



The 22nd Philippine Biodiversity Symposium: Cultural and Biodiversity Values of Conservation Areas



Central Mindanao University, Musuan, Bukidnon
16-19 April 2013



The **Wildlife Conservation Society of the Philippines (WCSP)** is a professional organization of wildlife researchers, managers, scientists, and conservationists. The Society was formed to advance wildlife research and conservation in the Philippines through promoting collaborative research, providing technical assistance and training and increasing public awareness. Since 1992, wildlife biologists and conservationists from throughout the country have been meeting at the **WCSP Annual Biodiversity Symposia** and the proceedings from most of these annual meetings have been published. The WCSP was officially registered in 1993.

The **WCSP Annual Philippine Biodiversity Symposia** are generally held in April at different venues around the Philippines. Symposium activities include an institutional fair where organizations involved in biodiversity research and conservation can present posters, plenary and keynote addresses, concurrent workshops, and contributed oral and poster presentations including special sessions for high school and undergraduate students.

Symposia of the Wildlife Conservation Society of the Philippines

1992 Dumaguete, Negros Oriental
1993 Los Banos, Laguna
1994 Initao, Misamis Oriental
1995 Quezon City, Metro Manila
1996 Dumaguete, Negros Oriental
1997 Los Banos, Laguna
1998 Davao City
1999 Puerto Princesa, Palawan
2000 Tagaytay, Cavite
2001 Dumaguete, Negros Oriental
2002 Cebu
2003 Murcia, Negros Occidental
2004 Antipolo, Rizal
2005 Tuguegarao, Cagayan Valley
2006 Puerto Princesa, Palawan
2007 Davao City
2008 Baybay, Leyte
2009 Baguio, Benguet
2010 Naga, Camarines Sur
2011 Dumaguete, Negros Oriental
2012 Manila and Dasmariñas Cities
2013 Musuan, Bukidnon

Proceedings of the Wildlife Conservation Society of the Philippines

Silliman Journal 1992, vol. 36, no. 1
Asia Life Sciences 1993, vol. 2, no. 2
Sylvatrop 1995, Vol. 5, nos. hh1 & 2
Sylvatrop 1997, Vol. 7, nos. 1 & 2
Sylvatrop 1998, Vol. 8, nos. 1 & 2
Sylvatrop 2000, Vol. 10, nos. 1 & 2
Silliman Journal 2001, vol. 42, no. 1
Sylvatrop 2003, Vol. 13, nos. 1 & 2
Agham Mindanaw 2004, vol. 2
Sylvatrop 2005, Vol. 15, nos. 1 & 2
Banwa Natural Science 2006, Vol. 3, nos. 1 & 2
Banwa Natural Science 2007, Vol. 4, no. 2

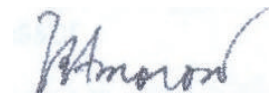
Warmest greetings to the officers and members of the Wildlife Conservation Society of the Philippines (WCSP) on the occasion of our 22th Annual Philippine Biodiversity Symposium with the theme, "Biodiversity and Cultural Values of Conservation Areas".

The Philippines is one of the 17 megadiversity countries. Altogether these countries hold two-thirds of the world's biodiversity and high endemism. However, the Philippines is also one of the 34 global biodiversity hotspots because our country's biodiversity and endemism is highly threatened. Moreover, many of the threatened and endemic species are found in 206 biodiversity sites as identified by DENR in the 2nd iteration of the National Biodiversity Strategy and Action Plan, in 117 Important Bird Areas (IBA) by HARIBON and Bird Life International, and 88 conservation priority areas for plants by Conservation International.

All these Key Conservation Areas have rich biodiversity and culture of indigenous people which need to be protected/preserved for the present and future generations to come. Human cultures co-evolve with their environment, and therefore the conservation of biodiversity can also be important for cultural identity.

We are pleased that you have chosen CMU as the venue to bring together scientists and researchers to discuss biodiversity and cultural values in conservation areas. In behalf of the CMU administration, we are hopeful that in addition to the scientific sessions, you will enjoy the ambience of the University campus and savor the fresh air.

Congratulations to WCSP and may success continuously come our way as we carry on our advocacies in promoting biodiversity research, education and conservation.



VICTOR B. AMOROSO
Chair, Local Organizing Committee
Central Mindanao University and
Director of Center For Biodiversity
Research And Extension In Mindanao
(CEBREM)

MESSAGE

We are coming together from different parts of the Philippines and abroad for the 22nd Annual Philippine Biodiversity Symposium of the Wildlife Conservation Society of the Philippines (WCSP) - a gathering of long-time colleagues and new friends. Our long time colleagues include members of the academe, the Department of Natural Resources, and conservation organizations, and we are glad that our symposia have helped to foster collaborative relationships. Our new friends include high school and college students who are already involved in wildlife research and whom we hope to continue to see over the years.

We are fortunate to be meeting on the island of Mindanao, with its rich in biodiversity, indigenous cultures, and important conservation areas. This is only the fourth annual symposium of the Wildlife Conservation Society of the Philippines to be held in Mindanao. We salute Central Mindanao University and its role in biodiversity research and conservation in Bukidnon and elsewhere in Mindanao. We hope to have more symposia in Mindanao and other areas of rich biodiversity that have been underrepresented as symposium venues so that we can better reach the people who are most able to contribute to wildlife research and conservation in these areas.

The theme of this symposium, “Biodiversity and Cultural Values of Conservation Areas”, is most appropriate for Mindanao, and especially the Province of Bukidnon. We have speakers with years of experience on the theme, as well as an impressive line up of presentations and workshops, having received a record number of over 140 abstracts on wildlife.

Let’s all have a wonderful and fruitful symposium!

Sincerely,



Nina R. Ingle, PhD
President
Wildlife Conservation Society of the Philippines

**22nd Annual Philippine Biodiversity Symposium
of the Wildlife Conservation Society of the Philippines (WCSP)
at Central Mindanao University (CMU)
Musuan, Bukidnon**

16-19 April 2013

Theme: Cultural and Biodiversity Values of Conservation Areas

16 April 2013, Tuesday

09:00–1:30 pm Lobby, Farmers Training Center, CMU	Symposium Registration Set-up of poster presentations, submission of PowerPoint presentations sign-up for workshops
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1:30–3:30 pm
Conference Hall,
Farmers Training
Center (FTC)

Opening Program
Emcee: Dr. Florfe M. Acma

Invocation

National Anthem: CMU Music Society

Welcome to the Philippine Biodiversity Symposium, Recognition of Represented Organizations: Dr. Nina R. Ingle, *President, WCSP*

Welcome to Central Mindanao University: Dr. Maria Luisa R. Soliven, *President, CMU*

Inspirational Message: Dr. Theresa Mundita Lim, *Director, Protected Areas and Wildlife Bureau*

Intermission: CMU Music Society

Inspirational Message: Datu Amay Mantangkilan Cumatang, *Higaonon tribe, Impasug-ong, Bukidnon*

Inspirational Message: For. Ruth Tawan-Tawan, *Regional Executive Director, Dept. of Environment and Natural Resources, Region X*

3:30–4:00 pm

Coffee Break

4:00-4:15

Biodiversity Research at Central Mindanao University: Dr. Victor B. Amoroso, *Director, Center for Biodiversity Research and Extension in Mindanao*

4:15–4:30 pm

Getting to Know Fellow Wildlife Researchers and Conservationists

4:30 –6:00 pm
Lobby, FTC

Opening of Institutional Posters and Exhibits

17:30–18:00 pm
Conference Hall,
FTC

Briefing for all presenters and moderators

18:00–20:00
Farmers Training
Center (FTC)

Welcome Dinner
with Cultural Presentation by the CMU Bidlisiw

PROGRAM

17 April 2013, Wednesday Conference Hall, FTC

08:00–08:45	Registration
8:45–8:50	Raffle and Announcements
08:50–09:00	The WCSP Silent Auction for WCSP Student Travel Support
	Plenary Presentations on the Symposium Theme: Cultural and Biodiversity Values of Conservation Areas Emcee: Dr. Reggie dela Cruz
09:00–9:40	Keynote Address: Cultural Values of Biodiversity, <i>Dr. Mark Infield, Director of Cultural Values and Conservation, Fauna & Flora International</i>
9:40–10:00	Contributed Plenary Talk: Other Ways of Knowing: Indigenous knowledge, practices, and beliefs on natural resource use in the Philippines, <i>Jayson Ibañez</i>
10:00–10:20	Coffee Break
10:20–10:40	Contributed Plenary Talk: Culture and Crocodiles: Consequences for conservation, <i>Merlijn van Weerd</i>
10:40–11:00	Contributed Plenary Talk: Traditional Forest Management Systems and Non-Timber Forest Products in Mintapod, Impasug-ong, Bukidnon, <i>Datu Benny Cumatang</i>
11:00–11:45	Open Forum
11:45–12:00	Group Photographs
12:00–12:30	Press Conference (invited guests and media)
12:00–1:30 pm	Lunch
1:30–1:45	270+@25: Amazing Philippine Wildlife (newly discovered endemic species)
	High School Scientific Paper Presentations Moderator: Dr. Andrea Azuelo
1:45–2:00	Philippine Flying Dragon (<i>Draco spiloferus</i>): Behavioral studies in residential areas with second growth forest cover, Juan Angelo D. Frejas , <i>Gideon Isaiah S. Fajardo, Michael Randal S. Udarbe and Adelvenci Elizar Felix Moraleta</i>
2:00–2:15	Comparative Bird Survey between Maharlika and Beverly Hills: A case study on the effect of habitat diversity on avian diversity, Jibril C. Cabiles , <i>Basilisa A. Nacionales, Frances S. Brinas and Harry Shon</i>
2:15–2:30	Tungtong River Microbats: Testing a harp trap design, Anna Nicole S. Cabuquit , <i>Jianne Joy M. Garcia, Mary Rose O. Obra</i>
2:30–2:45	The Asian Palm Civet of the Tungtong River: An initial mark-recapture population study, Christine Mae A. Capulong , <i>Justin Andrei C. Cabangon, Mark Jason C. Aquino and Federico Jr. L. Sevilla</i>
2:45–3:30	Coffee Break

3:30–6:00 Lobby, FTC	Opening of Scientific Posters and Exhibits Pecha Kucha - brief presentations for high school and undergraduate poster presenters Moderator: Dr. Neil Aldrin Mallari
7:00 - 8:00 Conference Hall, FTC	Roundtable Discussion: Developing tools to measure impact of avoided deforestation and forest degradation on biodiversity, <i>Fauna and Flora International</i>
18 April 2013, Thursday	
08:00–08:10 Conference Hall, FTC	Raffle and Announcements <i>Undergraduate Scientific Paper Presentations</i> <i>Moderator: Carlo Custodio</i>
08:30–08:45	Stream Macroinvertebrates in the Three Selected Habitats at Mt. Magdiwata, San Francisco, Agusan del Sur, <i>Maria Cristina A. Avila and Sherryl L. Paz</i>
08:45–09:00	Incidental Catches of Sea Cow (<i>Dugong dugon</i>) in the Coastal Barangays of the Municipality of Manay, Davao Oriental, <i>Meccar Moniem H. Elino, Jaycris P. dela Torre, Gisele A. Indino, Jun Calmen Z. Llamera, and Glenda Lou C. Parel</i>
09:00–09:15	Site Fidelity and Movement Patterns of the Critically Endangered, Endemic Palawan Forest Turtle <i>Siebenrockiella leytensis</i> (Taylor 1920): Implications for conservation, <i>Edgar D. Jose, Sabine Schoppe and Roger G. Dolorosa</i>
09:15–09:30	Effect of Seed Ingestion by Bats and Birds on Germination of <i>Ficus</i> spp. Seeds, <i>Pauline Dianne Santos and Regielene Gonzales</i>
09:30–9:45	Anuran Assessment: Their diversity, microhabitat and existing threat across elevational gradient in Mt. Magdiwata, San Francisco, Agusan del Sur, <i>Chenniel L. Solania and Sherryl L. Paz</i>
9:45–10:00	Bat Diversity in Selected Commercial Plantations and Protected Areas in North, Cotabato, <i>Krizler C. Tanalgo, Marion John Michael M. Achondo, Violeta P. Bello, James Gregory S. Salem, Angelo R. Agduma, Bryan Lloyd P. Bretaña, Liezl S. Mancao and Janette P. Supremo</i>
10:00–10:30	Coffee Break and Viewing of Posters and Exhibits
10:30–10:45	Hydroacoustic Survey of Fish Diel Distribution in the Upstream Portion of Pansipit River, Batangas, <i>Stephanie Lazo, Kenoses Legaspi, Abelardo Favila, Jr., Milette Mendoza and Rey Donne Papa</i>
10:45–11:00	Population Status and Habitat Preferences of the Camiguin Hawk-Owl (<i>Ninox leventisi</i>), <i>Andrew Ross T. Reintar, Dennis A. Warguez and Philip Godfrey C. Jakosalem</i>
11:00–11:15	Roosting Preferences of Bats in Selected Caves of Mindanao, <i>Marie Joy L. Requiros, Farlyn Grace C. Redoble, Fe Aliana A. Serapio, Kathlen Alexis D. Del Carmen, Melanicon M. Geografo, Kemuel A. Sanchez, Fatima A. Arumpac, Mark Louie M. Tangalin and Dennis A. Warguez</i>

PROGRAM

11:15–11:30	Habitat Requirements of Yellowish Bulbul (<i>Ixos everetti catarmanensis</i>) on Camiguin Island, Al-Ajhar M. Sumndad , Dennis A. Warguez and Philip Godfrey C. Jakosalem	
11:30–11:45	Assessment of Captive Wildlife Facilities in Mindanao, Marl Andrew B. Valdez , Dennis A. Warguez, Joanne Mae Justo and Daisy Lou L. Polestico	
11:45–12:00	Water Quality Assessment Using Macroinvertebrate Fauna in Villafuerte Spring and Maramag Rriver, San Miguel, Maramag, Bukidnon, Val Lagrada , Noelen Abaday, Greto Vyvor Garcia	
12:00–1:30	Lunch	
	Concurrent Regular Scientific Paper Presentations	
	<u>FTC Conference Hall A</u>	<u>FTC Conference Hall B</u>
	<i>Moderator: Emilia Lastica</i>	
1:30–1:45	The World as They Know It: Community development planning by Manobo cultural communities in Arakan, North Cotabato, Hadassah Carig	<i>Moderator: Rafe Brown</i> Mutualistic Networks among Fruiting Trees and Avian Seed Dispersers within an Urban Landscape, Regielene S. Gonzales and Jasmin C. Meren
1:45–2:00	Why Do Hunters Hunt? A Case Study on Negros Island, Apolinario B. Cariño , Angelita M. Cadeliña and Rene V. Vendiola	Population Genetic Structure of the Critically Endangered Philippine Eagle <i>Pithechophaga jefferyi</i> (Aves: Accipitridae), Adrian U. Luczon , Ian Kendrick C. Fontanilla, Perry S. Ong, Zubaida U. Basiao, Anna Mae T. Sumaya, Jonas P. Quilang
2:00–2:15	Biodiversity Conservation in Forest Restoration: A research study of the Philippine Peñablanca Sustainable Reforestation Project, Peñablanca, Cagayan, Milagros S. Salibad , Juan R. Acay, Jr., Oliver G. Coroza, Mariano Roy M. Duya, Ruth Grace R. Ambal and Yoji Natori	Freshwater Research in the Philippines: What has been done and what to do next? Francis S. Magbanua , Alyssa M. Fontanilla and Perry S. Ong
2:15–2:30	Mt. Malindang Plant Diversity: From Research to Development, Victor B. Amoroso , Belen O. Daba, Eden C. Pito , Aart Van den Berg, Anton Stortelder, Alita T. Roxas, Bobby Alaman and Fulgent P. Coritico	Phytoplankton and Zooplankton Communities and Water Quality of the Pantabangan Reservoir after Two Typhoons in 2011, Francis S. Magbanua , Nikki Yvette B. Mendoza and Perry S. Ong
2:30–2:45	Some Herbal Weed Species: Their biochemical components and the ethnomedical health practices of native herbalists in Bukidnon, Andrea G. Azuelo , Lalaine G. Sariana , Elicia L. Gamolo and Lorna Milly A. Navaja	Biogeography of the Spotted Stream Frog Complex in the Philippines: New Data, New Species, and New Conservation Concerns, Rafe M. Brown and Cameron D. Siler

2:45-3:00	Should Local Counters Count? Observer Error Effects on Trend Detection in Flying Fox Counts, Tammy L. Mildenstein , L. Scott Mills and Dave Patterson	Spatial Modeling Predicts Habitat Suitability for Selected Threatened Forest Tree Species, <i>Kristine B. Garcia, Bradfield Lyon, Amor Ines, Alfie Torres, Florencia Pulhin, Rodel Lasco, Oliver Agoncillo and Randy John Vinluan</i>
3:00-3:30	Snack Break	Snack Break
3:30-6:00 Farmers Training Center (FTC)	WCSP Annual General Meeting, Presentations of Possible Hosts, and Elections of Board Members	
6:30 Pool Side, University Food and Lodging Services (UFLS)	Fellowship and Awarding Banquet Announcing of Winners of WCSP Silent Auction Emcee: Apolinario Cariño	
19 April 2013, Friday		
8:30-8:40	Raffle and Announcements	
08:40-9:00 FTC Conference Hall A	Philippine Bat Champions, <i>Dave Waldien and Nina Ingle</i>	

Concurrent Regular Scientific Paper Presentations

FTC Conference Hall A

FTC Conference Hall B

Moderator: Sandra Yap

Moderator: Lisa Paguntalan

09:00	Concurrent Regular Scientific Paper Presentations	
09:00-09:15	Status of Mangrove Communities in Honda Bay, Palawan, Joel G. Becira , <i>Ria S. Sariego and Eunice M. Becira</i>	Reproductive Biology and Sex Ratio of the Suckermouth Sailfin Catfish <i>Pterygoplichthys spp.</i> in Marikina River: A fresh perspective on successful establishment and potential spread control of an invasive fish species, Joycelyn C. Jumawan , Benjamin M. Vallejo Jr., and Annabelle A. Herrera
09:15-09:30	Wild Orchids and Pitcher Plants: Imperiled Flora of Mt. Kiamo, Dave P. Buenavista and Fulgent P. Coritico	Biology and Ecology of the Lake Taal Sea Snake (<i>Hydrophis semperi</i>), Vhon Oliver S. Garcia , Rey Donne S. Papa and Arvin C. Diesmos
09:30-09:45	Do Tree Species' Leaf Litter Traits Structure Arthropod Diversity? Alfie M. Torres , Natalia S. Tangalin, Florencia B. Pulhin and Rodel D. Lasco	Notes on the presence of <i>Manta alfredi</i> in the Tubbataha Reefs Natural Park, Cagayancillo, Palawan, Rowell C. Alarcon , Theresa R. Aquino and Angelique M. Songco
09:45-10:00	Conservation of <i>Xylocarpus granatum</i> Koen.: A means of saving its Insects visitors/pollinators and Mangrove Forest Ecosystem, Pagbilao, Quezon, Amalia E. Almazol	Faunal Diversity of the Pantabangan- Carranglan Watershed, Nueva Ecija, <i>Melizar V. Duya</i> , Danah Marie P. Purificacion , Mariano Roy M. Duya and Perry S. Ong

PROGRAM

10:00–10:15	Snack Break	
	<u>FTC Conference Hall A</u>	<u>FTC Conference Hall B</u>
	<i>Moderator: Sandra Yap</i>	<i>Moderator: Lisa Paguntalan</i>
10:30–10:45	Diversity of Cicadas in Three Selected Mountain Ecosystems of Mindanao, <i>Alma B. Mohagan, Dave P. Mohagan, Leonil Jun B. Baguhin, Gloria L. Galan and Christopher G. Batbatan</i>	Patterns of Occurrence of the Small Non-Flying Mammals of Baguio City, <i>Aris A. Reginaldo, Karen Claude O. Soriano, Bernadette B. Iglesia and Ceszie Louise G. Vertudez</i>
10:45–11:00	Diversity of Cave-Dwelling Bats in Samal Island, Davao del Norte, <i>Ma. Niña Regina M. Quibod, Phillip A. Alviola, Anna Pauline O. de Guia, Ireneo L. Lit, Jr. And Virginia C. Cuevas</i>	Herpetofaunal Survey on Selected Caves in Puting Bato, Polillo Island, <i>James D. V. Alvarez, Maxine Stephanie M. Prado and Phillip A. Alviola</i>
11:00–11:15	Population density, distribution and habitat preferences of the Palawan pangolin, <i>Manis culionensis, Levita A. Lagrada and Leticia E. Afuang</i>	Microhabitats of Ranidae along Molawin Creek, Mt. Makiling Forest Reserve, <i>Christmas de Guzman, Julie Cabrerros, Valerie Corales, Kyla Molina, Melchor Moralina Jr. and Dennis Ruiz</i>
11:15–11:30	The Agusan Marsh (and the Agusan River Basin) – Such Great Importance, So Little Research, <i>Jurgenne H. Primavera</i>	
11:30–1:30	Lunch	
1:30–4:30	<i>Afternoon Workshops (to be held concurrently at different venues)</i> <i>Moderator: Sherry Paul Ramayla</i>	
FTC Conference Hall A1	Learning from the Experts: The science of local ecological knowledge, <i>Leo Rex C. Cayaban and Chris Poonian</i>	
FTC Conference Hall A2	Ecosystem Services, Cultural Values and Protected Area Management, <i>Mark Infield and Neil Aldrin Mallari</i>	
FTC Conference Hall B1	Fruit Bat Population Size Estimation and Monitoring, <i>Tammy Mildenstein and CE Nuevo</i>	
FTC Conference Hall B2	Integrating Wildlife Conservation in the Classroom, <i>Sherry P. Ramayla</i>	
4:30–5:00	Closing Program	
20 April 2013, Saturday		
04:00 UFLS	Assembly for Field Trip to Mt. Kitanglad Range Natural Park	
06:00 FTC	Assembly for Field Trip to University Projects and Mt. Musuan Climb	

TITLES

POSTER

HIGH SCHOOL POSTER PRESENTATIONS

Wild Sunflower (*Tithonia diversifolia* A. Gray): Its Bioecological Structure, Utilization and Antimicrobial Activity

Andrei Solara Jean L. Azuelo

Assessment of Anuran Species in the Visayan Electric Company (VECO) Reforestation Park in Mananga Waterhed in Central, Cebu

Jeriel Taray Bersano, John Jaykel Ponte Magadan and Abel Niño Manguilimotan Ulson

System Dynamics Model of Dissolved Oxygen in Butuanon River Using STELLA

Bebviet Franz R. Bulagao, Prince Roger N. Pulvera and James Christian O. Relampagos

UNDERGRADUATE POSTER PRESENTATIONS

Assessment of the Food Preferences of Fish from Pansipit River, Batangas

Peter Nesto Marion Acojido, Arvin Cabais, Jose Luis De Guzman, Jed Marco Rivera, Jonathan Carlo Briones and Rey Donne Papa

Importance and Comparative Genetic Diversity of In Situ *Oryza rufipogon* Griff. Populations in Lakes Apo and Napalit, Bukidnon

Jenilyn L. Balos and Joy M. Jamago

Diversity of bats in Mt. Timpoong, Camiguin Island Using Harp Trapping and Mist Netting Methods

Natasha R. Aclopen, Dennis A. Warguez and Philip Godfrey C. Jakosalem

Morphological Traits of the Spotless Ladybird Beetle, *Micraspis discolor* (Fabricius) from Calinan, Davao City

Abigail Alonzo, Gesmin Lascano and Elsa May Delima-Baron

Characterization and Biochemical Screening of Selected Plants in Mt. Banahaw de Lucban

Maryll V. Arceta, Leah D. J. Madrazo and Leonisa O. Bernardo

The Diversity Status of Mosses and Soil Nature in the Established Plots in the Montane Forest of Mt. Hamiguitan in San Isidro, Davao Oriental

Janet Arlalejo and Evelyn Bustillo

Species Richness of Odonata in Lanuza and San Agustin, Surigao del Sur

Jazzie D'Zeim Arreza, Samuel Jie Quisil, Olga Nuñezza and Reagan Joseph Villanueva

Snout Morphology of Common House Gecko (*Hemidactylus frenatus*) in Relation to their Diet Sampled in Urban and Sub-Rural Areas in Davao City

Norhaida S. Ayunan, Lilibeth A. Espinosa and Elsa May Delima-Baron

Initial Report on the Wild Macrofungi Of Minalungao National Park, Nueva Ecija

Karina N. Barrogo, Alexander M. Paraguas, Nea Ciara P. Fabalena, Jerwin R. Undan and Khristina J. Cruz

Diversity and Habitat Selection of Understory Birds in Mt. Timpoong, Camiguin Island

Aniah T. Cantal, Dennis A. Warguez and Phillip Godfrey C. Jakosalem

Species Diversity of Sea Urchins in Three Selected Municipalities of Misamis Oriental

