

The conservation status of the Blue-backed Parrot *Tanygnathus everetti*

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The conservation status of the Blue-backed Parrot *Tanygnathus everetti*, a species endemic to the Philippines, has long been obscured by its former taxonomic status as a subspecies of the Azure-rumped Parrot *T. sumatranus* of Sulawesi, Indonesia. A detailed review of evidence from museum material and birdwatchers' records indicates it is known from Luzon, Polillo Islands, Panay, Negros, Samar, Leyte, Mindanao and the Sulu archipelago. There is no evidence it survives on Luzon, Polillo Islands, Panay, Negros and Leyte. On Samar its numbers have dwindled towards extinction but it is likely to survive in tiny numbers (total <100) in the illegally logged Samar Island Natural Park (SINP). On Mindanao it has virtually disappeared from the only known predictable site, the PICOP logging concession at Bislig, and the few records elsewhere suggest <100 persist on the island. In the Sulu archipelago, it may survive in tiny numbers (<50) on Jolo (Bud Dajo National Park) and Tawi-Tawi in the Malum watershed. Records are mainly from primary lowland forest below 450 m, and it appears much less adapted to more open forest formations than its relative, the Blue-naped Parrot *T. lucionensis*. The almost total clearance of lowland forest in the Philippines, especially primary formations, is assumed to have greatly constrained its distribution and numbers. However, this has been compounded by a barely documented but evidently relentless trade in wild-caught birds. Legal protection for the last vestiges of forests holding this species is called for. SINP needs immediate protection from rampant logging and any poaching. An intensive survey of anticipated and known key sites is urgent, along with a broadscale community campaign to discourage the catching and keeping of parrots, plus an active search for captive birds to form an *ex situ* conservation breeding initiative. Any such initiative should keep the population on the Sulu archipelago (subspecies *burbidgii*) separate from *T. everetti* found in the rest of the Philippine islands, as they are so different.

INTRODUCTION

Parrots are among the publicly most familiar groups of birds, alongside ducks, pigeons, owls and eagles, yet are among the scientifically least known. This public familiarity derives from their popularity as pets, and their popularity as pets is, combined with habitat destruction, responsible for their remarkably high levels of endangerment: of the 379 living species of Psittacidae (under the taxonomy of BirdLife International 2020a), 108 are threatened and 91 Near Threatened, representing 52.5% of the total. The scientific knowledge deficit derives from multiple factors of parrot behaviour and ecology: their largely tropical distribution, wide-ranging non-territorial habits, cryptic canopy-based foraging and resting behaviour, difficulty to catch safely, ability to remove tracking devices, and elevated vulnerability, through their hole-nesting and gregarious habits, to poaching (which itself compromises the study of natural densities and reproductive rates) all combine to discourage academic engagement (Collar 1998a). A recent survey found that density estimates, a key parameter for gauging responses to environmental change, exist for only 25% of parrot species (Marsden & Royle 2015).

Among parrot genera one of the least known (and the least known in the Oriental region) is *Tanygnathus* (Collar 1998a), whose species are confined to Indonesia (Wallacea and satellite islands east of Kalimantan) and the Philippines. Traditionally only four species have been recognised, but recently one of these was split into two, the Azure-rumped Parrot *T. sumatranus* from Sulawesi, the Sula Islands and Sangihe and Talaud Islands, in Indonesia, and the Blue-backed Parrot *T. everetti* in the Philippines, the latter breaking down by subspecies into *T. e. freeri* on the Polillo Islands, *T. e. everetti* on the larger islands from Luzon (treating *duponti* as invalid) south to Mindanao, and *T. e. burbidgii* on the Sulu archipelago (Arndt *et al.* 2019). Before this split, the relatively strong conservation status of birds on Sulawesi prevented the species from being red-listed, although Philippine birds were known to be in difficulties, being characterised as 'rare except in the Sulus' (Dickinson *et al.* 1991), 'extremely rare in the country' (Juniper & Parr 1998), 'now very rare through most of its range except the Sulu Archipelago' (Kennedy *et al.* 2000), and 'common only in Sulu Archipelago, and elsewhere very rare' (Forshaw 2006).

In the course of researching the taxonomic status of the species (Arndt *et al.* 2019) it became apparent that, on the scant evidence available, the plight of the Blue-backed Parrot, even on the Sulu archipelago, was exceptionally serious and unaddressed by any conservation measures. An attempt at piecing together as full a profile of the species as possible from the many disparate and fragmentary sources of information available was therefore clearly necessary in order to establish an appropriate agenda for its future management.

