F., pers. obs.), may have increased in abundance in response to higher levels of human disturbance over the past two decades.

*Collocalia esculenta desiderata*. Glossy Swiftlet. Pekapeka.

This swift is even more widespread and variable than *C. vanikorensis*. Chantler and Driessens (1995) recognized 31 subspecies from Southeast Asia, most of Indonesia and the Moluccas, the Philippines, New Guinea, the Bismarck Archipelago, and the Solomon Islands south through Vanuatu to the Loyalty Islands and New Caledonia; *C. e. desiderata* is endemic to Rennell and Bellona.

**LAKE:** Common; often associated with *C. vanikorensis*; usually in pairs or small groups; seldom in open areas around TR and lake-

shore; on average a more agile and erratic flier than *C. vanikorensis* and forages closer to the ground, especially along trails and forest breaks.

**FOREST AND COAST:** Common; primarily in forest along cliff edges; loosely associated with *C. vanikorensis*; observed low against vegetation on the trail gap.

**ROAD:** Common; usually in smaller groups than *C. vanikorensis*; seemed to stay closer to the ground and vegetation although seen as high as treetops.

**AIRSTRIP:** Common; seen above airstrip, gardens, roads, and forest; singles, pairs, and small groups; behavioral observations as in other habitats.

*Comments:* As noted above (see *C. vanikorensis* account), we found *C. esculenta* to be less common than *C. vanikorensis*, in contrast to information gathered two decades earlier.

*Hemiprocne mystacea woodfordiana*. Whiskered Crested-Swift. Baapenuenu.

This species occurs in the Moluccas and Aru Islands (*H. m. confirmata*), New Guinea and west Papuan islands (nominate), the Admiralty Islands (*H. m. macrura*), the Bismarck Archipelago (*H. m. aeroplanes*), and the Solomon Islands (*H. m. woodfordiana* throughout, including Rennell, except *H. m. carbonaria* on San Cristobal).

**LAKE, FOREST AND COAST:** Not recorded.

**ROAD:** Rare; two birds perched in snag along road ca. 20 m above ground; single bird in disturbed forest perched on exposed snag ca. 15 m above road.

**AIRSTRIP:** Common; flying at dusk over gardens and second growth as low as 15 m above ground; occasionally vocal.

*Halcyon sancta sancta*. Sacred Kingfisher. Ligho tai.

This subspecies breeds primarily in Australia and migrates to Indonesia, New Guinea, the Bismarck Archipelago, and the Solomon Islands (including Rennell) during

the austral winter. Some populations may be resident on Guadalcanal and San Cristobal (Fry et al. 1992). Other resident subspecies occur in New Caledonia, the Loyalty Islands, Norfolk Island, and New Zealand.

LAKE, FOREST AND COAST, ROAD: Not recorded.

AIRSTRIP: Three perched together on wire; all had very buffy flanks and some buff on collar; all sat still and silent, whereas the resident breeder *H. chloris* called incessantly.

*Halcyon chloris amoena*. White-collared Kingfisher. Ligho.

This species is widespread and extremely variable, with 50 subspecies recognized (Fry et al. 1992) from northern Africa across southern Asia to Melanesia and Australia and then to western Micronesia and western Polynesia; *H. c. amoena* is endemic to Rennell and Bellona; nine other subspecies occur in the Solomons.

LAKE: Common; usually singly or in pairs; not as vocal as in other areas on Rennell; perched at any height in new growth, coconut plantations, forest edge, and closed forest; probably territorial; several observations of birds carrying orthopterans.

FOREST AND COAST: Uncommon; encountered twice in forest crossing trail; one netted in secondary forest; one seen ingesting orthopteran in tree at cliff edge.

ROAD: Not recorded.

AIRSTRIP: Common; very vocal in disturbed habitats; singly, in pairs, or groups of three; at all levels of vegetation, often on exposed branches.

*Specimen Summary and Comments:* Three males and three females collected. Their reproductive condition indicates that *H. c. amoena* was not breeding in late June. Bradley and Wolff (1958) reported a nest with three nestlings in early November. Stomachs ( $n = 3$ ) contained beetles (heads, elytra), orthopterans (mandibles), spiders (chelicerae and fangs), and other arthropod parts. Bradley and Wolff (1958) also reported land snails in the stomach of one bird.

*Hirundo nigricans*. Tree Martin.

This species breeds in Australia, Tasmania, the Lesser Sundas, the Moluccas, New Guinea, and New Caledonia. Southern populations (*H. n. nigricans*) migrate north as far as the Solomon Islands.

