

## **The Pacific shrikebills (*Clytorhynchus*) and the case for species status for the form *sanctaecrucis***

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Shrikebills constitute a poorly known genus (*Clytorhynchus*) of Pacific island forest birds, ranging from the Solomon Islands to New Caledonia and American Samoa. This review updates all aspects of their conservation ecology, including taxonomy and identification. Data sources are BirdLife International's field work in Fiji (totalling 43 surveys, mostly spending 2–5 days in old-growth forest, plus incidental records over three years, as reported in BirdLife International 2006); my own field work on Rennell and Nendo (=Ndeni) in the Solomon Islands, Santo, Éfaté and Erromango in Vanuatu, and New Caledonia; examination of specimens in the American Museum of Natural History (AMNH, New York) and Natural History Museum (NHM, Tring); and a review of the published literature.

### **The genus *Clytorhynchus***

*Clytorhynchus* is a genus of Monarchidae, closely related to *Mayrornis*, *Neolalage*, *Pomarea* and *Chasiempis*, which together form a clade of Polynesian taxa (Filardi & Moyle 2005). Mayr (1933) characterised *Clytorhynchus* as having a bill that is 'compressed laterally, has a hook and reaches an enormous size in the larger species of the genus.' He subdivided it into small forms, the *C. vitiensis* superspecies comprising Southern Shrikebill *C. p. pachycephaloides* on New Caledonia, *C. p. grisescens* on Vanuatu, and 11 subspecies of the Lesser (or Fiji) Shrikebill *C. vitiensis* on Fiji, Tonga, Wallis and Futuna and on American Samoa, and the large forms, comprising Black-faced Shrikebill *C. n. nigrogularis* on Fiji, *C. n. sanctaecrucis* on Nendo in the Santa Cruz archipelago, and Rennell Shrikebill *C. hamlini* on Rennell in the south-east Solomons. *C. nigrogularis*, *sanctaecrucis* and *hamlini* have boldly patterned plumage, the first two are sexually dichromatic, and *hamlini* has a slightly duller female, whilst *vitiensis* and *pachycephaloides* are plain brown and sexually monochromatic. Discussing the races of *C. vitiensis*, Mayr noted 'One can distinguish four extremes on the four corners of the range of this species within Fiji but the birds from all the other islands combine characters of all these four races. It is somewhat a matter of opinion to which subspecies the populations of some of the islands should be referred, and also whether or not additional races should be described from intermediate localities.' There have been no reviews of the genus since Mayr (1933), and Watling (2001) noted that the subspecific taxonomy of *vitiensis* is still uncertain.

## Ecology

Shrikebills are all territorial insectivores of forest understorey and midstorey. They differ from most other Monarchidae in often searching dead wood and clusters of dead leaves, using their heavy bills to crunch through these tangles, as described by Clunie (1984) and Bregulla (1992). All occur in closed-canopy wet forest at all altitudes, except *vitiensis* which also occurs in drier forests, on smaller islands and in heavily degraded forest and mangrove. Clunie (1984) also reported *nigrogularis* from mangrove, but this observation has not been repeated. Most shrikebills occur on islands with low mountains and little avifaunal variation with altitude, such that *nigrogularis* and *vitiensis* have been seen to *c.*1,200 m on Fiji's highest peak, of 1,324 m (Gorman 1975), but *pachycephaloides* no higher than *c.*1,000 m on Vanuatu's highest peak, of 1,879 m. *C. nigrogularis* and *sanctaerucis* males often shiver lowered wings, sometimes leading to their also lowering the head into a horizontal posture, when engaged in antagonistic behaviour displaying at another male (or tape-recording). *C. pachycephaloides* and *sanctaerucis* are the only taxa to often cock their tails. *C. nigrogularis* and *sanctaerucis* are the only forms to be usually seen alone or in pairs, rarely in mixed-species flocks like the others.

## Vocalisations

Shrikebills are often first detected by their loud calls. All have similar mournful whistles, *c.*1–2 seconds long, and repeated regularly. These are sometimes monotone but often increase in volume, sometimes rise or descend in tone, and are often quavering. They also give typical monarch scolds, usually deeper and harsher than sympatric monarchs (e.g. Slaty Monarch *Mayrornis lessoni*). *C. hamlini*, *nigrogularis* and *sanctaerucis* have a much wider range of complex whistles and harsher chatters. The most varied whistles are given by territorial males, which often call vigorously for long periods, these whistles presumably representing the territorial song. Short phrases of a whistle or scold, or combination, are usually repeated for one to a few minutes then replaced by another phrase. Males respond to playback of recordings, especially of the song. Some typical calls of *nigrogularis* and *vitiensis* are discussed in Bailey (1991). *C. nigrogularis* appears more vocal and much more easily observed in October–December; all previous breeding records are in August–December (Watling 2001). The highest counts of *nigrogularis* are six pairs at Garrick Memorial Reserve in November 2002 (pers. obs.), and five males and two females seen and others heard on Mt. Tomanivi in December 1993 (R. Thomas *in litt.*).