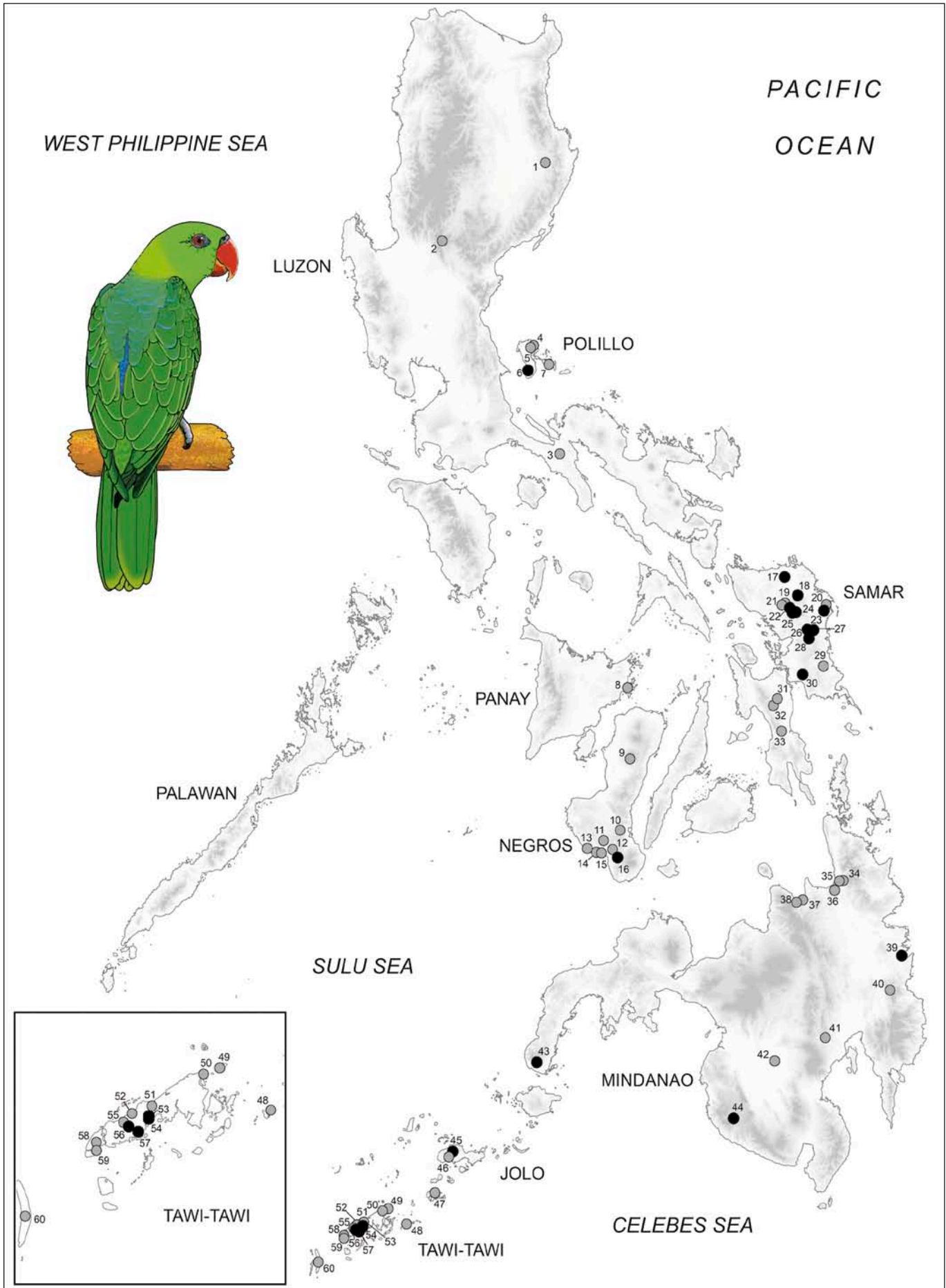
METHODS

All documents, published and unpublished, containing or possibly containing information on the Blue-backed Parrot were assembled and reviewed. Distributional data were taken from museum specimens based on direct visits to institutions, online listings on VertNet (www.vertnet.org) and requests to museum curators, plus sight records on eBird (www.ebird.org), the database of the Wild Bird Club of the Philippines (www.birdwatch.ph) and the contributions of biodiversity experts and birdwatchers who were contacted by email for their information past and present.

The structure of a 'Red Data Book' entry (see, e.g., Collar *et al.* 1999) was taken as a partial model to parse the information resulting from this review, but here grouping distribution, population and habitat loss by island, followed by a review of ecological traits and a consideration of trade pressure. Specific localities for the species were compiled and their coordinates traced through searches on the internet to create a map (Figure 1), although generalised localities in the literature or on specimen labels, such as Isabela province, are not listed if more specific sites, such as Disulap, exist within it. Coordinates of smaller general areas (e.g. barangays) were read from the eye-judged centre of the image on Google Maps. The biology of the Azure-rumped Parrot and Blue-naped Parrot *T. lucionensis*, themselves very little known, were researched in parallel for potential insights.

In this review AMNH = American Museum of Natural History, New York, USA; ANSP = Academy of Natural Sciences, Philadelphia, USA; CAS = California Academy of Sciences, San Francisco, USA; DMNH = Delaware Museum of Natural

Figure 1. The distribution of records of Blue-backed Parrot *Tanygnathus everetti*. Numbers correspond to those in superscript next to names in bold under Results. Grey circles and black circles indicate records before and after the year 2000, respectively.



History, Wilmington, USA; FMNH = Field Museum of Natural History, Chicago, USA; IUCN = International Union for Conservation of Nature, Gland, Switzerland; MCZ = Museum of Comparative Zoology, Cambridge, USA; MNHN = Muséum National d'Histoire Naturelle, Paris, France; Naturalis = Naturalis Biodiversity Center, Leiden, Netherlands; MTD = Museum für Tierkunde, Dresden, Germany; NHMD = Natural History Museum, Copenhagen, Denmark; NHMUK = Natural History Museum, Tring, UK; PICOP = Paper Industries Corporation of the Philippines; PNM = National Museum of the Philippines, Manila, Philippines; SNMB = Staatliches Naturhistorisches Museum, Braunschweig, Germany; SUNSM = Silliman University Natural Science Museum, Dumaguete City, Philippines; UPLBMNH = University of the Philippines Los Baños Museum of Natural History, Los Baños, Philippines; USNM = United States National Museum, Washington, DC, USA; WBCP = Wild Bird Club of the Philippines; YPM = Yale Peabody Museum of Natural History, New Haven, USA; ZMB = Museum für Naturkunde, Berlin, Germany. Initials and names of observers who provided records are given after the relevant information (initials without surnames refer to authors). In specimen notation, f = female, m = male, u = unsexed. The contraction 'Blueback' is used occasionally for ease of expression. Notation CR = Critically Endangered, EN = Endangered, DD = Data Deficient.

Forest cover data used here (excluding mangroves) derives from the Forest Management Bureau of the Department of Environment and Natural Resources of the Philippines (FMB-DENR 2018).

RESULTS

The Blue-backed Parrot is known from 60 localities—only 20 of them in the present century—distributed across six major Philippine islands (number of localities in brackets after each, with those from the twenty-first century after the slash), Luzon (3/0), Panay (1/0), Negros (8/1), Samar (14/10), Leyte (3/0) and Mindanao (11/3), plus two smaller island groups, the Polillo Islands (4/1) and the Sulu Archipelago (16+1 untraced/5). It can reasonably be considered extinct on four of the large islands and in the Polillo Islands, as reviewed in the Discussion, and its numbers elsewhere are dangerously low.

Distribution and population

From a review of the range maps in Kennedy *et al.* (2000), the distribution above appears to be unique among Philippine endemic birds: no other species has a range that consists exclusively of these islands, with or without the Polillo Islands, and, even if the Sulu Archipelago is excluded on the basis that the form *burbidgii* is possibly a separate species, the pattern remains unique. Mention by Parkes (1971) of Mindoro is clearly a *lapsus* for Mindanao. Mention by Namocatcat *et al.* (2013) of Dinagat, in a symposium abstract, has not been confirmed by other observers and is here set aside as requiring confirmation.

The first overall comment on the status of the Blue-backed Parrot was simply that it was 'less common than the Blue-naped Parrot... shyer' and 'usually found in deep forests' (Delacour & Mayr 1946). Since then, the only generalised published assessments appear to be those cited in the Introduction above.

In the following accounts, records are listed from north to south within islands, with traced sites marked in **bold** and mapped (grey dots before and including 1999, black dots from and including 2000) on Figure 1. An asterisk (*) before the site name indicates a record in the twenty-first century. The superscript number after the site name corresponds to the number on the map. The superscript letter after the superscript number indicates the source of the coordinates on which the map is based: D = Dickinson *et al.* (1991),

e = eBird, G = Google Maps, GG = Gruezo & Gonzalez (2004), i = iDigBio, Ma = Maplandia, Mi = Mindat, P = PhilAtlas, T = Collar *et al.* (1999), Wm = Wikimapia, Wp = Wikipedia. Elevations given originally in feet are converted to metres; it should be noted that ranges indicate the elevations at which observers worked at a site, not necessarily the elevations at which Blue-backed Parrots were seen.

Luzon

Records of the species are remarkably sparse. It was found in Isabela province in May 1894 (1m in AMNH, Whitehead 1899), and subsequently more specifically at San Mariano in May 1961, with the type-locality of the subspecies *duponti* (treated as invalid by Arndt *et al.* 2019) being further refined as Barrio **Disulap**^{1G} (Parkes 1971). Two other records are from **Dalton Pass**^{2G}, Nueva Ecija/Nueva Vizcaya border, June 1973 (1u in Naturalis), and **Lopez**^{3G}, Quezon, where A. H. Everett collected two undated specimens in presumably 1877-1878 (1u in AMNH, 1m in DMNH; years from Dickinson *et al.* 1991).

