

LEGATO final conference Banaue/Ifugao/Philippines 2-11 August 2016

"Rice Ecosystem Services in South-East Asian Landscapes"

Endemic birds as indicators for biodiversity maintenance in Lowland Evergreen Rainforests of Northeast Luzon, and their contributions to ecosystem services

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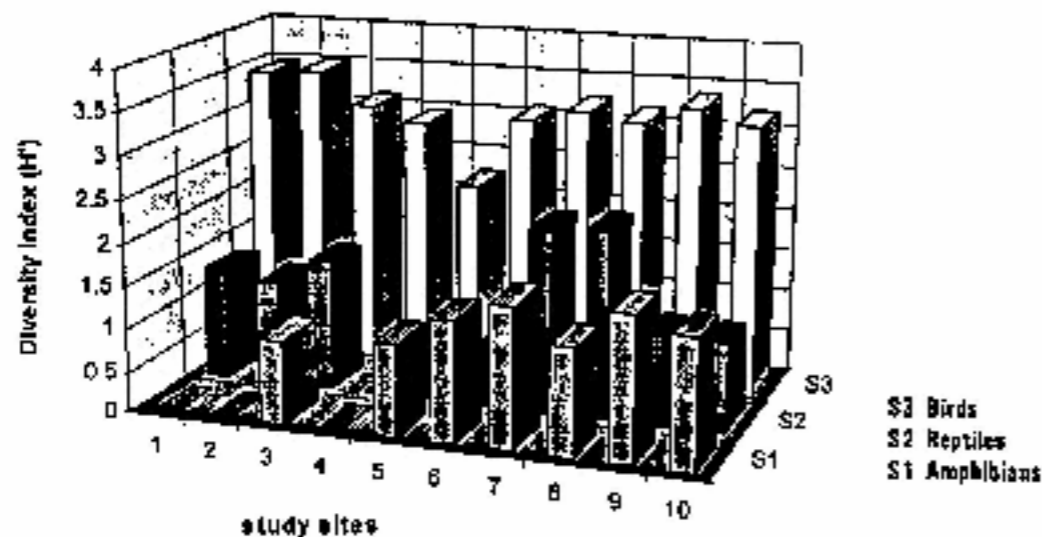


The Conditions of Biodiversity Maintenance in Asia

edited by
Michael R. Dove and Percy E. Sajise

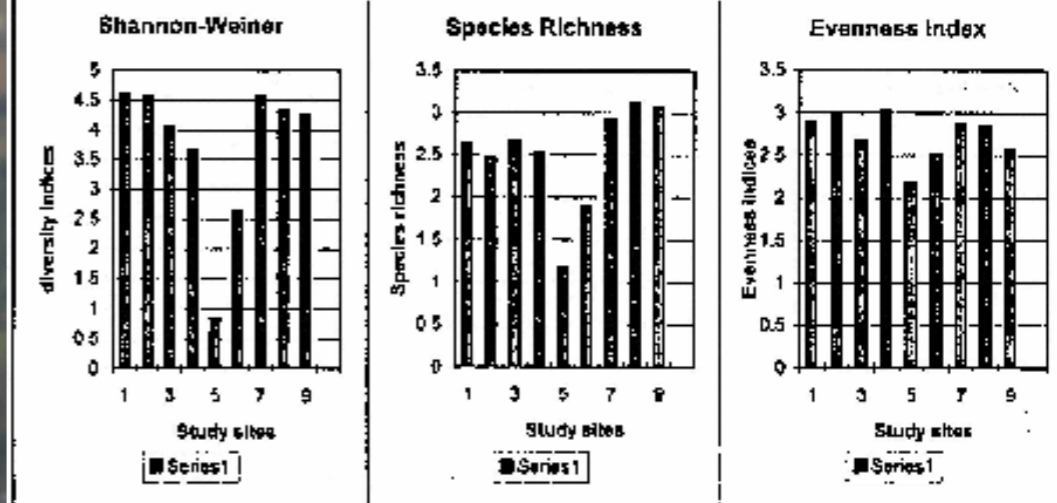
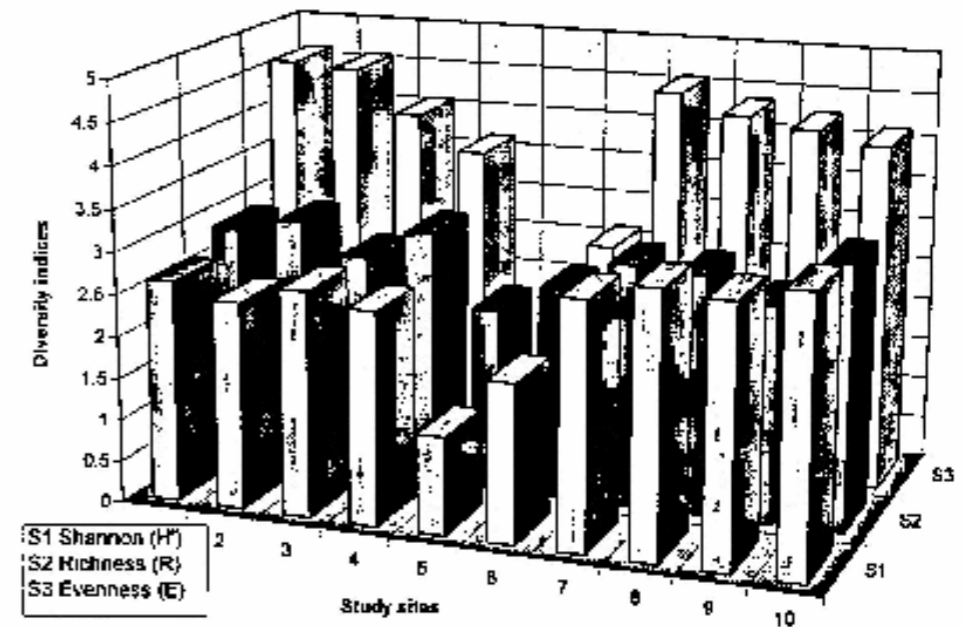
Implications of Faunal Diversity in Mount Makiling

Faunal diversity was analyzed based on the results gathered from the study of the four higher vertebrate groups conducted in ten study sites on Mount Makiling. Faunal diversity at the various study sites on Mount Makiling was compared to study differences and similarities between habitats or zones. The comparison of these diversity indices shows the possible differences among habitat types, particularly between forests and anthropogenic ecosystems (Figure 9.1).



Legend: 1—Agroforestry Bagong Silang; 2—Monoculture Bagong Silang; 3—Mixed Tree Bagong Silang; 4—Grassland Puting Lupa; 5—Dipterocarp Puting Lupa 450–500 m asl; 6—Dipterocarp Puting Lupa 550–650 m asl; 7—Dipterocarp Dampalit; 8—Dipterocarp Mid-montane 400–500 m asl; 9—Dipterocarp Mid-montane 500–600 m asl; 10—Mossy forest

Figure 9.1 Bar graph of diversity indices of birds, amphibians, and reptiles recorded at ten study sites on Mount Makiling.

