



PROGRAM AND ABSTRACT BOOK



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Table of Content

	Pages
Table of Content	1
Welcome Greetings from President ARRCN	2
Chairperson Report	3
Rector's Remarks	5
Theme, Scope and Committee	6
Keynote and Invited Speakers	8
List of Sponsor Company and International Student Grant	10
Sponsor of Conference Grant	11
Schedule of The 11 th ARRCN 2019	12
Oral Presentation Schedule Day 1	15
Oral Presentation Schedule Day 2	18
Poster Presentation List	22
Abstracts - Plenary 1	24
Abstracts - Plenary 2 : Country Report	26
Abstracts - Plenary 3	30
Abstracts - Workshop	33
Oral Presentation Abstracts	36
Poster Presentation Abstracts	79

Welcome Greetings from President ARRCN

I am very happy to welcome you to the 11th ARRCN Symposium which is held in Udayana University in Bali, Indonesia 9-12 October 2019. Thanks to great efforts by the Organizing Committee and Steering Committee members in Indonesia.

The first Symposium on Asian Raptors was held in Japan twenty-one years ago, in 1998. It was a challenge for us to promote raptor research and conservation activities in Asia. When the ARRCN was established in 1999, there were few raptor researchers in Asia and little information about raptors, even about their distribution. However, over the past 20 years, the number of raptor researchers, especially young students, has increased through each of our biannual symposiums. The 10th Anniversary Symposium was held in the Philippines two years ago and was attended by many participants from not only many Asian countries, but also many countries around the world. In addition, vital data about Asian Raptors has been accumulated. As the result, two books, "FIELD GUIDE TO THE RAPTORS OF ASIA," have been published.

Now, we are standing at a new mile stone and the Symposium will be a very important opportunity to promote raptor research and conservation activities cooperatively with all countries on earth. The theme of this Symposium is "Strengthening collaboration for supporting research and raptors' conservation". I definitely believe the Symposium will be a precious opportunity for all participants to encourage each other and to learn the essentials for further activities for raptor research and conservation towards our ultimate goal: the creation of a wonderful world for Raptors and Humans.

Best regards,

Dr. Toru Yamazaki



Chairperson Report

Raptor or Bird of Prey is widely recognized as an index species reflecting the soundness of their habitat. Protection ecosystems for raptors leads to conservation of biodiversity and survival of humans. The objectives of ARRCN are to exchange information concerning raptors among its member, in order to compile a database on raptors, including their distribution, population, habitat, ecology, breeding and all other aspects important to their conservation, especially on the status of native Asian raptors. The ARRCN also coordinate the research activities on migratory species, as well as common and widespread raptor species in Asia.

The 11th ARRCN International Symposium will be held on 9 to 12 October 2019. It will be a two days international symposium, comprises of key note and invited speaker presentations, country report, participant presentations, as well as workshops. It will also a welcome dinner and cultural night event to introduce/promote the culture of the host country to the audience. In accordance with this symposium, it will be a movie screening for public, an exhibition of Indonesia national priority raptor species, fieldworks to visit the site of resident raptor, as well as the site to observe the migratory raptor in Bali. Almost 250 participants from 14 countries will participate, namely from Thailand, Taiwan, Singapore, Philippine, Nepal, Mongolia, Malaysia, Korea, Japan, India, USA, UEA, Australia, and Indonesia. During this symposium, 90 research abstracts will be presented to the audience via oral or poster presentation, 6 presentations for plenary, also 5 countries will provide their report, which are from Indonesia, Malaysia, Mongolia, Philippine, and Taiwan.

There are several parties collaborated with ARRCN to organize this event. The Udayana University, the Directorate General of Natural Resource Conservation and Ecosystem Ministry of Environment and Forestry of Republic Indonesia, the Indonesian Ornithologist Union, and the Pertamina Geothermal Energy.

Great appreciations is forwarded to Rector Udayana University, Directorate General of Natural Resource Conservation and Ecosystem and his deputies, Vice Rector IV of Udayana University, Indonesia Ornithologist Union, the Nature of Conservation Agency of Bali Province, Bali Barat National Park, Pertamina Geothermal Energy, Raptor Indonesia, LIPI, IdeaWild, Kokokan Bali Birdwatcher Club, Satwa Alam Bali Wildlife Photographer Community, and PT Tirta Investama Bali. I would also thank the Philippine Eagle Foundation for their generosity to provide their Bird of Prey movie available for us for a free public screening.

Special thanks to Dean of Faculty of Mathematic and Natural Sciences of Udayana University, Director of Postgraduate Program, Dean of Vet Medicine, and Dean of



Agriculture of Udayana University, Director of Centre of International Program and Head of the Chinese Tourism Training Centre of Udayana University. Thanks must go to my colleagues and students (Himabio Udayana) at the Biology Study Program of Faculty of Mathematic and Natural Sciences, also students of Faculty of Veterinary Medicine (Minpro Rothschildi), for their tremendous supports and works to make this event is possible to conduct.

Special thanks is extended to Dr. Toru Yamazaki, the President of ARRCN, and his team, for his genuine trust to us to hold this international event. His willingness to allow us to express our creativity to conduct this event is truly appreciated.

I would like also to acknowledge the support from West Japan Engineering Consultants, Inc., IDEA Consultants, Inc., Hokuriku Birds Research Institute Inc., CTI Engineering Co., Ltd., The General Environmental Technos Co., Ltd., Tohoku Greening & Environmental Consulting Co., Ltd, Techno Chubu Company Ltd., and Usami Zorin (Usami Forestry Services) Co., Ltd. For providing International Student Grant (ISG) to attend this symposium. Conference grant is also provided by the Pertamina Geothermal Energy.

We also fortunate that during this event, we are able to derive the Memorium of Understanding between the Udayana University and the Directorate General of Natural Resource Conservation and Ecosystem Ministry of Environment and Forestry of Republic Indonesia on the Tri Dharma Perguruan Tinggi, which includes the area of education, research and community service. Special thanks to Vice Rector IV of Udayana University and his staff at the Cooperation Section, Directorate General of Natural Resource Conservation and Ecosystem and his deputies, the Head of the Nature of Conservation Agency of Bali Province, and the Raptor Indonesia, therefore this memory of understanding is possible to derive during this event. Soon, the Memory of Understanding will be followed by the Cooperation Agreement between faculties or units within the Udayana University and the Directorate General of Natural Resource Conservation and Ecosystem Ministry of Environment and Forestry of Republic Indonesia.

Lastly, I would like to express my sincere apology for -if any- inconvenience arose during the preparation of this 11th ARRCN International Symposium. Hope you all have a wonderful time in Bali for this symposium.

Sincerely yours

Dra. Luh Putu Eswaryanti Kusuma Yuni, M.Sc., Ph.D.



Rector's Remarks

The first Asian Raptor Research and Conservation (ARRC) International Symposium was held in 1998 with the participation of raptor researchers and conservationists throughout Asia in Shiga Prefecture, Japan. This year, I am very happy to welcome you to the 11th Asian Raptor Research and Conservation Network International Symposium, held in Udayana University in Bali - Indonesia, from 9 to 12 October 2019.

The 11th Asian Raptor Research and Conservation Network International Symposium aims to exchange information concerning raptors, including research methodology, techniques for habitat restoration, care for injured raptors, etc. It is also aim to compile database on raptors, especially on the status of native Asian raptors. This year, around 200 participants from 14 countries gather at Udayana University in Bali to exchange information concerning raptors among its member to establish the Asian conservation strategy for raptors which leads into conservation of raptors and their habitat throughout Asian countries in particular, as well as for raptor and its habitat conservation strategy across the globe.

I thank the ARRCN President Dr. Toru Yamazaki who trusted us, the Udayana University, to hold this international scientific event. Great appreciation to Ir. Wiratno, M.Sc. the Director General of Natural Resources Conservation and Ecosystem, Ministry of Environment and Forestry, Republic of Indonesia for his generous supports. To Pertamina Geothermal Energy for its financial support. I thank also many other parties for their in kind and financial supports, therefore the 11th ARRCN International Symposium is possible to conduct.

It is also a pleasure to understand that many faculties or units within the Udayana University collaborates together to manage this international event. To Frank Williams Museum of the Bird Statue, Faculty of Mathematic and Natural Sciences, Pasca Sarjana Program, Faculty of Agriculture, Faculty of Veterinary Medicine, the Centre of International Program, as well as the Chinese Tourism Training Centre of Udayana University. I do hope that this great collaboration keep working for the further future.

Rector, Udayana University

Prof. Dr. dr. A.A. Raka Sudewi, Sp.S (K)



The 11th Asian Raptor Research and Conservation Network International Symposium

THEME

"Strengthening Collaboration for Supporting Research and Raptors' Conservation"

SCOPE

1. Forest and raptors.
2. Migration, monitoring and movement.
3. Genetics, disease, and rehabilitation.
4. Local perceptions, threats and community-based conservation, including ethnobiology.
5. Population dynamics.
6. Raptor ecology and climate change.
7. Raptor in human modified landscape.

COMMITTEE

Advisory Board

1. Prof. Dr. dr. A.A. Raka Sudewi, Sp.S (K) (Rector, Udayana University)
2. Prof. Dr. Ida Bagus Wyasa Putra, SH., M.Hum (Vice Rector IV, Udayana University)
3. Ir. Ignatius Pramana Yuda, M.Si., Ph.D (President, Indonesia Ornithologist Union)
4. Dr. Toru Yamazaki (President ARRCN)

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3. Adam Supriatna (ARRCN -Indonesia)
4. Dr. Syartinilia Wijaya (IPB University)
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6. Magdalena Putri (Universitas 17 Agustus 1945 Banyuwangi)
7. Zaini Rahman (Raptor Indonesia)
8. Asman Adi Purwanto (Raptor Indonesia)
9. Gunawan (Perkumpulan Suaka Elang/Yayasan Konservasi Elang Indonesia)

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2. Ir. Ignatius Pramana Yuda, M.Si., Ph.D (President, Indonesia Ornithologist Union)
3. Dr. Dewi Malia Prawiradilaga (Indonesian Institutes of Sciences -RCB LIPI)



4. Adam Supriatna (ARRCN -Indonesia)
5. Dr. Syartinilia Wijaya (Institut Pertanian Bogor)

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Treasurer : Ni Putu Ariwathi, S.Pt., M.Pt.

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Drs. Job Nico Subagio, M.Si.

Drs. Deny Suhernawan Yusup, MSc.St.

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Dr. Ir. Made Ria Defiani, M.Sc. (Hort.)

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Dr. Sang Ketut Sudirga, S.Si., M.Si.

Drs. Martin Joni, M.Si.

Keynote and Invited Speakers



Ir. Wiratno, M.Sc.

*Directorate General of Conservation,
Natural Resources, and Ecosystem,
Ministry of Environment and Forestry
Republic of Indonesia*



Prof. Hiroyoshi Higuchi, Ph.D.

Japan



Dennis J. Salvador

Philippine



Wally van Sickle

USA



Dr. Dewi M. Prawiradilaga

*Indonesian Institutes of Sciences,
Research Centre of Biology
LIPI*



Dr. Syartinilia Wijaya

IPB University, Indonesia



Chuenchom Hansasuta D.D.S M.S.

Thailand



Zaini Rahman

Raptor Indonesia



Dr. Kelya Nakajima

Japan

*International Association for Falconry
& Conservation of Birds of Prey*

International Student Grant (ISG) to attend the 11th ARRCN International Symposium provided by:

West Japan Engineering Consultants, Inc.