Whitehead (1899) remarked that the species might be more widespread than he was willing to discover, its close resemblance to the much commoner *T. lucionensis* discouraging him from shooting every *Tanygnathus* 'in the hopes of obtaining a specimen [of *everetti*] now and then'; however, he was mistaken. The only record from Luzon since his own is that from Dalton Pass, despite the considerable ornithological coverage of the Sierra Madre (e.g. Danielsen *et al.* 1994, Poulsen 1995, van der Ploeg & van Weerd 2010). In the present century the species was not seen during frugivore-targeting surveys, each lasting nine days, of 14 sites within five ecologically distinct regions, namely 'Sierra Madre', 'Cordillera', 'West Luzon', 'Central Luzon' and 'South Luzon' (Española *et al.* 2013). Extensive fieldwork over the past 15 years in the northern Sierra Madre (including at Disulap), Cagayan Valley and northern Cordillera Central has yielded no records and no evidence from ethno-zoological interviews (M. van Weerd).

Forest cover on Luzon declined from 55% around 1955 to 20% in 2000, and lowland forest presently accounts for only about 2% of the island's land area (Heaney *et al.* 2016). Forest cover in Isabela and Quezon in 2015 was 37% and 24% respectively (FMB-DENR 2018), but much of these forests are in the highlands.

Polillo Islands

The Polillo Islands, off the east coast of Luzon at the latitude of Manila, consist of 24 islands of which much the largest is Polillo itself (761 km²) followed by Patnanungan (-ugan, -ongan) (139 km²) and Jomalig (52 km²) (BirdLife Datazone 2020). On Polillo the species was recorded at **Karlagan**^{4P} (Carlayan, Carlagan), November 1948 (1m in PNM); **Anibawan**^{5P}, December 1948 (1m in PNM; neotype locality in Manuel 1956) and February 1972, at 150 m (1u in DMNH); and near ***Polillo**^{6G} town, October-November 1909 (McGregor 1910), with records of three birds at Tambangin and four at Santa Maria in the watershed reserve immediately above the town, April 2005 (Anon. 2006, WBCP database). It was also recorded in the 1990s on **Patnanungan**^{7WP}, but it was not then found on Jomalig, Palasan or the tiny Minasawa Island (Gonzalez 1997, Dans *et al.* 2000).

Substantial efforts on behalf of Polillo's wildlife, involving surveys and monitoring, have taken place since 1999, but the only further records of the species are those from April 2005. In 2004, most forest users interviewed on Patnanungan could not differentiate between the two *Tanygnathus* species, but agreed that the 'large green parrots' had declined drastically due to poaching and the felling of nest-trees; only one self-confessed parrot poacher could provide a detailed and correct description of the two species, but had not seen Bluebacks for at least five years (PW). The species was not encountered during 10 days of survey work on the Philippine Cockatoo *Cacatua haematuropygia* on Polillo

(mangrove areas in the north and west, Anibawan and Sibulan watersheds, as well as nearby Palasan Island) in May/June 2004, nor on Patnanungan Island during 29 days of fieldwork in January/February and June 2004 (PW). A comprehensive survey on Polillo (May 2005–November 2006) of eight forest patches proposed as Local Conservation Areas (and not including the Polillo Watershed Reserve) failed to find the species, prompting speculation that its decline had been drastic (J. C. T. Gonzalez). The species was not observed in fieldwork on Polillo in 2007, so was considered ‘extremely rare’ and in need of measures to prevent its extinction within five years (Gonzalez & Ledesma 2007).

Practically intact in 1909, the forests of Polillo suffered intense logging in the period 1950–1990 that rendered them ‘devastated... and practically worthless’, leaving only a 2 km² area of unlogged watershed at Sibulan, after which local logging pressure on the few remaining fragments of secondary forest and primary logged forest continued, rendering their future ‘bleak’ (Clements 2001).

Panay

There appears to be just a single record: **Concepcion**^{8G}, January 1888 (Dickinson *et al.* 1989, 1m in NHMUK). However, F. S. Bourns and D. C. Worcester, in citing this record, added ‘and Mr Worcester saw another so near that there was no room for doubt as to its identity’ (McGregor 1909–1910). Of two Concepcions on Panay, the more likely locality (older, better known and closer to an established port), in Iloilo in the east, is mapped on Figure 1; the alternative, in Antique in the south-west, is at 10.822°N 121.970°E^P.

Panay was for long ornithologically much neglected, but since the late 1980s there have been several significant surveys of birds in the north and centre of the island (Miranda *et al.* 2000, Curio *et al.* 2001, LJP), but with no further indication (a record on eBird having been withdrawn) that the species survives on the island. Surveys at Pandan, Antique, June 2000, Bulabog-Putian National Park, July 2000, Aningalan, Antique, February 2008, and Mts Camantra and Igpaku, Antique, July–August 2016, yielded no records (PGCJ, LJP).

By the first decade of the last century, contiguous forest areas were already restricted to the central mountain ranges (Bankoff 2007). Forest cover in Antique and Iloilo in 2015 was 24% and 4% respectively (FMB–DENR 2018), but the proportions that are in the lowlands will be much lower.

Negros

Records are from the north on **Mt Kanlaon**^{9T}, March–May 1896 (1m, 1f in NHMUK, 1f in AMNH) and in 1962 (1u in CAS); **Mayapusi**^{10G} (Mayaposi), ‘Bais’ (=Mabinay), January 1982 (1u in SUNSM); **Bayawan**^{11G}, December 1959 (1m in YPM); Pagyabonan (Pagyabanon), ‘Bais’ (=Amio^{12P}), May 1949 (2u in FMNH); **Basay**^{13T}, December 1959 (1u in FMNH), including at Bayawan, same date (see above; 1u in UPLBMNH) and Kansan-a, December 1964 (1u in UPLBMNH); **Inubungan**¹⁴ⁱ, December 1948 (2u in FMNH); **Naliong**^{15T}, April–May 1950 (1m in PNM, 4u in FMNH) and Candomao (same coordinates as Naliong), April 1950 (1u in FMNH); and between Avocado and **Kakha**^{16G}, Santa Catalina, January 2003, where a local hunter was encountered with two Bluebacks in a bamboo cage, presumably having just caught them locally (LJP).

The last known record of a bird in the wild is thus 1982. The possibility of the extinction of the species on the island was raised 10 years later after a team spent five weeks in 1991 at four key sites, Mt Mandalagan, Mt Kanlaon, Ban-ban and Mt Talinis, without making contact with any *Tanygnathus* (Brooks *et al.* 1992). The 2003 record of a hunter with two captured Bluebacks must be assumed to indicate a surviving population at that time; but numerous intensive surveys across the island in the years 2000, 2003 and 2014–2019, including the three key protected areas (Northern Negros, Mt Kanlaon and Balinsasayao Twin Lakes Natural Parks)

and several other potential areas (Maliom, Bago City; Guintubdan, La Carlota; Mantiqel, Siaton; and Hinobaan), failed to produce a record (PGCJ, LJP).