LAKE: Rare; one seen twice soaring over the canopy, associated with *Collocalia vanikorensis*. Although the pale rump was not seen because of the angle and distance, the hirundine flight and shape (slightly forked tail), and light underparts contrasting with the dark back and cap, leave little doubt that this bird was *Hirundo nigricans*. The only other swallow known from the Solomon Islands is *H. tahitica*, which is much darker below, has a longer forked tail, and different flight.

FOREST AND COAST, ROAD, AIRSTRIP: Not recorded.

*Comments:* This is the first record of this species or any swallow for Rennell Island. *Hirundo nigricans* winters "occasionally in the Solomon Islands" (Mayr 1945) and has been recorded from Guadalcanal.

*Coracina lineata gracilis*. Yellow-eyed Cuckoo-shrike. Lighobai.

This polytypic species (10 subspecies) is found in New Guinea and surrounding islands, the Bismarck Archipelago, and the Solomon Islands. Endemic to Rennell and Bellona, *C. l. gracilis* is the only subspecies with males retaining femalelike ventral barring (Mayr 1945).

LAKE: Uncommon; one group of six in *Ficus* in secondary forest, and sporadic flyovers.

FOREST AND COAST: Common; heard and seen regularly within and above canopy, but not in understory; commonly in groups of four to six, gleaning fruit in canopy; six coming in to roost in snag in primary forest (all three specimens collected from this group); occasionally associated with *Aplonis* sp.

ROAD: Common; usually in groups of three to eight flying just above canopy or

across canopy gaps, often involving emergent *Ficus* sp.

**AIRSTrip:** Uncommon; a group of at least five in canopy of emergent *Ficus* sp. with *Ducula pacifica*, *Ptilinopus richardsii*, and *Aplonis cantoroides*; one on bare branch above second growth; heard sporadically.

*Specimen Summary and Comments:* Two males and one female collected. None in breeding condition. Bradley and Wolff (1958) reported an October/November clutch of two from Rennell. The stomachs ( $n = 2$ ) contained fruit pulp and seeds (including *Ficus* sp.), beetle parts (elytra, heads, bodies), and a phasmid.

*Coracina novaehollandiae*. Black-faced Cuckoo-shrike.

This species breeds in Australia and Tasmania, and migrates in the austral winter to northern Australia, the Lesser Sunda, New Guinea, and the Solomon Islands. It is part of the *C. caledonica* superspecies that ranges from the Himalayas to Australia and New Caledonia (Sibley and Monroe 1990).

**LAKE:** Rare; two sightings of one bird in a snag near fruiting *Ficus*; no evidence that more birds were present; in both cases associated with a flock of *Aplonis cantoroides* and *A. insularis*.

**FOREST AND COAST, ROAD, AIRSTrip:** Not recorded.

*Comments:* This is the first record of *C. novaehollandiae* for Rennell. The subspecies *melanops* winters in the Solomon Islands (Mayr 1945).

*Turdus poliocephalus rennellianus*. Island Thrush. Gagango.

The hypervariable *Turdus poliocephalus* (50 subspecies in Ripley 1964) occurs from Southeast Asia and Indonesia east to Tonga and Western Samoa (Steadman 1993); *T. p. feminina*, endemic to Rennell, is one of four subspecies in the Solomons (Bougainville, Guadalcanal, and Kolombangara each also with an endemic form).

**LAKE:** Uncommon (based on net results); pairs in understory of shaded scrub or sub-

mature closed forest; not in open gardens or other habitats without tall canopy; "chuck-chuck-chuck" call as described by Diamond (1984), reminiscent of American Robin (*Turdus migratorius*); no song identified.

**FOREST AND COAST:** Common; singles or pairs heard and seen regularly, never above 2 m.

**ROAD:** Uncommon; in undergrowth or flying low across the road.

**AIRSTrip:** Uncommon; in more mature forests away from airstrip.

*Specimen Summary and Comments:* Four males and two females collected. The two females were not of breeding age because they had incomplete skull ossification, immature ovaries, and bursae. All four males had enlarged testes. The three males collected by Bradley and Wolff (1958) in November also had enlarged testes. This suggests a prolonged breeding season on Rennell. One male had light body molt, and another had primaries sheathed at base. Females were not molting, except one had a single secondary in sheath. Stomachs ( $n = 6$ ) were empty. Bradley and Wolff (1958) identified millipedes, larvae, adult beetles, and small snails in their specimens.

*Gerygone flavolateralis citrina*. Fantail Gerygone. Lokeloke.

This species occurs on New Caledonia (*G. f. flavolateralis*), the Loyalty Islands (*G. f. roxi*, *G. f. lifuensis*), northern Vanuatu and the Banks Islands (*G. f. correiae*), and Rennell, where *G. f. citrina* is endemic. The species is not known elsewhere in the Solomons. This distribution is nearly identical to that of *Myiagra caledonica* (see below).