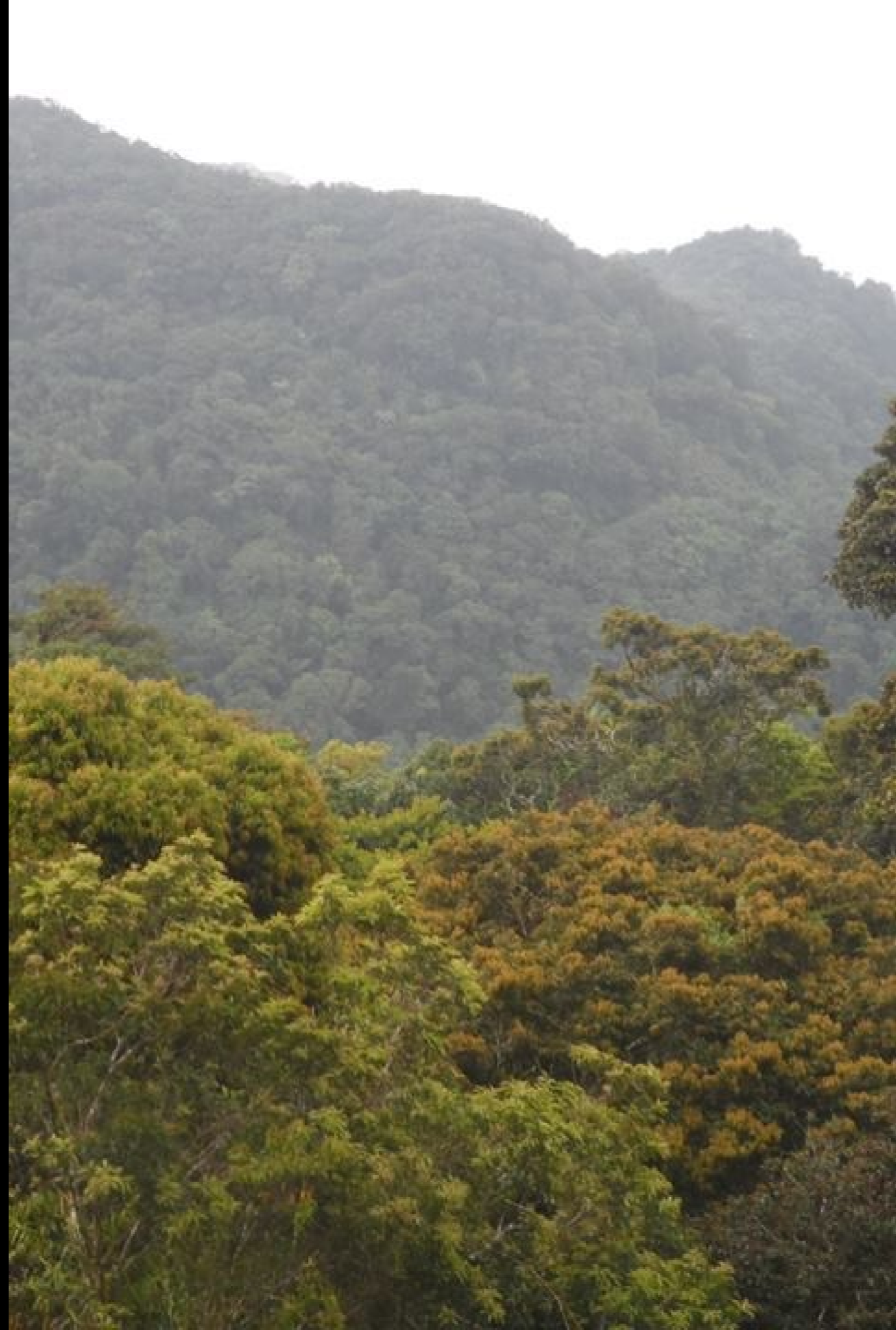


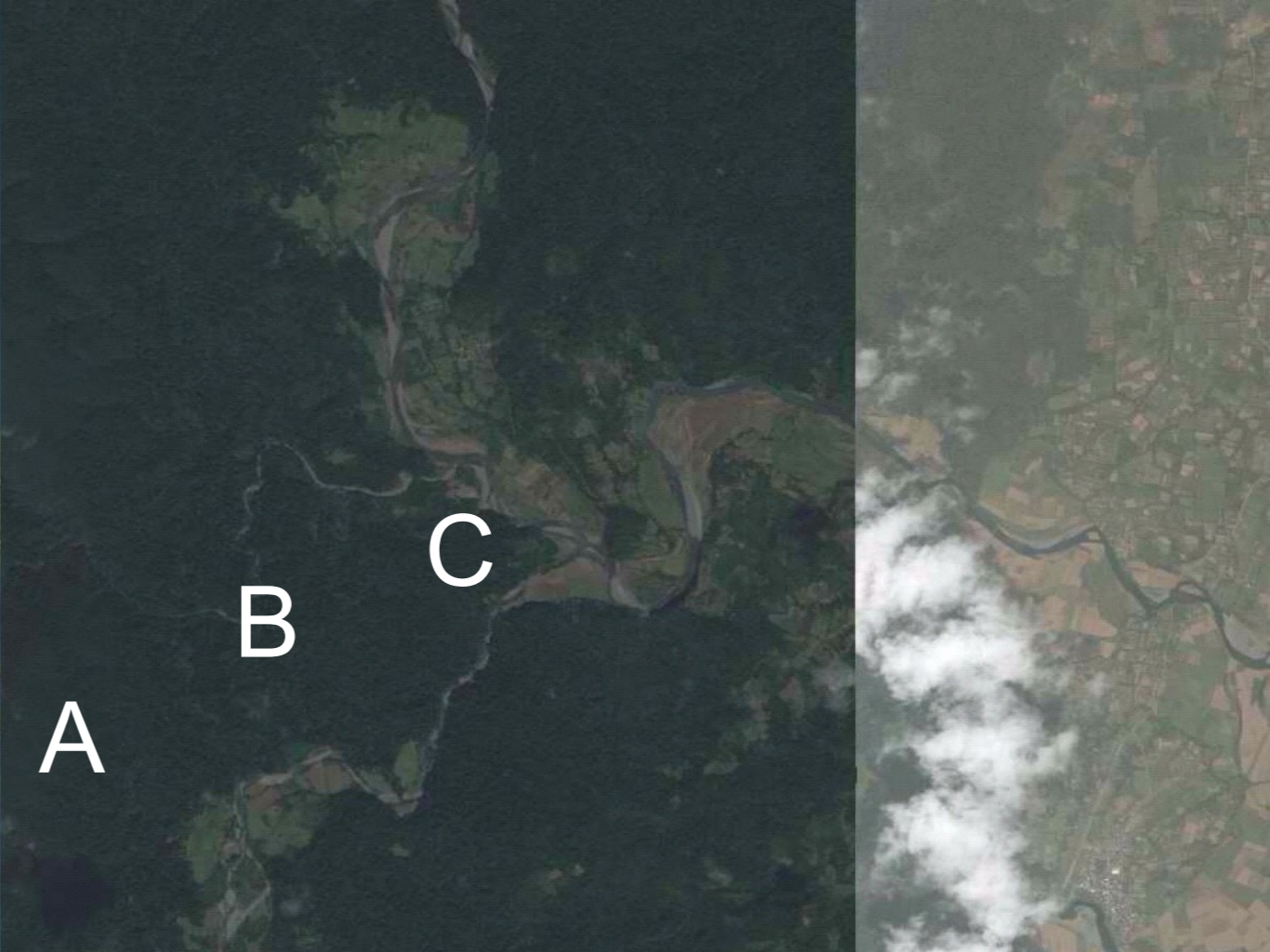
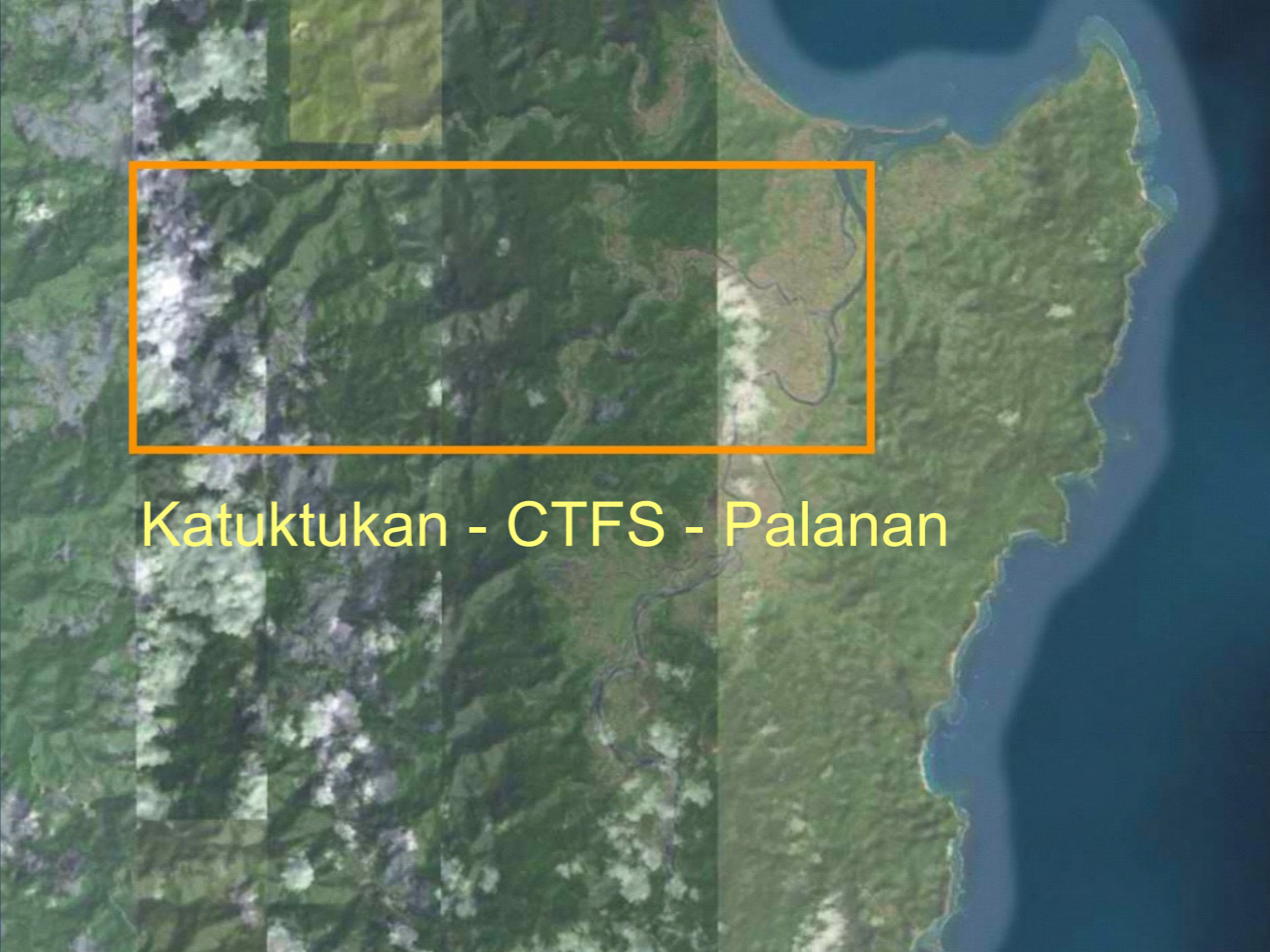
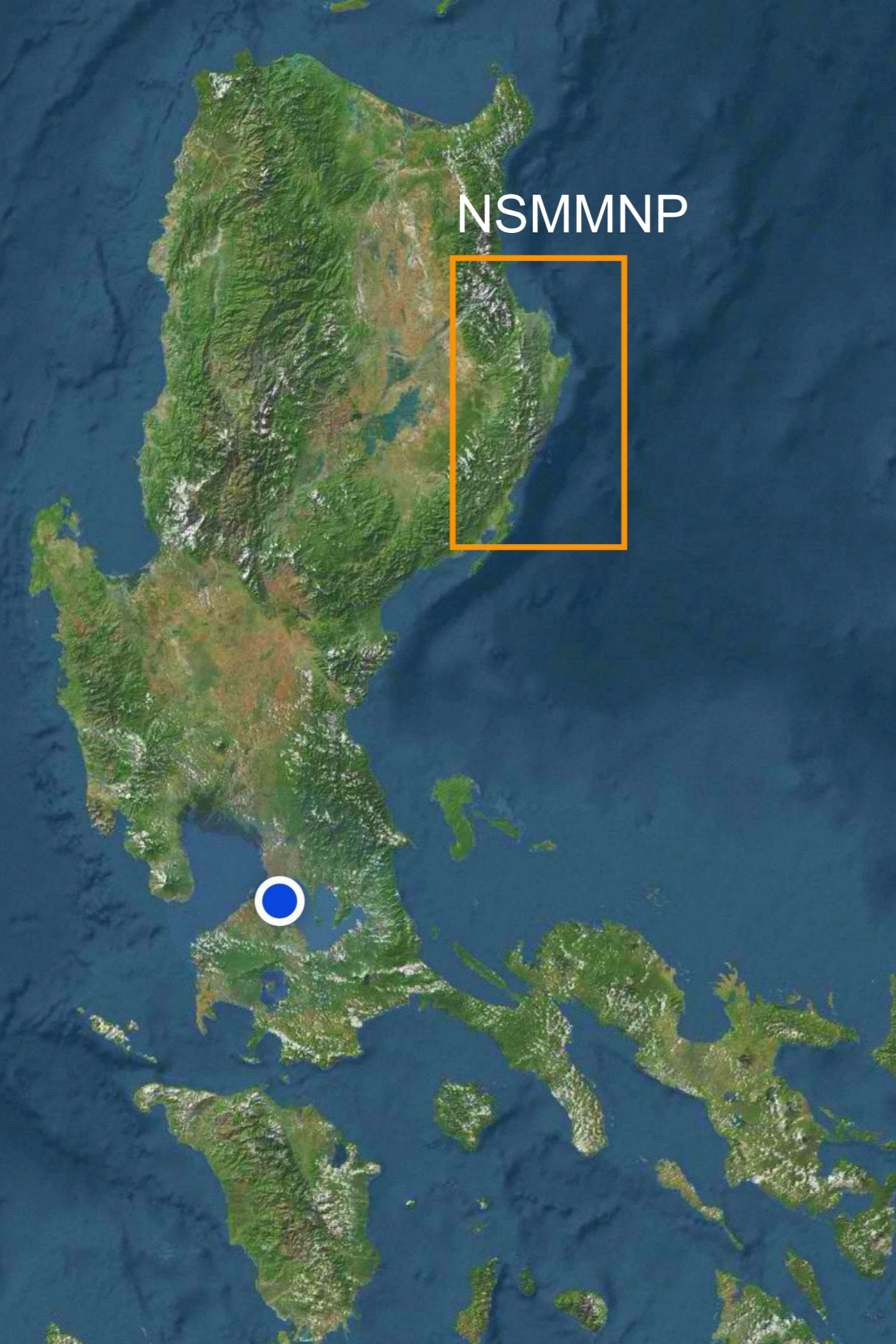
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Figure 9.2 Bar graph of Shannon-Weiner, Species Richness, and Evenness indices of each transect at ten study sites in Mount Makiling, Luzon, Philippines.