IDEA Consultants, Inc.

Hokuriku Birds Research Institute Inc.

CTI Engineering Co., Ltd.

The General Environmental Technos Co., Ltd.

Tohoku Greening & Environmental Consulting Co., Ltd.

Techno Chubu Company Ltd.

Usami Zorin (Usami Forestry Services) Co., Ltd.

List of International Student Grant Awardee:

Rofifah Aulia Suyitno (Indonesia)

Keanu Sitjar (Philippines)

Insan Fahmi (Indonesia)

Lee Zan Hui (Malaysia)

Ferla Zafitri (Indonesia)

Abdulsalam Abdulhamid (Philippines)

Jason Teo (Malaysia)

Devi Ayu Mandasari (Indonesia)

Radhika Jha (India)

Conference Grant to attend the 11th ARRCN International Symposium,

Sponsored by:

Pertamina Geothermal Energy



SCHEDULE

The 11th Asian Raptor Research and Conservation Network
International Symposium
Udayana University, Bali, Indonesia

Day 1: Wednesday, 9 October 2019

Time	Activity	Venue
	Delegates' arrival	Ngurah Rai International Airport, Bali
15.00 – 15.30	Registration	AA Made Djelantik Room, Udayana University Sudirman Campus
15.30 – 18.00	Bird of prey movie, Philippine Eagle Foundation : Movie screening	

Day 2: Thursday, 10 October 2019

Time	Activity	Venue
07.30 – 08.30	Registration	Nusantara Room, Udayana University Sudirman Campus
08.30 – 09.38	Opening Ceremony : <ul style="list-style-type: none"> • Welcome Dance (5') • Indonesian National Anthem (5') • Chanting Prayers (3') • Chairperson Report : Dra. Luh Putu Eswaryanti Kusuma Yuni, M.Sc., Ph.D. (5') • Speech 1. President ARRCN : Dr. Toru Yamazaki (10') • Speech 2. Major Sponsor : Pertamina Geothermal Energy (5') • Speech 3. Dirjen KSDAE as Government Representative : Ir. Wiratno, M.Sc. (10') • Speech and official opening by Rector Unud : Prof. Dr. dr. Anak Agung Raka Sudewi Sp. S (K) – (10') • MOU signing (Udayana University and Dirjen KSDAE) – (10') • Closing MC 	
09.38 – 10.00	Morning refreshment	
10.00 – 12.00	Plenary 1 : Keynote and invited speakers <ul style="list-style-type: none"> • Directorate General of Conservation, Natural Resources, and Ecosystem, Ministry of Environment and Forestry Republic of Indonesia • Wally van Sickle (USA) 	Nusantara Room, Udayana University Sudirman Campus



	• <i>Dr. Dewi M. Prawiradilaga</i> (Indonesian Institutes of Sciences – RCB LIPI)	
12.00 – 13.00	Lunch break	
13.00 – 15.00	Plenary 2: Country Report • Indonesia: Adam Supriatna • Malaysia: Dr. Chong Leon Puan • Philippine: Dr. Alex Tiongco • Mongolia: Prof. Gombobaatar Sundev • Taiwan: Tai-Hua Tsai • Japan: Takehiko Inoue	Nusantara Room, Udayana University Sudirman Campus
15.00 – 15.30	Afternoon break and refreshment	
15.30 – 17.00	Parallel 1	Nusantara room, CTTC room, CIP room, Architecture Landscape room
17.00 – 18.00	ARRCN Annual General Meeting	Nusantara room
18.00 – 19.00	Depart to Cultural Night venue	Garuda Pancasila Garden, Kertalangu Cultural Village
19.00 – 22.00	Welcome Dinner and Cultural Night	

Day 3: Friday, 11 October 2019

Time	Activity	Venue
08.00 – 09.00	Registration and morning refreshment	
09.00 – 11.00	Plenary 3 : Keynote and invited speakers • <i>Prof. Hiroyoshi Higuchi, Ph.D. (Japan)</i> • <i>Dennis J. Salvador (Philippine)</i> • <i>Dr. Syartinilia Wijaya (Indonesia)</i>	Nusantara Room, Udayana University Sudirman Campus
11.00 – 12.00	Parallel 2	Nusantara room, CTTC room, CIP room, Architecture Landscape room
12.00 – 13.30	Lunch break (including Friday Prayer for Moslem delegates)	
13.30 – 14.30	Poster Presentation	
14.30 – 15.30	Parallel 3	Nusantara room, CTTC room, CIP room, Architecture Landscape room
15.30 – 16.00	Afternoon break and refreshment	
16.00 – 18.00	Workshop • Accipiter identification technique (<i>Chuenchom Hansasuta D.D.S.M.S. - Thailand</i>)	CTTC room



	• Raptor rehabilitation program (<i>Zaini Rahman - Indonesia</i>) • Research and Conservation of Birds of Prey by Falconers (<i>Dr. Keiya Nakajima - Japan</i>)	CIP room Nusantara room
18.30 – 20.00	Closing ceremony: • Chairperson's Report (5') • Concluding remarks from President ARRCN followed by handover to the next ARRCN host (10') • Speech from the representative of the 12 th ARRCN Symposium host (10') • Speech from IdOU President to officially close the 11 th ARRCN Symposium (10') Farewell Dinner	Nusantara room

Day 4: Saturday, 12 October 2019

Time	Activity	Venue
08.00 – 17.00	Post-conference event : Field trip to choose • Segi Hill Tour • Buyan Tamblingan Lake Tour • Bali Bird Park Tour	(optional – additional cost will apply)
09.00 – 11.00	Business meeting	BPPS room, Pasca Sarjana Building

Parallel Rooms

Topic	Venue
Forest and raptors	R1 – Nusantara Room
Raptor ecology and climate change	Level 4 Agrokompleks Building
Migration, monitoring and movement	R2 – CCTC Room
Genetics, disease, and rehabilitation	Level 4 Agrokompleks Building
Population dynamics	R3 – CIP Room
Local perceptions, threats and community-based conservation, including ethnobiology	Level 3 Agrokompleks Building
Raptor in human modified landscape	R4 – Architecture Landscape Room, Level 3 Agrokompleks Building
Other Rooms	Venue
VIP Room (transit room)	University Senate Room
BPPS Room (for meeting room or business meeting)	Level 4 Agrokompleks Building
Room 3.10 (for Moslem prayer)	Level 3 Pasca Sarjana Building



ORAL PRESENTATION SCHEDULE

Day 1: Thursday, 10 October 2019 - PARALLEL 1

R1 – Nusantara Room, 15.30 – 17.00 local time

Topic: Raptor ecology and climate change; Forest and raptors

Session 1

No	Time	Presenter	Title
1	15.30 – 15.40	Insan Fahmi	Habitat Preferences of New Occurrence of Javan Hawk-Eagle (<i>Nisaetus bartelsi</i>) on Lowland Forest in Ujung Kulon National Park
2	15.40 – 15.50	Daya Shanker Sharma	Nesting Ecology of Indian Scops Owl (<i>Otus bakkamoena</i>) in Lucknow District, U.P., India
3	15.10 – 16.00	Zan Hui Lee	Surveys of Nesting Peregrine Falcons (<i>Falco peregrinus ernesti</i>) in Peninsular Malaysia

16.00 – 16.15 Discussion

Session 2

4	16.15 – 16.25	Aditya	Suburban Forest as Habitat of Eagles (Accipitridae): A Case Study in Gunung Bromo University Forest, Karanganyar, Central Java, Indonesia
5	16.25 – 16.35	Tedi Setiadi	Where to find the Flores Hawk-Eagle? A Prediction of Suitable Habitat Distribution
6	16.35 – 16.45	Firmann Aldy	Nesting and Chick Development Observations of Changeable Hawk-Eagle <i>Nisaetus cirrhatus</i> in Hutan Raya Djuanda, Northern Part of Bandung, West Java, Indonesia

16.45 – 17.00 Discussion

R2 – CCTC Room, 15.30 – 17.00 local time

Topic: Migration, monitoring and movement

Session 1

No	Time	Presenter	Title
1	15.30 – 15.40	Chuenchom Hansasuta	Raptor Plumage Photographic Analysis
2	15.40 – 15.50	Hansoo Lee	Various Raptor Tracking Results in Asia by Using GPS-Mobile Transmitters

3	15.10 – 16.00	Amarkhuu Gungaa	A Preliminary Result on First Migratory Raptor Count of Songino Mountain in Central Mongolia
16.00 – 16.15		Discussion	

Session 2

4	16.15 – 16.25	Gombobaatar Sundev	Preliminary Results of the Raptor Monitoring at the Choir Wind Farm, Mongolia
5	16.25 – 16.35	Joylyn R. Dayondon	3-year Monitoring of Migratory Raptors during Autumn Season in Glan, Sarangani Province, Philippines
6	16.35 – 16.45	Chien-Hung Yang	Migration Behavior of Eastern Buzzard <i>Buteo japonicus</i> Revealed by GPS-GSM Telemetry
16.45 – 17.00		Discussion	

R3 – CIP Room, 15.30 – 17.00 local time

Topic: Genetics, disease, and rehabilitation; Population dynamics

Session 1

No	Time	Presenter	Title
1	15.30 – 15.40	Anik B. Dharmayanthi	DNA Barcoding of Four Families (Accipitridae, Falconidae, Tytonidae and Strigidae) of Indonesian Raptors Using Cytochrome C Oxidase (COI) gene
2	15.40 – 15.50	Devi Ayu Mandasari	Phylogenetic Study of Changeable Hawk-Eagle (<i>Nisaetus cirrhatus</i>) based on Cytochrome-C Oxidase Subunit I (COI) Gene as One of the Conservation Effort in Genetic Diversity
3	15.10 – 16.00	Jalila Abu	Surgical Management of Malunion Fracture of The Proximal Third of Ulna and Radius in Two Species of Eagle (<i>Nisaetus cirrhatus</i> <i>Limnaetus</i> and <i>Haliaeetus leucogaster</i>)

16.00 – 16.15 Discussion

Session 2

4	16.15 – 16.25	Shiao-Yu Hong	Secondary Poisoning Might be The Reason Caused Black Kites Endangered in Taiwan
5	16.25 – 16.35	Allysa Khanza Artuti	A Phylogenetic Analysis of Crested Serpent Eagle (<i>Spilornis cheela</i>) based on Cytochrome-c Oxidase Subunit I (COI): A Stepping Stone



			towards Genetic Conservation of Raptors in Indonesia
6	16.35 – 16.45	Pramana Yuda	Use of Swab for DNA Sampling from Confiscated Raptors for Molecular Sexing
16.45 – 17.00		Discussion	

R4 – Architecture Landscape Room, 15.30 – 17.00 local time

Topic:
Local perceptions, threats and community-based conservation, including ethnobiology; Raptor in human modified landscape

Session 1

No	Time	Presenter	Title
1	15.30 – 15.40	Usep Suparman	Accelerating the Habitats Restoration of Javan Hawk-eagle (<i>Nisaetus bartelsi</i>) Functions through Proper Management of Landscapes Involving Local Stakeholders in Cibodas Biosphere Reserve, West Java, Indonesia
2	15.40 – 15.50	Premasagar Mestri	Survey, Identification and Protection of Nesting Sites and Food Management are the Key Roles to Restore the Endangered Species of Vultures (Gyps) Species In the Raigad District, India
3	15.10 – 16.00	Fitriana Salehah	Habitat Preference of Sunda Scops-Owl (<i>Otus lempiji</i>) at Universitas Negeri Malang
16.00 – 16.15		Discussion	