**LAKE:** Abundant; most often in groups of two to four; vocal throughout day; prominent member of morning chorus; occurs primarily in understory but also in higher strata; several birds carrying pieces of moss and rootlets; common anywhere with standing woody vegetation, including garden edges, coconut plantations, disturbed and older forest; often in mixed flocks with *Woodfordia superciliosa*, *Zosterops rennelliana*, *Rhipidura*

*rennelliana*, *Clytorhynchus hamlini*, and loosely with *Myzomela cardinalis*.

FOREST AND COAST: Abundant; behavior and group size similar to that given above.

ROAD: Abundant; consistent with above observations.

AIRSTRIP: Abundant; consistent with above observations.

*Foraging Behavior:* A very active forager, almost always using jumps or short sally strikes or hovers (5–50 cm) to live leaves for insect prey. Some hovers were protracted (to 2–3 sec), and the birds often gave audible bill snaps.

*Specimen Summary and Comments:* Four males and five females collected. Specimens were a mixture of breeding and nonbreeding birds although all lacked bursae and had fully ossified skulls. Bradley and Wolff (1958) found several nests in November, and the presence of reproductively active birds in our sample suggests a prolonged breeding season. The presence of adult males with either enlarged or small gonads points either to asynchronous breeding or to the presence of “floater” males (Brown 1969) in the population. Stomachs ( $n = 3$ ) contained spiders and spider parts (fangs and chelicerae), lepidopteran-type larvae, beetle elytra, and a hymenopteran head. Bradley and Wolff (1958) reported small beetles in stomachs.

*Rhipidura rennelliana*. Rennell Fantail. Maghighape.

Endemic to Rennell, *R. rennelliana* is a member of a superspecies that includes *R. drownei* on Guadalcanal and Bougainville; *R. tenebrosa* on San Cristobal; *R. spilodera* from Vanuatu, the Banks Islands, New Caledonia, and Fiji; *R. personata* of Fiji; and *R. nebulosa* in Western Samoa (Mayr 1986, Sibley and Monroe 1990).

LAKE: Uncommon; generally in closed-canopy stands, from scrubby second growth to submature forests; in scrub usually 1–3 m above ground, but up to 15 m in tall forests; usually in closely associated pairs, sometimes groups of three.

FOREST AND COAST: Uncommon, although more common than in more disturbed habitats; from understory up to 15 m; usually in pairs, loosely associated with mixed flocks; the only vocalizations noticed were harsh scolding calls.

ROAD: Uncommon; consistent with behavioral notes from other localities.

AIRSTRIP: Uncommon; group of four along airstrip in young second growth; usually 2–8 m above ground.

*Foraging Behavior:* Very active foraging, changing perches frequently and spreading its tail, and using short to midlength (15–100 cm) sally strikes to take flying insects. Appeared to flush and then chase prey. Some sallies became protracted flutter chases.

*Specimen Summary:* Four males and one female collected. None in breeding condition.

*Clytorhynchus hamlini*. Rennell Shrikebill. Ghoghobiu.

This monotypic species is endemic to Rennell.

LAKE: Common; singles or groups of two or three (adults with juveniles) in understory; never more than two adults together; any habitat with developed understory; often associated with *Gerygone flavolateralis*, *Zosterops rennelliana*, and *Woodfordia superciliosa*, but occasionally away from flocks; readily attracted to “pishing.”

FOREST AND COAST: Common; generally in mixed flocks with *Z. rennelliana*, *Myiagra calcedonica*, *Pachycephala pectoralis*, *Chrysococcyx lucidus*, *G. flavolateralis*, and *W. superciliosa*.

ROAD: Uncommon; consistent with behavioral notes from other localities.

AIRSTRIP: Uncommon; behavioral observations as at other localities; more associated with forested areas than in other localities; observed only away from airstrip.

*Foraging Behavior:* Difficult to see well as it moved sluggishly through rather dense understory; only foraging maneuver observed was a reach up and probe into a suspended and curled dead leaf.

*Specimen Summary and Comments:* Five males and five females collected. Half of these are young birds with bursae and less than 100% skull ossification. The five adults had small testes or ovaries without enlarged follicles. The five young birds suggest breeding within several months before our arrival. Diamond (1984) reported nest construction during October, although Bradley and Wolff (1958) had no evidence of breeding in specimen data from October and early November. Stomach contents were dominated by beetle and orthopteran parts (mandibles, elytra, legs, etc.). Spider chelicerae were also found. Bradley and Wolff (1958) reported beetles and other insects in stomachs.

*Myiagra caledonica occidentalis.* Broad-billed Flycatcher. Tangitangivilage.