Negros currently has c.3% old growth forest remaining, compared to 77% in the nineteenth century (Badon 2018). Forest cover in Negros Oriental and Occidental in 2015 was 7% and 6% respectively (FMB–DENR 2018). The three largest remaining tracts of forest are inside the natural parks listed above; other tiny patches in the south-west (Hinobaan–Cauayan–Sipalay) have local protection status (LJP).

Samar

The claim (Meyer de Schauensee & duPont 1962) that the Blue-backed Parrot was first recorded for Samar by Rand & Rabor (1960) overlooked a specimen (NHMUK 1842.2.15.91) taken there and reported by both Finsch (1867–1868) and Tweeddale (1877a). Precise localities for the species are: ***Cagbigajo**^{17P} (Cagbigajo), Pambujan, on the Baga-nga creek, one male at a site under parrot-poaching stress, 40–100 m, April–May 2002 (Gruezo & Gonzalez 2004, J. C. T. Gonzalez); ***Catubig**^{18GG} on the Panaon river, 100–200 m, April 2003 (Gruezo & Gonzalez 2004); **Mt Capoto-an**^{19T}, May 1957 (1m in YPM, 1f in AMNH); Sitio **Cadapnan**^{20T}, Bantayan, Oras, May 1948 (1f in PNM); **Barruz**^{21G} (Baruz), Matuguinao, December 1951 (1m in PNM); ***San Jose de Buan**^{22G}, San Nicolas, February 2009 (S. Wamelink in WBCP database); within 10 km of the Bag-ot River, ***San Isidro**^{23P}, 15 km east of Matuguinao, 300–400 m, April–May 1957 (Rand & Rabor 1960; 1f in YPM, 2m in AMNH, 4u in FMNH), with a pair crossing the Dolores River c.1.5 km upriver from San Isidro, Dolores, August 2004 (the only record in seven days of survey work in central and southern Samar south of the Tinane and Tubig River watersheds: IDLW, PW); ***Hibaca-an**^{24GG} on the Kag-naga creek, 300–400 m, May 2003 (Gruezo & Gonzalez 2004); ***Gandara**^{25GG} on the Kag-lanos river, 90–350 m, October–November 2002 (Gruezo & Gonzalez 2004); ***Paranas**^{26G} at Can-avid on the Kantara-ok river, 150–450 m, November 2002 (Gruezo & Gonzalez 2004), and at the Ulot River Research Transect, Samar Island Natural Park, May–June 2016 (ROH in eBird); barangay ***San Rafael**^{27G}, Taft, 150–200 m at Kanturin creek, May–June 2003 (Gruezo & Gonzalez 2004), and heard daily during four days of fieldwork, 2005, although possibly involving just 1–2 individuals, with the species then found commonly kept as pets at San Rafael and Malinao (ROH, Rheindt 2005), with a further record at San Rafael, February 2009 (S. Wamelink in WBCP database) and one near Milan Falls, San Rafael, March 2013 (ROH in WBCP database); ***Cansolabao**^{28Mi} (Cansulabaw, etc.), Hinabangan, August/September 2004, where birds were being offered for sale by village-based vendors who had caught the birds themselves, presumably therefore in the vicinity (IDLW, PW); **Tagaslian**^{29T}, Borongan, June 1948 (2m in PNM); and ***Sohoton Caves and Natural Bridge Park**^{30GG}, Basey, 45–100 m, August 2003 (Gruezo & Gonzalez 2004).

‘We searched for it in vain on Samar’, wrote F. S. Bourns and D. C. Worcester (McGregor 1909–1910), perhaps indicating the relative rarity of the species even at the end of the nineteenth century. Nevertheless, fieldwork involving walked transects at eight sites in 2002–2003 yielded evidence that Bluebacks were present in seven, namely (in descending order of highest relative abundance) San Rafael, San Isidro, Catubig, Cagbigajo, Paranas, Sohoton Park and Gandara (Gruezo & Gonzalez 2004). No records were made during three days of fieldwork in the south-western peninsula of Guian and on Calicoan Island in January 2013 (ILW, PW).

Owing to difficulties of access, commercial logging commenced later in the interior of Samar than in most other parts of the Visayas. In 1989 a logging moratorium was imposed on the island, and in 2003 the Samar Island Natural Park (SINP) was proclaimed, with a core area of 333,300 ha and a buffer of 124,000 ha (DENR

2016); nevertheless, illegal logging inside SINP is rampant (ROH). Moreover, the forest area south of San Rafael where birds were heard calling had been completely cleared by 2013, and fieldwork totalling 21 days in the period 2013–2019 did not encounter any birds being kept as pets at either San Rafael or Malinao, as they were in 2005 (ROH). Forest cover in what were then Eastern and Western Samar in 2015 was 40% and 28% respectively (FMB–DENR 2018), but much of this is in highland areas.

Leyte

Records (Meyer de Schauensee & duPont 1962, Parkes 1973) are from two adjacent sites in Dagami, July 1961, **Mt Lobi**^{31G} (1m in AMNH) and **Patok**^{32Ma} (Patoc) (1m in DMNH); and from **Mt Pangasugan**^{33Wp}, over four months in early 1994 (PW).

The records from Mt Pangasugan consisted of single females, possibly just one bird, and none was seen in subsequent visits from 1995 onwards (PW). Forest on and around Mahagnao Volcano was surveyed in January 2018, May and July 2019, but no Bluebacks were seen in the wild or captivity, although other parrots were commonly encountered (PGCJ, LJP).

Forest cover in Leyte and Southern Leyte in 2015 was 12% and 17% respectively (FMB–DENR 2018). Virtually all accessible lowland forest on Leyte has been cleared, but forest remains on the very steep slopes of the mountain ranges and interior valleys, as well as on limestone outcrops in the southern part of the island (PW).

Mindanao

Eleven localities have been recorded for the species, five of them clustering around the north-eastern city of Butuan: **Balangbalang**^{34G}, near Cabadbaran City, on Mt Hilong-hilong, Agusan, 150–300 m, March–April 1963 (1u in FMNH, 1m in USNM); **Agay**^{35Mi}, January 1952 (1f in NHMD); **Butuan**^{36Wp} (type locality of *everetti*), undated (Tweeddale 1877b); **Anakan**^{37P}, Gingoog City, July–August 1961 (Meyer de Schauensee & duPont 1962); **Civoleg**^{38G} (Civolig), Gingoog City, Misamis Oriental, July 1961 (2m, 1f in DMNH, ANSP); PICOP, i.e. **Bislig**^{39T}, specifically Road 5, km 38, March 1990 (Greensmith 1990), and simply PICOP, February–March 1998 (Morris & Fisher 1998), plus 21 separate birders' records in February–March (one December) 1999–2016 on Roads 1–4, 4a and 42, all 100–300 m (eBird, ROH), plus four records at PICOP, February–June in 2004, 2005 and 2008 (WBCP database); east of **Monkayo**^{40G} on Mt Pasian, March 1998 (eBird); **Davao**^{41G}, April–May 1889 (1m in ZMB, 1m in SNMB); **Kabacan**^{42G} (Kabakan), Cotobato, March 1957 (1f in PNM); **Baluno**^{43G}, Pasonanca Watershed Reserve, Zamboanga City, May 2008 (Paguntalan *et al.* 2011, LJP), with F. S. Bourns and D. C. Worcester having mentioned the species as 'Rare about Zamboanga. Only one specimen obtained' (McGregor 1909–1910; specimen untraced); **Senator Ninoy Aquino**^{44G}, Sultan Kudarat, August 2018 (eBird).