LOWLAND EVERGREEN RAINFOREST

- * BSD as a benchmark for biodiversity (BMS data)
- * Compare with standard BSD
- * Old growth Lowland TRF
- * Largest Protected Area
- * Northern Sierra Madre Mountains Natural Park
- * Palanan, Isabela, Luzon Island
- * BSD + TRF + PA + Luzon





BIRD SPECIES DIVERSITY BASED ON RANDOMISED POINT COUNTS

PHILIPPINE HORNBILL PROJECT 2008-2012 (NSMNP 2009 & 2010)

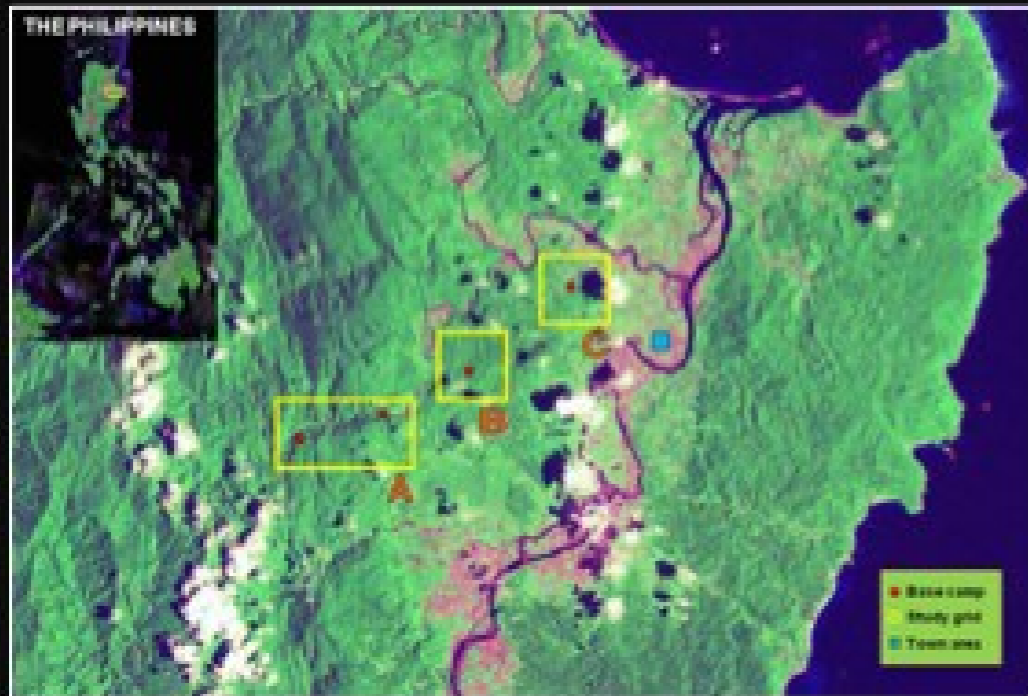


Basic ecology of two sympatric species of Philippine hornbills

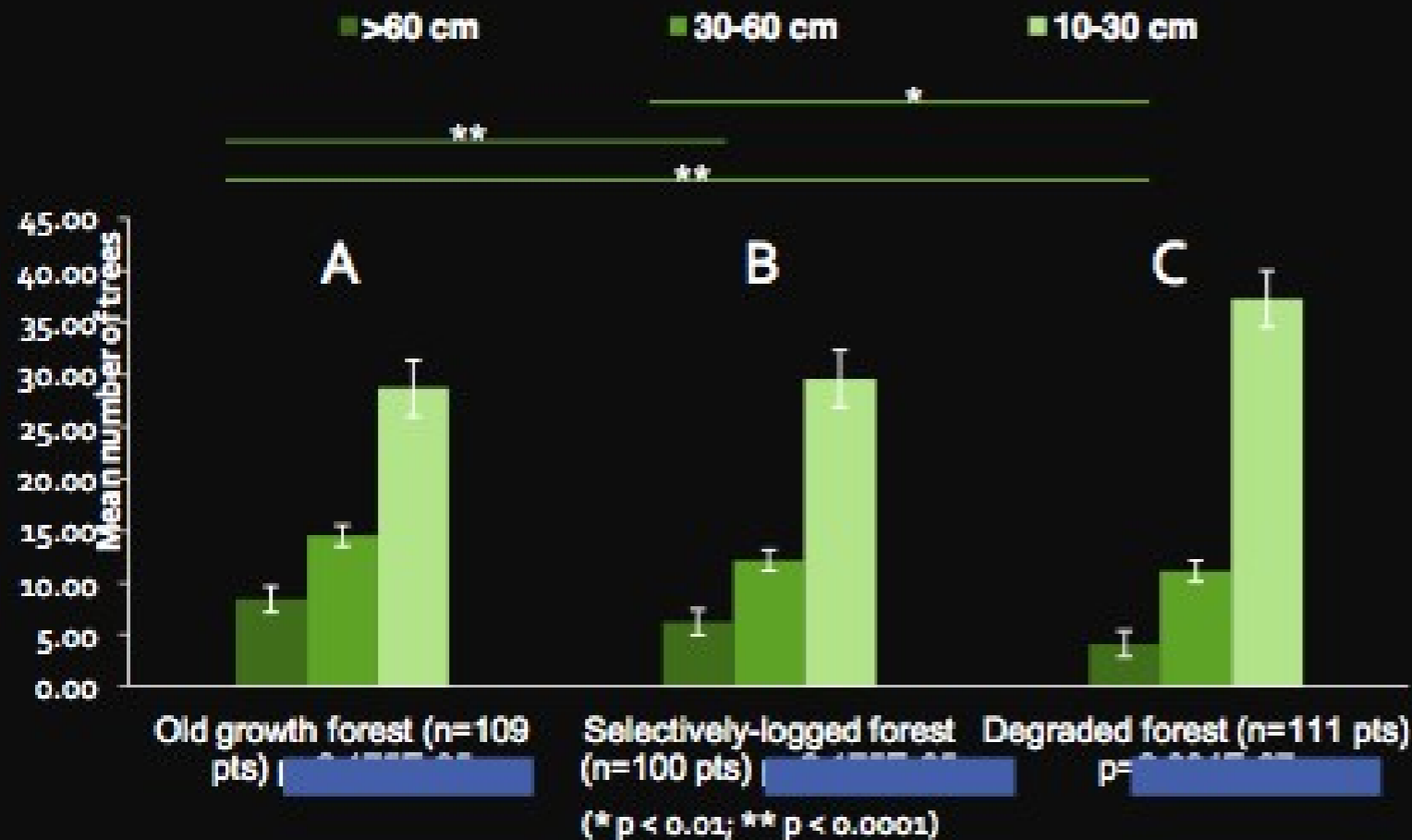
Do sympatric hornbills share similar diets and what key tree species do they disperse?

- *Buceros hydrocorax* and *Penelopides manillae*
- Nesting preferences and diet from seed fall
- Compared across habitat gradients
- Palanan side of Northern Sierra Madre Natural Park





- Density estimates of frugivores and fruit trees in 3 sites along a disturbance gradient
- Tree counts as proxy for habitat degradation
- Decline of large trees



PHILIPPINE ENDEMIC FOREST BIRDS OF LUZON



NORTHERN RUFIOUS HORNBILL
Buceros hydrocorax

PHOTO BY J.C. GONZALEZ

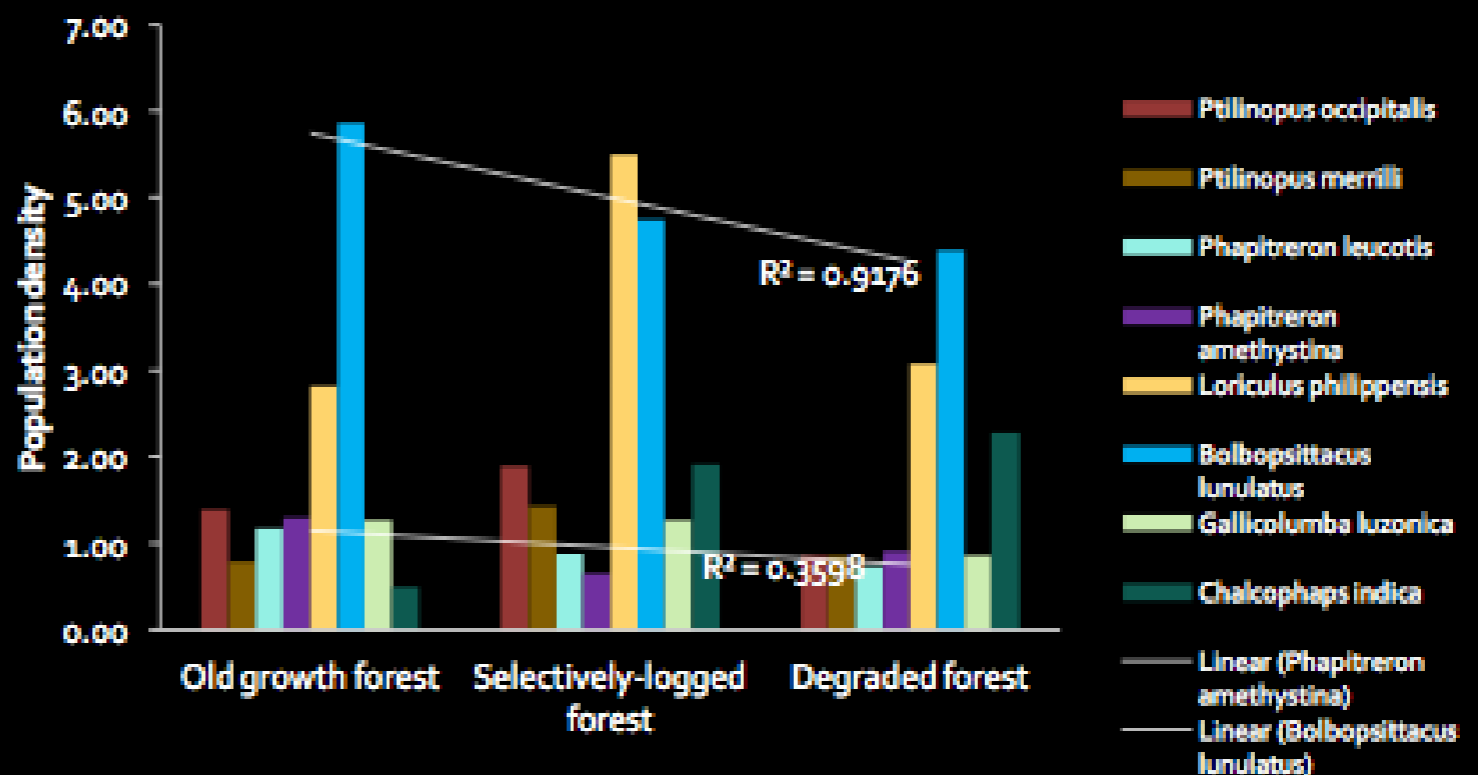
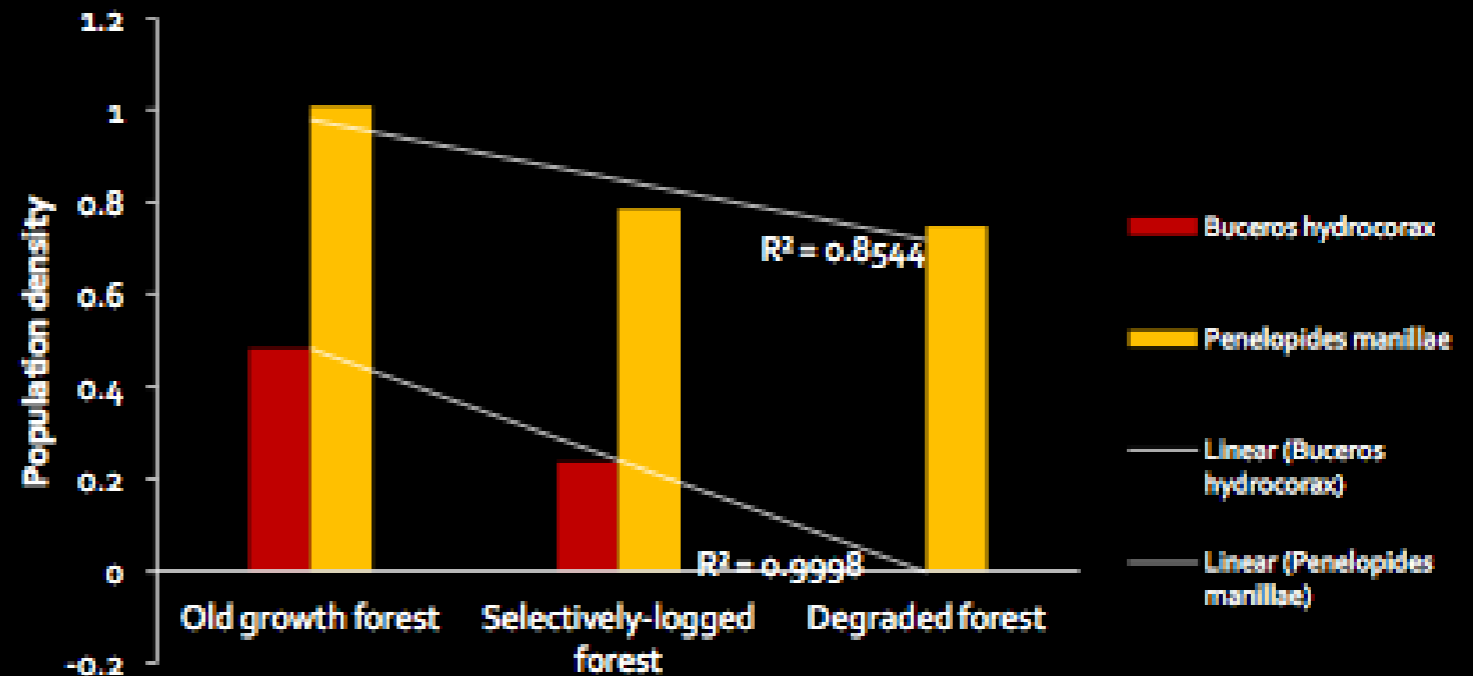
PHILIPPINE ENDEMIC FOREST BIRDS OF LUZON