This species is found in New Caledonia (*M. c. caledonica*), the Loyalty Islands (*M. c. viridinitens*), Vanuatu (*M. c. marinae*), the Banks and Torres Islands (*M. c. melanura*), and Rennell, where *M. c. occidentalis* is endemic. This distribution nearly matches that of *Gerygone flavolateralis*; it is also absent elsewhere in the Solomon Islands.

LAKE: Rare; one perched alone in understory (2.5 m) of disturbed forest.

FOREST AND COAST: Uncommon; seen on several occasions in forest with mixed flocks (tightly or loosely associated), usually low in undergrowth.

ROAD, AIRSTRIP: Not recorded.

*Foraging Observations:* In mature forest on 26 June (1100–1115 hours), an adult male made eight long sallies (ca. 1–3 m) from perches 1–3 m above ground; the sallies, which terminated in brief hovers at leaf substrates (sometimes touching feet on leaves), were more horizontal than vertical; the bird never returned to its original perch.

*Comments:* Diamond (1984) reported this species nesting in October although two adults collected by Bradley and Wolff (1958) in November showed no evidence of breeding.

*Pachycephala pectoralis feminina.* Golden Whistler. Taataga.

The incredibly polytypic *Pachycephala pectoralis/caledonica* assemblage (73 subspecies of *P. pectoralis* in Mayr 1967; also see Sibley and Monroe 1990) is found in Wallacea, Australasia, and southwestern Oceania; *P. p. feminina* is endemic to Rennell. Several other subspecies occur in the Solomons.

LAKE, ROAD, AIRSTRIP: Not recorded.

FOREST AND COAST: Uncommon; only within well-developed, closed-canopy forest; a core member in mixed-species understory flocks with *Myiagra caledonica*, *Zosterops rennelliana*, and *Clytorhynchus hamlini*; notably silent (uncharacteristic for *P. pectoralis* [D.W.S., pers. obs.]); fragment of typical song (described in Diamond 1984) heard only once from forest understory; one bird successfully lunged (cf. Remsen and Robinson 1990) for orthopterans.

*Comments:* Diamond (1984) recorded *P. pectoralis feminina* as abundant in forest with a common, conspicuous call. In contrast, we found *P. p. feminina* decidedly uncommon, even in appropriate habitat; they were not vocal or conspicuous. Because Bradley and Wolff (1958) reported nesting in October/November, Diamond's observations (made in October) probably reflect increased vocal activity of this species during the breeding season.

*Myzomela cardinalis sanfordi.* Cardinal Honeyeater. Baghigho (male, baghigho kuga; female, baghigho ugupoko).

This polytypic species (15 subspecies [Salomonsen 1967]) is widespread in Micronesia and occurs in scattered populations in eastern Melanesia and western Polynesia (to Samoa, and formerly Tonga [Steadman 1993]); *M. c. sanfordi* is endemic to Rennell; the only other populations of *M. cardinalis* in the Solomons are of *M. c. pulcherrima* on San Cristobal and Ugi.

LAKE: Abundant; seen and heard ("churp!" and scold notes) constantly in all habitats; adult males often on exposed perches above leafy canopy giving musical "cher-dert" or "cher-dert-dert" calls, the "derts" slightly lower pitched; singly, in



pairs, or pairs associated with single young; used a variety of exposed (mainly adult males) and protected perches; also on islets in lake and often flying over the lake; in mid-level (2–3 m) of scrub up into emergent canopies, coconut plantations, and exposed garden trees; loosely associated with mixed flocks of *Woodfordia superciliosa* and to a lesser extent *Gerygone flavolateralis*; in fruiting trees with *Ptilinopus richardsii*, *Coracina lineata*, *W. superciliosa*, *G. flavolateralis*, and *Aplonis cantoroides*; kept more closely to the canopy in mature forests.

**FOREST AND COAST:** Common; generally at higher levels in forest than in more disturbed habitats; less vocal in submature to mature forest and along cliff edges; in fruiting tree (*Fagraea* sp.) with *P. richardsii*, *C. lineata*, *Aplonis* spp., and mixed flocks of *W. superciliosa* and *G. flavolateralis*.

**ROAD:** Common; perhaps more abundant than any other passerine along the road; regularly seen perched and flitting about roadside vegetation and the visible canopy layer.

**AIRSTRIP:** Abundant; highly vocal, both scolds and whistles; frequent chasing (male-male and female-female); other behavioral observations as at other localities.

**Foraging Behavior:** Foraged on both nectar and insects, using gleanings and occasionally short (ca. 20 cm) sally strikes to live vegetation.