Ryann Jeb V. Cardeño, Marilou M. Ediza and Alma B. Mohagan

Microhabitat Preferences of the Camiguin Narrow-Mouthed Frog *Oreophryne nana* in Mt. Timpoong, Camiguin Island

Mel Daniel G. Dangel, Dennis A. Warguez and Philip Godfrey C. Jakosalem

TITLES

POSTER

Assessment and Diversity of Fern Flora in MT. Magdiwata, San Francisco, Agusan del Sur
Alvin B. Goloran, Custo, Claro and Demetillo

The Odonata in Selected Wetland Areas of Cagayan de Oro and Bukidnon
Dexter John Jomoc, Rachel Ruth Flores, Olga M. Nuñez and Reagan Joseph Villanueva

Species Richness of Odonata in Selected Freshwater Systems in Zamboanga Del Sur
Dysa Limitares, Roxanne Cayasan, Jan Vae Gomid, Olga Nuñez and Reagan Joseph Villanueva

Diversity, Abundance and Habitat Selection of Canopy Birds in Mt. Timpoong, Camiguin Island
Roderick C. Makiputin, Dennis A. Warguez and Phillip Godfrey C. Jakosalem

The Odonata of Lanao del Sur, Mindanao
Anzhira D. Malawani, Nor-ain M. Ampang-Macabuat, Olga M. Nuneza and Reagan Joseph T. Villanueva

Species Richness of Odonata in the Freshwater Areas of Lanao del Norte and Misamis Occidental
Emmarie F. Mapi-ot, Khary Aspacio, Katherine Mae Neri, Angeleth Taotao, Cherry Yuto, Olga M. Nuñez and Reagan Joseph Villanueva

Seaweed Composition of Littoral and Sublittoral Zones of Sogod Bay, Southern Leyte
Nadine C. Matondo, Jestoni T. Teador and Rosaminee B. Sanchez

Diversity of Odonata: The local way of assessing water quality in Lake Pinamaloy, Don Carlos and Dologon Spring, Mindanao
Dale Joy B. Mohagan, Merly Joy L. Cordero, Yllana Glocele Ellevera, Mary Vianey Geroncia R. Israel II and Roselyn Montecillo

Vertical Distribution of Spiders in Selected Areas in Taguibo Watershed, Agusan Del Norte
Christine S. Palad and Sherryl L. Paz

Diversity of odonata across vegetation types in Mt. Kiamo, Malaybalay, Bukidnon
Samuel Joseph B. Patalinghug

Distribution and Identification of Ground Dwelling Spiders at 850-1250 Meters above Sea Level in Mount Banahaw De Lucban, Lucban, Quezon
Mark Joseph R. Perez and Christopher John A. Pueblo

Initial Report on Fish Species on Minalungao National Park
S. M. Rivera, E. D. Alfonso, N. C. M. Bajum, R. A. P. Cardona, J.R. Undan and K. J. Cruz

Diversity and Status of Butterflies in Agro-forestry and Secondary Dipterocarp Forest of Mt. Magdiwata, San Francisco, Agusan del Sur
Nice E. Tambura and Sherryl L. Paz

REGULAR POSTER PRESENTATIONS

Revisiting the Sites of Distribution of the Isabela Oriole (*Oriolus isabellae*)
Joni T. Acay and Nikki Dyanne C. Realubit

Records of Wild Gingers (Family Zingiberaceae) from Eastern Mindanao: Morpho-Anatomical Studies
Florfe M. Acma

Yet another reason to conserve the Palawan Forest Turtle *Siebenrockiella leytensis*
Diverlie Acosta and Sabine Schoppe

TITLES

POSTER

Orchid Flora of Mt. Apo and Mt. Kitanglad Long-Term Ecological (LTER) Sites

Victor B. Amoroso, Florfe M. Acma, Dave P. Buenavista and Gerome B. Ga-as

Species Composition of Butterflies in Pasonanca Park, Pasonanca, Zamboanga City

Sheriffa T. Andas and Joseph V. Andas

Some Trees, Shrubs and Herbs in Mt. Kinasalapi (Kitanglad Protected Range), Sungco, Lantapan, Bukidnon

Mercedita L. Aranas – Laurie and Victor B. Amoroso

Shrubs along the Trail of Mt. Musuan, Central Mindanao University, Musuan, Bukidnon

Mercedita L. Aranas – Laurie and Florfe M. Acma

The Reproductive Patterns of Pteropodid Species Visiting Orchards in Davao City

Fritzie B. Ates-Camino and Charmaine Grace Malabanan

Raptor Observations in Mt. Susong Dalaga, San Luis, Aurora Province

Kevin Carlo Artiaga and Daniel Miguel

Western Philippines University-Palawan Research and Development Foundation, Inc. Efforts on Sea Turtle Diversity Conservation in St. Paul Bay, Puerto Princesa City, Palawan

Joel G. Becira, Benjamin J. Gonzales and Ria S. Sariego

New Records of Orchid Flora at Lake Danao Natural Park, Leyte

Ronny Boos and Facundo Rey M. Ladio

Is Community-Based Flying Fox Conservation Effective in the Philippines?

Apolinario B. Cariño, Anson Tagtag, Julia Lervik and James A. Namocatcat

Impacts of Rainforestation Farming to Wildlife Conservation: The Negros Oriental Experience

Apolinario B. Cariño, Rene V. Vendiola and Rico C. Mier

Epidermal Leaf Casts as Technique in Fern Study

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Recognising Nature's Cultural Values Helps Us to Protect It

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Conservation professionals don't agree on much but they do agree that conservation cannot be achieved without political commitment and the support of local communities. But after decades of efforts to engage local people in conservation initiatives, especially in developing countries, conservation activities and protected areas are as contested as ever. Conversion for agriculture and illegal hunting and logging still occur in protected areas, while outside, natural ecosystems and species are disappearing fast. These losses have significant implications for humanity in general and for local communities in particular.

Nature makes many easily recognisable material contributions to human well-being, such as providing food or protecting communities from floods. These can be described and measured in economic terms relatively easily. Most current conservation approaches emphasize these material and economic values of nature, but they do so at the cost of other important values of nature. The Ecosystem Services approach that is increasingly influencing the way governments think about nature and how to plan for its conservation is strongly focused on the economic services nature provides but struggles to represent nature's many other values.

Nature contributes much to both communities and nations that is complex, subjective, culturally specific and irreplaceable. People derive spiritual and religious beliefs, ethics and morals, philosophies and perceptions of self and identity from their interactions with nature. Recognising all of nature's contributions to well-being is essential if the trade-offs between managing for provisioning or regulating services and cultural services are to be understood.

The role of cultural values in supporting conservation is especially relevant to the design and management of protected areas. These remain central of local, national and global conservation strategies, but, unfortunately, often exclude the values of their neighbours, severing rather than build links between people and nature. Approaches that recognise local connections to and interest in the species and places conservation seeks to protect help build bridges to local communities and provide new ways of describing the benefits that nature brings to them.

By asking 'What and whose values are we conserving?' we can strengthen engagement in the management and protection of nature while, at the same time, helping communities retain cultural knowledge, practices and their unique connections to and understandings of the natural world.

**Mark Infield* is Director of Cultural Values and Conservation. He has a degree in Zoology, an MSc in protected areas and local attitudes, and completed an inter-disciplinary PhD examining cultural values and protected areas management in Uganda. He has 30 years of experience working in nature conservation, protected areas and natural resource management in Africa and Asia where he has focused on the social, economic and political environments in which protected areas are designed and managed. He has developed a particular interest in ways to integrate local values in nature into conservation initiatives.

Other Ways of Knowing: Indigenous knowledge, practices, and beliefs on natural resource use in the Philippines

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The practice of natural resource management (NRM) as underpinned by the “western scientific” tradition has been critiqued because of its limited success in achieving sustainable outcomes. In a number of documented instances, contemporary NRM rooted on a utilitarian philosophy has had negative rather than positive outcomes. To bring about holistic solutions to problems where (western) science-based approaches have been deemed inadequate, scholars have brought forward the idea of ‘rethinking’ the social science aspect of natural resource management by focusing on ‘cultural capital’ and ‘property rights’. One such cultural capital is the systems of knowledge, beliefs and practices of traditional, non-western societies that have evolved as adaptations to a dynamic environment. Called Traditional Ecological Knowledge or TEK, it is argued that these Indigenous “ways of life and knowing” have much to offer in terms of improving ways of managing our finite and dwindling resources. However, to date there is very limited countrywide exploration of Indigenous ecological practices and social mechanisms that can potentially inform NRM policies and practices at the national level. Using the Philippines as a case study, this paper will review and describe the range of knowledge, beliefs, and practices associated with resource use among Indigenous peoples. It will specifically provide a snap-shot of diverse resource-use practices by Philippine Indigenous groups as described from ethnographies, dissertations and other documents published between the 1900s up to the present. Further investigation of the potential of TEK in the management of Philippine biodiversity is recommended.

Culture and Crocodiles: Consequences for conservation?

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The endemic, critically endangered, Philippine crocodile *Crocodylus mindorensis* survives in the wild only in southern Mindanao and northern Luzon. Hunting and habitat conversion have brought the largest endemic predator of the Philippines to the brink of extinction. Crocodiles have an image problem in the Philippines. In mainstream Filipino society crocodiles are considered dangerous man-eaters, and compared with corrupt government officials or selfish basketball players. It is often argued that these negative public attitudes towards crocodiles make *in-situ* crocodile conservation impossible in the Philippines. But indigenous peoples all over southeast Asia have a history of co-existence with crocodiles. In pre-Hispanic Philippines, people feared and revered crocodiles: specific rules regulated the relationship between crocodiles and people. In the northern Sierra Madre on Luzon some of these belief systems still persist, not coincidentally in areas where crocodiles survive. Traditional beliefs and practices enable people to share the landscape with a potentially dangerous carnivore. This forces us to rethink conventional conservation strategies. Do conservation of culture and crocodiles go hand in hand? Or will crocodiles vanish with traditional culture in the Philippines? This presentation provides an overview of culture and crocodiles in Southeast Asia based on a literature review and field work in northern Luzon and discusses its implications for crocodile conservation in the Philippines.

Comparative Bird Survey between Maharlika and Beverly Hills: A case study on the effect of habitat diversity on avian diversity

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Conducting bird surveys helps examine the status of avian populations and predict their trends. It will also aid in evaluating the response of bird populations to environmental change, which makes it a useful tool in establishing conservation strategies. Data gathered from population trends will also aid in explaining other environmental factors such as habitat. The study involved the conduct of bird censuses in two residential areas, Beverly Hills and Maharlika hills, located in Taytay, Rizal, Philippines to compare their bird diversity and correlate it to habitat diversity. Data gathered from this comparative bird/habitat study can be used to design bird-friendly guidelines for the development of residential subdivisions. The transect method was used in the species count around the perimeter of the study areas. Aside from determining the species richness, bird calls were recorded to confirm identification and later compiled into a digital database. Terrain analysis of Beverly Hills and Maharlika Hills was done via Google Earth. A screenshot of both subdivisions was taken and placed against a grid plate using the Photoshop application to get the percentage of each habitat type. The dominant habitat type for Beverly and Maharlika Hills was residential with 59.64% and 44.73% followed by 26.48% and 38.44% of woodland, respectively. Based on the species lists, bird diversity was high for either subdivision in terms of habitat preference. Despite the larger percentage of residential area, the birds found in Maharlika and Beverly prefer woodland the most, only slightly dominating the other habitat types.

Tungtong River Microbats: Testing a harp trap design

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The Tungtong River is a diverse ecosystem found in Taytay, Rizal, Philippines. Here we studied microbats. Microbats are a suborder of the order chiroptera (bats). Microchiropterans primarily feed on insects but some species are carnivorous. Their main roles in the environment are fertilizers and pest control. We used a harp trap to catch the bats instead of mist nets. Harp traps do not entangle the bats, instead the bats fall into the catch bag after they hit the fishing lines strung vertically up the trap. Our harp trap design was provided by Dr. Jodi Sedlock. Compiling a species list and testing our harp trap were the main objectives in this study. To identify the species we took certain morphometric measurements and compared it to the guide written by Nina Ingle and Lawrence Heaney. We also planned to preserve voucher specimens that would act as an insurance should we make mistakes in identifying the species. Our study is the basis for follow up studies of bats in the Tungtong River.

**The Asian Palm Civet of the Tungtong River:
An initial mark-recapture population study**

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The Asian Palm Civet *Paradoxurus hermaphrodites* is a black furred nocturnal mammal with a white mask native to the Indian subcontinent down to the Malay regions. This animal has been classified under the category of “Least Concern” by the International Union for Conservation of Nature (IUCN) unlike some of its congeners. In the surroundings of the headwater of the Tungtong River in Antipolo, Rizal, Philippines, the Asian Palm Civet is often spotted. The Palm Civet’s ecological role as a seed dispersal agent makes it important in helping the Tungtong River Conservation Project attain its goal of preserving both flora and fauna. The team aimed to confirm the anecdotal sightings of the civet through scientific methods such as trapping and the Mark-Recapture method. In the event of a capture, the gender and morphometric details were determined. Three females were captured, two of which were adults. The other one, a juvenile, was sedated to obtain more accurate morphometric measurements. Body and tail measurements combined ranged from 250 mm to 400 mm. Having confirmed anecdotal sightings, we conclude that the Tungtong River watershed is an important habitat for the Asian Palm Civet.

**Philippine Flying Dragon (*Draco spiloferus*): Behavioral studies in residential areas
with second growth forest covers**

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Lizards have four legs, a long body, a tail, movable eyelids and a rough, scaly, or spiny skin. They belong to the Class Reptilia, Order Squamata and Suborder Lacertilia. An arboreal lizard, the so-called flying lizard, actually glides from tree to tree on the wing like skin flaps at the side of the body. Gliding lizards are territorial. Males will usually lay claim to two or three trees. We studied the behavior of the flying lizard *Draco spiloferus* in the Tungtong River and Maharlika Hills, Taytay, Rizal, Philippines. The Tungtong River is a body of water spreading for fifteen kilometers and is connected to Laguna Lake and Pasig River via the Manggahan Floodways. As a secondary objective, we surveyed for the different species of lizards. The species that we found were *B. marmorata*, *H. frenatus* and *Gekko gekko*. Some of them were captured and measured. We also gathered measurements like height of perch, diameter at breast height and height of tree of trees with lizards to characterize habitats and determine whether coexistence is possible between humans and the Philippine Flying Dragon. We conclude that coexistence is possible between *D. Spiloferus* and humans. Although coexistence is possible, we propose a few developmental guidelines. Tree maintenance in Maharlika should be implemented so that the population of these lizards can grow and deforestation should be prohibited.

Stream Macroinvertebrates in the Three Selected Habitats at Mt. Magdiwata, San Francisco, Agusan del Sur

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This study aimed to assess the macroinvertebrates found in the three selected habitats, mining site, oil palm plantation and pristine site, on Mt. Magdiwata watershed, San Francisco, Agusan del Sur from August to November, 2012. The physico-chemical and habitat characteristics of the stream and the richness, abundance and diversity of the good water quality indicators (EPT) were assessed in the three selected habitats. A total 35 families belonging to 16 orders of macroinvertebrates were collected. The mining site had significantly higher water temperature, total dissolved solids, conductivity and water velocity while it had significantly lower dissolved oxygen and water pH than that of the oil palm plantation and pristine sites. The mining area had poor to fair habitat condition while oil palm plantation and pristine sites had good to excellent habitat condition. The pristine site had the highest EPT richness, abundance and diversity than that of the oil palm plantation and mining sites. The results suggest that there is a need to rehabilitate the stream health of the mining areas of Mt. Magdiwata watershed. Constant water quality monitoring of the watershed is highly needed. There must be a continuing effort to mitigate the adverse impacts of mining and other anthropogenic activities on the watershed.

Incidental Catches of Sea Cow (*Dugong dugon*) in the Coastal Barangays of the Municipality of Manay, Davao Oriental

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Sea cows, commonly known as *dugong*, are now imperiled around the globe with a conservation status of "vulnerable" to extinction as listed by the World Conservation Union or the IUCN. Anecdotal evidence suggests most *dugong* populations are declining in Philippine waters. Causes of mortalities are varied, but a very serious threat is the incidental catch by commercial fishing gear. In Manay, Davao Oriental, *dugong* mortalities were recorded on the 2nd and 12th of January 2012; Initial findings on the cause of such deaths were believed to be fishery activities. To validate if there was involvement of fishermen in incidental catching, survey of fisherfolks was conducted last September 16 to 20, of 4 coastal barangays. The Dugong Catch/Bycatch Standardized Questionnaire by Pilcher & Kwan (2011), was used in the survey. The interview process was unstructured, skimp conversation/exploratory which was designed to open a dialogue. This research was to determine the fishing practice or profile (type of fishing gears, fishing vessel, and frequency of fishing); that influences the incidental catching of *dugong* by fisherfolks. and verify the involvement of the fisherfolks in the catching of *dugong*. Seventy-eight percent (78%) of the 187 registered fishermen were using hook-type of fishing gears; 82% used motorized-type of fishing vessel; and as for frequency of fishing: 35% were fishing everyday and 47% fished for 6 days per week. Fisherfolks in 3 out of 4 coastal barangays were involved in the incidental catching of *dugong*; all used fish nets and motorized fishing vessels. The mean incidental catches of Barangay Central was 0.06; Holy Cross with 0.03 and San Ignacio with 0.16. There was no significant difference of incidental catches among the four coastal barangays, however, there is a significant relationship between the incidental catches and type of fishing gear used. Further information were gathered: perception on *dugong* importance, tolerability, and the enforcement (frequency of sea patrolling & penalty imposing) by the local government; for these data had influenced the resort of fishermen to incidentally catch.

Site Fidelity and Movement Patterns of the Critically Endangered, Endemic Palawan Forest Turtle *Siebenrockiella leytensis* (Taylor 1920): Implications for conservation

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This study was generated to identify site fidelity and movement patterns of the critically endangered Palawan Forest Turtle *Siebenrockiella leytensis* in Palawan, Philippines. Eleven turtles captured from two locations along a stream in Puerto Princesa City, Palawan were radio-tagged and monitored from February 2011 to February 2012, generating a total of 1118 tracking data. Generally site fidelity among individual turtles was high, but juveniles and sub-adults showed relative lower site fidelity and higher dispersions compared to adults. The sizes of areas of concentration of juveniles, sub-adults and adults were not significantly different ($F_{(2, 35)} = 1.12; p = 0.3385$) and ranged from 2.6-12.1 ha (mean range = 1.1-3.0 ha). Distances travelled in 24 hours varied significantly ($F_{(2, 852)} = 8.28, p = 0.0003$) among adults, sub-adults and juveniles. Post-hoc Sheffé tests showed that distance travelled by sub-adults were significantly higher than the other two groups. This might indicate that once nearing adulthood, individuals intend to establish a territory. This is important information needed for in- and ex-situ conservation strategies.

Water Quality Assessment Using Macroinvertebrate Fauna in Villafuerte Spring and Maramag River, San Miguel, Maramag, Bukidnon

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The availability of potable water is now decreasing due to improper waste and garbage disposal and the unpredictable impact of climate change. Water quality in two bodies of water were assessed using a macroinvertebrate fauna diversity index and an ecological kit: Villafuerte Spring, which is the main source of potable water for the residents of Maramag and Maramag River, which is a major source of water for agriculture. Surface and dip net sampling were employed to sample invertebrate fauna in the two sampling stations at three trials per replicate namely: fast and slow. Samples were preserved using 70% ethanol. Species were assigned in their tolerance value on family level using Walley and Hawkes' BWMP Values and the Hilsenhoff Biotic Index for water quality assessments. Villafuerte Spring and Maramag River had very good water quality. Using BIOPRO software, the Shannhon-Weiner index showed low levels of diversity in Villafuerte Spring and Maramag River, $H' = 0.85$ and $H' = 0.6$ respectively. Villafuerte Spring (21 species) is more diverse than Maramag River (19 species). Although physico-chemical properties were better in Villafuerte Spring compared to Maramag River, the water quality in Maramag River is still within the DENR standard for survival of organisms. Water quality in both sites seems suitable for drinking but more study is needed to confirm this.

Hydroacoustic Survey of Fish Diel Distribution in the Upstream Portion of Pansipit River, Batangas

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Hydroacoustic survey in the 1.5 km upstream portion of Pansipit River in Taal Batangas was conducted on the months of April, May, June, August, and September. The object of this study was to determine the presence of fish at different depths using hydroacoustics, to identify fish and estimate its abundance using the echosounder and fish catch and also to determine the possible differences in the vertical distribution and abundance of fish. One surveillance activity was allotted for each month comprised of a morning, a noon, and an evening sampling. This hydroacoustic survey was performed using a dual beam echosounder, accompanied by various fishing techniques. Recorded echograms from the survey were analyzed and were used in determining the fish abundance of each sampling month. Along with the data obtained with the echosounder and fish catch, physico-chemical factors of the site were also collected. Gathered data were analyzed and correlated with each other. The depth where the average individual of fishes could be found along the water column was computed to determine the migration intensity in the river. Also, three statistical tests were used, namely the Shapiro-Wilk Test, the Kruskal-Wallis test and the Two sample Kolmogorov-Smirnov test to determine the diel patterns of fishes in the River. Thirteen species were identified present in the river. These fishes are: *Oreochromis niloticus*, *Channa striata*, *Glossogobius giuris*, *Parachromis managuensis*, *Trichopodus pectoralis*, *Hyporhamphus affini*, *Leipotherapon plumbeus*, *Ambassis interrupta*, *Sardinella tawilis*, *Mugil cephalus*, *Kuhlia marginata*, *Chanos chanos*, and *Caranx ignobilis*. Among these, non-native and introduced species *Oreochromis niloticus* and *Channa striata* were found to be the most abundant having a relative abundance of 53.92% and 33.82% respectively. The high abundance of these species may have caused competition with other fish species in terms of space and resources. The results also showed that there were no significant variations in terms of vertical distribution and abundance of fish. This was due to the shallow upstream portion of the river.

Population Status and Habitat Preferences of the Camiguin Hawk-Owl, *Ninox leventisi*

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A study on the population density estimate and habitat preference of the Camiguin Hawk-Owl *Ninox leventisi* across the different forest habitat types in Camiguin Sur was conducted from 18-27 October 2012 and 28-29 December 2012. Nocturnal line transects with playback of pre-recorded owl call was used to check for owl presence. A 10x10 m² plot on each transect was selected for habitat assessment. Kruskal-Wallis test was used to compare the presence of owl in different forest types while Logistic Regression was used to explore differences in the forest structure on transects with and without owls. A total of twenty transects was surveyed. Eight owl detection transects were positive; four in primary forests, two in secondary forests and two in mixed forest-plantations. The preferred habitat of the Camiguin Hawk-Owl was estimated to be at a total of 2,250 hectares of forest on the island. With this number of hectares and on the assumption that there could be three pairs of hawk-owl per hectare of forest, it can be inferred that the global population of the Camiguin Hawk-Owl is 750 pairs which qualifies the species to be categorized as "Endangered" based on the Red List assessment. With the proposed Endangered status of Camiguin Hawk-Owl, conservation and protection of this species and its habitat needs immediate attention.

Roosting Preferences of Bats in Selected Caves of Mindanao

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The species composition and diurnal roost selection of cave-dwelling bats were studied in four caves of Mindanao. The sampling sites are Guipos Resort Cave in Guipos Zamboanga del Sur, Bungi Cave in Bacolod, Lanao del Norte and Jampason Cave and Tubigan Cave in Initao, Misamis Oriental. Mist netting and use of sweep nets were the methods used for capturing bats. A total of six bat species was recorded. Two species were fruit bats and four species were insect bats. All species prefer totally dark areas except for *Hipposideros diadema* which prefers partially illuminated areas. *Rousettus amplexicaudatus* and *Eonycteris spelaea* prefer non-limestone caves while *Miniopterus schreibersi* and *Hipposideros ater* prefer limestone caves. *H. diadema* and *Rhinolophus arcuatus* are observed in both limestone and non-limestone caves. It was observed that *R. amplexicaudatus* roosts inside crevices and small holes singly or in groups while *H. diadema* and *R. arcuatus* roost either singly or in colonies in crevices, ceilings and stalactites. Both *M. schreibersi* and *H. ater* roost singly or in groups. *M. schreibersi* prefers shallow cavities while *H. ater* prefers to roost in ceilings and stalactites. The degree of disturbance, degree of illumination and reliefs are important parameters for roosting selection. Knowledge on the specific roosting requirements of each species would serve as basis for formulating guidelines in cave management and bat conservation measures.