Session 2

4	16.15 – 16.25	Aulia Nafi Sentanu	Vegetation Characteristic Around Changeable Hawk-eagle (<i>Nisaetus cirrhatus</i> Gmelin, 1788) Nest Location at Taman Buru Gunung Masigit Kareumbi Tourist Area
5	16.25 – 16.35	Rofifah Aulia Suyitno	Assessing Potential Habitat of Javan Hawk-eagle (<i>Nisaetus bartelsi</i>) Based on Landscape Characteristic in Banten Province
6	16.35 – 16.45	Septi Dewi Cahaya	Nutritional Evaluation of Raptors at Pusat Suaka Satwa Elang Jawa (PSSEJ)
16.45 – 17.00		Discussion	

ORAL PRESENTATION

Day 2: Friday, 11 October 2019

R1 – Nusantara Room

Topic: Raptor ecology and climate change; Forest and raptors

PARALLEL 2 : 11.00 – 12.00 local time

No	Time	Presenter	Title
1	11.00 – 11.10	Radhika Jha	Vulture Habitat Suitability and Impact of Climate Crisis in an Indian Stronghold
2	11.10 – 11.20	Adesh Kumar	Status of Raptor Diversity in Bundelkhand Region, India
3	11.20 – 11.30	Wardi Septiana	Javan Hawk-eagle's (<i>Nisaetus bartelsi</i>) Breed and Behaviour Patterns inside the Nest in Sukamantri Area, Gunung Halimun Salak National Park, West Java, Indonesia
4	11.30 – 11.40	Ferla Zafitri	Patch Habitat Connectivity of Javan-Hawk Eagle (<i>Nisaetus bartelsi</i>) in East Java, Indonesia
5	11.40 – 11.50	Sitta Y. Azizah	Habitat Suitability of Javan Hawk-eagle (<i>Nisaetus bartelsi</i>) in Mount Ungaran, Central Java, Indonesia
11.50 – 12.00		Discussion	

PARALLEL 3 : 14.30 – 15.30 local time

1	14.30 – 14.40	Shakeel Ahmed	Status of Birds of Prey and Owls in Abu Dhabi, United Arab Emirates
2	14.40 – 14.50	Keanu Sitjar	Temporal Distribution of Chinese Sparrowhawk (<i>Accipiter soloensis</i>) in Cape San Agustin, Governor Generoso, Davao Oriental
3	14.50 – 15.00	Tulus Pambudi	Updating Potential Habitat of Javan Hawk-Eagle's in East Java Province, Indonesia
4	15.00 – 15.10	Hery Kusumanegara	Habitat and Behavior of Black-Thighed Falconet (<i>Microhierax fringillarius</i>) in Bali Barat National Park
15.10 – 15.20		Discussion	



R2 – CCTC Room			
Topic: Migration, monitoring and movement			
PARALLEL 2 : 11.00 – 12.00 local time			
No	Time	Presenter	Title
1	11.00 – 11.10	Jia-Jia Lyu	Movement Pattern of Australasian Grass-Owl in Southern Taiwan Revealed by Satellite Tracking
2	11.10 – 11.20	Jo-Szu Tsai	Migration Ecology of Chinese Sparrowhawk in East-Asian Oceanic Flyway Using Satellite telemetry
3	11.20 – 11.30	Hart Suzanne Paja	Flight Behavior of Raptors during Migration in Cape San Agustín, Governor, Davao Oriental
4	11.30 – 11.40	Alex Jacob	Manna from heaven": Is this why Amur Falcon <i>Falco amurensis</i> Stop-over in Nagaland?
5	11.40 – 11.50	Karyadi Baskoro	Raptor Migration Dynamics In Semarang Landscape, Indonesia
11.50 – 12.00		Discussion	
PARALLEL 3 : 14.30 – 15.30 local time			
1	14.30 – 14.40	Lucia Liu Severinghaus	Serial Monogamy of the Lanyu Scops Owl (<i>Otus elegans botelensis</i>)
2	14.40 – 14.50	Muhammad Mulyo	Spring and Autumn Raptor Migration through Pulau Padang and the Kampar Peninsula, Riau
3	14.50 – 15.00	Muhamad Salamuddin Yusuf	Status of Raptor in Batu Hijau, Sumbawa, Indonesia
4	15.00 – 15.10	Luh Putu Eswaryanti Kusuma Yuni	Bird of Prey Migration Watch Festival to Promote Biodiversity and Conservation Awareness among Young Generation in Bali
5	15.10 – 15.20	Jason Teo Jia Hong	Migratory Raptor Counting in Tanjung Tuan, Peninsular Malaysia
15.20 – 15.30		Discussion	

R3 – CIP Room			
Topic: Genetics, disease, and rehabilitation; Population dynamics			
PARALLEL 2 : 11.00 – 12.00 local time			
No	Time	Presenter	Title
1	11.00 – 11.10	Dian Tresno Wikanti	Brief Report on Exposure of Newcastle Disease and Avian Influence Virus on The New Recent Eagle at the Pusat Konservasi Elang Kamojang Seen from the Serological Test of HA / HI ND and AI
2	11.10 – 11.20	Yuli S Fitriana	Phylogeny of Crested Serpent Eagle (<i>Spilornis cheela</i>) Based on DNA

			Mitochondrial Gene with Emphasize on the Utilization of Museum Material
3	11.20 – 11.30	Aditya Kuspriyanga	Breeding Records of Flores Hawk-eagle (<i>Nisaetus floris</i>) at Wolojita, Ende, East Nusa Tenggara, Indonesia
4	11.30 – 11.40	Lim Wen Sin	Increase Barn Owl Population with Mutual Assistance Base for Rat Population Control
5	11.40 – 11.50	Iwan Sunandi	The Population and Homerange of Javan Hawk-Eagle (<i>Nisaetus bartelsi</i>) in Gunung Ciremai National Park, West Java
11.50 – 12.00		Discussion	
PARALLEL 3 : 14.30 – 15.30 local time			
1	14.30 – 14.40	Made Pharmawati	A Study on Amplification of Mitochondrial COI Gene of <i>Nisaetus cirrhatus</i> Gmelin, JF, 1788
2	14.40 – 14.50	Retno Kawuri	The Existence of <i>Escherichia coli</i> and Total Bacteria in Brahminy kite (<i>Haliastur indus</i>) in Bali Birds Park
3	14.50 – 15.00	Tasya Darpen	No Variation in Speed and Accuracy of Raptors toward Prey Target during the Midday and the Afternoon Basic Instinct Show at Bali Bird Park
4	15.00 – 15.10	Abdulsalam, Abdulhamid	Species Diversity of Migratory Raptors in Lavigan, Governor Generoso, Davao Oriental
15.10 – 15.20		Discussion	

R4 – Architecture Landscape Room			
Topic: Local perceptions, threats and community-based conservation, including ethnobiology; Raptor in human modified landscape			
PARALLEL 2 : 11.00 – 12.00 local time			
No	Time	Presenter	Title
1	11.00 – 11.10	Nunik Prabawaningtyas	Successful Hand-Rearing of Javan Hawk Eagle (<i>Nisaetus bartelsi</i>) at Taman Safari Indonesia - Important and Significant Milestones in Chick Development
2	11.10 – 11.20	Hossein Taiyari	Raptors of Iran and the Recent Conservation Efforts
3	11.20 – 11.30	Melany Putri Ariawan	Analysis of Serak Jawa (<i>Tyto alba</i>) feed at the Fields Ecosystem in Cancangan, Yogyakarta
4	11.30 – 11.40	Endah Handayani	Conservation Research: Raptors-Early Education in 3 rd Elementary School in Malang, East Java, Indonesia



5	11.40 - 11.50	Farianna Prabandari	Raptor and Skipjack Tuna <i>Katsuwonus pelamis</i> in the Perspective of Local Fishermen for the Sustainability of Waters Ecosystem Bunaken National Park
11.50 - 12.00		Discussion	
PARALLEL 3 : 14.30 - 15.30 local time			
1	14.30 - 14.40	Hariyawan Agung Wahyudi	Community Based Conservation for Raptors in Mount Slamet, Central Java
2	14.40 - 14.50	Cipta Seutia Nugraha	The Behavior Comparison of the Five Types of Eagles during Rehabilitation at Pusat Konservasi Elang Kamojang
3	14.50 - 15.00	Irhamna Putri Rahmawati	A Community-Based Conservation as a Key for Succeeding Raptor Release Program in Jogja Wildlife Rescue Centre, Yogyakarta, Indonesia: a Crested Serpent Eagle Release at Jatimulyo Village (2019)
15.00 - 15.10		Discussion	

POSTER PRESENTATION LIST

Topic: Raptor ecology and climate change; Forest and raptors

No	Author	Title
1	Sandesh Gurung	Prey Item Selection and Prey Delivery of Indian Spotted Eagle during Chick-Rearing Period in Nepal
2	Kodai Mori	Diet of Osprey in Coastal Area, Japan
3	Kazuto Sato	Analysis of Osprey Hunting Grounds in Dam Lakes by Environmental Characteristics
4	DeAnne Rochelle L. Abdao	Correlation of Diet and Prey Abundance of Philippine Scops Owl (<i>Otus megalotis</i> : Walden, 1875) in the Threatened Species Arboretum, University of the Philippines Diliman
5	Andie Chandra Herwanto	Homerange and Habitat Type Used by Post Released Changeable Hawk-Eagle (<i>Nisaetus cirrhatus</i>) Based on Monitoring Studies Using Satellite Tracker in Yogyakarta
6	Fajar DNA	Population Dynamics of the Javan Hawk-Eagle (<i>Nisaetus bartelsi</i>) at Mt. Picis Natural Reserve and Mt. Sigogor Natural Reserve
7	I Ketut Ginantra	Encounter of the White Breasted Sea Eagle and Brahminy Kite in the Labuan Bajo
8	Sih Kahono	Hunting Behaviour of Migratory OHB to Migratory Giant Honey Bee on Java Island

Topic: Migration, monitoring and movement; Population dynamics

9	Gombobaatar Sundev	The First Pilot Survey of Satellite Tracking Device Use for Raptor Monitoring at a Wind Farm Site in Mongolia
10	Takayuki Sakakibara	Osprey Don't Large Scale Migration in Japan ? : The First GPS Tracking in Japan
11	Lee Lien Wang	Using Occupancy Model to Develop Long-Term Monitoring Program for Forest-Dwelling Raptors in Taiwan
12	Arai Mitsuko	Hawk Migration at Takatouyama, Kitakyushu City, Fukuoka Prefecture
13	Fathur Rohman	Trend of Raptor's Illegal Distribution in the Past Ten Years in Bali
14	Margareta Rahayuningsih	Raptors Record in Mount Ungaran Central Java
15	Toto Supartono	Monitoring of Migratory Raptor Birds in Kuningan District, West Java Province, Indonesia
16	Sudaryanto	The Lone Suren: the Last Tree of White Bellied Sea Eagle Nest in Nusa Penida
17	I Made Saka Wijaya	A Note of Diurnal Raptor Appearance above the Village in North Ceram, Moluccas