## Identification of *nigrogularis* and *vitiensis*

*C. nigrogularis* and *vitiensis* are the only sympatric shrikebills, in the wet forests of Fiji's five largest islands (Viti Levu, Vanua Levu, Taveuni, Kadavu and Ovalau). Most adult male *nigrogularis* have distinctive plumage, with black on the head and



Figure 1. Adult male and female Santa Cruz Shrikebill *Clytorhynchus (n.) sanctaecrucis* (Adam Bowley)



Figure 2. Adult male and female Black-faced Shrikebill *Clytorhynchus nigrogularis* (Chloe Talbot-Kelly)

Figure 3. Adult Lesser Shrikebill *Clytorhynchus vitiensis* (Chloe Talbot-Kelly)

face, a white ear-coverts patch, and sometimes washed grey, especially on the crown. Some adult males, many immature males and a few adult females are intermediate between this plumage and the plain female plumage. The proportion of males attaining such plumage may vary between islands, as none of the four males taken on Kadavu by the Whitney South Seas expedition had it (Mayr 1933). Plain female and immature *nigrogularis* are very similar to *vitiensis* and can only be identified with care (Watling 2001). The two species also have very similar ecology. Based on my observations of 23 individual *nigrogularis* (but only seven females) and museum specimens, the identification features are listed in Table 1 in descending order of significance or ease of use.

TABLE 1  
Identification features of *C. nigrogularis* and *vitiensis*.

Feature	<i>C. nigrogularis</i>	<i>C. vitiensis</i>
Male plumage	Distinctive.	Plain, as female.
Calls	Most calls louder or stronger. Male territorial call is repeated phrases of several harsh notes followed by one or a series of long whistles, often upslurred.	Standard generic calls. Whistles usually shorter and quieter. Harsh notes, given as contact- / alarm-calls or preceding whistles in territorial phrases, are softer—similar to Slaty Monarch <i>Mayornis lessoni</i> .
Bill size	Heavy, with strongly curved distal half of the bill.	Light, with straight lower mandible, almost parallel to upper mandible.
Bill pattern	Pale tip, sometimes extending on cutting edges. Upper mandible always has pale tip, and lower mandible usually has one, varying from just the very tip to an extension along the cutting edges almost to the bill base.	Pale cutting edges, the band becoming narrower towards the bill tip and not extending onto the very tip. A few have an all-dark bill. Note subspecific variation, e.g. <i>C. v. compressirostris</i> on Kadavu has broader white cutting edges.
Size	Large and bulky. Length = 21 cm, intermediate between Red-vented Bulbul <i>Pycnonotus cafer</i> (20 cm) and Island Thrush <i>Turdus poliocephalus</i> (22 cm).	Medium-sized and less bulky. Length = 19 cm, similar to Wattled Honeyeater <i>Foulehaio carunculata</i> .
Pale tail tips	Small buffy tips to outer tail-feathers.	Variable; often has large whitish tail tips but sometimes invisible. Note subspecific variation, e.g. <i>C. v. layardi</i> on Taveuni has less distinct tail tips.
Female plumage	Some have greyish-washed underparts.	Underparts paler but similar colour to upperparts.
Behaviour	Shyer and more cryptic than most Fijian birds. Rather sluggish.	As confiding and active as most Monarchidae.
Ecology	Singles or in pairs, usually alone but sometimes (especially female-plumaged birds) loosely associated with mixed-species flocks. Male usually calls from lower canopy.	Usually encountered in mixed flocks, sometimes in loose groups of 3–4 birds. Calls from midstorey.

## **Taxonomy of *Clytorhynchus nigrogularis* and *C. (n.) sanctaerucis***

*Clytorhynchus nigrogularis sanctaerucis* Mayr, 1933, was described, from two specimens collected in 1927 from Nendo (Santa Cruz Islands, Solomon Islands), as a subspecies of the previously monotypic Black-faced Shrikebill *C. nigrogularis* (E. L. Layard, 1875) from Fiji. The type-description was based on what was believed to be an adult male, but noted as ‘possibly not yet reached the fully adult plumage; a small grayish patch before the eye, a few scattered white feathers on the throat, and the buffy tinge of the ear-coverts seem to indicate this’, and brief notes on the second specimen, an ‘immature’ male (Mayr 1933). Mayr noted that ‘It is very distinct and would probably be regarded as a species by many conservative ornithologists. The bill on the new form is more than proportionally smaller and decidedly less heavy than in *nigrogularis*. It is less deep and gives an impression of greater slenderness. The colour pattern of the two forms, however, is essentially the same’ (Mayr 1933).