Effect of Seed Ingestion by Bats and Birds on Germination of *Ficus spp.* Seeds

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Seed ingestion by animal seed dispersers may enhance the rate and percentage of germination. This has important implications for natural regeneration of vegetation, since the plant community composition is directly influenced by the dispersers in an area. This study assessed the effects of bird and bat ingestion on germination of *Ficus spp.* seeds in UP Diliman campus. Figs are a significant source of food for wildlife, and can be considered as keystone species. Seed traps were placed under trees of four different fig species. Fruits and droppings of bats and birds were collected from the traps from May-November 2012. Seeds from positive control (manually removed from pulp), bird-ingested, bat-ingested, and intact fruits were allowed to germinate in Petri dishes under controlled laboratory conditions. Germination percentage, first germination time, mean germination time, germination index, and weighted germination index were calculated. Results showed that intact fruits were infected by fungi and did not germinate at all, while bird and bat-ingested seeds had the same germination rates as the positive control. Only the bird-ingested seeds from one species differed significantly from positive control in terms of germination percentage and weighted germination index. This study suggests that both bird and bat ingestion may significantly enhance germination of *Ficus* seeds primarily due to seed pulp removal rather than the modification of seed coats.

Anuran Assessment: Their diversity, microhabitat and existing threat across elevational gradient in Mt. Magdiwata, San Francisco, Agusan del Sur

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An assessment of anurans was conducted in the three elevational zones (lowland–154 to 165 masl, midland – 256 to 350 masl and upland – 525 to 575 masl) on Mt. Magdiwata, San Francisco, Agusan del Sur using transect (three 100-meter transect lines at each elevation) and time-constrained search (276 man-hours) methods from April-May, 2012. The study compared the richness, abundance and diversity of anurans in the three elevations. There were a total of 390 individuals, 12 species and six families of anurans collected of which, seven species were Philippine-endemics, three were threatened and two species were invasive. Most anurans were -dwelling and only *L. magnus* and *H. rugulosus* were known to be source of food. Two invasive species, *Rhinella marina* and *Hoplobatrachus rugulosus* were only observed at the lowland while *Platymantis dorsalis* and *Pelophryne brevipes* were found only at the midland and upland. Midland has significantly highest number of individuals collected. However, there was no significant difference in richness and diversity across elevations perhaps due to the small land area and there was not much difference in elevation of the mountain which has only a peak of 633 masl. Moreover, the vegetation types across elevation were almost the same. The results suggest that Mt. Magdiwata still harbors a variety of anurans despite some anthropogenic disturbances. Hence, there is a need for protection and conservation attention to the area to ensure the sustainability and integrity of the landscape.

Habitat Requirements of Yellowish Bulbul *Ixos everetti catarmanensis* on Camiguin Island

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We collected data on the habitat requirements of Yellowish Bulbul subspecies *Ixos everetti catarmanensis* in Mt. Timpoong, Camiguin Island specifically in the localities of Danao (original forest) and Pamahawan (lowland forest and mixed plantation) from 11 to 21 October 2012. A total of 38 500-meter line transects were surveyed. A 10x10 circular plot on each transect was selected to gather data on habitat requirements. The Mann – Whitney test was used to determine if there was a significant difference in habitat requirements between the two localities where the Yellowish Bulbul was found. Results show that 14 or 60.9% of observed yellowish bulbul were found in Danao while the remaining 9 or 39.1% were found in Pamahawan. Five individuals or 21.7% were observed in the lowland forest while four individuals or 17.4% are observed in mixed forests of Pamahawan. Most of the yellowish bulbuls inhabited the original forest. The study revealed that at a 0.07 level of significance, there was a significant difference in terms of average tree height and canopy height between the two localities. These results indicate that the occurrence of the Yellowish Bulbul can be attributed to factors such as higher average for DBH, distance to clearing and farmland, canopy cover, canopy height and tree height. Although its current conservation status is “Least Concern”, on-going bird hunting in the area poses a threat to this endemic species. Thus, conservation laws, rules and regulations must be strictly implemented in Mt. Timpoong as a protected area to keep hunters and habitat degradation from threatening the species.

**Bat Diversity in Selected Commercial Plantations and Protected Areas
in North, Cotabato**

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In many countries, the introduction of oil palm and rubber plantations were among the greatest threats to biodiversity. In North Cotabato, these plantations are rapidly expanding and may pose peril to native wildlife. In order to determine the implication of these commercial plantations and habitat alteration to bat communities and bat conservation, they were studied using mist nets and diversity was compared between four study sites. Two study sites representing commercial plantations: Oil Palm plantation (OPP) and Rubber Plantation (RP) and two other sites representing protected areas: Mt. Apo, National Park (MANP) and the Provincial Protected and Reforestation Areas, Kidapawan, were selected. A total of 817 individuals, from 12 species, and 3 families with were recorded in all sites. Five (5) endemic species were also identified from among those recorded. The highest number of captured individuals was recorded from the rubber plantation (35%) and *Cynopterus brachyotis* was the most common and most abundant species in all sites. Highest species richness and diversity was determined in MANP ($s=8, H'=1.88$). Between two plantations, RP had higher diversity ($H'=1.33$) compared to OPP ($H'=1.18$). Abundance of fruit bats in the rubber plantation may relate to the presence of common fruit trees that attracts the population. The result of the study suggests that commercial plantations may play a vital role in bat diversity therefore eyeing conservation strategies not only in protected areas but also in commercial plantations is necessary to conserve existing species in these areas. Long term studies and other methods in species documentation are recommended to further determine the contribution of these plantations to bat conservation.

Assessment of Captive Wildlife Facilities in Mindanao

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An assessment of eight captive wildlife facilities in Mindanao was conducted from September to December 2012 in order to determine whether these facilities were practicing proper captive wildlife management. An ocular survey of the enclosures and a semi-structured interview of the facility in-charge were conducted. The enclosure standards that were followed were based on the Basic Zookeeping Handbook prepared by the Zookeepers Association of the Philippines and the International Congress of Zookeepers. Animal Welfare practices were assessed with the use of the internationally recognized five freedoms. Kruskal-Wallis Test for difference was used to compare the attainment of every freedom in all eight facilities. Results show that the Bukidnon Deer Park and Wildlife Center had the highest score in terms of the attainment of all five freedoms with a mean of 80%, while the lowest score earned by a facility was 39%. Of all the five freedoms, freedom from physical and thermal discomfort was the most satisfied at 61%, while the freedom from injury and disease was the least attained at 44% only. The findings from these wildlife facilities show that they still have to make a lot of improvement in terms of compliance with the five freedoms.. It is highly recommended that authorities like the Department of Environment and Natural Resources to regularly evaluate captive wildlife facilities in order to ensure animal welfare and proper captive wildlife management in the country are observed.

Notes on the Presence of *Manta alfredi* in the Tubbataha Reefs Natural Park, Cagayancillo, Palawan

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A review of 33 photographs taken at the Tubbataha Reefs Natural Park (TRNP), Cagayancillo, Palawan, Philippines revealed that most, if not all, of the mantas photographed were clearly reef manta rays (*Manta alfredi*). Previously identified in surveys within the park as oceanic manta ray *M. birostris*, the presence of *M. alfredi* had never been established until now. Using the parameters described by Marshall et al. (2009), pictures in the Tubbataha Management Office (TMO) database were reviewed and noted. The identification of *M. alfredi* was more consistently based on the presence of black marks located posterolateral to the last gill slits and between the rows of gill slits. The identification of the species was further validated by a shark expert (Dr. William White, pers. comm.) after viewing three photographs from the said database. Since not all photographs in the database were determined to be of the *M. alfredi*, the presence of *M. birostris* in the park could not be completely ruled out. Nevertheless, this represents a new elasmobranch species record for the TRNP and, technically, for the Philippines as well. Furthermore, the confirmed presence of the globally significant *M. alfredi* as well as that of the *M. birostris* should have a strong bearing on the conservation policies of the park as well as that of the country. Further research on population dynamics, structure and abundance is recommended. Contributing to global efforts to generate better understanding of the species through partnership with Ecocean Manta Matcher is also recommended.

Conservation of *Xylocarpus granatum* Koen.: A means of saving its insects visitors/pollinators and the mangrove forest ecosystem, Pagbilao, Quezon

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Traditionally, *Xylocarpus granatum* is only as source of tannin, medicine and dye. Recent studies from different countries specifically Bangladesh and China found that *X. granatum* provides advanced medicinal properties. Honey bees produce honey and propolis from the flowers of *X. granatum* and propolis. Honey is used in the production of various pharmaceutical products such as ointment, drugs and in beauty products. However, with the various benefits that can be derived from the mangrove ecosystem, it is sad to note that it severely degraded and in need of immediate rehabilitation. The degradation of the mangrove ecosystem since the 1980's has been due to coastal conversion and development hence, *X. granatum* population has also been declining. The study was conducted to determine the flower phenology of *X. granatum*, its anthesis, its visitors and their foraging behavior, and the influence of pollinators on fruit setting. Results of the study revealed that *X. granatum* exhibits three flowering and fruiting seasons in a year. Floral anthesis during the study started at 1800h with a peak at 2200h. The visitors of the flowers were composed of different species of insects with 192 individuals belonging to 29 families and 9 orders. Moth species were its primary pollinators that actively foraged at night, while *Apis cerana* visited the flowers from 0600h until 1000h. Low fruit set was observed in unbagged flowers while none in bagged flowers, indicating that the species is an obligate outcrosser and requires pollination agents. The Pagbilao Experimental Forest where this study was conducted should remain a protected area and its biodiversity could be sustained through wise management and conservation of its genetic resources.

Herpetofaunal Survey on Selected Caves in Puting Bato, Polillo Island

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A herpetofaunal survey on three selected caves in Puting Bato, Polillo Island was conducted which employed the opportunistic exhaustive sampling method. The objectives of the study were to (1.) provide a preliminary list of the amphibians and reptiles found in cave 1, cave 3 and cave 4; (2.) compare the herpetofaunal species richness among the cave zones, and 3.) identify threats to the caves and their herpetofauna. A total of 61 individuals belonging to 10 species (4 amphibians, 6 reptiles) were collected. *Platymantis dorsalis* was the most represented species followed by *Limnonectes woodworthi*. Amphibians were generally more abundant in the caves than reptiles, though more species of reptiles were collected. 90% of the species are endemic to the Philippines. No Polillo endemic species was captured. Results suggest possible new habitat and island records for different species. The number of species and individuals that were captured decreased from the entrance to the dark zone of the three caves. Likewise, Cave 3 was the most species rich of the three caves. Threats to cave herpetofauna were include the presence of garbage brought by people inside, indications of guano extraction and treasure hunting. With this number of endemic herpetofauna that utilize caves in Puting Bato, it is important to strengthen the efforts to protect these fauna and their cave habitats. This is a pioneer survey of the herpetofauna of Cave 1.

*Special problem for BIO191-Special Topics (Cave Ecology) at the University of the Philippines Los Baños, 2nd Semester, AY 2011-2012.

Mt. Malindang Plant Diversity: From research to development

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Despite the recognized value of Malindang Natural Park as a major biodiversity refuge, little has been done to conserve and protect its flora. The commercial and social demand for floral resources has resulted in biodiversity loss. Thus, Malindang Natural Park is one of the hotspots in the Philippines needing high priority for protection and conservation. It is therefore important that plants be inventoried and assessed so that strategies for their sustainable use can be effectively implemented. Site selection, establishment of sampling plots and inventory were done with the Subanens as local researchers. Maps were produced and assessed to determine the status of biodiversity. Participatory inventory and assessment of the forest and agroecosystems delineated nine types viz, mossy forest, montane forest, dipterocarp forest, almaciga forest, two types of mixed dipterocarp forest, lowland dipterocarp forest, plantation forest and agroecosystem. The forest ecosystems showed a total of 1,284 species: 873 angiosperms, 20 gymnosperms, 280 pteridophytes, 85 bryophytes, 26 lichen species. It also revealed 56 endangered and locally threatened species. Among the vegetation types, the almaciga forest appeared with the most number of endemic species, followed by the Montane and the Mossy forests. The lowest species richness and endemism were found in the plantation forest. Using this knowledge on plant diversity, a 100- hectare rainforestation project was implemented by the Subanens to rehabilitate degraded areas in Mt. Malindang. This research has improved the lives and environment of the Subanens.

Some Herbs: Their biochemical components and the ethnomedical health practices of native herbalists in Bukidnon

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Ethnobotany and ethnopharmacology were noted as interdisciplinary fields of research that specifically look at empirical knowledge of indigenous peoples concerning medicinal substances obtained from plants and their potential health benefits. The study attempted to investigate some herbal weed species and their biochemical components and ethnomedical health practices of native herbalists in Bukidnon. Specifically, it aimed to: 1) determine some weed species with medicinal properties that inhabit the buffer zones of three mountains namely: Mt. Kalatungan, Mt. Kitanglad and Mt. Musuan; 2) collect, identify and describe the morphological characteristics of the herbal weed species; 3) determine the biochemical components of some weed species through phytochemical screening; and 4) identify the weeds with drug potentials and 5) the ethnomedical health practices among the native herbalists in Bukidnon. A survey of the flora was made by traversing the buffer zones of the three mountains. Field collections were conducted, the plant habit, type of stems, leaves, leaf base, leaf tips, leaf margins, leaf arrangement and flowers were described; phytochemical screening tests were done and interviews were made. Results of the study revealed a total of 68 medicinal weeds collected in all the three sites. Twenty-four (24) species belonging to 11 families and 23 genera for Mt. Kitanglad. Forty-two (42) species, 15 families, and 36 genera for Mt. Kalatungan, and 27 species belonging to 10 families and 23 genera for Mt. Musuan. Asteraceae and Poaceae were the most species-rich followed by Cyperaceae and Leguminosae and the families with the least number of species were Amaranthaceae, Caryophyllaceae, Commelinaceae, Euphorbiaceae, Iridaceae, Nyctaginaceae, Oxalidaceae, Rosaceae, Rubiaceae and Solanaceae. Fifteen (15) weed plants were subjected to phytochemical screening. Further results showed the presence of phenolic compounds such as saponins, tannins, flavonoids and alkaloids. The said constituents indicated distinctive therapeutic and antimicrobial properties. Twenty (20) herbalists were interviewed to gain knowledge of their ethnomedical health practices. They were asked which plant parts such as roots, leaves, stems, rhizomes and flowers of the weed plants were most extensively used to treat external and internal human ailments. The health practices were noted and documented. Other herbal weeds are recommended for further taxonomic studies, their pharmacological actions, their national significance and potential impacts on the environment.

Status of Mangrove Communities in Honda Bay, Palawan

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The status of mangrove communities in selected islands of Honda Bay, Palawan was evaluated and compared with the data gathered in 2000 during the implementation of the Fisheries Resource Management Project in the bay. Species composition, community structure, growth and recruitment of the mangrove communities were assessed at three sampling sites in April and November 2012 using the transect plot method. Twelve species were recorded namely, *Aegiceras floridum*, *Avicennia marina*, *Bruguiera gymnorrhiza*, *Ceriops decandra*, *C. tagal*, *Rhizophora apiculata*, *R. mucronata*, *R. stylosa*, *Scyphiphora hydrophyllacea*, *Sonneratia alba*, *Xylocarpus granatum* and *X. moluccensis*. The mangrove community is dominated by *Rhizophora* species. *Rhizophora apiculata* and *R. stylosa* recorded the highest stem density at 3,550 stems ha⁻¹, and 3,000 stems ha⁻¹, respectively, while *Rhizophora mucronata* registered the highest stem frequency at 24.27%. The basal stand area of mangrove species over the seven-month period increased by 14.44%. Recruitment of new seedlings was observed among *Rhizophora* spp., *B. gymnorrhiza*, and *Ceriops* spp., while 100% decline in the number of saplings was observed among *Ceriops* and *Xylocarpus* spp. Total seedlings density increased from 1083 seedlings ha⁻¹ to 2100 seedlings ha⁻¹, while the total sapling density increased from 67 saplings ha⁻¹ to 83 saplings ha⁻¹ during the seven month period. Human disturbance was noted as evidenced by fallen and dead trees in the sampling plots. Compared to 2000 data, difference in mangrove species composition, community structure, growth and recruitment pattern was observed.

Biogeography of the Spotted Stream Frog Complex in the Philippines: New Data, New Species, and New Conservation Concerns

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We re-evaluate a previously published biogeographic ‘dual-invasion hypothesis’ for Southeast Asia’s stream frogs of the *Rana signata* complex, using a new multilocus DNA sequence dataset, and new methods for ancestral area reconstruction. This new approach, utilizing robust geographical sampling from throughout Southeast Asia allows for comparisons between lineages from the mainland, adjacent land bridge islands, and the oceanic islands of the Philippines. We test simple intuitive hypotheses regarding lineage diversification on continents versus islands and revisit a previous biogeographic explanation for the colonization of the Philippines by stream frogs. Our data allow for the identification of new endemic Philippine species, and suggest the existence of additional geographical subcenters of Philippine amphibian biodiversity. This study also reaffirms the importance of faunal dispersion into the archipelago via the western and eastern Philippine island arcs as important processes that have contributed to the evolutionary and ecological assembly of Philippine vertebrate megadiversity. Finally, in this presentation we will discuss the newly identified conservation significance of Mindanao’s “cryptic” species, IUCN data-deficient species, and unnamed threatened species that deserve attention by conservation biologists despite the fact that they current await taxonomic description.

Wild Orchids and Pitcher Plants: Imperiled flora of Mt. Kiamo

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The Higaonon tribe which literally means “people of the wilderness” is among few remaining indigenous people in Mindanao living in the remote highland mountains of Kiamo. This is situated in northeastern part of Malaybalay City, Bukidnon, where floristic surveys and documentation of commonly harvested wild orchids and pitcher plants were carried out. Personal communications as well as fieldwork investigations with the local Higaonon guides were conducted. Photo documentation of the plants in the wild was made for taxonomic verification as no plant material was collected. Aside from those people from other communities who collect these plants, the local inhabitants also usually sold them to many local plant enthusiasts especially during annual festivities. Results showed that six (6) wild orchid species belonging to 3 genera and six (6) *Nepenthes* species were often harvested to meet the local demands. *Dendrochilum*, *Dendrobium* and *Phaius* species were among the most exploited wild orchids because of their conspicuously attractive inflorescence. However for the pitcher plants, this includes two (2) endangered species namely *N. merrilliana* and *N. truncata* as well as the two (2) site endemic species *N. pulchra* and *N. ceciliae*. With such astonishing and unique diversity of flora, it is highly important to declare the remaining forest ecosystem as a protected area so as to regulate the exploitation of the endangered as well as the economically important species that must be conserved. Educating the Higaonons must also be addressed in order to promote awareness and better attitude towards safeguarding the environment.

**The world as they know it: community development planning
by Manobo cultural communities in Arakan, North Cotabato**

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We facilitated development planning in three indigenous *Manobo Tinananon* communities with long-term forest restoration and protection efforts in known Philippine eagle territories in Arakan Valley, North Cotabato, Philippines from 2011 to 2012. We used an Indigenous planning approach anchored on the Sustainable Livelihoods Framework (SLF) which looked into community strengths and assets rather than deficiencies. The planning process fundamentally drew from a collective Indigenous worldview in identifying development priorities and aspirations. Vulnerable social groups like women and landless farmers were provided ample space for participation through special focus groups and photovoice sessions. We found out that problem-solving strategies inherent in the community were guided by their worldviews and that recognizing these promoted pride, developed enthusiasm and strengthened the involvement of community members. Special sessions conferred confidence to vulnerable groups and ensured that their priorities were not overlooked. The completed development plans covered community-initiated projects that continue to provide mutual benefits for people and wildlife. The planning process is iterative and is designed to be open for refinement. However, the approach described here has great potentials for enhancing self-governance by Indigenous peoples of natural resources within their own ancestral domains.

Why Do Hunters Hunt? A case study on Negros Island

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Hunting in general has been considered a major threat to wildlife conservation worldwide. The effects of subsistence and sport hunting on the decline of game species on Negros and in the Philippines have not been considered as important as habitat loss and alteration. This study aims to assess the current extent and frequency of hunting; identify the game species, hunting methods employed and reasons for hunting; assess local knowledge and attitudes towards legislations and programs protecting the environment and wildlife; and formulate recommendations aimed at developing improved wildlife conservation strategies and determine priorities for follow-up studies. Structured interviews and questionnaires were made amongst 152 hunters in the hinterland areas throughout Negros Island either informally approached or in group discussions for the interview. A total of 72 vertebrate species were hunted by 128 subsistence and 24 sports hunters who were interviewed, Six of the 72 vertebrates were reptiles, 2 amphibians, 19 mammals, and 45 were birds Seventeen (17) different hunting gears were used by the hunters. The reasons for hunting include; to augment their food supply, protect their crops, sport or recreation and hunting for pet trade. Of all species hunted, nine are considered threatened species in the IUCN Red List. Educating hunter groups and the establishment of more privately-owned or community-based initiated and managed wildlife sanctuaries may assist in the conservation of wildlife throughout the Island.

Microhabitats of Ranidae along Molawin Creek, Mt. Makiling Forest Reserve

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The Mt. Makiling Forest Reserve (MFR) in Los Baños was established as a reserve in 1910 and as such, the mountain has been protected for research and for the benefit of the species inhabiting the area. The most numerous inhabitants of Mt. Makiling are the amphibians, especially of the family Ranidae. The objective of this study was to describe different microhabitats of frogs belonging to Family Ranidae in the MFR. Two study sites were selected and three belt-transects (50 x 10) were prepared on each sampling site. Every amphibian found inside each transect was captured by hand, identified, photographed and measured. Microhabitats such as: tree holes, forest floors, spaces between buttress, axils of palms and aroids, tree fern, plant litter and moss accumulation were photographed and recorded. Field observations revealed the microhabitats of Ranidae could be identified and demarcated as follows: (1) water; (2) roots; (3) boulders and clumps of moss; (4) leaf litter; (5) tree stumps and felled logs; (6) tree ferns; and (7) tree bark and buttresses. Seven species of Ranids were apparent during the study in wide-ranging types of microhabitats. *Limonectes macrocephalusto* was specific to tree bark and buttresses, *Rana signata* and *Rana woodworthi* both preferred water, boulders and clumps of moss, and leaf litter but the former also favored roots, tree stumps and felled logs. *Occidozyga laevis* was exclusively found in water microhabitat. *Platymantis mimulus* and *Platymantis corrugatus* preferred leaf litter microhabitat while *Platymantis dorsalis* was partial to tree bark and tree buttresses microhabitats.

Faunal Diversity of the Pantabangan-Carranglan Watershed, Nueva Ecija

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A survey on fauna populations of the Pantabangan-Carranglan Watershed was conducted from September 10-25, 2011. The survey covered secondary forest along gullies and ridge top at 570 m, 630 m and 790 m and mixed forest, bamboo and agricultural area at 325 m and 330 m. A total of 112 species were recorded, including four fruit bats, six insectivorous bats, six rodents, one shrew, 73 birds, eight amphibians, eight snakes, six lizards, one deer, and a wild pig; has an endemism of 48%. A poorly known endemic species of flying fox, *Desmalopex leucopterus*, was relatively common with a capture rate of 46% and were captured in pairs. Two species of Bamboo Bat, *Tylonycteris pachypus* and *T. robustula*, which are among the smallest bats in the world, were the most common insectivorous bats captured in the study sites. Among the murid rodents, *Apomys sierrae* was the most abundant. Of the 6 murid rodents, two are considered exotic species, *R. exulans* and *R. tanezumi*. Both species were only captured in agricultural areas. A similar pattern was also observed in other mountains on Luzon Island where exotic and non-native species of rodents were not able to penetrate old growth or disturbed forest where native species of murids were present. Among the endemic birds documented, *Buceros hydrocorax* and *Tanygnathus lucionensis* are among the threatened species of birds recorded in the area. Despite of the degree of disturbance in the area diversity and endemism is still high.

Spatial Modeling Predicts Habitat Suitability for Selected Threatened Forest Tree Species

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Climate change is projected to exacerbate the threats facing biodiversity worldwide such as habitat fragmentation and human-induced changes to the landscape. Among the ecosystems that will be greatly affected are the forests. In the Philippines, threats to vulnerable forest tree species have been exacerbated as well by limited research on their habitat particularly on projections of the impacts of climate change. This study aimed to predict habitat suitability for selected threatened forest tree species and evaluate the consequences of climate change on spatial distribution of their habitat. It was designed to create spatial maps describing forest trees habitat suitability. The study mainly utilized Geographic Information System (GIS) and a machine learning algorithm called maximum entropy distribution modeling or Maxent. The data we used were from multiple sources such as Global Biodiversity Information Facility (GBIF), legacy literature of biodiversity, peer-reviewed journals, technical reports and biodiversity surveys for forest tree occurrences; WorldClim, Food and Agricultural Organization, and Consultative Group on International Agricultural Research for environmental data. We also developed multiple climate trend scenarios for the Philippines at the monthly time scale for precipitation, maximum and minimum temperature and derived bioclimatic variables from these parameters. The bioclimatic variables are biologically more meaningful to define eco-physiological tolerances of a species. The Maxent model predicted potential habitat distribution map for selected threatened forest tree species. The approach we used here promises to be an effective and useful tool for biodiversity conservation, monitoring and management. However, further improvements are recommended to refine model selection and the quality of the environmental data.