LUZON TARICTIC HORNBILL
Penelopides manillae

PHOTO BY J.C. GONZALEZ

- *B. hydrocorax* declined, absent in disturbed forest
- *P. manillae* declined but persisted
- Similar with other endemic birds
- No effect on non-endemic residents



Common name	Scientific name	Site A	Site B	Guild
Guaiabero	<i>Bolbopsittacus lunulatus</i>	48	27	AF
Bicolored Flowerpecker	<i>Dicaeum bicolor</i>	1	5	AF
Orange-bellied Flowerpecker	<i>Dicaeum trigonostigma</i>	47	52	AF
Philippine Fairy-bluebird	<i>Irena cyanogaster</i>	81	25	AF
White-bellied Munia	<i>Lonchura leucogastra</i>	10	0	AF
Philippine Hanging Parrot	<i>Loriculus philippensis</i>	68	76	AF
Coppersmith Barbet	<i>Megalaima haemacephala</i>	30	43	AF
Amethyst Brown Dove	<i>Phapitreron amethystinus</i>	57	3	AF
White-eared Brown Dove	<i>Phapitreron leucotis</i>	35	62	AF
Green Racket-tail	<i>Prioniturus luconensis</i>	2	2	AF
Olive-backed Flowerpecker	<i>Prionochilus olivaceus</i>	26	0	AF
Cream-breasted Fruit Dove	<i>Ptilinopus merrilli</i>	7	21	AF
Yellow-breasted Fruit Dove	<i>Ptilinopus occipitalis</i>	8	39	AF
Philippine Green Pigeon	<i>Treron axillaris</i>	2	1	AF
Philippine Trogon	<i>Harpactes ardens</i>	12	11	AIF
Philippine Bulbul	<i>Hypsipetes philippinus</i>	190	282	AIF
Black-and-white Triller	<i>Lalage melanoleuca</i>	6	11	AIF
White-lored Oriole	<i>Oriolus albiloris</i>	10	16	AIF
Yellow-wattled Bulbul	<i>Pycnonotus urostictus</i>	32	18	AIF
Stripe-headed Rhabdornis	<i>Rhabdornis mystacalis</i>	21	0	AIF
Coletto	<i>Sarcops calvus</i>	16	3	AIF
Lowland White-eye	<i>Zosterops meyeri</i>	33	11	AIF
Luzon Flameback	<i>Chrysocolaptes haematribon</i>	0	6	BGI
Northern Sooty Woodpecker	<i>Mulleripicus funebris</i>	2	3	BGI
Northern Rufous Hornbill	<i>Buceros hydrocorax</i>	50	3	FF
Slender-billed Crow	<i>Corvus enca</i>	3	0	FF
Luzon Hornbill	<i>Penelopides manillae</i>	12	25	FF
Scale-feathered Malkoha	<i>Dasylophus cumingi</i>	13	7	FGI
Rough-crested Malkoha	<i>Dasylophus superciliosus</i>	7	48	FGI
Rusty-breasted Cuckoo	<i>Cacomantis sepulcralis</i>	2	17	FGI
Rufous Coucal	<i>Centropus unirufus</i>	9	42	FGI
Blackish Cuckooshrike	<i>Coracina coerulescens</i>	3	1	FGI
Black-bibbed Cuckooshrike	<i>Coracina mindanensis</i>	6	0	FGI
Bar-bellied Cuckooshrike	<i>Coracina striata</i>	7	21	FGI
Asian Koel	<i>Eudynamys scolopaceus</i>	0	4	FGI
Philippine Hawk-Cuckoo	<i>Hierococcyx pectoralis</i>	0	1	FGI
Philippine Tailorbird	<i>Orthotomus castaneiceps</i>	65	100	FGI
White-fronted Tit	<i>Parus semilarvatus</i>	5	0	FGI
Elegant Tit	<i>Periparus elegans</i>	49	0	FGI
Lemon-throated Leaf Warbler	<i>Phylloscopus cebuensis</i>	0	4	FGI
Golden-crowned Babbler	<i>Sterrhoptilus dennistouni</i>	30	17	FGI
Philippine Coucal	<i>Centropus viridis</i>	9	29	FGI
Buzzing Flowerpecker	<i>Dicaeum hypoleucum</i>	26	35	NI
Handsome Sunbird	<i>Aethopyga bella</i>	2	0	NI
Flaming Sunbird	<i>Aethopyga flagrans</i>	16	3	NI



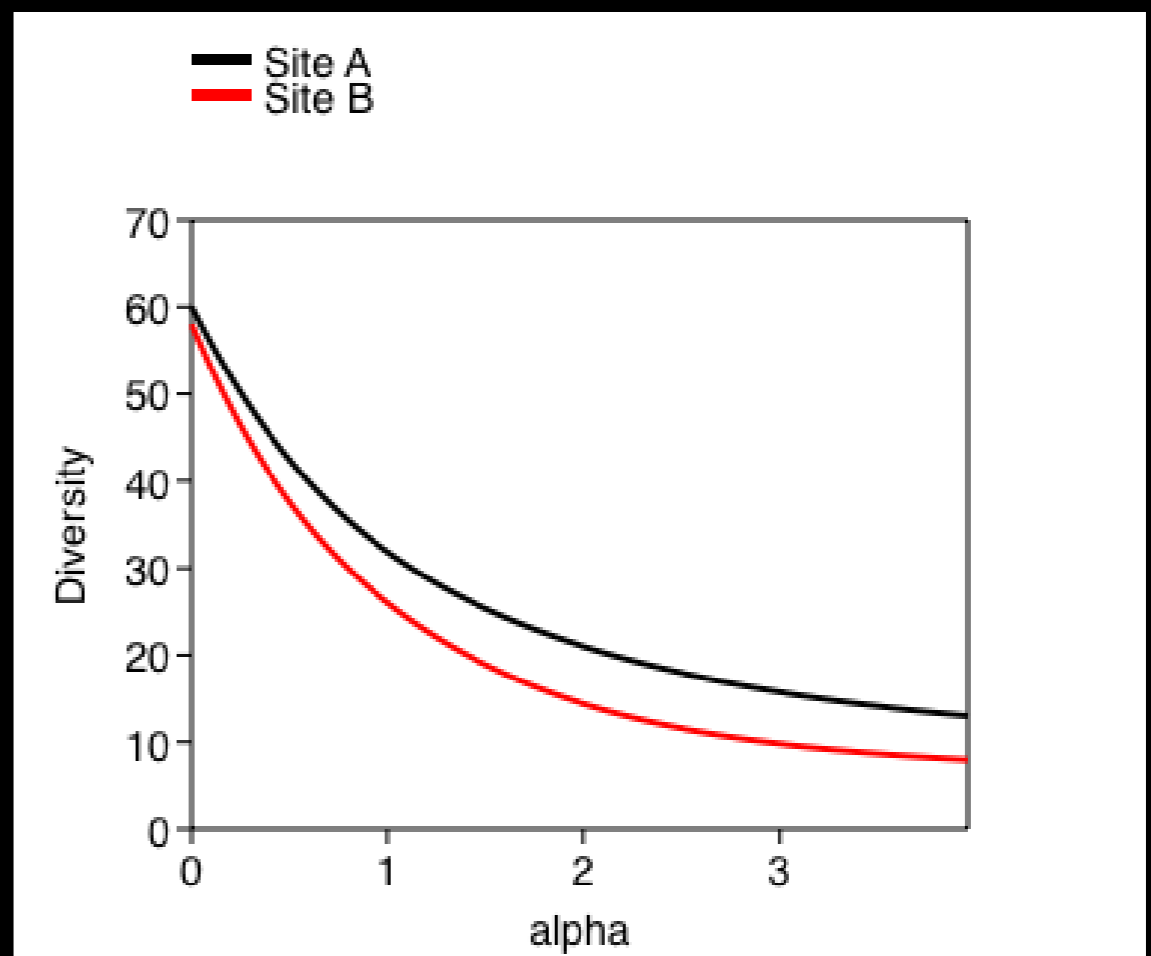
Common name	Scientific name	Site A	Site B	Guild
Flaming Sunbird	<i>Aethopyga flagrans</i>	16	3	NI
Purple-throated Sunbird	<i>Leptocoma sperata</i>	73	52	NI
Luzon Hawk-Owl	<i>Ninox philippensis</i>	0	1	R
North Philippine Hawk-Eagle	<i>Nisaetus philippensis</i>	1	1	R
Philippine Serpent Eagle	<i>Spilornis holospilus</i>	6	5	R
Balicassiao	<i>Dicrurus balicassius</i>	10	46	Sal
Black-naped Monarch	<i>Hypothymis azurea</i>	15	31	Sal
Short-crested Monarch	<i>Hypothymis helenae</i>	5	6	Sal
Philippine Falconet	<i>Microheirax erythrogegens</i>	4	0	Sal
Yellow-bellied Whistler	<i>Pachycephala philippinensis</i>	0	6	Sal
Blue-headed Fantail	<i>Rhipidura cyaniceps</i>	11	28	Sal
Philippine Drongo-Cuckoo	<i>Surniculus velutinus</i>	0	5	Sal
Rufous Paradise Flycatcher	<i>Terpsiphone cinnamomea</i>	10	1	Sal
Ameline Swiftlet	<i>Aerodramus amelis</i>	0	4	Swl
Glossy Swiftlet	<i>Collocalia esculenta</i>	9	8	Swl
Pygmy Swiftlet	<i>Collocalia troglodytes</i>	66	2	Swl
Pacific Swallow	<i>Hirundo tahitica</i>	2	0	Swl
Common Emerald Dove	<i>Chalcophaps indica</i>	12	1	TF
Luzon Bleeding-heart	<i>Gallicolumba luzonica</i>	3	3	TF
Spotted Wood Kingfisher	<i>Actenoides lindsayi</i>	0	2	TI
Philippine Bush-hen	<i>Amaurornis olivacea</i>	2	10	TI
Lesser Coucal	<i>Centropus bengalensis</i>	0	1	TI
White-browed Shama	<i>Copsychus luzoniensis</i>	38	49	TI
Red-bellied Pitta	<i>Erythropitta erythrogaster</i>	0	6	TI
Northern Indigo-banded Kingfisher	<i>Ceyx cyanopectus</i>	3	0	TI
Cinnamon Bittern	<i>Ixobrychus cinnamomeus</i>	1	0	TI
Red Junglefowl	<i>Gallus gallus</i>	5	0	TIF
2,676	Total individuals observed	1,334	1,342	
71	Total species observed	60	58	
Faunivore-Frugivore	3	3	2	FF
Nectivore-Insectivore	4	3	4	NI
Arboreal Insectivore-Frugivore	8	8	7	AIF
Terrestrial Insectivore-Frugivore	1	1	0	TIF
Arboreal Frugivore	14	14	12	AF
Terrestrial Frugivore	2	2	2	TF
Sweeping Insectivore	4	3	3	Swl
Sallying Insectivore	8	7	6	Sal
Foliage-Gleaning Insectivore	15	12	12	FGI
Bark-Gleaning Insectivore	2	1	2	BGI
Terrestrial Insectivore	7	4	5	TI
Raptorial	3	2	3	R
	71	60	58	