However the two male *sanctaerucis* seen on 4–5 October 2004 (pers. obs.) were very different to the types, having plumage analogous to adult *nigrogularis*. Male *sanctaerucis* and *nigrogularis* are believed to take two years to reach adult plumage, and some male *nigrogularis* might never attain full plumage, whereas females may attain some male plumage (Mayr 1933). This supports Mayr’s suggestion that the type-specimen of *sanctaerucis* is not in full adult male plumage. The two pairs seen in 2004 were the first records of *sanctaerucis* since the 1927 specimens and indicate that clear differences exist between *nigrogularis* and *sanctaerucis*, as listed in Table 2.

Mayr’s (1933) classification of *sanctaerucis* as a race of *nigrogularis* must be revised based on my sightings and current attitudes towards species-level taxonomy. As the differences noted between *sanctaerucis* and *nigrogularis* are significantly greater than the differences between *vitiensis* and *pachycephaloides*, and much greater than the intraspecific variation shown by any congener, I propose that *sanctaerucis* be recognised specifically under the Biological Species Concept as: Santa Cruz Shrikebill *Clytorhynchus sanctaerucis*

### **Description of Santa Cruz Shrikebill *Clytorhynchus sanctaerucis***

The following is based on prolonged observation of two pairs of *sanctaerucis* at close range. Males were almost pied, with silky white underparts from upper breast to vent, and a large white circular or pentagonal ear-coverts patch. One had a very fine white supercilium from behind the eye to the rear of the ear-coverts patch and tiny white terminal tips to the outer two pairs of rectrices, the other had no supercilium, tips >5 mm on the outer three pairs and tiny tips to all other rectrices, and a slightly smaller ear-coverts patch. The lores, throat and breast-band were jet black with a slight blue gloss and the rest of the head was slightly duller black. The rest of the upperparts were

TABLE 2  
Differences between *C. nigrogularis* and *sanctaerucis*.

Feature	<i>C. nigrogularis</i>	<i>C. (n.) sanctaerucis</i>
<i>Size: wing-length</i>	100–110 mm ( $n=25$ males; Mayr 1933)	90 and 91 mm ( $n=2$ males; Mayr 1933)
<i>tail-length</i>	79–92 mm ( $n=25$ males; Mayr 1933)	72 and 72 mm ( $n=2$ males; Mayr 1933)
<i>Culmen-length</i>	26.2–30.2 mm ( $n= 25$ males; Mayr 1933)	23.3 and 24.1 mm ( $n=2$ males; Mayr 1933)
<i>Bill-depth at nostrils</i>	8.7–9.3 mm ( $n= 3$ ; own measurements)	6.4 mm (holotype; own measurements)
<i>Bill shape</i>	Heavy, with strongly curved distal half of bill, especially gonys	Shallow, with almost parallel edges, similar in proportion to <i>vitiensis</i>
<i>Bill colour</i>	Black with a variably sized pale horn-coloured tip	Blue-grey with a black nail
<i>Male crown colour</i>	Grey or brown	Black, as rest of head
<i>Male mantle, wings and tail</i>	Variably greyish brown	Sooty
<i>Male underparts and tail-tip spots</i>	Variably pale greyish buff	Silky white
<i>Female plumage</i>	Dull cold brown, much paler on underparts	Uniformly rufous-brown
<i>Foraging height</i>	Never been seen on ground and rarely within 2 m of it (except for an unreferenced comment in Pratt <i>et al.</i> 1987)	One pair, especially the male, spent half of their active foraging time within 2 m of ground and significant periods on ground, tossing aside leaves
<i>Tail-cocking</i>	Never been seen to cock its tail; only seen to raise tail in antagonistic displays	Both pairs seen in 2004 often raised their tails and males often cocked their tails, especially during antagonistic calling
<i>Shyness</i>	Shy; invariably calls from concealed perch and flees approaching observer	Confiding; often perched on exposed understorey branches and allowed observer to within 2–3 m

sooty with a slight blue-green gloss and blacker rectrices. Females were uniform rufous-brown with slightly paler lores, around the eye, throat and underparts, and a noticeably paler central belly. All had similar bare parts: bill blue-grey with a black nail, legs slightly darker grey-blue and irides dark. Two males are described in Mayr (1933) and deposited in AMNH; both show signs of immaturity. Contact- and territorial-calls of male *sanctaerucis* are very similar to those of *nigrogularis*. Given the variation in calls in the limited series of tape-recordings from a single *sanctaerucis* (deposited at the British Library, London, UK), it is probable that the vocalisations are difficult to distinguish from *nigrogularis*.