Forest loss was a gradual process in Mindanao throughout the last century, by 1963 affecting about half of the island and by 1987 resulting in loss of all larger tracts of lowland forest (Heaney *et al.* 2006). Forest cover in Surigao del Sur (location of PICOP) and Agusan del Norte (the province in which the type locality of *everetti* is situated) in 2015 was 24% and 28% respectively (FMB–DENR 2018), but almost all remaining old-growth forest in Mindanao is now montane and mossy forest (Heaney *et al.* 2006).

Sulu Archipelago

The nine islands in the Sulu Archipelago for which records exist are listed individually below; those for Siasi and Tumbagaan are hitherto unpublished and represent minor range extensions. A vocal record of a Blue-backed Parrot from Mt Baliungan, Baliungan Island, off Tawi-Tawi, was treated as both certain and tentative (Allen 1998b), so is here assumed the latter and set aside. Thus, records are from:

Jolo (Sulu).—**Bud Dajo National Park**^{45G}, Talipao, 2012, around five birds (R. D. Quemado II); **Maimbung**^{46G}, May 1883 (1m in AMNH); **Schück's** (untraced and unmapped, but at 'Lukat Lupas'—also untraced, but see Bethge 2006), near Jolo town, May 1883 (1m in AMNH); and with no locality, April–May 1887 (2m in ZMB), November 1903 (2m in USNM); moreover, from context (F. W. Burbidge notes in Sharpe 1879) it appears highly probable that this island was the type-locality of the form *burbidgii*, taken in 1878 (Dickinson *et al.* 1991);

Siasi^{47T}.—No specific locality, undated but the specimen, from A. Marche (deduced to have visited the island around 1884: Dickinson *et al.* 1991: 88), was registered in 1885 (1m in MNHN);

Loran^{48Wm} (seemingly also *Doran*).—Sight-recorded in manuscript notes by E. A. Mearns, October 1906 (Dickinson *et al.* 1991);

Tumbagaan.—**Bato Bato**^{49G} (probably = Balo Balo on Google Maps), December 1971 (2m, 2f in DMNH);

Basbas (Babas)^{50D}.—Collected by W. C. Forbes, 1921 (specimen in MCZ), but uncertain which of two islands of this name were involved—either 5.333°N 120.233°E just off northern Tawi-Tawi (this chosen and mapped as more likely) or 6.050°N 120.483°E near North Ubian (Dickinson *et al.* 1991);

Tawi-Tawi.—Saingingan (untraced), **Maraning**^{51G}, September 1972 (1m in DMNH); **Tata-an**^{52T}, October 1891 (1m in USNM, hence Bourns & Worcester 1894); Malum watershed including **Buan**^{53G}, August 1994 (G. C. L. Dutson), 2018–2019 (PGCJ, LJP); **Lubuk**^{54Mi} (Lubbuk) or Lambug, July 1998 (Allen 1998b), March 1999 (eBird), Tawi-Tawi Agricultural College, January 2008 (D. Allen in WBCP database), as well as April 2010 and March 2019 (I. Sarenas and in WBCP database); **Tarawaken**^{55G} (Tarawakan), October 1961 (4m, 1f, 1u in NHMD; also Brooks 2002), August 1994 when 10 seen (T. M. Brooks), July 1998 (Allen 1998b); Busay (untraced), **Magsaggaw**^{56G}, 260–420 m, January–February 2020 (LJP, PGCJ); **Batu Batu**^{57G}, August 1994 (G. C. L. Dutson) and under the name Balimbing (Balimbing Proper), July 1998 (Allen 1998b), with maximum two birds in January 2003 (ROH);

Sanga-Sanga^{58T}.—No locality, October 1971 (duPont & Rabor 1973 [omitted by accident from Dickinson *et al.* 1991], 1m, 4f in DMNH);

Bongao.—**Port Bongao**^{59Mi}, March 1936 (1m, 2f in DMNH), and with no locality, July 1893 (2m in MTD, NHMUK, hence Sharpe 1894), October 1971 (1f in DMNH, 1u in UPLBMNH), with six seen, August 1994 (T. M. Brooks);

Sibutu^{60T}.—Sight-recorded in manuscript notes by E. A. Mearns, January 1906 (Dickinson *et al.* 1991); no locality, October–November 1971 (4m, 4f in DMNH, 1m in AMNH, 1m in NHMUK).

When Guillemard (1885) visited Jolo (formerly Sulu), he found the species 'tolerably abundant all over the island', while a decade or so later F. S. Bourns and D. C. Worcester found it 'common on Sulu but very shy' (McGregor 1909–1910); the most recent record is from 2012 (above). On Tawi-Tawi, which in 1891 was 'almost entirely covered by forest' (Worcester 1898), Bourns and Worcester found it less common than on Sulu (McGregor 1909–1910). DuPont & Rabor (1973) considered the species 'just as common as *T. lucionensis salvadorii* on the larger islands' they visited in late 1971 (Tawi-Tawi, Sanga-Sanga, Bongao, Sibutu). Based on visits in the mid-1990s, Allen (1998a) judged it 'the commonest of the three green parrots [with Blue-naped Parrot and Blue-winged Racquet-tail *Prioniturus verticalis*] of the province' (of Tawi-Tawi) and, after another visit in 1998, 'probably the least threatened of the three large green parrots', although he did not encounter the species on three satellite islands he visited, Tandubas, Tandubatu and Sikubong (Allen 1998b). As many as 10 individuals were seen at Tarawaken in 1994 (see above) and eight at Lubuk in March 1999 (eBird), but no more than two were encountered in four field-days

near Batu Batu, January 2003, where it was considered as rare as Blue-winged Racquet-tail and rarer than Blue-naped Parrot and Philippine Cockatoo (ROH). In recent years the species has proved less common than Blue-naped Parrot and Blue-winged Racquet-tail in the Malum watershed, with just 3–5 individuals recorded (PGCJ), although another observer has seen only one individual on each visit to the same area since 2014 (R. D. Quemado II).

An online review of the conservation status of Blue-winged Racquet-tail provides disturbing evidence of the degree of habitat loss in the southern Sulu Archipelago:

‘Virtually no primary forest remains on the island of Sibutu and there is little forest remaining on Sanga-Sanga. By the mid-1990s, the rapid clearance of primary forest on Tawi-Tawi had rendered remaining lowland patches highly degraded. Logging of the few remaining tracts, now confined to rugged mountainous areas, is likely to be followed by uncontrolled settlement and conversion to agriculture’ (ASAP 2020).