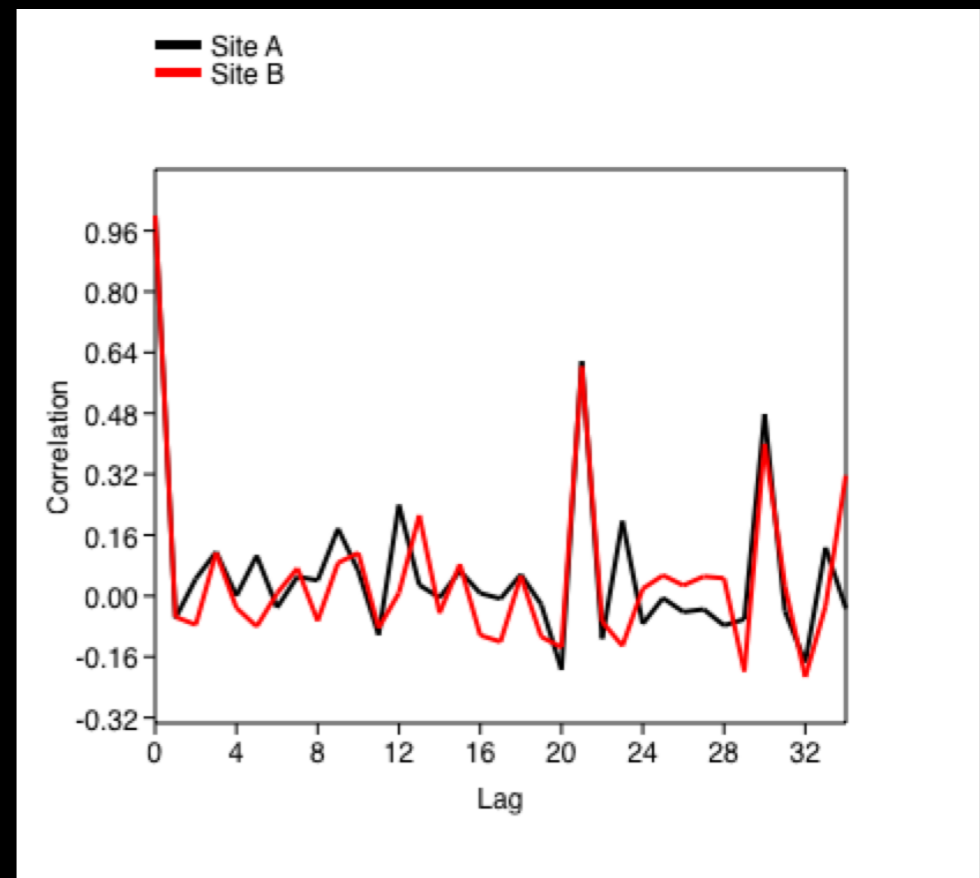
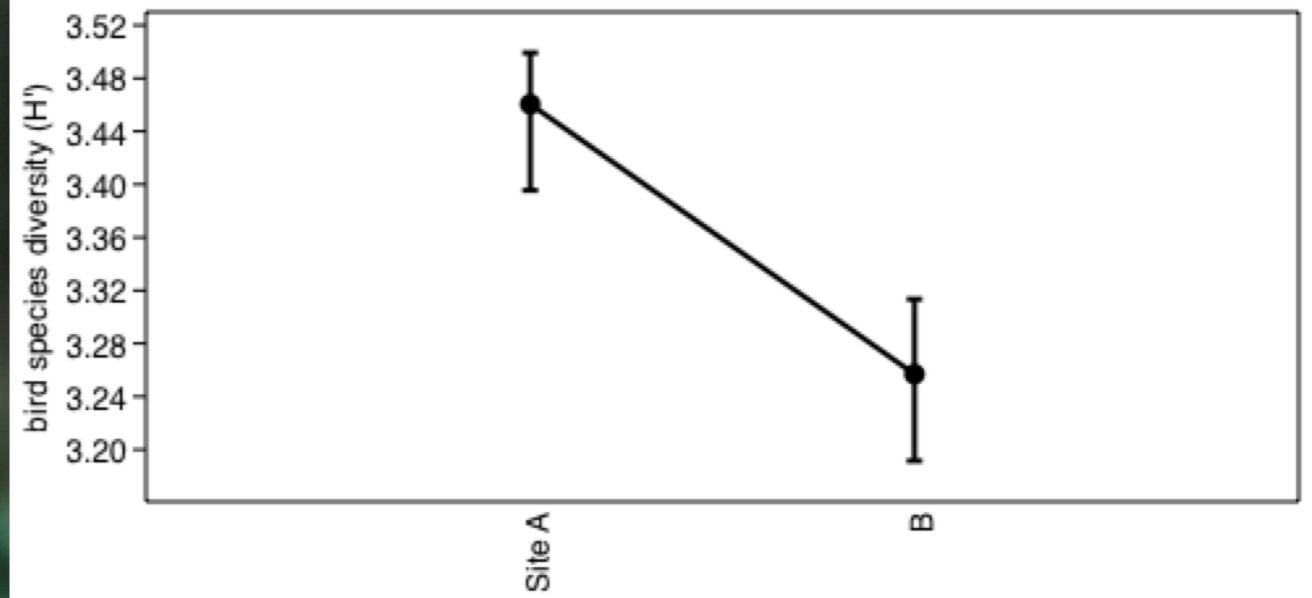


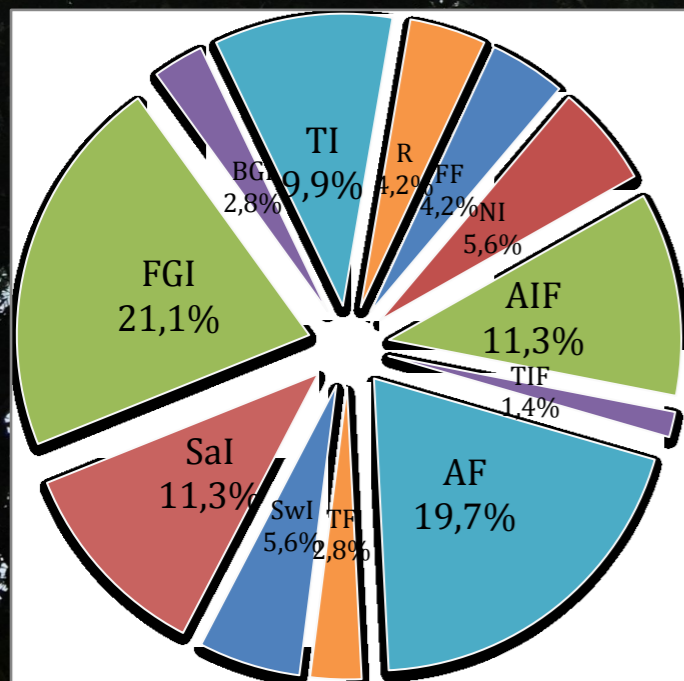
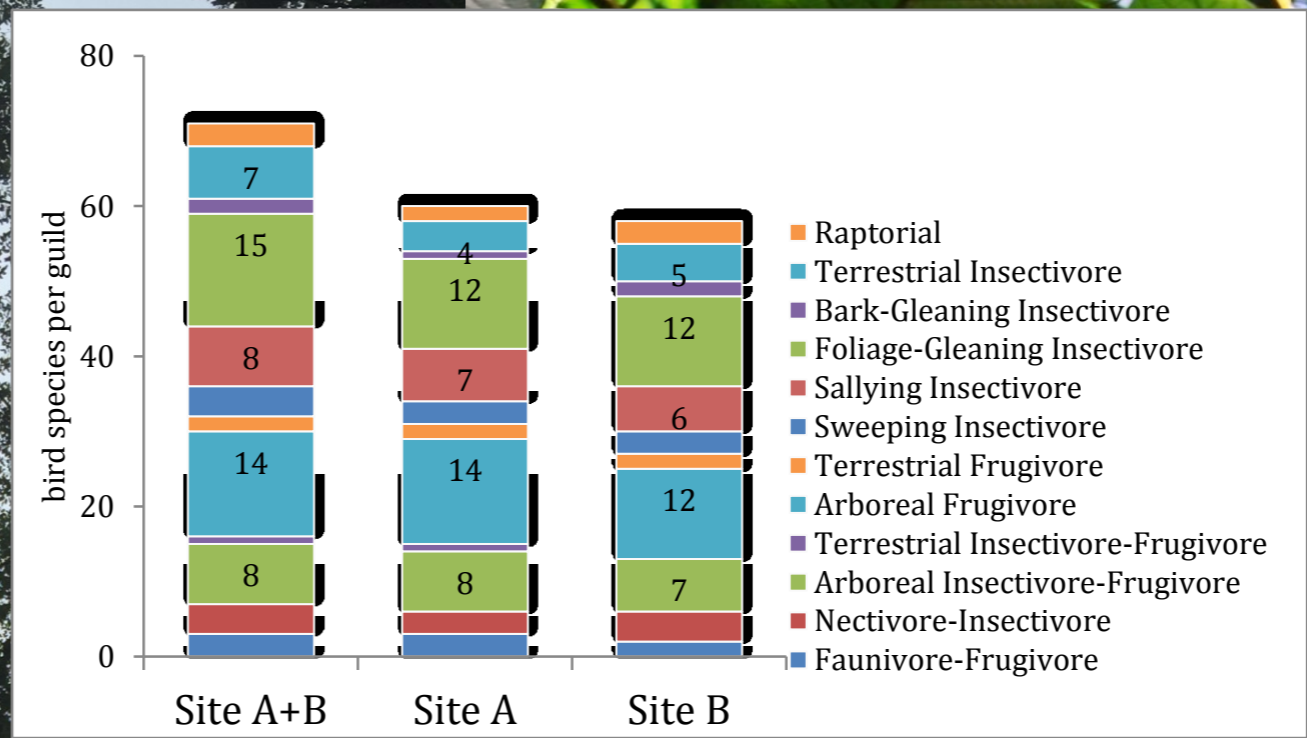