### Biogeography

The Santa Cruz group (or Temotu Province) of the Solomon Islands have three endemic bird species, Santa Cruz White-eye *Zosterops sanctaerucis* and Sanford's

White-eye *Woodfordia lacertosa* on Nendo, and Vanikoro Monarch *Mayrornis schistaceus* on Vanikoro. BirdLife International combined the Santa Cruz Islands with Vanuatu as an Endemic Bird Area, as another four species occur only on these two island groups (Stattersfield *et al.* 1998). However, the Santa Cruz Islands also have close biogeographic links with Fiji c. 1,400 km to the east; Vanikoro Flycatcher *Myiagra vanikorensis* is restricted to Vanikoro, in Santa Cruz, and Fiji, whilst Polynesian Starling *Aplonis tabuensis* occurs on these islands and east to Samoa, and the genus *Mayrornis* is restricted to Vanikoro (*M. schistaceus*) and Fiji (*M. lessoni* and *M. versicolor*). Given the additional species of *C. sanctaecrucis* and a new white-eye *Zosterops* species (pers. obs.), the Santa Cruz Islands could be reclassified as an Endemic Bird Area, independent of Vanuatu. The Santa Cruz group is an isolated province of the Solomon Islands with no conservation action, but the forest is subject to few current threats.

The discovery of the adult male plumage of *C. sanctaecrucis* may also shed some light on the evolutionary history of the genus. *Clytorhynchus* is believed to be phylogenetically closest to *Mayrornis* of Santa Cruz and Fiji, and *Neolalage* of Vanuatu (Filardi & Moyle 2005). Male *C. sanctaecrucis* is the most distinct of the genus, and is pied and patterned similar to *Neolalage* and many distantly related *Monarcha* species, such as on the Solomons immediately west of Nendo. It seems most likely that shrikebills (and perhaps *Mayrornis*) evolved in the Santa Cruz Islands, and radiated south and east.

### Encounter rates and population density

The BirdLife International Fiji Important Bird Areas project surveyed birds across Fiji in 2002–05, including standardised observations at 43 sites (BirdLife International 2006). Encounter rates for *C. nigrogularis* and *C. vitiensis* are presented in Table 3.

Comparative encounter rates are given for the other shrikebill species. These data are from the author's unpublished observations and are comparable to the BirdLife Fiji surveys (above), but encounter rates are likely to be lower as they include time in suboptimal habitat and outside the standard survey hours of dawn to 10.00 and 15.00 to dusk.

These encounter rates can only be converted to population densities with extreme caution as detectability distances away from the trail and the proportion of birds overlooked have not been estimated. Most shrikebills are detected when calling, with an effective detection distance of 25–50 m either side of the trail, and most surveys were undertaken at a mean pace of 1 km / hour. This suggests that 1–20 shrikebills were detected per km<sup>2</sup> (birds / hour, above, multiplied by 10–20 hours / km<sup>2</sup>). There are a number of probable errors in this estimate, especially the number of silent birds overlooked. The only published estimates of population density for shrikebills vary at 9–107 birds / km<sup>2</sup> for *vitiensis* on different American Samoan islands (Engbring & Ramsay 1989). These very approximate population

TABLE 3  
Encounter rates for *C. nigrogularis* and *C. vitiensis*.

Island and number of standardised observer-hours	<i>C. nigrogularis</i>	<i>C. vitiensis</i>	Unidentified calls: mostly <i>C. vitiensis</i> but some <i>C. nigrogularis</i>
<b>Viti Levu</b>			
271 hours	37 (=0.14 / hour) at 13/19 sites	171 (=0.63 / hour) at 17/19 sites	92 (=0.34 / hour) at 16/19 sites
<b>Vanua Levu</b>			
155 hours	7 (=0.05 / hour) at 5/11 sites	74 (=0.48 / hour) at 11/11 sites	85 (=0.55 / hour) at 10/11 sites
<b>Taveuni</b>			
19.3 hours	5 (=0.3 / hour) at 1/1 sites	6 (=0.3 / hour) at 1/1 sites	12 (=0.6 / hour) at 1/1 sites
<b>Kadavu and Ovalau</b>			
53 hours	0 at 0/3 sites*	30 (=0.56 / hour) at 3/3 sites	14 (=0.26 / hour) at 1/3 sites
All islands	49 (=0.10 / hour) at 19/34 sites	281 (=0.56 / hour) at 32/34 sites	203 (=0.41 / hour) at 28/34 sites

\*none seen in many tens of additional non-standardised hours, but one seen in 2000.

densities can be extrapolated to the total area of suitable habitat to give an equally approximate indication of the species' population size.

