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**GAZETTEER AND SITE-BASED HISTORY OF
THE ORNITHOLOGY OF
SABAH, MALAYSIAN BORNEO**

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GAZETTEER AND SITE-BASED HISTORY OF THE ORNITHOLOGY OF SABAH, MALAYSIAN BORNEO

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ABSTRACT

The gazetteer lists sites in the state of Sabah, Malaysia, where birds have been collected, studied, or watched. Its purpose is to identify locations for research and birding in Sabah and to provide a brief scientific history of the more important sites. Each site description includes latitude, longitude, and general information on location. For many sites, elevation, habitat, scientific or birdwatching importance, historical notes, citations of key papers, specimen records, and records of certain species are also included.

Key words: Birds, Birdwatching, Borneo, Georeference, History, Research, Scientific collecting

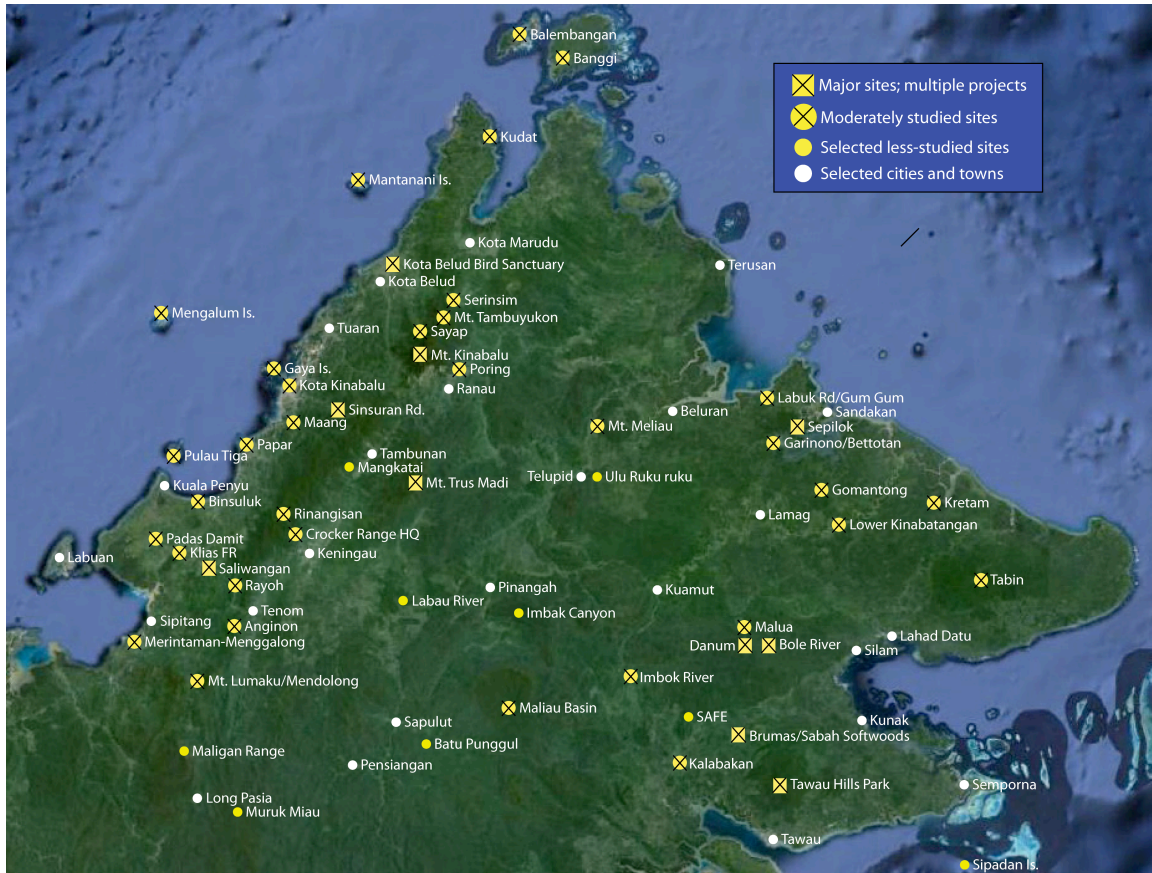
INTRODUCTION

The Malaysian state of Sabah, formerly known as British North Borneo, has a rich ornithological history extending back to the first publication on its birds by Motley and Dillwyn (1855). This gazetteer provides a view of that history by listing and characterizing sites where ornithologists have collected and studied birds and where birders have watched them. The gazetteer is a revised version of one that was included in Sheldon et al. (2001). It corrects mistakes in the original version by taking advantage of the development of new methods for finding and georeferencing localities (e.g., Google Earth, online gazetteers, and GPS devices). It also adds sites and references that were missed in the earlier version and sites that have been visited by ornithologists or birdwatchers since 2001. New site information derives mainly from published papers and not from birdwatching trip reports, unless those reports refer to unusual localities or birds. Some older birdwatching references are included in the gazetteer because they were in the original version.

The gazetteer indicates (explicitly or implicitly) why some locations were explored by ornithologists early in the history of Sabah. Mt. Kinabalu always attracted naturalists because it dominated the north Bornean landscape and promised scientific riches to its first explorers. Most other sites, however, were visited as much for convenience as scientific promise. These less well-known sites were often in the vicinity of the British North Borneo Chartered Company's offices, or along the Kinabatangan River or Kota Kinabalu-to-Tenom railroad, or in timber camps and plantations, where

food, transport, and labor were available. Not until the 1950s did ornithologists begin to explore the deep interior of Sabah away from colonial amenities (e.g., Mt. Trus Madi, Mt. Meliau, and Mt. Magdalena), and not until the 1980s did they conduct quantitative studies of ecology and conservation (Sheldon et al. 2001). Nowadays, with a good network of roads and research stations and large numbers of Malaysian and international scientists and birders working and visiting Sabah, few parts of the state remain ornithologically unexplored.

Figure 1: Map of important ornithological sites in Sabah (Google Earth).



In respect to forest quality, parts of Sabah have changed a great deal since the early years of ornithological exploration. Virtually all forest outside of parks, conservation reserves, and some mountains has been logged. Until 40-50 years ago, the lowlands and uplands east of Maliau Basin, were essentially untouched by man except adjacent to the Kinabatangan and Segama rivers. This area held the most magnificent rainforest in the world. Now the only substantial unlogged remnants of this remarkable forest are in Danum Valley, Imbak Canyon, and Tawau Hills Park. Some other unlogged low elevation forest also remains, usually in areas with ultramafic or sandy soils that make the trees less valuable as timber and the land less amenable to agriculture (e.g., in the Tawai Forest Reserve). In contrast to forests disturbed by the modern logging boom, many other areas of Sabah have been subjected to shifting cultivation and consequent

forest disturbance for hundreds of years, especially along the west, north, and northeast coasts, and in the interior from Sipitang to Pensiangan and from Tenom to Ranau. Despite this long-term disturbance, most of these areas remain rich in birds and are excellent places for birdwatching and study as long as native forest has been allowed to regenerate. Even the southeastern dipterocarp forest, despite its recent devastation, continues to hold its original bird species, although in different levels of abundance (Sheldon et al. 2010, Edwards et al. 2011). In areas where the forest has not been allowed to regenerate, but instead has been converted to plantation or repeatedly burned, rainforest birds are largely extirpated. This happened >100 years ago in the northern part of Sabah (most of the Kudat Division and Kota Belud and Beluran districts), and explains why that part of the state has not been well-studied ornithologically (Fig. 1); it holds few interesting breeding birds. More recently, especially in the last 30 years, the expansive growth of oil palm—a particularly poor habitat for native birds (Edwards et al. 2010, Sheldon et al. 2010)—has permanently removed rainforest and its avifauna from much of Sabah’s eastern lowlands and is now expanding in upland areas in western Sabah. As a result of this expansion, many of the localities listed in the gazetteer are no longer interesting as ornithological or birdwatching sites. They serve only as reminders of a past era.

METHODS

The gazetteer is organized alphabetically. However, it is intended to be searched using a search function. Thus, many lesser sites are not listed alphabetically, but rather under more inclusive sites (e.g., Laban Rata is under Mt. Kinabalu). Because variations in site spellings are common, alternative spellings are listed in parentheses after the accepted spelling. Sites on Mt. Kinabalu, whose names originated in the Dusun language, are usually provided with two spellings. Dusun spellings are from Beaman et al. (1996). Also included are alternative spellings (some quaint) of place names from old sources, such as the 18th and 19th century maps of Alexander Dalrymple (Durand and Curtis 2014:52) and D. D. Daly (1888a), and Rutter’s (1922) history of British North Borneo.

Language problems are usually circumvented by translating Malay descriptors to English. Translated words include *banjaran* (mountain range), *bukit* (hill), *danau* (lake), *gunung* (mountain), *kampung* (village, abbreviated as “Kg.”), *padang* (field or open area), *pulau* (island), *sungai* (river), *tanjung* (promontory, sometimes abbreviated “Tg.”), and *teluk* (bay). Sungai Bole is thus called Bole River, and Kampung Maang is simply Maang or Kg. Maang. However, certain Malay descriptors are simpler and more useful than their English counterparts, e.g., *kuala*, river mouth or confluence of rivers, and *ulu*, the headwaters of a river or river system. Kuala Papar is the mouth of the Papar River; Ulu Papar is the Papar River watershed in the Crocker Range. These useful terms are retained. Also retained are local names that are widely used, such as Pulau Tiga.

In the original gazetteer, locality coordinates were read from Gazetteer No. 10 of the United States Board on Geographical Names (1955, 1970), a tactical pilotage chart (TPC L-11BG, scale 1:500,000, Ministry of Defense, UK, 1976), and a Sabah map (Rampaian 37 Jenis C, Cetakan 2- PPNM, Director of National Mapping, Malaysia 1981). Other coordinates were from Tangah and Wong (1995) and gazetteers appended to papers (Davis 1962, Davies and Payne 1982, Stuebing 1991, Mat-Salleh 1993, Beaman et

al. 1996). Since then, sites of 59 limestone habitats have been added from the gazetteer of Lim and Kiew (1997), and other new sites have been added using the maps above and online gazetteers. Coordinates of all sites have been checked using the Geonet Names Server (<http://earth-info.nga.mil/gns/html/index.html>) and www.geonames.org, and many have been checked in person with a GPS device or via Google Earth (earth.google.com). In some cases, site names describe wide areas and, thus, their coordinates are approximations. Localities that lack latitude and longitude could not be found in gazetteers or on maps.

Major ornithological sites are noted on the map in Fig. 1. For those seeking convenient birdwatching sites, Phillipps and Phillipps (2014: 328-333) provide descriptions of many, with maps and short lists of birds found in each. Comprehensive information on modern bird research and watching on Mt. Kinabalu, including online birdwatching records, is available in Harris et al. (2012).

Taxonomy

Bird names in the gazetteer follow the classification of Gill and Donsker (2014).

Forest Reserves

Sabah has numerous Forest Reserves with varying purposes. The names and classification of many of these reserves have changed in recent years, so older reserve designations may no longer apply (although they are often mentioned in the gazetteer). Current reserves are shown in Fig. 2, and their purposes are described in the following classification (Sabah Forestry Department website, April 2015):

Class I - Protection Forest. “Forest conserved for the protection of watershed and maintenance of the stability of essential climatic and other environmental factors. These areas cannot be logged. There are 342,848 hectares of Protection Forest in 44 locations throughout Sabah.” [Most of these reserves were logged previously and are now protected from future logging and conversion to plantation.]

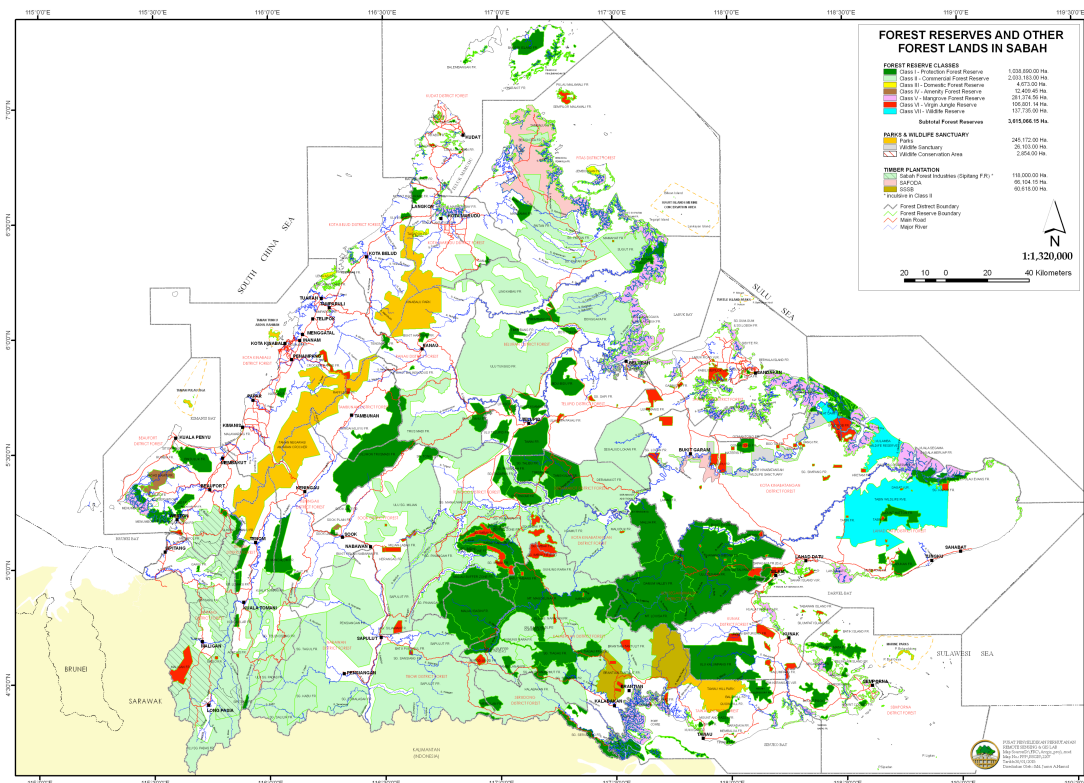
Class II - Commercial Forest. “Forest allocated for logging to supply timber and other produce contributing to the State's economy. Logging is carried out according to Sustainable Forest Management (SFM) principles. Collectively there are 2,683,480 hectares of Commercial Forest Reserves in 31 locations throughout Sabah.” [Commercial logging is now largely finished in Sabah, except where forest is being cleared for plantations. One exceptions is Deramakot FR, which is a carefully managed reserve being logged on a 40 year rotation. Plantations, primarily tree plantations for wood production, but also including plantations of oil palm, are allowed in some Commercial Forests in Sabah.]

Class III - Domestic Forest. “The produce from this forest is for consumption of local communities only and commercial use is discouraged. Collectively there are 7,355 hectares of Domestic Forest Reserves in 10 locations throughout Sabah.”

Class IV - Amenity Forest. “Forest for providing amenity and recreation to local inhabitants. Recreational facilities may be provided in attractive sites, often on roadsides,

within these reserves. Exotic tree species are often planted to enhance the amenity value of these areas. Collectively, there are 21,092 hectares of Amenity Forest Reserves in 14 locations throughout Sabah.”

Class VI - Virgin Jungle Forest. “Forest conserved intact strictly for forestry research purposes. Logging is strictly prohibited in this forest reserve. The Sepilok Virgin Jungle Reserve in Sandakan covers [4,300] hectares and is one of the largest tracts of undisturbed lowland dipterocarp forests in Sabah. Collectively, there are 91,914 hectares of Virgin Forest Reserves in 50 locations throughout Sabah.” [In fact, VJR is a misnomer, as most of these reserves have been logged one or more times.]



To save space, we use 1° and 2° to indicate primary and secondary forest. Also, ornithologists and birdwatchers who provided large amounts of information to the gazetteer in the form of personal communications, notes, and unpublished reports are cited by their initials. Major collectors, collections, government agencies, NGOs,

publications, and common terms are also indicated with initials. Additional information on many of these sources can be found in Sheldon et al. (2001).

AMNH	American Museum of Natural History (specimen data)
ANSP	Academy of Natural Sciences of Philadelphia (specimen data)
ADG	Antonio D. Garcia, Sabah Agriculture Department (Thompson 1966)
B&W	D. Beadle and A. Whittaker (1985)
BBT	British Borneo Timbers Ltd. (Sabah Timbers after 1963)
BNBC	British North Borneo (Chartered) Company
BNBH	British North Borneo Herald
BMNBE	British Museum North Borneo Expedition, 1956 (Banks 1982, R.W. Sims unpublished manuscript, specimen data)
BMNH	British Museum (Natural History; specimen data)
CMF	Charles M. Francis (Francis 1987, pers. comm.)
DMB	Dennis M. Batchelor (Batchelor 1959, pers. comm.)
DMS	D. M. Simpson (Simpson 1982a, b)
DRW	David R. Wells (University of Malaya, pers. comm.)
FHS	Frederick H. Sheldon
FMNH	Field Museum of Natural History (Chicago Natural History Museum; specimen data)
FR	Forest reserve
KU	University of Kansas Natural History Museum (specimen data)
KVT	K.V. Thompson (pers. comm.)
L&K	Lim and Kiew (1997)
LSU	Louisiana State University Museum of Natural Science (specimen data)
MAPS	Migratory Animal Pathological Survey, U.S. Army Research and Development Group, Far East (McClure and Leelavit 1972, McClure 1974)
MCT	Max C. Thompson, Bishop Museum Expedition, 1962-1963 (Thompson 1966)
MCZ	Harvard University's Museum of Comparative Zoology, Asiatic Primate Expedition, 1937 (Griswold 1939, Coolidge 1940, Peters 1940)
MMN	Mary Norman (Norman 1964)
NAMRU	United States Naval Medical Research Unit (Kuntz 1969; USNM specimen data)
RI	Ross Ibbotson (pers. comm.)
RM	Raffles Museum, formerly the National University of Singapore Collection, then Raffles Museum of Biodiversity Research of the National University of Singapore (specimen data)
RGM	Robert G. Moyle (LSU, AMNH, KU, pers. comm.)
SAD	Sabah Agriculture Department (specimens housed at Sabah Museum)
SM	Sabah Museum (specimen data)
SP	Sabah Parks (specimen data)
SRM	Sarawak Museum (specimen data)
SWD	Sabah Wildlife Department and its predecessors, the "Game Branch" and the "Wildlife Section" of the Forest Department (specimen data)

UNIMAS	University Malaysia Sarawak
UKMS	Universiti Kebangsaan Malaysia, Sabah Campus (specimen data; collections now at UKM Bangi, Selangor)
UKMS-ANS	UKMS - Academy of Natural Sciences Expedition, 1989 (Sheldon et al. 2001).
UMS	Universiti Malaysia Sabah
USNM	United States National Museum (Smithsonian; specimen data)
VJR	Virgin Jungle Reserve
WFVZ	Western Foundation of Vertebrate Zoology Expedition, 1981-1983 (Sheldon et al. 2001)
WWFM	World Wildlife Fund Malaysia (Davies and Payne 1982)
YU	Yale University Expedition, 1976-1977 (Sheldon et al. 2001)

LOCALITIES

ABAI. A village at Kuala Abai that served as the landing for Kota Belud and Tempasuk in the early years of ornithological exploration (6°23'N 116°21'E). See Kota Belud Bird Sanctuary and Abai on the Kinabatangan River. **Elevation:** Sea level. **Habitat:** Currently mangrove, beach strand, coastal scrub, and grassland (pasture). **Sources:** F.X. Witt, 1881-1882 (BNBH 1908:242, Everett 1889); Marchesa Expedition, first week in June 1883 (Guillemard 1889); J. Whitehead, Feb.-Mar. 1886, Dec. 1887 (Sharpe 1889c, Whitehead 1893, Gibson-Hill 1952); V.W. Ryves, Jan. 1939 (Gibson-Hill 1952). **Remarks:** William Pretyman landed here in 1878 and set up a fortified residence as representative of the British Borneo Provisional Association that became the BNBC two years later. His diaries provide details of the geography and people at the time (Harrison 1956). Abai was the main starting point for early trips to Mt. Kinabalu (Moulton 1915), and many birds were collected in the area. It still serves as a launching site to the Mantanani Islands.

AMBONG (AMBOONG) AND AMBONG BAY. A sheltered bay and anchorage on the W coast near Kota Belud (6°19'N 116°18'E) and a village (6°18'N 116°20'E). See Lamas Mountain and Tuaran. **Elevation:** Sea level. **Habitat:** 2° scrub, rice fields, and mangrove. **Sources:** SM and MAPS, mainly Jan. and Apr. 1970, some banding in 1971; D. R. Wells, 2 Nov. 1980 (pers. comm.). **Remarks:** H. Tsen of Sabah Museum banded birds for MAPS here. Ambong was District Headquarters starting in about 1890. It was attacked by Mat Salleh in 1897 and abandoned in 1901/2 in favour of Kota Belud.

ANGINON. A peak 8 km SW of Tenom on the SW side of the Padas Gorge in the Gunung Lumaku Class I FR (5°06'N 115°53'E). **Elevation:** 1198m. **Habitat:** 1° oak and "moss forest," with considerable amounts of climbing bamboo and some 2° scrub (MCT). **Sources:** MCT, Dec. 1962.

APAS-BALUNG AREA. 12-15 km NE of Tawau between the Apas (ca. 4°15'N 118°04'E) and Balung (ca. 4°18'N 118°10'E) rivers. Class I forest reserves in the area include Bald Hill, Quoin, and Mt. Wullersdorf. **Elevation:** <100 m. **Habitat:** 1° and 2° lowland forest during Norman's time; nowadays, the area has been converted completely

to agricultural plantation. **Sources:** MMN, June 1961 - Feb. 1962. **Remarks:** The Apas and Balung Rivers were initially logged by a Japanese compang, Kubota, in 1919 (Ibbotson 2014:163). Norman visited the Apas-Balung timber concession of North Borneo Timbers, which worked 56 sq. mi. in the area from 1961-67.

BAI ISLAND. In Sandakan Bay (5°46'N 118°06'E). **Elevation:** Sea level. **Habitat:** Closed forest, beach strand, coconut plantation, and scrub. **Sources:** W.B. Pryer, ca. 1883-1898 (Tregonning 1954); Bartsch, 1-3 Mar. 1908 (Mearns 1909); V.W. Ryves, 5 June 1938 (Gibson-Hill 1949, 1952, RM). **Remarks:** Pryer owned the island, on which he planted coconut, coffee, and areca nut palms, and ran cattle.

BAIT ISLAND. A limestone site ca. 12 km N of Semporna (4°32'30"N 118°31'30"E). **Remarks:** No commercial swiftlet nesting occurs here (Lim and Kiew 1997).

BAKAPIT. In the S coastal region of the Dent Peninsula (4°59'30"N 118°41'E). **Elevation:** Ca. <200 m. **Habitat:** Logged upland forest. **Sources:** WWFM, 9-17 Sept. 1981. **Remarks:** First base camp of an American company, Kennedy Bay Timber, which was established at nearby Kennedy Bay in 1952 (Ibbotson 2014:293-302).

BALD HILL FR. A very small Class I FR just east of Tawau Hills Park (4°25'20"N 118°01'49"E).

BALEMBANGAN FOREST RESERVE. A Class I FR of 371 ha on Tanjung Kalutan at the S end of Balembangan Island (7°13'00"N 116°52'45"E). See Balembangan Island. **Habitat:** Limestone forest and mangrove. **References:** CAIMS (2005).

BALEMBANGAN (BALAMBANGAN) ISLAND. The second largest island (150 km²) off the N tip of Sabah between 6°10'N - 7°25'N and 116°45'E - 117°02'E, including Siburungei, Tanjung Periuk, Teluk Lung (beach), Tanjung Panbatu (beach), Tanjung Timohing (swiftlet caves), Sekrumit River (mangrove), Air (Kuak or Kok) Simpul (CMF, Wells 1977, 1982c). **Elevation:** Sea level to 134 m at the limestone peak near Air Simpul. **Habitat:** Closed-canopy forest in the center and S portion of the island; also open shore, beach strand, reed marshes, swamp-thicket, mangrove, heathland, and inland Heathland has apparently increased since 1927 at the expense of closed forest and also possibly reed marshes. Grassland covers much of the area in the NE (Tanjung Periok) and N (Nor 1996). Limestone caves occur on two main hills, Siburungei (7°12'N 116°51'E) and Kok Simpul (Koksimpul) (7°13'N 116°53'N), and are inhabited by Edible-nest Swiftlets (*Aerodramus fuciphagus*) and other swiftlets. Other smaller caves are entered from the sea (CMF). **Sources:** F.N. Chasen and C. B. Kloss, 9-14 Sept. 1927 (Chasen and Kloss 1930a, b, RM); SP Survey, 7-13 Apr. 1977 (Wells 1977, 1982); UKMS and SWD, 4-7 Apr. 1984; D.H. Clayton and T. Jones, 18 Mar. 1994 (Clayton et al. 1996, Lee et al. 1996, Tompkins 1999, Tompkins and Clayton 1999, Price et al. 2004). **Remarks:** Balembangan was the site of the first British settlement in North Borneo, which was ceded to Alexander Dalrymple of the British East India Company by the Sultan of Sulu in 1773. A fort was built on the S portion of the island, but it was attacked by Suluks in 1775 and abandoned (Fry 1970). Chasen and Kloss collected on Tanjung

Periuk. Wells (1977) described habitats and speculated about changes since Chasen and Kloss's 1927 expedition. Wells (1982: 10) provided a map with site names. **References:** Nor (1996), Cranbrook et al. (2013).

BAL ESTATES (BORNEO ABACAR LTD ESTATES). NW of Tawau (4°21'N 117°48'E). **Elevation:** 50-400 m. **Habitat:** Cocoa and oil palm plantation. **Sources:** WWFM, 11-16 and 20 July 1980. **Remarks:** One of the largest estates in Sabah, originally established by the Japanese company Nishin Norin in 1915 because of the rich volcanic soils in that area. A considerable amount of timber was logged from the Merotai valley on the W boundary of the estate by Nissan Norin and North Borneo Trading Ltd between 1915 and 1940 (Ibbotson 2014:105, 232, 277, 303). Initially comprising rubber and abaca, the plantation was acquired by the Commonwealth Development Corporation after the Second World War. Cocoa was planted in the 1950s and abaca was replaced with oil palm. Currently, it is 100% oil palm and owned by Sime Darby.

BANDAKAN. A limestone site in the Sapulut FR (4°43'45"N 116°36'00"E). No commercial swiftlet nesting at this site (L&K).

BANDAU. The old name for Kota Marudu at the foot of Marudu Bay on the Bandau River (ca. 6°31'N 116°45'E). Bandau does not appear on modern maps. It lies between the Bongon and Langkon rivers (maps in Rutter 1922, Gore 1968). See Bongon, Madalon Mountain, Marudu Bay, Sungai River, and the homonymous site under Membakut. **Sources:** E.J.H. Berwick, Feb. 1958 (Smythies 1963); SM, Nov. 1970.

BANGGI (BANGUEY) ISLAND. The largest island (450 km²) off the N tip of Sabah between 7°07'N - 7°23'N and 117°03'E - 117°25'E; includes Balak Island (7°08'N 117°08'E) visited by Gore in July 1965 and Banggi Island Class I FR. See Karakit FR and Molleangen Island. **Elevation:** Sea level to 572 m (Senambung Hill). **Habitat:** Nor (1996) described the habitat as mainly mangrove, 1° forest, forest on limestone soil, plantation, and shifting cultivation. The interior is mostly logged forest and that much of the area was destroyed by fire during the El Niño drought in 1983 (A. Lamb pers. comm.). Primary forest occurs mainly in two forest reserves: Banggi FR, a Class II commercial forest reserve in the NE portion of the island (11,206 ha); and Karakit FR, a Class IV VJR covering 24 ha in the SW part of the island (Nor 1996). **Sources:** Marchesa Expedition, a few days in late May and early June 1883 (Guillemard 1885, 1889, Chasen and Kloss 1930a); A.H. Everett, June 1886, Feb. 1887, Jan. 1893 (Everett 1886, 1889, Sharpe 1894, Chasen and Kloss 1930a); F.N. Chasen and C. B. Kloss, 31 Aug. - 8 Sept. (Chasen and Kloss 1930a,b, RM); M.E.J. Gore, June - July 1965 (Gore 1968); UKM and SWD, 7-8 Apr. 1984 (UKMS and SWD); M. A. Rahman and M. T. Abdullah, 25-31 Jan. 2001 (Rahman and Abdullah 2002). **Remarks:** A concession to cut and export timber from Banggi was awarded to Möller Brothers of Shanghai in 1903, but operations were abandoned in 1907 (Ibbotson 2014:110). The proprietor of the Japanese owned Borneo Fisheries, Captain Orita (see Si Amil), built a large tuna canning facility, ice factory and considerable supporting infrastructure on the island, which were completed in 1939, but destroyed during the Second World War (Shimomoto 2010:110). Everett held a Chartered Company post at Kudat and probably visited Banggi several times (Chasen and

Kloss 1930a). The UKM-SWD group collected terns off the coast of Banggi. Rahman and Abdullah (2002) netted and surveyed birds in Karakit Forest FR. **References:** Nor (1996), CAIMS (2005).

BANJAR. Kg. Banjar, Mile 29, Keningau (5°18'N 116°8 E). **Sources:** ADG, Nov. 1963.

BARU JUMPAH. Ca. 29 km S of Tenom (4°57'N 115°54E). See Tomani. **Elevation:** 275 m. **Sources:** ADG, Jan.- Feb. 1963 (Univ. Malaya specimen data).

BATU BELAS. A limestone site on the Segama River (5°07'45"N 118°8'45"E). Not a commercial swiftlet nest site (L&K).

BATU BUNOD. A limestone site N of the Kinabatangan River (5°31'45"N 118°02'45"E). Not a commercial swiftlet nest site (L&K).

BATU MANDI. Two large sandstone rocks off the W coast of the Kudat peninsula at Tanjung Tambuluran (6°53'N 116°37'E). **Sources:** CMF, 23 Feb. 1984. **Remarks:** A site where Edible-nest Swiftlets and Black-nest Swiftlets (*Aerodramus maximus*) nest. **References:** Cranbrook et al. (2013). **Remarks:** These rocks have been the cause of a number of shipwrecks, including the loss of the *Kinabalu* in 1941.

BATU MATERIS. A limestone site N of the Kinabatangan River and 6 km SW of Gomantong (5°30'30"N 118°02'15"E). **Remarks:** A site where swiftlet nests have been collected, but about which little is known (CMF).

BATU PUNGGUL. Site of a large Murut longhouse community and limestone caves (4°39'00"N 116°33'45"E); includes two forest reserves: Batu Punggul (amenity) and Sungai Sansiang (VJR). **Elevation:** 300 m. **Habitat:** An area that would have experienced substantial shifting cultivation early on; dipterocarp forest in 1988, limestone outcrop, secondary forest, riparian and. Most of the forest has since been logged. **Sources:** CMF and K. Phillipps, 24-26 May 1984; SM, Dec. 1985, Mar. 1988 (specimen data, R. Goh, pers. comm.). **Remarks:** Historically, Batu Punggul was at the highest point on the Palagan River in the ulu Sapulut that could be reached by prahu. The interior beyond Batu Punggul is uninhabited, but in the 19th Century native tracks linked its longhouse to other Murut communities, notably Pinangah in the ulu Kinabatangan, Lunud on the ulu Kuamut, Kalabakan and Serudong on the SE coast of North Borneo, and also communities on the Sibuku River in Dutch Kalimantan. Thus, Batu Punggul was an important hub for trade in jungle produce. It was visited by F.X. Witt in 1881 (diaries 1881-2), shortly before his murder (Woolley 1971). This site has caves that apparently contained Edible-nest Swiftlet nests at one time, but not when visited by Francis and Phillipps in 1984. The only swiftlets they observed were Mossy-nest Swiftlets (*Aerodramus salangana*). Batu Punggul has become a tourist site, with a 2,000 ha reserve established around the limestone pinnacle. SM worked in on the Upper Palagan River in 1985, SE of Batu Punggul.

BATU QUOIN. A limestone site in Tabin Wildlife Reserve (5°18'00"N 118°44'30"E). No commercial swiftlet-nest collecting occurs at this site (L&K).

BATURONG HILL AND CAVES. A limestone outcrop in the Madai-Baturong VJR just N of Kunak along the Lahad Datu/Tawau highway and the Binuang River (4°42'00"N 118°00'30"E). **Elevation:** 10-450 m. **Habitat:** The caves are surrounded by a small island of lowland dipterocarp forest no more than a few km in diameter, which may extend N and W and has been selectively logged (CMF). CAIMS (2005) indicates fairly intact dipterocarp, kerangas, and limestone forest surrounded by oil palm plantation. **Sources:** F.G. Callaghan, July 1887 (Daly 1888b); P. Orolfo, Oct.-Nov. 1930 (RM, USNM); SM, July 1978, Aug. 1980, Mar. 1982, Apr.-May 1992; CMF, periodically 1982-1984. **Remarks:** An important swiftlet nest site with more than 36 caves. Baturong is also one of the few sites in Sabah where Bornean Ground Cuckoo (*Carpococcyx radiceus*) has been collected (SM).

BATU SUPAD. A limestone site near Madai in the Madai-Baturong VJR (4°42'15"N 118°10'15"E). No commercial swiftlet nesting at this location (L&K).