18	Santi Ayuningtyas	Does the Bird of Prey Migratory Arrival Correlate with the Temporal Climate at Mt. Segi Karangasem Bali
19	Mahmuddin Rahmadana	Distribution and Population Status of Javan Hawk-Eagle in Bromo Tengger Semeru National Park
Topic: Genetics, disease, and rehabilitation		
20	Worata Klinsawat	DNA Barcoding and Intraspecific Genetic Variation of Migratory Himalayan Griffon (<i>Gyps himalayensis</i>) Populations from Thailand
21	Dian Tresno Wikanti	Quick Brief of Percentage of Eagles that Cannot be Release Compare with the Eagles That Can be Release on Pusat Konservasi Elang Kamojang Garut
22	Atih Sundawati	The Role of the Resort-Based Management Program to Determine the Javan-Hawk Eagle's Monitoring Sites in GHSNP
23	Tri Wahyu Widodo	Javan Hawk-Eagle Release Program at Mt. Picis Natural Reserve and Mt. Sigogor Natural Reserve, East Java
24	Mariana Fikriyanti	Sex Determination of Changeable Hawk-Eagle (<i>Nisaetus cirrhatus</i> Gmelinn 1788) from Pusat Konservasi Elang Kamojang Using DNA Sexing Method
25	Yaman Hidayat	Identification of the Eagle Rehabilitation Process at Pusat Konservasi Elang Kamojang
26	Endah Nur Sya'bani	The Diversity of Eagles Based on Habitat Type in Conservation/ Natural Tourism Park of Kawah Kamojang
27	Made Krisna Ananda	Identification of <i>Falculifer</i> sp. Mite Parasites on Eagles in Captivity Cage of Bali Wildlife Rescue Center
Topic: Local perceptions, threats and community-based conservation, including ethnobiology; Raptor in human modified landscape		
28	Atsuki Azuma	The First International Summit on Grey-Faced Buzzard was Held in Japan
29	Ni Nyoman Sumarlita	The Importance of Introducing the Bird Conservation Education to the Primary School Students through Audio Visual Media, Games and Images Learning
30	Iriani Setyawati	Morphometry of Four Eagle Species from Family Accipitridae at Bali Bird Park
31	Putu Laksmi Candra Dewi	Types of Flying Performed for the Basic Instinct Show at Bali Bird Park
32	Gede Oka Widiyavedanta	Enrichment Variation Provided for the Confiscated Raptors at Tabanan Animal Rescue Centre

PLENARY 1

Conservation Policy on Raptors and Their Habitat in Indonesia

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Indonesia is a mega biodiversity country. It is reflected by the high number of biodiversity across each taxa, including diurnal raptor species. There are 81 species of diurnal raptors with 10 to 17 species among them are endemic to Indonesia. Indonesia is also one of the countries with the highest number of threatened species. To overcome this problem, the government has been working very intense through establishing various appropriate policies, laws, regulations, and conservation actions. Based on Aichi target, the threat of species extinction should be eradicated by the year 2020 and the threatened species' conservation status should be upgraded by then. Two species of raptors, Javan Hawk-eagle and Flores Hawk-eagle, are designated as priority species for conservation action along with 23 others species according to Medium Term National Development Plan of 2015-2019, Strategic Plan of Ministry of Environment and Forestry of 2015-2019, and Strategic Plan of General Directorate of Conservation of Natural Resources and Ecosystem (KSDAE) of 2015-2019. The population of these species should be increased by 10% from its population in 2013 as baseline data. The Ministry has developed a road map to achieve this goal by initiating General Directorate KSDAE decree No. 180/TV-KKH/2015 on assignment of 25 threatened species as conservation priority target to increase the population by 10% in 2015-2019. The Ministry established Javan Hawk-eagle Conservation Strategy and Action Plan (*Strategi Rencana Aksi Konservasi*) in 2013 and had generated promising results as shown by its increasing population. Important lesson learned from Javan Hawk-eagle conservation was applied to develop its sister species i.e. Flores Hawk-eagle's conservation effort. The Ministry along with stakeholders have been developing the Flores Hawk-eagle Conservation Strategy and Action Plan with the intention of implementation in 2020. This document emphasized the important of stakeholders' involvement, good research executions, and practical conservation effort involving species and habitat management and local community empowerment. With this plan being implemented the goal of saving threatened species will be achieved.

Keywords: conservation policy, javan hawk-eagle, flores hawk-eagle, species conservation priority

PLENARY 1

The Value of MZB Collections for Raptor Research and Conservation

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Museum Zoologicum Bogoriense (MZB) under the Research Centre for Biology-Indonesian Institute of Sciences (LIPI), is a national depository for scientific specimen collections of Indonesian fauna. It was established in 1894. Currently, it houses 2,792,611 specimens in which 13.2% (36,845 specimens) are the bird specimens. Among bird specimens, 25.5% (940) are raptor and owl collections. Bird specimen collection is a crucial fundamental for biological or ecological research and serves as a library of bird diversity. The research topic includes bird taxonomy, systematics, zoogeography, geographic variation, anatomy and morphology, sexual dimorphism, age or gender characters, moult and plumage sequences, population biology and genetics, time of reproduction and migration. In terms of conservation, accurate identification of a species is important for establishing priority. Specimen data on distribution, habitat, diet and breeding can be used to assess former and current status of threatened species. Recently, specimen collection is also used for forensic analysis of illegal bird or parts of bird trade. Indeed, that the value of specimen collection depends on the information contained on its label and extra records on the field notes of the collectors. Old specimen collections have at least data on precise locality, date of collection, sex and name of collector. However, current specimen collections usually have additional data such as elevation and coordinates, reproductive condition, subcutaneous fat level, body mass, degree of skull ossification as an index of age, presence and size of the bursa of Fabricius for age index, colours of those parts of specimen that disappear or change after death etc. and accompanied by various material such tissue sample, blood smears for blood parasite analysis and other necessary data. So far, the specimen collection of raptors and owls at MZB have been used for research on taxonomic status of Flores Hawk-eagle (*Nisaetus floris*), research on phylogeny of Crested Serpent-eagle (*Spilornis cheela*), learning to sex the Javan Hawk-eagle and identify migratory raptors, description of new species of owls and producing a guide book for raptor monitoring.

Keywords: Museum Zoologicum Bogoriense, raptor conservation, raptor research, specimen collection

PLENARY 2 : COUNTRY REPORT

Raptors in Indonesia: Current Status and Conservation

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There are 72 species reported in Indonesia consisting of sedentaries, migrants and vagrant. Regularly, migratory raptors visit Indonesia through the East-Asia Continental Flyways and the East-Asian Oceanic Flyway. Oriental Honey Buzzard *Pernis ptilorhynchus orientalis*, Chinese Goshawk *Accipiter soloensis* and Japanese Sparrowhawk *Accipiter gularis* are among common migrants to Indonesia. In terms of endemism, 18 out of 72 are known as endemic species in Indonesia. Unfortunately, due to habitat loss and illegal hunting, currently 12 species in Indonesia are threatened by extinction. Among notable species are Flores Hawk Eagle *Nisaetus floris* (Critically Endangered) and Javan Hawk Eagle *Nisaetus bartelsi* (Endangered) as stated by International Union for Conservation of Nature (2019); whereas, Bawean Serpent-eagle *Spilornis cheela baweanus* being Critically Endangered as suggested by Global Raptor Information Network (2019). This paper will present status and conservation of all species concerned as summarized in Redlist, IUCN (2019) as well as summarized from direct field observations and published and unpublished literatures available.

Keywords: status, conservation, raptor, migration, threat.

PLENARY 2 : COUNTRY REPORT

Current Status of Raptor Research in Malaysia

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In Malaysia, the majority of raptor studies have been started about 15 ago. Despite this, nearly 80% of the resident species are still understudied. There are relatively more published works on nocturnal than diurnal species and most research were conducted in Peninsular Malaysia. After a ten-year gap, the distribution of Peregrine Falcon (*Falco peregrinus ernesti*) on limestone hills in Peninsular Malaysia has been reassessed. In Perak state, detailed information on cooperative breeding and feeding behaviour of Black-thighed Falconet (*Microhierax fringillarius*) and nesting of Grey-headed Fish-eagle (*Ichthyophaga ichthyaeus*) have been collected since 2008. For migratory raptors, shorter spring migration counts covering two-weeks at Tanjung Tuan in Malacca state have continued for the past three years due to financial and manpower constraints. In the case of nocturnal raptors, there has been an increase in ecological research on the Malaysian owls over the past five years ranging from density, vocalisations, ranging behaviour to influence of environmental variables on species assemblages in agro- and natural ecosystems. It has been demonstrated that owl species that are associated with forest habitats may not able to thrive in man-made habitats. Many potential studies await to be carried out on raptors of Malaysia especially the diurnal species.

Keywords: raptor, cooperative breeding, feeding behaviour, species assemblages, Malaysia.



PLENARY 2 : COUNTRY REPORT

Raptor Migration in the Philippines

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Raptorwatch Network Philippines

The Philippines is a small country with only about 300,000 sq. miles area but it has 7,600 islands spread over 1,120 miles length and 660 miles width. Discovering raptor migration routes and roosting areas is a formidable undertaking if done by just one organization. Together with the ARRCN and its allied partners in Japan, Raptorwatch Network Philippines believes that in order for its raptor study and conservation projects to succeed, there must be not only community involvement and empowerment but the projects must be lead and planned by the community itself in partnership with Raptorwatch Network Philippines. So far since 2013 we have as active partners:- 6 local government units, 2 national government units, 3 universities, 1 local college and 1 Science high school, all doing study, conservation and livelihood work in 4 active areas. For Autumn Migration - before the raptors leave the Philippines for Indonesia: 1) Cape San Agustin, Governor Generoso, Davao Oriental. Our raptor studies here have been augmented by sustainable reforestation livelihood project. We are now involved in the town's almaciga reforestation project of the buffer zones of Mt. Hamiguitan which is a Unesco World Heritage Park; 2) Cross/Rio del Pilar, Glan, Sarangani. Our partners the Environmental Conservation and Protection Center of the Office of the Governor have been conducting studies on this site for the last 4 years. In 2018, this site was declared an Important Avian migration Flyway by the National Geographic. Last year our partners organized a Raptorwatch and Reforestation Festival held in October. The second festival will be celebrated in the last week of October this year. For Spring Migration - before the raptors leave the Philippines for their breeding areas in the Palearctic: 1) Pancian, Pagudpud, Ilocos Norte. Our partners here, the Northwestern University had been at watch with us for the last 4 years. In 2018, Pagudpud had been declared also as an Important Avian Migratory Flyway by the National Geographic in 2018, purely because of our studies. This year our partners have started exploring southwards in the hope of tracing the routes and finding other roosting areas for conservation and protection; 2) Sanchez Mira and Pamplona, Cagayan Valley. In 2013, we discovered this area to be an important spring migration roosting site for Grey-faced Buzzards. In 2014 we started the campaign against hunting with the hunters and town officials. Unfortunately, we were met with great hostility. We changed our tact and spoke to the university students instead. Together with the ARRCN, for 3 years, we organized mini seminars on Raptor studies and conservation for the students. In 2017 the town mayors decided to support our conservation campaign and hunting was essentially stopped that year. In support of the campaign, ARRCN brings ecotourists from Japan annually. We are also looking around for outside support on the local cottage industry to augment the town's livelihood program. Plans for the future: 1) For 2020 we intend to start a raptorwatch site at Santa Ana, on Cagayan Valley, the eastern seaboard of the Philippines following the long Sierra Madre ranges; 2) Another major project for 2020 is to establish a watchsite at Bo. Inaban, Tikwi, Dupax Norte, Nueva Viscaya. We have reports that there is hunting going on here. We have already contacted our partners in conservation - the Department of Tourism and the DENR for assistance in our drive. We shall be needing your support on this matter.