**Specimen Summary and Comments:** Twelve males and six females collected. Eight birds had bursae and incomplete skull ossification. No adults had enlarged gonads. Bradley and Wolff (1958) reported a male with enlarged gonads in October/November and found one active nest. Eight of their 18 specimens were classified as juveniles, and one was a nestling, suggesting a breeding season in the austral spring. Stomachs ( $n = 4$ ) contained mostly insect parts, including beetle elytra and heads (weevils and other families), lepidopteran larvae mandibles, and hymenopteran bodies and wings. Also found were seeds, pollen, and a few spider chelicerae. This species undoubtedly relies heavily on nectar on Rennell, but we

did not analyze stomach contents for nectar or pollen.

*Woodfordia superciliosa*. Woodford's White-eye. Ghaga.

The two species of *Woodfordia* are large white-eyes with narrow distributions; *W. superciliosa* is endemic to Rennell, whereas *W. lacertosa* is endemic to Ndende in the Santa Cruz Islands, about 600 km ENE.

**LAKE:** Abundant in all vegetation types; generally in groups of four to eight; most commonly with *Gerygone flavolateralis*; sometimes with *Zosterops rennelliana* and *Myzomela cardinalis*; appeared less common in more mature forest; seen crossing gaps of all kinds; most often 2–8 m above the ground but occurs at all levels including canopies of emergent *Ficus* trees; generally very vocal; larger groups (6–10 birds) occasionally exploded into musical chatter as if mobbing something; groups often emitted soft contact notes reminiscent of contact calls of *Pitohui* spp. and *Pomatostomus isidorei* within mixed-species foraging flocks in New Guinea (C.E.F., pers. obs.); sometimes gave agitated, metallic notes in a long series (possibly an alarm call); apparently frequent vocal mimicry between *Zosterops rennelliana* and this species (see Diamond 1984).

**FOREST AND COAST:** Abundant, although somewhat less so than around the lake; similar group sizes nearly always moving in the upper understory but also at higher and lower levels; in fruiting trees with *Ptilinopus richardsii*, *Coracina lineata*, *M. cardinalis*, and *Aplonis* spp., as well as *G. flavolateralis*, *Z. rennelliana*, and *Clytorhynchus hamlini*; also sporadically in mixed flocks of varying species composition throughout the forest.

**ROAD:** Common; behavior as at other localities.

**AIRSTRIP:** Abundant; behavior as at other localities.

**Foraging Behavior:** Foraged at a variety of forest strata and in open growth or disturbed vegetation; most frequently observed eating fruits (including melastomes, *Macaranga harveyana*, *Pipturus argenteus*), but also visited



flowers for nectar and inspected dead leaves, vines, and leaf axils for arthropods.

**Specimen Summary and Comments:** Seven males and 11 females collected. Gonads of all 11 adults indicated that *W. superciliosa* was not breeding in late June. Three had skulls <50% ossified, suggesting fledging within several months. Diamond (1984) observed many begging juveniles in October. Bradley and Wolff (1958) noted two nests and one clutch of two in October/November. Stomachs ( $n = 4$ ) contained several types of seeds, fruit skin and pulp (including papaya), insect parts (beetle elytra, lepidopteran larvae mandibles), a scorpion abdomen, and spider fangs.

*Zosterops rennelliana*. Rennell White-eye. Suusuubagu.

This species is endemic to Rennell. Other members of the *Zosterops griseotinctus* superspecies (see Mayr 1967, Sibley and Monroe 1990) occur on small islands in the central Solomons (*Z. vellalavella* on Vella Lavella and Mbava, *Z. luteirostris* on Ghizo, *Z. kulambangrae* in the New Georgia group, and *Z. splendidus* on Ranongga) and off New Guinea and the Bismarck Archipelago (*Z. griseotinctus*).

**LAKE:** Common; usually in pairs, occasionally three, but not seen alone; generally 1–6 m above the ground; song with much spacing between phrases, heard primarily at dusk and dawn, and sporadically during daylight; also a chattery contact call; rare in early second growth; more common with increasing age of woody vegetation; associated regularly with *Woodfordia superciliosa* and/or *Gerygone flavolateralis*, sometimes with *Clytorhynchus hamlini*.

**FOREST AND COAST:** Common; generally in pairs both within and outside of mixed flocks; usually at 2–10 m from understory to subcanopy.

**ROAD:** Common; but in small overall numbers; behavior as at other localities.

**AIRSTRIP:** Common; behavior as at other localities.

**Foraging Behavior** ( $n = 13$ ): Less varied

than in *Woodfordia superciliosa*; all foraging observations 1–6 m above ground; consistently inspected dead leaves ( $n = 11$ ); also inspected flowers (Rubiaceae) and live leaves; frequently used hang-sideways ( $n = 3$ ) and hang-down ( $n = 4$ ) maneuvers from horizontal to vertical perches to inspect leaves or probe into curled dead leaves.