BATU TEMANGGONG KECIL. A limestone locality along the Kinabatangan River (5°32'00"N 118°18'00"E) associated with Pangi VJR.

BATU TENGAR CAVE. An important nesting site for Edible- and Black-nest swiftlets in the Segarong Class I FR (4°34'15"N 118°24'30"E). **Elevation:** Sea level, with limestone hills reaching 300 m. **Habitat:** Limestone, 2° scrub, mangrove, and nipah. **Sources:** CMF, 13-18 Jan. 1983. **References:** Daly (1888b).

BATU TIMBANG FR. A VJR of 261 ha in the Mt. Magdalena Class I FR and a site of swiftlet caves (4°58'20"N 117°05'52"E). See Mt. Kuli and Kuamut. **Elevation:** The cave is 777 m. **Habitat:** 1° forest (as of 1984) and forest on limestone. **Sources:** J.T. Richardson, August 1908; YU, Apr. 1977; CMF, 1984. **Remarks:** A cave site with all four swiftlet species nesting. **References:** Daly (1888a,b), Richardson (1908), and CAIMS (2005).

BATU URUN. A limestone site in the Pinangah River FR (4°49'30"N 116°38'00"E). No commercial swiftlet nesting at this site.

BAUTO (BOTO). On the Labuk River (5°40'N 117°12'E). **Elevation:** Ca. 200 m. **Sources:** E.J.H. Berwick, 8 Feb. 1959 (Smythies 1963).

BEAUFORT. A major town on the lower Padas River (5°20'39"N 115°44'41"E). **Remarks:** Beaufort was founded by the BNBC Managing Director, W.C. Cowie, in 1898, where the now defunct Weston rail line crossed the Padas River and where the current rail line starts up the Padas towards Tenom. Beaufort served as the provincial administrative headquarters. The rail line allowed collectors easy access to primary forest in the hills above the Padas and into the interior of Sabah. This is why substantial collections exist from Rayoh (RM), Anginon (MCT), and Saliwangan (YU, WFVZ).

BEAUFORT HILL. 3 km NW of Beaufort town (5°22'N 115°45'E). **Elevation:** 150 m. **Habitat:** Until the 1980s, most of the hills inland of Beaufort were covered in 1° dipterocarp forest. This forest was some of Sabah's richest in terms of lowland western Bornean endemic tree diversity. It was logged and subsequently severely damaged by the El Niño fire in 1983 (Beaman et al. 1985; J. Beaman and A. Lamb, pers. comm.). **Sources:** L.A. Charles, Mar. 1941 (RM).

BELURAN. District administrative headquarters from the 1900s at the mouth of the Labuk River (5°54'N 117°33'E). Birds also have been collected at Kolapis, ca. 7 km E of Beluran on the S shore of Kuala Labuk (5°53'N 117°36'E). **Elevation:** Sea level. **Habitat:** Grassy fields, gardens, 2° growth, mangrove, mudflats, and estuary. Some specimen labels say "edge of 1° forest." **Sources:** BMNBE, May 1956. **Remarks:** The mangroves here and to the north constitute the Kuala Bonggaya & Kuala Labuk Class V FR.

BENGKOKA RIVER. SE of Kudat across Marudu Bay (6°50'N 117°03'E). Pitas Estate is located at 6°43'N 117°04'E. **Elevation:** Sea level. **Habitat:** Undescribed, but probably mangrove and 1° and 2° swamp and coastal forest. Whitehead's notes suggest that he did not find many bird species normally expected in lowland dipterocarp forest (e.g., no Spotted Fantail, *Rhipidura perlata*). KVT noted that mangrove in that area ends abruptly and suggested that the region was probably cleared shortly after Whitehead's visit. This may have been because of the influence of a fairly large population of Rungus shifting cultivators. Tobacco was planted in ca. 1900 (perhaps earlier) and then rubber. **Sources:** J. Whitehead, Sept.-Nov. 1885 (Sharpe 1889a, Whitehead 1893, AMNH); F.N. Chasen and C. B. Kloss, Sept. 1927 (Chasen and Kloss 1930b); KVT, intermittently 1950-60s.

BENONI. A small village on the Benoni River ca. 4 km S of Papar (5°42'N 115°56'E). The Paper-Beaufort highway crosses the river at (5°39'28"N 115°53'38"E). See Papar. **Elevation:** Sea level. **Habitats:** Paddy, fields, marsh, ponds, mud flats, heath forest, mangrove, estuary, and beach strand. **Sources:** Marchesa Expedition, first week in June 1883 (Guillemard 1885, 1889); C. M. Enriquez and Mengga, 29 June - 6 July 1925 (Enriquez 1927, RM); WfVZ, intermittently 1981-1983; B&W, Sept., Nov., and Dec. 1984; R. V. Lansdown, Sept. 1986 (Lansdown 1989). **Remarks:** After rail access in 1902, Benoni became a popular beach resort. Membakut and Sapong Rubber Estates rented beachside bungalows to visitors (Rutter 1922). Enriquez's group collected from one of these. More recently, surveys and collections have been made inland and closer to the village along the Kota Kinabalu-Beaufort highway, where there are mudflats, marsh, and swamp.

BENUNUK. "Ulu Padas, Beaufort" (exact locality unspecified). **Habitat:** "1° forest." **Sources:** SM, Dec. 1981.

BERHALA (BAHALLA) ISLAND. An island at the entrance to Sandakan Bay with an amenity FR (5°52'N 118°08'E). **Elevation:** Sea level to 180 m. **Habitat:** Sandstone hills with caves, heavy forest on the W side, sandy beach, and coconut plantation. **Sources:**

W.B. Pryer, Feb. 1878 (Tregonning 1954); C.F. Adams, May 1887 - Feb. 1888 (Elliot 1890, 1891); F.N. Chasen and C. B. Kloss, July 1929 (RM); BMNBE, May 1956; J.C. and M.G. Pearson, 6 Apr. 1981 (pers. comm.). **Remarks:** Before WWII, Berhala was a leper colony. During early stages in the Japanese occupation, it was a civilian internment camp. Edible-nest and Glossy swiftlets (*Collocalia esculenta*) nest in the sandstone caves (Daly 1888b, CMF). The Pearsons collected terns off-shore. **References:** Chasen (1931), Cranbrook et al. (2013).

BETTOTAN (BETOTAN, BATATAN) RIVER. Ca. 35 km W of Sandakan at the end of Sandakan Bay (5°47'10"-5°47'17" N 117°49'36"-117°52'04"E). See Garinono FR. **Elevation:** Sea level. **Habitat:** 1° forest at the time of Chasen and Kloss; no longer any natural forest. **Sources:** F.N. Chasen and C. B. Kloss, July-Aug. 1927 (Chasen and Kloss 1930b, RM). **Remarks:** Bettotan was the location of the first mechanical logging operations in North Borneo. BBT introduced North American logging methods in 1920. The operations were not very successful, but steam locomotives continued to operate until about 1943 (Ibbotson 2014:171-193).

BINSULUK (BINSULOK) FR AND ENVIRONS. A large reserve on the N side of the Klias Peninsula near Membakut (5°31'N 115°41'E). **Elevation:** Sea level. **Habitat:** Peatswamp, fire-padang kerangas, riverine, beach strand, and the interface between mangrove and beach scrub. Binsuluk FR is a Class I reserve for peatswamp forest. However, much of the forest has been heavily logged and burned. **Sources:** DMB, intermittently 1958-62, Dec. 1984, Jan. 1985, Jan. and Mar. 1986; WFFVZ, intermittently 1982-1983; SWD, Apr. 1984 (CMF specimen data); B. King and D. Yong (pers. comm.), 6 Sept. 1986; UKMS, Aug. 1987, periodically 1992 (R. Stuebing, pers. comm., UKMS). **Remarks:** This heading includes shore areas not necessarily in the reserve. The WFFVZ collected Sabah's only Brown-backed Flowerpecker (*Dicaeum everetti*) at this site (Sheldon 1985b). UKMS found Hooked-billed Bulbul (*Setornis criniger*) and Grey-breasted Babbler (*Malacopteron albogulare*) to be common in the swamp forest in 1992. **References:** (Mohamed et al. 2000).

BOD NARKIOW. Site of a swiftlet nest cave along the Kinabatangan River mentioned by Daly (1888a). From his map, Daly appears to be referring to the ridges of Imbak Canyon.

BOLE KECIL (LITTLE BOLE) RIVER. W of Bole River in the Ulu Segama FR (5°10'N 117°52'E). **Elevation:** 100-150 m. **Habitat:** 1° lowland forest, logged in 1981. **Sources:** WFFM, 16 Feb. - 14 Apr. 1980.

BOLE RIVER. In the Ulu Segama FR ca. 50 km W of Lahad Datu where the road to Danum Valley crosses the Bole (4°59'01"N 117°54'04"E). This site refers specifically to what is now called Rafflesia Hill, where a small stream exits the forest. **Elevation:** 100-300 m. **Habitat:** 1° and logged upland forest. **Sources:** WFFVZ, 16 Feb. - 14 Apr. 1982; A.D. Johns, intermittently from 18 June 1987 - 17 Nov. 1988 (Johns 1989, 1992, 1996); F.R. Lambert, May 1989 - Oct. 1990 (Lambert 1990b, 1992; pers. comm.). **Remarks:** This site is now the location of a telephone relay tower. The WFFVZ collected many

specimens here when it was 1° forest. Johns and Lambert studied the effects of logging on 1° forest bird communities by comparing 1° forest populations with those in segments of logged forest of varying age and isolation. Other groups have studied orchids here.

BONGAWAN (BANGAWAN). A small town on the Bongawan River between Membakut and Kimanis, (5°33'N 115°49'E). The Papar-Beaufort highway crosses the Bongawan River at (5°32'16"N 115°51'31"E). **Elevation:** Ca. 30 m. **Habitat:** Paddy W of the village along the Bongawan River, and rubber. In the 1980s a Sabah Land Development Board oil palm plantation was established E of the village. **Sources:** DMB, intermittently 1958-62, Jan. 1985, Jan.-Mar. 1985; KVT, half-yearly 1952-1964; SM, Sept. 1970, May 1983; WFFVZ, intermittently during 1983; B&W, Sept., Nov., and Dec. 1984. **Remarks:** Bongawan was developed in 1902 after the completion of the Jesselton - Beaufort railway. B&W banded shorebirds at this locality.

BONGON AND BONGON RIVER. A site and river at the foot of Marudu Bay, east of Kota Marudu and the Marudu River (ca. 6°27'N 116°49'E). See Bandau and Marudu Bay. **Sources:** Marchesa Expedition, late May 1883 (Guillemard 1889); A.H. Everett, Jan. 1893 (Sharpe 1893, 1894, ANSP). **Remarks:** Bongon was a well established town in the late 19th Century and visited briefly by Guillemard. It is not on modern maps but was on Daly's (1888a) map.

BRUMAS. Formerly a logging camp and now a plantation town in the Kalabakan District Forest ca. 50 km NNW of Tawau (4°37'N 117°45'E) along the Umas Umas (4°22'N 117°44'E) and Gumpal (4°40'N 117°36'E) rivers. See Sabah Softwoods. **Elevation:** 150-200 m. **Habitat:** Mostly exotic-tree and oil palm plantation, some islands of logged forest within the plantation; included 1° forest in the 1970s and 80s. **Sources:** YU, 5 Mar. -14 Apr. 1977; WWFM, June-July 1981 (Davies 1981, Davies and Payne 1982); WFFVZ, 4 May - 14 June 1982; UKMS, Sept. 1984 and Nov. 1985; LSU, 23 June - 12 July 2005 (Sheldon et al. 2009a, Sheldon et al. 2010, Sheldon and Styring 2011, Styring et al. 2011). **Remarks:** Brumas was named for the two main rivers in the area (BRantian-UMAS = BRUMAS). It was established in 1971 to take over from Kalabakan as the headquarters for timber and tree planting operations of the North Borneo Timbers Co. It was taken over by Sabah Softwoods in 1987. YU and WFFVZ collected many birds at Brumas. WFFVZ, WWFM, LSU, and UKMS conducted surveys in Sabah Softwoods at Brumas.

BRUNEI VILLAGE. Near Membakut (5°30'N 115°48'E). **Sources:** DMB, Dec. 1984.

BUKIT IBUL. In the Maligan mountains (4°50'N 115°42'E). **Elevation:** 1050-1200 m. **Habitat:** Lower montane forest. **Sources:** WWFM, 2-7 May 1981 (J. Payne, pers. comm., Davies and Payne 1982).

BUKIT MALINGAI. The site of a swiftlet nesting cave (Daly 1888b). No other information.

BULOH RIVER. **Sources:** L.A. Charles, 13 May 1941 (RM). **Remarks:** Placed in Sabah by date, but may actually be in Singapore.

BUNDU. A small rubber holding on Klias Peninsula (5°32'N 115°33'E). See Klias Peninsula and Sitompok Lake. **Elevation:** Sea level. **Habitat:** Rubber, sago in swamp jungle, and scrub. **Sources:** DMB, intermittently 1958-62, 1984. **Remarks:** DMB mentioned a site called Sitompok Lake, which may be near Bundu or Kuala Penyu.

BURONG ISLAND. A limestone site S of Labuan (5°14'30"N 115°11'30"E). See Labuan. **Remarks:** No commercial swiftlet nesting at this site (L&K).

COWIE BAY OR HARBOUR. 4°18'N 117°45'E. See Sebatik Island and Wallace Bay.

CROCKER RANGE. The chain of mountains running SW from the Benkoka River to the borders of Sarawak and Indonesia. Much of the range is contained in the Crocker Range Park. **Remarks:** The Crocker Formation of mudstone-sandstone shales is the most prominent geological feature in Sabah, next to Mt. Kinabalu, which started as an igneous intrusion into the sedimentary Crocker Formation. Subsequent uplift of the Kinabalu Massif, ca. 7-8 million years ago, and erosion of softer overlying sedimentary rock (including by glaciers during the Pleistocene) yielded the mountain we see today (Choi 1996, Cottam et al. 2010).

CROCKER RANGE NATIONAL PARK. A 139,919 ha park extending NE to SW from just S of Tenompok to the Padas River. Park Headquarters is 15 km NW of Keningau (5°23'59"N 116°06'08"E). For sites along the road from Kota Kinabalu to Tambunan, see Sinsuran Road. For sites along the Kimanis to Keningau road, see Ulu Kimanis Substation, Rinangisan, and Park HQ. For sites along the Padas River, see Rayoh, and Saliwangan. See Inobong Substation, Kauran River, Lumaku, Makaniton, Tambunan, Ulu Losan, and Ulu Senagang. **Elevation:** Ca. 300 m to 1670 m at Mt. Alab; ca. 1000 m at Park HQ. **Habitat:** 1° and 2° lower and upper montane forest. **Sources:** At Park HQ: RGM, 4 – 16 June 1999; UNIMAS, 16-22 Oct. 1999 (Rahman et al. 2002). **Remarks:** The Park is the largest protected land area in Sabah. RGM's specimens are in the Sabah Park's Collection at Mt. Kinabalu and at LSU. **References:** (Das 2006).

DAGAT FR. A VJR of 169 ha in the north-central part of Tabin Wildlife Reserve. **Habitat:** Logged lowland dipterocarp and freshwater swamp forest. **References:** CAIMS (2005).

DALIT BEACH AND RASA RIA RESORT: On the Tuaran coast (6°09'N 116°08'E). **Reference:** Phillipps and Phillipps (2014: 328).

DANUM VALLEY CONSERVATION AREA. 438 km² within Danum Valley FR and the Ulu Segama/Malua District Forest located ca. 75 km W of Lahad Datu (ca. 4°49'N-5°04'N and 117°28'E-117°49'E). The resthouse and research facilities are on the Segama River (4°58'N 117°48'E). The Borneo Rainforest Lodge is located on the Danum River (5°01'11"N 117°44'48"E). The SP Survey took place at three camps: at the confluence of

the Beatrice and Segama Rivers (4°52'16"N 117°40'27"E) and two sites on the Danum River (4°54'30"N 117°34'20"E and 5°1'35"N 117°45'50"E). WWFM surveyed "Ulu Danum" (4°54'N 117°34'E). UKMS-ANSP visited Mt. Danum, with a base camp at the confluence of the Danum and "Sabran" Rivers (ca. 4°47'N 117°41'50E). Lambert (1990c) worked at ca. 5°00'N 117°30'E (plot P) and along the Sapat Kalisun River in logged forest (plot L89, ca. 1 km from plot P). Most other work has been across the Segama from the research facilities. **Elevation:** Most surveys ca. 100-400 m. The highest point, Mt. Danum (=Mt. Tribulation) is 1093 m (sometimes listed as 1287 m). **Habitat:** 1° upland to lower montane, riparian, logged, and 2° forest. **Sources:** T. Harrisson, 21-22 Feb. 1965 (Fogden 1965); SP Survey, 5 Aug. - 5 Sept. 1976 (Kiew 1977; SM and Univ. Malaya specimen data); WWFM, 5-8 Aug. 1979; B. King and D. Yong (pers. comm.), July-Aug. 1986, July and Aug. 1988, July 1989; A.D. Johns (Royal Society), 18 June 1987 - 17 Nov. 1988 (Johns 1989, 1992); F. Lambert (Royal Society), May 1989 - Sept. 1990 (Lambert 1990b, 1992; Danum Valley Ann. Rept. 1989, 1990; pers. comm.); UKMS-ANSP, 9 - 14 June 1989; Mohd. Zakaria Hussin (Univ. Pertanian Malaysia), Aug. 1990 - Feb. 1992 (Danum Valley Ann. Rept. 1990; Zakaria 1994, Nordin and Zakaria 1997, Zakaria and Nordin 1998); D.A. Showler, March and April 1992 (Showler 1992, 1993); SM, Nov. 1999; Iqbal et al. (2012), May 2009; D. Edwards research group, June-Oct. 2007 and May-Sept. 2008, May-Oct. 2009 (Edwards et al. 2009a, Edwards et al. 2009b, Edwards et al. 2010, Ansell et al. 2011, Edwards et al. 2011, Edwards et al. 2014). **Remarks:** The early exploration of the Segama River for gold makes good reading (e.g., the death of Frank Hatton, BNBH 1 May 1883 p. 3; Beeston, BNBH 1888 1 Jan. 1888 p. 302-303; Skertchly BNBH 1 Feb. 1889 p. 32; Seelhorst, BNBH 1 May 1895 May p. 111). Names like Mt. Tribulation and Dismal Gorge indicate how difficult the exploration was. Johns, Lambert, and the Edward's group compared bird communities in primary forest and logged forest; the Edwards group further studied managed regenerating forest (Malua FR) and adjacent oil palm. **References:** The first phase of research at Danum as a Royal Society research station was summarized in a discussion meeting, 18-19 Sept. 1991 (Johns 1992, Lambert 1992, Marsh and Greer 1992, Marshall 1992). Research at Danum is also summarized in Annual Reports of Danum Valley Field Centre, Sabah Foundation, Kota Kinabalu. Reynolds et al. (2011) provided a recent update on the status of forest in the Danum area. Also, Hazebrook et al. (2012).

DARVEL (LAHAD DATU) BAY. The large bay S of Lahad Datu (4°50'N 118°30'E). See Lahad Datu, Segarong, Silam, and Semporna Islands. **Sources:** C.A. Gibson-Hill, July 1949 (Gibson-Hill 1950).

DENT PENINSULA. The large promontory forming the easternmost part of Sabah--the area N and E of Lahad Datu. See Bakapit, Kulamba, Sahabat, Segama River, Tabin, and Tambisan.

DEWHURST BAY. Estuary of the Kinabatangan and Kretam Rivers (5°35'N 118°35'E). See Kretam Forest FR and Tanjung Linsang. **Sources:** KVT, July 1963 and Mar. 1965.

DINAWAN ISLAND. Off Kinarut, between Kota Kinabalu and Papar (5°51'N 115°59'E). **Sources:** E. Banks, no details (pers. comm.).

DULONG LAMBU HILL. 5°31'30"N 118°04'15"E. See Gomantong VJR.

DUMPIL. A promontory (Tg. Dumpil) ca. 12 km SW of Kota Kinabalu (5°54'N 116°02'E). **Sources:** Phillipps family, 14 July 1968 (Phillipps 1970). **Habitat:** Mangrove.

ENO ISLAND. Near Labuan (5°15'N 115°14'E). **Sources:** J. Whitehead, 29 Dec. 1885 (Sharpe 1890b).

ENSUAN RIVER. A tributary of the Labuk River, flowing from the S end of the Meliau Range. See Meliau.

GARINONO FR. A VJR of 451 ha ca. 38 km WSW of Sandakan (5°47'N 117°52'E). Garcia headquartered at the Oil Palm Research Station, Mile 32 on the main Sandakan Road. Sabah Museum collected at "Ulu Dusun," which is the locality name of the Agricultural Research Station (A. Lamb, pers. comm.). See Bettotan. **Elevation:** 10 m. **Habitat:** 1° lowland forest, freshwater swamp forest, mixed mangrove/nipah, and oil palm plantation. Logging in the area started in the 1930s and continued through the 1960s (J. Payne, pers. comm.). The Reserve itself was not disturbed until the late 1970s (A. Lamb, pers. comm.). **Sources:** F.N. Chasen and C. B. Kloss, July-Aug. 1927 (Chasen and Kloss 1930b, RM); ADG, Aug. 1963 (MCT); SM, Oct. 1977 (specimen data, R. Goh, pers. comm.). **Remarks:** Chasen and Kloss (1930b) collected at Bettotan. Presumably this means they entered the forest along the Bettotan River, which reaches Garinono FR. **References:** CAIMS (2005).

GAYA BAY. The bay surrounding Kota Kinabalu (5°59'N 116°06'E), including the coastal section of Likas (Likas Bay), Kuala Bakut (Lansdown 1989), Kuala Darau (near the Sabah Foundation), and small islands such as Udor (6°05'N 116°05'E). See Gaya Island, Kota Kinabalu, Likas Lagoons, and Likas Swamp. **Elevation:** Sea level. **Habitat:** Bay, beach, tidal flats and ponds, mangrove, grassland, casuarinas, and coastal scrub. At Kuala Darau there was also a shrimp-pond project in the 1980s. Now the area is completely developed as suburbs. **Sources:** WFVZ, intermittently 1981-1983; DMB, 1984-1990; UKMS-ANSP, May-July 1989; B&W, intermittently Aug.-Dec. 1984; R. V. Lansdown, Sept. 1986 (Lansdown 1989). **Remarks:** Gaya Bay, Kudat, and Sandakan were the key harbors of north Borneo beginning in colonial times (Daly 1888a). Sheldon and Marin A. (1985) reported a night heron roost along the Darau River, and Lansdown found an egret roost at Kuala Bakut. Likas Bay, immediately NE of Kota Kinabalu, is a convenient locality for watching shorebirds and waders, and it is now a bird sanctuary.

GAYA ISLAND (TUNKU ABDUL RAHMAN PARK, KOTA KINABALU). Gaya is the large island adjacent to Kota Kinabalu (6°01'N 116°02'E). T.A.R. Park encompasses most of Gaya Island and also includes the small islands W of Gaya: Sapi (6°03'N 116°00'E), Mamutik (5°58'N 116°00'E), Manukan (5°58'N 116°00'E), and Sulug (5°57'N 115°59'E). See Gaya Island (Semporna). **Elevation:** Sea level to 300 m. **Habitat:** Sandy and rocky beaches, beach strand, mangrove, nipa, and dipterocarp forests (Wells 1976). **Sources:** Marchesa Expedition, early June 1883 (Guillemard 1889); J. Whitehead, 28

Apr. - 8 May 1885 (Whitehead 1893); SM (H. Tsen), Feb. 1965 (Gore 1968); M.E.J. Gore, Jan. 1966 (Gore 1968); D. Yong, May ca. 1975 (Wells 1976); SP Survey, 13-15 Mar. 1975 (Wells et al. 1975, Wells 1976); YU 16-20 Nov. 1976; Phillipps family, Oct. 1981 (A.P. Lamb, pers. comm.); B. King and D. Yong (pers. comm.), 17-19 July 1983, 16 Aug. and 9 Sept. 1986; DMB, 1 Jan. 1985, 20-22 Feb. 1986, 14 and 19 Nov. 1990; F. H. Sheldon and R. Stuebing, 1 Aug. 1990; Stamm and Stamm, 9 June 2007 (Robson 2007); Bourhis et al. (2008) (Manukan), 13-14 November 2007; P. Olsson (Manukan), 1 Nov. 2010 (Robson 2010b); UMS, 28 June – 3 July 2013 (Sompud et al. 2013).

Remarks: First timber exports from North Borneo were cut on Gaya in 1878 (Ibbotson 2014: 51-55). Gaya Station was built by BNBC as administrative headquarters for the West Coast in 1881-2. It was abandoned in favour of Gantian and ultimately Jesselton after attack and sacking by rebel leader Mat Salleh on 11 July 1897 (BNBH 1 Aug. 1897, pp. 202-2033). Gaya Island was logged a few times in the 1900s to provide timber for the Jesselton sawmill (Ibbotson 2014:108-109). The Park was founded in 1974. **References:** Phillipps and Phillipps (2014: 328).

GOLDEN SPHERE SDN BHD. An oil palm plantation E of Lahad Datu near Silabukan (5°00'N 118°33'E). **Sources:** Koh and Gan (2007), 8 Sept. – 14 Oct. 2006. **Habitat:** Oil palm. **Remarks:** Koh and Gan (2007) surveyed birds and butterflies in the oil palm plantation.

GOMANTONG FR. A Class I FR of 3,297 ha surrounding the Gomantong VJR ca. 35 km S of Sandakan (5°31'N 118°04'E). **Habitat:** Regenerating dipterocarp forest, freshwater swamp forest, and peat swamp forest (most of the limestone forest is in Gomantong VJR, see below.) The dipterocarp forest was selectively logged in ca. 1970, extensively burned during the El Niño drought in 1983, and subsequently overgrown with scrub. Much of the forest beyond 5 km from the caves has been replaced with oil palm and cocoa (CMF). The BMNBE found undisturbed forest during their visit in 1956.

Remarks: The WFVZ collected along the Sukau Road, which travels E-W between the Sandakan-Lahad Datu highway and Sukau, passing close to the caves. In 1983, much of the forest along the road had been burned in preparation for oil palm planting, but there were still good stands of ca. 20-30 year old selectively logged lowland forest.

References: CAIMS (2005), Chasen (1931), Cranbrook et al. (2013), Phillipps and Phillipps (2014: 332), Stresemann (1931).

GOMANTONG (GOMANTON) CAVES AND RESERVE. A VJR of 1,816 ha within the Gomantong FR and location of Bukit Dulong Lambu, which contains Gomantong Cave (5°31'30"N 118°04'15"E). **Elevation:** Sea level to 229 m (Tangah and Wong 1995).

Habitat: The VJR is mostly virgin forest growing on limestone soil. **Sources:** W.B and H. Pryer, 19-22 Mar. 1884 (Pryer 1884); F.N. Chasen and C. B. Kloss, July 1929 (Chasen and Kloss 1930b); P. Orolfo, 24-27 July 1930 (FMNH); BMNBE, Apr. 1956; T. Harrison, 14 July 1964, 27 Apr. 1965 (Fogden 1965); WWFM, 21 Oct. - 2 Nov. 1979; WFVZ, Dec. 1982, 2- 5 Aug. 1983; CMF, 1982-1984; J.-M. Thiollay et al. (1983), July 1982; DMB, 15 Dec. 1984; D. Clayton, D. Tompkins, and T. Jones, various times 1994-1995 (Clayton et al. 1996, Lee et al. 1996, Tompkins 1999, Tompkins and Clayton 1999, Price et al. 2004); J.J. Hobbs, July and August 2001 (Hobbs 2004). **Remarks:** All four

swiftlet species nest in the caves. **References:** Daly (1888b), Burder (1961), and Lim and Cranbrook (2002).

GUM GUM FR. A reserve of ca. 67 ha ca. 30 km NW of Sandakan on the main road (5°53'30"N 117°55"E). See Labuk Road VJR and Kabili-Sepilok FR. **Elevation:** 10 m. **Habitat:** Originally, probably 1° and 2° lowland dipterocarp forest and scrub; now mainly experimental plantings of plantation species. **Sources:** ADG, Sept. 1963; WFFVZ, 31 July - 4 Aug. 1983; SWD, intermittently 1983-1985 (SWD). **Remarks:** Garcia collected at the Agricultural Research Station at mile 17 on the Sandakan Road. WFFVZ and SWD collected birds at various locations in the area of the Labuk Road VJR.

GUNUNG RARA FR. Formerly a large commercial FR in south-central Sabah, now subdivided by the Mt. Magdalena Class I FR. See Batu Timbang FR and Imbak River. **Elevation:** 180-300 m in low areas. **Habitat:** logged forest. **Sources:** H. Bernard and P. Diun, 17-26 Feb. 1997 (Bernard and Diun 1999).

IMBAK CANYON CONSERVATION AREA. A conservation area in the Imbak Canyon Class I FR just north of Maliau Basin (5°06'23"N 117°01'51"E) in south-central Sabah. The canyon is a ca. 25 km valley between two sandstone cliffs, each protected as part of the multisectional Sungai Imbak Class I FR. **Elevation:** ca. 200 m by the river, 800-900 m on the cliff tops. **Habitat:** 1° lowland to upland dipterocarp forest, 1° lower and upper montane kerangas forest, and shifting cultivation along rivers. **Sources:** RGM, June 2000. **Remarks:** This site differs from "Imbok River" at which the WFFVZ made a substantial collection (see next). However, early explorers, such as Pryer and Daly referred to the modern-day Imbak River as "Imbok River" (Daly 1888a, Mayne 1888).

IMBOK RIVER. A tributary of the Kuamut River formerly in the Gunung Rara FR and now in the Mt. Magdalena FR near the Imbok VJR, ca. 80 km NW of Tawau (4°54'N 117°19'E). **Elevation:** ca. 200 m. **Habitat:** 1° upland forest in 1982, now logged. **Sources:** WFFVZ, 11-26 July 1982. **Remarks:** Formerly in the North Borneo Timber Co. concession area. The WFFVZ collected a many 1° forest birds at this site, and labeled their specimens as from "Imbak River".

INOBONG (INOANG) SUBSTATION, CROCKER RANGE NATIONAL PARK. In the hills E of Penampang, ca. 14.5 km SSE of Kota Kinabalu (5°52'24"N 116°11'28"E). **Elevation:** 400 m. **Habitat:** Primary (in the Park) and secondary forest (in and around the Park). **Sources:** LSU, KU, and SM, 30 May – 1 June 2008. **Remarks:** LSU, KU, and SM collected a few birds just outside the Park in secondary forest.

JEROCO (JURUCO). Plantation area on the Dent Peninsula (ca. 5°23'N 118°27'E). **Source.** SM, Mar. 1988.

KABILI-SEPILOK FR. A VJR of 5,529 ha (Kabili-Sepilok 4,294 ha and Sepilok 1,235) located ca. 24 km W of Sandakan (5°47'-5°52'N, 117°55'-118°03'E). The headquarters and orangutan and sunbear rehabilitation centers are located at 5°51'53"N 117°56'56"E. **Elevation:** Sea level to 170 m. **Habitat:** The forest was logged in the 1920s, but in the

1930s it was turned into a reserve by Conservator of Forests Harry Keith against considerable opposition from BBT. 1° and 2° lowland dipterocarp forest, mangrove, kerangas, freshwater marsh, 2° forest and scrub, and in adjacent areas overgrown rubber and oil palm. **Sources:** Because of its accessibility and popularity, Sepilok and its birds have been surveyed formally and informally by many individuals and groups, e.g., B.J. Smith, 1974-1975 (de Silva 1981); B. King (pers. comm.), 27 Feb. - 1 Mar. 1977; WFVZ, intermittently 1981-83; DMB, Dec. 1984, Mar. 1986, 1989, and 1990; B. King and D. Yong (pers. comm.), July 1983, Aug.-Sept. 1986; B&W, 21-28 Sept., 25 Oct. - 11 Nov. 1984 (pers. comm.); J. Wall and D. Yong (pers. comm.), 24-27 July 1985. Formal surveys include: University of Malaya banding project, Feb. 1981 - Aug. 1983 (CMF and J. Spenser pers. comm.); WWFM survey, July 1979 - Nov. 1981 (Davies and Payne 1982, pers. comm.); J.-M. Thiollay et al. (1983), July 1982; C. Gönner, during 1990 (Gönner 1990); K. Ickes, during 2000 (K. Ickes, pers. comm.). **Remarks:** The mangrove on the edge of Kabili-Sepilok and encompassing the Kabili and Sepilok rivers constitutes a separate reserve, the Sepilok Mangrove VJR, and is contiguous with the Elopura Mangrove FR, which extends around Sandakan Bay and includes mangrove areas of some islands (Payne 1988b). An important feature of Sepilok is the Orangutan Rehabilitation Center, established on the N border of the reserve in 1964. The Sepilok Nature Education Center building, constructed at the Rehabilitation Center headquarters in 1980-81, used to house a small but fairly complete collection of Sabah's birds (which was subsequently moved to the Tawau Forest Department headquarters). Francis (1984) compiled a checklist of Sepilok's birds, and Payne (1988b) reviewed its history and wildlife. **References:** Fox (1973), de Silva (1981), and Phillipps and Phillipps (2014: 332).