PLENARY 2 : COUNTRY REPORT

The Status, Population Threat and Conservation of Raptors in Mongolia

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A total of 44 species of raptors belonging to 3 families and 17 genera are recorded in Mongolia. Out of 44 species of raptors, 27 (61%) are Breeding Visitor (BV), 4 (9%) Resident Breeder (RB), 26 (59%) Passage Migrant (PM), 4 (9%) Summer Visitor (SV), 2 (5%) Winter Visitor, and 7 (16%) Vagrant (VA). From this analysis suggests that Mongolia is an important country for migratory raptors in Asia. Raptor biologists published many important references that particularly focused on the taxonomy, species assessment, population, habitats, breeding ecology, migration, threats and conservation actions of all occurring raptors in Mongolia in different languages. Of 44 species of raptors, 2.3% have particular references on taxonomy, 11% population, 16% habitats, 20.5% breeding ecology, 16% migration, 13% threats, and 4.5% conservation actions. This shows that population estimation and conservation actions for raptor species in Mongolia are needed to improve in the near future. According to the national species assessment by IUCN criteria conducted in 2009, 3 species (6.8%) of raptors were assessed as Endangered (EN), 3 species (6.8%) Vulnerable (VU), one species (2.3%) Near Threatened (NT), 24 species (54.5%) Least Concern (LC), 8 species (18.2%) Not Applicable (NA), and 5 species (11.4%) Data Deficient (DD). Of these, the Short-toed Snake-eagle, Greater-spotted Eagle, and Pallas's Fish Eagle were assessed as Endangered whilst the Bearded Vulture, Eastern Imperial Eagle and Saker Falcon were assessed as Vulnerable. Based on analyses of the National Red List in 2011, dominant threats to Mongolian raptors which are affecting all species are: tree cutting (11.8%), transport (9.7%), mining (9.2%), poisoning (9.2%), tourism (8.8%), fire (8.8%), pylon and building collision (8.4%), predators (8.4%), drought (8.0%), shooting (6.3%), and other (habitat loss and degradation, pathogens or parasites, hydroelectric dams, water pollution, and entanglement with fishing lines and ropes: 11.3%). According to the IUCN Global Assessment, 1 species (2.3%) is Endangered (EN), 5 species (11.4%) Vulnerable (VU), 3 species (6.8%) Near Threatened (NT), and 35 species (79.5%) Least Concern (LC) within all occurring species in Mongolia. The species richness of raptors in the country differs by habitats and natural zones. The reason for high richness of threatened raptors in particular areas is associated with habitat diversity (forest, forest steppe, mountain steppe, river valleys, and high mountains) and global migration flyways that passes through the areas. National and international organizations including ARRCN shall collaborate on the species assessment of raptors in Asia using IUCN red list criteria and will initiate management projects on population threats to raptors at regional and country (Mongolia) levels.

Keywords: Mongolia, raptors, Choir wind farm, collision risk, mitigation



PLENARY 2 : COUNTRY REPORT

Current Raptor Conservation in Taiwan

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More than 663 species of birds have been recorded in Taiwan with 34 diurnal and 13 nocturnal raptor species. Booted Eagle (*Hieraaetus pennatus*) was the most recent raptor added to the list at Kinmen in 2018. Taiwan is located in the middle of the East-Asian Oceanic Flyway. We keep monitoring numbers of migratory raptors from September 1st to October 30th every autumn at Kenting National Park on the southern tip of Taiwan since 2004. Researchers counted 187,599 Chinese Sparrowhawks and 59,803 Gray-faced Buzzards during 2018. Numbers of individuals for both species were much higher than historic average (2004-2017) and the numbers of Gray-faced Buzzards set the new record since 2004. A first ever satellite tracking project of Chinese Sparrowhawk was started in spring 2016 and a total of 14 individuals were tagged since. The satellite-tracked Chinese Sparrowhawks wintered in Negros, Mismis Occidental and Sarangani provinces in the Philippines, and Gorontalo, Central Sulawesi, South Sulawesi and Moluccas in Indonesia and then back to Shandong, Jiangxi, Henan and Zhejiang provinces of China in spring. For the resident raptors of Taiwan, the population of Black Kite has been declined in the past decades. In order to monitor the numbers of Black Kites in Taiwan, we coordinated synchronized count of Black Kite at roost sites every fall and winter at 10+ locations since 2013. There were about 600 individuals in Taiwan during 2016-2018 that suggested the population maintain steadily. National Pingtung University of Science and Technology bird ecology lab reported that the rodenticide was found in the raptor corpses and this may be linked with the rodenticide providing policy for public health in Taiwan. The results from this research provide a powerful evidence to stop the rodenticide providing policy. RRGIT managed the Facebook group to collect Black Eagle data and it is a good tool to study the species which is hard to survey. We hold the Workshop about Black Eagle Survey Techniques and Results in 2018 and about 100 people joined. Crested Goshawk breed at the urban environment in Taipei city was recorded since 2009. They nested in the parks, schools, even in street trees in the city. We broadcasted the nest on Youtube, which provided opportunities to people to participate in breeding data collection and also be a good media for raptor conservation education. From 2017, RRGIT started to provide professional rescue and rehabilitation services for raptors in need. There were 118 cases in Northern Taiwan in 2018 and most of them were Crested Goshawks and Collared Scops-Owls. Car accidents, glass hitting and fledglings are the reasons why they came to the rescue centre.

Keywords: Taiwan, Raptor, RRGIT, Black Eagle, Rescue centre

PLENARY 3

Migration and Conservation of Raptors in East Asia

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Since 2002, my colleagues and I have satellite-tracked the migration of raptors from Japan. The species include Oriental Honey-Buzzards, Grey-faced Buzzards and Rough-legged Buzzards. The results showed the general migration routes, the differences in seasons and years, habitat use, and locations of important sites. We used the results to study the site fidelity for each individual, the relationship with weather conditions, conservation issues along the migration routes, and the potential impact of climate change. Oriental Honey-Buzzards (OHBs), a well-studied species, had very detoured migration routes, and migrated through all the East Asian countries during the whole migration of fall and spring. In fall, they crossed the East China Sea to reach the east coast of China, and continued migration down to Indonesia and the Philippines. In spring, they did not cross the East China Sea, and instead, went up to the base of the Korean Peninsula, coming down there to reach Kyushu, southern Japan. The seasonal migration differences were related to the weather conditions on the East China Sea. Tail winds from the east prevail on the sea in fall, which is suitable for OHBs to cross the sea, while weather conditions are unstable there in spring, and it is dangerous for OHBs to cross there. All the individuals had stopover sites in southeastern Asia only in spring, which suggests that more energy is needed to finish longer spring migration for breeding in Japan. The migration routes of Grey-faced Buzzards were simpler than those of OHBs, but differed by the breeding localities. Grey-faced Buzzards breeding in central and northern Japan commuted between the northern breeding and the southern wintering areas of Japan, while the buzzards breeding in southern main island of Kyushu migrated down to the Philippines in fall, went up to Taiwan in spring, and then crossed the sea to reach the mainland China. Their further spring migration routes are not well known, so far. We succeeded in tracking Rough-legged Buzzards that visited Japan as irruption in winter, and showed that they migrated north in spring following the retreat of snow in Siberia. Regarding the impact of climate change, weather models and simulations have predicted that OHBs may lose suitable fall migration areas in the East China Sea after 70-80 years from now.

Keywords: East Asia, conservation, migration, raptors, satellite-tracking



PLENARY 3

Death by a Thousand Cuts: Human Persecution of the IUCN "Critically Endangered" Philippine Eagles in the Republic of the Philippines

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A retrospective study was conducted to identify the extent of human induced mortalities and morbidities among Philippine Eagles *Pithecophaga jefferyi*, an IUCN "critically endangered" species that is endemic to the Philippines. The study included 77 birds that were admitted to the former Philippine Eagle Research and Nature Center (1970-1987) and the Philippine Eagle Center (1988-present), 11 eagles that were released in the wild after rehabilitation and 10 free-living eagles studied using radio and GPS-based telemetry from 2008-present. Of the 77 admitted at the PERNC and PEC, 16 (20.8%) were reportedly hand-captured, 2 (2.6%) were poached and sold, 20 (26.0%) were shot, 9 (11.7%) were trapped, 5 (6.5%) were removed from the nest, while 25 (32.5%) had unknown circumstances of capture. Forty-five (58.4 %) of these eagles have died, with 25 (55.6 %) of these deaths happening within the first six months of admission at the center, primarily due to either (i) trauma, (ii) organ failure and metabolic & nutritional diseases, or (iii) infectious diseases. Out of 11 eagles that was released after rehabilitation at the PEC, 3 (27.3 %) died of gunshot while 1 (9.1%) bird died of wound infection as a result of illegal trapping. Out of 10 free-living birds that were studied using telemetry, two died from gunshots while two died from accidental trapping in native snares. Two cases of accidental electrocution were also documented. Our results underscore the important role of wildlife law enforcement in conserving the Philippine eagle, in concert with other outcome oriented strategies.

PLENARY 3

An Assessment of the Current Habitat Distribution and Population Size of the Javan Hawk-Eagle in Java Island

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Javan Hawk-eagle, JHE (*Nisaetus bartelsi*) is Indonesian endangered raptor on remaining natural rain forest in Java, Indonesia. JHE has been designated as one of the 25 top priority protected species to be increased by 10% of current population size in 2019. Unfortunately, information of the current habitat distribution still lack for evaluating the increasing of population size. Since the last predicted habitat distribution and population size were done based on habitat distribution model only and very few validation. Therefore it is necessary to update the habitat distribution model and do more validation so that it can be distinguished, which is the actual or potential habitat patches. This study presents an assessment for updating the current habitat distribution of

JHE and their population size. The current habitat distribution was obtained from combining the updated probability model of logistic regression and the information from local society/NGOs. Then, population size was assessed only on actual habitat patches that are validated with ground truth checking data in order to reduce the errors. Currently, suitable habitat is covered about 10910.18 km² (69 patches) throughout Java Island and the largest distribution were in East Java (41.71%) then followed by West Java (32.38%), East Java (13.85%), and Banten (12.06%). About 34.55% (3769.54 km²) of those areas located inside the protected area, while 65.45% (7140.65 km²) located outside the protected area. Habitat patches were located mainly in the mountainous and high elevation areas, but recently there were habitat patches detected in the low land forest such as Ujung Kulon National Park, Alas Purwo National Park, Meru Betiri National Park, and Baluran National Park. About 35 habitat patches (10191.13 km²) were actual habitat, which is validated with ground truth check and the presence of JHE. Meanwhile, 34 habitat patches (719.06 km²) were identified as potential habitat and no validated yet. The estimated number of JHE pairs based on actual habitat would place the population size about 511 pairs. It can be concluded that in the period of 2002-2019 there has been a very significant increase in suitable habitat that is 7803.19 km² or 251% and an increase in population size of 186 pairs or 57.2%. The results of this study will be used as the baseline information for monitoring and evaluation of the 2013-2022 conservation strategy and action plan (SRAK) document that will be updated.