Biology and Ecology of the Lake Taal Sea Snake, *Hydrophis semperi*

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We studied the basic biology and ecology of the endemic Lake Taal Sea Snake (*Hydrophis semperi*) in Lake Taal, Philippines. Gill net trapping was primarily employed during sampling (June-November 2012). Morphometric data was gathered from snake samples with live snakes tagged and released and dead samples extracted of its gut content. Environmental parameters (e.g. water temperature, light intensity, conductivity) were also collected for multivariate analysis. Out of 112 snakes, mostly collected from the south basin, only 24 individuals belong to *Hydrophis semperi*. No sea snake was caught in the north basin. The remaining (n=88) were identified as the Little File Snake (*Acrochordus granulatus*) with one recapture from tagged samples (n=33). Snake captures reflect relative less abundance of *H. semperi* and high capturability of *A. granulatus*. Identified gut contents reveal *H. semperi* feeding on three fish families (Gobiidae, Hemiramphidae, Anguillidae). The sympatric *A. granulatus* however contain prey items from one fish family (Gobiidae). This suggests that the endemic sea snake species is a gape-limited generalist predator. *In-situ* observations show *H. semperi* exhibiting a “surface-arch” movement distinct from *A. granulatus* when surfacing from underwater. Further observation suggests that both species are strongly associated with rocks and crevices. Higher conductivity values present at the mouth of the river near the lake reflect the marine origins and volcanic nature of the lake which may have created the conditions which are suitable for the survival of *H. semperi*. This effort to revive studies on this species revealed certain aspects that provide insights for further investigation.

Mutualistic Networks among Fruiting Trees and Avian Seed Dispersers within an Urban Landscape

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Animal-dispersed plant species account for a significant proportion of plant communities, and a large majority of plant species depend on animals to disperse their seeds. These mutualistic relationships between plants and frugivores have been studied at various scales in different systems worldwide. Mutualistic interactions are said to be assymmetrically structured and are highly nested, i.e. the more specialist frugivores interact with plants that are within a subset of the plants that the more generalist frugivores interact with; conversely the more specialist plants also interact with a subset of frugivores that interact with the more generalist plants. Higher nestedness translates to higher cohesiveness, which means a more stable network. We used a mutualistic network approach to investigate plant-frugivore interactions at three sites: the University of the Philippines Diliman campus (UPD), La Mesa Ecopark (LMEP), and La Mesa Watershed Nature Reserve (LMNR). From Mar-Oct 2012, we monitored fruiting and counted the fruit set of several trees at each site and recorded all avian frugivores that consumed the fruits. Our main results indicate that areas with bigger fleshy-fruited trees and higher fruit sets had higher nestedness values (i.e., more cohesive networks). In addition, networks at the local level are less cohesive than at the landscape level, and therefore larger areas of trees that can provide fruits for consumption of birds are needed if mutualisms between the plants and the animals are to persist.

Reproductive Biology and Sex Ratio of the Suckermouth Sailfin Catfish *Pterygoplichthys* spp. in Marikina River: A fresh perspective on successful establishment and potential spread control of an invasive fish species

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Life history traits and reproduction of successful invaders are scarcely documented but could offer insights to their invasion of new environments. This study described the ultrastructural and histologic features of the gonads, Length-weight relationships (LWR), sex ratio and reproductive phenology of the highly invasive Janitor fish *Pterygoplichthys* spp. from Marikina River, Philippines for one year (July 2010-June 2011) to elucidate its reproductive strategies and seasonality of reproduction. Transmission electron micrographs show that the testis is of unrestricted spermatogonia testicular type while female *Pterygoplichthys* spp. possessed cystovarian ovaries containing three cohort oocyte diameters suggesting a group synchronous mode of oocyte development. Males attained peak spawning during the rainy months (June to August), have overlapping regression and recrudescence during December to January and prolonged recrudescence during the dry months (February to May). Females have a relatively short spawning period (June to September) coinciding with the rainy season, followed by a short regression phase (October to December) which overlapped with the long recrudescence stage (October to early June). Pooled LWR for males and females was expressed by $\text{Log } W = -1.396 \text{ (LS)}^{2.74}$ ($r^2=0.975$), suggesting negative allometric growth. Sex ratio did not deviate from the 1:1 ratio, although females were often more numerous during the spawning season. Males dominated the larger size classes (41-45 cm SL). Females are highly fecund and are spawning-capable even at smaller sizes compared to its congeners. New facets on the reproductive features that contribute to their invasion and potential spread control are discussed.

**Population density, distribution and habitat preferences of the Palawan Pangolin,
*Manis culionensis***

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The Palawan pangolin (*Manis culionensis*) is a rare species endemic to the province of Palawan. There is scant information on its population status in its natural habitat. Its biology and ecology are not well understood while collection and hunting for wildlife trading are noted to occur at local and regional levels. This study describes its morphology, aspects of species ecology specifically habitat preferences, behaviour in relation to population density, and foraging/feeding habits to formulate appropriate conservation strategies. A modified variable transect method was used to characterize habitats. Trapping was done along transect lines to assess population density and habitat preference. Micro-habitats, food and feeding habits were noted. Ethno-biological survey was conducted to confirm observations. Results indicate that the Palawan pangolin lives in varied habitats but with higher preference for primary forests. The species searches for food from termite and ant mounds. Being a rare species, it has a low population density. Habitats loss caused by agricultural expansion, slash-and-burn farming as well as wildlife hunting, threatens its survival. Locals confirm that population of the species has decreased through time. Protection, conservation and management should address socio-economic, environmental, and political issues involving the species. The following conservation and management strategies are recommended to ensure survival: 1) Identification and management of endangered/ critical habitats, 2) Implementation of research programs for better management, 3) Development and implementation of programs to strengthen enforcement of wildlife laws and other related policies, and 4) Creation and implementation of outreach programs for public awareness.

Population Genetic Structure of the Critically Endangered Philippine Eagle *Pithecophaga jefferyi* (Aves: Accipitridae)

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The Philippine Eagle *Pithecophaga jefferyi* is a diurnal raptor that is endemic to the Philippines. Its distribution includes the islands of Luzon, Samar, Leyte and Mindanao. The Philippine Eagle is classified as a critically endangered species under the IUCN Red List, with a high end estimated population of only 500 breeding pairs existing in the wild. Their decline has been attributed to the continuing forest destruction in the country and to unabated hunting. Population genetic studies serve as one of the guides for biodiversity conservation; however, they are lacking for this species. This study aimed to identify the effect of this population decline on the genetic structure of the Philippine Eagles' present population. The population was subdivided into two: Luzon-Visayas and Mindanao. Three mitochondrial regions were used as a genetic marker. Of the three, the control region was the most variable, showing overall haplotype diversity ($H=0.890$) and nucleotide diversity ($\pi=0.00557$) that are comparable with other accipitrid species with high genetic diversity. An F_{ST} value of 0.362 indicates a restricted gene flow between the Luzon - Visayas and the Mindanao subpopulations. Maximum likelihood trees and network analysis shows no haplogroups corresponding to the subpopulation divisions. Mismatch distribution is multimodal and follows a pattern of spatial expansion that indicates a recent bottleneck, possibly corresponding to the population decline. This study shows that conservation efforts will have to concentrate on local populations in order to increase the highest possible genetic diversity for this species.

Freshwater Research in the Philippines: What has been done and what to do next?

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Globally, declines in freshwater biodiversity have been recognized to be far greater than those in marine or terrestrial realms. In Asia, freshwater ecosystems face grave threats due to the rapid pace of development and the growing human population, as well as the indifference of the public and the low priority accorded to research on them. Our goals in this review are to provide indications where further research is needed, what systems are underrepresented and which organisms have been neglected thus aiding in future freshwater ecosystem management, conservation and sustainable use. In this study, the current knowledge on freshwater ecosystems in the Philippines was determined through critical evaluation of available peer-reviewed literature. A structured search of ISI-indexed studies on Philippine freshwater systems published from 1988 to 2012 was performed using two online search engines. A total of 279 papers that have directly assessed Philippine freshwater systems and/or have actually collected and examined aquatic organisms from these systems were included in the review. Of these, 75 studies were conducted in 28 protected areas (PAs), 59 in 13 key biodiversity areas (KBAs) and 72 in nine candidate KBAs. More than 70% of the papers were produced solely by local researchers or with international collaborators. Since 1988, there appears to be a significant steady increase in Philippine freshwater studies, with systematics (106 of 279 papers) and freshwater fish (76 of 279) being the most frequently studied research area and organism, respectively. Among the papers reviewed, Visayas and Mindanao received little research attention. These results and their implications for future research will be discussed.

Phytoplankton and Zooplankton Communities and Water Quality of the Pantabangan Reservoir after Two Typhoons in 2011

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Natural disturbances, such as typhoons, induce large-scale land-water interactions, profoundly influencing plankton ecology and biogeochemical cycles. On September 28 and 30, 2011, Category 4 supertyphoons Nesat and Nalgae, locally named Pedring and Quiel, respectively, struck Pantabangan Reservoir, Nueva Ecija, Luzon, Philippines. Because of these events, it was possible to compare the reservoir's phytoplankton and zooplankton communities (density, richness, diversity, evenness, taxonomic composition) and water quality (temperature, dissolved oxygen, conductivity, total dissolved solids, total nitrogen and total phosphorus) before and after the consecutive passage of these typhoons. This allowed for an elucidation of the effects of increased catchment runoff on plankton dynamics. Plankton and water samples collected on September 9-10 and October 25-26, 2011 at four depths at each of five sites showed Bacillariophyta (diatoms; 81% and 76% respectively) and Cyclopoida (copepods; 55% and 69%) as the most dominant groups. Non-metric multidimensional scaling using the Bray-Curtis similarity measure suggested comparable phytoplankton and zooplankton community compositions before and after the typhoons (stress value=0.19). Moreover, Analysis of Similarity revealed no differences in phytoplankton ($R=0.39$) and zooplankton ($R=0.35$) assemblages with sampling dates. The same pattern was observed for density, richness, diversity and evenness for both phytoplankton and zooplankton communities (two-way repeated-measures ANOVA, $P>0.05$ in all cases). On one hand, nitrogen and phosphorus concentrations and total dissolved solids decreased markedly after the typhoons, while dissolved oxygen increased after the typhoons (two-way ANOVA, $P<0.0001$ in all cases). This dilution effect on nutrients due to the typhoons may have prevented plankton blooms in the reservoir.

Should Local Counters Count? Observer Error Effects on Trend Detection in Flying Fox Counts

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Citizen science has potential to make substantial contributions to wildlife conservation, especially in the tropics, where biodiversity and threats are high but resources are scarce for conservation. Although biologists are ambivalent about error due to inexperienced observers, Old World fruit bats (Pteropodidae) provide a best case scenario for community-based counts, because these species aggregate which reduces components of sampling error. We studied whether local community members could be employed as citizen scientists to detect trends in populations. We used survey data from fruit bat exit counts across the Philippines to measure observer error in counters with different levels of experience and to demonstrate the impact of observer error on trend detection. As expected, field experience was inversely correlated with observer error; average error was 70% of number counted for observers with no field experience, 11% for fieldworkers, and 5% for experienced counters. However, even the largest error (from inexperienced observers) did not greatly compromise trend estimation. In a projection model incorporating observer error from our field data, we found estimates of exponential trend to be robust to the measured levels of observer error, with no misidentifications of trend direction after 20 years of counting even for amateur counters and few misidentifications after only 5 years of counting. Fruit bat conservation in Southeast Asia is dependent on regular monitoring of populations of concern. The modeled success in trend estimation by citizen scientists suggests that community-based monitoring programs are scientifically valid in addition to being cost-effective, sustainable, and locally-relevant.

Diversity of Cicadas in Three Selected Mountain Ecosystems of Mindanao

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Diversity of cicadas was determined in three selected mountain ecosystems of Mindanao namely: Mt. Musuan, Mt. Kitanglad and Mt. Hamiguitan. Cicadas were considered for this study for their being biomass converters and indicator of a forest quality. They are dependent on trees for shelter. Hence the diversity of cicadas indicates habitat quality. This paper aimed to provide information on cicada species composition and species level-diversity in three selected mountain ecosystems of Mindanao. Data generated may be used for species monitoring, distribution, biogeography and conservation of cicadas. Belt transect, time constraint, transect walk samplings, light trap, malaise trap and pan traps were employed from April 2011 to May 2012. A total of 21 species of cicadas were captured and identified: 8 from Mt. Musuan, 9 from Mt. Kitanglad and 17 from Mt. Hamiguitan. Species diversity level using Shannon-Weiner index showed low level in all sites. In Mt. Musuan $H'0.697$, Mt. Kitanglad $H'0.965$ and Mt. Hamiguitan $H'1.063$. Highest species richness was observed in Mt. Hamiguitan, lowest in Mt. Musuan. Bray-Curtis analysis showed that all study sites had unique habitats for cicadas. The way the habitats were clustered showed that cicada species' preference for certain habitats. The locals utilize cicadas for food, bait for fishing and for forecasting weather conditions. They also recognized that cicadas too are worthy to be conserved as they indicate forest quality.

The Agusan Marsh (and the Agusan River Basin) – Such Great Importance, So Little Research

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The Agusan Marsh is an extensive flood plain of ~60 lakes and ponds, a wetland covering 111,540 ha with a catchment area of 661,200 ha comprising the middle portion of the Agusan River Basin in northeastern Mindanao (3rd largest river basin in the Philippines covering 1.2 million ha in Caraga and Region XI). As such, the Marsh acts like a giant sponge, soaking up excess water from the mountains during the rainy season (4.3 m/yr rainfall), protecting downstream towns and Butuan City from catastrophic floods, and trapping sediments. Because of its ecological significance in water supply regulation and provision of vital ecosystem services in eastern Mindanao, the Marsh has been declared a protected area under the National Integrated Protected Area System in 1994, the Agusan Marsh Wildlife Sanctuary by Presidential Proclamation 913 in 1996, and as Wetland of International Importance by the Ramsar Convention in 1999. In recent years, the Marsh has received national and international media attention with the capture of Lolong, the biggest brackishwater crocodile in captivity, reports of ongoing illegal logging despite government crackdowns, and the occurrence of devastating floods and landslides in Agusan del Sur spawned by increasingly severe typhoons. Already these are signs and symptoms of environmental abuse and management failures, but equally worrisome is the lack of research – all the published papers on the Agusan Marsh could easily fit on one sheet of paper, as of 2007. Since then, very few researches have been added, for example, on new orchid species and stable isotope studies on the invasive janitor fish. This paper argues for the need for scientific research to establish baseline information on hydrology, sediment dynamics and ecology to provide guidance to future interventions and developments such as dams and canals, and to mitigate damage from continuing drainage of marshland and conversion to agriculture, e.g., rice, orchards and oil palm plantations, and for wildlife researchers to simply be present where the biodiversity is. The challenge is thrown to Filipino scientists, especially those from Mindanao, but also elsewhere in the country.

Diversity of Cave-Dwelling Bats on Samal Island, Davao del Norte

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More than 2,000 caves have been documented in the Philippines, yet cave research is very poor. There is hardly any published study on caves and cave biodiversity in the country. To address and fill the gaps of knowledge on cave bats, this study was conducted primarily to provide benchmark information on the diversity of cave bats on Samal Island. Thirty caves with different diversity, architecture, microclimate, and disturbances were surveyed in this study. Influences of cave architecture and microclimate on the diversity and abundance of cave bats were also determined. Results showed that the diversity of cave bats on Samal Island was moderate, with 15 species identified; however, abundance was comparatively high in caves known to harbor more than 10,000 individuals. Eight new records were identified for the Island, including one possible new species of *Rhinolophus*; thus, increasing the distribution and diversity of known bats in the country. A positive and highly significant relationship was determined between species richness and abundance. Statistics also showed strong positive and highly significant correlation between species richness and abundance with several cave parameters (cave length, cave height, number of chambers and entrance size). Sixteen disturbances were identified, of which proofs of bat hunting were frequently observed (i.e. bonfire and bamboo poles). Among the disturbances, tourism use and guano harvesting were identified to have a highly significant negative correlation with cave bats species richness and abundance. With this, conflicts between cave use and cave conservation arises; however, conflicts could be reduced with proper cave management.

Patterns of Occurrence of the Small Non-Flying Mammals of Baguio City

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An earlier study of the small non-flying mammals of pine forest patches of the highly urbanized City of Baguio, Northern Luzon, Philippines revealed that six species of small non-flying mammals, including three endemic species (*Rattus everetti*, *Bulimus luzonicus* and *Apomys musculus*), thrived in these areas. It appeared that the endemic species were restricted to the less disturbed forest, while the non-native species tended to be found across the habitats. To investigate further these observed tendencies of the species, we conducted a series of trappings in other pine forests and areas of human habitation in Baguio City using the standard methodology for small mammal survey. After 5233 trap-nights, only three species were documented, including two murid rats (*Rattus exulans* and *Rattus tanezumi*) and one shrew (*Suncus murinus*), all of which are non-native species. The results suggested that the endemic species previously documented were not thriving in the pine forests of the City anymore. Non-native species, on the other hand, were generally more widespread and abundant. *Rattus tanezumi* was the most common and widespread occupying both pine forests and areas of human habitations. The forest patch, which is a forest reserve, where the 3 endemic species were previously collected, appears to play a crucial role in keeping the species survive and persist. It is important that any program of conservation should include the continuous protection of the area in order protect the species.

Biodiversity Conservation in Forest Restoration: A research study of the Philippine Peñablanca Sustainable Reforestation Project, Peñablanca, Cagayan

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The Philippine Peñablanca Sustainable Reforestation Project was initiated to restore the forests of the Peñablanca Protected Landscape and Seascape for watershed enhancement and biodiversity conservation within six years. The project is supposed to demonstrate the compatibility among multiple uses of forest, for biodiversity protection, watershed management and ecosystem services for the benefit of the local communities and at the same time serve as a catalyst for socio-economic development in the area. To measure the success of biodiversity conservation projects, implementers should have the ability to demonstrate positive impacts of the project on the local communities and biodiversity. In order to show project benefits, a research monitoring program was developed to assess and monitor the impact of the project activities on biodiversity within the project area. Having established a baseline prior to the project, monitoring was conducted throughout the project duration to measure changes to flora and fauna (birds and bats). Biodiversity monitoring has been carried out continuously for five years at the inception of the project. Monitoring activities was done twice per year for fauna, once during dry season and another during rainy season and once per year for flora to monitor patterns of changes in the biodiversity of the area. The survey of the flora was conducted using the Braun-Blanquet Relevè method. A total of 30 transects were established in random sites within the five barangays of the project site. A total of 361 species of flora were recorded during the base lining and monitoring, 24 of which are endemic, 11 are threatened and five are threatened endemic. There are major differences in floristic composition during the five-year survey monitoring compared to the baseline data. The fauna survey was conducted using transect walks, mist netting, and harp trapping. There was an increase in bird and bat species observed during the five-year monitoring survey. A total of 141 bird species were recorded of which 52 are endemic and four are threatened endemic. For bats, 19 species were documented and five of which are endemic. The faunal survey sites were selected independent from the sites of the survey for flora. A positive result for five-year biodiversity monitoring surveys would indicate a possible effect of project activities conducted. It is noteworthy that the project area adjoins the primary forests of the Sierra Madre Mountains and plays an important role in protecting biodiversity through rainforest regeneration for sustainable ecosystem services.

Do Tree Species' Leaf Litter Traits Structure Arthropod Diversity?

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Tree species' leaf functional traits are indicators of leaf decomposition rates. Slow decomposing recalcitrant leaves will persist and increase structural complexity in the leaf litter. We hypothesized that: (1) tree species have leaves with different functional traits that structure arthropod diversity and (2) recalcitrant leaves will create habitat and increase the diversity of litter-dwelling arthropod assemblages. To determine whether our hypotheses are true or not, we investigated the effect of three different tree species on structuring litter-dwelling arthropods assemblages in the old growth forest of Bulong Nature Reserve, Xishuangbanna, Yunnan, China. Three tree species selected were: *Macaranga sp.*, *Syzygium sp.*, and *Cryptocarya sp.* *Macaranga sp.* has soft leaves while *Syzygium sp.* and *Cryptocarya sp.* have moderate and hard leaves, respectively. Arthropods were collected from ten plots per tree and extracted from the litter with Winkler bags. The tree's diameter at breast height, dominance of its leaves in the total litter in the sample, litter depth and moisture were measured within the sampling plots. The result showed that 2499 arthropods were collected across to 113 morpho-type species that belong to 15 orders. Leaf functional traits of selected tree species are significantly different using principle component analysis. Non-metric multidimensional scaling tells that arthropod community is significantly different in *Cryptocarya sp.* However, arthropod richness is not significantly affected by the tree species. We also found that arthropod richness to be most strongly correlated to litter depth, although litter depth is not significantly different among tree species sampled.

Wild Sunflower (*Tithonia diversifolia* A. Gray): Its Bioecological Structure, Utilization and Antimicrobial Activity

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Bio-ecological structures of the wild sunflower (*Tithonia diversifolia* A. Gray), its utilization and antimicrobial activity were investigated. Three phases of work were conducted namely: a) description of the biology and ecology of the plant; b) fiber extraction from the stem employing the flammability test, capillarity action, tensile strength, and microscopy examination; and c) determination of antimicrobial activity of the leaf extracts. The Agar well diffusion method was used to determine the inhibitory concentration. Results of the study showed the distinct morphology of the leaves, stems, roots, flowers and seed structure of the wild sunflower. A crude fiber was produced from the stem which resulted in thread-like filaments with a rough texture and crème to very white in color. The flammability tests showed that the produced fiber burnt and glowed even when removed from the flame. The absorbent action indicated an easy, gradual to very slow absorptive motion of liquids to penetrate into the fiber. The tensile strength showed a comparable stronghold capacity to specific amounts of weights. The microscopy examination revealed a thread-like structure and thick-walled cell compared to commercial Abaca fiber. The leaf extracts demonstrated an antimicrobial activity against the two test organisms, *Escherichia coli* and *Staphylococcus aureus*. When compared, the Gram-negative organisms (*E. coli*) were more sensitive and demonstrated a higher antimicrobial activity than the Gram-positive organisms (*S. aureus*) with aqueous extracts. The two strains showed variable responses toward leaf extracts. The present study suggests that other parts of the plant organs of sunflower be investigated to determine the varied levels of antimicrobial activity against other tests organisms.

Assessment of Anuran Species in the Visayan Electric Company (VECO) Reforestation Park in Mananga Waterhed in Central Cebu

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The objective of this study was to determine the anuran species present in the VECO Reforestation Area in central Cebu. The anurans captured were immediately examined, identified and measured. Overall, five species were identified: *Occidozyga laevis*, *Platymantis dorsalis*, *Rana magna*, *Bufo marinus* and *Polypedates leucomystax*. The different characteristics of the anuran species and their habitats were also considered so as to provide data necessary for their conservation. Environmental factors such as the relative humidity, elevation and the topography of the area were determined. The overall Margalef's species richness index for the assessed area was 0.82 indicating that many species are found in the assessed area despite its size. With a value of 0.95 for the species evenness, species were equally distributed. The computed biodiversity index of 1.522 indicates that overall diversity of the anuran species was not that high within the area studied. Some of the factors that contributed to this were charcoal making and the availability of habitats with enough moisture. The reforestation efforts of the Philippine Business for Social Progress (PBSP) could serve as a stepping stone in promoting the conservation of biodiversity within the area.

System Dynamics Model of Dissolved Oxygen in Butuanon River Using STELLA

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The Butuanon River in Mandaue City, Cebu is a biologically dead river and is classified as a Class D water body. This means that its dissolved oxygen (DO) does not reach the DENR Class D standard of 40% DO saturation and its biological oxygen demand (BOD) concentration exceeds the standard 15mg/L. Rehabilitation efforts are currently being conducted by the DENR and other organizations to improve the river's water quality. In line with this goal, a dissolved oxygen model of Butuanon River was constructed in STELLA, a system dynamics modeling software. The DO model took into account dissolved oxygen consumption and replenishment as a result of re-aeration and BOD. The DO levels of four existing DENR river monitoring stations were simulated. When validated against Butuanon River data, the simulated DO for two midstream stations reasonably differed from actual data by 0 and 0.13 mg/L (0% and 6.5% absolute error, respectively). However, the simulated DO for the upstream and downstream stations showed less adequate results, differing from actual data by 3.19 and -1 mg/L (79.75% and 100% error), respectively. The model best simulates the DO levels of middle sections of the river. Validation runs of the DO model also showed that the key variables behave as expected when the values of other relevant variables are changed. The model could be used to make projections about long term dissolved oxygen and to propose policies in river water management to mitigate the risks posed by poor water quality to public health and the ecosystem.