KALABAKAN FR AND ENVIRONS. A commercial reserve NW of Tawau, which changed greatly in configuration after 2000. Now, much of the original area is called Kalabakan District Forest, and the Kalabakan FR is in the Serudong District Forest. Kalabakan town (4°24'40"N 117°29'30"E); Kalabakan Kalabakan River (4°21'N 117°32'E). The MCZ collected at the "mouth of the Kalabakan River". FMNH worked on the Marikut River (4°27'N 117°26'E) and at the mouth of the Tibas River, a small tributary of the Kalabakan (Davis 1962). MCT, Garcia, and Norman visited a variety of Kalabakan areas. One of MCT's more important sites was in 1° forest "12 miles" [19.3 km] N of Kalabakan base camp. This was the Mile 12 Camp (4°35'N 117°27'E), a satellite labor camp on the main road that eventually led to Luasong and the Kuamut River. At that time there was virgin forest N of Mile 12 camp. MCT and Garcia also collected along the Brantian River (4°25'N 117°35'E) and at Tiger Estate (probably near Tiger Hill, 4°25'N 117°49'E). MCT's group snared a Bornean Ground Cuckoo at his 1° forest site 20 km N of Kalabakan. See Brumas, Imbok River, Sabah Softwoods, and Tukok. **Elevation:** Sea level to 300 m. **Habitat:** 1°, 2°, and logged lowland and upland forest, and rubber and oil palm plantation. Until the 1970s, much of the upland 1° forest remained, although Inger and Gaun collected in some "logged dipterocarp forest." Nowadays, all of the lowland 1° forest is gone, as is most of the loggable highland forest. **Sources:** H.G. Deignan, June-Aug. 1937 (MCZ, Davis 1962); FMNH (R.F. Inger and Gaun anak Sureng), 2-28 June 1956 (Davis 1962, SRM); MMN, June 1961 - Feb. 1962; MCT, Oct.- Nov. 1962. **Remarks:** The original communities at Kalabakan were Tengara

Muruts who lived in long houses upstream of the present town at the junction with the Tigau River. There were also some Tidoengs from Dutch Kalimantan. Jungle trails connected Kalabakan to Serudong and the Sibuku River in Kalimantan. They also reached the Lunud longhouse on the Kuamut and thence to Batu Punggul, Sapulot, and the W interior. Via the Brantian River, a trail led into the Segama drainage. This area was visited by W.R. Flint and G.E. Hewett in 1890 (BNBH 1 Nov. 1890, p.350) on a punitive expedition (J.H. Molyneux, BNBH 16 Sept. 1904 pp224-225; M.W.H. Beech, 1 May 1907, pp. 89-90). Kalabakan was the base camp for the Bombay Burmah Trading Corporation Ltd operations established in 1953 to work the original 1000 sq. mile concession in the Kalabakan FR. The company became North Borneo Timbers in the 1970. Logs were exported from Wallace Bay on Sebatik Island. In the 1950-70s, this was the largest logging operation in Borneo and one of the first to use road haulage (Ibbotson 2014:337-347).

KALANGKAMAN. A village on Banggi Island (7°17'51"N 114°04'44"E). **Elevation:** 25 m. **Habitat:** Gardens and secondary forest. **Sources:** D.F. Gawin, 20-23 July 2010 (Gawin 2014).

KALLANG (KALLIANG) RIVER. Tenom district (5°20'N 115°24'E) (Stuebing 1991).

KALUMPANG. At the headwaters of the Pang Burong tributary of the Kalumpang River, near the Tawau-Semporna road junction (4°33'N 118°15'E). The WWFM surveyed an area called Ulu Kalumpang (4°36'N 117°56'E). Koh surveyed oil palm plantations of the Kelumpang Development Corporation (4°27'N 118°13'E). **Sources:** WWFM, Feb. 1982; CMF, Oct. 1984; L.P. Koh, Sept.-Oct. 2006, Mar.-Apr., May and June 2007 (Koh and Gan 2007, Koh 2008a, b). **Habitat:** 1° forest and limestone during the early surveys; now primarily oil palm plantation. **Remarks:** Kalumpang was part of logging concession of British Borneo Timber Company. Operations commenced in 1953 (Ibbotson 2014:317-336). A swiftlet nesting site called Batu Pang, with Edible-nest, Uniform and Glossy swiftlets, is found at Kalumpang.

KAPUR RIVER FOREST RESERVE. A VJR of 1,250 ha. in the NE end of Tabin Wildlife Reserve and adjacent to the Sungai Lasun and Pulau Evan Class I FR (5°19'N 118°56"E). **Habitat:** Originally freshwater swamp, kerangas, dipterocarp (dominated by *Dryobalanops beccarii*), and mangrove forest. However, the VJR was logged (illegally) in 1997.

KARAKIT FR. A forest reserve of 24 ha on the SW tip of Banggi Island (7°7'15"N 117°05'00"E). **Source:** M. A. Rahman and M. T. Abdullah (2002), 25-31 Jan. 2001. **Elevation:** Sea level to 91 m. **Habitat:** Heavily disturbed forest, much of it on limestone soil. **Remarks:** A limestone site occurs here, but it does not contain nesting swiftlets (L&K). Rahman and Abdullah (2002) netted and surveyed birds in the vicinity bat caves on steep limestone cliffs.

KARAMUAK RIVER. 5°17'N 117°13'E. See Kunatong. **Sources:** E.J.H. Berwick (Gore 1968). **Remarks:** British Borneo Exploration Company prospected for copper along this river and excavated two drifts in 1903-1904.

KAURAN RIVER. Near Keningau; ca. 5 km towards Tenom on the main road, then W to the base of the Crocker Range (5°19'N 116°08'E). **Elevation:** 850 m. **Habitat:** 2° forest adjacent to 1° forest. **Sources:** UKMS, Jan. 1991 (R. Stuebing, pers. comm.). **Remarks:** A road was built into a quarry at this site, permitting access, but the area was never heavily logged. UKM Bangi has a small collection from here.

KAWAG RIVER. In the Kawang Gibong FR at 5°05'N 117°59'E. **Elevation:** Ca. 350 m. **Habitat:** 1° upland forest. **Sources:** WWFM, 27 Mar. - 7 Apr. 1980.

KEDAMAIAN AND KEDAMAIAN RIVER. Kota Belud district (6°22'N 116°26'E; Stuebing 1991). See under Kinabalu Mountain.

KELABANGAN. A limestone site with nesting swiftlets in the Pinangah River FR (4°49'30"N 116°38'00"E).

KENINGAU. A large town on the E side of the Crocker Range (5°20'N 116°10'E). YU collected around the SAD catfish farm, ca. 3 km NE of town on the main road. DMB visited the nearby village of Bunsit (5°26'N 116°10'E), located on the Keningau-Tambunan road. See Lime Cave. **Elevation:** 300 m. **Habitat:** Upland and highland heath, woodland, grassy fields, cattle range, plantation, and scrub left by shifting agriculture. **Sources:** T. Harrisson, Feb. 1952 (SRM); Cambridge University Expedition, 2-3 Aug. 1956 (J. Boys notes); YU, 11 - 19 Dec. 1976.

KENINGAU CAVES. Swiftlet caves in the Keningau-Sapulut area that produce commercial nests are loosely referred to as "Keningau Caves" because their produce is often sold in Keningau (CMF). See Lian Cave, Pun Batu, Batu Punggul, and Sinuron Cave.

KIABAU AGRICULTURAL STATION. Along the Labuk River NE of Telupid (5°49'N 117°13'E). **Sources:** E.J.H. Berwick (SAD), Dec. 1961 (Gore 1968).

KIMANIS AND KIMANIS BAY AND RIVER. A town near the mouth of the Kimanis River on the coast SW of Kota Kinabalu between Membakut and Papar (5°37'N 115°53'E). Kimanis is often used loosely to refer to a wide area around the actual town, reaching from the Kimanis Bay (5°44'N 115°45'E) to Kg. Ulu Kimanis (5°34'N 115°57'E). The Paper-Beaufort highway crosses the Kimanis River at 5°37'21"N 115°53'58"E. **Elevation:** Sea level to 200 m. **Habitat:** Mangrove, mudflats, small islands, coastal scrub, freshwater swamp, swamp forest, and old rubber plantation. Currently, Kimanis is the site of Sabah's off-shore gas terminal and the starting point of a pipe line to Bintulu, Sarawak. **Sources:** Marchesa Expedition, first week in June 1883 (Guillemard 1885, 1889); DMB, intermittently 1958-62, Dec. 1984, 1-11 Jan. 1985, 20 Jan. - 9 Mar. 1986; KVT, intermittently 1950-60s (Smythies 1981; pers. comm.); WFFVZ,

intermittently 1981-1983; C. Byers and C. Robson (1992), 17 Feb. 1992. **Remarks:** DMB managed a rubber estate, "Kimanis Estate," S of the town. On this estate is the site of the first and only American colony in Borneo. It was established in 1865 by C. Lee Moses and abandoned after the death of the American entrepreneur Thomas Bradley Harris in 1866. Harris's grave marks the site, and DMB used to watch migrating birds from the grave.

KEMBAMBANGAN (KIMBAMBANGAN). A village in the Penampang District (5°52'46"N 116°08'40"E). **Elevation:** 160 m. **Habitat:** Gardens and secondary forest. **Sources:** D.F. Gawin, 6-8 July 2010 (Gawin 2014).

KINABALU (KINA BALU, KEENEY BALLOO) MOUNTAIN AND KINABALU NATIONAL PARK. Kinabalu (6°05'N 116°33'E) is SE Asia's highest mountain (4095 m), the most important biogeographic feature of Borneo, and the centerpiece of the 766 km² Kinabalu National Park. Ornithologically, Mt. Kinabalu is interesting because of its extensive high-elevation habitat and species. See Tambuyukon, Templer, and Madalon Mountains, which are part of Kinabalu Park but listed separately.

In the early years of 19th Century exploration, Kinabalu was considered to encompass not only the mountain but also lower elevation sites between it and the coast (Sharpe 1879c, Durand and Curtis 2014:53), so that specimens attributed to the mountain were not necessarily from it. Ornithology on the mountain itself was conducted mainly along the main access routes (described by Moulton 1915). The most important of these was the western approach via the Kadamaian River from Kota Belud to Kiau and then up the mountain (essentially) by the current path from Park headquarters. An alternative route to Mt. Kinabalu was by train from Beaufort to Tenom, overland (e.g., via horseback) to Keningau, Tambunan, Ranau, and Kundasang. Few expeditions took this southern route, but Harrisson did in 1952 (SRM). More recently the most common route has been from Kota Kinabalu to Tuaran to Tamparuli and along the path of the current highway, by 4-wheel drive before 1980 and by car thereafter.

Habitat: Kinabalu comprises a complex set of habitats depending on elevation, aspect, and soil (Fox 1972, Kitayama 1992, Beaman 1996, Corner 1996). In older literature, the habitat classification scheme of Gibbs (1914) was employed (e.g., Smith 1931 and Pendlebury and Chasen 1932): 2° forest resulting from shifting agriculture, ca. 750-1250 m; tall lower montane forest, ca. 1000-1850 m; "mossy forest," which is non-continuous, ca. 1550-2750 m; "serpentine scrub" ultramafic forest (e.g., at Marai Parai 1550 m); "low sheltered forest" ca. 2700-3250; and "subsummit dwarf" and "granite core" above ca. 3200 m. Nowadays Kitayama's (1992) classification based on plants and soil is more commonly used to designate forest elevations: lowland (<1200 m), lower montane (1200 to 2000-2300 m), upper montane (2000 to 2300-2800 m), and subalpine (2800 m to forest line).

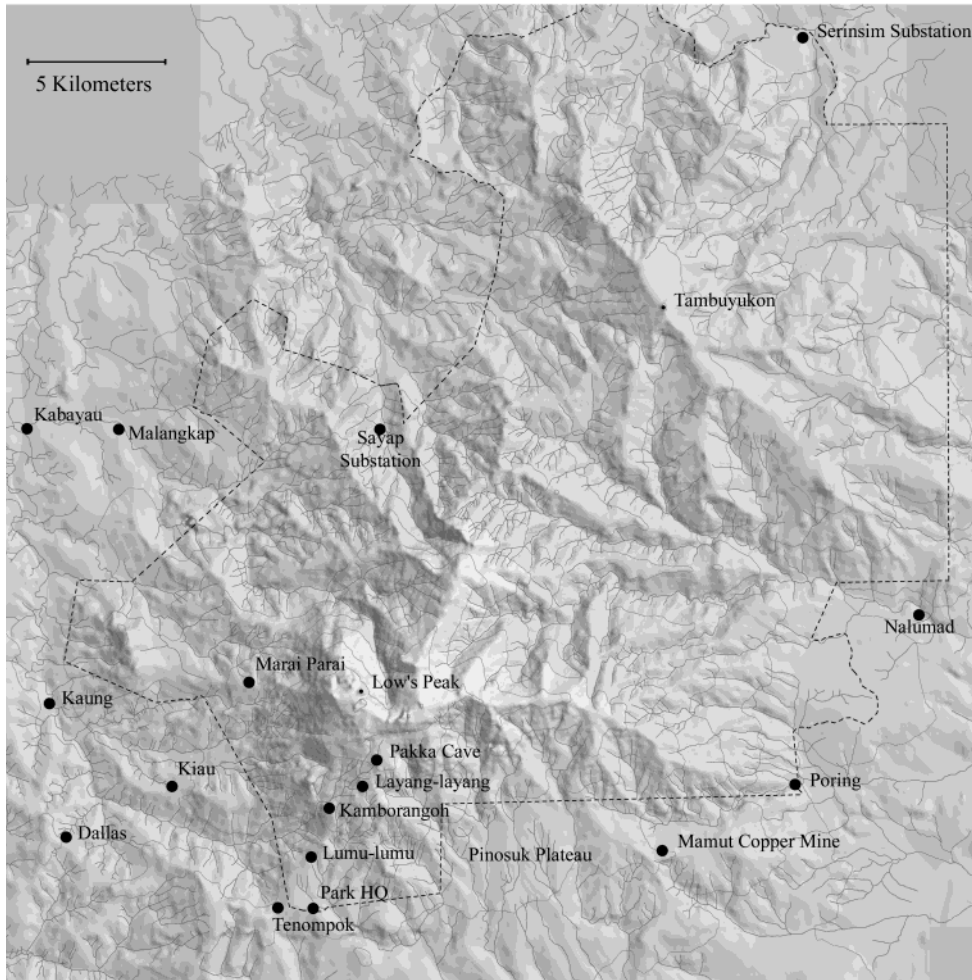
By the 19th century, shifting agriculture had removed 1° forest along the traditional access routes up to ca. 1000 m (Moulton 1915), but 1° forest persisted at Tenompok and in general above ca. 1200-1300 m into the 1930s (Gibbs 1914, Smith 1931, Fox 1972).

Since then, the lower montane forest has been degraded or destroyed at higher elevations in many areas (to ca. 1700 m on some of the W, S, and E slopes, but only 900-1000 m on some parts of the N slope). Among lower montane habitats destroyed within the last 40 years was the rich oak forest on the Pinosuk Plateau. Because of its relatively gentle slope and elevation, this area was excised ("de-gazetted") from the Park and developed into a resort area, temperate vegetable patches, tea plantation, etc. (Sheldon 1985a). As a result of such deforestation, some historical lower elevation 1° forest bird ranges from Kinabalu no longer apply. On 5 June 2015, shaking caused by the 6.0 moment magnitude earthquake, with its epicenter close to Mt. Kinabalu, caused massive landslides that resulted in significant loss of forest cover on many of mountain's the steeper slopes.

General References: Sharpe (1879c), Kloss (1931c, b), Smith (1931), Corner (1964), Smythies (1964a, 1978), MAPS, Jenkins (1978), Jenkins and de Silva (1978), Davison (1992), Jenkins et al. (1996), Wong and Phillipps (1996), and Harris et al. (2012). Phillipps and Phillipps (2014: 330) provide information on individual sites in the Park. Merckx et al. (2015) offered a general view of the evolution of endemism on Mt. Kinabalu, but largely excluding birds. Sheldon et al. (2015) described sources of endemism on Mt. Kinabalu and elsewhere in the mountains of Borneo.

Sources: W.H. Treacher, late 1870s (Sharpe 1879c); F.W. Burbidge, Dec. 1877, Aug. 1878 (Sharpe 1879c, Burbidge 1880 [reprinted in 1998]); J. Whitehead, Feb.-May 1887, Jan.-Mar. 1888, (Sharpe 1887a, b, 1889a, b, c, d, e, 1890a, b, c, Whitehead 1893); C.D. Haviland, Mar.-Apr. 1892 (Stapf 1894, BMNH); A.H. Everett, Nov. 1892, Feb. 1893, Jan. 1894 (Sharpe 1893, 1894, BMNH, ANSP, FMNH); F.S. Bourns and D.C. Worcester, 15 Mar. - 7 Apr. 1893 (Smythies 1960, Jenkins 1978, USNM); J.B. Bell, Sept.-Oct. 1896 (ANSP and FMNH); R. Hanitsch, 18-25 Mar. 1899 (Hanitsch 1900); J. Waterstraat, Nov. 1899 - Jan. 1900, July 1903, June 1909 (Blasius 1901; Jenkins 1978, AMNH, BMNH, FMNH); G.H. Goss and H.D. Dodge, Apr.-May 1904 (Richmond 1905, USNM); J.C. Moulton, Aug.-Sept. 1913 (Moulton 1913, 1915, SRM); T. Harrisson, Feb. 1952 (Harrisson 1955b, 1964), Dec. 1964 (Fogden 1965); W. Corris, Aug. 1964 (Fogden 1965); SM, Feb. 1970, Sept. 1978; University of Aberdeen Expedition, July - Sept. 1981 (Prentice and Eddie 1981; A. Phillipps, pers. comm.); J.-M. Thiollay et al. (1983), July 1982; UKMS, June 1986; S. Goodman, Apr. 1988 (Goodman 1989); C. Robson, 27 Jan. 1992 (Robson 1992); F. D. Steinheimer (1999), 16-17 Feb. 1997; A. Biun and Park staff periodically 1990s-2015 (Biun 1999); 24 Mar.-2 Apr. 2001 (Parr et al. 2002); LSU, KU, SP, and UNIMAS, 8-11 Aug. 2004, 24-28 Feb. 2005, 20-25 June 2008, (Haines 2007, Moyle et al. 2008, Moyle et al. 2009, Sheldon et al. 2009a); A.J. Boyce, Feb.-June 2009-2011, and J.B.C. Harris, March-April 2010 (Harris et al. 2012); Univ. Montana team, nesting seasons (ca. Feb-June) 2009-2014 (Harris et al. 2012, Martin et al. 2013, Boyce et al. 2015, Martin 2015, Martin et al. 2015a, Martin et al. 2015b).

Figure 3: Map of key sites in Kinabalu National Park (©Reed S. Beaman and John R. Beaman).



Principal sites on Mt. Kinabalu

Map coordinates are mainly from Beaman and Regalado (1989) and Beaman et al. (1996). Dusun spellings of site names from Beaman et al. (1996) are noted in parentheses.

Bukit Tupai. 6°00'N 116°32'E. See Lumu-lumu.

Bundu Tuhau. A village ca. 2 km S of Kinabalu Park headquarters (5°59'N 116°32'E). **Elevation:** Ca. 1250 m. **Sources:** Mengga, June 1925 (Enriquez 1927, RM); J.A. Griswold (MCZ), June 1937; D.H. Johnson, June-July 1951 (USNM); T. Harrison, Jan. 1952 (SRM).

Carson's Camp. On the summit trail (6°03'N 116°33'E). **Elevation:** 2750 m. **Sources:** Q. and J. Phillipps, Feb.-Mar. 1969 (Phillipps and Phillipps 1970); DMB, Nov. 1980. **Remarks:** The Phillipps' were banding for the MAPS program during their visit.

Dallas. On the ridge between Tenompok Pass and Kaung (6°02'N 116°28'E). **Elevation:** Ca. 950 m. **Sources:** Mengga, June 1925 (Enriquez 1927, RM); T. Harrison, Jan. 1952 (SRM).

East Ridge. The summit approach from Poring (6°03'-6°05'N, 116°36'-116°42'E). **Elevation:** 1000-3250 m. **Sources:** B.E. Smythies (Royal Society), 4-24 July 1961 (Smythies 1964b). **Remarks:** This site is arbitrarily separated from Poring at ca. 1000 m. **References:** Corner (1964).

Kabayau (Kebayau). On the Kedamaian River near Kuala Penataran (Pangataran, Pengantaran), ca. 12-14 km S of Kota Belud (6°12'N 116°28'E). **Elevation:** Ca. 200 m. **Habitat:** Mainly 2° upland forest and scrub. Smith (1931) and Pendlebury and Chasen (1932) describe the area as 2° forest with some patches of 1° forest left on isolated peaks. **Sources:** F.N. Chasen, May 1929 (Pendlebury and Chasen 1932, RM); V.W. Ryves, 5 Feb. 1939 (Gibson-Hill 1949). **Remarks:** Kabayau was a rest-stop on the Kota Belud route to Mt. Kinabalu (Moulton 1915).

Kamborangoh (Kemburongoh). On the main route up the mountain from Park headquarters (6°02'N 116°33'E). **Elevation:** Ca. 2220 m. **Habitat:** "Mossy forest" similar to the next lower site, Lumu Lumu, but shorter and scrubbier (Smith 1931). **Sources:** J. Whitehead, 31 Jan. - 3 Mar. 1888 (Sharpe 1889a-d, 1890a-c, Whitehead 1893); F.N. Chasen, Apr. 1929 (Pendlebury and Chasen 1932, RM); D.H. Johnson, July 1951 (USNM); B.E. Smythies, 5-10 Mar. 1959 (Smythies 1959); J. and Q. Phillipps, Feb.-Mar. 1970 (Phillipps and Phillipps 1970); A. Biun and Park staff, 1996 (Biun 1999). **Remarks:** Whitehead collected his first Golden-naped Barbet (*Megalaima pulcherrima*), Friendly Bush Warbler (*Locustella accentor*), Bornean Stubtail (*Urosphena whiteheadi*), and Mountain Black-eye (*Chlorocharis emiliae*) at this site. The Phillipps banded birds for MAPS on their visit.

Kandis Shelter. **Elevation:** Ca. 2000 m. **Sources:** Kimura et al. (2001), July 1996-June 1997.

Kaung. Ca. 5 km downstream from the confluence of the Kinataki and Kadamaian Rivers (6°05'N 116°28'E). **Elevation:** Ca. 400 m. **Habitat:** Some 1° upland and highland forest in gullies and ridges, but mainly 2° growth (Smith 1931). **Sources:** F.N. Chasen, Apr. 1929 (Pendlebury and Chasen 1932, RM); V.W. Ryves, Feb. 1939 (Gibson-Hill 1949, 1952, RM); D.H. Johnson, June 1951 (USNM); T. Harrison, Jan. 1952 (SRM). **Remarks:** An alternative spelling is Koung.

Kenakok. A valley leading to Marai Parai on the W slope of Kinabalu at the headwaters of the Kinataki River (ca. 6°04'N 116°30'E). **Elevation:** 1000-1100 m. **Habitat:** 1° lower montane forest. **Sources:** J. Whitehead, 12 Mar. - 9 Apr. 1888 (Sharpe 1889a-d, 1890a-c, Whitehead 1893); A.H. Everett, Nov. 1892 (Sharpe 1893, ANSP); F.N. Chasen, Apr. 1929 (Pendlebury and Chasen 1932, RM); J.A. Griswold (MCZ), June 1937. **Remarks:** An alternative spelling is Penokok. Approached from Kiau by following the Kinataki rather than Kadamaian River. Whitehead collected his first Whitehead's Trogon (*Harpactes whiteheadi*) at this site.

Kiau. SW of Kinabalu peak (6°02'N 116°30'E). **Elevation:** Ca. 925 m. **Habitat:** Mainly 2° lower montane forest (even in the early days), but with 1° forest on ridges (Smith 1931, Pendlebury and Chasen 1932). **Sources:** J. Whitehead, 22-25 Jan., 4-5, 10-12 Mar., 9-10 Apr. 1888 (Sharpe 1889a-d, 1890a-c, Whitehead 1893); F.N. Chasen, Mar.-Apr. 1929 (Pendlebury and Chasen 1932, RM); V.W. Ryves, 17 Jan. - 7 Apr. 1939 (Gibson-Hill 1949, 1952, RM). **Remarks:** Sometimes called Kiaw in old literature (e.g., Mayne 1888).

Kiau Gap View. A viewpoint on the road from Park HQ to the Power Station (6°01'22"N 116°32'31"E). **Elevation:** 1750 m.

Kundasang. Ca. 4 km S from Park Headquarters on the road to Ranau (5°59'N 116°34'E). Includes the very small Sosopodon Class I Forest. **Elevation:** Ca. 1300-1600 m. **Habitat:** Much of the country around 1200-1550 m was 1° forest during the 1950s and 1960s (KVT). Now it is mostly cleared. **Sources:** B.E. Smythies, 24 Feb. - 2 Mar., 10-13 Mar. 1959 (Smythies 1959); KVT, intermittently 1955-1965; Q. Phillipps, Mar. 1969 (Phillipps 1970); T. Miyamoto, 14-16 Aug. 1969 (Miyamoto 1971); WFVZ, intermittently 1981-83; DMB, 9-12 Dec. 1984, 15-18 Nov. 1990; J. Eaton, 13 May 2009 (Robson 2009b). **Remarks:** Kundasang is on the south route to the mountain. Virtually all Kundasang records derive from the last 60 years.

Laban Rata. Site of the modern rest facilities on the summit trail (6°03'52"N 116°33'97"E). **Elevation:** 3270 m. **Sources:** P. Hosner (LSU), 24-29 Feb. 2005 (Sheldon et al. 2009).

Layang-layang. A site on the main trail. (6°03'N 116°33'E). **Elevation:** 2600 m. **Habitat:** Upper montane forest, moss forest, and ultramafic forest. **Sources:** A. Biun and Park staff, 1996 (Biun 1999); D.F. Gawin (UNIMAS), 5 June 2004 to 7 July 2004, and M.F.S. Ramji (UNIMAS), 13-26 February 2008 (Ramji 2010, Ramji et al. 2012, Gawin et al. 2014).

Liwagu River. The main river flowing from SE of Park headquarters through Ranau (6°02'N 116°32'E). **Sources:** T. Harrison, 9 Dec. 1964 (Fogden 1965). **Remarks:** Harrison recorded Sabah's first Asian House Martin about 1000 m above Ranau.

Lobang (Lubang). A large overhanging rock on the left bank of the Kadamaian River upstream from Kiau (6°02'N 116°32'E). **Elevation:** 1200-1450 m. **Habitat:** "Heavy jungle" (Smith 1931). **Sources:** J. Whitehead, 25-31 Jan. 1888 (Sharpe 1889a-d, 1890a-c, Whitehead 1893); C.D. Haviland, Mar. 1892 (Stapf 1894, Moulton 1915); F.N. Chasen, Apr. 1929 (Pendlebury and Chasen 1932, RM).

Lumu-lumu (Park Headquarters, Park HQ). Formerly an important camp on the main mountain spur below Kamborangoh. It is presumed to be near the Park Headquarters (6°00'N 116°32'E). Beaman et al. (1996) placed it at the power station (6°01'N 116°32'E). **Elevation:** 1400-1750 m. **Habitat:** "Tall 1° mossy forest" (Pendlebury and Chasen 1931, Smith 1931). The area is still 1° forest with scrub along roads and in developed sections. **Sources:** F.N. Chasen, Apr. 1929 (Pendlebury and Chasen 1932, RM); J.A. Griswold (MCZ), June-Aug.; D.H. Johnson, July 1951 (USNM); T. Harrison, Dec. 1964 (Fogden 1965); Q. Phillipps, Aug. 1970, and Q. and J. Phillipps, Feb. and Mar. 1970 (Phillipps and Phillipps 1970); B. King (pers. comm.), 1-4 Mar. 1977, 2 and 4-7 Mar. 1982; W.F.V.Z., intermittently 1981-83; J.C. and M.G. Pearson, 18-22 Mar. 1981 (pers. comm.); B. King and D. Yong (pers. comm.), July 1983, Aug. and Sept. 1986, July and Aug. 1988, and July 1989; DMB, intermittently 1984-1990; A. Whittaker, Nov. 1984 (pers. comm.); F. Lambert, July 1985 (Robson 1985); S. Goodman, Apr. 1988 (Goodman 1989); A. Biun and Park staff, 1996 (Biun 1999); C. Robson and C. Scott, 13 April 1996 (Robson 1996); Kimura et al. (2001), July 1996-June 1997; RGM, 18-29 May 1999; D. Bakewell, 24 Oct. 2008 (Robson 2009b). **Remarks:** Bukit Tupai is located near the headquarters. **References:** Phillipps (1986).

Malangkap (Melangkap). In the W foothills of Mt. Kinabalu along the Penataran River (6°09'N, 116°30'E). See Sayap. **Elevation:** The village is at ca. 400 m. **Habitat:** 1° and 2° highland and lower montane forest, including coniferous and serpentine scrub forest. **Sources:** J. Whitehead, 9 Feb. - 7 Apr. 1887; 6-20 Jan., 10 Apr. - 23 May 1888 (Sharpe 1887a, 1889a-d, 1890a-c, Whitehead 1893); A.H. Everett, during 1893 (Sharpe 1893). **Remarks:** Whitehead used this site as a base of operations for his two trips to Kinabalu. From mid-Feb. to mid-Mar. 1887, Whitehead camped above Malangkap at ca. 1000 m and surveyed up to ca. 1500 m. From the camp at 1000 m he collected the first Fruithunter (*Chlamydochaera jefferyi*) and Whitehead's Spiderhunter (*Arachnothera juliae*).

Mamut River. 6°03'N 116°28'E (Stuebing 1991).

Marai-Parai. At the headwaters of the Kinataki River above Kenokok on the W side of the mountain (6°05'N 116°31'E). It is accessed via the Kenokok Valley. **Elevation:** 1550 m. **Habitat:** Forest on ultramafic soil from disintegrating serpentine, as well as more typical 1° montane forest. **Sources:** F.N. Chasen, May 1929 (Pendlebury and Chasen 1932, RM); A. Phillipps, 13 Feb. 1985 (Phillipps 1985b).

Mesilau River. 5°58'N 116°37'E. See Pinosuk Plateau.

Mokodou River (Mekedeu). A river in the E foothills of Mt. Kinabalu and N of Poring (ca. 6°07'N 116°40'E). **Habitat:** 2° forest. **Sources:** SM, Nov. 1976.

Nalumad. On the E side of Mt. Kinabalu NW of Poring. The village is located at 6°06'N 116°44'E, the river at ca. 6°07'E 116°42'E (Beaman et al. 1996). **Elevation:** 750 m. **Sources:** D. Jenkins, 1975 (Jenkins and de Silva 1978). **Remarks:** Cited by Jenkins and de Silva (1978) as a location where a small collection was made in 1975.

Pakka Cave (Paka or Paka-paka Cave). Slightly to the W of the main modern route up the mountain, where a large rock overhangs on the left bank of the Kadamaian River (6°03'N 116°34'E). See Panar Laban. **Elevation:** Ca. 3150 m. **Habitat:** Dense subalpine forest; largely leptospermum scrub. **Sources:** J. Whitehead, 10 Feb. 1888 (Whitehead 1893, Moulton 1915); A.H. Everett, Nov. 1892 (BMNH); J.A. Griswold (MCZ), 4 Aug. 1937; D.H. Johnson, July 1951 (USNM); T. Harrisson, Feb. 1952 (Harrisson 1964, SRM); B.E. Smythies, 5-10 Mar. 1959 (Smythies 1959); W. Corris, 22 Aug. 1964 (Fogden 1965); A. Biun and Park Staff, 1996 (Biun 1999); Kimura et al. (2001), July 1996-June 1997.

Panar Laban. Site of the main summit resthouses at the base of the rock face (6°04'N 116°34'E). **Sources:** J. Whitehead, 11 Feb. 1888 (Whitehead 1893). **Elevation:** 3350-3700 m. **Remarks:** On Feb. 11th, Whitehead climbed from Pakka Cave to the peak and then returned to Kamborangoh. The only birds he found on the summit rock face were Sunda Bush Warblers (*Horornis vulcanius*) and Mountain Black-eyes.

Park Headquarters (Park HQ). See Lumu Lumu.

Pinosuk Plateau. At the headwaters of the Bambang and Mesilau Rivers above Kundasang and E of Park headquarters (6°01'N 116°36'E). **Elevation:** Ca. 1500 m. **Habitat:** The Pinosuk Plateau was well-known among botanists for its extremely rich oak forest, which was cleared in the 1970s and early 1980s. **Sources:** Medway [Cranbrook] (University of Malaya and Royal Society), Feb.-May 1964 (Gore 1964, Fogden 1965, Cranbrook, pers. comm., University of Malaya specimen data). **Remarks:** The 1964 Royal Society Expedition began in Jan. 1964, and Cranbrook collected and banded birds at a camp between the main forks of the Mesilau River (5°58'N 116°37'E) on 5 Feb. Other Royal Society collections were made along the "Kelangkaan" (site unknown) and at Poring. Banding data are reported in McClure and Leelavit (1972). Pinosuk habitat destruction is described by Sheldon (1985a).

Power Station. At the end of the Park Headquarter's road (6°01'N 116°32'E). See Lumu-lumu. **Elevation:** 1750 m.