Keywords: *Actual habitat, Logistic regression, Nisaetus bartelsi, Patch, Potential habitat, Population size.*



WORKSHOP

Accipiter Identification Workshop for Counters

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Migration of accipiters along East Asian–Australasian Flyway is both spectacular and confusing. Part of the confusion comes from plumage changes as a bird grows up. Juvenile accipiters are the most difficult raptor to identified in field. But if you can, you will start to see interesting patterns. Counters who can identify them down to age, sex, and subspecies enjoy the facts more. The 11th Asian Raptor Research and Conservation Network Symposium will be an opportunity for us to share our counting experiences in this workshop. Photographic record of flight feathers of a bird can be analysed in the same ways that a dentist analyses successive radiographic records of a patient without clinical examination. What used to be seen only by an ornithologist looking at a bird in hand is now can be seen in bird-in-flight photographs with good angle and enough resolution. I will present participants of the workshop sets of photographs of migratory accipiters. Participants will see how to age and sex them before identify them. Then we will analyse field photographs taken by participants together. Workshop participants need to register in advance by email to chuenchom.h@gmail.com and receive instruction on how to crop and label your samples. Participation is free of charge and you are not donating your photographic files automatically. Of course, I will be grateful for participants of future workshops if you want to donate after this workshop. Let's gain more information for Asian Raptor Research and Conservation Network by better identification.

Keywords: accipiter, identification, species, age, sex, east asian-australasian flyway

WORKSHOP

Research and Conservation of Birds of Prey by Falconers

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Falconry is traditional hunting art that trained birds of prey are used to catch quarry. It is a worldwide culture that is recognized by 19 countries as Intangible Cultural Heritage of UNESCO (<https://ich.unesco.org/en/RL/falconry-a-living-human-heritage-01209>). Wild birds of prey were used for falconry in the traditional style. Recently, it is not promoted in many countries by the policy of conservation of wildlife. Besides, falconry is prohibited in some countries. Actually, some traditional falconry birds are listed to the Red List by IUCN as Endangered species. Conservation of raptor species is basic issue for falconry community. Falconry is not only hunting method. Falconer's knowledge is an advantage for the conservation of birds of prey. Captive breeding for restoration project or rehabilitation of injured bird are typical examples of contribution by falconer who has skill to manage live birds. In addition, falconers in local area know the situation of the environment or ecosystem in the area. The observation result is useful for the research or conservation of endangered species regardless of whether it is raptor species for falconry or not. Following topics will be presented in the workshop to show examples of



The 11th Asian Raptor Research and Conservation Network International Symposium, Bali - Indonesia | 10-11 October 2019

conservation works by falconers. This workshop will be a good opportunity to know falconry that has potential of conservation of wild birds of prey.

- Introduction of falconry and conservation (Keiya Nakajima). Falconry and advantage of falconer's knowledge are not well known in the modern world. Outline of them is introduced before other presentations.
- Prevention of electrocution of Saker Falcon (*Falco cherrug*) in Mongolia (Otgonsaikhan Dorjsuren). There is severe problem that huge number of Saker Falcon is killed by electrocution on power line in Mongolia. Falconer in Mongolia used their initiative to save Saker Falcon by "Hand to Help" project. Falconers in many countries supported the project by donation. Situation of electrocution and the result of improvement are reported.
- Falconry and technological advances in the rehabilitation of birds of prey (Michael Calvin). Rehabilitation is important step to check the condition of recovered birds of prey from injury. Confirmation of hunting ability is also included in the rehabilitation with falconry technique. It is helpful to prevent the starvation of birds that was released back to wild after recovery. Advanced technology is also used for the rehabilitation in addition to traditional method.
- Field research of Mountain Hawk-eagle (*Nisaetus nipalensis orientalis*) in Japan (Keiya Nakajima). Continuous observation of wild birds of prey in specific area is useful to know behavior of birds in long period such as total number of breeding in their life. The observation result is provided to environmental assessment, if it is asked by other groups. Falconer knows basic character of birds of prey. The knowledge is helpful to prevent negative impact by development project or using of new product (e.g. drone) in the habitat of birds of prey.

Keywords: falconry, falconer, conservation of birds of prey, electrocution, rehabilitation

WORKSHOP

Management of Confiscated Eagles in Indonesia: Case Study at Kamojang Raptor Center

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PURWANTONO

Nature Resource Conservation Agency of West Java

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One of the problems to conservation of raptors in Indonesia is poaching eagles for illegal trades and keeping. Therefore, Indonesian Ministry of Environment and Forestry cq Nature Resource Conservation Agency of West Java (BKSDA JABAR) in collaboration with Raptor Indonesia (RAIN) and PT Pertamina Geothermal Energy had been establishing Kamojang Raptor Center



The 11th Asian Raptor Research and Conservation Network International Symposium, Bali - Indonesia | 10-11 October 2019

(Pusat Konservasi Elang Kamojang) in 2014. The main program of this center is to rescue and rehabilitate confiscated eagles before returning them to the wild. The scheme for management of confiscated eagle at Kamojang Raptor Center had been referred to IUCN Guideline for Placement of Confiscated Animals and IUCN Guideline for Reintroduction and other Conservation Translocation, while the facilities are referred to Indonesia regulation for Conservation Agencies (P.22/2019), also to the minimum standard for Wildlife Rehabilitation provide by International Wildlife Rehabilitation Council. Since establishing, this center was received 239 confiscated eagles and 46 of them had been released, 126 are in rehabilitation process and 67 were died due to medical problems (heavy injured and virus infected). Post-release monitoring was carried out that 74% of released eagles (34 individual) are survived, we classified the survival rank into breeding success (11%), occupying a new territorial (26%) and adaptation in new location (37%). However, 26% of released eagles (12 individuals) are failed with classified into recaptured (4%), died (13%) and unknown (9%).

Keywords: confiscated animals, raptors, Kamojang Raptor Center, return to wild, survival ranks

ORAL PRESENTATION ABSTRACTS

Topic: Raptor ecology and climate change; Forest and raptors

Habitat Preferences of New Occurrence of Javan Hawk-Eagle (*Nisaetus bartelsi*) on Lowland Forest in Ujung Kulon National Park

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Ujung Kulon National Park (TNUK) uses camera trap to help monitoring the occurrence of javan rhinos (*Rhinoceros sondaicus*) but the result showed many species were recorded included unexpectedly javan hawk-eagle (JHE). JHE is a rare endemic raptor species that was previously suspected could be found only on highland forests such mountain forests. The new occurrence of JHE in TNUK proved that JHE can be found not only on highland forest but on lowland forest too in Java Island. Based on the result of camera trap that recorded the occurrence of JHE, observation and analysis were done around the location of the camera trap to get informations about JHE's behavior against landscape where it were. Observation was done to get informations of landscape characteristics around encounter locations. The results of observation were used to validate the previous JHE's habitat distribution modelling too. Vegetation analysis was done to get Important Value Index (IVI) and diversity index that represented plants species domination. The results of analysis and observation distinguished JHE's habitat into two habitat preferences based on JHE's behavior. Observations indicated that on TNUK lowland forest, the JHE hunted and nested around Cigenter River and it tributary with sloping ground. For hunting, JHE preferred habitats with dominance of trees that were used by species were constituted JHE's prey. JHE was observed hunting a juvenile langur which usually eats fruits of salam (*Syzgium polyanthum*) that had 88,97% IVI. For nesting, the JHE preferred habitats with existence of emergent trees combined with fruit-producing trees. JHE's nest found on the top of Kiara (*Ficus gibbosa*) tree which had 40 meters height from the ground. Nesting habitat had higher diversity index for higher tree than hunting habitat had.

Keywords: Habitat preferences, lowland forest, *Nisaetus bartelsi*, Ujung Kulon National Park

Nesting Ecology of Indian Scops Owl (*Otus bakkamoena*) in Lucknow District, U.P., India

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A detailed investigation of the nesting ecology of Indian Scops Owl was carried out from 2016 to 2019 in Lucknow district. Scops owls belong to family Strigidae. They prefer areas which exhibit old trees with hollows and prey upon insects, reptiles, small mammals such as bats and mice and other small birds. To assess Indian Scops Owl habitat, line transect surveys were conducted within the study area. On an average, four transects were carried out each month



between March 2016 to April 2019. The surveys were carried out on consecutive nights. During the study, 21 nests were found and it was observed that the majority of the nests were located in tree cavities, especially in old Neem (*Azadirachta indica*), Khair (*Senegalia catechu*) and Cluster Fig (*Ficus racemosa*) trees. Some of the nests were also found in a dead tree. The average cavity dimension was 16 x 25cm long and depth was 25cm. The average nest height was 3.6 m from the ground and size of the nest entrance was 17cm x 31cm. The majority of the nests were located near agricultural land where owls can easily access their prey, which comprises mostly of insects. The clutch size was 2-4 and hatching rate was 61%. The nesting success was 57% (12 of 21 nests). These figures indicate that Indian Scops Owls' population in the study area is viable.

Keywords: scops owls, tree cavity, nest, nesting, average.

Surveys of Nesting Peregrine Falcons (*Falco peregrinus ernesti*) in Peninsular Malaysia

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Despite the peregrine falcon's worldwide distribution, hardly any information on its ecology in the tropics is available. Population studies by Molard et al. (2005, 2007) on the resident subspecies (*Falco peregrinus ernesti*) in Peninsula Malaysia, are fairly exceptional in this respect. Given the falcon's cliff-nesting behaviour, Molard identified 19 occupied sites in this region. Building upon on this foundation, Malaysian Nature Society-Perak carried out three surveys between 2017 and 2019. The three surveys were carried on January during the courtship period of peregrine falcon in Peninsular Malaysia, when active vocalization and flight display improve the likelihood to confirm previously known and identify new pairs. The surveys aimed for a country-wide coverage, and a total of nearly 100 potential cliffs were surveyed, which included all sites known from past studies and other naturalists in the region. Overall, a total of 17 new breeding sites were discovered, increasing the total number of known nesting sites stands at 36 now in Peninsular Malaysia. Cliff habitat in this region mainly comprises limestone outcrops, which are increasingly threatened by quarrying for cement and gravel production. Identifying occurrence of nesting and obtaining conservation status for this unique habitat, as well as toward a clearer population survey are important to ensure viability of the locally breeding peregrine falcons in Malaysia. Being one of few population studies of peregrine falcon in tropical area, this volunteering survey is an ongoing effort and more researches are planned for the coming years.

Keywords: Peregrine Falcon, nesting survey, limestone, community volunteering, Peninsula Malaysia



Suburban Forest as Habitat of Eagles (Accipitridae): A Case Study in Gunung Bromo University Forest, Karanganyar, Central Java, Indonesia

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The abilities of an ecosystem will decrease when fragmentation occurs, just as like eagles (accipitridae) is sensitive to against environmental disturbance such as fragmented environment. Gunung Bromo University Forest is totally fragmented suburban forest located only 7 km from center of city on Subdistrict of Karanganyar, Central Java. The forest area covers 120 ha, production forest with dominated vegetation by Merkus's Pine (*Pinus merkusii*), Mahogany (*Swietenia* spp.), Indonesia Rosewood (*Dalbergia latifolia*), Cotton Trees (*Bombax ceiba*), Laban (*Vitex pinnata*) and Figs (*Ficus* spp.). Gunung Bromo University Forest is bordered by rubber plantations, sugar cane fields, residential settlements and Tirtomarto Reservoir. There are two species of eagles is known on there namely Changeable Hawk-eagle (*Nisaetus cirrhatus*) and Crested Serpent-eagle (*Spilornis cheela*). This study aims to explain the forest in Gunung Bromo as habitat of the these two species of eagles. The research method used is case study, monitoring presence of eagles and literature review. Potential of prey for two eagles that can found is 6 species of snakes, 8 species of amphibians, 5 species of lizards, 34 species of birds, and 3 species of small mammals. Inactive eagle's nest also found in there forest. The shape of nest is a big circle with neat plaits created from branches placed in the upper canopy of a cotton tree. The nest presumed used by Changeable Hawk-eagle. The study also noted the competitor of eagles in forest such as White-breasted Woodswallow (*Artamus leucorhynchus*) often aggressively mobbing the Crested Serpent-eagle and Changeable Hawk-eagle when soaring. Threats for conservation of eagles in the forest are illegal hunter and noise from voice of visitors's motocross.