Forest loss and degradation in the Sulu Archipelago is currently due to clearing for subsistence and commercial agriculture, logging and the establishment (on Sibutu and Simunul, but not on Tawi-Tawi) of oil palm plantations, as well as open-pit mining (Datta *et al.* 2019). Within four municipalities in Tawi-Tawi, about 42,000 ha are affected by the latter, mostly on the northern (Languyan) side of the island (Datta *et al.* 2019, LJP). Forest cover in Jolo and Tawi-Tawi in 2015 was 1% and 25% respectively (FMB–DENR 2018). On Jolo, Bud Dajo National Park retains under 100 ha of degraded and intact forest along steep ravines and around the crater lake (LJP). In early 2020 remaining forest on Tawi-Tawi was estimated to cover just 3,000 ha, much of it legally claimed under Certificates of Land Ownership Award (LJP) and under continual attack from chainsaws (ROH, PGCJ).

Ecology

The Blue-backed Parrot of the Philippines is much less well documented than the Azure-rumped Parrot of Indonesia, so that condensed accounts of the two when treated as a single species (e.g. Juniper & Parr 1998, Forshaw 2006) are greatly weighted by knowledge of the latter. However, this knowledge does not necessarily apply to the Blueback. Fieldwork on Sulawesi in the 1930s produced evidence that *Tanygnathus sumatranus* (a) is both diurnal and nocturnal, (b) occupies, in order of preference, groups of trees in cultivated land, forest edge and forest interior, and (c) inflicts significant damage on crops (Stresemann & Heinrich 1939–1941). However, none of these behaviours has been reported in Bluebacks; nor have they been found to visit plantations (bar one glancing report: see next paragraph) or paddyfields (Juniper & Parr 1998), or to occupy swamp forest and mangroves (Forshaw 2006).

Most of the records above took place in an era when—and at such a low frequency that—any assessment of habitat choice, habits, food and other requirements were of the most basic type. Consequently, it is possible that the Blueback *does* exhibit some of the ecological and behavioural traits of its Indonesian relative. However, the fact that the former is sympatric with the congeneric Blue-naped Parrot, whereas the latter has no close relative in its range, strongly suggests that the Blueback is ecologically constrained by a competitor in a way that Azure-rumped Parrot is not. Such a relationship was noted by Delacour & Mayr (1946), who remarked that Blue-naped Parrots live in forests but frequently come ‘out into the open’, whereas Bluebacks are ‘shyer’ and are ‘usually found in deep forests’. This may have been garnered from F. S. Bourns and D. C. Worcester, who noted the species to be ‘found in deep forest, and in fruit trees in the open’ on Sulu (Jolo) and ‘observed only in the forest’ on Tawi-Tawi (McGregor 1909–1910). This was confirmed by observations in the southern part of the Sulu Archipelago where, in comparison to Blue-naped Parrot, Blueback ‘was more often encountered in well forested areas

deeper in the interior of the islands and quite far from the coasts’ (duPont & Rabor 1973). Dickinson *et al.* (1991) were evidently correct to call it simply ‘a forest resident’. On Samar in 2002–2003 the species was found at eight sites, of which map numbers 18, 24 and 25 were in ‘old-growth lowland evergreen forest’ and 17, 26, 27, 29 and 31 were in ‘residual lowland evergreen forest’ (Gruezo & Gonzalez 2004). In early 2020 birds were found only three times in one 400 ha forest on Tawi-Tawi, twice inside the forest with large (20 m) trees and once at the forest edge (LJP). Recorded elevations are 150 m on Polillo, extremes of 40–450 m at nine sites on Samar, 150–300 m on Mt Hilong-hilong, Mindanao, 100–300 m at Bislig, Mindanao, and 260–420 m on Tawi-Tawi, indicating the Blueback’s use of lowland habitats (no record higher than 450 m, except for the considerably higher Dalton Pass, at >900 m, where the bird in question was presumably a short-distance migrant); but the extent of its constraint to low-lying areas is unclear. A bird in a wooded ravine on Mt Pangasugan, Leyte, in 1994 was repeatedly observed from an adjacent ridge but it was never seen when the observer was within the ravine itself, suggesting how unobtrusive the species might be when perched within the canopy (PW). Captive birds (either *T. sumatranus* or *T. everetti*) had the tendency to freeze motionless for some time when disturbed (Bublitz 1987), a response which in the wild would make detection by human eyes virtually impossible.

In captivity *Tanygnathus* parrots become obese on energy-rich diets, suggesting they need much roughage (S. Bruslund). Both Forshaw (1989) and Juniper & Parr (1998) reported food for the composite species as ‘fruit, seeds, nuts and berries’. However, there seems to be only a single report, entirely neglected, that mentions the Blueback’s food in the wild. Following a typhoon on Polillo, McGregor (1910) recorded birds eating ‘kamansi’ (breadnut) *Artocarpus camansi* and ‘katmon’ (elephant apple) *Dillenia philippinensis*, both familiar species in the Philippines *vide* Malabrigo *et al.* (2016). However, as McGregor was on Polillo from at least 4 September (mentioned in the paper) yet only saw the species after the typhoon on 24 October, the birds he saw may have been displaced from their customary foraging habitats. This is putatively supported by his note that ‘the individuals observed by us were silent, thus presenting a marked contrast to the noisy... *T. lucionensis*’; such behaviour, although perhaps simply typical, could have been a response to being forced by hunger into an unfamiliar but competitively occupied foraging habitat.

There are almost no data on breeding. Nests, placed in tree-holes, have been recorded in February and March (Kennedy *et al.* 2000), and both females collected at San Isidro, Samar, in April, had well-developed gonads, one with an egg in its oviduct (Rand & Rabor 1960); a female on Tawi-Tawi (apparently an escape, as it proved to be wearing some kind of leg attachment) was photographed at an apparent nest-hole in a tall bare straight trunk, hole c.15 m from the ground, on 2 April 2009 (I. Sarenas); a pair apparently preparing to breed were seen at a nest-hole created by a broken branch c.18 m up in a c.20 m tree, 1 km from the forest edge, January 2020 (PGCJ, LJP). Most notably, at PICOP in April 2000 several pairs were found to be nesting in different holes in a single dipterocarp, probably *Shorea*, with 13 birds including young estimated to be present (Z. Goring). F. S. Bourns and D. C. Worcester (in McGregor 1909–1910) found birds moulting when they visited Jolo, which was in September *vide* Dickinson *et al.* (1991: 88). However, a juvenile female, appearing about 90% grown, was collected at Agay, Mindanao (see above), in mid-January (NHMD), suggesting that its laying date might have been in early October. Forest users stated during interviews conducted in 2004 that the breeding season of ‘large green parrots’ (so possibly only Blue-naped and not Blue-backed Parrot) lasted from May to July on Polillo (PW). In captivity the incubation period has been recorded at around 26 days, with a bird out of a clutch of three eggs fledging at 65 days, and it was noted that in this cycle the female always waited

to be fed by the male (Volkmar 1996). *Tanygnathus* parrots belong to a group of genera in which the females are dominant (Thompson 1997), and males have been found to produce high quantities of sperm throughout the year, which suggests that females may mate with several males or at least be highly selective in their choice of mate (S. Bruslund). This may explain the sexual dimorphism in this species and some of its relatives.