Sayat-sayat. Site of the rock face rest huts (6°04'N 116°34'E). **Elevation:** 3750 m. **Sources:** J. Griswold (MCZ), Aug. 1937.

Tenompok and Tenompok Pass. Ca. 2 km W of Park headquarters on the main road, where the road to Bundu Tuhan turns off (6°00'15"N 116°31'45"E). **Elevation:** 1520 m. **Habitat:** "A patch of 1° forest" in 1929 (Smith 1931), which is now cut. **Sources:** Mengga, June 1925 (Enriques 1927, RM); D.H. Johnson, July 1951 (USNM); T. Harrisson, Feb. 1952 (Harrisson 1955a); B.E. Smythies, 24 Feb. - 2 Mar., 10-13 Mar. 1959 (1959); KVT, intermittently 1960s. **Remarks:** This has been a good site to find night-flying migrants attracted to lights (Jenkins and deSilva 1978).

Villosa Shelter. **Elevation:** 2900 m. **Sources:** Kimura et al. (2001), July 1996-June 1997.

KINABALU NATIONAL PARK MESILAU RESORT. Above the Pinosuk Plateau (6°02'30"N 116°35'50"E). **Elevation:** 1900 m. **Sources:** C. Lee, 11 Sept. 2009 (Robson 2010a). **References:** Phillipps and Phillipps (2014: 330).

KINABATANGAN RIVER. Kinabatangan applies specifically to the section of river running from Kuamut (5°13'N 117°30'E) to Kuala Kinabatangan Besar (5°38'N 118°36'E) and Kuala Kinabatangan Kecil (5°41'N 118°34'E). At Kuamut, the Kinabatangan is formed by the confluence of the Kuamut and Milian Rivers. The Lower Kinabatangan Wildlife Sanctuary is a popular ecotourist destination comprising ca. 27,800 ha. of 2° flood plain forest. See Gomantong FR, Karamuak River, Kretam FR, Kuamut River, Langut River, Milian River, Menanggul River, and Segaliud-Lokan FR.

General Observations: The Kinabatangan played a key role in natural history exploration of Sabah by providing access to deep interior forest before the development of roads. Because little information is available on specific collecting sites along the river, and much collecting occurred during boat trips, the general characteristics of the Kinabatangan River are described here rather than for each site. **Elevation:** Sea level to ca. 50 m, depending upon adjacent terrain. **Habitat:** Originally, 1° riparian, dipterocarp, seasonally flooded, and freshwater swamp forests inland and nipa palm and mangroves along the coast. Nowadays, virtually all adjacent forest has been logged or cleared at least once, except in a few reserves (see figs. 2 and 3 in Estes et al. 2012). Along the river in the Wildlife Sanctuary's the forest is full of fruiting trees, which attract large mammal and frugivorous birds (most notably hornbills). At the lower end of the river are extensive mangroves, freshwater swamp forests, reed swamps, and oxbow lakes. The swiftlet cave sites have forest growing on limestone (e.g., Gomanton, Keruak, and Panggi). **References:** Payne (1989b), Scott (1989), Davison (1998), Boonratana (2003), Ancrenaz et al. (2004), Matsuda et al. (2014), Mohamed et al. (2003), and Phillipps and Phillipps (2014: 332).

General Sources and Collection Sites: An important early Kinabatangan expedition, which reported on swiftlet nesting sites among other things, was by D. D. Daly, Aug.-Sept. 1884 (Daly 1888a,b). Kinabatangan" collections include: C.F. Adams between May 1887 - Feb. 1888 (Elliot 1890, 1891); A.H. Everett in Jan. 1892 (Sharpe 1893); J.B. Bell in June 1895 (ANSP); and "Tubb" recorded birds [in the 1950s?] during a trip up to Lamag (Smythies 1960, Fogden 1965). Barbara Harrisson (wife of the Sarawak Museum curator, Tom Harrisson) recorded birds while travelling from Abai to Pintasan Station, 17 May - 3 June 1965 (Fogden 1965). The WFVZ recorded birds on a trip from Bukit Garam to Kuala Malubuk, 9-10 Aug. 1983.

Among important Kinabatangan sites are edible-nest swiftlet caves (CMF). The anthropology of these caves (including nest collection) was described by Harrisson and Harrisson (1971). Since the 1990s, the development of ecotourist facilities along lower sections of the Kinabatangan has increased bird sightings, including of such high profile species as Bornean Ground Cuckoo and Giant Pitta (*Hydrornis caeruleus*).

Principal sites on the Kinabatangan

Abai. Near the mouth of the Kinabatangan River (5°47'N 118°25'E). **Habitat:** Mangroves. **Sources:** H.G. Deignan (MCZ), summer 1937; DMB, 21 Mar. 1990; R. Boonratana (2003), 1990-1991.

Baladut. A solitary hill ca. 10 km up the Kinabatangan River from Bilit, not far from the Baladut River (5°26'30"N 118°08'00"E). **Remarks:** A poorly known cave site where edible-nests were at one time harvested (CMF).

Batu Batangan. A long, low hill ca. 17 km up the Kinabatangan River from Bilit (5°27'40"N 118°06'E). **Remarks:** A cave site where nesting swiftlets have been reported, but for which no records are available (CMF).

Batu Putih (Batu Puteh). A village (5°25'17"N 117°56'33"E) and the site where the highway bridge (and previously a ferry) crosses the Kinabatangan (5°24'26"N 117°57'03"E). **Source:** WFVZ, 3-7 Feb. 1982. **Remarks:** Actually there are three villages in the area called "Batu Putih": Kg. Mengaris, Kg.

Batu Putih, and Kg. Perpaduan. Lim and Kiew (1997) noted that the limestone outcrop near Batu Putih is properly called Batu Tulug (5°25'45"N 117°56'30"E). Batu Supu is also nearby. Ca. 1890-1910, Batu Putih was the site of a tobacco estate.

Batu Supu. A limestone site (Bukit Supu) within the Pin-Supu VJR on the N bank between the Kinabatangan River bridge and Bukit Garam (5°29'00"N 117°55'15"E). See Butong, Bukit Garam, and Pin-Supu FR. **Remarks:** A site with several caves and all four swiftlet species nesting (CMF). This may be Chuko Besar and Butong Caves mentioned by Daly from his visit in Aug. 1884 (1888a,b).

Batu Tulug. A limestone site near Pin-Supu VJR on the N bank of the Kinabatangan River (5°25'45"N 117°56'30"E). See Pin-Supu FR. **Remarks:** An important archaeological grave site. No commercial swiftlet nests (L&K).

Bilit. A village and Kinabatangan River launching site for the Lower Kinabatangan Wildlife Reserve, up-river from Sukau (5°29'51"N 118°12'28"E).

Bod Tai Cave. A low limestone hill located in the Bod Tai VJR along the Menanggul River ca. 10 km (as the river winds) from Sukau (5°31'45"N 118°13'00"E). **Remarks:** The site of several caves where Edible-nest Swiftlet nests. **References:** (CMF).

Bod Tai FR. A VJR of 1,816 ha along the Menanggul River (5°31'45"N 118°13'00"E). See Bod Tai Cave. **Habitat:** Heavily disturbed dipterocarp, freshwater swamp, and limestone forest. **Remarks:** A road between the Sukau Rd. and Kg. Bilit passes through the reserve.

Bukit Belanda. A VJR just N of Bilit (5°30'16"N 118°12'03"E).

Bukit Garam. A town 15 km W of the Kinabatangan bridge (5°29'25"N 117°50'00"E). See Butong, Batu Supu, and Pin-Supu FR. **Habitat:** Lowland dipterocarp forest logged as part of BBT concession 1950-70; swamp, and fire-damaged forests (Davison 1998). Now mostly oil palm. **Sources:** J.C. and M.G. Pearson, 30 Mar. - 3 Apr. 1981 (pers. comm.); R. V. Lansdown, Sept. 1986 (Lansdown 1989). **Remarks:** Lansdown surveyed several sites near Bukit Garam: the Butong area; Tg. Bulat, a large oxbow-lake adjacent to and joined by the Bulat River across the Kinabatangan from Bukit Garam; and at Danau Labaung, a lake at the head of the Labaung River W of the town. See map 3 in Payne (1989b).

Butong. Lakes and caves east of Bukit Garam in the Pin-Supu FR (5°29'N 117°48'E). **Sources:** Daly (1888b), Sept. 1884; R. V. Lansdown, Sept. 1986 (Lansdown 1989). See Batu Supu, Bukit Garam and Pin-Supu FR. **Remarks:** The supposed location Butong Caves, which were mentioned by Daly and which features in a local legend, is an entirely flat swamp. It is about 3 km NW of the Supu caves (J. Payne pers. comm.). Lansdown surveyed the surrounding area, including Kuala Butong to Kuala Lokan on the W side of Bukit Garam. He found egret roosts at the following sites: Danau Butong, one of a series of small peaty lakes at the head of the Butong River. This area is nicely presented in map 3 of Payn (1989b).

Deramakot FR. A forest reserve of 55,083 ha on the N side of the Kinabatangan River toward central Sabah (5°13-28'N 117°19-35'E). The Forestry Department headquarters are at 5°26'N 117°20'E and its river headquarters are at 5°19'N 117°36'E. **Elevation:** 30-330 m. **Habitat:** Mainly 1° forest when visited by FMNH. The area has been now been logged, but with the help of sustainable management since 1997 the forest looks relatively good. **Sources:** FMNH, 22 Apr. - 18 May 1956 (Inger 1956, Davis 1962, SRM); Samejima et al. (2012), Feb. 2008-Sept. 2009. **Remarks:** Daly (1988a) referred to the village as "Dalimarkot". The FR was part of the United Timbers concession and logged from 1956 through 1987. Now, it is operated with sustainable forest management aims as a dipterocarp rehabilitation project managed by the Sabah Forestry Department (2005). Modern accommodations and facilities make this a good potential site for bird research. The FMNH expedition was principally

ichthyological and herpetological, but birds were also collected by Gaun anak Sureng of SRM (Smythies 1960, R.F. Inger, pers. comm.). **References:** Lagan et al. (2007).

Keruak (Cave). A low hill on the N bank of the Kinabatangan River in the Keruak VJR (5°31'30"N 118°17'00"E). **Remarks:** The site of three swiftlet caves, with nesting Edible-nest and Glossy swiftlets (CMF).

Keruak FR. A VJR of 225 ha adjacent to Sukau on the lower Kinabatangan (5°31'45"N 118°17'15"E). See Keruak Cave. **Habitat:** Mostly regenerating swamp forest and limestone. **Remarks:** Location of Keruak Cave, a commercial swiftlet nest site.

Kinabatangan Jungle Camp. An ecotourist lodge a few km downstream from Bilit run by noted bird-guide Robert Chong (5°28'40"N 118°13'22"E). **Sources:** W. Duckworth, 20 Oct. 2008 (Robson 2009a).

Lamag. Site of a tobacco estate and District Office on the Kinabatangan River (5°29'N 117°49'E). **Elevation:** Up to 150 m. **Habitat:** Graydon was stationed at Lamag Estate, and he described the area as "dense impenetrable jungle, some few thousand acres of which have been felled for planting purposes" (Sharpe and Chubb 1909:137). **Sources:** P.N. Graydon, Sept. 1901 - May 1902 (Sharpe and Chubb 1909); ADG, Oct. 1963 (MCT, SM); M.E.J. Gore, June 1965 (Gore 1968).

Malua River. A tributary of the Kinabatangan River (5°18'N 117°37'E). **Sources:** ADG, date undetermined.

Melapi (Malapi): On the S shore near the junction of the Menanggul River and now part of Kg. Sukau (5°29'38"N 118°17'09"E). See Proboscis Lodge. **Remarks:** D.D. Daly (1888a) visited Melapi in Aug. 1884, noting it was a depot for Edible-nest Swiftlet nests from Gomantong being shipped down river.

Pangi FR. A VJR of 439 ha (5°31'45"N 118°17'15"E). **Remarks:** This site features Bukit Temanggong Besar, an irregular low limestone hill on the S bank of the Kinabatangan (5°32'15"N 118°18'30"E). It has many swiftlet caves, with all four swiftlet species nesting (CMF). The forest is mostly logged.

Pin-Supu FR. A VJR, 4,696 ha, consisting of three blocks located N of the Kinabatangan River at Batu Putih and the river bridge. See Butong, Batu Tulug (5°25'45"N 117°56'30"E), and Batu Supu (5°29'00"N 117°55'15"E). **Habitat:** Degraded dipterocarp, swamp, and limestone forest. **Remarks:** Contains Batu Supu, a commercial swiftlet-nest site.

Pintasan Agricultural Station. On the Kinabatangan River (5°26'N 117°42'E). **Elevation:** 10 m. See Segaliud-Lokan FR. **Sources:** ADG, 11 and 17 Oct. 1963.

Proboscis Lodge. A Kinabatangan ecotourist lodge at Bukit Melapi (Malapi) (5°29'38"N 118°17'09"E).

Sukau. A village on the lower Kinabatangan River (5°32'N 118°17'E). See Menanggul River. **Sources:** DMB, Mar. 1989; Boonratana (2003), 1990-1991. **Habitat:** Freshwater swamp and riparian forests. **Remarks:** Sukau is the location of several ecotourist lodges, such as the Sukau Rainforest Lodge (5°29'52"N 118°16'48"E).

Tenegang River. A tributary on the S shore of the Kinabatangan River near Sukau (5°27'59"N 118°15'11"E). See Sukau.

LOWER KINABATANGAN WILDLIFE SANCTUARY. Protected forest of ca. 27,800 ha. along the lower Kinabatangan River flood plain. See Kinabatangan River.

KINARUT (KEENAROOT). 12 km SSW of Kota Kinabalu on the coast (5°49'N 116°01'E). See Dinawan Island. **Elevation:** Sea level. **Habitat:** Beach, mangrove, and coastal scrub. **Sources:** UKMS, Oct. 1986; UKMS-ANSP May-July 1989; WFFVZ, intermittently from 1981-83; SM, June 1983.

KIULU. 6°04'N 116°17'E (Stuebing 1991). **Elevation:** 300-500 m. **Habitat:** 2° forest and old rubber plantations.

KLIAS ESTATE. At Kg. Sungei Klias (5°23'N 115°45'E). **Elevation:** Sea level. **Habitat:** Formerly rubber and 2° forest; oil palm since ca. 1978. **Sources:** DMB, intermittently 1958-62, Dec. 1984, Jan. 1985 and 1986.

KLIAS FR. A Class I FR of 3,620 ha on the Klias Peninsula ca. 10 km SW of Beaufort (5°19'34"N 115°40'25"E). **Elevation:** Sea level – 20 m. **Habitat:** Logged peatswamp forest. By February 2004, parts of the forest had been severely burned and much of the area had been cleared and was covered with melastome scrub less than 3 m in height. **Sources:** G. Davison, June 1998 and Feb. 2002; AMNH, LSU, SM and SWD, 5-12 Feb. 2004 (Sheldon et al. 2009b, Sheldon et al. 2014). **Remarks:** Mainly ramin and jongkong were extracted by the Chung Chao Lung Timbers rail operations, c.1955-1970 (Ibbotson 2014:386-294). Despite heavy disturbance, this reserve has substantial numbers of Hook-billed Bulbuls, Grey-breasted Babblers, and Scarlet-breasted Flowerpeckers (*Prionochilus thoracicus*), which are difficult to find in other parts of Sabah (Sheldon 1987). **References:** Mohamed et al. (2000).

KLIAS PENINSULA. The large promontory in SW Sabah, which forms the NE shore of Brunei Bay and SW shore of Kimanis Bay (5°23'N 115°45'E) featuring three main rivers (not including the Bukau near Weston): Padas, Padas Damit, and Klias. Wells surveyed an area from Menumbuk up the Klias River to the Garama (Gramma) River (5°25'N 115°33'E), along the SW coast to the Padas River, and up the Padas River. **Elevation:** Sea level to 150 m. **Habitat:** Mangrove, nipa, swamp forest, peatswamp, heath (kerangas) scrub, oil palm, rubber, grassy fields. **Sources:** DMB, intermittently 1958-62 (Smythies 1981); G. Mikil, late Aug. 1974 (Wells 1976); SP Survey, 23-25 Mar. 1975 (Wells et al. 1975, D. R. Wells, pers. comm.); WWFM, 17-20 Aug. 1979; WFFVZ, intermittently 1981-1983; AMNH, LSU, SM and SWD, 5-12 Feb. 2004 (Sheldon et al. 2009b, Sheldon et al. 2014). G. Mikil observed birds in the "south Klias swamp" (Wells 1976). **Remarks:** In 1978, 30,900 ha of the coastal parts of Klias were gazetted as a National Park, but the area was de-gazetted in 1980. Now this area is in the Menumbok Class I and mangrove FR. **References:** Early exploration of the Padas River on the peninsula is described briefly by Daly (1888a). The physiographic features of Klias are described in Scott (1989) and by Bernard and Hamzah (2006). Peatswamp forest is described by Mohamed et al. (2000).

KLIAS RIVER. On the Klias Peninsula running from the coast at Menumbok (5°18'N 115°22'30"E) and crossing the main road near Kota Klias (5°27'N 115°37'E). Much of it lies in the Padas Damit amenity FR. **Elevation:** Sea level. **Habitat:** Mangrove, nipa, gallery forest, swamp forest, and old rubber plantation. **Sources:** SP Survey, 23-25 Mar.

1975 (Wells et al. 1975, D. R. Wells, pers. comm.); UKMS-ANSP, 6-7 June 1989, 3-4 July 1989.

KOTA BELUD (KOTABELUD). A large town ca. 55 km NE of Kota Kinabalu (6°21'N 116°26'E). **Remarks:** The town lies on the original northern route to Mt. Kinabalu (Moulton 1915). It is also the namesake of an important bird-watching site: the Kota Belud Bird Sanctuary (see below).

KOTA BELUD BIRD SANCTUARY. Ca. 12,200 ha stretching from Kota Belud in the S to Rampayan village in the N. Outlining coordinates are: 6°23' - 6°32'N and 116°21' - 116°31'E (Payne and Parish 1985, Scott 1989). The Sanctuary is bordered by the Tempasuk River (=Kadamaian River) in the S and the Kuang-kuang River (6°29'N 116°30'E) in the N. Although commonly called "Tempasuk Plain," after the river and Kg. Tempasuk (Tempassuk, Tampassuk, Tampassook) (6°21'N 116°27'E). The Sanctuary comprises four main parts, as summarized by Lansdown (1987c): Kerah (Kra or Krah) swamps in the NE (6°27'N 116°27'E), Tempasuk Plain grassland in the NW (the grassland is now largely overgrown with brush), rice fields in the SE, and settlements in the SW. The N and S Kerah Swamps lie on the E side of the Kota Belud - Kudat highway, and the Kerah River, a small tidal river, parallels the beach in the center of the plain (Lansdown 1986b). A commonly used entrance to the area is the turn-off from the main road to Rampayan Laut (6°25'52"N 116°28'22"E). See Abai, Ambong, and Pandasan. **Elevation:** Sea level. **Habitat:** Grassy plain (formerly largely grazed and often wet), freshwater marsh and mudflats, rice fields, ponds, freshwater swamp and swamp forest, coastal and inland river, mangrove-nipa, estuary, and beach strand. Tempasuk Plain was much more open and grassy 20 years ago than it is today. **Sources:** J. Whitehead, Feb. 1886 (Sharpe 1889a, Whitehead 1893, Gibson-Hill 1952); V.W. Ryves, Jan. and Apr. 1939, (RM); E.J.H. Berwick Oct. and Nov. 1956, 17 July 1965 (Smythies 1963, Fogden 1965, Gore 1968); P.F. Burgess, Jan. and Nov. 1959 (Smythies 1963, Gore 1968); KVT, intermittently 1960s; T. Harrisson, 17 July 1965 (Fogden 1965); Phillipps family, intermittently 1960s- 1980s (Phillipps 1982, pers. comm.); D. R. Wells, 2-3 Nov. 1980 (1981, pers. comm.); WWFM, 1 Dec. 1981; WFWZ, intermittently 1981-1983; B. King and D. Yong (pers. comm.), 17 July 1983, 5 Aug. and 8 Sept. 1986; DMB, intermittently 1984-89; SWD (CMF and S. Ambi), 9-11 Apr. 1984; Beadle and A. Whittaker, 9-13 Sept., 22-25 Nov., 11-12 Dec. 1984; D. Parish, 7-19 Feb. 1985 (Payne and Parish 1985); R. V. Lansdown, 27 Feb. - 12 Mar. 1986, Sept. - Dec. 1986 (Lansdown 1986a, b, 1987a, b, Robson 1987, Lansdown 1989); S. Harrap and N. Redman, 1 August [1987] (Robson 1988); C. Robson and D. Scott, 8 April 1996 (Robson 1996); S. Myers, 28 Nov. 2003 (Robson 2004); K. Madoya, 31 Oct. 2007 (Robson 2008). **Remarks:** William Pretymann landed at Tempasuk in 1878 and set up a fortified residence as representative of the British Borneo Provisional Association that became the BNBC two years later. His diaries give some details of the geography and people at the time (Harrison 1956). The Sanctuary, originally 12,200 ha of marsh and grassland, was constituted in 1960 (Burgess 1964). Its birds have been well surveyed, e.g., by WFWZ, SWD, INTERWADER, and WWFM, which funded a tourist-feasibility study (Payne and Parish 1985). Lansdown located an egret roost in the S Kerah swamp near Sangkir village (opposite the secondary school). He also found a Black-crowned Night Heron

(*Nycticorax nycticorax*) roost on an oxbow lake of the Tempasuk River at Kg. Merabau. **References:** de Silva (1966), Phillipps (1982b), Parish et al. (1987), and Phillipps and Phillipps (2014: 330).

KOTA KINABALU (JESSELTON). Founded as Jesselton in November 1899, and now the capital city of Sabah (5°59'N 116°04'E). Included under this heading are the following suburban areas: Bukit Padang (5°57'N 116°03'E), Dah Yeh Villa, Kapayan (5°56'N 116°04'E), Kasigui (5°55'N 116°07'E), Kiansom (5°59'N 116°12'E), Luyang, Inanam (Inannam) (5°59'N 116°08'E), Penampang (5°55'N 116°07'E), and Petagas (5°55'N 116°03'E). See Dumpil, Gaya Bay, Gaya Island, Likas Lagoons, Likas Swamp, and Tanjung Aru, which are bird-watching areas close to the city, and Maang, a major WFVZ collecting site. **Elevation:** Sea level to 50 m. **Habitat:** 2° growth, grassy fields, coastal waters, mangrove, mud and sand flats, rubber, and gardens. **Sources:** Crane Pacific Expedition (R.E. Wheeler and F.C. Wonder), July - Aug. 1929 (Mayr and Camras 1938, FMNH); MCZ, May 1937; KVT intermittently 1950-1960s; DMB, intermittently 1958-1962, 1984-1990; NAMRU, 24 Aug. - 4 Oct. 1960; T. Harrison, Dec. 1960 (Gore 1968); SM (H. Tsen) and MAPS, mainly during 1967; WFVZ intermittently 1981-83; UKMS, intermittently 1984-1989; UMS, 19 Feb.-14 Mar. 2014 (Sompud et al. 2014).

KOTA KINABALU WETLANDS. Formerly the Kota Kinabalu City Bird Sanctuary, this site consist of 24 ha of mangrove on the Likas side of the city (6°59'37"N 116°06'18"E). See Likas Swamp. **References:** Han (2011), Phillipps and Phillipps (2014: 328).

KOTA KINABATANGAN. A stop on the main N-S road to the Kinabatangan River from Sandakan (5°35'18"N 117°50'46"E). Sources: J. Pan, 3 Sept. 2007 (Robson 2008).

KOTA MARUDU. A town in northern Sabah (6°29'N 116°46'E). See Bandau and Bongon.

KRETAM FR. Area surrounding the Big and Little Kretam rivers (5°32'N 118°33'E), which run into the SW end of Dewhurst Bay. Davis (1962:11) collected along the Little Kretam River, working from a logging camp at Kretam Hill (5°29'N 118°34'E) near the river mouth. The WWFM surveyed the large Kretam River system from 5°18'N 118°26'E to 5°37'N 118°35'E. **Elevation:** Sea level to 200 m. **Habitat:** In Davis's day, a mixture of lowland 1° and logged forest. In 1981, mainly logged forest, mangrove, and nipah.). Only 423 ha remains as a heavily logged, regenerating VJR; the remainder of what was formerly the FR is now wholly under oil palm plantation. **Sources:** FMNH (D. Davis and R. Inger), May-June 1950 (Davis 1962, FMNH); WWFM, Aug.-Sept, Nov. 1980, Mar. 1981. **Remarks:** The reserve was first logged in the 1920s or perhaps earlier by North Borneo Trading. In 1949, the concession was acquired by North Borneo Timbers. It is the site of the first experiments with Caterpillar tractors in 1951 (Ibbotson 2014:271-280). NB Timbers combined camp tractor extraction with hauling by rail, 1953-1972 (Ibbotson 2014: 287-292).

KUALA PENYU. A town on the NW tip of the Klias Peninsula (5°34'N 115°36'E). The promontory N of Kuala Penyu is Tanjung Nosong (5°38'N 115°36'E). Nukohan (5°27'N 115°37'E) is a village ca. 2 km E of the hill before Kuala Penyu center. **Elevation:** Sea level. **Habitat:** Sandy-mud beaches and flats, mangrove, paddy, grassy fields, freshwater marsh, sandy soil scrub, and estuary. **Sources:** DMB, intermittently 1958-62, Dec. 1984, Jan. 1986 (Smythies 1963); KVT, intermittently 1960s; SM, 9 Sept. 1970; SP Survey, 26 Mar. 1975, 7 Nov. 1980 (Wells et al. 1975; Wells 1976); WFVZ intermittently 1981-1983; B&W, 1-4 Sept. 1984. **Remarks:** Seaward of Tg. Nosong are "rock stacks," noted by DMB as the nesting site for such birds as Pacific Reef Heron (*Egretta sacra*) and Black-naped Tern (*Sterna sumatrana*).

KUALA SEGAMA. The mouth of the Segama River (5°26'N 118°48'E). See Kulamba Wildlife Reserve and Segama River. **Sources:** KVT, intermittently 1953-1969. **Elevation:** Sea level. **Habitat:** 1° dipterocarp and freshwater swamp forest (inside the delta) and mangrove. The delta was all mangrove and uninhabited from 1952-1956 (KVT).

KUAMUT. A village at the confluence of the Milian and Kuamut (Quarmote) rivers (5°13'N 117°30'E). See Batu Timbang and Malubuk. **Sources:** ADG, 20 Oct. 1963 (MCT, SM); CMF, 3 Aug. 1984 (SWD); SM, Nov. 1987. **Remarks:** District officer J.T. Richardson (1908) traveled up the Kuamut River in August 1908 and described the Wasa Maya Falls. YU passed the Falls in 1976 on their way to the the Batu Timbang swiftlet caves. SM collected in the "Ulu Kuamut, Kalabakan/Tawau Road". Daly (1888a,b) noted that the trip up the "Quarmote" to Batu Timbang was difficult because of rapids.

KUBONATOK CAVE. Cited as "Dallas, Lahad Datu" by Orolfo, but exact locality unknown to us and not listed by (CMF). It might refer to Batu Tatak on Daly's (1888a) map; nowadays Buttock Batu (5°12'56"N 117°51'58"E). **Sources:** P. Orolfo, 24 Sept. 1930.

KUDAT (CUDAT). A large town in N Sabah at entrance to Marudu Bay. (6°53'N 116°50'E). Included under this heading are Tg. Tajau (6°58'N 116°49'E) ca. 7 km N of Kudat, and Kg. Nangka (6°46'N 116°47'E) ca. 8 km S of Kudat on the Milau River. See Sempang Mangayau Cape and Teuton. **Elevation:** Sea level. **Habitat:** Beach strand, coastal scrub, and mangrove. **Sources:** Marchesa Expedition, 22-30 May 1883 (Guillemard 1885, 1889, Chasen and Kloss 1930b); A.H. Everett, Jan. 1893 (FMNH); J.B. Bell, June 1895 (ANSP and BMNH); F.N. Chasen and C. B. Kloss, Sept. 1927 (1930a); B.E. Smythies, 23 Dec. 1954 (Smythies 1957); E.J.H. Berwick, Feb. 1958 (Smythies 1963); SM, Jan. 1970; WFVZ 1-2 Oct. 1981; UKMS and SWD, 8 Apr. 1984 (SWD). **Remarks:** Kudat was a provincial headquarters and briefly considered as the capital of North Borneo before Sandakan. It was a regular port of call for coastal steamers. Everett was posted as a government officer in Kudat (Chasen and Kloss 1930b), from which he visited Balembangan and Banggi islands.

KULAMBA WILDLIFE RESERVE. A 20,682 ha reserve between Kuala Kinabatangan and Kuala Segama on the Dent Peninsula (5°36'N 118°36'E). The Payne

and INTERWADER surveys included Tg. Tundunbuangin (5°36'N 118°36'E).

Elevation: Sea level. **Habitat:** Mixed forest on freshwater swamp and dry land, open freshwater swamp forest, forest dominated by aru trees (*Casuarina equisetifolia*), forest dominated by butabuta trees (*Excoecaria agallocha*), beach strand, muddy sand flats, nipah, riparian forest, 1° dipterocarp forest (Payne 1985). **Sources:** J. Payne (WWFM), Aug. 1980, May 1983, 2-12 Apr. 1984 (Payne 1985, pers. comm.); B&W, 25 Oct. 1984 (Payne 1985); DMB, Oct. 1984, Dec. 1984; GD, 25-27 May 1999. **Remarks:** Payne (1985) listed birds by habitat. **References:** (Payne 1988a), Scott (1989).

KULI MOUNTAIN. Mountain associated with a commercial swiftlet cave (Batu Timbang) in the Mt. Magdalena (formerly Gunung Rara) FR (4°57'N 117°04'E). See Batu Timbang and Kuamut. **Elevation:** 1387 m. **Sources:** YU, April 1977; CMF, 1984.

KUNATONG RIVER. A small river off the Karamuak River in the vicinity of Telupid and Tawai Hill, not far from Entelebon (5°30'N 117°03'E). See Tawai FR. **Habitat:** 1° and 2° forest. **Sources:** SM, Oct.-Nov. 1977.

KUN KUN RIVER (KUNKUN). In the Tangkulap FR (5°28'N 117°13'E). **Elevation:** 200 m. **Habitat:** 1° upland forest. **Sources:** WWFM, 28 Apr. - 9 May 1980 (Davies and Payne 1982, pers. comm.). **Remarks:** The Forestry Department has developed a picnic area at a picturesque site along the Kun Kun (5°29'20"N 117°11'45").

KUNTOS. A limestone locality in the Gomantong Class I FR (5°33'00"N 118°04'30"E).

LABAUNG (LABAONG) RIVER AND LAKE. 5°29'N 117°48'E. See Bukit Garam under Kinabatangan River.

LABAU RIVER. Site of the Bornion Timber Co. concession, 40 km ESE of Keningau (5°10'N 116°31'E). **Elevation:** Ca. 400 m. **Habitat:** 1° upland dipterocarp, 1° tall kerangas, and recently logged forest. **Sources:** CMF, 15-20 Feb. 1982 (Forest Department report); WFVZ 19-30 Oct. 1982. **Remarks:** The WFVZ recorded many forest-dwelling migrant individuals, e.g., of Siberian Blue Robin and Crow-billed Drongo, in Oct. 1982.

LABUAN. The large island SW of the Klias Peninsula in Brunei Bay (5°19'N 115°13'E). Ceded to the British by Sultan of Brunei in 1846 and maintained as the British base in the region. All early explorations of North Borneo started at Labuan. Also included under this heading are the surrounding islets: Keraman (5°14'N 115°08'E), Papan (5°15'N 115°16'E), and Burong (5°14'N 115°11'E). A limestone site without commercial swiftlet nesting occurs at (5°18'45"N 115°12'00"E). **Habitat:** Ussher in the 1870s noted that Labuan was "finely timbered" although areas had been burned for paddy (Sharpe 1879b). Whitehead (1893) lamented the lack of natural habitat on the island, and Pendlebury and Chasen (1932) found that all forest had been removed by the time of their visit in the 1920s. Burong Island had some forest during Harrison's 1960 visit, but limestone on the island had been quarried to build Labuan airport and much of the natural vegetation was destroyed (Smythies 1963). **Sources:** J. Motley, ca. 1851 (Motley and Dillwyn 1855,

Sclater 1863, Salvadori 1874, Smythies 1960); H. Low, 1848-1877 (Sharpe 1879b, Smythies 1960); "Frank," intermittently 1873-1886 (SRM archives); F.W. Burbidge, 1877 (Burbidge 1880, Sharpe 1879a); H. T. Ussher and a Kadyan named "Buak," May 1876 - Mar. 1877 (Sharpe 1879a, b); W.H. Treacher, 1870s (Sharpe 1879b,c); E. G. Lempriere, early 1880s (Nicholson 1883); Marchesa Expedition, early June 1883 (Guillemard 1889); J. Whitehead, June-Aug. 1885, Nov. 1885-Jan. 1886, intermittently Mar.-July 1886, Jan. 1887, Apr. 1887, Dec. 1887, and May 1888 (Sharpe 1889a,b Whitehead 1893, Gibson-Hill 1952); A.H. Everett, intermittently 1877-1893 (Everett 1889, 1890a,b, Whitehead 1893, Sharpe 1893, 1894, ANSP and FMNH); J. Waterstraat, Dec. 1897 (Smythies 1960); "Local collector," June 1924 (RM); T. Harrisson, 3 Dec. 1952, 23 Nov. 1955, May-June 1960 (Smythies 1957, 1963, SRM); KVT, Nov. 1960; DMB, 26-27 Feb. 1962; J. Collman, 11 Oct. 1970 (Vowles and Vowles 1985). **Remarks:** Guillemard (1889) reported megapodes on Keraman Island. Everett collected a Peregrine Falcon in Feb. 1892 on Papan Island. T. Harrisson visited Burong Island. **References:** The earliest reference is Motley and Dillwyn (1855). Sharpe (1875) compiled a list of birds based on the Motley-Dillwyn collection and some specimens sent by H. Low. Subsequently, Sharpe realized that some of the birds he had listed for Labuan actually came from the adjacent mainland. To correct mistakes, he wrote an updated list (Sharpe 1879b), which benefited from the relatively well documented collection of H. T. Ussher. This second list nevertheless contained mistakes, e.g., the inclusion of a montane green magpie (*Cissa*).