**Specimen Summary and Comments:** Four males and two females collected. Our sample contains breeding and nonbreeding adults, and two birds with incomplete skull ossification and bursae. Two males had enlarged testes, and one female had a shelled egg in her oviduct and two ruptured follicles (clutch size >2). Both Diamond (1984) and Bradley and Wolff (1958) reported active nests in October/November. The combined observations suggest that *Z. rennelliana* has a prolonged and perhaps asynchronous breeding season, spanning from at least June to November and likely longer. Stomachs ( $n = 2$ ) contained many small seeds (ca. 30 1-mm diameter seeds in one stomach and >150 in the other), beetle parts, spider fangs, and the mandible of a lepidopteran larva.

*Aplonis cantoroides*. Singing Starling. Ghaapilu-ghae.

This monotypic species (if *Aplonis crassa* of Tanibar Island is treated as specifically distinct [e.g., Amadon 1962, Sibley and Monroe 1990]) is found on New Guinea and surrounding islands, the Bismarck Archipelago, and the Solomon Islands.

**LAKE:** Common, but patchily distributed; often in vicinity of roosts or fruiting trees, or flying in compact groups of 10–15 birds in the early morning or late afternoon; in fruiting trees often with *Ptilinopus richardsii*, *Coracina* spp., and *Aplonis insularis*; eating fruits of *Fagraea* and *Ficus*; distribution seemed to depend on presence of fruiting trees more than any other habitat variable; not seen in understory; ratio of adult : young ca. 3 : 1.

**FOREST AND COAST:** Uncommon; with *Ptilinopus richardsii*, *Coracina lineata*, *A. insularis*, and mixed flocks of *Woodfordia superciliosa*, *Myzomela cardinalis*, and *Gerygone flavolateralis* in and around fruiting trees, es-

pecially *Fagraea* sp.; observed tearing flesh from *Fagraea* fruits; not very vocal.

ROAD: Common; several flocks of 8–12 birds appeared to be postbreeding flocks based upon the prevalence of juveniles; also perched in groups on exposed snags and sparse-canopy trees, once with putative *A. insularis*.

AIRSTrip: Not recorded.

*Comments:* Bradley and Wolff (1958) documented an early November nest with four young in a hole in the coral rock on an islet in Lake Te Nggano and reported that this species kept mainly to the islets. They collected a female with enlarged gonads and a juvenile male. Previously, *A. cantoroides* had been recorded only once from Rennell (Mayr 1945) and was regarded as a straggler.

*Aplonis insularis*. Rennell Starling. Ghaapilumouku.

This species is endemic to Rennell and Bellona. Amadon (1962) stated that it may be a race of *Aplonis feadensis*, which occurs on small islands in the Bismarcks and Solomons (Fead, Nissan, Ontong Java). Sibley and Monroe (1990) considered *A. feadensis* and *insularis* to be a superspecies.

LAKE: Uncommon; always associated with *A. cantoroides*; commonly two to four individuals appearing to be *A. insularis* (shorter tail and stubbier bill) in flocks of 8–12 birds; no observed behavioral differences between *A. insularis* and *A. cantoroides*; calls different from those of *A. cantoroides*—a rapid dry series of monotonic, metallic clinks and clicks; the presumed song is two short series of notes like a squeaky bicycle wheel “wreee-eee-eee-eee,” pause, “eee-eee.”

FOREST AND COAST: Uncommon; associated with *A. cantoroides*; general habits seem similar to those of *A. cantoroides*.

ROAD: Rare; found once in a flock of *A. cantoroides*; relative abundance reported here likely an artifact of the tractor ride and our uncertainty as to the field identification of this species.

AIRSTrip: Not recorded.

*Comments:* Bradley and Wolff (1958) found this species more common on the land around Lake Te Nggano than *A. cantoroides* and documented *A. insularis* nesting in stumps of coconut trees. They also collected three specimens, including one juvenile, in November and examined a clutch of three eggs.

#### DISCUSSION

Several novel observations merit additional discussion and further confirm that basic fieldwork can contribute to our understanding of how Rennell's avifauna is changing over time.