Keywords: Accipitridae, Human-modified Habitat, University-Forest, Raptor

Where to Find the Flores Hawk-Eagle? A Prediction of Suitable Habitat Distribution

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Flores Hawk-Eagle *Nisaetus floris* currently is listed as one of the most endangered raptors across the globe. Only recently, a comprehensive conservation approach led by Ministry of Environment and Forestry is launched through the arrangement of Conservation Strategy and Action Plan. Information on its bio-ecology is still limited, specifically on its distribution across its range. Data



on distribution range is fundamental to achieve the conservation goal. Current distribution of Flores Hawk-Eagle comprises of mostly the main island of Lesser Sunda region i.e. Lombok Is., Sumbawa Is., and Flores Is. (including Alor Is.), except Sumba Is and Timor Is. However, information on detailed distribution within its range is incomplete. Therefore, in this study we modelled the distribution of suitable habitat of Flores Hawk-eagle in order to produce potential distribution map, to design further research sites, and to propose new conservation area to protect this eagle in the region. We applied species distribution model based on presence-only data to generate species' potential habitat suitability distribution. Models were developed using maximum entropy (MaxEnt). We used 20 environmental variables encompassing temperature, precipitation, altitude, along with species locality records across current distribution. The distribution models showed three suitability habitat categories, i.e. high suitability habitat around current distribution e.g. Mt Rinjani NP, western part of Flores Is., around Kelimutu NP, and Alor Is.; high suitability habitat beyond current distribution on its range, e.g. around Mt. Tambora NP, Mojo Is., and several patches on eastern part of Flores Is.; and weak suitability habitat inside current distribution and outside current distribution range e.g. small fragment on western part of Sumba Is. and several small fragments on Timor Is. These findings are important for further action such as priority site for field survey and other conservation initiatives.

Keywords: *Accipitridae, MaxEnt, Lesser Sunda, conservation area.*

Nesting and Chick Development Observations of Changeable Hawk-Eagle *Nisaetus cirrhatus* in Hutan Raya Djuanda, Northern Part of Bandung, West Java, Indonesia

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Nested patterns of changeable Hawk-Eagle *Nisaetus cirrhatus* have been observed in Hutan Raya Djuanda, northern part of Bandung, the location is at position 107°30' East Longitude and 60°52' South Latitude. Observations have been carried out from January to September 2017. Using the point focus sampling method, with 8x30 nikon binoculars and 600mm monoculars, shooting using a Nikon D 800 camera with a 600mm f4 lens plus 2x Telle-Confiter. The position of the nest is at an altitude with an estimated 40-45m, in the formation of the Pine trees (*Pinus merkusii*) forest community. Vertical nest tree on the slope contour 60°, is the tallest tree. The nesting pattern begins with nest making behavior for about one month, egg incubation is carried out for 46 days, followed by nurturing and protecting the territory to protect the chick from the threat of predators with alarm calls. The following stages of chick development at 1-3 weeks the chick only sleeps and eats fed by its mother, at the age of 4-5 weeks chick start walking and flapping wings and jumping, at 6-9 weeks chick flap their wings and jump into branches another distance of 5-10m and 20m., at 10-11 weeks the chick flies a distance of 50m-100m and starts learning to eat alone, at 12-13 weeks the chick can fly a distance of 200m, at 14-15 weeks the chick flying more than 300m and learning to hunt. baits that are observed to be delivered by male or female parents for chick care include; squirrels, mice, lizards, chameleons, quails, pigeons and chickens.

Keywords: *nesting pattern, Changeable Hawk-Eagle, chick development, chick activity, feeds*



Vulture Habitat Suitability and Impact of Climate Crisis in an Indian Stronghold

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Vultures provide invaluable ecosystem services and play an important role in ecosystem balancing. India is home to nine vulture species among which the natives are threatened. Numbers of these species had declined due to many factors including Diclofenac use. Since the drastic decline was reported in vultures of the Indian subcontinent, the present study was carried out in a vulture stronghold of India. The ongoing climate crisis may cause change in habitat suitability and impact the existing population. The objective of the present study is to predict habitat changes in the short- and long-term using Species Distribution Model. MaxEnt software was chosen. We attempted GCM ensemble (CCSM4, HadGEM2AO and MIROC5). Ten models were made using data from over 900 locations of 7 vulture species over two seasons together. They were found to be robust (AUC 0.864 - 0.892). We used different climatic and environmental variables. Environmental variables were used only to predict the current habitat but could not be incorporated in future models since they themselves are dynamic and needed future predictions. Most important variables influencing the distribution were Isothermality, Precipitation seasonality, Precipitation of warmest quarter, Mean Temperature of coldest quarter and Mean temperature of driest quarter. Forest and water bodies were the major influencers in the current prediction of habitat (landuse-landcover). ArcGIS was used for area calculation. Extremely suitable area decreased over time as compared to the present-day data. Data generated can be used in conservation planning and management and thus saving the vultures from any future threat.

Keywords: *Species Distribution Modelling, MaxEnt, Central India, Short term, Long term, Area loss*

Status of Raptor Diversity in Bundelkhand Region, India

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People have attributed cultural significance to birds of prey for millennia. Despite this, it is likely that predatory birds have been victimized at least since people began rearing livestock and managing game. The declining raptors population from last few decades has attracted many biologists to find out the exact reason of sudden decline of their population. The most alarming



example is the Bundelkhand region which constitutes some of the districts of both Madhya Pradesh and Uttar Pradesh, within the boundaries of India. A study was carry out to assess the distribution and status of raptors in Bundelkhand region of India from January 2015 to June 2018. Survey is being carried out on foot or vehicle according to the area. In this study three main methods are used for the census of breeding raptors: (i) line transects for surveying small areas on either side of a road; (ii) point count surveys in specified areas around fixed points and (iii) territory mapping (Fuller and Mosher 1987). The observation revealed that raptors distributed throughout the Bundelkhand region are influenced by food availability and habitat. In the present investigation, 44 species of the Raptors were recorded from the Bundelkhand region of India. Out of 44 family Accipitridae has 33 species, Tytonidae has 2 species and Strigidae has 10 species of raptors. According to IUCN Least Concern (LC), 5 species were Not Accessed (NA), and 4 species were Critically Endangered (CE), 3 species were Near Threatened (NT), 3 species were Vulnerable (V) and 1 was Endangered (E). During the study observation indicates that different raptor species exhibit different habitat preferences. Forests types, food availability, water body distance, socioeconomic ratio, human habitation vicinity and precipitation reflect the diversity of raptors in study area. As a result, those species which are on the edge of being threatened can be prevented from inflowing this category and those which are previously threatened can be pulled out. The protection of breeding, roosting and feeding sites to help in the conservation of raptors, awareness and education programmes for people that contribute in raptors conservation. Identification is one key to understanding the biology of a species, it might then be possible to develop conservation strategies to ensure the future of the raptors.

Keywords: Raptors, Bundelkhand Region, Habitat, Population, Diversity

Javan Hawk-Eagle's (*Nisaetus bartelsi*) Breed and Behaviour Patterns inside the Nest in Sukamantri Area, Gunung Halimun Salak National Park, West Java, Indonesia

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Javan hawk-eagle (*Nisaetus bartelsi*) is one of the top predators in Gunung Halimun Salak National Park (GHSNP). The nesting period is the most important in the life cycle for their continued existence. We observed the behavior pattern of Javan Hawk-eagle in nurturing their young ones, as well as the growth and the behavior of the young ones inside the nest using visual observation. The identified characters of the juvenile included white coloured feather with many needle-feather grow underneath its wings, immobile, sleeping, and nurtured by its parent. While, the recorded ecological behavior of the juvenile consists of its feather discoloration, its development, its movement, and its whole activity, start from the moment it was found until it was fell from the tree nest. The activities that could be seen from the parents consist of protecting,



The 11th Asian Raptor Research and Conservation Network International Symposium, Bali - Indonesia | 10-11 October 2019

feeding, bringing twigs and leaves, as well as coaching the young ones how to fly on their own. However, there was no record of both parents do the nurturing activities together. They always did the activities separately.

Keywords: Javan Hawk-eagle, Gunung Halimun-Salak National Park, Nest, Breeding, Behavior

Patch Habitat Connectivity of Javan-Hawk Eagle (*Nisaetus bartelsi*) in East Java, Indonesia

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Javan-Hawk Eagle (*Nisaetus bartelsi*) is an endemic species of Java Island which is currently endangered due to habitat destruction, forest fragmentation, and illegal poaching. As a protected animal, this species has an important role in the ecosystem, namely as a top predator and as an indicator that measures the health of the ecosystem in the surrounding area. East Java Island is the largest location for Javan-Hawk Eagle habitat because it has a high quality natural landscape. From the results of previous studies using a resolution of 250 meters² in 2015, it was found that there were 28 patches identified with an area of 4766,26 km². The patches were then analyzed using conefor sensonide 2.6 to determine the probability of connectivity between patches. From the results of the analysis patch 11, patch 18, patch 9, patch 15, patch 17, patch 25, and patch 2. Of the four patches, patch 11 is the patch that has the highest PC value (dPC = 18,97%, PCflux = 18,23%, PCintra = 30,82%) with an area of 936,95 km². Thirteen patches that have PCcon under 10% can act as stepping stones among the patches around them. Among the 28 patches of Javan-Hawk Eagle habitat in eastern Java, there are eight patches isolated from other patches because they have PCconnector = 0. The patch which has the smallest PC value is patch 5. This indicates that there is a need for corridor stepping stone to help the Javan-Hawk Eagle move from one patch to another.

Keywords: Connectivity, Core habitat, Corridor, East Java, *Nisaetus bartelsi*, Stepping stone.

Habitat Suitability of Javan Hawk-Eagle (*Nisaetus bartelsi*) in Mount Ungaran, Central Java, Indonesia

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Javan Hawk-eagle is a top predator that has been declared as the national symbol of Indonesia. Moreover habitat loss is threatening this eagle population which causes this species classified as endangered. Some publication describe that Mount Ungaran is one of suitable habitats patches distribution of this raptor in Java Island. There is one of the IBA (Important Bird Area) but not



The 11th Asian Raptor Research and Conservation Network International Symposium, Bali - Indonesia | 10-11 October 2019

listed as conservation area, it caused the management of this raptor and other biodiversity are not the main focus. Therefore research the specific habitat of this raptor locality is needed and important to biodiversity management in this area. Field survey has been conducted then compared with citizen sciences data to identify the distribution of this species. Afterward it analyzed with six environmental variables in maxent software ver 3.4 to create habitat suitability map. Before being analyzed, all the variables have ensured that there is no multicollinearity using Rstudio software. Result presents that 4960.620 hectares (22,2 %) area of Mt. Ungaran is suitable for Javan Hawk-eagle's habitat and 17.318,70 hectares (77,7 %) area is unsuitable. In Mt. Ungaran, elevation is the most important variable for this raptor presence which has 61,1 % contribution, then land use (14,2%), distance to river (10,4%), distance to settlement (6,9%), NDVI (4,1%) and slope (3,3%). Due to elevation is the most influential variable, therefore the condition habitat between 944 mAsl - 1457mAsl should be monitor regularly.