LABUK RIVER. A major river in NE Sabah (5°54'N 117°30'E), with its mouth at Labuk Bay. See Bauto, Beluran, Ensuan, Meliau, Rumidi, and Telupid. **Sources:** E.J.H. Berwick, intermittently 1950-60s (Smythies 1963, Gore 1968); KVT, intermittently 1950-60s; BMNBE, Apr. and May 1956; T. Harrisson 12 July 1964 (Fogden 1965). **Remarks:** Officers and businessmen on SAD business often travelled this river to visit plantations. With the exception of the BMNBE, relatively little bird collecting or study has taken place in this part of Sabah.

LABUK BAY PROBOSCIS SANCTUARY. (5°46'N 118°18'E). **Reference:** Phillipps and Phillipps (2014).

LABUK ROAD FR. A VJR ca. 30 km W of Sandakan (5°53'N 117°55'E). See Gum Gum FR. **Elevation:** Ca. 50 m. **Habitat:** Old logged forest, oil palm, and a small stand of 1° forest. **Sources:** WFFVZ, 31 July - 4 Aug. 1983; SWD, intermittently 1983-1985 (SWD). **Remarks:** Labuk Road is the name of the main Sandakan-Telupid Road in the vicinity of Kebili-Sepilok FR. SAD collected extensively along this road following the establishment of a bird collection at Sepilok in 1982-83.

LAHAD DATU. A major town in E Sabah (5°02'N 118°19'E). See Silam and Segama River. **Elevation:** Sea level. **Habitat:** 2° scrub, grassy fields, gardens, and sea coast. Formerly, the area immediately around the town in the Segama River flood plain was largely tobacco plantation (KVT); now it is oil palm. **Sources:** ADG, early 1960s; WFFVZ, intermittently during 1981-1983; CMF, Oct. 1982 (Francis 1985a); D. R. Wells, J. Payne, and C. Wells, 28-31 July, 11-19 Sept. 1987 (D. R. Wells, pers. comm.); UKMS-

ANSP, June 1989; D. Clayton and T. Jones, 8 May 1996 (e.g., Clayton et al. 1996, Lee et al. 1996, Tompkins and Clayton 1999, Price et al. 2004); P. Bawden, 10 Oct. 2007 (Robson 2008). **Remarks:** In the Darvel Bay area, Silam was the first BNBC base because of its harbor potential. Lahad Datu grew subsequently as a result of gold prospecting in the Segama in the 1890s and development of the Darvel Bay Tobacco Estate (originally German owned), which as the most successful tobacco estate in North Borneo operated until the early 1960s. The first record of Striated Grassbird (*Megalurus palustris*) on Borneo was at the Lahad Datu airport (Francis 1985). **References:** (William 1981).

LAHAD DATU (DARVEL) BAY. The large bay S of Lahad Datu (4°50'N 118°30'E). See Lahad Datu, Segarong, Silam, Sibuan Island, and Semporna Islands.

LAKUTAN. A limestone site in the Sabah Forest Industries concession near Sipitang (5°7'00"N 115°43'15"E).

LAKUTAN RIVER. A small river ca. 7 km N of Sipitang (5°08'N 115°33'E). **Sources:** J. Waterstraat, Apr.-Aug. 1899 (Blasius 1901).

LAMAS MOUNTAIN. A coastal hill ca. 10 km N of Tuaran (6°17'N 116°15'E). See Ambong and Tuaran. **Elevation:** Sea level to 417 m. **Habitat:** Unspecified, but likely to include mangroves and coastal scrub. **Sources:** ADG, Mar. 1963 (MCT, SM).

LANGKON. A village in Kota Marudu District on the Langkon River (6°34'19"N 116°42'19"E). **Elevation:** 35 m. **Habitat:** Gardens and secondary forest. **Sources:** D.F. Gawin, 12-14 July 2010 (Gawin 2014).

LANGUI LANGUI. A peak in the Mt. Templer extension of Kinabalu Park (6°22'N 116°36'E). **Elevation:** 1198 m; mammals and birds were surveyed at 762 m. **Habitat:** 1° highland forest. **Sources:** WWFM, 20-27 Nov. 1979.

LANGUT RIVER. Sungai Milian near the village of Pinangah (5°12'N 116°51'30"E). **Elevation:** Ca. 50- 125 m. **Habitat:** 1° lowland forest and shifting cultivation. **Sources:** G.E. Hewett, 1880s (Treacher 1888); WWFM, 31 May - 4 June 1980. **Remarks:** Hewett was a Chartered Company representative in the Kinabatangan district and resided at Pinangah. He provided Treacher with information on the first record of Bulwer's Pheasant (*Lophura bulweri*).

LARAPAN ISLAND. A limestone site ca. 12 km N of Semporna (4°33'45"N 118°36'15"E). **Remarks:** No commercial swiftnet nesting occurs here.

LAWA MANDAU. Behind the former UKMS campus, 7 km NE of Menggatal (6°03'N 116°12'E). This site is reached by a road from Telipok. **Elevation:** The peak is 851 m; birds were collected at ca. 600 m. **Sources:** UKMS, Mar. 1991 (R. Stuebing, pers comm.). **Remarks:** A potential site for lower montane species close to Kota Kinabalu.

LAYANG ISLAND. Off Papar (5°46'N 115°53'E) (Stuebing 1991).

LAYANG-LAYANG ISLAND (SWALLOW REEF). A Spratly island, ca. 275 km NW of Kota Kinabalu (7°22'N 113°50'E). **Sources:** GD, 25-26 Sept. 1998 (Davison 1999). **References:** Haile (1964), Normaly and Normaly (1985), Wells (1991), and Poole (1994).

LIAN (LAING) CAVE. A limestone site 10-15 km N of Keningau, probably the same as Lime Cave (5°29'30"N 116°10'30"E). **Sources:** CMF, May 1984. **Remarks:** CMF visited "Lime Cave" and noted that although nesting swiftlets had been reported there, he found none. L&K noted that no commercial swiftlet nesting occurred at Lian Cave (L&K).

LIME CAVE. A small cave ca. 10 km N of Keningau. See Lian Cave. **Sources:** **Remarks:** Purported to have nesting swiftlets, but none were found by (CMF).

LIBARAN (LEEBARRAN) ISLAND. 6°06'N 118°01'E. See Turtle Islands. **Sources:** The Marchesa Expedition visited Libaran in Apr. or May 1883 (Guillemard 1885, 1889). P. Burgess and T. Harrisson surveyed "Selinggan" (Selingan), Gulisaan, Bakungan Kecil, Lankayan, "Lebakan", and "Lelingan" during 13-17 July 1965 (Harrisson 1966).

LIKAS LAGOONS. Ponds popular for birdwatching adjacent to the main road near the Kota Kinabalu mosque (5°59'30"N 116°06'E). **Sources:** C. Robson and C. Scott, 8 and 13 April 1996 (Robson 1996); C. Robson, 29 July 2007 (Robson 2007).

LIKAS SWAMP. A mangrove 3 km NE of Kota Kinabalu, the remainder of which is now the Kota Kinabalu Wetlands (5°59'N 116°06'E). See Gaya Bay. **Elevation:** Sea level. **Habitat:** Disturbed mangrove surrounded by suburbs. **Sources:** WFFVZ, May and June 1983; UKMS, Feb. 1986; DMB, 20-21 Dec. 1984, Feb. and Mar. 1986. **Remarks:** A good birding site close to Kota Kinabalu, with roosting and nesting herons. The WFFVZ located Black-crowned and Nankeen night herons (*Nycticorax caldonicus*) breeding there in 1983 (Sheldon and Marin A. 1985). GD counted more than 600 Black-crowned Night Herons and 30 Nankeen Night Herons there in Aug. 1998 (Smythies 1999).

LIMBAWAN. Near Keningau (5°19'N 116°09'E) (Stuebing 1991).

LINSANG, TANJUNG. 5°38'N 118°38'E. See Tanjung Linsang.

LOKAN RIVER. 5°26'N 117°44'E. See Bukit Garam under Kinabatangan River and Segaliud-Lokan FR.

LOKAPAS. 6°53'N 117°14'E. See Melobang.

LOK KAWI. A shoreline area 10 km SW of Kota Kinabalu (5°51'32"N 116°02'39"E) opposite the military camp. **Elevation:** Sea level. **Habitat:** Beach and tidal flats. **Sources:** WFFVZ, intermittently 1981-1983; B&W, 18 Oct. 1984; D. Bakewell and J.

Eaton, 18 Oct. 2008 and 14 Oct. 2009 (Robson 2009b). **Remarks:** A good shorebird site with sand and mud flats.

LONG PASIA. A village in the Ulu Padas in extreme SW Sabah (4°24'N 115°43'E). See Muruk Miau. **Elevation:** Ca. 900m. **Habitat:** 1° lower montane forest, logged forest, and shifting cultivation. A considerable amount of *Agathis* occurred on the surrounding hills, which were still unlogged in 1988. **Sources:** GD, Apr. 1996 (Smythies 1999). **Remarks:** This is still an understudied area. Trails connect it to long house communities in the ulu Baram, Sarawak.

LUMAKU FR. A Class I FR in two sections at the S end of the Crocker Range (4°51'N 115°42'E): northern section (5,180 ha) and southern section (6,665 ha). See Lumaku Mountain and Mendolong.

LUMAKU (LAMAKO, LUMAKO) MOUNTAIN. An isolated mountain between the Crocker and Maligan ranges in SW Sabah (4°51'N 115°42'E). See Mendolong.

Elevation: 1966 m; birds collected up to 1500 m. **Habitat:** 1° in the 1980s; now logged and 2° montane forest. *Acacia mangium* was planted by Sabah Forest Industries up to ca. 1300 m in 1989. **Sources:** UKMS-ANSP, 22-27 June 1989; SM, June 1992, June-July 1995, and July 1996; SP, Nov. 1998; AMNH, LSU, and SM, 15-18 Jan. 2005 (Haines 2007, Sheldon et al. 2009a). **Remarks:** Biogeographically, this is one of the most interesting areas in Sabah. At lower elevation (=Mendolong), the Sabah Park staff collected a White-rumped Shama (*Copsychus malabaricus*); at higher elevation (1,435 m), Sabah Museum collected Bornean Barbet (*Megalaima eximia*). **References:** Wong (2003).

LUMAT. Near Beaufort (5°24'N 115°45'E). **Elevation:** Ca. sea level. **Habitat:** Old rubber, peat swamp, and logged dipterocarp forest during DMB's time. **Sources:** DMB, 1958-62.

LUMBIDAN, LAMBIDAN, AND LUMADAN. Lumbidan is not shown on maps, and its exact location is unknown. The name may refer to several different localities or the Klias Peninsula region in general. Ussher described it as a "...little Kadyan settlement...on the NW coast, and about thirty miles [48 km] above the mouth of the Brunei River" (Sharpe 1879b). He also noted that the Klias River is W of Lumbidan. Davis (1962) listed the coordinates in his gazetteer as 5°23'N 115°22'E. These coordinates place Lumbidan on the NW coast of the Klias Peninsula, and there is a small island just off the coast in this area named Lambidan (5°23'19"N 115°22'31"E). However, DMB visited Lumadan Estate (5°16'N 115°41'E) on the Lumadan River near the Bukau River (5°16'N 115°36'E), on the road between Beaufort and Weston. **Elevation:** Sea level. **Habitat:** Lumadan: mature rubber, new plantations, swamp, and dipterocarp forest. Lumbidan: circumstantial evidence from specimens indicates peat swamp forest (Hooked-billed Bulbul and Grey-breasted Babbler) and lowland, riverine forest (Bornean Ground Cuckoo) (Long and Collar 2002). **Sources:** H. Low, 1848-1877 (Sharpe 1879a); H. T. Ussher, ca. May 1876 - Mar. 1877 (Sharpe 1879a,b, BMNH); W. H. Treacher, ca. 1879

(Sharpe 1879a,b); A.H. Everett, Nov. 1889, Mar. and Apr. 1892 (ANSP); DMB, intermittently 1958-62 (Smythies 1981).

LUMUTAN HILL. A hill N of Pensiangan (4°37'N 116°22'30"E). **Elevation:** 750 m. **Habitat:** 2° forest. **Sources:** SM, May 1998.

LUNGMANIS VJR. Ca. 50 km W of Sandakan (5°44'N 117°40'E). **Elevation:** <100 m. **Habitat:** Lowland forest. **Sources:** WWFM, 5-10 Oct. 1979.

MAANG. A suburb of Penampang ca. 12 km S of Kota Kinabalu (5°51'31"N 116°04'54"E). **Elevation:** 50 m. **Habitat:** Paddy, scrub, and overgrown rubber in the 1980s; paddy is now largely covered with housing. **Sources:** WFVZ, continuously 1981-1983. **Remarks:** The WFVZ was headquartered in Kg. Maang and collected many birds in the vicinity. **References:** Marin and Sheldon (1987).

MADAI HILL AND CAVES. A limestone outcrop in the Madai-Baturong VJR just N of Kunak along the Lahad Datu/Tawau highway (4°43'00"N 118°09'15"E). **Elevation:** Sea level to 359 m (Tangah and Wong 1995). **Habitat:** Fairly intact dipterocarp, kerangas, and limestone forest and 2° growth, some parts extensively burned during the 1983 El Niño (CMF). The area is completely surrounded by oil palm. **Sources:** D.D. Daly and W.H. Treacher (1888b), July 1884; P. Orolfo, Oct.-Nov. 1930 (RM, USNM); SM, Oct. 1978, Jan. 1980; D. Clayton, T. Jones, and R. Chong, 9-11 May 1996 (e.g., Clayton et al. 1996, Lee et al. 1996, Tompkins and Clayton 1999, Price et al. 2004); J.J. Hobbs, July and August 2001 (Hobbs 2004). **Remarks:** An important swiftlet nest site with 23 caves.

MADAI-BATURONG FR. A VJR of 5,867 ha just N of Kunak along the Lahad Datu/Tawau highway. There are two blocks of forest in the reserve, one containing Madai Mountain (4°43'00"N 118°09'15"E) and the other Baturong Hill (4°42'00"N 118°00'30"E). See Madai and Baturong. **Elevation:** 0-450 m. **Habitat:** The forest in the Baturong block is most intact and consists of dipterocarp, kerangas, and limestone forest. The forest at Madai is degraded and consists of dipterocarp, ultramafic, and limestone forest. Both areas are surrounded by oil palm.

MADALON MOUNTAIN. In the Mt. Templer extension of Kinabalu Park (6°27'N 116°37'E). See Sungai River. **Elevation:** ca. 650-1100 m. **Habitat:** 1° highland forest. **Sources:** WWFM, 20-27 Nov. 1979 (Davies and Payne 1982, pers. comm.).

MAGDALENA MOUNTAIN. Ca. 30 km N of Tawau in Tawau Hill Park (4°30'N 117°57'E). The BMNBE approached Magdalena from the right branch of the Merutai River and, thus, surveyed mainly the W slope. Banks (1982) referred to Magdalena as Bukit Goram. The S slopes of Magdalena are in the Tawau Hills Park. **Elevation:** 1311 m, collections from 600-1300 m. **Habitat:** 1° lower montane forest. **Sources:** BMNBE, June 1956. **Remarks:** Banks (1982, pers. comm.) remarked on the absence of montane birds on Magdalena, but there are examples in the BMNBE collection of some lower-montane species, e.g., Pygmy White-eye (*Oculocincta squamifrons*), and many lower

montane species occur on Mt. Lucia, which is nearby and lower in elevation (Sheldon et al. 2009a)

MAKANITON. Ca. 15 km NE of Tenom behind Melalap Estate on the Purulon River (5°13'N 115°57'E). Sometimes referred to as Purulon or Ulu Purulon. See Melalap and Ulu Losan. **Elevation:** 300-400 m. **Habitat:** 1° upland forest and forest edge in 1989, cocoa plantation, and 2° scrub. The area was severely burned in the 1998 El Niño event, and the forest was essentially destroyed (P. Yambun, pers. comm.). **Sources:** UKMS-ANSP, 27 May - 4 June 1989; SP, Nov. 1998. **Remarks:** This site is ca. 3.8 km from the Tenom-Keningau road, accessed at Simpang Ladang Getah Melalap. **References:** Stuebing (1991), Wong (2003).

MALAWALI (MALLEWALLE, MALLAWALLÉ) ISLAND. A large island (45 km²) off the N tip of Sabah (7°04'N 117°10'E). **Elevation:** Sea level to 160 m in the hilly interior. **Sources:** F.N. Chasen and C. B. Kloss, 8-9 Sept. 1927 (Chasen and Kloss 1930a,b). **Habitat:** Mangrove, two sandy beaches, grassland near inland of the S coast, and primary vegetation inland of shore flora (few commercial trees). **References:** Nor (1996).

MALIAU BASIN CONSERVATION AREA. This area (390 km²) in south-central Sabah (ca. 4° 50'N 116°53'E) includes Mt. Lotung and its southerly basin draining into the Maliau River. **Elevation:** 450-1684 m. See Simatuoh and Ulu Samuran. **Habitat:** 1° upland to upper montane, upland riparian, highland or lower montane kerangas (1000-1100 m), lower montane coniferous (950-1000 m), and upper montane ericaceous (above ca. 1200 m) forests. The coniferous forest forms a narrow band. **Sources:** SM, May 1981 (specimen data, R. Goh, pers. comm.); Sabah Foundation/WWFM Expedition, Apr. - May 1988 (Yong et al. 1989); SM, Sept. 1998; SP, between Sept. 2001 and Oct. 2002 (Lakim et al. 2006), Noramly and Idek, 5 days-no dates, (Noramly and Idek 2010); V. Ruiz (SAFE Project), June-Aug. 2011; V.S. Kiong and A. Chang, 16 Sept. 2014 (Sykes and Loseby 2015). **Remarks:** In dry weather, the black waters of the Maliau River stain the Kuamut River like an oil slick for a mile or two. M.W.H. Beech passed here in 1906 and recorded the black water as undrinkable (BNBH, 1 May 1907, p. 89-90). The Sabah Museum Expedition approached Mt. Lotung from Sapulut via the Sapulut and Sabutan Rivers. The participants walked to Ulu Samuran and up the W ridge to ca. 1200 m. The Sabah Foundation/WWFM group flew into the Basin by helicopter and established a base camp along the Maliau River at 490 m. Yong et al. (1989) listed birds according to habitat. Lakim et al. (2006) conducted a thorough survey of birds. Recently, the SAFE Project has been using Maliau Basin old growth forest as a baseline for studies in its disturbed forest and plantation. **References:** Marsh (1989), Marsh and Gasis (1990), Hazebrook et al. (2004), Phillipps and Phillipps (2014: 332).

MALUBUK. In the Kuamut FR (5°08'30"N 117°33'E). **Elevation:** 150-200 m. **Habitat:** Logged upland forest. **Sources:** WWFM, 28 July - 6 Aug. 1981.

MALUBUK RIVER. 5°14'N 117°33'E.

MALUTUT RIVER. Tenom district, 5°15'N 115°58'E (Stuebing 1991).

MAMUT RIVER. 6°03'N 116°28'E (Stuebing 1991).

MANDAHAN. Ca. 50 km SW of Kota Kinabalu between Kimanis and Bongawan (5°32'N 115°54'E). The Papar-Beaufort highway crosses the Mandahan River at 5°35'30"N 115°53'05"E. **Elevation:** Sea level. **Habitat:** Beach strand, mangrove, coastal swamp (inland), and heath scrub. Until 1970, there was a small rubber estate surrounded by 1° forest. **Sources:** YU, 27 Feb. - 2 Mar. 1977.

MANDANGIN. A village just NW of Membakut (ca. 5°29'N 115°47'E). **Elevation:** Sea level. **Habitat:** Paddy and swamp forest. **Sources:** WFVZ, intermittently in 1983. **References:** Marin and Sheldon (1987).

MANGGIS. Two villages, one near Papar (5°42'N 116°00'E) and another near Mt. Tambuyukon (6°12'N 116°45'E).

MANGSI (MANGSEE) ISLANDS. Two small islands N of Banggi Island (7°31'N 117°18'E). **Remarks:** Mentioned by Smythies (1957) as one of several north Bornean record localities for Grey Imperial Pigeon (*Ducula pickeringii*). He did not specify who worked at this site.

MANTANANI ISLANDS. Two main islands, Mantanani Besar (6°42'40"N 116°21'E), and Mantanani Kecil (6°42'30"N 116°19'E), and a small rocky islet, Lungisan (6°42'55"N 116°20'E), ca. 40 km NNE of Kota Belud. Limestone caves with nesting swiftlets on Mantanani Besar are at 6°43'30"N 116°20'30"E and Mantanani Kecil at 6°43'00"N 116°18'30"E. **Elevation:** Sea level. **Habitat:** Mantanani Besar: beach strand, coconut groves, heath grassland, enclosed forest, forest on limestone soil, and limestone bluffs. Mantanani Kecil: limestone hill, and rocky and sandy shores. Lungisan is a small rocky islet consisting of a steep limestone hill ca. 40 m. high. **Sources:** A.H. Everett, Dec. 1887, Dec. 1891, Apr. 1892 (Everett 1889, Sharpe 1893, Kloss 1930a); C. Hose, 1891 (SRM); J. C. Moulton, 18 June 1921 (Kloss 1930a); C. B. Kloss, 15-16 June 1924 (Kloss 1930a); P. Orolfo, June 1931 (RM, USNM); V.W. Ryves, 25-26 Jan. 1939 (Gibson-Hill 1949b); SM, 13 July 1970, 18-21 Apr. 1971; J.T. Marshall, 12 Nov. 1974 (Marshall 1978); WFVZ (F. H. Sheldon, B. King, D. Yong, and CMF), 9-11 Mar. 1982 (Sheldon 1983); J. Wall and D. Yong (pers. comm.), 29-31 July 1985; Cranbrook (pers. comm.), 21 Mar. 2014, June 2015. **Remarks:** The Mantanani islands are home to the endemic Mantanani Scops Owl (*Otus mantananensis*), as well as nesting Blue-naped Parrots (*Tanygnathus lucionensis*), Black-nest and Edible-nest swiftlets, and several insular pigeons. Recently, the islands have become a well-visited tourist destination. **References:** Chasen (1931), Cranbrook et al. (2013), Daly (1888b), CMF, Phillipps and Phillipps (2014: 330).

MARAK-PARAK. Kota Marudu district (6°14'N 116°48'E) (Stuebing 1991).

MARUDU (MALLOODOO) RIVER AND BAY. Northernmost Sabah (6°45'N, 116°55'E). See Bandau, Bengkoka, and Kudat. **Elevation:** Sea level. **Habitat:** Sandy

beach, 2° scrub, mangrove, intertidal mudflats, estuary, and open water. **Sources:** A.H. Everett, Jan. 1893 (Sharpe 1893, 1894); C.A. Gibson-Hill, July 1949 (Gibson-Hill 1950); KVT, intermittently 1960s. **References:** Scott (1989).

MASIKUAN. Near Padas Damit on the Klias Peninsula (5°19'40"N 115°30'48"E). **Elevation:** Sea level. **Habitat:** Heavily disturbed swamp forest, scrub, and plantation. **Sources:** LSU and KU, 3-4 June 2008 (Sheldon et al. 2009a). **Remarks:** A small collection was made at this site.

MAWAO (MAWAU) ESTATE. Immediately S of Membakut town on a line with the left bank of the Membakut River (ca. 5°27'N 115°46'E). The Paper-Beaufort Highway crosses the Mawao River at 5°27'21"N 115°46'50"E. **Elevation:** Sea level. **Habitat:** Oil Palm, old and new rubber, swamp forest, and scrub. **Sources:** DMB, intermittently 1958-62, Dec. 1984, Jan.-Mar. 1986.

MANGKATAI (MEGATAI). Ca. 5 km N of Tambunan in Crocker foothills (5°39'11"N 116°17'47"E). **Elevation:** Ca. 500-1000 m. **Habitat:** 2° forest, bamboo and sapling thickets, and shifting agriculture. **Sources:** WFVZ, 18-29 Nov. 1981, 20-22 June 1983.

MELALAP. Site of a large plantation ca. 15 km NNE of Tenom (5°14'N 116°00'E). See Makaniton and Ulu Losan. **Elevation:** 100 m. **Habitat:** 1° and 2° upland forest and scrub, oil palm, rubber, and gardens. **Sources:** L.A. Charles, Apr. 1941 (RM); KVT, intermittently 1950-60s. **Remarks:** The railway was extended to Melalap in 1906 (Ibbotson in prep.).

MELIAU. A village (ca. 5°51'N 117°8'30"E) and river (5°52'N 117°13'E). Meliau also describes the general area from the Meliau-Labuk river junction and the route travelled by the BMNBE on their way to Mt. Meliau (Ensuan). **Elevation:** Ca. 60 m. **Habitat:** 1° lowland to upland forest, 1° and 2° riparian forest, 2° growth in the vicinity of Meliau village, and possibly forest on ultramafic soil. **Sources:** BMNBE, Apr.-May 1956. **Remarks:** Ultramafic-soil forest is suggested by Sim's description of stunted forest in the Mt. Ensuan area and by the presence of Grey-breasted Babbler (Sheldon 1987, Sheldon et al. 2009a).

MT. MELIAU (MELIAO). **Location:** A mountain ca. 23 km N of Telupid (5°51'N 117°07'E), between the Meliau and Ensuan rivers. FHS, RGM, and SM collected on a NE shoulder of Meliau (5°52'08"N 117°10'00"E) and in the Meliau River valley E of the peak (5°50'41"N 117°10'57"E). The British Museum collected in Kg. Meliau and along the Meliau River up to the summit of Mt. Meliau (which they called Ensuan). **Elevation:** 1336 m. FHS and RGM collected from 100-1067 m. **Habitat:** 1° highland to lower montane forest growing on soils derived from ultramafic rock. Much of the forest consists of pole-like trees and climbing bamboos. Below ca. 400 m the forest has been logged. Above ca. 900 m the forest is primary. Rivers and streams in the area are remarkably clear from lack of silt. Sims (Unpublished manuscript) described the forest as follows:

"Camp was established at 1,500 feet [ca. 500 m] on a saddle between Gunong Ensuan [=Mt. Meliau] and the main Meliau Range. The sides of Gunong Ensuan are steep and an

extensive area had been exposed by a land-slip or wash-out....Another area towards the other side of the saddle showed signs of similar erosion but there grasses had become established. No birds ventured out over this barren region except for a flock of *Hemiprocne comata* [Whiskered Treeswifts] which hawked for insects every evening around the camp. The forest surrounding the area was low, the girth of the trees seldom exceeding two feet [ca. 0.65 m]. The canopy was incomplete and the undergrowth dense. Above 2,000 feet [ca. 650 m] there were many small outcrops of rock and the covering of soil nowhere thick. At 3,000 feet [ca. 980 m], the average cloud base, the character of the forest changed completely and bryophytes were common. Wherever the soil was a little thicker there were trees less than twenty feet [ca. 6.5 m] high with roots often exposed over rocks, elsewhere there was impenetrable undergrowth, all being covered with mosses which remained wet in the cloud that shrouded the mountain top for most of the day. Progress was impossible without laboriously chopping a...path, through the undergrowth. Above 4,000 feet [ca. 1,300 m] there were only stunted trees about eight feet [ca. 2.6 m] high, usually growing closely together and interwoven with vines, with a dense undergrowth almost as high as the trees. At this altitude birds were uncommon and their calls rare. Collecting was difficult because the heavy cloud reduced visibility and if a bird was shot it could seldom be found in the tangled undergrowth if it fell more than two or three yards [meters] away from the path. Rain fell most afternoons and thunderstorms were common so adding to the burdens of collecting.”

Sources: BMNBE, 29 Apr. - 18 May 1956 (7-12 May on the mountain itself); SP, August 2004; RGM and FHS with SM, 22 May – 1 June 2006 (Sheldon et al. 2009a).

Remarks: The BMNBE used the name "Mt. Ensuan," but this does not appear on modern maps and its absence has led to confusion as to which mountain the British Museum explored. Specimen data with coordinates 5°51'N 117°08'30"E indicate that their Mt. Ensuan is Meliau. R. Sims' (unpubl. ms) description of the route taken by BMNBE corroborates this. The Expedition traveled up the Labuk and Meliau Rivers and then overland to "Mt. Ensuan". The only discrepancy is that Sims noted a summit elevation of "4,700 feet" [1,433 m], and Meliau is 4,383 feet [1,336 m]. Banks (1982:120) further confused the issue by stating that Ensuan is posted on maps as Mt. Mentapok, and this mountain is ca. 20 km [12 miles] SW of Mt. Meliau and 5188 feet [1581 m]. Smythies (1960) stated that Ensuan "(=Tonsuan on some maps)" is ca. 4,500-4,900 feet high [1,372-1494 m] and 6 miles [9.7 km] SW of Mt. Meliau. Among birds on Meliau are montane species (e.g., Chestnut-crested Yuhina and Temminck's Babbler, *Pellorneum pyrogenys* (Sheldon et al. 2009a), and the poor-soil specialist, Grey-breasted babbler, which was first collected in Sabah by the BMNBE at this site (Sheldon 1987).

MELOBANG (MALUBANG, MALLOOBANG). Site of swiftlet caves in the Marudu Bay area (6°53'30"N 117°02'30"E). **Remarks:** Caves also have been reported on the E side on Bukit Karamunting at Lokapas (6°53'N 117°14'E).

MEMBAKUT. A town developed on the railway 65 km SW of Kota Kinabalu (5°28'22"N 115°47'50"E) and the surrounding area from the coast to the Crocker Range foothills (Ulu Membakut). The Papar-Beaufort highway crosses the Membakut River at 5°28'17"N 115°48'02"E. Included under Membakut are several villages that have been worked by collectors and birders: Kg. Pimping, 5°30'N 115°46'E (WFVZ); Bandau, 5°29'22"N 115°48'27"E (YU); Kg. Gana, 5°39'38"N 115°49'03"E (DMB); and Kg. Sungai Damit, 5°30'55"N 115°49'47"E (DMB). See Binsuluk, Mawao, Mandangin, and Selagon. **Elevation:** Sea level. **Habitat:** Heath, beach strand, mangroves, swamp and

peatswamp forest, paddy, fallow paddy, rubber, and 1° dipterocarp forest (in Ulu Membakut). **Sources:** DMB, intermittently 1958-62, Dec. 1985, Jan. 1985, Jan.-Mar. 1986; SM, June 1971; YU, 21-26 Feb. 1977; WFFVZ, intermittently during 1983.

MEMPAKUL (MEMPAKOL). On the SW tip of the Klias Peninsula at the end of the road to the Labuan ferry (5°18'N 115°20'E). The town of Menumbok (5°18'N 115°22'E) is adjacent to Mepakul. **Elevation:** Sea level. **Habitat:** Sandy-mud beaches, beach strand, coconut plantation, scrub, and village. **Sources:** SM, 11 Jan. 1981; B&W, 5 Sept. 1984; DMB, 22 Dec. 1984; SM, Oct. 1991. **Remarks:** Mepakul was the capital of the former "Province Dent" (covering the western side of North Borneo; Daly 1888a,b), and where the telegraph extension from Labuan was first landed in Borneo in 1894. It was extended to Sandakan over the next three years (BNBH 1 May 1894 p. 101, 1 June 1894 pp. 142-144).

MENANGGUL (MENANGUL, MENUNGAL, MENANGOL, MENANGEL) RIVER. A black water river that flows through several small forest reserves, starting near Gomantong and entering the Kinabatangan at Sukau/Melapi (5°30'16"N 118°16'36"E). See Bod Tai. **Elevation:** Ca. 20 m. **Habitat:** 2° freshwater swamp, dipterocarp, and limestone forest. **Sources:** D. Hill and C. Hill, 13 Mar. 2009 (Hill and Hill 2010). **Remarks:** This river flows into the Kinabatangan near the Sukau Rainforest and Proboscis lodges and, thus, at the hub of the Kinabatangan tourist region. Bornean Ground Cuckoo occurs along the shore of this river near its junction with the Kinabatangan (Long and Collar 2002, Hill and Hill 2010).