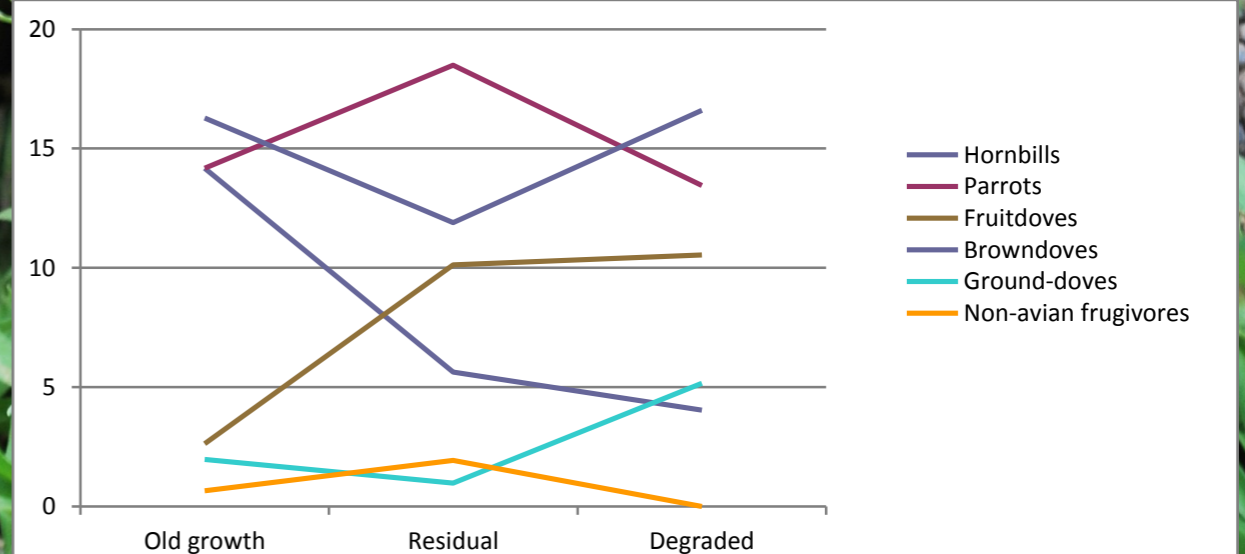
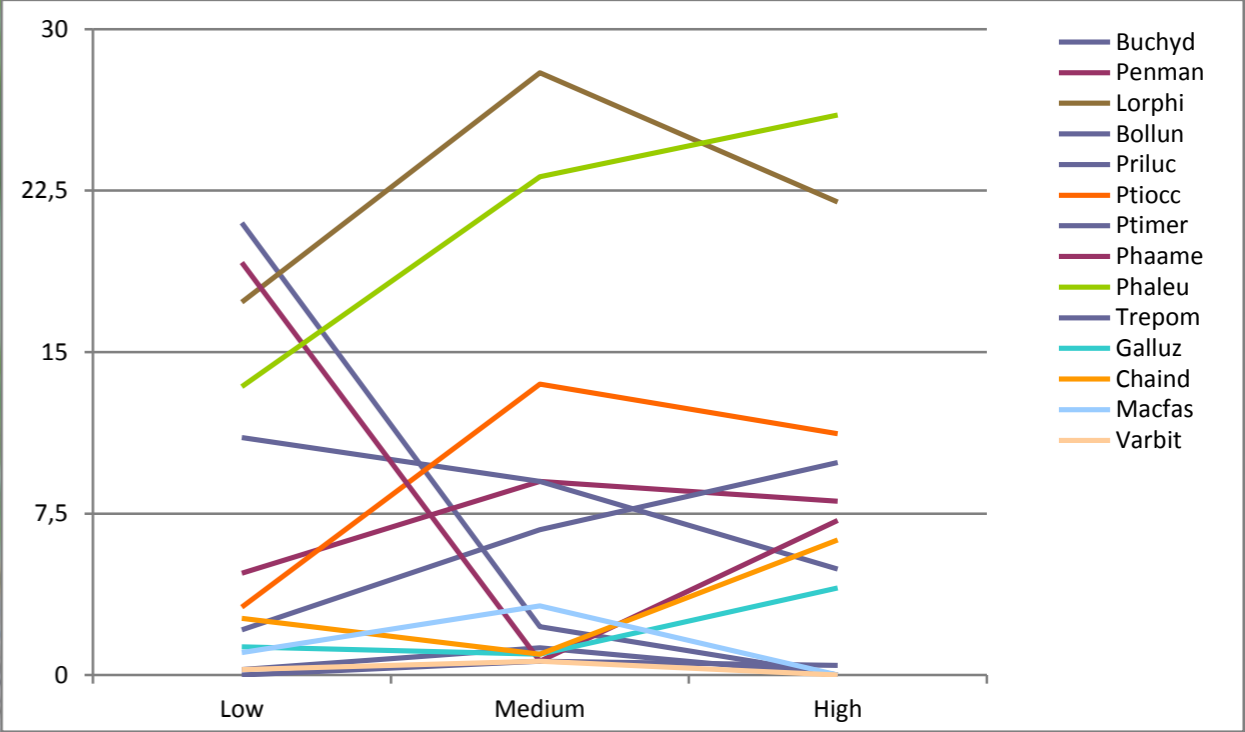
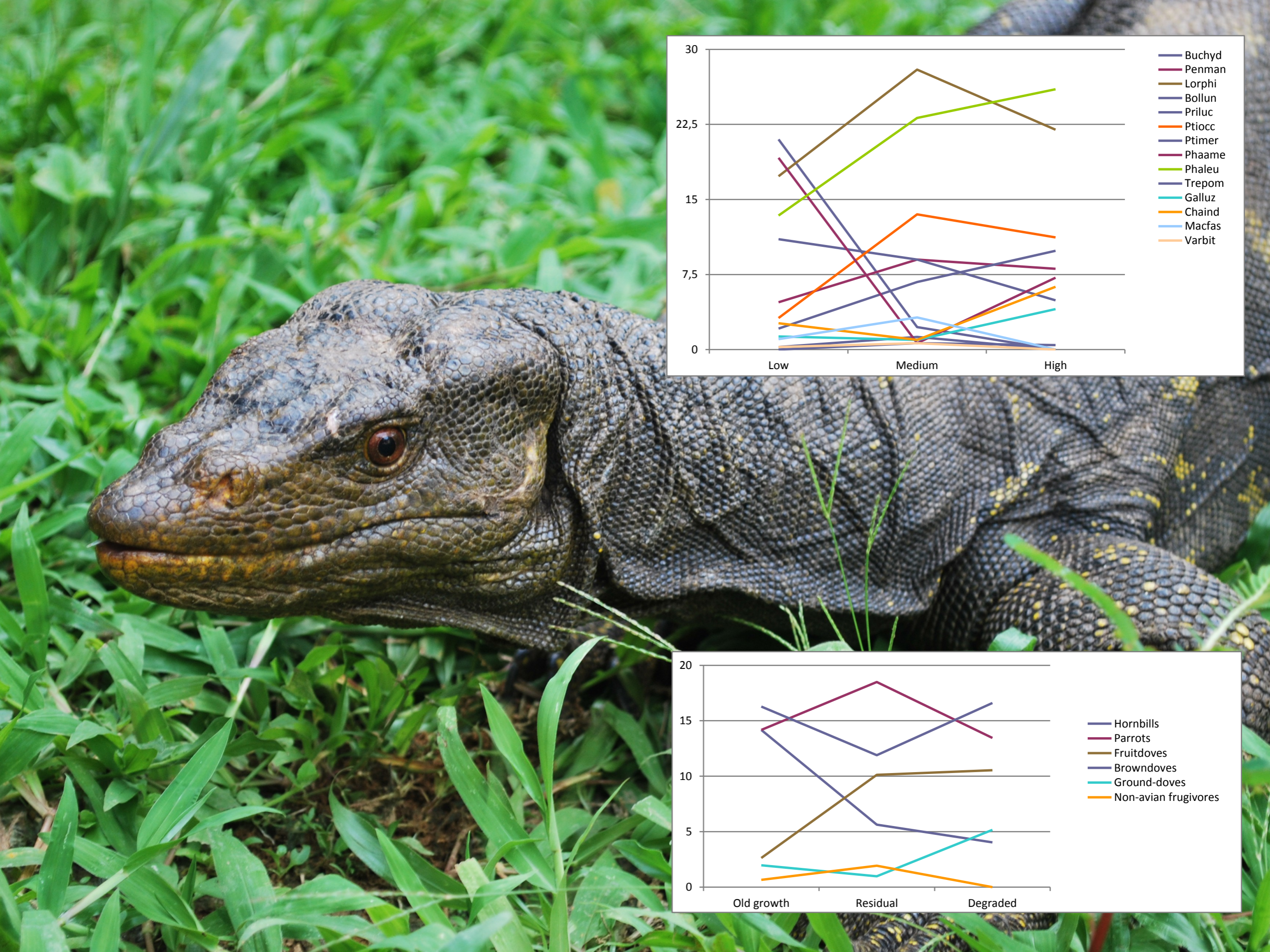
	Site A	Lower	Upper	B	Lower	Upper
Taxa_S	60	59	60	58	58	58
Individuals	1334	1334	1334	1342	1342	1342
Dominance_D	0.04766	0.04406	0.05291	0.06955	0.06226	0.07837
Simpson_1-D	0.9523	0.9471	0.9559	0.9305	0.9216	0.9377
Shannon_H	3.461	3.395	3.499	3.257	3.191	3.313
Evenness_e^H	0.5306	0.4976	0.5517	0.4477	0.4194	0.4738
Brillouin	3.369	3.306	3.407	3.172	3.108	3.227
Menhinick	1.643	1.615	1.643	1.583	1.583	1.583
Margalef	8.199	8.06	8.199	7.915	7.915	7.915
Equitability_J	0.8452	0.8295	0.8547	0.8021	0.786	0.816
Fisher_alpha	12.91	12.64	12.91	12.35	12.35	12.35
Berger-Parker	0.1424	0.1237	0.1612	0.2101	0.1878	0.2325
Chao-1	60.38	60	70.5	65	58.43	73