### Conservation status

The IUCN / BirdLife Red List is based on objective criteria published by IUCN and BirdLife International ([www.redlist.org](http://www.redlist.org)). The only shrikebill previously listed as threatened was *C. nigrogularis*. The BirdLife surveys have found *nigrogularis* at many additional sites but confirmed its low tolerance of heavily logged or degraded forest. The data suggest that the species should remain categorised as Vulnerable but under criterion C1 (continuing decline >10% in 10 years or three generations) on the assumption that it is declining at the same rate as forest loss and degradation, which is estimated to be *c.* 0.5–0.8 % per year (Claasen 1991) and which equates to 6–10% over 12 years (estimating generation length as four years, based on Australian monarchs), whilst the total population is estimated at 2,500–10,000 birds using the encounter rates above and an estimate that the bird occurs in *c.* 50% of the forest within its range. Although generally uncommon or rare, one or two can be heard most days in the central hills between the Nausori Highlands to Nadrau and Monasavu, and it can be more obvious than *vitiensis* when calling in November/December. The species' rarity on Vanua Levu and especially Kadavu and Ovalau merits further research.

TABLE 4  
Encounter rates for other shrikebill species.

Island and year	Species	Number of hours (not standardised)	Number of birds
<b>Santa Cruz</b> (1997, 2004)	<i>C. (n.) sanctaecrucis</i>	6 hours in old-growth forest; 18 hours in closed secondary forest	4 (=0.7 / hour in old-growth forest; 0.17 / hour in all forest)
<b>Rennell</b> (1998, 2002, 2004)	<i>C. hamlini</i>	58 hours	41 (=0.71 / hour)
<b>Santo, Vanuatu</b> (1997, 2003)	<i>C. pachycephaloides griseus</i>	20 hours <600 m; 53 hours >600 m	7 (=0.35 / hour <650 m); 2 (=0.04 / hour >650 m)
<b>New Caledonia</b> (1998, 2003, 2004)	<i>C. p. pachycephaloides</i>	49 hours	13 (=0.27 / hour)

*C. sanctaecrucis* is assessed here as Endangered (C2a<sup>ii</sup>) based on an estimated population of 250–2,500 birds in a single subpopulation and an inferred ongoing decline through small-scale forest loss for subsistence farming. However the population estimate is based on few data and a poor knowledge of the area of suitable habitat on Nendo. The Whitney South Seas expedition took just two specimens in seven days. Two pairs were recorded in six hours in suitable old-growth forest in the hills inland of Luselo, Nendo, but none had been seen previously by several observers in degraded forest closer to Lata. Most local people did not know this species, but one local guide knew the bird's call to belong to an uncommon species of dense forest close to streams. The local name was reported to be 'Upalalu.' The two specimens were taken near the highest point (550 m), whereas the 2004 birds were seen at *c.* 80 m. Nendo Island is 505 km<sup>2</sup> but the area of suitable habitat may be nearer 250 km<sup>2</sup>. The two pairs seen in *c.* 10 km or six hours suggest an extremely crude population density of 4–14 birds / km<sup>2</sup>.

BirdLife International (2000) categorised *hamlini*, *pachycephaloides* and *vitiensis* as Least Concern, which is supported by the observations tabulated above. *C. hamlini* has been considered potentially at risk from colonisation of Rennell by Black Rats *Rattus rattus*, but other congeners show no evidence of decline from rat predation, and there is no forest clearance on Rennell. *C. pachycephaloides* is uncommon in Vanuatu, especially the southern islands (Bregulla 1992; pers. obs.) and fairly common (to uncommon) in humid forests across Grande Terre of New Caledonia (Barré & Dutton 2000, Ekstrom *et al.* 2002). Forests continue to be cleared and degraded across Vanuatu, and the conservation status of the race *griseus* is of concern. However, there is very little loss of wet forest on New Caledonia where subspecies *pachycephaloides* is more common. *C. vitiensis* is common in humid and semi-dry forests on most Fijian islands and although these are being cleared and degraded slowly, the species appears to be tolerant of logging and other

habitat degradation (Watling 2001; pers. obs.). Nonetheless, *vitiensis* has been extirpated from the Mamanucas/Yasawas in Fiji and some Tongan islands, and is categorised as At Risk in Tonga and of Conservation Concern in American Samoa (Watling 2001).

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