MENDOLONG. The region of the Sabah Forest Industries' plantation between Sipitang and Tenom on the Mendolong River (4°52'N 115°42'E). See Lumaku. **Elevation:** Ca. 200-1300 m. Moyle and Hosner collected at 550 m. **Habitat:** An *Acacia mangium* plantation; also 2° scrub, logged and unlogged 1° upland to lower montane forest. (Wong 2003). **Sources:** UKMS, May 1987, Dec. 1987; UKMS-ANSP, 22 - 27 June 1989; SP, Nov. 1998; AMNH, KU, and SM, 15-18 Jan. 2005 (Sheldon et al. 2009a); D.F. Gawin, 27 June – 2 July 2010 (Gawin 2014). **Remarks:** UKMS students conducted bird and small mammal surveys in the plantation in the 1980s. Sabah Park staff collected White-rumped Shama at this site. **References:** Wong (2003).

MENGALUM (MANGALUM) ISLAND. 55 km NW of Kota Kinabalu (6°12'N 115°36'E). **Elevation:** Sea level. **Habitat:** Beach strand, swamp (with sago), heath grassland, enclosed heath forest, and enclosed good-soil forest. **Sources:** C. B. Kloss, 10-15 July 1928 (Kloss 1930b, 1931a); WFFVZ, 2-3 June 1983.

MENGGATAL. A town ca. 13 km NE of Kota Kinabalu (6°01'N 116°09'E). **Sources:** D.H. Johnson, Aug. 1951 (USNM); SM, Nov. 1970; J.C. and M.G. Pearson, 10 Apr. 1981 (pers. comm.); UKMS, Mar. 1988. **Remarks:** Johnson collected at "Menggatal Rubber Estate." Locally this is called Labao Estate and lies on the main road between Menggatal and Telipok (KVT). The Pearsons collected on the Menggatal River, presumably in mangrove.

MENKABONG (MANGCABOONG). A Bajau fishing village on a inland estuary (more like a lake), ca. 2 km SW of Tuaran (6°08'N 116°12'E). **Elevation:** Sea level. **Habitat:** Mangroves, estuary. **Sources:** D. R. Wells, 1 Nov. 1980; DMB, 18 Nov. 1990. **Remarks:** In the 19th Century, Mengkabong had a large population (estimated ±5000). The chief of Menkabong at that time exerted considerable influence on the W coast. Some early explorers (e.g. Spenser St John) landed at Gantisan in Sapangar Bay, crossed the short neck of land along the coast and then took boats across the Menkabong estuary to reach Tuaran and then Tamparuli. This route avoided shallow bars in the Tuaran and Menkabong rivers. Until the road was built from Jesselton to Tuaran in the 1920s and cars arrived, this overwater route was the preferred way to reach Tuaran and Tamparuli.

MENUNUK. Padas River near Tenom (5°19'18"N 115°45'41"E). **Habitat:** "1° forest." **Sources:** SM, 30 Dec. 1981.

MERABALI. Unknown, possibly Tanjung Merabai (6°22'N 116°20'E) or Merabau (6°51'N 116°54'E), all between Kota Belud and Kudat. **Sources:** A.H. Everett, Dec. 1892 (ANSP).

MERINTAMAN-MENGGALONG FR. A forest reserve on the SW coast near Sipitang, so named for its two bordering rivers: Menggalong (Mengalong, Mengalung) to the S (5°01'N 115°28'E) and Merintaman to the N (5°02'N 115°32'E). Two rivers within the reserve are the Marantongan and Sebuoh. **Elevation:** Sea level. **Habitat:** 1° peatswamp forest, fire-padang kerangas, scrub. Until the early 1980s, the reserve held the last good stand of coastal Ramin swamp forest in Sabah (W. Meijer, pers. comm.). Fruiting *Eugenia* (jambu) trees in the kerangas attracts large numbers of birds during Feb. to Apr. The forest was cleared in the early 1980s for a mill. See Binsuluk, Membakut, and Selagon for similar habitats. **Sources:** H. Low, ca. 1870s (Sharpe 1879a); H. T. Ussher's collectors, during May 1876 - Mar. 1877 (Sharpe 1879a,b); A.H. Everett, no date (Everett 1889); J. Waterstraat, Apr.-Aug. 1899 (Blasius 1901); SP Survey, 18-22 Mar. 1975 (Wells et al. 1975, Wells 1976); WFWZ, 14-16 June 1983 (Sheldon 1987, Sheldon et al. 2014). **Remarks:** Waterstraat collected on the Menggalong River during the spring and summer of 1899. Low obtained a few birds along the Menggalong River as well. Among birds collected in 1899 was Bornean Ground Cuckoo (Long and Collar 2002). It is home to two of the most habitat-specific bird species in the state, Hook-billed Bulbul and White-throated Babbler (Sheldon 1987, Holmes and Wall 1989). The Merintaman-Menggalong peatswamp forest was protected as a National Park in 1978, degazetted in the early 1980s, and then re-gazetted (minus the Merintaman forest) as a VJR in 1984. **References:** Scott (1989).

MERISULI FR. A VJR of 552 ha about 19 KM NE of Lahad Datu on the N side of the Segama River (5°08'30"N 118°8'15"E). See Tempadong. **Elevation:** 0-183 m. **Habitat:** Heavily degraded limestone flora surrounded by oil palm. **Remarks:** Location of Bukit Tempadong, and important commercial limestone site.

MERUTAI (MEROTAI, MORUTAI, MALOTAI) BESAR. A village (4°25'N 117°46'E) and an estate (4°24'N 117°49'E) on the Merutai River NW of Tawau. See Bal

Estates and Ulu Merutai. **Habitat:** Mainly logged and unlogged forest at the time of the MCZ visit; now gardens and oil palm. Logged by Masuda 1903; later by North Borneo Trading Co. 1920-1940 (Ibbotson 2014:105, 232, 277, 303). **Sources:** H.G. Deignan (MCZ), June-July 1937; BMNBE, June 1956; D.F. Gawin, 4 Aug. 2010 (Gawin 2014). **Remarks:** The original population of the village on the coast was mostly Tidoeng from the Tarakan area of Indonesia, then Javanese brought in by the Japanese to work rubber from 1915-1945. Ibans from Sarawak acquired 15 acre plots for oil palm in ca. 1963.

MILIAN (MELIAN) RIVER AND VALLEY. The main northern tributary of the Kinabatangan running from the Maitland Range to Kuamut (5°13'N 117°25'E). The Milian Valley refers to the physiographic region separating the Kuamut and the Labuk highlands, and includes Mananam Plain (5°21'N 116°53'E), a flat and partially alluvial area E of the Tongod River (Collenette 1963). Garcia worked two sites: Ka-Karis, the location of which is uncertain, but is likely to be Karis-Karis (Kariskaris) in the Deramakot FR (5°16'N 117°27'E), and Tongod (5°16'N 116°58'E). WWFM surveyed on Mananam Plain and in the Milian Valley (exact site unspecified). See Kinabatangan, Labau, and Langut Rivers, and Ulu Tiulon. **Elevation:** Ca. 50-150 m. **Habitat:** In Garcia's day probably some 1° lowland forest. WWFM found logged lowland forest and shifting cultivation. **Sources:** ADG, 20-21 Oct. 1963 (MCT, SM); WWFM, 29 Apr. - 1 May, 22-24 Nov. 1980.

MOKODAU RIVER. A river in the E foothills of Mt. Kinabalu and N of Poring (ca. 6°07'N 116°40'E). **Habitat:** 2° forest. **Sources:** SM, Nov. 1976.

MOLLEANGEN ISLAND. A small island (1.5 km²) off the S tip of Banggi Island in N Sabah (7°05'N 117°02'E). **Elevation:** Sea level to 120 m. **Habitat:** Mostly coconut plantation, some forest in an elevated area in the SE. **References:** Nor (1996).

MOUNT CONNER FOREST RESERVE. A small Class I FR near Semporna (4°23'57.08"N 118°34'8.98"E).

MOUNT HATTON FR. A Class I FR of 8,550 ha that forms the core area of Tabin Wildlife Reserve, ca. 45 km NE of Lahad Datu (5°13'N 118°41'E). See Tabin Wildlife Reserve and Tabin FR. **Elevation:** Sea level to 570 m. **Habitat:** Mainly 1° lowland dipterocarp forest with a small patch of swamp forest in the W section. **Remarks:** In addition to lying within Tabin Wildlife Reserve, Mt. Hatton FR encompasses one of the two blocks of the Tabin VJR.

MUMIANG. At the mouth of the Mumiang and Kinabatangan Rivers ca. 15 km E of Sandakan (5°49'N 118°19'E). **Elevation:** Sea level. **Habitats:** Tidal flats, estuary, and mangroves; includes an island where shorebirds roost. **Sources:** SWD, 4-11 July 1984; B&W, intermittently 27 Sept. - 23 Oct. 1984; DMB, 15-17 Dec. 1984, Mar. 1986, 1989, 1990. **Remarks:** B&W surveyed and banded shorebirds at this site for INTERWADER.

MURUK. A village ca. 10 km E of Ranau on the Ranau-Telupid road (5°58'N 116°45'E). **Elevation:** 300-450 m. **Habitat:** 1° and 2° forest. **Sources:** H. Tsen (SM), May-June 1970.

MURUK MIAU. In SW Sabah near Long Pasia (4°22'N 115°50'E). **Elevation:** 1100-2083 m. **Habitat:** 1° oak forest, with a 30 m canopy, disturbed in late 1998 or early 1999 by logging. **Sources:** SM 16-25 Apr. 1999. **Remarks:** The museum collected 57 birds (23 species), as well as mammals and frogs. Among the birds was Whitehead's Broadbill.

NABAWAN. A town near Sapulut in south-central Sabah (4°42'N 116°29'E). **Elevation:** 300m. **Sources:** SM, May 1998. **Remarks:** Sabah Museum has a specimen of Bornean Barbet from this site.

NEXUS KARAMBUNAI RESORT: (6°06'N 116°06'E). **Reference:** Phillipps and Phillipps (2014: 328).

NILAU RIVER. Cited by Gore (1968) as a site for Palm Swifts. No data or references.

NORTHERN BOUNDARY. The boundary between Sabah and Kalimantan. **Sources:** Dutch Boundary Commission, 1912 (Kloss 1930a). **Remarks:** Many of the birds collected by the Commission are in the Bogor Museum.

OBANG-OBANG. Site of limestone swiftlet caves in the Ulu Melikop (5°03'39"N 116°39'39"E). **Elevation:** 650 m. **Sources:** Daly (1888a,b), Sept. 1884. **Remarks:** Daly traveled for three days up the Melikop River from Pinangah to reach this site. He said Obang-obang mountain runs N-S and is ½ mile in length; the summit was 2150 feet (655 m). **References:** CMF.

PAAL RIVER. A tributary of the Padas ca. 13 km S of Tenom (5°01'N 115°55'E). **Elevation:** Ca. 300 m. **Habitat:** Unspecified, but likely to have been 1° forest or shifting cultivation. **Sources:** J. Comber, Jan. 1966 (Gore 1968).

PABABAG ISLAND FOREST RESERVE. A 911 ha Class I FR on Pababog Island ca. 12 km NW of Semporna (4°32'30"N 118°29'30"E). **Remarks.** This reserve includes a limestone site, but without commercial swiftlet nesting (L&K).

PABABOLA CAVE. An important nesting site for Edible- and Black-nest swiftlets in the Segarong FR (4°33'30"N 118°24'15"E). See Segarong FR. **Elevation:** Sea level, with limestone hills reaching 300 m. **Habitat:** Limestone, 2° scrub, mangrove, and nipah. **Sources:** CMF, 13-18 Jan. 1983. **References:** Daly (1888).

PADANG TERATAK BIRD SANCTUARY. See Padas Damit.

PADAS DAMIT. A village on the Klias Peninsula ca. 40 km WSW of Beaufort on the Padas Damit River (5°20'N 115°32'E). See Masikuan. **Elevation:** Sea level. **Habitat:** Fresh water marsh, sago, swamp forest, mangrove, and nipah. **Sources:** WFVZ,

intermittently 26 May - 5 June 1983; B&W, 28 Aug., 7-9 Dec. 1984; DMB, 23-24 Dec. 1984, 19-20 Jan., 16-17 Feb. 1986; D. Parish, 21 Feb. 1985 (unpublished WWFM report); R. V. Lansdown, Sept. 1986 (Lansdown 1989). **Remarks:** SW of the village is the Padang Teratak Bird Sanctuary (5°19'45"N 115°31'06"E). This is a large, open, buffalo-grazed marsh, with swamp forest growing on island-like outcrops of high ground. It is known for attracting wintering waders and ducks and has an egret roost (Lansdown 1989). **References:** Scott (1989).

PADAS DAMIT FR. A large amenity reserve on the Klias Peninsula, centered on the Klias River (5°23'N 115°30'E). **Sources:** SP Survey, 23-25 Mar. 1975 (Wells et al. 1975, D. R. Wells, pers. comm.).

PADAS RIVER. The main river draining the interior of SW Sabah into Brunei Bay via Tenom and Beaufort (5°12'N 115°34'E). See Beaufort, Klias Peninsula, Padas Damit, Pegalan River, Rayoh, Saliwangan, Spong, Tatalahan Caves, Tenom, and Tomani. **Sources:** J. Whitehead, 2-17 June 1885 (Whitehead 1893); A.H. Everett, May 1893, Oct. 1893 (ANSP); J. Waterstraat, Sept. - Dec. 1897 (Smythies 1960); SP Survey, 23-25 Mar. 1975 (Wells et al. 1975, pers. comm.). **Remarks:** Early exploration of the Padas was described by Daly (1888a). A bridle path following the N bank of the river through the Padas Gorge was constructed to Tenom in 1890. This was replaced by the Beaufort-Tenom railway, completed in 1905, which is still operational. This railway allowed ornithologists to reach primary and rich secondary forest along the river between Beaufort and Tenom (e.g., at Rayoh and Saliwangan) until about 1980, when the forest was logged and subsequently burned. Whitehead collected briefly along the "upper Padas" before exploring Mt. Kinabalu (Sharpe 1889a, Whitehead 1893). He appears to have reached Padas Gorge, just below Tenom.

PAITAN. A village on the Paitan River in NE Sabah (6°23'N 117°22'E). **Elevation:** Ca. 50 m. **Habitat:** 1° and 2° forest in Everett's day; now logged forest, 2° forest, and oil palm. **Sources:** A.H. Everett, July 1892 (Smythies 1957, AMNH and ANSP); W. Frost, 1938-1939 (Smythies 1957); KVT, intermittently 1950s-60s; SM, Apr. 1997. **Remarks:** Everett collected Bornean Peacock-Pheasant (*Polyplectron schleiermacheri*) and Long-billed Partridge (*Rhizothera longirostris*) at Paitan (Davison 2008). Historically, the forests accessed by the Paitan and adjoining Kaindagan and Sugut rivers were the principal source of Borneo's camphor. Extracted (in this area) from *Kapur minyak* and *Dryobalanops beccarii*, camphor had been traded from Borneo for over 1000 years, and associated rivers were known by name by Arab traders in the 10th Century and Spanish and Portuguese traders in the 16th Century (Ibbotson 2014:18-26).

PANAN. Unknown, but possibly Panar Laban on Mt. Kinabalu, as Harrisson visited the mountain at that time (Harrisson 1964). **Sources:** T. Harrisson, 11 Feb. 1952 (SRM).

PANDASAN (PANDASSAN, PINDASSAN, PINDUSAN). A village on the Pandasan River at the N end of the Kota Belud Bird Sanctuary (6°28'N 116°32'E). It is located at Mile 61 on the Kudat Road near Rampayan Beach (Phillipps 1970, A. Lamb, pers. comm.). Tapinatan appears on maps at the same locality. Sabah Museum collected at a

site called "Kampung Bungoliu, Pandasan." The Pandasan River mouth is 6°28'E 116°30'N. See Kota Belud Bird Sanctuary. **Elevation:** Sea level. **Habitat:** 1° riverine forest (probably now destroyed), 2° forest, fruit trees, gardens, coconut, and riparian growth. **Sources:** Q. Phillipps, May and July 1970 (Phillipps 1970); T. Miyamoto, 8-13 Aug. 1969 (Miyamoto 1971, SM); SM, Mar. 1969, Apr.-May 1970, Oct.-Nov. 1971. **Remarks:** Miyamoto (1971) described the Pandasan area as "lovely woods and streams" and KVT as "charming."

PANGAKAYAN. Just S of Papar along the coast (5°42'N 115°54'E). **Habitat:** Swampy land flanked by dying trees. **Sources:** DMB, intermittently 1958-62 (Smythies 1963). **Remarks:** DMB found a roost at this site with breeding Purple Herons (*Ardea purpurea*).

PANGAS RIVER. At the base of a ridge NE of Mt. Trus Madi (6°32'N 116°34'E). **Sources:** UKMS, 8-24 May 1991 (Stuebing 1991, pers. comm.).

PAPAR. 33 km SW of Kota Kinabalu (5°44'N 115°56'E). Included under this heading are: Manggis, 6 km inland (5°42'N 116°00'E), Limbahau (5°43'N 115°57'E), and Papar beach (Pantai Manis). See Benoni River, Pangakayan, Layang Island. **Elevation:** Sea level to ca. 50 m. **Habitats:** Paddy, fields, ponds, mud and sand flats, mangrove, estuary, and beach strand. Ulu Papar includes rubber and some forest. **Sources:** A.H. Everett, no date (Everett 1889); DMB, intermittently 1958-1962, 1984-1990 (Smythies 1981); KVT, intermittently 1960s, particularly at Limbahau during 1966-1967 (Smythies 1981); SM and MAPS, intermittently 1964-1981; T. Miyamoto, 17-23 Aug. 1969 (Miyamoto 1971, SM); YU, 24 Apr. 1977; SP Survey, 26 Mar. 1975 (Wells 1976); D. R. Wells, 2, 4 Nov. 1980 (Wells 1981); WFVZ, intermittently 1981-1983; B&W, Sept., Nov., Dec. 1984; R. V. Lansdown, Sept. 1986 (Lansdown 1989); J. Eaton, 14 Oct. 2009 (Robson 2009b). **Remarks:** Papar was the third outpost of Alfred Dent's British North Borneo Provisional Association. A.H. Everett was landed here off the steamer *America* in 1878. Thereafter, Papar became an important provincial administrative center. The Jesselton-Beaufort railway passed through the town in 1901-2. Sabah Museum banded birds for MAPS in Papar during 1964-1967. Lansdown located a communal egret roost ca. 1 km NW of Papar center in nipah swamp along a tributary of the Papar River.

PARANG BESAR. **Sources:** L.A. Charles, Mar. 1941 (RM).

PEGALAN (PAGALAN) RIVER. The main river draining the E side of the Crocker Range through Sinsuran, Tambunan, and Keningau to Tenom, where it joins the Padas River (5°07'N 115°57'E). See Tambunan, Keningau, Melalap, and Tenom. **Remarks:** Early exploration of the lower Pegalan was described by Daly (1888a).

PENAMPANG BYPASS RICE FIELDS: Rice paddies along the "new" road from Kota Kinabalu to Penampang (5°55'N 116°05'E). **Sources:** D. Degullacion and T. Foo, 28 Oct. 2008 (Robson 2009b); Z. Hazim and K. Madoya, 16 Apr. 2011 (Robson 2012). **Remarks:** A popular birding spot because the fields are fairly close to Kota Kinabalu.

PIGTON. A “limestone hill, Darvel Bay,” with swiftlets, listed without particulars by Daly (1888b). This may refer to Pigton Hill, which Daly mentioned in his text is “behind” (west of) Madai.

PILAJAU. A village on the Klias Peninsula (5°25'N 115°39'E). Source: D.F. Gawin, 8 June 2010 (Gawin 2014).

PINANGAH (PENUNGAH) RIVER. A major tributary of the Milian River running NE on the W side of Maliau Basin. It joins the Milian at the town of Pinangah (5°12'37" N 116°50'E). **Elevation:** ca. 70 m.

PITAS. A town on the Benkoka (Bankoka) River on the E shore of Marudu Bay northern Sabah (6°42'N 117°01'E). **Remarks:** An important centre for tobacco plantations, ca.1900.

POCH. Unknown. Cited as "Poch, Kinabalu". **Sources:** A.H. Everett, Aug. 1892 (ANSP).

PORING HOT SPRINGS. On the SE slopes of Mt. Kinabalu, 15 km N of Ranau (6°03'N 116°42'E). **Elevation:** 500-1000 m. **Habitat:** 1° highland and lower montane forest, 2° highland forest and scrub. **Sources:** B.E. Smythies (Royal Society), July 1961 (Smythies 1964b); Medway (University of Malaya, Royal Society), Apr.-May 1964 (Cranbrook, pers. comm.); Q. Phillipps, Aug. 1970 (Phillipps 1970); J. and Q. Phillipps, Sept. 1969, Feb.-Mar. 1970 (Phillipps and Phillipps 1970); SM, Feb. 1970, Sept. 1978; YU, 25 Feb. - 2 Mar. 1977 (Jenkins and deSilva 1978); WFVZ, intermittently from 1981-83; B. King and D. Yong (pers. comm.), Feb.-Mar. 1982, July 1983, Aug.-Sept. 1986; J. Wall and D. Yong (pers. comm.), 21-22 July 1985; DMB, intermittently 1986-1990; UKMS, Nov. 1987; A. Biun and Park staff, 1996 (Biun 1999); UNIMAS, July 1996 (Rahman 2002); Kimura et al. (2001), July 1996-June 1997; C. Robson and C. Scott, 11 April 1996 (Robson 1996). **Remarks:** Poring is arbitrarily separated from the "East Ridge" (see above) approach to the summit of Kinabalu at ca. 1000 m. **References:** Corner (1964), Jenkins and de Silva (1978).

PULAU TIGA PARK AND THE KALAMPUNIAN ISLANDS. Pulau Tiga lies 55 km SW of Kota Kinabalu. It consisting of two islands: Tiga (5°43'N 115°39'E) and Kalampunian Damit (Kalampunian Kecil or Snake Island) (5°46'N 115°41'E). A third island, Kalampunian Besar (5°45'N 115°40'E), was present until the mid-1980s, but has subsequently disappeared. Larai-Larai is a beach on Pulau Tiga. **Elevation:** Sea level. **Habitat:** Beach strand, mangrove, and closed-canopy forest. Kalampunian Besar was beach and strand. Kalampunian Damit is almost entirely covered with Pisona trees. **Sources:** J. Whitehead, 21-28 Apr. 1886 (Sharpe 1889d, Whitehead 1893); A.H. Everett, Apr. 1887, Apr. 1892 (Everett 1887, 1889, ANSP); DMB, intermittently 1958-62, 1984-86; SM, 24 Mar. 1971; WFVZ, 10-15 Jan. 1982, 11-13 May 1983; UKMS, June 1982 and in 1986 (Stuebing and Zazuli 1986, Stuebing et al. 1990); Q. and K. Phillipps and J. Schmitt, 16-19 Apr. 1985 (Phillipps 1985a); C. Byers and C. Robson (1992), 17 Feb. 1992; 16 Oct. 1996 and 22 Oct. 1997 (Dymond 1999); A.-H. Ahmad, Aug. and Sept.

1998 (Ahmad 1999); D.F. Gawin, 15-18 June 2010 (Gawin 2014). **Remarks:** The Park was founded in 1978. Kalampunian Damit is also called Snake Island for its abundant sea snakes. **References:** Phillipps and Phillipps (2014: 330)

PULUN. A limestone site in the Sabah Forest Industries concession near Sipitang (4°46'15"N 115°39'45"E). No commercial swiftlet nesting at this site (L&K).

PUN BATU OR POHON BATU. On the upper reaches of the Talankai River which flows to Sapulut (4°48'00"N 116°12'00"E). **Remarks:** A cave site with nesting Edible-nest Swiftlets (CMF).

PUTATAN (POOTATAN, PATATAN). 8 km SW along the coast from Kota Kinabalu (5°53'N 116°02'E). **Elevation:** Sea level. **Habitat:** Heath, scrub and freshwater marsh consisting mostly of *Eleocharis variegata* in deep water and *Scleria* spp. in shallow water (J. Beaman, pers. comm). **Sources:** WFVZ, intermittently from 1981-1983 (Marin and Sheldon 1987).

QUOIN HILL COCOA ESTATE AND RESEARCH STATION. Ca. 25 km NE of Tawau (4°25'N 118°01'E). We include under this heading Ulu Balung Cocoa Estate (4°22'N 118°08'E) and the SAD Cocoa Research Station where MCT and ADG collected. See Tawau Hills Park, Bal Estate, and Apas-Balung Area. **Elevation:** Maximum elevation 533 m, but most records come from ca. 250 m. **Habitat:** During the 1960s, 1° and 2° upland forest and scrub, abaca, and cocoa shaded by *Trema orientalis*. **Sources:** MMN, June 1961 - Feb. 1962; MCT, July-Dec. 1962; ADG, Apr.-July 1963; KVT, Aug. 1966. **Remarks:** MCT and ADG were based at two cocoa plantations, Quoin Hill Cocoa Research Station and Ulu Balung Cocoa Estate. Most of their work centered at the Cocoa Research Station, where they collected in cocoa and adjacent forest. They also collected in areas specifically designated as Ulu Balung and Ulu Apas. KVT visited Quoin Cocoa Estate, which was owned by the Bombay-Burma Co.

QUOIN HILL FR. A small Class I FR just E of Tawau Hills Park (4°25'N 118°01'E). See Quoin Hill Cocoa Estate and Tawau Hills Park.

RAMPAYAN. A village and beach at the N end of Tempasuk Plain (6°32'N 116°31'E). See Pandasan.

RANAU. A major town ca. 15 km SW of Kinabalu Park headquarters (5°58'N 116°41'E), including Kg. Sinarut Baru (5°57'N 116°40'E). See Bundu Tuhan, Mt. Kinabalu, Kundasang, Mokudau, Muruk, Poring, and Pinosuk Plateau. Elevation: 550 m. **Habitats:** Suburban, village and garden. **Sources:** T. Harrisson, Feb. 1952, 9 Dec. 1964 (Fogden 1965; SRM); NAMRU, Sept. 1960; F. Gudin, 12 July 1999 (Biun et al. 2006). **Remarks:** Ranau is occasionally cited as the locality for work done in the surrounding hills. F. Gudin collected an Eastern Grass Owl (*Tyto longimembris*) at this locality.

RANKAM RIVER. In the Tambunan district (5°50'N 116°25'E) (Stuebing 1991).

RAYOH. A station on the Beaufort –Tenom railway, on the N bank of the Padas River just below the gorge at “mile 75” from Jesselton (ca. 5°12'38"N 115°52'45"E). The Rayoh River flows into the Padas here from the N. **Elevation:** Ca. 60 - 600 m. **Habitat:** Narrow strip of flat land rising steeply from the river to 1000 m to the N and S. Likely to be 1° upland forest affected by shifting cultivation near the river 1920s. 1° forest in the hills beyond. **Sources:** C. B. Kloss and Mengga, June 1928 (Chasen and Kloss 1930a). **Remarks:** An early reference to Rayoh as made by Daly (1888a). A fortified blockhouse later used as a resthouse was built on this site, ca.1890, before the railway was completed. The Raffles Museum has many specimens collected at Rayoh.

RINANGISAN. In the Crocker Range 60 km S of Kota Kinabalu at the highest point on the Kimanis-Keningau road (5°29'N 116°03'E). **Elevation:** 1050- 1325 m. **Habitat:** 1° and 2° montane forest, moss forest, and a helicopter pad. **Sources:** WWFM, 26 Sept. - 6 Oct. 1981; WFFVZ 18 Mar. - 17 Apr. 1983, 25-28 June 1983; CMF, 17-18 May 1984 (SWD). **Remarks:** Davies and Payne refer to this area as "Ulu Kimanis." The WFFVZ group made several interesting elevational, behavioral, and migrational observations here during the height of the 1983 El Niño drought.

RUMIDI. On the Labuk River (5°56'N 117°17'E). **Habitat:** A cocoa estate near 1° lowland forest, some of which may be growing on ultramafic soils. **Elevation:** Ca. sea level. **Sources:** KVT, 7 Mar. 1966. **Remarks:** Thompson observed Hook-billed Bulbul at this site.

SAHABAT. Ca. 80 km E of Lahad Datu on the coast (5°04'N 119°03'E). **Elevation:** Sea level. **Habitat:** Heavily logged lowland forest and oil palm plantation. **Sources:** D. R. Wells, J. Payne, and C. Wells, 28-31 July, 11-19 Sept. 1987 (Wells and Francis 1988, D. Wells pers. comm.); Felda Plantation crew, July 2003, Nov. 2004, Jan. 2005, and March 2013 (Hamid et al. 2008, Abidin et al. 2014). **Remarks:** Hamid et al. (2008) reported on Eastern Grass Owls and Abidin et al. (2014) on Black-winged Kites (*Elanus caeruleus*) in the oil palm plantation.

SABAH SOFTWOODS PLANTATION. At the Brumas Timber Camp ca. 75 km NW of Tawau (4°37'N 117°45'E) along the Umas Umas (4°22'N 117°44'E) and Gumpal (4°40'N 117°36'E) rivers. See Brumas. **Elevation:** 150-300 m. **Habitat:** At the time of the WFFVZ visit, Sabah Softwoods was ca. 30,000 ha of exotic tree plantation, comprising mainly *Albizia falcataria*, *Eucalyptus deglupta*, *Acacia mangium*, and *Gmelina arborea*. The oldest stands were established in 1974, ca. 7-8 years at the time of the 1982 study (Mitra and Sheldon 1993), and have been subsequently harvested on a rotation of 8-10 years. Thus some areas are now in the 4th rotation. There was also some cocoa and coffee shaded by *Eucalyptus* and *Albizia*. In 1982, the plantation was adjacent to a large area of recently logged and some unlogged 1° upland forest. By 2005, the industrial trees were mainly *Eucalyptus deglupta*, and a considerable area of the original tree plantations had been converted to oil palm. The area surrounding the plantation was entirely oil palm (Sheldon et al. 2010). **Sources:** WWFM, 26 June - 6 July 1981 (Davies 1981, Davies and Payne 1982); WFFVZ, 26 May - 27 July 1982 (Mitra and Sheldon 1993); UKMS, Sept. 1984; LSU, 23 June – 12 July 2005 (Sheldon et al. 2010, Sheldon and Styring 2011,

Styring et al. 2011). **Remarks:** Davies of the WWF surveyed large mammals and birds (including by netting) in *Albizia*, *Eucalyptus*, and *Gmelina* stands. WFFVZ spent several weeks censusing birds in different age groups of *Albizia* to study serial community change. WFFVZ also collected specimens in the *Albizia* for about 1 month. In 2005, LSU surveyed birds in *Albizia*, *Acacia mangium*, oil palm, and logged forest to assess bird communities in different plantation types and to see how much the bird community had changed in the plantation since 1982. **References:** Duff et al. (1984), Gasis (1984), Stuebing (1985), Stuebing and Gasis (1989), and Senior et al. (2013).

SAINT LUCIA (SIBUKO) BAY. The body of water outside Tawau Harbor and SW of Semporna (4°00' 118°26'E).

SALIWANGAN. A village and station on the Beaufort-Tenom railway on the Padas River at "Mile 65" from Kota Kinabalu (5°16'22"N 115°48'08E). YU and WFFVZ collected from a small house at 5°16'46"N 115°48'13"E. **Elevation:** 35-200 m. **Habitat:** 1° and 2° forest and scrub, riparian forest, and overgrown rubber. Now much of the area is oil palm. **Sources:** L.A. Charles, Mar. 1941 (RM); YU, Dec. 1976 - Jan. 1977; WFFVZ, 26 Aug. - 3 Sept. 1981, 10 Feb. - 16 Apr. 1983. **Remarks:** During the YU expedition, substantial stands of 1° upland forest existed on both sides of the river. A notable feature of this forest was the presence of Helmeted and Rhinoceros hornbills. The forest was severely logged in ca. 1979-1980 and subsequently the area burned.

SAMANTOLANG. In the Ulu Serudong (ca. 4°23'N 117°02'E). **Elevation:** Ca. 500 m. **Habitat:** 1° upland forest. **Sources:** WWFM, 10-19 July 1980.

SAMAWANG AND SAMAWANG RIVER. 40 km NW of Sandakan (5°55'N 117°46'E). **Habitat:** Although Chasen and Kloss do not specify habitat, from their collections it appears that they worked in 1° lowland forest. ADG collected primarily at Kuala Samawang, i.e., in mangrove and open areas. **Sources:** F.N. Chasen and C. B. Kloss, July 1927 (Chasen and Kloss 1930a); ADG, Sept. 1963 (MCT, SM).

SAMBULYAN. A limestone site near Sapulut (4°43'30"N 116°33'30"E). No commercial swiftlet nesting at this site (L&K).

SANDAKAN (ELOPURA) 5°50'N 118°07'E. Precise locations of old collecting sites are often unclear. Ryves collected eggs and birds at three localities (Gibson-Hill 1949b): Bai Island (5°46'N 118°06'E); Batang River (5°55'N 118°02'E) on Sandakan Estate, which was 11 miles [18 km] from Sandakan town and had a "bit of forest" in the its vicinity (KVT); and Tanjung Teluk, where he found Philippine Megapode (*Megapodius cumingii*) nesting. The Crane Pacific Expedition collected at the mile 8 (Batu 8) on the Labuk (main Sandakan) Road (Davis 1962). Harrison and the BMNBE collected at Sandakan airport, ca. 14 km W of Sandakan town. SWD collected a few specimens at Kg. Manila at mile 12 on the main Sandakan road and at Bukit Sino-sino. Dale Clayton's group studied Glossy Swiftlets at "Mrs. Chong's" house, mile 10 on the Sandakan Road (5°53'N 118°00'E), where a colony had been in place for at least 30 years. At mile 13, along the driveway to the Anglican church (5°53'20"N 117°57'28"E), is a tree with Baya

Weaver (*Ploceus philippinus*) nests. See Bai Island, Berhala Island, Betotan, Garinono FR, Gum Gum FR, Labuk Road FR, Samawang River, and Kabili-Sepilok FR.