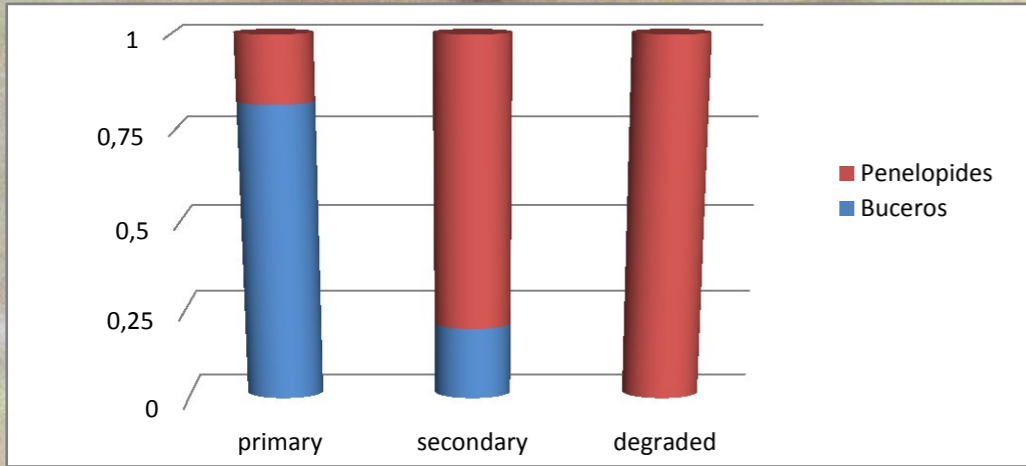
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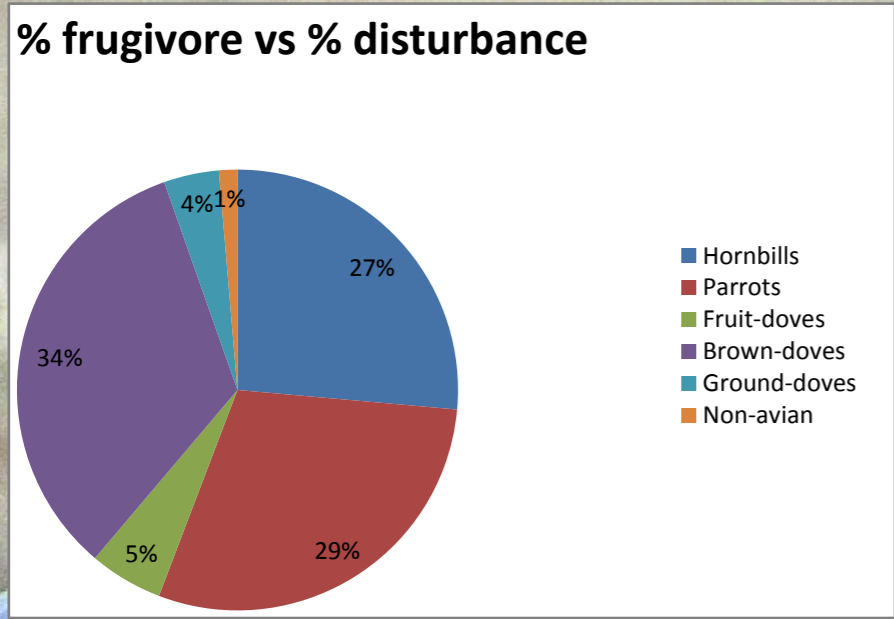








% frugivore vs % disturbance



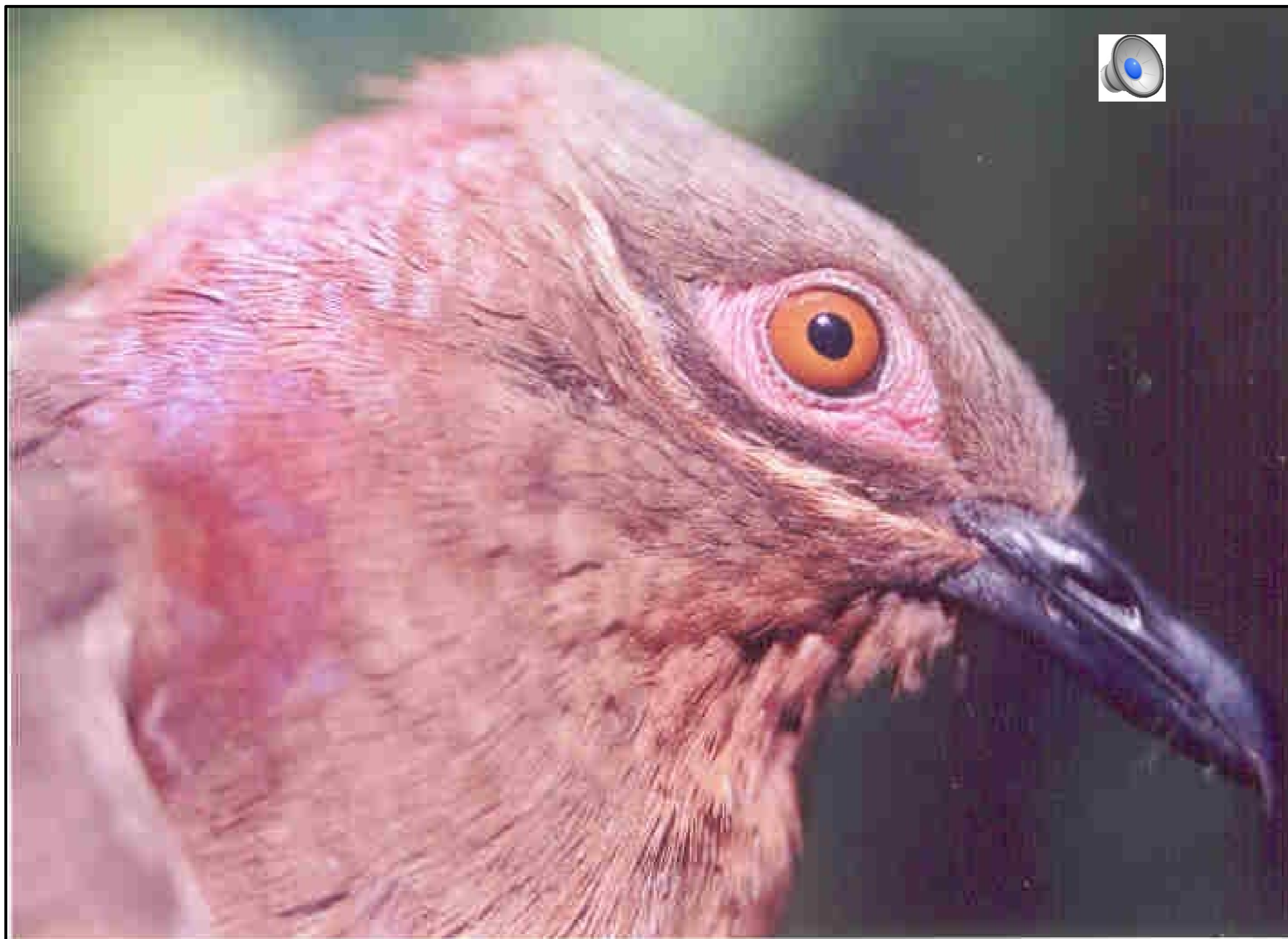
PHILIPPINE ENDEMIC FOREST BIRDS OF LUZON



LUZON BLEEDINGHEART PIGEON
Gallicolumba luzonica

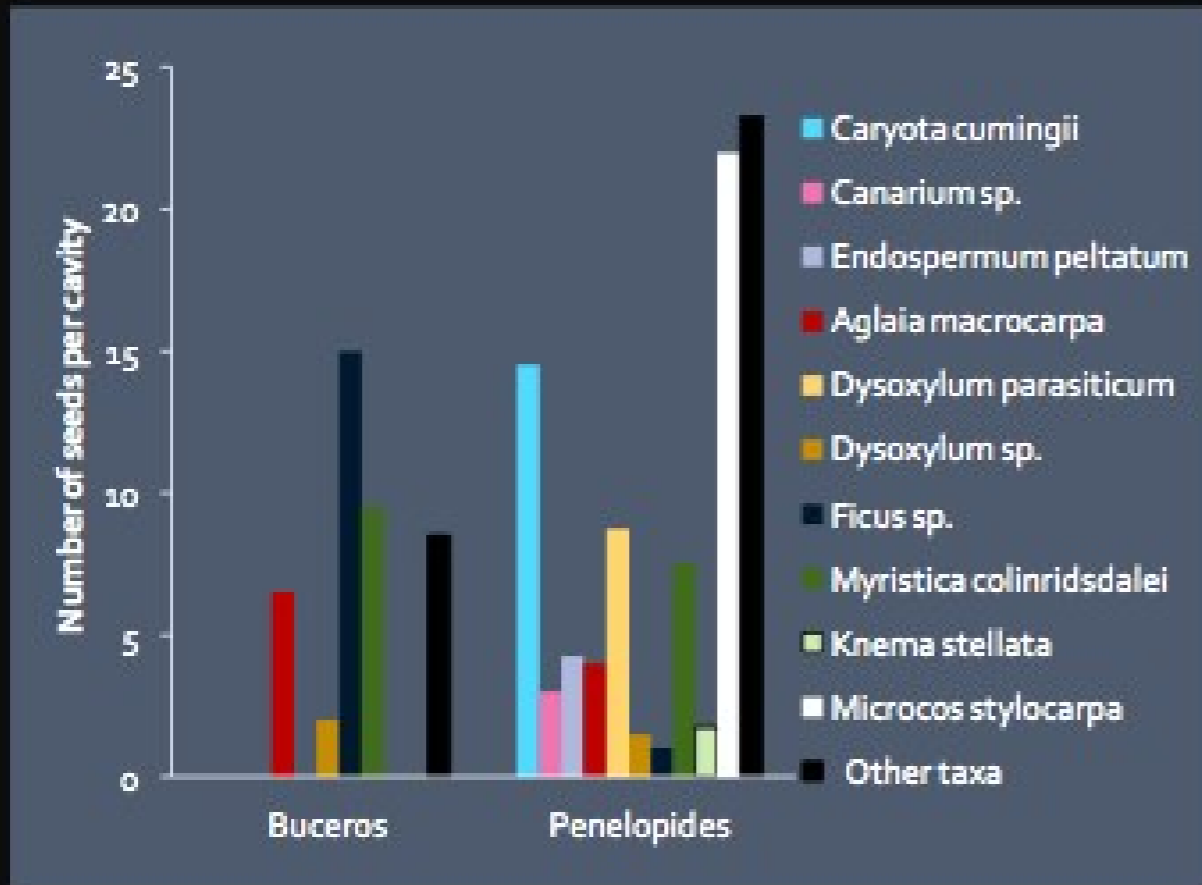
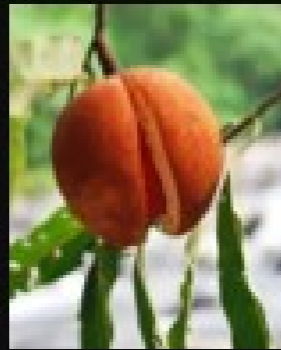
PHOTO BY J.C. GONZALEZ