Diversity of Bats in Mt. Timpoong, Camiguin Island Using Harp Trapping and Mist Netting Methods

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A study on the diversity of bats was conducted from 17 to 28 October 2012 in Mt. Timpoong on three different types of forest; namely, primary forest, secondary forest and mixed plantation. Sampling methods used were harp trapping and mist netting. It was the first time that the harp trap method was used in studying the bats of Camiguin Island. A total of 4 fruit bats and 10 insect bats were recorded. Six species were not previously recorded in the island and will be added to the list of known bats in Camiguin. They are *Hipposideros diadema*, *Rhinolophus virgo*, *Rhinolophus cf. acuminatus*, *Murina aenea*, *Rhinolophus sp1* and *Rhinolophus sp2*. Most of the endemic species were found in the primary forest. Since Mt. Timpoong is now a protected area, strict implementation of conservation laws, rules and regulations is highly needed to ensure the protection of bats in the area.

Morphological Traits of the Spotless Ladybird Beetle, *Micraspis discolor* (Fabricius) from Calinan, Davao City

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Twenty morphological characteristics of the Spotless Ladybird Beetle (*Micraspis discolor*) collected from rice fields in Calinan, Davao City were examined to identify extent of morphometric variation. Samples were handpicked and preserved in 70% ethanol and characters were examined under a compound microscope while measurements of characters were taken through a calibrated ocular micrometer. One-way ANOVA and coefficient of variation were used to test significant difference in the measurements obtained from each character per sample. Twenty-two individuals were measured and were grouped according to the two distinct colors of the elytra: pale orange and reddish orange. Variation in color patterns of elytra in ladybird beetles is a defense to their predators and is also associated with melanic polymorphism. Among the characters examined, the length of head and breadth of prosternum showed significant difference at $P < 0.05$. The coefficient of variation generally showed 10-20% variability except for four characters: breadth of head between antennae, breadth of scutellum at base, breadth of elytra epipleuron at middle, and length of second ventrite which showed greater than 20% variability. Reduced variability of samples was expected given that samples were taken from one geographic location. It appeared that isolation of beetle samples may impact variability of characters among individuals of spotless Ladybird beetle. Studies comparing characters of samples from different geographic locations may confirm this assumption.

Characterization and Biochemical Screening of Selected Plants in Mt. Banahaw de Lucban

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Morphologically uncommon plants collected from the vicinity of Mt. Banahaw de Lucban underwent characterization and biochemical screening particularly phytochemical analysis and antimicrobial testing. Each plant was characterized by describing their different parts and comparing them, with some phytoimages and description from literature. Subsequently, herbarium specimens were prepared and brought to the National Museum for final identification. The leaf methanolic extract of each plant was tested for the presence of phytochemicals including alkaloids, anthraquinones, cyanogenic glycosides, flavonoids, saponin, steroids, tannins and terpenoids through test tube reaction method and thin layer chromatography. The extract also underwent antimicrobial analysis by paper disc diffusion method against three test organisms such as *Staphylococcus aureus*, *Escherichia coli*, and *Candida albicans*. Among the six plants, *Weinmannia luzoniensis*, *Maesa indica*, *Ficus linearifolia* and *Matthaea sancta* were identified up to the species level while the *Palaquium sp.* and *Aglaia sp.* were up to the genus level only. All the plant extracts were potential sources of flavonoids and saponin. Four plants, (*W. luzoniensis*, *M. sancta*, *M. indica*, and *Aglaia sp.*) had alkaloids. Three plants, (*W. luzoniensis*, *M. indica* and *Aglaia sp.*) were verified to contain tannins. Terpenoids was obtained from *W. luzoniensis* and *Palaquium sp.* while cyanogenic glycoside was positive in *M. sancta* only., *M. indica* and *Palaquium sp.* proved to be potential sources of antifungal and antibacterial drugs, respectively. Further research within the framework of this project may lead to new sources of medicines.

The Diversity of Mosses in Relation to the Soil of the Established Plots in the Montane Forest of Mt. Hamiguitan in San Isidro, Davao Oriental

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The study was conducted to determine diversity of mosses in the established plots in the montane forest of Mt. Hamiguitan in San Isidro, Davao Oriental and to correlate moss diversity with soil properties. There is an abundance of compressed trees and various bryophytes among the montane vegetation of Mt Hamiguitan. The area has high humidity or moisture. due to less penetration of light. The 1-ha sampling plot was laid on the left and right of the mountain trail. In a total 25 stations, There were 6 orders composed of 10 families and 28 species under Class Musci found from a total of 25 stations. These families include Leucobryaceae, Sematophyllaceae, Dicranaceae, Calymperaceae, Pterobryaceae, Rhizogoniaceae, Hypnodendraceae, Orthotrichaceae, and Meteoriaceae. The most diverse in terms of species and most abundant in terms of individuals were Sematophyllaceae (5 spp) and Dicranaceae (4 spp) followed by Family Leucobryaceae (5 spp.). *Trismegistia calderensis* in plot 1 (15.71%) and *Braunfelsia sp.* in plot 2 (15.09%) had the most number of individuals. The least number of individuals were *Leucophanes aungustifolium*, *Garovaglia aungustifolia*, *Ectropothecium falcifome*, *Rhizogonium sp.*, *Barbella sp.*, and *Macromitrium semperi* having 1.43%. The study site had clay loam having heavy texture. Soil moisture ranged from 1.05-1.07%, average temperature was 19.7°C-21.1°C. Soil pH was moderately to strongly acidic (4.9-5.8pH). PO_4^{3-} was very low (4-6ppm) and K^+ was deficient (25-45ppm). Percent organic matter (Wilde's %OM) ranged from 3.0-14.0% with station 4 of plot 1 as the highest with 14.0%. Correlation Coefficient Test showed none for moss diversity and temperature ($r = -0.0176$ and $r = -0.0981$) in the 2 plots. There was slight correlation to soil moisture ($r = -0.2372$) only in plot 1. Soil pH has a slight positive correlation for both plots ($r = 0.2087$ and $r = 0.1459$). For the soil macronutrients, Wilde's OM% and potassium in plot 1 were positively correlated but a slightly to highly negative in plot 2. Dailey's (2007) hypothesis stating that the diversity of mosses can define the character or the natural state of the soils was supported only by a few factors based on the calculated values. Though moss species composition in the established plots of the montane forest of Mt. Hamiguitan was intermediately higher by 1.68 and dominance value of 0.83 with twenty eight (28) species belonging to 6 orders and 10 families, soil nature remained clay loam and ultramafic and that moss diversity appeared to respond to only a few soil parameters such as pH and soil fertility by NPK macronutrients. It had no relation to soil temperature. Most probably because naturally only very few moss species grow directly in contact with the soil.

Species Richness of Odonata in Lanuza and San Agustin, Surigao del Sur

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Members of the order Odonata spend time in water and on land during according to their life cycle making this invertebrate order an important link between aquatic and terrestrial ecosystems. To determine species richness of Odonata in Lanuza and San Agustin, Surigao del Sur, an assessment was conducted in 18 sampling sites in August and October 2012. Forty-nine species were documented where 26 species under the suborder Zygoptera and 23 under suborder Epiprocta (Anisoptera), were documented. Himatagan River of Lanuza, Surigao del Sur was found to be the most species-rich. Three species which are indicators of environmental disturbance were found to be abundant in eight sampling sites. These are the highly disturbed sites being in the vicinity of agricultural lands such as rice paddies, eggplant farms and root crop fields. Out of the 22 endemic species documented, two species were new Mindanao records. More species are expected to be documented with extensive surveys especially in pristine habitats.

Snout Morphology of Common House Gecko (*Hemidactylus frenatus*) in Relation to their Diet Sampled in Urban and Sub-Urban Areas in Davao City

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The snout morphology of the common house gecko (*Hemidactylus frenatus*) sampled from urban and sub-urban areas of Davao City were examined and compared. Lizards were visually searched from the ceilings, walls and floors of houses from Calinan (sub-urban) and from Matina, Ecoland and Bangkal (urban sites). The snout-vent length, head length, snout length, tail length, and total length of each specimen were taken using a dial caliper. Fifty individuals were captured with 25 individuals per site. The bulk of the urban samples were captured from the ceiling whereas those of the sub-urban site were dominantly from the walls of the houses. Samples from the sub-urban sites appear to have bigger snouts with average snout length of 7.904 compared to the 7.356 millimeters among urban samples. The t-test however revealed that there was no significant difference in snout length of the samples taken from the two sites. The difference in snout length may indicate partial preference in the size of the prey item consumed by the lizards. Competition for available food may also impact snout size among samples inhabiting different areas as in the case of urban and sub-urban sites. Examining more samples may help elucidate this statement.

Initial Report on the Wild Macrofungi of Minalungao National Park, Nueva Ecija

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The Philippines is one of the most fortunate countries in the world for its highly biologically diverse area that accommodates endemic species, many of which are still in the process of identification. However, many of these unidentified species become endangered before they are identified due to many interventions. One area of priority and has a potential for the detection of endemic species still undiscovered is Minalungao National Park in Nueva Ecija Philippines. Minalungao National Park covers more than 2000 hectares of protected area situated at Nueva Ecija, Philippines. It holds a high diversity of organisms concentrated in its dense forests and rich rivers. It is considered as one of the last natural environments north of Manila. This area presents a good prospect for studying systematics and in identifying the species inhabiting the area for the formulation of action plans for the conservation of macrofungi as well as other species. This research aims to build a Biodiversity Database of species of mushrooms in Minalungao National Park to provide baseline information to support conservation activities. Furthermore, some identified species of mushrooms can be potential source of medicine by identifying their secondary metabolites, which can eventually lead to drug discovery (Lindequist et al., 2005).

Methods: *Mushroom Collection.* Fruiting bodies of mushrooms were collected and photographed at the site of actual collection.. The specimens were preserved in 95% ethanol and then assigned code numbers. . Accession numbers were assigned to each collected specimen.

Results: A total of 10 macrofungi belonging to 5 orders and 9 families were identified as follows: Xylariales (*Xylaria, Daldinia*), Agaricales (*Mycena, Pleurotellus, Maramius, Coprinus*), Polyporales (*Favolus, Coriolus*), Auriculariales (*Auricularia*) and Tremellales (*Tremella*).

Diversity and Habitat Selection of Understory Birds in Mt. Timpoong, Camiguin Island

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A study on the diversity and habitat preferences of understory birds in Mt. Timpoong was conducted from 18 to 28 October 2012 using the mist netting method. Sampling was done in 100 net days in the localities of Danao and Pamahawan. A total of 14 species of birds was recorded. Understory birds were observed in six out of ten or 60% of areas in Danao and 80% of the chosen sites in Pamahawan. Of the total 20 sites, 14 or 70% of the sites from both Danao and Pamahawan were inhabited by understory birds. This could imply that the understory birds could be present or absent in an area regardless of its canopy height, canopy cover, tree density, vine percentage, left litter depth, total understory cover and understory height.

Species Diversity of Sea Urchins in Three Selected Municipalities of Misamis Oriental

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Diversity study of sea urchin was conducted to give information on species composition and diversity of sea urchins habitats: Slightly disturbed, disturbed and estuarine of Misamis Oriental. Three study stations were chosen on each site. Plot sampling technique of three 4X8-meter plot was laid in the shore in every site. The plots were laid in three different gradients: slightly disturbed, disturbed, and estuarine. Sea urchin species were collected using tongs, identified, sorted, and counted. The data was analyzed using BioPro software. A total of 5 species accounted in the three selected municipalities of Misamis Oriental. Three species observed in slightly disturbed and the disturbed habitats include *Diadema setosum*, *Echinothrix calamaris*, and *Echinometra mathaei*. Two additional species which were unique to estuarine area namely: *Toxopneustes pileolus* and *Tripneustes gratilla*, were found. Species richness showed highest in slightly disturbed $H^1= 0.446$, estuarine $H^1= 0.423$, and lowest in disturbed $H^1= 0.307$, habitats. Highest species abundance was highest in estuarine with 23.8 mean value, followed by disturbed habitat with 12.4 mean value, and lowest in slightly disturbed habitat. Similarity index of species composition showed 2 major clusters of habitats: estuarine and disturbed are closely related with similarity index of 67%. The slightly disturbed habitat had only 50% similarity index which suggests that disturbance affects species composition and diversity. This study recommends community awareness of the sea urchin species for them to develop a culture of conservation for the protection of their own biodiversity.

Microhabitat Preferences of the Camiguin Narrow-Mouthed Frog *Oreophryne nana* in Mt. Timpoong, Camiguin Island

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The Camiguin Narrow-Mouthed Frog, *Oreophryne nana* is listed as Data Deficient in the International Union for Conservation of Nature. A study was conducted on 18-27 October 2012 to determine the microhabitat requirements of *Oreophryne nana*. Visual transect method was used and a total of 40 100m - transects were surveyed. A 5x5 meter plot was selected for each transect to gather data on microhabitat variables. Results showed that most *O. nana* individuals were found on leaves which are on the average, 66.67 cm from the ground. On the average, *O. nana* found in ferns were 86.33 cm. from the ground, while those found on stems were 116.83 cm from the ground. On the average, *O. nana* was found either on branches, ferns, leaves, stems or vines, which were 118.50 cm. from the ground.. However, the shortest distance from the ground observed for *O. nana* was on leaves which were 15 cm from the ground. *O. nana* does not necessarily require the presence of water due to the fact that this species reproduces via direct development.

Assessment and Diversity of Fern Flora in Mt. Magdiwata, San Francisco, Agusan del Sur

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A study on the fern flora was conducted on Mt. Magdiwata, San Francisco, Agusan del Sur, Caraga Region, Philippines. A total of 9 sites were surveyed using opportunistic and systematic methods. The study revealed a total of 64 species of ferns in 22 genera and 22 families, from established sites and along trails. The sites were dominated by *Selaginella involvens*, *Tectaria weberi*, *Pleocnemia macrodonta*, *Microsorium punctatum* and *Asplenium polyodon*. The fern flora of Mt. Magdiwata occupies 6.23 % of the total known species of ferns in the Philippines. Of the 64 species, only *Psilotum nudum* was noted to be endangered. Most of the species found were epiphytic in palm oil (*Elaeis guineensis*) plantation. The conversion of natural forest of Mt. Magdiwata into oil palm plantation was a factor that some species of epiphytic ferns dominated the area.

The Odonata in Selected Wetland Areas of Cagayan de Oro and Bukidnon

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Monitoring the environment through indicator species such as Odonata, considering that it has an aquatic larval stage and a terrestrial adult stage, allows fast and easy means of evaluating habitat quality. This study aimed to examine the species richness of Odonata in nine wetland areas of Bukidnon and Cagayan de Oro City. A survey using random sampling method was conducted from October to December 2012. Thirty-eight species were recorded under 28 genera and 12 families, eighteen species of which are endemic. Species richness (S) of Odonata in relatively undisturbed areas ranged from 17-20 species. A lower species richness of 6-12 species was recorded in urbanized and disturbed areas. A relatively rare taxon, *Rhinagrion reinhardi* was recorded in one of the pristine areas. Further surveys in poorly studied and undisturbed areas may result in a higher record of species of Odonata.

Species Richness of Odonata in Selected Freshwater Systems in Zamboanga Del Sur

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The Order Odonata as a group is an environmental indicator and about 300 species under 15 families are known in the Philippines. However, the Odonata of Zamboanga del Sur is very poorly known. To determine the species richness of Odonata in Zamboanga del Sur, the freshwater systems in 12 barangays were assessed from August to December 2012 using the random sampling method. Thirty-eight (38) species were documented of which 16 species are Philippine endemics (42%). High species richness was recorded in Barangay Cabilinan. Species richness is also considerably high in some other sites despite high degree of human activities in the freshwater bodies such as extensive logging, water pollution, carabao drenching, fishing and bathing. The presence of Oriental species which are indicators of disturbed environments suggests that these freshwater systems are seriously disturbed. However, the presence of endemic species in some sampling sites indicates that these freshwater systems are still favorable habitats for some Odonata.

Diversity, Abundance and Habitat Selection of Canopy Birds in Mt. Timpoong, Camiguin Island

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Diversity, abundance and habitat selection of canopy birds were studied in Mt. Timpoong, Camiguin Island. Visual transect method was used to survey the birds in two habitat types: original forest (1200 masl) and mixed plantation (700 masl). A total of 38 transects (500 m) was surveyed from 18 to 28 October 2012. A 10x10² plot on each transect was used for habitat assessment. The Mann - Whitney test was used to determine if there was a significant difference in habitat requirements between the two habitats where the canopy birds were observed. Results show that twenty-six species of canopy birds inhabit the forest of Mt. Timpoong. The most abundant species was *Zosterops everetti*. In addition, 60.9% of the canopy birds inhabit the original forests while only 39.1% inhabit plantations. There were no significant differences in the tree density, distance to clearing and farm and percentage canopy between the original forest and plantation. However, there was sufficient evidence to indicate that the average DBH in the original forest was higher by 27.39 cm than in the plantation. Thus, the presence of canopy birds was affected by the average DBH. Since most canopy birds depend on original forest, conservation laws, rules and regulations must be strictly implemented in the Mt. Timpoong protected area to ensure the survival of canopy birds.

The Odonata of Lanao del Sur, Mindanao

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Order Odonata is a biological indicator and is dependent on freshwater habitats. This study aimed to identify the Odonata in selected freshwater systems in Lanao del Sur. Sampling using sweep nets was done in nine sampling sites. Sampling was conducted on August 26- 31, October 4-6, October 16-17 and December 16, 2012 for a total of 12 sampling days. Forty -six (46) species composed of 27 dragonflies and 19 damselflies were documented. Higher species richness (S=27) was found in the upstream of Malaig River. Moderate species richness of 7-27 was found in eight sampling sites while low species richness of five (5) was recorded in the lakeshore of Lake Dapao in Barangay Tuka. One species, *Aethriamata gracilis*, was recorded for the first time on the island of Mindanao. *Coeliccia exoleta*, a vulnerable species, was found in the mountain upstream of the municipality of Wato Balindong. Construction of houses near freshwater bodies, pollution and small scale logging were some of the threats to the freshwater habitats of the Odonata.

Species Richness of Odonata in the Freshwater Areas of Lanao del Norte and Misamis Occidental

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The Philippines is known to have a diverse flora and fauna, but little is known on the Odonata particularly in the Mindanao region. In this study, species richness of Odonata was determined in the different freshwater systems in Buru-un, Iligan City, Tubod, Lanao del Norte, and Ozamis City, Sinacaban, Oroquieta City and Plaridel, Misamis Occidental., Collection of specimens of Odonata was done by using sweep nets. Twenty eight species were recorded. *Drepanosticta krios* of sub-order Zygoptera, a Mindanao endemic, was collected in Buru-un, Iligan City. Two species which are indicators of environmental disturbance were abundant in all sampling sites. Lake Babuyan in Tubod, Lanao del Norte had the highest species richness (12) while Bahay stream in Sinacaban, Misamis Occidental had the least (5). The low species richness and the presence of indicator species of environmental disturbance suggest that the sites sampled were already disturbed. More studies are needed to be done especially in the forested and undisturbed areas to have a complete data on the Odonata of Lanao Del Norte and Misamis Occidental.

Seaweed Composition of Littoral and Sublittoral Zones of Sogod Bay, Southern Leyte

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A study was conducted to determine the different seaweed species that thrive in the littoral and sublittoral zones of the fourteen coastal barangays of Sogod Bay, Southern Leyte. There were 28 species of seaweeds identified and classified into green, brown and red algae, Thirteen species of green seaweed, seven species of red seaweed and eight species of brown seaweed were found and assessed using the transect-quadrat method. Among the three classes of seaweeds, green seaweed the most abundant group but the least covered compared to brown seaweed as the most covered group. *Padina japonicum* (brown alga) was determined as the most abundant species with percent cover of 29.53% among the seaweed species found in the area. Some seaweed species like *Bornetella nitida*, *Bornetella sphaerica*, *Codium arabicum*, *Halimeda opuntia*, *Neomeris vanbossene*, *Tydemania expeditionis*, *Amphiroa foleacea*, *Sargassum cristaefolium* and *Tubinaria decurrens* were present only in Tomas Oppus municipality. *Acetabularia major*, *Bornettela oligospora*, *Enteromorpha intestinalis*, *Halicoryne wrightii*, *Claudea multifida*, *Galaxaura fasciculata*, *Hormophysa cuneiformis* and *Turbinaria conoides* were unique to Malitbog, Southern Leyte. The rest of the seaweed species were common to both municipalities. There was no seaweed species found in the littoral zones of Divisoria, Bontoc, Southern Leyte instead a mangrove community was found. The study also determined some physico-chemical factors such as salinity, water temperature, pH, and dissolved oxygen that could affect the existence and the life of the seaweed community in the area.

Diversity of Odonata: The local way of assessing water quality in Lake Pinamaloy, Don Carlos and Dologon Spring, Mindanao

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Water quality assessment of Lake Pinamaloy and Dologon spring, Bukidnon was conducted using diversity indices of Odonata species to provide information as to whether species composition, diversity and status of Odonata in the vicinity of Lake Pinamaloy and Dologon Spring can be used by locals in assessing water quality. A total of 3 families, 11 genera and 18 species of Odonata in Lake Pinamaloy and 3 families, 13 genera and 20 species in Dologon Spring were recorded. Species diversity of Odonata in Lake Pinamaloy and Dologon Spring are of low level $H' 0.66$ and $H' 0.875$, respectively. Field Biotic Index (FBI) showed medium water quality for both water bodies (50.7) and (60). Species richness of Odonata was higher in Dologon spring than Lake Pinamaloy which was observed to have forest fragments and had less human activities near the source. Two endemic species were listed and members of the Order Odonata were unevenly distributed in the two sites. Distribution varied in two sites with different vegetation types, degree of light penetration, presence of microhabitats and quality water. The results suggest that, Odonata can be useful in assessing and monitoring water quality in the absence of an expensive ecological kit. The local communities could be empowered by creating water conservation culture especially if they recognize that members of the Order Odonata are more sensitive indicators for testing water quality.

Vertical Distribution of Spiders in Selected Areas in Taguibo Watershed, Agusan Del Norte

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The vertical distribution of spiders was assessed in the leaf litter, ground cover and understory strata of five selected sites within the watersheds of Sitio Iyao, Barangay Anticala, Barangay Pianing, Barangay Taguibo and Barangay Sumilihon, Butuan City. Pitfall trapping, sweep netting and hand searching, were the sampling methods employed from April-July, 2012. A total of 62 species of spiders belonging to 13 families were captured. Sitio Iyao had 37 species of spiders belonging to 12 families, Barangay Anticala had 29 species of spiders belonging to 11 families, Barangay Pianing had 28 species of spiders belonging to 11 families, Barangay Taguibo had 26 species of spiders belonging to 9 families and Barangay Sumilihon had 26 species of spiders belonging to 10 families. Leaf litter had the lowest species richness (23) and diversity ($H'=2.44$) of spiders. Ground cover and understory had the same species richness (40) and they had nearly the same diversity ($H'=3.2$ and $H'=3.0$ respectively). The study suggests that ground and understory strata offer more diverse habitats for spiders. Further assessment of spiders in the canopy and other strata must be included in future studies in order to know more about the species of spiders in the area.

Diversity of Odonata Across Vegetation Types in Mt. Kiamo, Malaybalay, Bukidnon

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Odonata are very good indicators of the health of the ecosystem. Mt Kiamo is one of the mountain ecosystems biologically unexplored for Odonata. This paper aimed to provide information on the species composition, species diversity, species richness trend and the conservation status of Odonata at the species level in Mt. Kiamo, Malaybalay, Bukidnon. Three sampling visits were done from October to December 2012 to sample Odonata using combined techniques: opportunistic, visual and transect line method. Results revealed 8 families, 20 genera and 24 species of Odonata. Ten (10) species were dragonflies (Anisoptera) and 14 species were damselflies (Zygoptera). Species richness using Shannon-Weinner index showed highest in the agroecosystem with $H= 1.176$ (16 species) followed by grassland with $H= 1.05$ (13 species) and mossy forest with $H= 0.463$ (3 species), the lowest. Of the 24 species, 25% or 6 were locally common species, 17% or 4 were locally rare and 58% or 14 were locally very rare. Thirty percent of the total number of species were endemic. The Mindanao endemics were *D. podolestoides basilanensis*, *E. amphicyana* and *R. flammea*. The Philippine endemics were *R. appendiculata*, *R. colorata*, *R. turconii*, and *V. melania*. The result of the study showed low diversity for Odonata in Mt. Kiamo which indicated a higher than average degree of disturbance on the health of ecosystem. Availability of a good water system, vegetation types with optimum light penetration, cool temperature could be observed in Mt Kiamo and locals have started rainforestation at the denuded parts of the mountain.