Elevation: Ca. sea level to 100 m. **Habitat:** Usually unspecified. Certainly many of the 19th and early 20th century records are from 1° lowland dipterocarp and riparian forest, which was extensive in the vicinity of Sandakan before the Second World War. Until 1955, 1° forest began at mile 15 on the main road to Telupid (KVT). Deforestation continued into the 1960s (J. Payne, pers. comm.). The only substantial 1° lowland forest left is at Kabili-Sepilok FR. The region around Sandakan airport in the 1950s (and today) is grassy fields, plantation, and 2° growth. Sandakan harbor is lined with the mangroves of the Elopura Mangrove FR. **Sources:** W.B. Pryer, 1878 - ca. 1899 (Sharpe 1881, Tregonning 1954); Marchesa Expedition, Apr.-May 1883 (Guillemard 1885, 1889, Chasen and Kloss 1930b); J. Whitehead, 10-28 Apr. 1885 (Sharpe 1889a-d, Whitehead 1893); C.F. Adams, May 1887 - Feb. 1888 (Elliot 1890, 1891, USNM); J.C. Prakke, ca. 1890 (G.F. Mees, pers. comm.); P. Bartsch, 1-3 Mar. 1908 (Mearns 1909); Crane Pacific Expedition (W.A. Weber and F.C. Wonder), 3-7 July, 17-26 Aug. 1929 (Mayr and Camras 1938, Davis 1962, FMNH); H.G. Deignan (MCZ), June 1937; V.W. Ryves, 27 Mar. - 24 Aug. 1938 (Gibson-Hill 1949b, 1952, personal notes, RM); D.D. Davis (FMNH), Aug. 1951 (FMNH); T. Harrisson, Jan. and Feb. 1952, July 1964, Apr. 1965 (Harrisson 1955a, Fogden 1965, SRM); BMNBE, Apr.-May 1956; WFVZ, intermittently 1981-1983; SWD, intermittently 1983-1985 (SWD); DMB, intermittently 1984-1990; D. Clayton, T. Jones, and R. Chong, Nov. and Mar. 1994, Aug. and Sept. 1995 (e.g., Clayton et al. 1996, Lee et al. 1996, Tompkins and Clayton 1999, Price et al. 2004). **Remarks:** The town was founded by William Pryer in 1879, after the first settlement at Kg. German was destroyed by fire. Later the town was developed by BNBC as the capital of North Borneo. **References:** Pryer (1881).

SAPONG ESTATE. Ca. 5 km S of Tenom (5°04'N 115°57'E). A BNBC government estate and experimental garden established in ca. 1890 to plant tobacco. Later it was converted to rubber. See Benoni River. **Habitat:** No details are available, but KVT sighted a Hook-billed Bulbul here, suggesting swamp or other poor-soil forest. **Sources:** J. Comber, 1960s (Gore 1968, Comber 1971); KVT, Mar. 1966. **Remarks:** Comber was manager of the estate in the 1960s. He recorded Long-billed Partridge (Davison 2008)

SAPULUT (SAPULOT, SEPULOT). A town in south-central Sabah on the Sapulut River (4°43'N 116°29'E). Sapulut commonly refers to the entire Sapulut River drainage. The river drains southward into the Sibuku River, which flows E to the sea N of Tarakan, Kalimantan. S. Ambi collected at "km 108 on the Keningau-Sapulut road." See Bandakan, Batu Punggul, Labau River, Maliau Basin Conservation Area, Nabawan, Sambulyan, Simatuoh, Ulu Sabutan, Ulu Samuran, Ulu Sapulut, and Ulu Tiulon. **Elevation:** Ca. 200-400 m. **Habitat:** In 1984, considerable 1° forest still existed; since then the area has been completely logged. **Sources:** S. Ambi (SWD), 10-12 Dec. 1984 (SWD).

SARUPI. A limestone site near Kuamut (5°14'00"N 117°28'30"E). No commercial swiftlet nesting at this site (L&K).

SAYAP OR SAIAP. On the NW slopes of Mt. Kinabalu along the Penataran River (6°9'51" 116°33'55"E). See Malangkap. **Elevation:** ca. 1000 m. **Habitat:** 1° lower montane forest (in the Park), bordering on shifting cultivation. **Sources:** UKMS, Feb. 1991 (R. Stuebing, pers. comm.); Sabah Parks 1992 (Rahman et al. 1998); RGM, July 2000. **Remarks:** This site is close to Malangkap, where Whitehead collected type specimens of Fruithunter and Whitehead's Spiderhunter. Sayap features a rich lower montane avifauna (including Whitehead's and Long-tailed broadbills), but is remarkably lacking in lowland forest species, probably because of long-term shifting agriculture below the Park. The Park is developing the area for the public, and it is an excellent site for research. **References:** Stuebing (1991).

SEBATIK ISLAND (SIBATIK). The large island forming the S shore of Cowie Harbor or Sibuku Bay and divided by the E-W international boundary with Indonesia (4°10'N 117°45'E). **Elevation:** Sea level. **Habitat:** Originally primary forest with few settlements on its N side. First logging recorded was by Masuda in 1903 and was continued by various companies until 1940. Logging resumed in 1946 and continued into the 1960s (Ibbotson 2014). Andrews said it was "...heavy jungle similar to that of the adjacent mainland" (Amadon 1943b:331). Now it consists of 2° growth, largely impenetrable "prickly cane", farms, small plantations, and mangrove. **Sources:** R.C. Andrews, 3 Nov. 1909, 10 Jan. 1910 (Allen 1911, Amadon 1943); MMN, June 1961 - Feb. 1962; KVT, intermittently 1960s. **Remarks:** In 1906 the ship-loading terminal for the Silimponon Coal Mine was constructed on the island and remained in operation until 1933 (Ibbotson 2007). Norman described local bird seasonality on the island. From June to Aug. there is a great influx of birds and evidence of nesting, apparently corresponding with fruit abundance. From Sept. to Dec. bird activity diminished, but picked-up again in Jan. and Feb. Sebatik Island is one of two locations where Greater Flameback (*Chrysocolaptes guttacristatus*) has been collected in Sabah. The other is near Sandakan.

SEGAMA RIVER. Ca. 5°00'-5°35'N, 117°30'-118°50'E. KVT regularly visited plantations on the lower Segama. J. MacKinnon worked primarily at Kuala Bole (5°10'N 117°53'E), but also camped further up the Bole. WFVZ surveyed from Kg. Segama (Segama bridge, ca. 5°06'N 118°14'E) to Kuala Bole (May 1983); and between Kg. Segama and Kg. Salyawak, ca. 20 km NW of Lahad Datu (5°07'N 118°03'E), in Aug. 1983. See Bole River, Danum Valley, and Kuala Segama. **Elevation:** Sea level to ca. 100 m. **Habitat:** Mainly riparian forest, 1° lowland and upland forest, logged forest, 2° growth, and limestone cliffs. **Sources:** KVT, intermittently 1950-1960s; B. Harrison, early Sept. 1964 (Fogden 1965); J. MacKinnon, July-Sept. 1968, Sept. 1969-Sept. 1970, briefly in 1981 (MacKinnon 1974, unpubl. Wildlife Dept. Report, pers. comm.); D. Foote (WFVZ), C. Marsh (Sabah Foundation), J. Payne (WWFM), and R. Whitaker (WWFM), 28-31 May 1983 (Whitaker 1984); WFVZ, 18-20 Aug. 1983; A.D. Johns (Royal Society), intermittently from 18 June 1987 - 17 Nov. 1988 (Johns 1989, 1992, pers. comm.). **Remarks:** MacKinnon informally surveyed birds during his Ph.D. research on orangutans at Kuala Bole. In 1981, he returned briefly and compiled a list of birds. In an unpublished report to the Wildlife Department, he compared this list to his recollections of the birds that were present in 1968-70.

SEGALIUD-LOKAN FR. The drainage area of the Segaliud and Lokan rivers, centered at ca. 5°38'N 117°40'E. The Lokan River (5°26'N 117°44'E) flows into the Kinabatangan near Pintasan, and the Segaliud River (5°45'N 117°52'E) enters Sandakan Harbor. The Marchesa group explored the lower section of the Segaliud River up to Batang Ipil. See Bettotan. **Elevation:** Sea level to ca. 120 m. **Habitat:** The Segaliud River area is now almost entirely oil palm. The Lokan area is now all logged lowland forest and oil palm (Davies and Payne 1982, J. Payne, pers. comm.). **Sources:** E. G. Lempriere, early 1880s (Nicholson 1883); Marchesa Expedition, 11-14 Apr. 1883 (Guillemard 1885, 1889); WWFM, Dec. 1979, Feb. and Apr. 1980 (Davies and Payne 1982, pers. comm.). **Remarks:** It is unclear whether Lempriere's collection and the Marchesa Expedition involved separate trips. Logging in the lower Segaliud started in the 1880s, and this may explain why early collectors worked in the area. The logging concession of BBT were based at Lungmanis (Ibbotson 2014:317-326).

SEGARONG FR. A Class I FR 22 km NW of Semporna on the coast (4°34'N 118°26'E). The reserve contains three limestone sites: Batu Tengar (4°34'15"N 118°24'30"E), Pababola (4°33'30"N 118°24'15"E), and Semorang (4°35'45"N 118°25'00"E) (L&K). **Elevation:** Sea level, with limestone hills reaching 300 m. **Habitat:** Limestone, 2° scrub, mangrove, and nipah. **Sources:** Daly (1888b) visited a few of the swiftlet caves in July 1884; CMF, 13-18 Jan. 1983. **Remarks:** Batu Tengar and Pababola caves are nesting sites for Edible- and Black-nest swiftlets. **References:** Daly (1888b) referred to the caves in this area as the Sigalong or Mt. Segalong caves.

SEGUNTOR (SIGUNTOR) RIVER. A river flowing into the "north bay" of Sandakan Harbor (5°49' 118°00'E). **Elevation:** Sea level. **Habitat:** Mangroves. **Sources.** WFVZ and SWD, 8 Dec. 1982; SWD, 7 Sept. 1983.

SELAGON. An area just SW of Membakut on the way to Beaufort (5°23' 115°43'E). The pertinent forest is adjacent to the highway on the W side (or was before clearing). **Elevation:** Sea level. **Habitat:** Peatswamp forest. **Sources:** UKMS, Jan. 1992 (R. Stuebing, pers. comm.). **Remarks:** UKMS collected Hook-billed Bulbul and Grey-breasted Babbler at this site in 1992.

SELANGAN ISLAND FR. A Class I FR consisting of the 120 ha Selangan Island, ca. 20 km NW of Semporna (4°34'45"N 118°30'00"E). **Elevation:** Sea level. **Habitat:** Degraded forest growing on corraline limestone. **Remarks:** The island is noted as a limestone site, but has no commercial swiftlet nesting (L&K).

SILIMPOPON RIVER. A river flowing into Cowie Harbor opposite Wallace Bay (4°15'N 117°31'E). **Sources:** MMN, Feb. 1962 (Gore 1968). **Elevation:** Below 200 m. **Habitat:** Primary forest until the 1970s. **Remarks:** Site of an underground coalmine operated by Cowie Harbour Coal Company, 1900-1933. Coal was delivered by railway 5 miles to a loading terminal on the river and transferred by barge to the export terminal on Sebatik (Ibbotson 2007). Conservator of Forests, D.M. Matthews enumerated and photographed timber from this reserve from ca. 1915-1917.

SELINSING. A village on Klias Peninsula (5°21'43"N 115°38'06"E). **Sources:** D.F. Gawin, 9-13 June 2010 (Gawin 2014).

SEMBAKONG RIVER. 4°15'N 116°27'E. Ulu Sembakong Caves is a swiftlet site reported by Daly (1888b). It is in East Kalimantan, Indonesia.

SEMORANG CAVE. A limestone cave in the Segarong FR (4°35'45"N 118°25'00"E). No commercial swiftlet nesting at this site (L&K).

SEMPORNA. A town in SE Sabah (4°28'N 118°36'E). **Elevation:** Sea level. **Habitat:** Coastal scrub and gardens. **Sources:** BMNBE, 7 July 1956; MCT, 16 Aug. 1962.

SEMPORNA ISLANDS. The islands off the coast of Semporna. These islands have been visited for short periods by several groups. **Habitat:** Beach strand, thin fringes of mangrove, heath forest and scrub, and enclosed forest. **Remarks:** The high volcanic islands (Bohey Dulang, Bod Gaya, and Tatagan) and associated smaller islands (Mantabuan, Sibuan, Maiga, Selakan, and Sebangkat) were surveyed for inclusion in a marine park during 26 Aug. - 6 Sept. and 9-15 Sept. 1980 (Yong 1980, Wood 1981). The Park, called the Tun Sakaran Park (also known as the Semporna Islands Park or Semporna Marine Park), comprises the following islands: Bohey Dulang, Bod Gaya, Sabangkat, Selakan, Mantabuan, Sibuan, and Maiga (Lakim et al. 2003). **References:** Phillipps and Phillipps (2014: 332).

Principal islands

Bohayen. **Location:** Ca. 37 km E of Semporna (4°28'N 118°55'E). **Sources:** BMNBE, 10 July 1956. **Remarks:** This was a log export terminal for BBT from the early 1950s until ca.1980. BBT maintained a substantial presence on this island for thirty years with resident European and local staff and a considerable work force.

Bohey Dulang. Furthest E of the three high volcanic islands (4°35'N 118°47'E). **Habitat:** Some tall forest stands (Wood 1981). **Sources:** BMNBE, 9 July 1956; Marine Park Survey, Aug. and Sept. 1980 (Yong 1980, Wood 1981). **Remarks:** Bohey Dulang was designated as a bird sanctuary intended to protect nesting megapodes (Burgess 1961).

Bum Bum (Bumbun). A large island just offshore from Semporna (4°27'N 118°40'E). **Sources:** C.A. Gibson-Hill, July 1949 (Gibson-Hill 1950); BMNBE, 7 July 1956. **Remarks:** A limestone site, without commercial swiftlet nesting, is located at 4°28'N 118°40'E (L&K).

Bod Gaya (Gaya). The largest of the high volcanic island group and location of the Bod Gaya FR (4°37'N 118°45'E). **Elevation:** Highest point 455 m. **Habitat:** Tall forest (Wood 1981), agricultural clearings, and beach strand. **Sources:** Marine Park Survey, Aug.-Sept. 1980 (Yong 1980, Wood 1981); WFWZ, 16 Aug. 1983. **Remarks:** Edible-nest Swiftlets nest in caves on the island (CMF).

Karindingan. A small island S of Semporna point (4°23'N 118°39'E). **Habitat:** Thompson (1966:385) and Banks (1982, pers. comm) described the principal vegetation as mangroves. There is also a 2 km wide coral sand beach that attracts shorebirds. **Sources:** BMNBE, 7 July 1956; MCT, 17 Aug., 24 Nov. 1962.

Manampilik (Menampilik). A small island S of Semporna point (4°20'N 118°34'E). **Sources:** E.J.H. Berwick, Aug. 1959 (Smythies 1963).

Mantabuan. 4°37'N 118°47'E. **Sources:** Marine Park Survey, Aug.-Sept. 1980 (Yong 1980, Wood 1981).

Maiga. A small island W of the Gaya group (4°36'N 118°41'E). **Sources:** Marine Park Survey, Aug.-Sept. 1980 (Yong 1980, Wood 1981); WFFVZ, 16 Aug. 1983.

Pandan. A small island ca. 15 km E of the Gaya (Bod Gaya) group (4°35'N 118°55'E). **Sources:** Kok (1998) cited in Smythies (1999).

Sabangkat. A small island SW of Gaya Island (4°33'N 118°39'30"E). **Sources:** BMNBE, 9 July 1956; Marine Park Survey, Aug.-Sept. 1980 (Yong 1980, Wood 1981).

Selakan. Between Sabangkat and Gaya islands (5°34'N 118°42'E). **Sources:** Marine Park Survey, Aug.-Sept. 1980 (Yong 1980, Wood 1981).

Si Amil. 4°19'N 118°52'E. **Elevation:** Ca. 100 m. **Habitat:** Basalt cliffs and boulders with lots of sea snakes on shore and in water. Includes a steep, partially forested hill with thick rattan; otherwise mostly coconuts and pandans. A small area of closed forest was being cut and replaced with coconut during Thompson's visit. **Sources:** BMNBE, no details; MCT, 19-20 Sept. 1962 (MCT, pers. comm.). **Remarks:** This island features a good sheltered anchorage in the caldera of a submerged volcano between Si Amil and Danawan islands. It was the site of the Japanese owned Borneo Fisheries canning and ice factory. Established in 1919, originally to supply fish to Japanese estates, the factory expanded into a substantial export business with monthly catches of over 1000 tons —primarily oceanic bonito, skipjack and yellow fin tuna (BNBH 16 Sept. 1927 p.166). In the 1930s one of the main markets was New York. The facilities were destroyed by fire in 1938, rebuilt, then later destroyed by allied aircraft in 1944. The island was visited and photographed by Martin and Osa Johnson in July 1936 (BNBH 2 Aug 1936 p. 201). Edible-nest Swiftlet nests have been collected from this island (CMF). Banks visited the caves, but found "no birds."

Sibuan (Battleship). Ca. 9 km NW of Gaya Island (4°38'N 118°39'E). **Sources:** E.J.H. Berwick, 23 Aug. 1959 (Smythies 1963); Marine Park Survey, Aug. and Sept. 1980 (Yong 1980, Wood 1981). **Remarks:** Gore (1968) and E. Banks (pers. comm.) called it "Battleship Island." (It looks vaguely like a battle ship in profile.)

Sipadan. S of Semporna (4°06'N 118°38'E). **Habitat:** Forest on sandy organic soil, coconut groves, beach scrub. **Sources:** BMNBE, 10 July 1956; S. Cope, May-June [1960?] (Smythies 1963); WWFM National Park Survey, 6-9 Sept. 1980 (Wood 1981, Yong 1980); DMB, 27-29 Mar. 1989; F. Lambert, 22-23 Oct. 1989, Apr. 1990 (Gretton 1990, Lambert 1990a, Lambert 1993); CMF, during 1995 (Francis and Andau 1997). **Remarks:** Sabah's only oceanic island. Sipadan was designated as a bird sanctuary to protect Lesser Frigatebirds (*Fregata ariel*), which were thought to nest there (Burgess 1961). S. Cope, in Smythies (1963), briefly described the island and made special reference to its large pigeon population. However, DMB felt that Sipadan's attractiveness to birds (particularly pigeons) may be overrated; it is a relatively small island and consists largely of coconut groves. The WWFM survey proposed that the island and associated reef be protected as the Sipadan Marine Reserve (Wood 1981). **References:** Phillipps and Phillipps (2014: 332).

Tatagan (Tetagan). A small island attached to the SW tip of Gaya Island (4°35'N 118°43'E). **Sources:** Marine Park Survey, Aug.-Sept. 1980 (Yong 1980, Wood 1981); WFFVZ, 16 Aug. 1983.

SENOBANG. Caves on the Senobang River, a small stream flowing into the upper Pinangah River (probably 4°56'31"N 116°43'03"E, but listed by others as 4°54'N 116°40'E). **Elevation:** 318 m. **Remarks:** This site has a cave with nesting Edible-nest Swiftlets. Daly (1888a,b) tried to reach the site, but never did because of high water. **References:** CMF.

SAPAGAYA (SEPAGAYA) RIVER. Inland from the S shore of Sandakan Harbor on the old route to Gomantong (5°37'N 118°07'E). The Pryers followed the river to reach Gomantong caves. Adams collected along the Sapagaya and, just to the E, the Suanlamba River. The FMNH collected in an area ca. 16 km from the mouth of the Sapagaya River. **Elevation:** Sea level. **Habitat:** At the time the Pryers' visit, a coffee and sugar plantation near the coast and 1° forest further inland. The FMNH expedition noted 1°, newly, and 15-year-old selectively logged forest. Now the area is oil palm. **Sources:** W.B. and H. Pryer, Mar. 1884 (Pryer 1884); C.F. Adams, intermittently from May 1887 - Feb. 1888 (Elliot 1890, 1891, AMNH, FMNH); FMNH, 13 July - 12 Aug. 1950 (Davis 1962, FMNH). **Remarks:** Site of the first successful commercial logging venture in North Borneo (1883-1890). Several companies exported logs to Australia, Hong Kong, and China on sailing ships (Ibbotson 2014:57-84). From 1920-1935, logs were transported by rail (Ibbotson 2014:203.218). Note: Sapagaya FR is different; it is located at Silam at the beginning of the road to Danum Valley (4°59'N 118°13'E).

SEPILOK B&B. On the road to the Sepilok Rainforest Discovery Centre (5°52'36"N 117°56'55"E).

SEPILOK RAINFOREST DISCOVERY CENTRE. A Forestry Department public facility (5°52'35"N 117°56'41"E). **Elevation:** 35 m. **Habitat:** Gardens and regenerating logged forest. **Sources:** D.F. Gawin, 27-28 July 2010 (Gawin 2014). **Remarks:** A canopy walkway constructed after 2005 represents a remarkable facility popular with bird-watchers and photographers.

SERINSIM. A Kinabalu Park substation located at the junction of the Kinarom and Sorinsom rivers at the N border of the Park near Kota Marudu (6°17'36"N 116°42'39"E). **Elevation:** 190 m at the substation to about 450 m on adjacent trails; 1,681 m at the top of nearby Mt. Namboyukong. **Habitat:** 2° forest around the substation, which was heavily burned during the 1998 El Niño drought. Mature (selectively logged) forest can be found ca. 1 km up the Sorinsom River. **Sources:** A. Biun and SP staff, Aug. 1998; AMNH, LSU, and SP, 17 Jan. – 1 Feb. 2004 (Sheldon et al. 2009a); Cornell Univ., July-Aug. 2014 (pers. comm.). **Remarks:** The forest around the headquarters is full of common and not so common birds (e.g., Chestnut-capped Thrush, *Geokichla interpres*), including some unusually low elevation records for montane species (e.g., Chestnut-crested Yuhina, *Yuhina everetti*, at 300 m). Hornbills and monkeys are scarce or non-existent at this site.

SIBUKO (SIBUKU, SIBUCO, ST. LUCIA) BAY. The body of water outside Tawau Harbor and SW of Semporna (4°00' 118°26'E).

SILABUKAN FR. A series of forest reserves on the S Dent Peninsula (5°00' 118°32'E), two of which are a Class I (10,601 ha.) and eight of which VJRs (816 ha). Two of the latter are in the Tabin Wildlife Reserve (4°59' 118°28'E). See Tabin Wildlife Reserve and Golden Sphere Sdn Bhd. **Habitat:** Mainly logged lowland and upland dipterocarp forest. **Sources:** SM, Jul. 1982.

SILAM. Area about 15 km WSW of Lahad Datu at the turn off from the main highway to Danum Valley (4°59'N 118°13'E). Plantation workers quarters on the Silam-Danum road are at 4°58'51"N 118°07'31"E. See Bole River, Lahad Datu, Mt. Silam, and Sapagaya FR. **Elevation:** 50 - 200 m. **Habitat:** Logged forest (Sapagaya FR), 2° forest and scrub, and *Albizia*, *Eucalyptus*, and *Albizia* over cocoa plantations. **Sources:** E. G. Lempriere, early 1880s (Nicholson 1883); Marchesa Expedition, 1883 (Guillemard 1885, Chasen and Kloss 1930b, AMNH); KVT, intermittently 1960s; WFVZ intermittently 16 Feb. - 14 Apr. 1982, 19 Aug. 1983. **Remarks:** Silam offered an sheltered deep water anchorage and was visited regularly by BNBC officers in the 1880s. It is the site of Silam Experimental Gardens. The BNBC's first agricultural officer (von Donop) set up progeny trials of many tree species in 1882, including oil palm, which was "planted for ornamental reasons." A lot of the seed material was sourced from a Dutch research station at Bogor, East Java (BNBH 1 May 1884 pp. 13-14). The station at Silam seems to have been abandoned ca.1910. Kennedy Bay Timber Co (Weyerhaeuser) moved their operations from Kennedy Bay, Bakapit, to Silam in 1958 and set up new headquarters and a large export log pond (Ibbotson 2014:300-301). T. Howell of the WFVZ made a small collection of birds at Silam.

MT. SILAM. A small mountain ca. 18 km WSW of Lahad Datu in the Sapagay FR (4°58'N 118°10'E). See Bole River, Lahad Datu, Silam, and Sapagaya FR. **Elevation:** 50 - 884 m. **Habitat:** 1° and 2° ultramafic forest, scrub and plantation. **Sources:** KVT, intermittently 1960s; WFVZ 16 Feb. - 14 Apr. 1982; UNIMAS, 11-15 Sept. 1995 (Rahman et al. 2010). **Remarks:** Despite montane forest at the peak of Mt. Silam, no montane birds appear to occur there (R. Burner, Q. Phillipps, FHS; pers. comm./observation). **References:** Several studies of forest ecology have been conducted on Mt. Silam (Proctor et al. 1988, Proctor et al. 1989, Bruijnzeel et al. 1993). T. Howell of the WFVZ made a small collection of birds on Mt. Silam.

SILIKAP. Uncertain, but likely to be on the lower slopes of Kinabalu between Kiau and Kota Belud. **Sources:** V.W. Ryves, 4 Apr. 1939 (RM).

SIMATUOH. Ca. 10 km up the Sapulut River from Sapulut (4°41'N 116°32'). See Maliau Basin Conservation Area, Ulu Sabutan, and Ulu Sapulut. **Elevation:** Ca. 400 m. **Habitat:** 1° in 1981, but now logged (J. Payne, pers.comm.). **Sources:** SM, May 1981 (R. Goh, pers. comm.). **Remarks:** The Sabah Museum group travelled via Simatuoh on their way to Mt. Lotung (Maliau). Simatuoh is an interesting site for mammals because of the presence of a salt lick (J. Payne, pers.comm.).

SIMPANG MENGAYAU (SIMPANG MENGAIAU, SAMPAN MAN GIO) CAPE. Known as the "Tip of Borneo", this is the large promontory NW of Kudat forming the northernmost point on mainland Borneo (7°02'N 116°45'E). See Kudat. **Sources:** Marchesa Expedition, 30 May 1883 (Guillemard 1885 1889); A.H. Everett, June 1886 (Everett 1886, 1889). **Remarks:** Recently this cape has been developed as a tourist destination. **References:** "Tip of Borneo", Phillips and Phillips (2014: 330).

SINSURAN (SUNSURAN, SONSURAN). A town in the Pegalan River valley near Tambunan (5°44'N 116°23'E).

SINSURAN ROAD, CROCKER RANGE. The road between Kota Kinabalu and Sinsuran and Tambunan over the Crocker Range through the NE end of the Crocker Range National Park. It includes adjacent sites: Alab Peak (5°51'N 116°22'E), Mengkaladom (5°53'N 116°17'E), Moyog (5°53'N 116°14'E), Rafflesia Information Centre (5°46'38"N 116°20'36"E), and Togudon (Tagodon) (5°51'40"N 116°16'02"E). See Crocker Range National Park. **Elevation:** Ca. 900 m - 1760 m (at Alab). The elevations of individual work sites are given below. The highest point accessible from Sinsuran Road is 2085 m on the ridge near Alab. **Habitat:** 1° and 2° montane forest, roadside scrub. **Sources:** KVT, intermittently 1960s; Q. Phillipps, Apr. 1968, May 1969 (Phillipps 1970); SM, Aug. 1969, July 1974, June 1975; YU, 30 Jan. - 21 Feb. 1977; D. R. Wells, Nov. 1980 (pers. comm.); WFVZ at Moyog, 1-20 Dec. 1981, 11-19 Nov. 1982, intermittently during 1983; UKMS, Aug. 1984, Apr. 1986; DMB, 8-12 Feb. 1986, 19 Mar. 1990; B. King and D. Yong (pers. comm.), 17 Aug. 1986; UKMS-ANSP, 29 June - 2 July 1989; S. Myers (Rafflesia Centre), Nov. 2003 (Robson 2004). **Remarks:** YU collected in the area adjacent to the Forestry Department resthouse at Mile 28 (5°51'19"N 116°18'38"E, ca. 1300-1500 m). 1° forest in this area was cleared in ca. 1980 and replaced with a (now defunct) temperate vegetable project. WFVZ stayed at the SAFODA resthouse at Moyog, which subsequently belonged to Outward Bound, at Mile 30 (5°50'23"N 116°19'41"E, ca. 1400-1700 m). The surrounding area was surveyed and collected extensively. Day trips were made from that site to the following locations: Mile 32 (5°49'42"N 116°19'42"E, ca. 1700 m), located ca. 300 m down (W) the road from the Gunung Emas complex; Mile 34 (ca. 1800 m), Sinsuran Road's highest point; and Mile 39 (ca. 1100-1200 m), an excellent section of lower montane forest on the E side of the Crocker ridge (near the Rafflesia Centre, which did not exist in those days). UKMS-ANSP camped at Mile 32 and also spent one day on the highest ridge. SM collected principally at Mile 29 and Mt. Alab. Phillipps (1970) reported nests at Mile 16, 20, and 25. **References:** Phillipps and Phillipps (2014: 328).

SINURON CAVE. Ca. 1-2 hr. walk from Kg. Samuran (Kg. Sinuron) along the upper Sapulut River (ca. 4°40'N 116°36'E). See Ulu Sabutan. **Remarks:** Site of a small cave purported to have Edible-nest Swiftlets (CMF).

SIPITANG. On the SW coast (5°05'N 115°33'E). The name Sipitang is used loosely to describe a wide area in W Sabah. See Merintaman and Menggalong FR. **Sources:** M.E.J. Gore, May 1965 (Gore 1968). **Remarks:** This town was originally intended to be the W terminal of the railway from Jesselton, but the idea was dropped in favour of Weston, which was closer to the proposed route up the Padas to the interior.

SOOK. SSE of Keningau (5°08'N 116°18'E). **Elevation:** 350 m. **Habitat:** Upland 1° and 2° dipterocarp and heath forest and scrub. **Sources:** KVT, intermittently 1960s.

STABILITY OF ALTERED FOREST ECOSYSTEMS PROJECT (SAFE PROJECT). An area of new oil palm plantation managed by Benta Wawasan, a

subsidiary of the Sabah Foundation (Yayasan Sabah), ca. 25 km SSW of Danum and 70 km E of Maliau Basin in the Kalabakan District Forest (Ca. 4°43'N, 117°35'E). **Habitat:** An area of logged forest being converted to oil palm, with islands of twice-logged forest and the once-logged Brantian-Tantulit VJR retained for wildlife research. **References:** Ewers et al. (2011), Turner et al. (2012), Luke et al. (2014).

SUGUT (SOOGUT, SOO GUT) RIVER. The main river between the Paitan and Labuk Rivers running NE to the Sulu Sea, exiting at Trusan Sugut FR (6°26'N 117°43'E). See Paitan. WWFM surveyed 6°12'N 117°18'E to 6°40'N 117°43'E. **Elevation:** Sea level to 30 m. **Habitat:** Beach vegetation, shifting cultivation, mangrove, nipah, and riparian logged lowland dipterocarp and freshwater swamp forest. **Sources:** SM, Nov. 1973; M.E.J. Gore, intermittently Aug. 1963 to Mar. 1966 (Gore 1968); WWFM, 14-22 Oct. 1981; R. Whitaker, May 1983 (Whitaker 1984, pers. comm.). **Remarks:** The Sugut River was well known to Suluk traders before the British arrived in Labuan or Sandakan—the “famous town of Sugut” (Hunt 1812). Whitaker (1984) found a colony of Oriental Darters (*Anhinga melanogaster*) roosting in mangrove trees in an oxbow lake near Kg. Karudan. **References:** Stuebing (1991).

SUGUD ISLANDS MARINE CONSERVATION AREA (SIMCA). A Category II Marine Protected Area in the Sugud Islands—Billean, Lankayan, and Tegapil--NE of Labuk Bay (6°30'N 117°55'E). **Remarks:** P. Burgess and T. Harrisson surveyed Lankayan Island while also looking at the Turtle Islands during 13-17 July 1965 (Harrisson 1966). **References:** Phillipps and Phillipps (2014: 332)

SULAMAN BAY OR LAKE. Ca. 7 km N of Tuaran (6°15'N 116°15'E). **Elevation:** Sea level. **Habitat:** Mangroves and mud and sand flats. **Sources:** D. R. Wells, 1 Nov. 1980 (pers. comm.).

SUNGAI RIVER. A tributary of the Langkon River draining N from Mt. Madalon into Marudu Bay (ca. 6°30'N 116°39'E). See Bandau and Madalon Mountain. **Source:** M.E.J. Gore, Sept. 1964 (Gore 1968).

TABIN FR: A VJR consisting of two blocks within Tabin Wildlife Reserve: block 1 about 27 km NE of Lahad Datu (5°05'N 118°35'E) and block 2 in the W section of the Mt. Hatton FR (5°13'N 118°41'E). See Tabin Wildlife Reserve. **Elevation:** ca. 50-450 m. **Habitat:** Mainly logged dipterocarp forest, some primary in the eastern section of the VJR.