Like most parrots, the species is at least moderately sociable: in the Sulu Archipelago it was ‘frequently seen in pairs or in small flocks flying about on feeding excursions’ (duPont & Rabor 1973). Response to playback (e.g. Morris & Fisher 1998) is usual in this species in any context (ROH). At least two communal roosts were previously known within PICOP. One in primary forest off Road 4 held up to six individuals until it was cut down in 2000 (Z. Goring). The other, at the Road 1-Road 4 junction in remnant tall dipterocarps at the forest edge, held up to 10 individuals in March 2003; the birds roosted in the uppermost branches, arriving up to an hour before sunset, but in misty conditions some remained up to three hours after sunrise (ROH, Woods *et al.* 2003). This latter roost was known to hold up to 20 birds in previous years, but the trees had been cut by 2005 (ROH).

In captivity birds have been recorded living to at least 11 years (Webb 1950) and to 14 years (Brouwer *et al.* 2000). In the wild a male was seen taken by a Rufous-bellied Eagle *Lophotriorchis kienerii* (McGregor 1909).

Trade

The internal trade in birds in the Philippines appears, at least until quite recently, to have been entirely neglected as a conservation issue. There have been no studies of it at the national level and no figures to characterise or quantify it with any confidence. The scale of it cannot be expected to match that found in Indonesia, and notably Java, where bird-keeping has long been understood as a culturally transmitted behaviour and is now identified as a prime cause of avian population declines and even extinctions (Jepson & Ladle 2005, Eaton *et al.* 2015, Harris *et al.* 2017, Marshall *et al.* 2020). Nevertheless, it is clearly a significant socio-economic factor in Philippine popular culture: Collar *et al.* (1999) reported that 18.5% of threatened birds in the country were at least partly affected by trade, Gonzalez (2006) referred to ‘the widespread inter-island trade of wildlife in the Philippines’, and Cruz *et al.* (2007) provided considerable insight from a study in Palawan that demonstrated how thousands of live animals are trafficked clandestinely to Manila as well as Cebu, Zamboanga City and General Santos City.

These two latter studies mention trade in the commoner Blue-naped Parrot, which is first on a list of ‘widely transported’ birds in Gonzalez (2006), who however used ‘*Tanygnathus* sp.’ after the English name, perhaps indicating that Blueback was also involved. Cruz *et al.* (2007) conservatively estimated that 4,750 Blue-naped Parrots were being smuggled out of Palawan every year, commanding very low prices because they were so common on the island, yet still in high demand for their attractive plumage and ability to mimic. Given the low numbers encountered everywhere except in the Sulu Archipelago, it is clear that Blue-backed Parrots can never have been traded in such volume. However, the revelation of such a high general interest in the Philippines in parrots either as pets or for onward sale elsewhere, as also indicated by a glancing reference to the Philippines as a consumer of parrots from Indonesia (Shepherd 2005), suggests how populations of Bluebacks seem likely to have suffered serious and indeed fatal damage from intensive but indiscriminate parrot-trapping activities across the country—activities which, in the second half of the twentieth century, reduced the Philippine Cockatoo from 52 islands to 12 and to the IUCN status of Critically Endangered (Collar *et al.* 1999, PW). During forest-user interviews on Polillo in 2004, trade in wildlife was reported to be continuing owing to the relative proximity of Manila, although much reduced in volume

compared to the 1990s, the decline in parrots being attributed not only to the poaching of chicks but also to the felling by some poachers of nest-trees, as well as to the impact of typhoon ‘Onsang’ in 1994, which caused severe direct casualties and subsequent starvation among all parrot species on the island (PW).

In monthly visits to Cartimar market, Pasay City, Manila, over the year March 1987 to February 1988, Girdler (1989) never saw more than three Bluebacks per visit (16 birds in total), but although these low numbers may reflect the relative rarity of the species at the time, they nonetheless confirm its presence in trade. Indeed, in 2018 a Luzon-based breeder reported to D. Gutierrez that birds of this species ‘used to be traded regularly on the black market but unlike *Tanygnathus lucionensis* they hardly see them around nowadays.’ It is perhaps implausible that the night-catching of birds at Dalton Pass and other sites in northern Luzon impacted the species greatly, but a specimen was taken there (see above), and Alonso-Pasicolan (1992) mentioned that the only birds not killed for finger-food were ‘doves, pigeons and parakeets’, which were instead sold to pet shops in Manila.

On Polillo, Gonzalez (1997) remarked that ‘dwindling populations of large non-passerine species... are still heavily poached for the pet trade (i.e., *Tanygnathus sumatranus freeri*, *Tanygnathus lucionensis hybridus*’.

On Negros, Brooks *et al.* (1992) reported both *Tanygnathus* species as ‘heavily trapped throughout their ranges and may be extinct on the island’, which appears true now of Blue-backed Parrot and likely to be true soon, through poaching, of Blue-naped (LJP).

On Samar, at Cansolabao, Hilabangan, in September 2004, 60 individuals of three parrot species (fewer than 10 Bluebacks) were found for sale along the roadside by 10 families who trapped parrots locally, each family capturing around 50 parrots per month for the two-month catching season from mid-April to mid-June, i.e. 1,000 parrots, potentially therefore 100 Bluebacks, per year (IDLW, PW). Interviews with members of these families established that fledglings of all parrot species were taken from the nest, reached with the help of ropes and nails in the trunk, and occasionally through felling the tree, but that birds were also unselectively captured throughout the year in smaller numbers using glue derived from the sap of the antipolo tree *Artocarpus blancoi*; the birds were either sold to a middleman or directly to passengers on buses bound for Manila, this latter option being taken after road improvements and more frequent bus traffic increased demand in the preceding 3-4 years (IDLW, PW). Many roadside vendors had difficulties in telling the green parrots apart, some even claiming *Prioniturus* to be immature *Tanygnathus*, and in 2004 were charging the same roadside price of 250-500 PhP (US\$4.70-9.50 at 2004 exchange rate) as for Blue-naped Parrot and Blue-crowned Racquet-tail *P. discurus* (IDLW, PW). Bluebacks were also kept in private households at that time, mainly by local dignitaries, who usually received them from forest users as tokens of appreciation, although one priest was collecting birds and ordering them specifically from trappers (IDLW, PW).

On Tawi-Tawi, Allen (1998a,b) reported seeing several Bluebacks in captivity. He was informed that they made a very popular cagebird since they will survive on rice, whereas racquet-tails need fruit, which is too expensive year-round for most people (D. N. S. Allen).

With respect to the discovery of trade pressure in 2004 on Samar, it is perhaps of interest to note that, while only 184 Bluebacks were recorded on CITES as being exported from the Philippines in the period 1990-2019, 106 of them went to Malaysia in 2003 (R. Thomas).

DISCUSSION

The unique distribution of the Blue-backed Parrot across the Philippine archipelago, with its absence from major islands like

Mindoro, Cebu and Bohol, as well as its evident numerical weakness everywhere outside of the Sulu Islands already in the nineteenth century, could conceivably be attributable to natural evolutionary processes of decline and retreat. Outside the Philippines the only place where two *Tanygnathus* parrots are sympatric is the island of Buru, where Great-billed Parrot *T. megalorynchos* and the endemic Black-lored Parrot *T. gramineus* co-occur, but these are well separated by bill size and elevation (Poulsen & Lambert 2000). By contrast, *T. everetti* and *T. lucionensis* overlap extensively in both, *everetti* having a slightly larger bill but with an elevational range less than half that recorded for *lucionensis* (1,000 m in Kennedy *et al.* 2000), so that their co-existence appears to be permitted simply by their respective greater adaptations to primary lowland forest (*everetti*) and secondary or naturally fragmented and disturbed lowland-to-mid-elevation forest (*lucionensis*); even so, on the evidence assembled above, *lucionensis* seems more able to tolerate the habitat of *everetti* than *everetti* does the habitat of *lucionensis*, and this might therefore be a major constraint on *everetti*.