Distribution and Identification of Ground Dwelling Spiders at 850-1250 Meters Above Sea Level in Mount Banahaw De Lucban, Lucban, Quezon

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Ground dwelling spiders of class Arachnida are those that are usually seen below knee level that most commonly inhabit in leaf-litter. Spiders are considered as the most diverse and abundant invertebrate predators in terrestrial ecosystems. Identification and determination of the diversity of ground dwelling spiders found at the three selected elevations -850, 1050 and 1250 masl of Mt. Banahaw de Lucban were done to serve as baseline information since there had been no research about spiders in the area. Ecological parameters such as elevation, air and soil temperature and humidity were measured at quadrats established at each elevation to determine their correlation to the abundance of ground dwelling spiders. Using pitfall trap and Berlese-tullgren funnel, collection of specimens was done twice a month during the months of June to August 2012. during the day and at night.. A total of 86 ground dwelling spiders were identified up to the genus level representing 19 and two unknown genera. The results show that the distribution of ground dwelling spiders at each elevation appears to be highly diverse and also had a high degree of evenness in all elevations. On the other hand, daytime and night- time samples revealed no significant difference. Moreover, different ecological parameters showed no significant relationship to the abundance of ground dwelling spiders which contrast to the results of studies conducted in temperate countries.

Initial Report on Fish Species on Minalungao National Park

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The Government of the Philippines established protected areas to help maintain the present natural resources and prevent extinction of endangered and endemic organisms. Minalungao National Park is a protected area located in the municipality of General Tinio, Nueva Ecija in Central Luzon. Identification of species inhabiting the area should be done to formulate conservation action plans and to determine their interactions and their response to climate change. Species with useful secondary metabolites for drug development should also be identified. This study aimed to contribute to the Biodiversity Database of Minalungao National Park that will supply information and fill the gap relating to the need of baseline data in the area. The specimens were collected at Minalungao River with the voucher specimens preserved in 95% ethanol and then assigned code numbers. Samples were initially identified belonging to five families with five genera. The families were Clariidae (*Clarius*), Cichlidae (*Oreochromis*), Gobiidae (*Glossogobius*), Hemiramphidae (*Hyporhamphus*) and Cyprinidae (*Poropontius*). Further DNA barcoding will be done to verify the identity of the collected specimens.

Diversity and Status of Butterflies in Agro-forestry and Secondary Dipterocarp Forest of Mt. Magdiwata, San Francisco, Agusan del Sur

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This study was conducted in order to determine the diversity and status of butterflies in two vegetation types of Mt. Magdiwata namely the agro-forestry and secondary dipterocarp forest using 2km transect line and opportunistic sampling methods. A total of 41 species of butterflies were collected in the two sampling sites (36 species in agroforestry and 41 species in secondary dipterocarp forest) of which 61% belong to family Nymphalidae which also had the most number of individuals, 17%, Papilionidae 16% Pieridae, 4% Lyncaenidae and 2% Hespiriidae. It showed that secondary dipterocarp forest had a higher diversity ($H'=3.49$) than agro-forestry ($H'=3.36$). In terms of endemism, 85.37% were endemics while 14.63% of species were non-endemics in the two sites. Eighty-one percent (81%) were endemics and 19% were non-endemics in the agro-forestry site while the secondary dipterocarp forest had 83% of endemic and 17% were non-endemics. Local status of butterflies showed that 18.18% were common, 6.49% very common, 72.73% rare and 2.59% were very rare. In agro-forestry site, 80.56% were rare, 2.78% very rare, 11.11% common and 5.57% very common. The secondary dipterocarp forest had 65.85% rare, 2.44% very rare, 24.39% common and 7.32% were very common. Further researches and scientific studies in other vegetation types are needed to be able to identify unknown butterflies, examine their distribution their conservation status and determine butterfly-habitat relationships which are essential steps in developing conservation measures for the butterflies of Mt. Magdiwata.

Revisiting the Sites of Distribution of the Isabela Oriole (*Oriolus isabellae*)

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The Isabela Oriole, *Oriolus isabellae*, is one of the rarest birds of the world and one of the least known Philippine bird species. Endemic to Luzon, it is critically endangered and probably survives in the last remaining lowland forests of this island. Historical and recent information show that it has been seen to occur in 4 provinces, namely Isabela, Cagayan, Quirino and Bataan. Each of the sites was revisited from September 2012 to March 2013 and playback method was used in the survey to verify the occurrence of the species. The status of the species and the present condition of its habitat was also assessed. We have confirmed, with very few encounters, the presence of the species in Isabela and Cagayan, particularly at the edge of the Sierra Madre Mountain Range. Despite the degradation of the forest and large-scale conversion of the original habitat to mainly agricultural lands, the remaining forest fragments serve as an important habitat for the Isabela Oriole. Hence, this re-affirms the importance of the Sierra Madre Mountain Range as a key conservation area in the Philippines.

Records of Wild Gingers (Family *Zingiberaceae*) from Eastern Mindanao: Morpho-Anatomical Studies

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The Zingiberaceae family is poorly known taxonomically. Hence, a taxonomic study on the family was done by conducting field studies, supplemented with herbarium, as well as morpho-anatomical studies. Field sampling were conducted on the eastern part of Mindanao, viz., Mt. Hamiguitan, Davao Oriental; Bislig experimental Forest and Hinatuan Logged-over forest, Surigao del Sur. The necessary permits were obtained to conduct field sampling and collect specimens. Morphological descriptions on the different plant organs was conducted by doing the following: Dissection of floral parts to show detailed characters and leaf clearing technique was employed to reveal leaf epidermal features. The identification of specimens was done by reviewing the protologues and the conduct of herbarium studies at UPLB Herbarium (CAHUP), Philippine National Herbarium (PNH), and Singapore Botanical Gardens (SING). Results showed the presence of *Amomum microchiela* Ridl., *A. muricarpum* Elm., *Etlingera dalican* (Elm.) Poulsen, *E. philippinense* (Ridl.) R. M. Smith, *Geocharis fusiformis* (Ridl.) R. M. Smith and *Hornstedtia conoidea* Ridl. The important characters which were diagnostic in the identification of species were the shape and length of the leaves, characters of the petiole, base of the lamina and the structure of its inflorescence. Further, leaf epidermal features support the delineation of the different taxa into the different genera which used to be placed in the genus *Amomum*. Data obtained in this study supports the taxonomic transfer of these Philippine taxa from the genus *Amomum* to the present generic placements.

POSTERS

Yet Another Reason to Conserve the Palawan Forest Turtle *Siebenrockiella leytensis*

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Populations of the country's largest and only endemic freshwater turtle - the Palawan Forest Turtle *Siebenrockiella leytensis* - are decreasing as a result of rampant collection and habitat destruction. Knowledge on its biology and role in the environment is very limited but vital for its conservation and management. Local communities do not see the need for conservation of the species but rather consider it a pest in rice fields. Therefore, the present study aimed to assess the diet of *S. leytensis*. Sampling was conducted monthly in 2012. Turtles were trapped during the night and then placed individually in containers and kept overnight. In the morning, the fecal matter was collected. Prior to release of the turtles, standard measurements were taken. Presumably viable seeds were potted and the remainder preserved. Food items were identified to the lowest possible level. A total of 147 fecal samples were collected from 79 *S. leytensis*, 28 of which had been captured more than once. Some 18 different food items were identified and grouped into three major categories: animal matter, fruits, and leaves. All except one food item (rice) originated from the stream itself or from riparian vegetation. Only 5% of the samples contained rice grains and all except one were from August during heavy rain. Of the 42 potted samples two germinated (*Elaeocarpus* sp. and unid. palm sp.1). Sixty-three of the fecal samples (43%) contained gastropods with the Golden Kuhol *Pomacea canaliculata* being the dominant species. Thirty-two of the samples contained seeds of the palm sp. 1 and 22 contained seeds of *Elaeocarpus* sp. The study shows that *S. leytensis* is omnivorous and predominantly forages in the stream. Based on the dominant food items we conclude that *S. leytensis* plays an important role in reducing pest species (Kuhol) rather than being a pest itself. Furthermore, the species functions as seed disperser of riparian vegetation. This is important information that will help communities to better understand the importance of the species and the need for its conservation. Likewise, the gained knowledge is essential for the husbandry of the species.

Orchid Flora of Mt. Apo and Mt. Kitanglad Long-Term Ecological (LTER) Sites

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Orchids are among the most gorgeous and highly priced plants harvested in the mountains of Mindanao. As such, several species are already endangered and threatened due to habitat destruction, over collection and illegal trade. Taxonomic studies are therefore badly needed to identify and assess the status of this economically important flora. Floristic studies were conducted in one-hectare permanent plot established in Mt. Kitanglad, Lantapan Site and Mt. Apo, Kidapawan Site. Fieldwork investigations and complete inventory of orchid flora were conducted for ex-situ propagation and conservation initiatives. Field collections and documentations were made for taxonomic verification of the plant materials. Results of the study revealed a total fifteen (15) species of orchids belonging to 11 genera. Species richness was higher in Mt. Kitanglad with 13 species while Mt. Apo was represented with ten (10) species only. Eight (8) species were found to be common in the two mountain ecosystems. *Mycaranthes* and *Cryptostylis* species were found only on Mt. Apo while *Cystorchis*, *Stichorkis*, *Hippeophyllum* and *Pinalia* species were unique to Mt. Kitanglad. *Dendrochilum*, *Agrostophyllum* and *Crepidium* species on the other hand were the most dominant in both sites. Ex-situ conservation of dwindling orchid populations was initiated for more effective conservation measures.

Species Composition of Butterflies in Pasonanca Park, Pasonanca, Zamboanga City

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The inventory of butterflies in Pasonanca Park, Zamboanga City was conducted to provide information on species composition and status of butterflies in Pasonanca Park, Pasonanca, Zamboanga City using transect line and opportunistic sampling techniques with the aid of an insect net. Data revealed 15 species of butterflies in Pasonanca Park. They belong to 13 genera and 4 families. The ecological status assessment of these butterflies shows 6.7% were rare, 6.7% were Mindanao endemic, 13.33% were Philippine endemic and 73.33% were common. These butterflies were: *Jamides philatus osias* (Rare), *Eurema alitha alitha* (Mindanao endemic) and *Ypthima stelleria stelleria* and *sempera* (Philippine endemic). The common species of butterflies were: *Jamides celeno lydanus*, *Calopsilia pyranthe pyranthe*, *menelaides leda leda*, *Junonia hedonia ida*, *Anosia melanipus edmondii*, *Eurema blanda vallivolans*, *Leptosia nina terentia*. Four species of butterflies, namely, *Apias sp.*, *Neptis sp* and *Eurema sp* were identified to the genus level only.

Shrubs along the Trail of Mt. Musuan, Central Mindanao University, Musuan, Bukidnon

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The study was conducted last August, 2012 along the trail of Mt. Musuan, CMU (Central Mindanao University), Musuan, Bukidnon. The objectives of the study were to determine the number of shrubs species found along the trail of Mt. Musuan from the base to the peak. All the shrubs found along the trail 5 meters left and 5 m right of Mt. Musuan were identified and tagged with labels of their Official Common Name, Scientific Name and Family Name in a laminated paper. The method used was transect walk. This study is part and parcel of the LTER (Long – Term Ecological Research) sites in Mindanao with natural forest and grassland vegetation types. The result of the study gave only 9 families, 12 genera and 12 species namely: *Bauhinia purpurea* L.; *Glochidion canescens* Elmer.; *Memecylon myrtilli* Blume; *Melastoma polyanthum* Blume; *Ficus benjamina* L. var. *bejamina*; *Piper arborescens* Roxb.; *Mitragyna diversifolia* (Wall.exG.) Havill; *Mussaenda philippica* A. Rich; *Pterospermum cumingii* Merr. & Rolfe; *Leucosyke capitellata* (Poir.) Wedd.; *Lantana camara* L. and *Premna subglabra* Merr. As a conclusion, the study area along the trail of Musuan Peak has a few number of shrubs species. As a recommendation, supplemental planting of shrubs species along sides of the trail should be done to add amenity and aesthetic value of the area. Most of the shrubs are medicinal and ornamental, therefore it should be cultivated and conserved. Suggested shrubs to be planted were endemic and exotic species that will also serves for research and scientific purposes.

Some Trees, Shrubs and Herbs in Mt. Kinasalapi (Kitanglad Protected Range), Sungco, Lantapan, Bukidnon

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This study was conducted last August 2012 at Sungco, Lantapan, Bukidnon, in the montane and mossy forest of Mt. Kinasalapi as part of Mt. Kitanglad Protected Range. This study aimed to identify and classify species of trees, shrubs and herbs in Mt. Kinasalapi. Specifically it aimed to: a) Determine the number of species, genera and families of some trees, shrubs and herbs existing in Mt. Kinasalapi; b). To assess the conservation and ecological status of each identified tree, shrub and herb existing in Mt. Kinasalapi. This study started from 1,445 meters above sea level (masl) to 2,475 masl. A rapid survey using transect walk along the trail from the bench mark (1,445 m asl) to Mt. Kinasalapi montane and mossy forest and traversing the trail going to Mt. Dulang-dulang at an elevation of 2,475 m and turning back along the trail of the one hectare plot of the National Museum. Trees, shrubs and herbs encountered along the trail and its vicinity were recorded, photographed using digital camera and the elevation monitored was monitored using the Global Positioning System (GPS). The result of the study showed that there were 9 species of trees, of which, 6 were gymnosperms and 3 were angiosperms. The trees were in 9 genera and 7 families. There were 8 species of shrubs that were encountered belonging to 6 genera and 6 families. There were 10 species of herbs in 9 genera and 6 families. The trees that are gymnosperm should be protected and preserved because they can serve as mother trees and source of seeds for regeneration of the species. It is recommended that this gymnosperms be used in the implementation of the NGP (National Greening Program) of the government. The gymnosperms should be planted in elevations of more than 2000 masl. These trees are very important for the following reasons: they serve as components of protection forests, thus preventing soil erosion and landslides.; they also help stabilize the watershed areas for the continuous supply of quality water in the river systems; they serve as the habitat of most endemic ferns in the Philippines; they maintain understory species like shrubs and herbs because of the ecological and economic services that the trees provide.

Raptor Observations in Mt. Susong Dalaga, San Luis, Aurora Province

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Mount Susong Dalaga in San Luis, Aurora is a 600 meter mountain at N 15°41'32", E 121°35'17" adjacent to the Aurora Memorial National Park and is covered by patches of primary forest. We conducted a rapid raptor survey in November 2012 by setting up observation posts where raptors from adjacent mountain peaks were monitored daily at 9:00 AM to 3:00 PM except during inclement weather. Four (4) species were observed in 15 observation hours, with encounter rates of 0.6 hr⁻¹ for *Butastur indicus* and *Spilornis holospilus*, 0.533 hr⁻¹ for *Haliastur indus* at, and 0.067 hr⁻¹ for *Haliaeetus leucogaster* at The maximum number of individuals observed simultaneously for each species was at 4 for *B. indicus* 2 for *S. holospilus*, 5 for *H. indus*, and 1 for *H. leucogaster*. *Lophotriorchis kernerii* was observed on further general observation at a nearby community in Sitio Calapnit, Barangay Dibalo. A short perception survey of locals in Calapnit shows reports of *Pithecophaga jefferyi* in Mt. Susong Dalaga, but the presence of the species was not validated in the ecological survey. Indications of high prey abundance from direct observations of *Varanus sp.*, *Buceros hydrocorax*, *Penelopides manillae*, and 2 snake species, as well as interviews of locals who report the presence of *Macaca fascicularis*, *Phloemys cumingi*, and *Sus philippensis*, seem to show that the species richness and encounter rates of raptors are due to there being plenty of prey available in the area. The conservation implications of the raptor observations and presence of threatened species in an unprotected area close to human settlements are discussed.

The Reproductive Patterns of Pteropodid Species Visiting Orchards in Davao City

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The reproductive patterns of six Pteropodid species (*Ptenochirus jagori*, *Cynopterus brachyotis*, *Macroglossus minimus*, *Ptenochirus minor*, *Rousettus amplexicaudatus*, and *Haplonycteris fischeri*) visiting orchards in Davao City were studied from May 2010 to December 2012. The reproductive condition of bats captured through mist netting was determined by external analyses of the specimens. Male bats were characterized according to their testes: abdominal (non-reproductive) testes and scrotal (reproductive) testes. Female bats were characterized according to their nipples or abdomen: non-reproductive, lactating, post-lactating and pregnant. Observations on the *C. brachyotis* suggest a polyestrous pattern;; it has reproductive periods during high rainfall and high availability of durian flowers and lanzones. A polyestrous pattern was likewise exhibited by *R. amplexicaudatus*, with pregnant and lactating females being observed during periods of high rainfall. The data on *M. minimus* suggests it could be polyestrous or being highly asynchronous. *P. major* exhibits a bimodal polyestrous reproductive pattern which are synchronous with the months having an abundant supply of bananas and lanzones. Births among *P. minor* was found to have birth peaks during periods of abundant durian flowers. *H. fischeri* demonstrates a reproductive period at the onset of the wet season. Male bats synchronize their reproductive patterns with that of the female. The patterns of this study highly suggest their relation with climate, rainfall and food availability in the farms.

Western Philippines University-Palawan Research and Development Foundation, Inc. Efforts on Sea Turtle Diversity Conservation in St. Paul Bay, Puerto Princesa City, Palawan

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The Western Philippines University through the Palawan Research and Development Foundation Inc. initiated sea turtle management and conservation in the vicinity of St. Paul Bay, Puerto Princesa City. This activity was undertaken in collaboration with four local Barangays, the Puerto Princesa Subterranean River National Park (PPSRNP), Protected Area Management Board (PAMB), Department of Environment and Natural Resources – Protected Areas and Wildlife Bureau – Pawikan Conservation Project (DENR-PAWB-PCP), and the City Government of Puerto Princesa. To deepen the commitment of the partner community, capacity building was conducted to include a study tour of the Pawikan Conservation Center, Morong, Bataan, and the provision of livelihood opportunities. Trainings on sea turtle tagging and monitoring, and para-legal rights were likewise conducted. Sea turtle conservation activities include beach patrolling (night foot patrolling), establishment of sea turtle hatchery, and sea turtle tagging. Beach patrolling was conducted during full moon and new moon throughout the turtle's nesting season in 2012. Two sea turtle hatcheries were established in Martapi, Cabayugan, one of the nesting areas in St. Paul Bay. One thousand three hundred seventy eight (1,378) eggs were collected and transferred to the hatchery. Of these, 958 were successfully hatched, 808 of which imprinted on Martapi, and the rest on Sabang, Cabayugan. Two cycles of chicken (kabir) production were conducted as part of the livelihood opportunities provided to the partner community, and a mangrove nursery with 2,000 seedlings was established. The success of any management and conservation effort is dependent upon the active participation of the primary stakeholders, the local community.

POSTERS

New Records of Orchid Flora at Lake Danao Natural Park, Leyte

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The orchid family is one of the diverse and mostly epiphytic flowering plant. Due to its unique flower variations, many species are harvested from the wild for trade as ornamental plants or cut flower. Despite being popular as ornamental plants in the Philippines, many endemic and indigenous species of orchids are still unknown. The limited information on the orchid family prompted a survey of orchid flora at Lake Danao Natural Park (LDNP). Orchids were recorded along the circumferential road around the lake and existing trails within the park. Both epiphytic and ground orchids were listed during the survey; but it was focused on species that were not commonly gathered as ornamental plants. The survey found 46 species from 26 genera of both epiphytic and ground orchids at LDNP. One species, *Bulbophyllum alagense*, is a new record for the country, being previously known only from Sulawesi. Many other species are endemic to the Philippines or to Leyte Island, like *Dendrobium boosii* and *D. milaniae*. Further surveys of other forests in Leyte and Samar may yield more species of orchids.

Is Community-Based Flying Fox Conservation Effective in the Philippines?

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Flying fox conservation through community-based initiatives has been the greatest challenge in most areas throughout the tropical and sub-tropical Asia, Australia and on Islands of the Indian and western Pacific Oceans. Some roosting sites in the Philippines particularly on Luzon, Boracay, Negros, Cebu, Camotes, and Mindanao were documented to evaluate whether such community-led activities can effectively promote conservation of flying foxes at the grassroots. Several community-based initiatives identified include; protection of flying fox roosts through personal initiatives, declaring roosting sites as bat sanctuaries or important ecotourism destination, and conservation education programs initiated by government and non-government organizations. Formulation of legislations by the local government units, provision of incentives to local communities in sustaining protection of the roosting sites, and the conduct of innovative and artistic ways of increasing awareness on flying fox conservation in the localities when effectively implemented may facilitate sustainability of bat protection locally.

Impacts of Rainforestation Farming to Wildlife Conservation: The Negros Oriental Experience

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Forest restoration has been one of the major initiatives that most countries in the tropics and elsewhere have implemented for the past decades to help mitigate and adapt climate change. These include growing and nurturing of endemic and non-endemic species of trees either initiated personally or in groups by the government and non-government organizations. On Negros, the establishment and implementation of rainforestation demonstration farms provided learning experiences for other potential implementers to adopt using the technology. These demonstration farms did not only increase revenues of the farmers, but also provided beneficial impacts to other wildlife species. The demonstration farms in Bacong, Dauin, Valencia and in the Balinsasayao Twin Lakes Natural Park showed dramatic increase and records of birds, mammals, amphibians, reptiles and lepidopteran species within three years of establishment. At least six species of vertebrate wildlife were recorded. It is therefore imperative that by increasing the number of adopters and implementers will also provide education awareness of the surrounding communities and by letting them involved in the establishment of such initiatives will provide better opportunities of these species to survive.

Epidermal Leaf Casts as Technique in Fern Study

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Epidermal leaf study is an important aspect of plant biology most particularly among ferns where elaboration of the laminar landscape appears to be developed by a particular group as structural and functional compromises of the genes to the environment. Solidifying liquid fixatives (e.g. acrylic, varnish, or clear glue) after being applied on the leaf surface yields within its cast sculpted images of the epidermis. This study was made in order to show that leaf impression as a technique is a good method for revealing epidermal morphology with descriptive details that are useful in fern study; and to compare epidermal morphology of selected species of ferns under genus *Asplenium* using the casts. Results obtained from nine (9) species of ferns proved that using epidermal leaf casts is a convenient, economical, and rapid method that can be used to examine morphologic features such as: shape, organization and distribution of epidermal cells and stomatal apparatuses; the presence or absence of differentiated structures such as glandular hairs, or trichomes; the emergence of developing structures; and the patterns of venation, all features observed under the microscope are displayed visibly and distinctly for diagnostic purposes. Comparative assessment of epidermal morphology of four species under the genus *Asplenium* showed stomatal organization characteristic of the genus and distinct epidermal cell organization characteristic of one species, the *Asplenium nidus*. Comparative study of epidermal structures and their distribution are important for understanding fern anatomy and physiology, developmental plant morphology, taxonomy, and phylogeny.

Terrestrial Faunal Diversity of the Caliraya Watershed, Lumban, Laguna: A Preliminary Assessment

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The Caliraya Watershed is considered a forest reservation with special uses as reservoir for power generation in Luzon. The watershed is now in a state of degradation and over-exploitation due to varying conflicting uses (agriculture, tourism, recreation and real estate). The diversity of terrestrial fauna needs to be assessed as the area is threatened by anthropogenic activities contributing to habitat degradation affecting the biodiversity of the area. This study aimed to document existing faunal diversity (mammalian, avian, amphibian and reptilian species) as a requisite for the preparation of conservation and development plan for Caliraya Watershed. Field survey methods such as line transect, mistnetting, trapping and habitat analysis were used to gather primary data. A total of 75 faunal species were documented which comprised of 51 species of birds, 11 species of reptiles, 7 species of amphibians and 6 species of mammals. Wildlife endemism in the area is about 20% (birds comprised 62%, reptiles 15%, amphibians 15%, and mammals 8%). The two endemic genera, *Phapitreron* and *Sarcops*, are documented to be present in the area. The presence and status of wildlife have been known to be an early warning for humans of the environmental health of an ecosystem. Generally, the study generated baseline data on the terrestrial fauna of the watershed. Findings will be used as basis for conservation and restoration of the watershed and support the need to formulate better policies and projects. Further studies through more extensive surveys and research on certain species or groups of species are suggested.

Assessment of Flora in the Mountains of Carrascal, Surigao Del Sur

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A total of 105 species belonging 47 genera and 52 families were recorded at an altitudinal range of 200-500 meters above sea level in the mountains of Carrascal, Surigao del Sur. Of these numbers, 78 species were Angiosperms, 8 Gymnosperms and 19 Pteridophytes. Among the angiosperms, 40 species were trees and 38 were shrubs and herbs. Transect walks and established plots revealed several species of flora both in overstorey and understorey layer. Generally, the area is considered a forest over ultramafic soil that includes a mixed-dipterocarp species. A diverse family forms the major component of the forest and its emergents. The canopy structure is often greatly modified with dense growth of tangles calamoid palms and lianas. Epiphytic plants were abundant in twigs and trunk of trees, like orchids, ferns and pitcher plants. Both sampling sites have patches of secondary growth forest and were dominated by Batino, (*Alstonia macrophyla*) agohe (*Casuarina equisetifolia*), Kiti-kiti (*Adina sp.*) and magkono (*Xanthostemon verdugonianus*). Endemicity at the Project site is 21.74% (15 spp.). The expansion of mining industry is the greatest threat to the flora of the mountains of Carrascal, Surigao del Sur. This plant inventory will play a very significant role in the formulation of policies for the conservation and protection for this very fragile environment and for the rehabilitation of lateritic and acidic soils.