TABIN WILDLIFE RESERVE. This is a reserve of 111,971 ha. on the Dent Peninsula, ca. 30 km NE of Lahad Datu (5°10'-5°15'N, 118°30'-118°45'E). It is the location of Tabin Wildlife Resort (5°11'14"N 118°30'08"E), a popular ecotourist site. Tabin includes Mt. Hatton Class I FR (8,550 ha, 5°13'N 118°41'E), Tabin VJR (two blocks: 5°05'N 118°35'E and 5°05'N 118°41'E), Dagat VJR (169 ha), Sungai Kapur VJR (1,250 ha), and two blocks of the Silabukan VJR, as well as Tabin Salt Spring (5°12'N 118°40'E) and Tabin-Tagas (5°02'N 118°29'E), which were surveyed by WWFM, and four limestone sites are noted by Lim and Kiew (1997): Batu Quoin (5°18'00"N 118°44'30"E) and three unnamed

sites (5°20'30"N 118°43'30"E, 5°21'00"N 118°40'30"E, and 5°16'15"N 118°46'15"E). **Elevation:** Ca. 15-450 m. **Habitat:** Heavily logged lowland and upland forest, except Mt. Hatton FR, which is mostly 1° forest. **Sources:** SM, Nov. 1979, Mar. 1982; WWFM, Mar.-Apr. 1980, Nov.- Dec. 1980, Apr. and Sept. 1981, 1983 (Davies and Payne 1982, J. Payne, pers.comm., WWF Malaysia 1984); CMF, 15-25 Oct. 1982, Feb. 1983; A.D. Johns (Royal Society), 13 May - 15 June 1988 (Johns 1989, Lambert 1990b, Johns 1992, pers. comm.); SM and UKM (Sabah), 26 Sept. - 3 Nov. 1988 (Goh et al. 1989); DMB, Mar. 1989. **Remarks:** CMF banded birds for the University of Malaya during his visits to this site. As part of a study on the effects of logging on bird populations, Johns (Johns 1989, Lambert 1990b) compared a 3 km² unlogged tract with a twice-logged section of Tabin. Tabin is surrounded by oil palm, and the oil palm/forest edge provides good views of some birds, e.g., birds of prey and Storm's Stork (*Ciconia stormi*). **References:** Ghazally (1989), Payne (1989a), Phillipps and Phillipps (2014: 332), and Wells and Francis (1988).

TAGODON, TAGODAN, OR TAGUDAN. A village on the W slope of the Crocker Range along the road from Kota Kinabalu to Tambunan (5°51'40"N 116°16'02"E). See Sinsuran Road. **Remarks:** SM has a specimen of Blue-banded Pitta (*Erythropitta arquata*) from this area.

TAMBISAN. At the NE tip of the Dent Peninsula (5°27'N 119°08'E). **Elevation:** Sea level. **Habitat:** Unspecified, except as "coral." **Sources:** B&W, 19-20 Oct. 1984. **Remarks:** B&W mention this site in reference to Grey-tailed Tattler (*Tringa brevipes*).

TAMBUNAN. A town SE of Kota Kinabalu on the E side of the Crocker Range in the Pegalan River valley (5°43'N 116°24'E). WWFM surveyed nearby in the Crocker foothills (5°38'-5°41'N, 116°14'-116°17'E). See Mangkatai and Trus Madi Mountain. **Elevation:** At the town, ca. 600 m; in the Crocker foothills 600-1350 m. **Habitat:** Largely 2° forest and shifting cultivation, with some 1° highland and lower montane forest on ridges and along rivers. Grassy fields and paddy on the plain. **Sources:** T. Harrisson, Feb. 1952 (Harrisson 1955a, SRM); Cambridge University Expedition, 13-16 Aug. 1956, 19-24 Sept. (J. Boys, pers. comm., SRM); WWFM, 16-21 Oct. 1980; WFFVZ, intermittently 1981-1983; UKMS, Apr. 1986.

TAMBUYUKON (TAMBOYUKON) MOUNTAIN. Mt. Tambuyukon lies in Kinabalu Park, ca. 20 km NE of Mt. Kinabalu (6°12'N 116°39'E). See Waleigh-waleigh. **Elevation:** The third highest peak in Borneo at 2579 m. **Habitat:** In 1982, 2° forest and open country in the vicinity of Manggis and Pinawantai; a combination of 1° and 2° forest between the villages and 550 m; 1° montane forest above 550 m; and ultramafic forest at the summit. **Sources:** Q. Phillipps and A. Lamb, 20-26 Jan. 1982 (Phillipps 1982a); A. Boyce (Univ. Montana), May or June 2012-2015 (pers. comm.). **Remarks:** Boyce surveyed birds (also some netting) between Monggis and the summit on both the "new" and "old" trails for a total of six week's work. Phillipps and Lamb approached via the villages of Manggis (Monggis; 6°12'N 116°45'E) and Pinawantai (6°07'N 116°42'E) on the E boarder of the Park. They surveyed from the "lowlands" to the summit and

camped at ca. 550 m and 1200 m. Above ca. 2100 m, Phillipps and Lamb observed only Mt. Black-eyes and the Island Thrushes (*Turdus poliocephala*). Phillipps wrote:

"The birdlife of Mt. Tambuyukon is characteristic of rich and relatively undisturbed submontane and montane forest. The 5 different species of hornbill encountered is indicative of low hunting pressure. All birds above 5000 ft [1524 m] were extremely tame and unafraid -- a reminder of what Kinabalu's higher level bird life must have been like once....The Friendly [Bush] Warbler is one of Borneo's rarest birds and has only been found before on Kinabalu and Trus Madi. The zonation of higher level vegetation on Tambuyukon would appear to correspond with that on Kinabalu but becoming operative at lower level. This would also appear to apply to the birds. Thus Blackeyes and Friendly Warblers seen at 6000 ft [1829 m] on Tambuyukon would not normally be seen until 8000 ft [2438 m] on Kinabalu. Similarly, the characteristic birds of 11,000 ft [3353 m] on Kinabalu are characteristic of Tambuyukon at 8000 ft...."

TAMPARULI. A town on the Tuaran river upstream from Tuaran (6°08'N 116°16'E). Elevation: Ca. 20 m. **Remarks:** Until the new Kota Kinabalu - Mt. Kinabalu highway was built in the early 1980s, Tamparuli was an important stopping point on the way to Kinabalu Park and Kota Belud overland from Kota Kinabalu. **References:** Stuebing (1991).

TAMPIAS. Between Ranau and Telupid on the main road (5°42'N 116°51'E). Elevation: Ca. 150 m. **Habitat:** 2° forest. **Sources:** SM, Dec. 1972.

TAMU DARAT. A village in Kota Belud District (6°15'53"N 116°27'28"E). **Elevation:** 80 m. **Habitat:** Gardens and secondary forest. **Sources:** D.F. Gawin, 6-8 July 2010 (Gawin 2014).

TANGKULAP. A site on the S side of the Milian River and a Class I FR N of the river (5°18'N 117°17'E). See Kunkun River. **Habitat:** Logged forest. **Remarks:** District officer R.T. Richardson (Richardson 1908) visited Tangkulap in August 1908.

TANJUNG ARU. Beach and suburban area immediately W of Kota Kinabalu near the airport, including Prince Philip Park and the Shangri-La Resort (5°57'N 116°03'E). **Elevation:** Sea level. **Habitat:** Beach strand, grassy fields, and gardens. **Sources:** E.J.H. Berwick, intermittently during the 1950s and early 1960s (Smythies 1963); DMB, intermittently 1958-1962, 1984-1990 (Smythies 1981, pers. comm.); NAMRU, 24 Aug. - 4 Oct. 1960; the Phillipps family from the 1960s to present (Smythies 1981, Phillipps 1987, pers. comm.); SM, intermittently; WfVZ, intermittently from 1981-1983; B. King and D. Yong (pers. comm.), 16 July 1983; UKMS-ANSP May-July 1989. **Remarks:** Tanjung Aru is a good site to see beach strand and fall migrant species. It also has populations of introduced species, such as Peaceful Dove (*Geopelia striata*), Blue-naped Parrot, and Crested Myna (*Acridotheres cristatellus*). **References:** Phillipps and Phillipps (2014: 328)

TANJUNG BATU. A limestone locality on the Kinabatangan River, 5°36'30"N 118°20'00"E (L&K).

TANJUNG KAPUR. A limestone site ca. 4 km NW of Semporna (4°31'30"N 118°32'15"E). **Remarks:** No commercial swiftlet nesting occurs here (L&K).

TANJUNG LINSANG. The S promontory at Kuala Kinbatangan (5°38'N 118°38'E). See Kulamba Wildlife Reserve. **Elevation:** Sea level. **Habitat:** Beach, mangrove, and nipah. **Sources:** WWFM, 29 and 31 Aug., 8 Sept. 1980.

TANJUNG TIMOHING. A promontory on the NW side of Balembangan Island (7°17'30"N 116°54'30"E). **Remarks.** Location of a commercial swiftlet nesting site (L&K).

TATALAHAN CAVES. Swiftlet nesting caves purportedly on the Padas River (Daly 1888b), but no specific details.

TAWAI FR. A Class I FR of 22,697 ha just S of Telupid (5°32'N 117°07'E). See Karamuak River, Ruku Ruku (Rukuruku) Valley, and Ulu Ruku Ruku. **Elevation:** 100 - 500 m. **Habitat:** Substantial stands of 1° lowland and upland ultramafic forest and kerangas. The Tawai highlands are ultramafic rock and much of the surrounding forest, which grows on ultramafic soils, is stunted. This probably explains why it has not been logged. **Sources:** SM, Oct. 1977, Nov. 1996; LSU and SM, 13-19 Aug. 2004 (Sheldon et al. 2009a). **Remarks:** The exact locality of the 1977 Museum collection is unspecified, but likely to be on the W slopes because the Museum collected along the Karamuak River at nearly the same time. LSU and SM collected in 1° kerangas and mixed dipterocarp forest in the Ruku Ruku Valley. They found Grey-breasted Babbler and Scarlet-breasted Flowerpecker in the kerangas, and Bornean Wren-Babbler in the mixed dipterocarp forest.

TAWAU (TAWAO). A large town in SE Sabah (4°15'N 117°54'E). Sabah Museum collected at the Tawau Agricultural Research Station. **Habitat:** 2° growth, grassy fields, rubber and coconut plantations, mangroves, mudflats, and gardens. See Kalabakan FR, Sebatik Island, Tawau Hills Park, Ulu Merutai, and Wallace Bay. **Sources:** R.C. Andrews, 2 Jan. 1910 (Allen 1911); S. Tanaka, Sept.-Oct. 1923, Feb.-Oct. 1931 (Kuroda 1925, 1933); H.G. Deignan (MCZ), summer 1937 (MCZ, Smythies 1960); BMNBE, June 1956; MMN, June 1961 - Feb. 1962; MCT, intermittently July-Dec. 1962; SM, Nov. 1964. **Remarks:** Norman (1964) noted that Tintagat Point ("near Tawau"), with its stretches of sand and reef, is an excellent shorebird site during the winter months.

TAWAU HILLS PARK. A park of 27,972 ha encompassing the highlands ca. 15-30 km N of Tawau (ca. 4°22'-4°31'N 117°47'-118°04'E), including Mt. Lucia (4°28'N 117°56'E), the S slopes of Mt. Magdalena (4°30'N 117°57'E), and Bombalai Hill. Nearby Class I forest reserves are: to the E, Mt. Wullersdorf, Bald Hill and Quoin Hill; to the S, Mt. Andrassy; and to the N, Ulu Kalumpang (Fig. 2). Park headquarters are 4°24'09"N 117°53'24"E. See Bal Estates, Magdalena Mountain, Quoin Hill, and Ulu Merutai. **Elevation:** 200-1300 m; Mt. Lucia 1201 m, Mt. Magdalena 1311 m, Bombalai Hill 530 m. RGM and colleagues collected at Park HQ (280 m) and, in 2005, on Mt. Lucia (900-1,150 m). **Habitat:** 1° upland to lower montane forest and logged lowland to highland

forest on rich volcanic soils. **Sources:** WWFM, 26 June - 7 July 1980 (Davies and Payne 1982, J. Payne, pers.comm.); J.-M. Thiollay et al. (1983), July 1982; UKMS, 22-29 Nov. 1989 (Stuebing and Nor 1995); RGM and SP staff, 24 June – 9 July 1999, 18 May – 2 June 2000 (Moyle 2003); AMNH, LSU, and SP staff, 25–30 Jan. 2005 (headquarters) and 2–6 Feb. 2005 (Mt. Lucia) (Haines 2007, Moyle et al. 2009, Sheldon et al. 2009a, Moyle et al. 2011); D.F. Gawin, 31 July – 3 Aug. 2010 (Gawin 2014); Cornell Univ., July-Aug. 2012 and Mar. 3 – Apr. 22 2013 (Pegan et al. 2013, Shipley et al. 2015). **Remarks:** UKMS and RGM surveyed the area around the Park headquarters and the hot springs. Other surveyed areas are the W slopes of Mt. Magdalena (BMNBE) and Quoin Hill (MCT and ADG). LSU, AMNH, and SP collected from 350-750 m near Mt. Lucia. These specimens are stored at the Sabah Park collection and LSU. **References:** Phillipps and Phillipps (2014: 332).

TELIPOK. 15 km NE of Kota Kinabalu near the coast (6°05'N 116°11'E). **Elevation:** Sea level to ca. 25 m from the coast to town, and to 850 m in the nearby hills. **Habitat:** 2° scrub, paddy, and forested highland. **Sources:** ADG, Feb.-Mar. 1963 (MCT, SM); N.F. Wong and G.R. Conway (SAD), Mar. 1965 (SM).

TELUPID. On the road between Ranau and Sandakan (5°39'N 117°07'E). See Kunatong, Meliau, Tawai FR, and Ulu Ruku Ruku. **Elevation:** Ca. 100-150 m. **Habitat:** 1° and 2° forest. **Sources:** KVT intermittently 1960s.

TEMBUNGO OIL RIG. Esso oil platform ca. 56 km NNW of Kota Kinabalu (6°37'N 115°47'E). **Elevation:** Sea level. **Habitat:** Open sea. **Sources:** DMS intermittently 1979-81, 15 June - 31 Oct. 1981 (Casement 1979); WFVZ 7-8 Oct. 1982. **Remarks:** On foggy or stormy nights birds often settle on the platform. DMS recorded the demise of many of passerine migrants on the night of 19 Sept. 1981, when stormy conditions and the light of the oil platform's gas flare apparently disoriented night-flying individuals. The birds either burned up in the flare or fell exhausted into the sea. WFVZ observed migrating birds circle the platform (apparently attracted to the lights and gas-flare) all during a clear night in Oct. 1982 before disappearing towards the Bornean mainland at dawn.

TEMPADONG (TAPADONG). On the N bank of the Segama River in the Merisuli VJR, ca. 21 km upstream from the Segama bridge crossing (5°08'30"N 118°08'15"E). Davis (1962) cited the coordinates as 5°02'N 118°20'E. **Elevation:** Ca. 10-183 m. **Sources:** P. Orolfo, Jan. 1931 (RM). **Remarks:** An important swiftlet nesting site for all four swiftlet species (CMF).

TEMPLER EXTENTION OF KINABALU PARK. The area of Kinabalu Park jutting N past Mt. Templer (6°24'N 116°36'E). See Madalan Mountain, Langui Langui, Sungai River, and Tambuyukon Mountain.

TENOM. At the Pegalan-Padas River confluence (4°59'N 115°55'E). See Anginon, Makaniton, Melalap, Rayoh, Sapong Estate, Tomani, and Ulu Losan. **Elevation:** 200 m. **Habitat:** 2° growth, fields, marshes, oxbow lakes, plantations, and gardens. **Sources:**

MCT, Dec. 1962 -Jan. 1963; A. Lamb, 1970s-1990s (Phillipps 1982b, pers. comm.); YU, Sept. 1976. **Remarks:** Daly (1888a) provided a lengthy description of the Tenom area.

TEUTON. Locality unknown, but J. B. Bell in 1895 collected important specimens of Black Partridge, *Melanoperdix niger* (ANSP), and Bornean Ground Cuckoo (Royal Ontario Museum), at this site. It may be near Kudat (or Paitan River), since Bell apparently collected in the vicinity of Kudat that year.

TIBAS RIVER. Listed in gazetteers as 5°42'N 116°01'E, but see under Kalabakan FR for a much different location.

TIGER ESTATE. 35 km NW of Tawau, probably near Tiger Hill (4°25'N 117°49'E). See Kalabakan FR. **Elevation:** Ca. 200 m. **Habitat:** A cocoa plantation in 1962, now oil palm. **Sources:** MCT, Nov.-Dec. 1962 (MCT, pers. comm., SM), ADG, Apr.-July 1963 (MCT, SM).

TOBOBON OR TOBOBAN. Kg. Tobobon and Tobobon River are listed as 6°03'N 116°10'E in gazetteers. See under Trus Madi for an important (and apparently different) bird collecting site.

TOMANI. Includes a village, Kuala Tomani, ca. 30 km S of Tenom (4°51'N 115°53'E) and the surrounding Padas River watershed (Ulu Tomani). See Baru Jampa. **Habitat:** 1° and 2° forest, shifting agriculture, and logged forest. **Sources:** SM, Dec. 1977; SM, 23-24 June 2010 (Gawin 2014). **Remarks:** Ornithologically, this area is largely unexplored. Sabah Museum worked at "Kampung Bekuku, Ulu Tomani." (4°42'N 115°53'E).

TONGOD. A district in the Sandakan Division. Kuala Tongod is a village where the Tongod and Milian rivers come together (5°16'N 116°58'E). Ulu Tongod is the watershed of the Tongod River to the NW of Kuala Tongod. **Remarks:** The Sabah Museum has a Bornean Peacock Pheasant specimen caught in a snare in the Ulu Tongod, primary forest, 250 m, 18 Jan. 2002.

TRUS MADI MOUNTAIN. Highest peak in the Trus Madi Range on the SE side of the Pegalan River valley near Tambunan (5°33'08"N 116°30'52"E). The village of Kaingaran at 738 m (5°38'19"N 116°27'31"E), the Forestry Department resthouse at 1450 m (5°35'09"N 116°29'26"E), and the helicopter platform at 1630 (5°34'12"N 116°28'58"E) are common expedition waypoints. **Elevation:** Trus Madi (2649 m) is Borneo's second highest mountain after Mt. Kinabalu. Bird have been recorded most commonly between Kaingaran (738 m) and the peak. **Habitat:** 2° highland and lower montane forest in the vicinity of Kaingaran, 1° montane forest from ca. 1000-1800 m, and stunted myrtaceous-ericaceous forest and scrub above 2000 m. Logging has reached over 1800 m in some areas. **Sources:** Cambridge University Explorer's and Traveller's Club - Sarawak Museum Expedition, 13 Aug. - 19 Sept. 1956 (J. Boys notes, pers. comm., Boys and Harrisson unpubl. ms, Bryant et al. unpubl. report, SRM); A. Phillipps, 20 Mar. 1984 (Phillipps 1984); WFFVZ, 30 June - 10 July 1983 (Sheldon and Francis 1985); RGM and

SM, 2-12 Aug. 1999; UMS, 30 Oct. – 2 Nov. 2001; LSU and SM, 21 Jul. – 2 Aug. 2005 (Haines 2007, Sheldon et al. 2009a, Gawin et al. 2014); D.F. Gawin and M.F.S. Ramji (UNIMAS) and SM, 8-13 July 2008 (Ramji 2010, Ramji et al. 2012, Gawin et al. 2014).

Remarks: Trus Madi is one of only three mountains in Sabah where Friendly Bush Warbler, Island Thrush, and Mountain Black-eye co-occur (the others are Kinabalu and Tambuyukon). In 1956, the Cambridge Expedition collected ca. 200 specimens of 63 species on Trus Madi. It had two ornithologists, John Boys (a Cambridge undergraduate) and R. Nyandoh (a collector from the Sarawak Museum). Nyandoh made an early foray from Tambunan to Kaingaran (a village on the Kaingaran River at 738 m) and collected in that area from 13-16 Aug. He was joined by Boys on the 16th, and by the 19th they had established a main camp on the Kidukarok River (ca. 5°36'N 116°31'E, 1500 m), a tributary of the Kaingaran River. They collected at this camp during 19-24 Aug., 31 Aug. - 6 Sept., and 9-17 Sept. Boys and Nyandoh collected at ca. 2,450 m from 24-31 Aug. and 6-9 Sept. Specimens were also collected at Tobobon on the Kaingaran River (ca. 1100 m). The Cambridge group returned to Tambunan on 19 Sept. In 1983, The WFVZ collected at three sites: Kaingaran, and at 1600 m and 2100 m (Sheldon and Francis 1985). In 1999, RGM and SM collected on the E slope at ca. 1500 m (5°34'51"N 116°29'30"E). Their specimens are stored at the Sabah Museum and LSU (Moyle and Wong 2002). In 2001, UMS banded birds in 2001 in the vicinity of the Forestry Department resthouse. In 2005, LSU-SM collected at the Forestry Department resthouse, near the helicopter platform, and in the Taman Bunga near the summit (5°33'27"N 116°30'03"E, 2350 m). UMS banded birds were caught and released. Specimens from that expedition are stored at SM and LSU. **References:** Acres (1972).

TUARAN (TAWARRAN) AND TUARAN RIVER. 30 km NE of Kota Kinabalu along the coast (6°11'N 116°14'E). The Sabah Museum banded birds for MAPS at 6°12'N 116°12'E during 1964-1965 and at 6°10'N 116°10'E during 1967-1970. See Mengkabong and Sulaman. **Elevation:** Sea level to 400 m. **Habitat:** 2° scrub, rice fields, grassy fields, beach strand, and heath scrub. **Sources:** C.D. Haviland, 17 Mar. 1892, 5 Oct. 1913 (SRM); NAMRU, Sept. 1960; MCT, Dec. 1962 and Jan. 1963, ADG, Mar. and Dec. 1963, S.F.W. Chong (SAD), Nov. 1962, E.J.H. Berwick (SAD), Dec. 1963 (MCT, SM); N.F. Wong (SAD), Mar. 1965 (SM); Phillipps family, intermittently 1960s- 80s; SM, intermittently from 1964-1970, Mar. 1975; WFVZ, intermittently from 1981-1983; CMF, 14 Apr. 1984 (SWD). **Remarks:** The SAD research station at Tuaran had a small bird collection. Most of the specimens from that collection are now in the Sabah Museum. **References:** Stuebing (1991).

TUKOK MOUNTAIN. A ridge NW of Tawau (4°29'N 117°31'E). **Elevation:** Ca. 425 m. **Sources:** MMN, between June 1961 and Feb. 1962. **Remarks:** Norman recorded Bornean Barbet (*Megalaima eximia*) at this site. In Sabah, records of this species are rare, and this is the only record on so low a mountain.

TUNGUD (TONGUD) AND ULU TUNGUD FR. Tungud is a river and site of an estate (5°59'N 117°23'E). For Ulu Tungud see Ulu Kiberibi (5°51'N 116°58'E).

TURTLE ISLANDS AND TURTLE ISLAND PARK. The Turtle Island (Pulau Penyu) Park consists of Selingan (Selingaan, Siligan, Silingan, Silingaan; 6°10'N 118°03'E), Gulisaan (6°09'N 118°03'E), and Bakungan (Bakkungaan) Kecil (6°10'N 118°07'E) islands, ca. 45 km N of Sandakan. For practical purposes, Selingan is *the* Turtle Island. Libaran is the largest island in the area, ca. 30 km N of Sandakan (6°07'N 118°01'E). Lankayan is ca. 80 km N of Sandakan (6°30'N 117°55'E). **Elevation:** Sea level. **Habitat:** Beach strand, coconut, coral outcrop, and mangrove. **Sources:** The Marchesa Expedition visited Libaran in Apr. or May 1883 (Guillemard 1885, 1889). P. Burgess and T. Harrisson surveyed “Selinggan” (Selingan), Gulisaan, Bakungan Kecil, Lankayan, “Lebakan”, and “Lelingan” during 13-17 July 1965 (Harrisson 1966). G.S. de Silva and C. Chong recorded birds on Selingan intermittently during 1973 (de Silva and Chong 1974). C. Phillipps surveyed Selingan in Apr. 1981 and 1982 (Phillipps 1982b). DMB visited Selingan 22-24 Mar. 1990. **Remarks:** Harrisson (1966) recorded birds on two small islands, Lebakan and Lelingan, which presumably lie nearby the main Turtle Islands. Selingan was constituted as a game and bird sanctuary on 12 Aug. 1971 (de Silva and Chong 1974) and a park in 1977. **References:** Phillipps and Phillipps (2014: 332).

ULU KIBERIBI. In the Ulu Tungud FR (5°51'N 116°58'E). **Elevation:** 450 m. **Habitat:** 1° upland forests. **Sources:** WWFM, 2-10 June 1981.

ULU KIMANIS SUBSTATION. 5°34'N 115°57'E. See Crocker Range National Park, Kimanis and Rinangisan (5°30'17"N 116°00'48"E). **Elevation:** 565 m at the headquarters. **Habitat:** Highland primary and secondary forest and gardens. **Sources:** LSU and KU, 14-18 June 2008. **Remarks:** A small collection was made at this site. Because of its extensive plantings of bananas and gingers, Ulu Kimanis headquarters has a remarkable number of spiderhunters and bats.

ULU KUKUT FR. A Class I FR of 1,297 ha in the Kota Belud District along the highway to Kota Marudu (6°31'11"N 116°35'10"E). **Habitat:** Mainly *Acacia mangium* plantation.

ULU LAUHON, MALIGAN (MELIGAN) RANGE. Ca. 58 km SSE of Sipitang (4°34'28"N 115°41'45"E). **Elevation:** 1700 – 1800 m. **Habitat:** Roadside scrub, heavily logged lower montane forest, and some primary forest on ridges. **Sources:** LSU and KU, 5-11 June 2008. **Remarks:** A small collection was made at this site. It is an important area not only for its elevation but also its location in the taxic transition zone between Sarawak and Sabah. **References:** Moyle et al. (2008)

ULU LOSAN. On the SE slopes of the Crocker Range above Melalap (5°14'N 115°59'E). See Makaniton and Melalap. **Elevation:** 500-850 m. **Habitat:** 1° highland forest. **Sources:** WWFM, 28 Sept. - 4 Oct. 1980.

ULU MERUTAI OR MEROTAI. The right branch of the Merutai River in the W foothills of Mts. Magdalena and Lucia (ca. 4°29'N 117°52'E). See Tawau Hills Park. **Elevation:** 150-500 m. **Habitat:** At the time of the BMNBE, 1° upland to highland forest. It was logged by 1980. **Sources:** BMNBE, June 1956; WWFM, June-July 1980

(Davies and Payne 1982, J. Payne, pers.comm.). **Remarks:** The BMNBE approached Mt. Magdalena via the Merutai River. Much of this area is not part of Tawau Hills Park.

ULU RESANG. At the edge of the same limestone hills as Panggi (ca. 5°28'45"N 118°23'00"E). See Panggi under Kinabatangan. **Remarks:** A small cave with nesting Edible-nest Swiftlets (CMF).

ULU RUKU RUKU. Ca. 15 km ESE of Telupid (5°37'N 117°12'E). See Ruku Ruku Valley. **Elevation:** 50-100 m. **Habitat:** Kerangas and ultramafic forest, growing on soils derived from ultramafic rock of the Tawai highlands. **Sources:** WWFM, 5-9 May 1980 (Davies and Payne 1982, pers. comm.); LSU and SM, 13-19 Aug. 2004. **Remarks:** WWFM sighted Grey-breasted Babbler during their survey, the first record for Sabah (Sheldon 1987). LSU and SM made a small collection at this site, which included Grey-breasted Babbler, Scarlet-breasted Flowerpecker, and Bornean Wren-Babbler (*Ptilocichla leucogrammica*).

ULU SABUTAN OR SAMURAN. The village of Samuran lies on the Sapulut River, ca. 18 km SE of Sapulut (4°40'N 116°36'E). Ulu Sabutan is the SW watershed of Mt. Lotung (ca. 4°43'N 116°45'E). See Maliau Basin Conservation Area, Simatuoh, Sinuron Cave, and Ulu Sapulut. **Habitat:** 1° forest and shifting cultivation in 1981, now mainly logged. **Sources:** SM, May 1981 (R. Goh, pers. comm.). **Remarks:** The Sabah Museum Expedition to Mt. Lotung approached the mountain from Sapulut via the Sapulut and Sabutan Rivers. Their specimen labels seem to have used Samuran and Ulu Samuran (=Ulu Sabutan) interchangeably.

ULU SAPULUT. E of Sapulut at 4°37'N 116°36'E. See Simatuoh and Ulu Samuran. **Elevation:** Ca. 450 m. **Habitat:** 1° upland forest. **Sources:** WWFM, 29 Apr. - 7 May 1981.

ULU SEGAMA FR. See Bole Kecil, Bole River, Danum Valley Conservation Area, Kawag, Segama River, and Ulu Segama-Malua FR.

ULU SEGAMA-MALUA FR. An area adjacent to and E of Danum Valley (4°58'N 117°48'E). **Elevation:** ca. 250 m. **Habitat:** Logged dipterocarp forest (1976-1991) and various experimental regeneration projects. **Sources:** D. Edwards' research group, June-Oct. 2007 and May-Sept. 2008, May-Oct. 2009 (Edwards et al. 2009a, Edwards et al. 2010, Ansell et al. 2011, Edwards et al. 2011, Edwards et al. 2014). **Remarks:** The Ulu Segama-Malua Sustainable Forest Management Project was established in 2006 with the object of producing forest products on a sustainable basis. The Edward's group compared bird communities in primary forest (Danum Valley), logged and regenerating forest (in the Ulu Segama and Malua FR), and adjacent oil palm. **References:** Ancrenaz et al. (2010), Reynolds et al. (2011), Senior et al. (2013).

ULU SENAGANG. In the Crocker Range, up-river from Kg. Senagang, between Tenom and Keningau (5°18'N 116°02'E). **Habitat:** 1° lower montane forest. **Sources:** SP survey,

Feb. 2000. **Remarks:** The Park staff collected a Hill Blue Flycatcher (*Cyornis banyumas*) at this locality.

ULU SUNGAI RESANG. At the edge of the same limestone hills as Panggi (5°28'45"N 118°23'00"E). See Panggi. **Remarks:** A small cave with nesting Edible-nest Swiftlets (CMF).

ULU TELIDUSAN. In the former Sugut FR (6°16'N 117°09'E). **Elevation:** 150-275 m. **Habitat:** 1° upland forest. **Sources:** WWFM, 6-11 June 1981.

ULU TIULON. In the Ulu Sungai Milian FR ca. 30 km SW of Keningau (5°12'N 116°28'E). Note that gazetteers list the "Tiulan River" as 4°26'N 117°30'E. **Elevation:** 450-600 m. **Habitat:** 1°, 2°, and recently logged upland and highland forest. **Sources:** (WWFM), (WVZ), and (SWD), 24-25 Oct. 1981; C. Phillipps, during 1981 (CMF).

UPAK. A limestone site on the N side of the Segama River (5°7'00"N 118°03'45"E). No commercial swiftlet nesting at this site (L&K).

USUKAN BAY AND ISLAND. Bay at the mouth of the Abai River, 12 km W of Kota Belud (6°22'N 116°19'E) and site of Usukan Island (6°23'N 116°20'E), which was visited by Harrison. See Abai. **Sources:** Marchesa Expedition, early June 1883 (Guillemard 1885, 1889, Everett 1889); T. Harrison, Dec. 1960 (Smythies 1963).

WALEIGH-WALEIGH. The exact locality is unclear, but said to be on the Kinarom River (6°26'N 116°50'E), a tributary of the Bongon River on the N side of Mt. Tambuyukon (ca. 6°18'N 116°43'E). See Serinsim. **Remarks:** The site of purported swiftlet caves (Daly 1888b).

WALLACE BAY. A sawmill town on the NW coast of Sebatik Island (4°16'N 117°41'E). See Tawau and Sebatik Island. **Elevation:** Sea level. **Habitat:** Scrub, gardens, mangrove, and estuary. **Sources:** BMNBE, 7 July 1956; MMN, June 1961 - Feb. 1962 (1964); WVZ, 6 - 9 July 1982. **Remarks:** In 1952 the Bombay Burmah Trading Corporation Ltd (BBTCL) built its headquarters, saw mill and log ponds at a point close to the defunct Silimpon coal station on Sebatik Island. This site was officially named Wallace Bay after A.F. Wallace a managing partner of BBTCL (Ibbotson 2014). **References:** Scott (1989).

WASA MAYO FALLS. On the Kuamut River. The site where the trail to the swiftlet cave at Batu Timbang heads NW from the Kuamut.

WESTON. A town near the SE corner of the Klias Peninsula (5°13'N 115°36'E). **Habitat:** Mainly mangroves, but also 2° growth, fields, gardens, and other coastal habitats. **Sources:** L.A. Charles, Mar. 1941 (RM); DMB, late 1950s and early 1960s; SP Survey, Mar. 1975, (Wells et al. 1975, Wells 1976, pers. comm.); B&W, early Sept. 1984. **Remarks:** The road between Beaufort and Weston was originally the railway bed

between Weston and the S. bank of the Padas completed 1896-9 and uplifted in 1966 (Ibbotson in prep.)

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