Equally, however, there may be an anthropogenic factor in the disadvantage of *everetti*, and it is possible that this factor is entirely responsible for the situation. Lowland primary forest has been the target of human activity since the western colonisation of the Philippines, so *everetti* will have suffered significantly more in the past 500 years than *lucionensis*. Moreover, the finding that on Palawan *lucionensis* nests preferentially in large emergent trees—*Koompassia excelsa* in the south (Bernardo 2016)—suggests a specialism that *everetti* is likely to share, so that any targeting for timber of the tallest trees by settlers and loggers in a lowland forest would be likely to affect the lowland-restricted *everetti* disproportionately.

What is certain is that the combination of lowland forest loss and trapping for the pet trade has led to the extinction of some populations and subspecies of the Blue-backed Parrot and has severely endangered the entire species. Gonzalez *et al.* (2018) proposed that it be classified as Critically Endangered on the Philippine National Red List based on three subspecies *duponti* (=Luzon *everetti*), *freeri* and *burbidgii* each being Critically Endangered and *everetti* being Endangered. However, BirdLife International (2020b) have evaluated the evidence as qualifying the Blue-backed Parrot for Endangered status under IUCN (2001) criterion C2a(i), which accepts that the species has a population of fewer than 2,500 adults, is undergoing a continuing decline, and no subpopulation is larger than 250 adults. This bears some reflection based on the evidence compiled here, balancing the danger of prematurely presuming extinction (Collar 1998b) against the evidence of continuing lowland forest clearance and an ongoing, possibly intense but virtually unreported country-wide internal trade in parrots:

Luzon: last recorded 1973, balance of evidence suggests extinct;

Polillo Islands: no record since 2005, balance of evidence suggests extinct;

Panay: last recorded 1888, balance of evidence suggests extinct;

Negros: last recorded 1982 although captives seen 2003, balance of evidence suggests extinct;

Samar: recent records, but extremely rare, reasonable to presume <100 persist in the wild;

Leyte: last recorded 1994, balance of evidence suggests extinct;

Mindanao: recent records, but extremely rare, reasonable to presume <100 persist in the wild (and precautionarily unsafe to presume its unrecorded presence in areas currently too dangerous to visit);

Jolo: recent records, but now very rare, reasonable to presume <50 persist in the wild;

Siasi, Loran, Tumbagaan, Basbas, Sanga-Sanga, Bongao, Sibutu: no information, but unsafe to presume its survival;

Tawi-Tawi: present, but extremely rare, reasonable to presume <50 persist in the wild.

On this basis, the Blue-backed Parrot is represented by a population of potentially far fewer than 300 birds, and a reasonable precaution would place this below 250 and allow the species to be registered as Critically Endangered.

Whatever its designation, it is clear that the Blue-backed Parrot needs attention as a matter of the highest urgency. The legal protection of remaining forests with existing populations of the species, e.g. on Tawi-Tawi and in eastern Mindanao, is now required (the key forest site on Tawi-Tawi now has a ranger employed by the town of Panglima Sugala). Samar Island Natural Park holds a significant amount of lowland forest and the number of records from or near it suggests that it represents the single best hope for preserving a population of *T. e. everetti* in the long term. An exhaustive survey of its forests is now a top priority, along with an assessment of the damage being done by illegal logging together with a concerted campaign to close this activity down. At the same time, searches are needed among local communities there for captive individuals, in order to assemble an *ex situ* population that can be bred up for reintroduction. Moreover, a broadscale community campaign can be conducted to discourage the trapping of wild birds (of any species) and recruit supporters for the conservation of the parrots and their forested lands. The forests of central Samar were long since identified as critically important for survey (Mallari *et al.* 2004) and work undertaken now for the Blue-backed Parrot can compose part of a wider initiative to safeguard a suite of important species, from the Philippine Eagle *Pithecophaga jefferyi* (CR) to the Visayan Miniature Babbler *Micromacronus leytensis* (DD). A very similar programme is needed for the Sulu archipelago, with a strong emphasis on Tawi-Tawi, whose last small forest tracts hold a suite of species equally or even more at risk, including Tawi-Tawi Brown-dove *Phapitreron cinereiceps* (EN), Sulu Hornbill *Anthracoceros montani* (CR) and Sulu Racquet-tail *Prioniturus verticalis* (CR). Redoubled efforts to locate birds at known sites on Mindanao are clearly imperative, and checks on the small Sulu Islands which have not been revisited in recent years (Siasi, Loran, Tumbagaan, Basbas) are desirable. All such fieldwork should incorporate intensive study of any birds encountered in order to build a basic natural history profile of the species, tracking behaviours and activity patterns, habitat use, foods, movements, interspecific interactions and evidence related to breeding.

A captive-breeding programme requires urgent initiation. Captive birds of the two forms *everetti* and *burbidgii* must be sought out and acquired for management under government licence, bringing together a multidisciplinary team to oversee the work and develop an integrated *ex-situ/in-situ* conservation plan. Given the substantial dissimilarities between the two taxa, such that they might well be determined by further research to constitute two species (Arndt *et al.* 2019), it is clearly important to maintain the captive populations as separate entities.

ACKNOWLEDGEMENTS

We express our warm thanks to many people and institutions (full names of museums are in Methods) for their help in the creation of this review: P. Sweet and T. Trombone (AMNH), P. Boussès (MNHN), M. Päckert (MTD), P. Kamminga (Naturalis), J. B. Kristensen (NHMD), R. Urriza (PNM), M. Forthuber (SNMB), M. Alcalá (SUNSM), J. C. T. Gonzalez (UPLBMNH), C. Milensky (USNM) and S. Frahnert and P. Eckhoff (ZMB) for access to and/or information on specimens in their care; D. N. S. Allen, M. Bajarias, Birdtour Asia, T. M. Brooks, A. Constantino, B. Demeulemeester, G. C. L. Dutson, the late T. H. Fisher, B. Glick, M. Kearns, Polillo Ecology Stewardship Project, R. D. Quemado II, J. Rudy, I. Sarenas, P. Simpson, M. Villa and S. Wamelink for their records of birds in the wild, many of them filed on eBird and the Wild Bird Club of the Philippines database (to which we were generously given access), plus

a long series of contacts who kindly replied to our inquiries albeit with no information to offer; S. Bruslund, P. Jørgensen, R. Low and R. Wüst for providing literature and advice on *Tanygnathus* in captivity; J. C. T. Gonzalez, Z. Goring, D. Gutierrez, C. Perez, E. Sy, R. Thomas, M. van Weerd and R. Wilkinson for information and help; B. Ong and L. Pabico for preparing Figure 1; the USAID-funded Protect Wildlife Project in Tawi-Tawi for information; R. Wirth for constant multiple forms of support; and J. C. T. Gonzalez and a second referee for important additional information.

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