Strengthening Education for Effective Biodiversity Conservation: Educator and stakeholder Partnership

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The island of Mindoro is recognized as one of the global biodiversity conservation areas, particularly in terms of the number of endemic species, diversity of habitats and degree of threats to the environment. The collaborative effort of the different sectors in the society is one of the best tools in promoting conservation efforts, strengthening applied and effective learning experiences for stakeholders. Teachers have been identified as the best ambassadors in promoting one of our advocacies in the island of Mindoro which is designed to cover elementary and high school teachers from Mindoro and Calapan City divisions. Teachers who have been trained are expected to re-echo their learnings to other teachers. The objective is to heighten the awareness and understanding among their co-teachers, students, parents and eventually to local communities of the need to conserve Mindoro's biodiversity. All activities are properly coordinated with the Department of Education's (DepEd) regional and division offices. This lesson-type training program was monitored regularly through teachers' and/or supervisors' semestral reports, classroom observations, examination and evaluation of lesson plans. This program was initiated 10 years ago which MBCFI re-introduced in 2012. Lesson plans with biodiversity integration in their syllabi were prepared with proper guidance from their supervisors. This training has also been a good opportunity to synchronize DepEd's K-12 curriculum. Four (4) batches of trainees have been trained to-date with a total of 205 teachers, including supervisors and principals.

Biodiversity of Lichens Along the Slope of Mayon Volcano Natural Park

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The study of lichens along the slopes of Mayon Volcano Natural Park focused on the different growth forms that lichen species exhibit such as crustose, foliose and fruticose lichens. Mayon Volcano was divided into four quadrants and two barangays were chosen per quadrant to serve as sampling areas. Modified line plot method was used in the study. A total of two thousand four hundred fifty seven individuals (2457) were recorded. Among this, sixty (60) lichen species belonging to 18 families and 30 genera were identified. Of these species, forty (40) were crustose lichens, eighteen (18) were foliose lichens, and three (3) were fruticose lichens. Among the four quadrants of Mayon Volcano Natural Park, the northwestern quadrant (Brgy. Buang and Baligang) recorded the highest number of individuals with seven hundred one (701), and the southeastern quadrant (Brgy. Mi-isi and Bonga) recorded the lowest number of individuals with five hundred twelve (512). Seven (7) lichen species were the most common species found in the four quadrants which include: *Coccocarpia palmicola*, *Leptogium hibernicum*, *Lecanora albescens*, *Pertusaria leucosorodes*, *Physcia dubia*, *Micarea erratica*, *Lepraria incana* and *Lepraria membranacea*. The Family Graphidaceae had the greatest number of species identified. Among the total lichen species found on the four quadrants of Mayon Volcano Natural Park, *Leptogium hibernicum* was the densest while *Coccocarpia palmicola* was the most frequent species. The northwestern quadrant (Baligang and Buang) has the highest diversity index value of 1.29 using the Shannon-Weiner Index. The northeastern quadrant was the least diverse because the areas sampled were mostly grassland and kalamansi plantation.

POSTERS

Abundance Assessment and Identification of Fireflies in UP Diliman

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Fireflies have always been of great interest because of their aesthetic value due to their bioluminescent ability, yet their preference for cleaner and undisturbed environments make them valuable indicators of ecosystem health. In the Philippines however, studies on identification, distribution and diversity of firefly species have not been performed yet. To serve as a baseline study on fireflies in the Philippines, the objectives of this paper are to assess the abundance of fireflies in selected areas in the UP Diliman campus and to relate the abundance data with the environmental parameters observed in each area. The firefly abundance was performed through visual counting while species were photographed, collected and preserved for identification. Results have shown that the right side area of the Marine Science Institute had the most number of fireflies observed: a total of 108 counts and an average of 36, for three sampling days. The most number of fireflies were observed between 6:00 to 6:30 in the evening. A representative firefly sample was identified to belong to the genus *Luciola* and due to similarities in physical attributes, all fireflies observed from the sites are believed to be of the same genus.

A Comparison of the Species Composition and Community Structures of Four Philippine Long-Term Ecological Forest Plots

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Long-term ecological forest plots have been established to document and monitor floristic diversity and forest dynamics. This study compared the tree communities of four plots in the islands of Luzon (Palanan, Isabela and Pantabangan, Nueva Ecija) and Visayas (Northern Negros and Leyte). The spatial distribution of dipterocarps, an economically and ecologically important family, was also determined for each site. Non-metric multidimensional scaling (MDS) was used to determine the similarities between plots based on species composition and abundance. MDS results showed distinct tree assemblages for each forest plot, with the Leyte and Negros sites appearing to have the most similar community structures. Among the four plots, the Leyte site was measured to have the highest diversity (Fisher's α : 51.86), the Palanan site with the highest basal area per hectare (44.3485), and the Negros site with the highest density of trees per hectare (7432/ha). In addition, the spatial patterns of dipterocarps for the Leyte, Pantabangan, and Palanan sites were analysed using Morisita's index of dispersion (scaled from [-1,1]), with values of -0.06, 0.564, and 0.414, respectively. This further demonstrates the dissimilarity across forest types, with random distribution occurring in the Leyte and Palanan plots, and clumped patterns in the Pantabangan plot. Further studies should examine the role of environmental factors on the variation of species composition between sites.

DNA Barcoding of Selected Philippine Taxa

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DNA barcoding is a molecular method that rapidly identifies an individual to a known taxon or its closest relative based on a 650-bp fragment of the cytochrome c oxidase subunit I (COI) or, to a limited extent, a 450 bp of the 18s ribosomal RNA. DNA barcoding is increasingly being used by researchers across the globe to aid in the identification of species. In the Philippines, the Institute of Biology, UP Diliman has initiated a project called DOLPHIN (DNA-barcoding Of Life – PHilippine Network) which aimed to apply DNA barcoding on Philippine species. The project initially focused on bird species within the Philippine Eagle Center in Davao as well as bird species within the UP Diliman campus. On its second phase, the project expanded to species of birds across the Philippines, anurans, reptiles, bats, gastropods and parasitic nematodes in molluscan intermediate hosts. To date, we have barcoded 156 birds from 55 species, 47 chiropteran bats from 15 species, 36 anurans from 7 species, 15 snakes from 3 species, 162 gastropod mollusks from 31 species, and 226 nematodes, of which 2 species have been identified. These efforts of the UP Biology have merely scratched the surface where only a small number of Philippine species have been barcoded. The DNA barcoding of Philippine species should be expanded as a national and international collaborative work as. DNA-barcoding can be a useful tool to contribute to truly know and understand what is out there in Philippine biodiversity.

Dipterocarps of Bohol: A molecular study using *rbcl* and *trnL-trnF*

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Dipterocarps are the dominant trees of tropical forests. Known not only by its ecological importance, the family is also the main timber trees of South Asia. An abundance of these trees have been identified to persist across the Philippine Archipelago. In the island of Bohol, the family is represented by 15 species of 52 recognized Philippine Dipterocarps. With the aid of DNA barcoding, this study aims to provide the first molecular analysis of Bohol dipterocarp species. To date, genetic characterization of plants, alongside morphological identification, is essential for their conservation and other sustainable use. Thirteen species belonging four genera, including: *Anisoptera* (1 sp.), *Dipterocarpus* (1 sp.), *Hopea* (4 spp.), and *Shorea* (7 spp.) were successfully sequenced using a paired chloroplast DNA barcode consisting of the *rbcl* gene (557 bp) and the *trnL-trnF* intergenic spacer (418 bp). The remaining two species (*D. hasseltii* and *Vatica mangachapoi* ssp. *mangachapoi*) were represented by individuals from other localities. Phylogenetic trees such as Neighbor Joining (NJ), Maximum Parsimony (MP), and Maximum Likelihood (ML) were constructed using PAUP* with Bootstrap analyses of 1000 replicates based on individual and concatenated sequences. With considerable bootstrap values of above 50, all species except *S. palosapis* and *S. malibato* were clearly delineated. Anomalous placement of the two were flagged for further evaluation. Genetic diversity within the family showed 2.4% species divergence across genera, and pairwise distances of 1.3% and 0.3% for inter- and intra- specific divergence, respectively. Future study will focus on the genetic characterization at the population level.

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Insect Diversity at the Different “Puestos” of Mt. Banahaw de Dolores, Dolores Quezon

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This study conducted at Mt. Banahaw de Dolores aimed to generate data on the diversity and abundance of insects thriving at the different “puestos”. A descriptive method of research was used in the study. Active and passive collection techniques were utilized to sample insects following the established foottrail and sample spots. Active collection techniques included Berlese funnel extraction, net sweeping, and opportunistic sampling while passive collection techniques included pit fall traps and light traps and for aquatic insects; D-net and Surber sampler were utilized. Coordinates were taken using GPS portable unit. Collected insects were brought to the Museum of Natural History for identification and classification. Insect diversity was analyzed using Shannon-Weaver Diversity Index (DI). Findings revealed 283 species that were representative of more than 103 families and 17 orders were identified. Five orders dominated the puestos, these were; Diptera, Coleoptera, Hymenoptera, Lepidoptera and Hemiptera. In the order of decreasing DI, the puestos are ranked as follows; Puesto 2 (Suplina) > Puesto 4 (Kuweba ng Dios Ama > Puesto 5 (Durungawan) > Puesto 1 (Kristalino) > Puesto 3 (Salaming Bubog). Orders of insects which have essential role in the area include Ephemeroptera, Plecoptera, Trichoptera, and some aquatic species of the Order Coleoptera, Diptera and Hemiptera, these insects are indicator of water quality. All the puestos got relatively high diversity index with low dominance values. This implies that the species of insects are equally represented in each puesto and that all puestos can support diverse species of insects.

Integrating Climate Change Mitigation and Adaptation in Protected Area Planning and Management in the Northern Sierra Madre Natural Park

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The Northern Sierra Madre Natural Park (NSMNP) in northeast Luzon is one of the largest and is one of the protected areas with high diversity in the Philippines. Nine municipalities are entirely or partly covered by the park. Four municipalities are situated along the isolated coast of Isabela Province. This area is strongly affected by typhoons every year and receives very large amounts of rainfall during the NE Monsoon season. The other five municipalities are situated in Cagayan Valley and are partly sheltered from typhoons and the NE Monsoon by the Sierra Madre Mountains. Here, droughts during El Nino events are a threat to agricultural production and facilitate forest fires. Climate Change is expected to increase the frequency of extreme rainfall and drought events and will impact both residents and biodiversity in this area. In a project to demonstrate the mainstreaming of Climate Change (CC) adaptation in biodiversity conservation a study was conducted on the knowledge and awareness regarding Climate Change (CC) among 500 residents and local government officials in the Sierra Madre. The results of this study were used as a basis for the production of information materials. In a second study, bird surveys were conducted and the distribution of birds was modeled in relation to environmental variables including climate in the Sierra Madre. A model of the predicted distribution of birds in the future under various CC scenarios was developed. Finally, workshops were held with the nine municipalities of the NSMNP to design local CC mitigation and adaptation plans and integrate the plans in the NSMNP management plan.

Comparative Nesting Ecology in Two Sympatric Species of Philippine Hornbills

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Philippine hornbills are canopy frugivores that inhabit old growth lowland forests due to their need for large nesting trees and preference for fruits of climax tree species. To understand nesting ecology in hornbills, differences in resource use between two sympatric species (*Buceros hydrocorax* and *Penelopides manillae*) were investigated in Northern Sierra Madre Natural Park, Luzon. Diet preferences and nest availability were compared across three study sites based on counts of large trees and nesting cavities. Density of hornbill nests were estimated within an area of 16 km² with each cavity sampled for nest characters (i.e., cavity size) and contents (i.e., seeds). Nearly 40 species of seeds from rainforest plants were recorded in nest cavities, with the majority from large-seeded non-fig fruits (i.e., *Aglaiia*, *Knema*). This strengthens the importance of hornbills as key dispersal agents for equally threatened old growth rainforest trees (*Myristica colinridsdalei*). Competition was limited between the two sympatric species, given their differences in resource use. Availability of suitable cavities was crucial in the persistence of both Rufous and Tarictic hornbills in old growth and disturbed forests on Luzon, regardless of quantity of large dipterocarps. Atypical low nest density of both Rufous and Tarictic hornbills in pristine forests of NSMNP raises a “red light” on their conservation status, and therefore evokes urgent re-evaluation. Rufous hornbills appear to be vulnerable to habitat loss, being more specialised in nest choice, fruit and habitat preferences, whereas Tarictic hornbills are more adaptable and resilient, being able to use sub-optimal habitats and extend fruit choice.

Species Composition and Status of Anurans in Barangay Gamut, Tago, Surigao del Sur

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Species composition in the study area was determined using a 200 meter transect line combined with opportunistic sampling techniques resulted to a total of 31 individuals of anurans that were collected. Thirty are frogs and the remaining 1 is a representative of toad species. Further analysis showed that the specimens belong to 9 species belonging in 4 different genera. Among the 9 species, 7 were identified: *Rana grandocula*, *Platymantis dorsalis*, *Fejervarya limnocharis*, *Rana leytensis*, *Occidozyga laevis*, *Limnonectes magnus*, and *Bufo marinus*, the unidentified specimens were placed in *Rana sp.* and *Fejervarya sp.* *Rana grandocula* was the most abundant species comprising 35.48% of the total number of individuals, and the species that have the lowest abundance percentage were *Platymantis dorsalis*, *Fejervarya limnocharis*, *Bufo marinus*, and *Rana sp.* having 1 representative of the total individual or just 3.23% of the total individuals. Forty five 45% of these species are considered endemic to the Philippine and based on IUCN list *Rana magna* is considered as near-threatened and the rest are species of least concern. Species were mostly observed on terrestrial areas, and *Fejarvaryia limnocharis* was the only species observed on aquatic microhabitat. Climate, pollution and anthropogenic activities within the vicinity are said to be the factors affecting the distribution of the species in the area.

Rhinella marina (Linnaeus, 1758); new name for *Bufo marinus*

Chaerephon plicatus*: a Lesser Known Bat in the PhilippinesReizl P. Jose¹ and Kendra L. Phelps²*¹Bohol Island State University - Bilar, Bohol²Texas Tech University, Lubbock, Texas, U.S.A.

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A lesser known bat species in the Philippines was found in Dakong Buho Cave in Barangay Biabas, Guindulman, Bohol. This species is called *Chaerephon plicatus* (wrinkle-lipped free-tailed bat), an insectivorous bat. The species gets its name from distinctive features including lips with a wrinkled appearance and a thickened tail that protrudes from the terminal edge of the interfemoral membrane. A 12-meter mist net was used to capture bats at the cave entrance. A total of 204 individuals were recorded, and age, sex and reproductive status were documented. Our findings are based on the capture results after 2 trap-nights. The bats were observed roosting in high inaccessible chamber, hence human disturbance is not a threat inside the cave. However, landscape disturbances, specifically reduction of forest habitat by expanding rice farms, could still present threats to this species population.

Vegetation Analysis and Biodiversity of the Mangrove Forest in the Vicinity of Mining Area in Claver, Surigao del Norte*Jess H. Jumawan, Meljan T. Demetillo and Romell A. Seronay*

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Mangroves are known to be ecologically significant by its variety of functions in the ecosystem. In the Philippines, mangroves have been declining significantly in the past decades. Despite this threat, many of the remaining mangrove areas are still not fully assessed and studied. The study attempted to conduct an inventory of mangroves and mangrove associates, biodiversity assessment, vegetation analysis, and regeneration of seedlings and saplings. There were 6 quadrats established with an area of 400 m². Three (3) regeneration plots were laid within the quadrats. Biodiversity indices and multivariate analysis were done to explore the data on mangroves. Bray-Curtis Similarity Index was determined and the resulting matrix submitted to a single linkage clustering and non-metric multi-dimensional scaling (nMDS). PRIMER 6 and BioDiversity Pro softwares were used in the analyses. The results showed the presence of 16 mangroves and 11 mangrove associates. m. Dominance was highest in quadrat 3, Shannon's diversity in quadrat 1 and supported by the rarefraction analysis, evenness in quadrat 4, and species richness in quadrats 1, 2 and 6 with 9 species were observed. The species distribution of pooled samples was at random (P=0.04) Vegetation analysis revealed 3 species with highest importance values and these were *Lumnitzera littorea* (68.76%), *Bruguiera sexangula* (44.42%), and *Scyphiphora hydrophyllacea* (40.29%). *Bruguiera gymnorrhiza* had excellent seedling regeneration. All saplings had poor regeneration. Quadrats 4 and 5 were separated from other groups at 87.7% similarity followed by quadrats 1 and 2 at 67.6%. This was projected into nMDS overlaid with biodiversity indices showing 0.01 stress value.

Impact of Domestic Cats on the Endangered Calayan rail (*Gallirallus calayanensis*): An ethnobiological survey

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Domestic cats have been shown to be among the biggest threats to wildlife (Longcore, et al., 2009; Peck, et al., 2008; Nogales, et al., 2004), affecting species such as the sooty tern, *Sterna fuscata* (Peck, et al., 2008). They have been implicated in species decline on islands (Nogales et al., 2004) and on continents (Jessup, 2004), and affect mammals, birds, reptiles and amphibians (Boned, et al., 2007). A preliminary assessment of the threats to the Calayan Rail was gathered from information on hunting practices and from observations on the extent of forest cover removed for slash-and-burn farming (Española and Oliveros, 2007). Of these, three challenges to the conservation of the Calayan rail were identified to be habitat destruction, hunting and introduced species. No particular actions have been done to examine the threats brought about by introduced species such as dogs, cats and rodents (Española and Oliveros, 2007; Broad and Oliveros, 2006). However, domestic cats were identified as one of the more important threats to the rail based on conditions on other islands similar to Calayan (Allen, et al., 2004). This study was conducted to determine human perceptions on the possible impact of domestic cats on the endangered Calayan rail (*Gallirallus calayanensis*) in order to provide a basis for future management modalities. Results of the study show that cats were not perceived to be threats to wildlife by the respondents, however, they also claimed that the cats often roam around the area during the day and sometimes at night. All respondents were not able to monitor their cats' activities during the day. It may not be concluded that cats directly impact the Calayan Rail, but they may possibly cause some disturbance in its habitat.

A Preliminary Assessment of the Chiropteran Fauna of Cagayan de Oro River, Cagayan de Oro City

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Bats are integral components of the environment serving an indispensable role in maintaining the health of different ecosystem ranging from forested areas up to riparian zones. Rivers and riparian areas provide an important habitat for bat fauna by providing direct valuable resources. The bat fauna along the Cagayan de Oro river had never been assessed and the current study was the first. Bat survey was conducted in different relevant locations along the river communities through mist netting designed to provide baseline ecological information and initial data on species composition and biometrics of bat species present in the Cagayan river zone. Eight bat species – five Pteropodids, two Vespertilionids and one Emballonurid – were recorded representing 15% of the bats of Mindanao faunal region and over 10% of the total Philippine bat fauna. Two species were Philippine endemics though with stable population status but are considered of conservation priority. Further studies along additional portions of Cagayan de Oro River would likely add essential information on bat species composition and distribution in the area and would give a clearer overview regarding the bat fauna along the River.

Distribution and Status of Crocodiles in Agusan Marsh, Eastern Mindanao

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This report contains the result of an exploratory survey conducted in Agusan Marsh Wildlife Sanctuary on November 2011 to March 2012 in the mid-section of Agusan River Basin in Eastern Mindanao which presents crocodile distribution and condition of the marsh as to crocodilian habitat. Day exploration, night spotlighting and key informant interviews reflect that the marsh supports extant population of crocodiles but considered remnant and declining. One of the highlights in the survey was the discovery of two remaining habitats that might contain healthy populations of crocodiles in the Marsh. No large number of crocodiles were observed in known rivers and lakes that could form viable breeding populations. The present distribution based on current sightings and verified reports are documented.

Nesting Sites of Marine Turtles in Marinduque: Management Concern

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The green turtle (*Chelonia mydas*), hawksbill (*Eretmochelys imbricata*), olive ridley (*Lepidochelys olivacea*), loggerhead (*Caretta caretta*) and the leatherback (*Dermodochelys coriacea*) were the species of marine turtles that have been recorded in the Philippines. Three of these, namely, green turtle, hawksbill and olive ridley occurred throughout Marinduque waters with reported sighting, stranding and nesting concentrations in Boac and Gasan towns. The results of Key Informant Interviews (KIIs) and Focus Group Discussions (FGDs) in the local community provided the data on the nesting sites, clutch size, number of hatchlings, and the stranding and salvaging incidents of marine turtles in their area. The marine turtles were released after being identified, measured and tagged by the trained locals and/or staff of the Department of Environment and Natural Resources (DENR). The conduct of Information, Education and Communication (IEC) campaigns in the coastal communities and schools, deputation of Wildlife Enforcement Officers and training of locals on handling marine turtles were some of the efforts of the DENR in collaboration with the academe, local community, NGOs and LGUs in order to protect the marine turtles from natural, environmental and human threats.

Diversity of Bats in Cagayan de Oro River, Cagayan de Oro City

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Diversity assessment of bats was conducted from February to April 2012 using mist nettings to provide information on bat species composition and richness trend in the different segments of Cagayan de Oro River. A total of 9 species of megachiropterans were recorded during the assessment. Most of the samples were found in Station 2 (Cadula bridge) near the fruit tree plantation of Del Monte. Diversity index was at fair level in 2 stations 3 and 4 low in Station 1 (Ugautaban). Station 2 had $H' = 2.126$ at 9 species and 6 for station 4. Station 3 had ($H' = 1.577$) with 4 species at 1.8 mean individuals station 1 ($H' = 1.56$) with 2 species at 1.2 mean individuals in station 1. The presence of *Harpionycteris whiteheadi* was noteworthy and could have been due to the presence of small pasture area that provided a small haven for wildlife in the City. Bats were most abundant in Station 2 where fruits were very abundant and the presence of caves across the river that could have been the shelter of the bats.

Avifaunal Diversity, Abundance and Endemism across Habitat Gradients in Tubajon, Dinagat Islands

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Avifaunal surveys by using transects were conducted across habitat gradients in coastal, wetland, and mangrove areas, grassland communities, and secondary forests in Tubajon, Dinagat Islands to determine species diversity, relative abundance, endemism, conservation status, and possible locally contexted conservation initiatives. The study revealed a total of 883 individuals resolved into 53 species and 25 Families, where the Family Columbidae dominated with six species, followed by Ardeidae, Nectariniidae, Pycnonotidae, and Sylviidae with four species each. The most abundant species across all sites were the glossy swiftlets (*Collocalia esculenta*) and the migratory wild duck (garganey, *Anas querquedula*) with relative abundances of 10.08 and 8.38%, respectively. Wild ducks were particularly abundant in Tambongon, a picturesque and relatively enclosed lagoon teeming with luxuriant seagrass beds despite the denudation of its hilly areas. About 30 species of birds surveyed in the area are Philippine endemics (56% endemism), *Halcyon capensis*, *Buceros hydrocorax*, *Ducula poliocephala*, and *Phapitreron amethystina* are categorized as Near Threatened (NT) and *Penelopides affinis* is a species of Least Concern among the endemics as listed in the Philippine IUCN Red List of Threatened Species 2012. Birds listed under Appendix II of CITES are *Tanygnathus sumatranus*, *Loriculus philippinensis*, *Spilornis holospilus*, *Buceros hydrocorax*, *Penelopides affinis*, and *Haliastur indus*. The rest of the birds recorded from the area are categorized as Least Concern, that either are migrants or residents. Extant forest cover in Tubajon is generally a regenerating ultramafic secondary forest dominated by trees with low CBH values (<38 cm) due to unabated logging pressure. While the bird surveys yield rich taxonomic data, more field studies, however, are required to document additional species before establishing the avifaunal profile and developing community-based and site-specific conservation measures in the wake of emerging potential development in the area.