PHILIPPINE ENDEMIC FOREST BIRDS OF LUZON



AMETHYST BROWN-DOVE
Phapitreron amethystina

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- ***Buceros hydrocorax***
 - limited fruit choice
 - large-seeded non-figs
 - Meliaceae & Myristicaceae
- ***Penelopides manillae***
 - wider fruit choice
 - palms & variety of non-figs
 - same fruits, but more added



PHILIPPINE ENDEMIC FOREST BIRDS OF LUZON



SCALE-FEATHERED MALKOHA
Dasylophus cumingi

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PHILIPPINE ENDEMIC FOREST BIRDS OF LUZON



ROUGH-CRESTED MALKOHA
Dasylophus superciliosus

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PHILIPPINE ENDEMIC FOREST BIRDS OF LUZON



WHITE-BROWED SHAMA
Copsychus luzoniensis

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PHILIPPINE ENDEMIC FOREST BIRDS OF LUZON



BLUE-HEADED FANTAIL
Rhipidura cyaniceps

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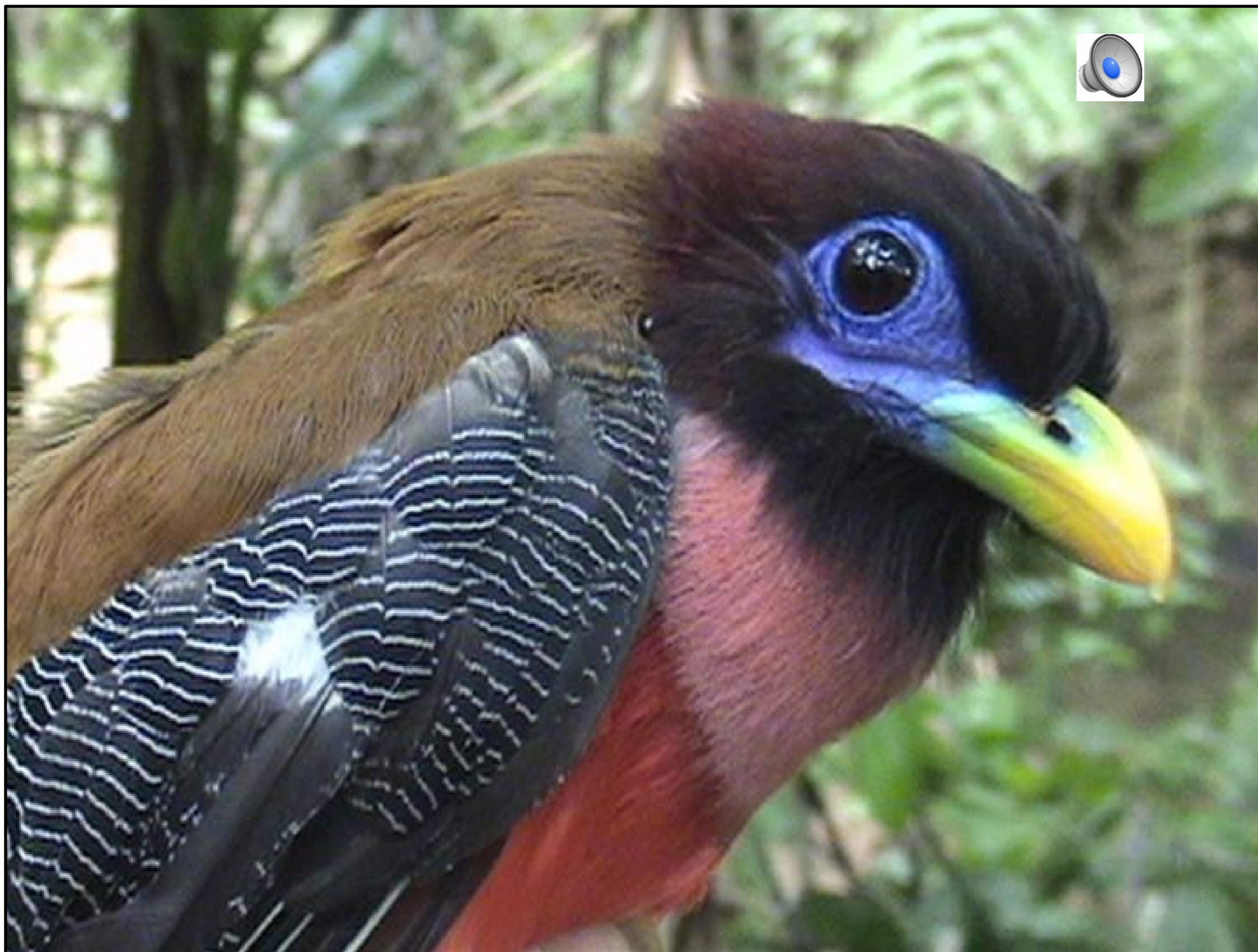
PHILIPPINE ENDEMIC FOREST BIRDS OF LUZON



PHILIPPINE SCOPS-OWL
Otus megalotis

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PHILIPPINE ENDEMIC FOREST BIRDS OF LUZON



PHILIPPINE TROGON
Harpactes ardens

PHOTO BY J.C. GONZALEZ



FOREST BIRDS OF NORTHERN LUZON

LUZON ISLAND, PHILIPPINES



More than 200 birds are recorded from the 10,000+ ha protected Mt. Pulag Biosphere Reserve within the Protected Forest System that not only protect all growth and secondary forest remnants. This important bird area features extensive montane and lowland species, most of which are unique to Luzon (some found only in Luzon and some only in Luzon). It is a stronghold for several threatened and critically endangered species. This poster serves as a general guide to the readily sighted birds within the protected area, mostly according to seasonal occurrence. Several illustrations, but also includes some common forest birds. Illustrations are provided for each species. Illustrations include: names, scientific names, relative abundance, and other details for each species. Images were taken during the 2010 National Forest Inventory for the Philippines National project of the University of Calicut and U.P. Los Baños.



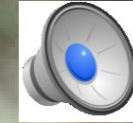


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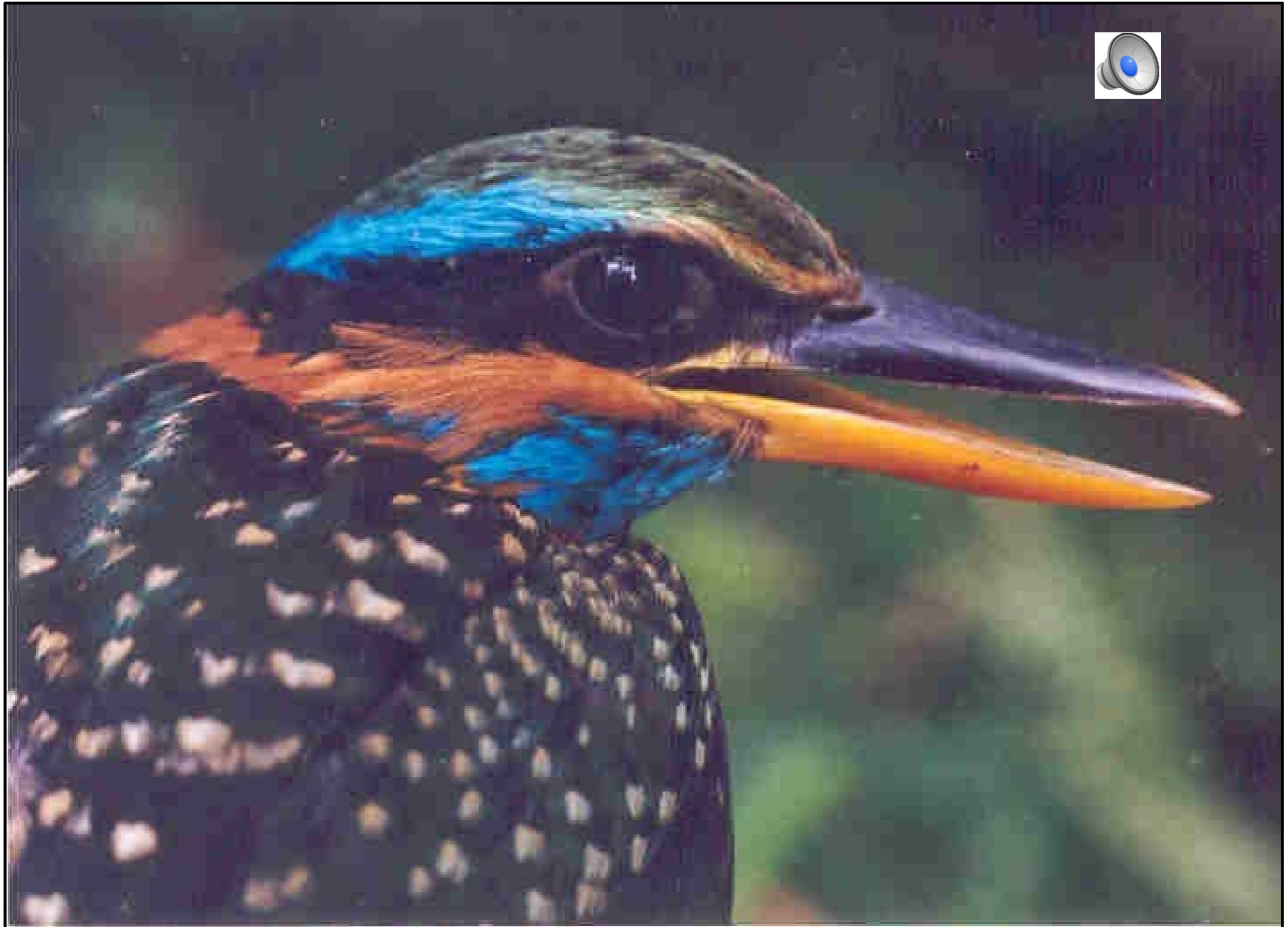
PHILIPPINE ENDEMIC FOREST BIRDS OF LUZON



PHILIPPINE FAIRY BLUEBIRD
Irena cyanogaster

PHOTO BY J.C. GONZALEZ

PHILIPPINE ENDEMIC FOREST BIRDS OF LUZON



SPOTTED WOOD KINGFISHER
Actenoides lindsayi

PHOTO BY J.C. GONZALEZ

PHILIPPINE ENDEMIC FOREST BIRDS OF LUZON



YELLOW-BELLIED WHISTLER
Pachycephala philippinensis

PHOTO BY J.C. GONZALEZ

PHILIPPINE ENDEMIC FOREST BIRDS OF LUZON



RUFOUS PARADISE FLYCATCHER
Terpsiphone cinnamomea

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PHILIPPINE ENDEMIC FOREST BIRDS OF LUZON



PHILIPPINE FROGMOUTH
Batrachostomus septimus

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PHILIPPINE ENDEMIC FOREST BIRDS OF LUZON



BALICASSIAO DRONGO
Dicrurus balicassius

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PHILIPPINE ENDEMIC FOREST BIRDS OF LUZON



PHILIPPINE FALCONET
Microhierax erythrogenys

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PHILIPPINE ENDEMIC FOREST BIRDS OF LUZON



INDIGO-BANDED KINGFISHER
Ceyx cyanopectus

PHOTO BY J.C. GONZALEZ

PHILIPPINE ENDEMIC FOREST BIRDS OF LUZON



YELLOW-WATTLED BULBUL
Pycnonotus urostictus

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PHILIPPINE ENDEMIC FOREST BIRDS OF LUZON



PHILIPPINE BULBUL
Hypsipetes philippinus

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