#### *General Patterns of Breeding*

In combination with previous work, our specimen data suggest that many land birds on Rennell have prolonged breeding seasons typical of those of lowland tropical regions (Gill 1995, and references therein). Although virtually no ornithological research has been undertaken on Rennell from January to May, our specimen evidence suggests that *Clytorhynchus hamlini*, *Woodfordia superciliosa*, and *Myzomela cardinalis* probably breed during some portion of those months (but were not in breeding condition in late June). On the other hand, specimens of *Zosterops rennelliana*, *Gerygone flavolateralis*, and *Turdus poliocephalus* in breeding condition were collected during our stay. Diamond (1984) and Bradley and Wolff (1958) both reported October/November breeding in most species of land birds, including the three we observed breeding in June and the three others that we infer to have bred just before our arrival. These patterns suggest a prolonged (8+ months) or bimodal breeding season for many species of land birds on Rennell. It is possible that some species (*T. poliocephalus* and *Z. rennelliana*) may breed throughout the year, and others (*W. superciliosa* and *M. cardinalis*) may have a non-breeding period during the early austral winter ending sometime in June or July.

According to local inhabitants, many of

the aquatic birds of Lake Te Nggano bred before our arrival. The small cormorant *Phalacrocorax melanoleucos* and frigatebirds (*Fregata minor* and *F. ariel*) clearly were not breeding, and none of the roosts or islets we observed harbored nesting birds. The two specimens of *Phalacrocorax carbo*, however, had gonad and plumage conditions suggesting that they would breed soon, when it was unlikely that any of the other aquatic species would be breeding.

### *Dawn Chorus and Mixed-Species Flocks*

In general, our observations of dawn choruses and mixed-species flocks on Rennell are consistent with those of Diamond (1984). We stress that both Diamond's and our fieldwork on Rennell were for short periods (5–13 October for Diamond and 20–30 June for us). The dawn chorus on Rennell is rather monotonic, consisting largely of *Zosterops rennelliana*, *Gerygone flavolateralis*, *Myzomela cardinalis*, *Woodfordia superciliosa*, and occasionally *Ptilinopus richardsii*. The order by which birds began to sing before and through dawn was consistent with that reported by Diamond (1984), although we recorded a somewhat different species composition. The predawn vocal activity described by Diamond of *Rhipidura rennelliana*, *Clytorhynchus hamlini*, and *Zosterops rennelliana* was conspicuously absent during our fieldwork, although all three species were present at our sites. It seems likely that these differences reflect seasonal variation in vocalization. Neither *R. rennelliana* nor *C. hamlini* were breeding during our stay, although some *Z. rennelliana* were (see species accounts). Differing vocal activity may also be related to differences in the habitats we sampled.

Our findings on mixed-species flocks were consistent with those of Diamond (1984): flocks with *Woodfordia superciliosa*, *Zosterops rennelliana*, and *Rhipidura rennelliana* as regular members and *Clytorhynchus hamlini* and *Myzomela cardinalis* as occasional members. Our observations suggest that *Rhipidura* was a more occasional than regular member of the *Zosterops*/*Woodfordia* flocks

described by Diamond and that *Myzomela* appeared to be only loosely associated with mixed-species flocks. *Clytorhynchus* was an occasional member of the *Zosterops*/*Woodfordia* flocks but was encountered more often as a core member in a different type of mixed-species flock that consisted of *Pachycephala pectoralis*, *Myiagra caledonica*, and *Gerygone flavolateralis*. *Chrysococcyx lucidis* and *Zosterops rennelliana* appeared to be more peripheral members of this last type of mixed-species flock.

### *New Observations*

We observed three species previously unrecorded from Rennell. What appeared to be a single Black-faced Cuckoo-shrike, *Coracina novaehollandiae*, was observed several times. An Australian breeder, *C. novaehollandiae* reaches the Solomons only sparingly in the austral winter (Mayr 1945). We also repeatedly observed a putative species of caprimulgid on the road and on forest trails near the lake (most probably *Eurostopodus mysticallis*) and twice observed a Tree Martin (*Hirundo nigricans*). We were unable to collect specimens from any of these three species. In light of the evidence for colonization of Rennell in recent decades by *Phalacrocorax carbo* and *Aplonis cantoroides* (see below), it is possible that some of the new records of nonbreeding birds might also represent the early stages of once-vagrant species establishing resident populations.

### *Changes during Recent Decades*

Our observations suggest two major changes in the avifauna of Rennell since Diamond visited the island in 1976. First, *Phalacrocorax carbo* is increasing in abundance. Reported initially as an Australian vagrant by Diamond (1984), the marked population increase and breeding of this cormorant (Gibbs 1996) follows the introduction of the fish *Tilapia mossambica* into Lake Te Nggano in 1957. We have no evidence that *P. carbo* feeds on anything but *Tilapia*, or that it uses coastal or marine environments on Rennell. Thus, the proliferation of *Tilapia*