Dendrological Assessment of Remnant Secondary Forests in Kiamba, Sarangani Province

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A rapid dendrological assessment using the Point Center Quarter Method (PCQM) in eight 0.5-1.5 Km long vegetation transects with sampling points set every 25-m interval in remnant lowland secondary forest patches of Barangay Kapate, Tamadang, Gasi and Tambilil in Kiamba, Sarangani Province was conducted to determine tree composition and diversity, importance values, conservation status, and existing habitat threats. The survey recorded 157 species of trees, distributed in 39 families, dominated by Dipterocarpaceae and Moraceae. Tree density was generally dominated by miscellaneous species but notable forest trees such as loktob (*Duabanga moluccana*), latel (*Pometia pinnata*), and pangi (*Pangium edule*). Premium hardwood species represented by white lawaan (*Shorea contorta*), red lawaan (*Shorea negrosensis*), and yakal (*Shorea astylosa*) were sporadic in distribution, occurring in low density usually as singular tree stands, when not 'poached' by timber poachers. Four vegetation types were recognized in all areas- (i) remnant lowland secondary forest, (2) *Piper adduncum*-dominated open landscape, (3) Kaingin areas, and (4) mixed agricultural areas, creating a patchwork of heavily fragmented habitats, strongly indicating eventual encroachment and potential decimation of remaining forest cover. In Tambilil, 'carabao logging' of remaining white lawaan and red lawaan appeared to be 'pervasive', while Gasi was the most deforested of the four barangays surveyed, with remnant forest patches occurring only along riparian zones. Invasion of buyo-buyo (*Piper adduncum*), an exotic species poses another significant threat to the remaining forest cover, as it tends to smother the growth of saplings and other understory flora. Despite the fragmentation, the study site host many species of trees where 7 are categorized as critically endangered, 13 vulnerable, 4 endangered, and 1 rare species. Strong implementation of the log ban at the barangay level supported by active citizenry or people's organization may prevent further denudation of what seems to be the only remnant secondary forests of Kiamba, Sarangani Province.

Preliminary Notes on Morphology and Composition of Philippine Fireflies (Lampyridae) from Selected areas of Bukidnon and North Cotabato

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This preliminary note on Philippine firefly morphology and composition is based on specimens collected from 2007 until 2012 in selected areas of Bukidnon and North Cotabato both in semi-urban and mountain landscapes. Beetles captured by handpicking or by sweep netting were preserved in 70% alcohol and examined in the laboratory. Paucity of literature on Philippine fireflies reveals a state of neglect in the pursuit of understanding these ecologically important and exceedingly diverse taxa. Initial classification based on morphology has revealed four possible genus (Pyrocoelia, Pteroptyx, Photuris, and undetermined). Out of the 105 collected specimens, around 18 (possibly more) distinct morphotypes were noted indicating a potentially high firefly diversity in the Philippines. Since biodiversity is considered important in maintaining a healthy, balanced ecosystem, much remains to be done in sustaining firefly populations in the fast changing landscape of the Philippines. Cultural beliefs surrounding the “sacred” nature of fireflies might have played a role in dissuading researchers from pursuing the study of fireflies.

On the Conservation of Nationally Threatened Birds of the Philippines

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Species have been assessed for their conservation status to monitor and maintain ecological balance and biodiversity. There were seven species added to the 73 globally threatened birds identified in the Threatened Birds of the Philippines Red data book (1999) to come up with the list of national threatened birds (2004). Ten species from the national list of threatened birds were recently downgraded to Near Threatened status and Least Concern status by the IUCN Red list in 2012. Furthermore, the current list of Philippine birds indicates that 17 species have been added to the threatened list in past 13 years making it a total of 87 species. The list has become the basis for the identification of the Important Bird Areas (IBAs) which are sites home to threatened, limited range or congregatory bird species. Establishment of protected areas (PAs) as sites of unique physical or biological significance by the National Government under the NIPAS Law or locally by the Local Government Units through the Local Government Code are initiatives to address the threats. Comparison through map overlaying of IBAs and nationally declared protected areas in the Philippines indicates that protection broadly covers the Philippine forests. However, the increasing number of threatened Philippine bird species calls for the evaluation of the efficiency of conservation actions to address the lingering threats. Therefore synergy of the NIPAS law and other conservational efforts is needed to put a halt in the increase in the number of threatened birds of the Philippines.

Beach Forest Species and Mangrove Associates for the National Greening Program

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The National Greening Program (NGP) of the DENR aims to plant 1.5 billion trees in 1.5 million hectares over a 4-year period (2012-2016). For the first year planting, however, only 10% of the 50 million seedlings will be indigenous species, compared to 50% for fast-growing species (mostly exotics such as *Swietenia mahogani* and *Gmelina arborea*), and 40% allotted to fruit trees. The Maasin Paradox in Iloilo of low water supply in the dry season and floods during storms (e.g., Typhoon Frank of 2009) despite increasing forest cover illustrates why such introduced species are not suitable for planting in watersheds. (Leaves of the exotic mahogany do not decompose, therefore there is no organic matter in the soil drastically reducing its ability to absorb rainfall.) The latter species may be used in commercial plantations that sell timber, but not for biodiversity conservation, watershed rehabilitation and Climate Change mitigation. We should plant native flora for reforestation – but which particular species? As many of the areas for planting are barren sites, ecology dictates that colonizers should be the species of choice over climax flora such as dipterocarps. By definition, climax should come at the end and pioneers at the beginning. The new book *Beach Forest Species and Mangrove Associates in the Philippines* describes 140 such pioneer species (mainly trees, but also vines, shrubs) – major groups (Herbaceous Beach, Beach Scrub, Beach Woodland, *Casuarina* Forest, and Mixed Littoral Forest); morphological adaptations to severe environmental factors (thin, slender leaves, thickened cuticle, low growing habit, small gnarled forms and multiple stems), and taxonomy. It also discusses their importance – for coastal protection as greenbelts/ bioshields (together with the intertidal mangroves), medicinal/other traditional uses, ornamental species, biotech/ industrial applications, wildlife habitat and reforestation. Among the colonizing species, of particular interest is *Millettia pinnata*, locally called **bani** or **balukbaluk**, whose seeds were collected in 2007 from a tree (P generation). These seeds produced nursery seedlings (F_1) outplanted to a barren lot in 2008 which in turn bore flowers and fruits and wildings (F_2) in 2011 – 3 generations from P to F_2 , all in 4 years! This remarkable performance (compared to the 17-30 years it takes for dipterocarps to reproduce) merits the selection of *M. pinnata* and other colonizing mangrove associates and beach species for the NGP.

Sonograms of Calls of Six Endemic and Resident *Columbiids* in Luzon

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Birds are known for the diversity of vocal sounds they produce. These vocal sounds encompass a variety of function and can be categorized into two: calls or songs. A bird's call note is defined as a brief sound with a relatively simple acoustic structure. Song, on the other hand, is defined as a sustained, more or less uninterrupted repetition of one or more notes which has a specific purpose like securing a mate or defending a territory. Columbiids (doves and pigeons) are specifically known for their "roo-roo" cooing call notes as well as their booming songs. This study involved recording of columbiid calls in Luzon used for identification of columbiid species during distance line transect sampling for assessing abundance and distribution of frugivores. Call recording and production of sonograms is not only helpful for identification but also for describing behaviour of species in the wild. Recordings were made during transect walks done from 600-1100h and 1500-1800h. Extraneous noise (rivers, cicadas and movements of recorders) were avoided/minimized. Field notes including locality, weather, habitat were also recorded. Calls were recorded using a Marantz (PMD661) recorder with a Sennheiser microphone. All recordings were saved as .WAV files. The sonograms were produced using the software RavenLite Version 1.0. Six columbiid species calls were recorded with enough intelligibility to make a sonogram. The amplitude of the frequency was amplified by a factor of 4 to facilitate clarity of the graph. Sonograms were then described based on frequency and syllables of the calls.

POSTERS

Educational Awareness Campaign on Philippine Mammalian Biodiversity and Ecology for Elementary (Grade 6) Level Pupils

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An educational awareness campaign on Philippine mammals targeting elementary pupils was performed last February 20, 2012. Eight sections of Grade 6 pupils from Lopez Elementary School were given a pre-test to evaluate prior knowledge. The four topics (mammalian characteristics, Philippine mammalian diversity, ecology and conservation) were discussed in four 30-minute sessions. A post-test was then administered to determine comprehension and retention. Results of the pre-test showed lower average score (5.3, negative skewness) while the post-test manifested a higher average (8.1, positive skewness), indicating a significant ($p < \alpha_{0.05}$) increase. Results of the pre-tests showed no significant difference ($p > \alpha_{0.05}$) in the percentage of pupils who identified native mammals as compared to those who identified non-native mammals. However, there was a significant ($p < \alpha_{0.05}$) increase in percentage of those who identified native mammals in the post-test, indicating increased awareness of Philippine mammalian diversity. Furthermore, results from the evaluation of facilitators, topics chosen and the impact of the lessons showed a positive response (1.24 on a scale of 1 to 5, one being the highest). Hence, the educational awareness campaign conducted was a worthwhile strategy in imparting knowledge on Philippine mammals to pupils as young as twelve years old. However, it was not possible to test long-term retention because pupils who participated already graduated and were hard to trace to their respective high schools the year after. It is recommended that this kind of strategy be applied to other Philippine taxa and be conducted to Grade 5 pupils so that long-term retention can be tested.

The Avifauna of Philippine Peñablanca Sustainable Reforestation Project Site, Peñablanca, Cagayan

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The avifauna of the Philippine Peñablanca Sustainable Reforestation Project was surveyed from April 2008 to May 2012. Specifically, the study aimed to assess the avian community in terms of species composition and conservation status. Mist netting and a 2-km transect walk were used to assess and account bird species. This study recorded 141 avian species from 39 families. Eighteen or 13% of the species are migrants or winter visitors while the rest are considered resident breeding species of which 37% are endemics, with four globally threatened species. These include *Anas luzonica*, *Bubo philippensis*, *Ceyx melanurus* and *Nisaetus philippensis* categorized as Vulnerable under IUCN. Two Near-threatened species were recorded, *Otus longicornis* and *Stachyris striata*. Bird species recorded in the project site comprised 25% of the birds species found in the country.

Benthic Nematode Community in Aquaculture Ponds in the Regional Fisheries Research and Development Center (RFRDC) Sta. Cruz, Davao del Sur

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The study was conducted to assess the nematode composition in aquaculture including other major meiofaunal taxa. Samples were taken from four ponds, two of which had extensive and two had semi-intensive management practices. Nematode taxon dominated the meiofaunal population in all aquaculture ponds. Other major meiofaunal taxa were also identified including copepods, foraminiferans, ostracods and polychaetes. A total of 30 nematode genera and 1 unidentified representing the Order Chromadorida were recorded. Based on the trophic diversity, the identified nematodes were classified into three feeding types including deposit feeders, epistrate feeders and omnivore-predators in which deposit feeding nematodes dominated. Shannon-Weiner Index, Hills Indices, relative abundance and Simpson's Index of Diversity were used to measure nematode diversity wherein these showed that semi-intensive aquaculture ponds have higher nematode diversity than extensively managed aquaculture ponds. It can be speculated that the variation in the population of nematodes can be correlated to the values of the measured abiotic parameters including temperature, salinity, water pH, sediment type and organic matter composition. However, using t-test at 95% significance level found no significant difference in the mean population of the nematodes.

Herpetological Biodiversity of the Caraga Region: The conservation significance of NE Mindanao's amphibian and reptile megadiversity

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We present a synthesis of new data from four major biodiversity inventory field surveys (2010–2012) and institutional biodiversity repository databases, which provide new insight into amphibian and reptile biodiversity of Mindanao. The emergent pattern suggests that the Caraga Region and surrounding northeast Mindanao (and smaller, offshore landmasses) supports the highest levels of amphibian and reptile biodiversity ever recorded in the Philippines. Compared to other areas of Mindanao, Palawan, Visayas, and Luzon that have been properly surveyed for herpetological biodiversity, the mountains of Northeast Mindanao support as much as 25% higher species diversity than any other center of diversity in the country. In this presentation we will evaluate competing explanations for the generation, partitioning, and maintenance of Mindanao's herpetological megadiversity and we will discuss the immediate and urgent conservation significance of these new findings.

POSTERS

Species Composition and Abundance of Snails (Gastropods) in Mt. Malambo, Davao District

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Mt. Malambo is a small mountain along the highway of Datu Salunay, Marilog, Davao District. The elevation at its peak is 1,379 masl covered with original or native plants in the fragmented forest at the base and mossy forest near the top. A transect survey for snails was conducted on the western slope of the mountain to provide information on snail species composition. A total of 6 snail species under one family of snail were listed from a total of 82 individuals. The most abundant species was *Cyclophorus presto* (30), the rarest species on site was *Leptopoma perlycidum* (5). The effort to conserve the snail species will also conserve the forest and the fireflies therein as they are food for the fireflies and for ecological balance.

Preliminary Study of Caimpugan Peat Swamp Flora, San Francisco, Agusan del Sur

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The Philippines is rich in biodiversity, in fact, it is one of the 17 “megadiverse” countries in the world. However, it is not an exception to the general trend of forest destruction that occurs in the country. Caimpugan Peat Swamp Forest in Agusan is a natural forest, one of the areas where biodiversity has been severely threatened due to natural destruction and anthropogenic disturbances. To determine the abundance and distribution of the existing flora in Caimpugan, a preliminary study was conducted from November 23 to December 15, 2012. Data were collected using combination of line transect, quadrat, and opportunistic random sampling methods. The plants were classified and described according to plant habit and its diagnostic morphological characters. A taxonomic key has been prepared to identify the species, genera and families of plants. Results of the preliminary study revealed 117 species in all study sites. Of these, 98 species were flowering plants, 13 species were ferns, five species were mosses, and one species was palm. Despite habitat degradation in the forest ecosystem, a substantial number of endemic and indigenous species were found, *Baccaurea philippinensis*, *Dillenia philippinensis*, *Elaeocarpus cumingii*, *Ficus benguetensis*, *Hoya imbricata*, *Nepenthes mirabilis*, *Premna leytensis*, *Pterocarpus indicus*, to name a few. *Tristianopsis aff. micrantha* has the highest relative frequency, density, and dominance. The tree species with highest importance value index (IVI) are *Tristianopsis aff. micrantha*, *Syzygium nitidum*, and *Hoya imbricata*. The most represented families are Myrtaceae and Asclepiadaceae with 6 species each, and Orchidaceae and Lauraceae with 5 species each. The forest exhibits high endemism which is at 35%. The conservation of the existing flora of the forest would provide protection to forest ecosystem and serve as a wildlife sanctuary. Results indicate that the forest sites at the inner area are highly significant for the continued existence of wildlife such as birds, deer and monkeys. However, Particular attention should be given to the forest ecosystem in the formulation of conservation plan for Agusan Marsh since these areas are still able to support a considerable number of endemic species. It is recommended that 3-hectare permanent plot should be established for long-term ecological studies.

Fungal Flora of Taal Volcano Protected Landscape, Southern Luzon

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Fungal species collection was conducted at Taal Volcano Protected Landscape (TVPL) in Talisay area, Batangas, Southern Luzon, Philippines (13.66255°N, 121.24797°E) from the months of March to August 2012. TVPL has an elevation of 600 meters above sea level. It is situated in the municipalities of Talisay, Tanauan, Laurel, Agoncillo, Sta. Teresita, Cuenca, Alitagtag, Mataas na Kahoy, Lipa City, Balite and San Nicolas. This Protected Area is considered as having one of the most diverse forest ecosystems in CALABARZON (Cavite, Laguna, Batangas, Rizal, and Quezon) region, thereby indicating the need for conservation and protection. This paper aims to document the fungal species in the area by preparing taxonomic accounts based on an extensive systematic collection and by facilitating the identification or recognition of each fungal species. Using transect line (TL) method, four transect lines were established from the baseline (200m asl) toward the peak (600m asl) with 20m x 30m quadrat sampling each transect line and at an interval of 200 meters between quadrats. All in all, 12 quadrats were laid out. The fungal species within the quadrats along the TLs were identified and recorded. Simpson's Index was the diversity index used in assessing fungal species growing in TVPL Talisay area. Opportunistic sampling method was also used during the survey. Field sampling of fungi has resulted to the collection and identification of 75 species belonging to 36 genera and 23 families. There is relatively high fungal species diversity in Taal Volcano Protected Landscape, Talisay as compared with other forest ecosystems in the region. This is the first report of fungi present in TVPL.

Imbaw (*Adontia edentula*) as a Resource, Food and Livelihood of Camotes Islands

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Imbaw known as mangrove clam (*Adontia edentula*) and an abundant resource in the mangrove areas of Camotes Islands, Cebu, Philippines was studied particularly its perceived abundance, food processing and livelihood of the inhabitants. A questionnaire was made to serve as an interview guide to the gleaners, vendors and selected inhabitants of Camotes Islands. Results show that imbaw are usually found among mangroves in muddy areas with less pneumatophores and usually collected at 2 feet below the surface. They are gathered throughout the year during low tide. Phases of the moon have nothing to do with its abundance. Gathering techniques usually done by visual techniques and manually searching for the shell in the mud. Perceived distance between clams is 3 meters. Imbaw is prepared as tinola, broiled and salad (kinilaw). Broiled imbaw mixed with a bit of margarine is excellently served during special occasions. Gleaning usually is concentrated in mangrove areas of Teguis, Poro Cebu being the largest mangrove area in Camotes Islands. Marketing was done through middle men with an average of 5 pieces large clams and 15 pieces smaller clams in an hour of gleaning. Prices for bigger clams range from Php2.00 to Php3.00 per piece and smaller clams sell for Php0.50 to Php1.00 each. Results further show that 1/3 of their catch was left for the gleaners' kitchen and 2/3 for the market. Proceeds of clam gleaning are generally used to purchase food. Some of the perceived problems are that there are so many gleaners; severe disturbance of areas where the shells are collected; dwindling catch and prevalence of small clams. Reforestation and size limits were the suggested measures to solve scarcity.

POSTERS

Species Diversity of Seagrasses in Camotes Islands

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The seagrasses of Camotes Islands were studied to determine their diversity. A transect-quadrat method was used where 3 transects were laid in each station in the four municipalities of San Francisco, Poro, Tudela and Pilar of Camotes Islands. Results show that there were 11 species of seagrasses found in the four municipalities of Camotes Islands which are *Halophila decipiens*, *Thalassia hemprichii*, *Cymodocea rotundata*, *Cymodocea serrulata*, *Halodule pinifolia*, *Halodule uninervis*, *Halophila minor*, *Halophila ovalis*, *Halophila ovata*, *Enhalus acoroides* and *Syringodium isoetifolium*. *Halophila decipiens* and *Thalassia hemprichii* are the distinct species of seagrass found in the municipalities of Poro and San Francisco, respectively while there are 9 species that are common in all the municipalities that include: *Cymodocea rotundata*, *Cymodocea serrulata*, *Halodule pinifolia*, *Halodule uninervis*, *Halophila minor*, *Halophila ovalis*, *Halophila ovata*, *Enhalus acoroides* and *Syringodium isoetifolium*.

A Preliminary Assessment of Long-Term Ecological Research Studies in Terrestrial Ecosystems in the Philippines

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Forest dynamics plots are set up around the country to monitor changes in biodiversity over time. Intuitively, research in these plots is not maximized due to limited resources and personnel. This hypothesis is tested by consolidating and analyzing data on terrestrial ecosystems in the Philippines from reports and publications accessible online through Google Scholar. Eighteen sites (14 LTERs and 4 priority sites) identified as part of Key Biodiversity Areas (KBAs), Nationwide Operational Assessment of Hazards (NOAH), and the New Conservation Areas in the Philippines Program (NewCAPP) were included in this analysis. A standard database was created using data extracted from available references collated online. A total of 98 publications (64 journal articles) reflected 177 studies ranging from 1956-2012 for the 18 sites, averaging 5.4 studies/site for the past 56 years. About half (51%) of the studies were led by local institutions (7% government, 44% academe). Most studies focused on Mt. Makiling (24%), Mt. Malindang (20%), and Mt. Kitanglad (20%), while birds (25%), mammals (23%), flora (21%) and herps (21%) were the most studied taxa. In the biodiversity-focused studies, 66%, 48%, 28% and 20% reported species richness, endemism, threatened species and diversity indices, respectively. These preliminary figures seem to support the hypothesis that the country is largely understudied and underreported. Thus, it is not enough that properly designed LTER's in terrestrial ecosystems in the Philippines are implemented to better understand and protect our ecosystems and keep our ecosystem services sustainable, but these need to be published in peer-reviewed journals as well.

Collection of Philippine Plant DNA Barcodes

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Correct and accurate representation of any species is crucial for protecting biological diversity. As such, DNA barcoding has been widely useful especially when limitations by conventional identification procedures were encountered. Plant barcodes produced from DNA markers are now readily available through various databases; however, plant species from the Philippines are not well represented. To address this, a study was conducted to produce DNA barcodes and establish a database for native and endemic Philippine plants using the *rbcL* gene (484 bp). A total of 103 individuals representing 82 species from 24 genera within 16 families were successfully barcoded. A Neighbor-Joining (NJ) tree was constructed using the Kimura-2-parameter model with bootstrap analysis of 1000 replicates. All sequences clustered in accordance to their taxonomic classification, based on reference sequences obtained from GenBank. The DNA barcodes generated can be used for further phylogenetic study in combination with other target gene regions. For example, trnL-trnF sequences have also been collected for the Dipterocarpaceae family. DNA barcoding efforts will be further pursued on native Philippine plants.

Learning from the Experts: The science of local ecological knowledge - The value of local ecological knowledge in Biodiversity Research and Conservation

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The use of science in facilitating the effective management of natural resources cannot be overstated enough. This is all the more true when taken in the context of biodiversity conservation in the world today. Besieged by issues ranging from a changing climate, increasing population pressure and changes in consumer patterns, biodiversity conservation (or a lack thereof) has never been more important (or relevant) to human life.

Given the importance of science in biodiversity conservation, just how safe or reliable is the use of local knowledge? For instance, is there any scientific value to be derived from the thoughts of an impoverished forest dweller who never even had a formal education but whose entire existence revolved around the forest in question?

The Science of Local Ecological Knowledge is a workshop designed to share experience and field practices on the use of local knowledge for biodiversity research and conservation. The workshop's three presentations will provide three concrete examples of how local knowledge has been used to help answer important questions to address biodiversity conservation issues.

The workshop discussion which follows will call on participants to ask questions on techniques and tactics on how best to use of local knowledge in their specific areas of assignment. It will also be a venue for participants to share their own experiences in the use of local knowledge and how it helped address biodiversity conservation issues.

Ecosystem Services, Cultural Values and Protected Area Management

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The Ecosystem Services approach helps explain the contributions nature makes to human well-being. Describing ecosystem functions in economic terms helps decision makers take account of nature in planning. Nature's services are currently treated as 'free' - putting a financial value on them helps ensure they are recognised. Many of the values people recognise in nature - its beauty, the spiritual values attached to it, how it creates a sense of place and identity - are essential to our well-being but are not easily described. How can they be assessed so that decisions made about the conservation and management of nature take them into account?

People, both urban and rural, are increasingly divorced from nature. We need to change this if we wish to build greater support for conservation objectives. Can assessment of the cultural values of nature help or is economic value all that really matters?

Four presentations will explore the ecosystem services framework and its relevance to conservation in the Philippines and elsewhere:

- Is the ecosystem services framework useful for conservation in the Philippines?
- Cultural values in nature; what they are and why they are important to conservation?
- How can cultural services be accessed and communicated to ecosystem managers?
- Can cultural ecosystem services approach support nature conservation in the Philippines?

An expert panel and participants will discuss the presentation. Key points will form the basis of a statement concerning cultural services approaches in the Philippines.

Fruit bat population size estimation and monitoring

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Many aspects of conservation, such as 1) priority setting, 2) measuring impacts of disturbance and/or management, and 3) establishing conservation status (e.g. IUCN Red List) depend on knowing species' population sizes and trends. However, these measures may be very difficult to obtain for many species. Old World fruit bats (Pteropodidae) provide a best case scenario for population counts and monitoring, because these species aggregate which increases detection probability. In this workshop we will discuss three simple and inexpensive fruit bat population size estimation techniques: exit counts, roost counts, photographic count, and outline the pros and cons of each. We will provide an overview of a standardized method that is being used across SE Asia for assessing fruit bat population size and monitoring population changes over time. We will demonstrate the simple data analysis techniques by working through examples, and we will discuss sources of error in fruit bat counts and how these may affect trend detection over time. The workshop will be interactive with many examples, photographs, and sharing among the group. If possible, we will integrate a field component by traveling to a nearby fruit bat colony to perform an exit count and use the count data as a group to develop a population estimate for this colony. A written description of the monitoring methods discussed will be provided to all participants with appropriate references

Integrating Wildlife Conservation in the Classroom

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Education is the best way to promote nature conservation at the grassroots level. Teachers play an important role in wildlife conservation at an early stage of man. However, majority of elementary and high school science teachers in the Philippines lack knowledge of the Philippine wildlife species and its status as this information are not included during their college education. If teachers are well equipped with knowledge and different teaching strategies on Philippine wildlife species, wildlife conservation will be inculcated from childhood up to adulthood. This workshop will highlight range of practical teaching strategies/activities/projects that will promote awareness or conservation of the Philippine wildlife species and its habitat. Most of the activities are designed for classroom setting. Part of the workshop is sharing of experiences of the teachers in integrating wildlife education and conservation to the science curriculum.

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ACKNOWLEDGEMENTS



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Cultural and Biodiversity Values of Conservation Areas