TABLE 1

RESIDENT SPECIES OF BIRDS PREVIOUSLY RECORDED ON RENNELL ISLAND THAT WE DID NOT RECORD DURING  
20–30 JUNE 1997

SCIENTIFIC NAME	COMMON NAME	LATEST RECORD	POSSIBLE EXPLANATION FOR LACK OF RECORD
<i>Anas superciliosa pelewensis</i>	Australian Black Duck	1965, 1976	Extirpated by disruption of food supply
<i>Anas gibberifrons remissa</i>	Gray Teal	1928	Extirpated by disruption of food supply
<i>Porzana tabuensis</i>	Sooty Rail	1963	Overlooked?; extirpated by rats?
<i>Sterna anaethetus anaethetus</i>	Bridled Tern	1976	Overlooked because it resides in middle of lake or on remote islets
<i>Caloenas nicobarica nicobarica</i>	Nicobar Pigeon	1930	Rare or extirpated?
<i>Tyto alba crassirostris</i>	Barn Owl	1930	Rare?; little night work?

may have led to the establishment of breeding populations of a formerly vagrant species. Monitoring how changes in the aquatic ecosystem affect bird populations is imperative to conservation of the Rennellese avifauna. A consideration of the potential impact of introducing exotic species should guide future management decisions.

A second indication of change concerns the starling *Aplonis cantoroides*. Generally, *A. cantoroides* is associated with shoreline coconut plantations, human settlements, and other types of disturbed or edge habitats. Because it is rare or absent in true forest, Mayr (1945) explained his single observation on Rennell as accidental. In the 1950s, Bradley and Wolff (1958) collected two adults and reported an active nest in November on a lake islet. By the 1970s, Diamond (1984) encountered this species regularly around the lake but never more than ca. 400 m from the lakeshore. We observed *A. cantoroides* both around the lake and along most of the road, but observations ceased as we approached the western end of the island. Habitat alteration associated with villages near the lake and on the cross-island road may be enabling a population expansion of this starling.

The recent population increases of *Phalacrocorax carbo* and *Aplonis cantoroides* portend the importance of vagrant species on islands subjected to increased human disturbance. That these species colonized Rennell suggests that human-instigated changes in the aquatic or terrestrial landscape have enabled former vagrants to establish resident populations. Other vagrant

species that prefer open or disturbed habitats (such as *Hirundo nigricans*) may also be candidates for colonization. Because of the exceptional endemism and unusual composition of Rennell's avifauna, the impacts of newly colonizing species are worthy of long-term monitoring.

The process of successful colonization by vagrant species following anthropogenic disturbance probably has been occurring in Oceania for thousands of years. For example, the fossil record of rails in remote Oceania shows that the arrival of widespread, volant species (*Porzana tabuensis*, *Gallirallus philippensis*, *Porphyrio porphyrio*) occurred only after human arrival and resultant deforestation beginning 3000 yr ago (Steadman 1993, 1995). Previous to that time, each island was inhabited by endemic flightless species of rails.

#### *What Is Missing Today from Rennell's Avifauna*

We did not find six resident species previously reported from Rennell (Table 1). As Diamond (1984) speculated, the presence of *Tilapia* undoubtedly has affected the aquatic food web of Lake Te Nggano and probably is responsible for the apparent loss of Rennell's two resident species of ducks. Overhunting is unlikely to explain the extirpation of these ducks because large parts of the lake are seldom visited. With our limited field time and the small portion of the island we explored, we may simply have overlooked

*Porzana tabuensis*, *Sterna anaethetus*, and *Tyto alba*. Because *Caloenas nicobarica* typically is nonvocal but can be visually conspicuous, lack of record since 1930 suggests extreme rarity or possible extinction. Specific searches for these species should be made to confirm their status.

Rennell is unusual among major islands in Oceania in that its birdlife was well surveyed right at the time of the first major Western contact. There is no fossil record of birds for Rennell, so our assessment of which birds may have been lost during prehistoric human occupation is purely speculative and based on the species recorded in prehistoric sites from nearby areas of Oceania such as New Ireland (Steadman et al. 1999), New Caledonia (Balouet and Olson 1989), Tikopia and Anuta (Steadman et al. 1990), and Tonga (Steadman 1993, 1995). We consider these taxa to be among those most likely to be identified if prehistoric bone deposits were found on Rennell: procellariids, tropicbirds, megapodes, flightless rails in any of five genera (*Porzana*, *Gallirallus*, *Nesoclopeus*, *Gallinula*, *Porphyrio*), other species of *Ducula* and *Gallicolumba*, *Aegotheles*, *Eclectus*, *Charmosyna*, *Corvus*, and a meliphagid larger than *Myzomela*. Additional prehistoric losses on Rennell might include eagles, strigid owls, frogmouths, hornbills, pittas, and other birds that occur today no further east in the Pacific than the main chain of the Solomons.

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