Keywords: Javan Hawk-eagle, habitat suitability, R maxent, ungaran

Status of Birds of Prey and Owls in Abu Dhabi, United Arab Emirates

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A total of 44 species of raptors and owls occur in the United Arab Emirates (UAE), majority of which are migrants. We collected data on birds of prey and owls from 94 monitoring from 2005 to 2018, covering all key habitats in Abu Dhabi Emirate. A total of 25 species of birds of prey and 5 owl species were recorded during the surveys of which five species are globally threatened. Migratory species represented 60% of all the species record followed by 20% with resident breeding birds. Moreover, 20% of the total species were recorded as year-round resident, resident/migratory and vagrant. Overall sampling effort highlighted the highest number of species (18) from Al Wathba Wetland Reserve followed by Abu Al Abyad with 9 species. Whereas 8 monitoring sites have recorded more than 5 species each. The highest number of species were recorded in the month of April, which coincided with the return migration of migratory raptors to their breeding grounds. Although some variation in sampling effort occurred amongst the survey sites. The number of raptor and owls species varied significantly across the years ($F=5.98$, $df=13$, $p<0.00$, One-Way ANOVA) but no significant difference was recorded across the months ($F=1.52$, $df=11$, $p<0.115$, One-Way ANOVA). (Egyptian Vulture (*Neophron percnopterus*), Western osprey (*Pandion haliaetus*), Sooty falcon (*Falco concolor*) and Pharaoh eagle-owl (*Bubo ascalaphus*) are regional priority species identified for conservation in the UAE. Conservation Action Plans for some the species are in place to mitigate the threats to the species. Satellite tracking of some raptors species were undertaken to study the local movement and migration of the species. This movement data helped in the creation and extension of protected areas providing valuable protection for several avian species.

Keywords: Al Wathba, Emirates, Migratory, Sooty Falcon, Abu Dhabi

Temporal Distribution of Chinese Sparrowhawk (*Accipiter soloensis*) in Cape San Agustin, Governor Generoso, Davao Oriental

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Chinese Sparrowhawk (*Accipiter soloensis*) population is in a constant decline in the recent years with the concern of the conservation of the said raptor species. Thus, understanding their nature is essential. However, data about the migration behaviour of the said species are scarce especially on the migration period in the Philippines. This work aims to generate knowledge about the temporal distribution of Chinese Sparrowhawk in Cape San Agustin, Governor Genoroso, Davao Oriental. Migration count and monitoring were conducted using the point count method during the first week of October 2018 from 5:00 AM to 5:00 PM. The study findings indicate that the optimal time for Chinese Sparrowhawk to take flight is during the time interval 9:00 AM to 10:00 AM. Also, the study result showed that the wind direction can affect the temporal distribution of the Chinese Sparrowhawk. If the wind direction is to the South and West, there will be an increase in the number of individual that takes flight.

Keywords: Chinese Sparrowhawk, Temporal Distribution, Environmental Parameters

Updating Potential Habitat of Javan Hawk-Eagle's in East Java Province, Indonesia

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According to IUCN Redlist, Javan hawk-eagle (JHE) categorized as endangered species. Moreover, this endemic species also designed as one of the 25 top priority protected species by Indonesian Government. The condition of this raptor is very threatened by habitat fragmentation, declining quality of its habitat and wildlife trade. This raptor using primary or secondary tropical forest where located on steep slopes as its habitats. Meanwhile Natural forest in East Java is mostly confined to the upper slopes of the isolated volcanoes and other mountains, therefore East Java is vital area for JHE's Habitat. This study reports the recent condition of JHE's potential Habitat in East Java Province in 2019. Logistic regression model that obtained by Syartinila and Tsuyuki, 2008 was used in this study. Moreover, 90 m² image resolution of slope, altitude and NDVI (Normalized Difference Vegetation Index) was used to predict JHE's potential habitat in East Java. Total area of potential habitat of JHE in East Java is 4813,15 Km², there are located in conservation area (1031,80 Km²), protection forest (1920,54 Km²), production forest (922,09



Km²) and other land use (938,72 Km²). Due to potential habitat of JHE in East Java mostly located in outside conservation area, therefore collaboration between multi stakeholders in East Java is needed to conserve JHE and its habitat.

Keywords: *Nisaetus bartelsi*, Habitat suitability, East Java

Habitat and Behavior of Black-Thighed Falconet (*Microhierax fringillarius*) in Bali Barat National Park

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Black-Thighed Falconet (*Microhierax fringillarius*) considered as Least Concern species by IUCN redlist 2016 and protected species by Ministry of Forestry and Environment Regulation No.106/menlhk/setjen/kum.1/12/2018. Bali Barat National Park is a conservation area and its one of the natural habitat of Black-Thighed Falconet distribution (Native species). The study was aimed to analysis its habitat and the behavior. Purposive sampling was used on focused observation area base on direct context with the bird. The habitat analysis was approach with vegetation analysis dan habitat used method. Focal animal sampling used as approach describe to know the daily activities. The result showed that the bird used of monsoon forest as main habitat and the bird distribute as equal (focused) at monsoon forest. Characteristic of sheltering site of the bird using tree in C strata and B strata, which is likely dead tree. The Black-Thighed Falconet choosing at big tree for the nesting site, with characteristic of big tree, with many hole of woodpecker nest or barbet nest, and the position of the tree close to hunting area. Characteristic of hunting areas of the bird is monsoon forest with diverse and abundant of preys. The bird like preys on small insect like dragonfly, butterfly, skink, or gecko, and bird such as munia, white eye and swiftlet. The behavior was most often observed was resting in monsoon forest with six times encounter (55,5 %). But the bird also done activities of preening and observing surrounding to focus on seaching food. Hunting activity was observed used hunting attack in Monsoon forest at Bali Barat National Park.

Keywords: Bali Barat National Park, habitat, behavior, black-thighed falconet



Raptor Plumage Photographic Analysis

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Photographs of birds in flight are routinely taken at bird migration count sites for species identification and for the exact numbers of similar species that come very fast in the same flock eg. needle-tails. If their qualities are good enough, they can also be used for plumage studies to tell age, sex, and if they are photographs of the same bird that circles back to the counting site. Bird feathers are integumentary appendages just like human teeth. Generations of feathers successively replace old ones in the similar way that human teeth do. Unlike teeth, there are many more generations of feathers. Photographic record of flight feathers of a bird can be analysed in the same ways that a dentist analyses successive radiographic records of a patient without clinical examination. What used to be seen only by an ornithologist looking at a bird in hand is now can be seen in bird-in-flight photographs with good angle and enough resolution. So this review oral presentation is intended to show field examples and how to analyse each flight feather.

Keywords: raptor, plumage, photograph, analysis, flight, feather

Various Raptor Tracking Results in Asia by Using GPS-Mobile Transmitters

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It has not been long since the detailed migration behavior of raptors was studied using wildlife tracking transmitters in Asia. In Korea, the newly invented GPS-Mobile transmitters were first used in the fall of 2011. Since then, the devices were used for tracking many kinds of raptors started for Cinereous Vultures *Aegypius monachus* in Korea, 2012. After the vulture tracking work, international collaborative research works with Mongolia, Nepal, Russia and Philippine research teams have been carried out since 2014 to study the migration and habitat useage behaviors of raptors. Thus, I want to introduce the recent achievement of raptor tracking research in 5 Asian countries. Until now, we deployed a total of 76 tracking transmitters on 9 raptor species. The Cinereous Vulture, Steppe Eagle *Aquila nipalensis* and Black Kite *Milvus migrans* deployed in Korea, Mongolia and Russia are long range migratory species. The Bearded Vulture *Gypaetus barbatus*, Red-headed Vulture *Sarcogyps calvus*, Philippine Eagle *Pithecophaga jefferyi*, Mountain Hawk Eagle *Nisaetus nipalensis*, Indian Spotted Eagle *Clanga hastata*, and Eagle Owl *Bubo bubo* deployed in Korea, Nepal and Philippine are resident or short range migratory species.

Keywords: tracking, GPS, mobile, transmitter, raptor



A Preliminary Result on First Migratory Raptor Count of Songino Mountain in Central Mongolia

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Migration count is important because raptors are sensitive bioindicators at the tops of food chains, and changes in their numbers reflect changes in the health of the environment. Mongolia provides large breeding site for many species of raptors and a total 56 species of diurnal and nocturnal raptors recorded and most of them are partial migrants. We started the first experimental count on migratory raptors in Mongolia last autumn and the six visits have been made between mid-September and mid-October, 2018 to monitor the migratory raptors from Songino Mountain which locates in 20km to west from capital Ulaanbaatar. A total 1,678 individuals from 15 species of raptors including three unknown species were recorded during the six visits. Most numerous raptors were Black-eared Kites, Common Buzzards, Steppe Eagles and Cinereous Vultures. Previously, this site has already been visited by amateur birdwatchers between 2008 and 2016 and the total of 26 species of raptors had been observed during that time, although it was not regular observation. This site can be essential to monitor the large number of migratory species such as Steppe Eagle, Common Buzzard, Amur Falcon and Black-eared Kite for long term in the future. We also hope that the results from this monitoring count will be important for Asian raptor count data and even for Mongolian raptor science as well.

Keywords: migratory raptors, counting, monitoring, central Mongolia, East Asia

Preliminary Results of the Raptor Monitoring at the Choir Wind Farm, Mongolia

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This paper describes the results of ornithological surveys carried out at Choir Wind Park (CWF) in 2018- 2019. The aim of the field survey, conducted by ornithologists from Mongolian Ornithological Society (principle) and National University of Mongolia, was to provide data and information on raptors, assessment of collision risks from wind turbines and mitigating measures at pre-construction phase. Out of 58 recorded bird species, 14 species are raptors (Black Kite, Steppe, Golden and Booted Eagles, Cinereous Vulture, Eurasian Sparrowhawk, Hen Harrier, Long-legged, Eastern and Upland Buzzards, Oriental Honey Buzzard, Lesser and Common Kestrels and Saker Falcon). The average number of Saker Falcon, Upland Buzzard, Common Kestrel and Cinereous Vulture has not been significantly changed over the period. This result was associated with resident status of these species. Based on our survey data and criteria of the

"Sensitivity and Impact Significance Matrix, we have identified Saker Falcon and Steppe Eagle as "Moderate" sensitive; Cinereous Vulture, Upland Buzzard, Common Kestrel and Long-legged Buzzard - "Low" sensitive. The frequency and average number was much higher in July (mean = 10.53, SD 40.24 n = 169) and April (mean = 2.64, SD 3.8 n = 157) than other months, due to fledglings dispersal and hunting activities of raptors. Mean flight height of all observed birds at all vantage points was estimated to 23.8 m (min. 0.5, max. 300, n=913). The analysis showed that there was significant difference between the mean flight height among species. The flight height was much high at 11:00 to 14:00 o'clock. Flight duration with more than 3 minutes were recorded in Black Kite, Cinereous Vulture, Golden and Steppe Eagles, Long-legged Buzzard and Lesser Kestrel. These raptors spent a longer time in the site in winter than other periods. Further monitoring programme on globally threatened and near threatened species that breed near the site is very important to assess the further risk of these raptors at the operation phase.

Keywords: Mongolia, raptors, Choir wind farm, collision risk, mitigation

3-Year Monitoring of Migratory Raptors during Autumn Season in Glan, Sarangani Province, Philippines

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The Philippines is part of the East Asian-Australasian Flyway and is considered as an important bird and biodiversity area (IBA). The latter designation puts the country as among the top priority site for conservation and protection of birds and other wildlife. Majority of raptor studies in the country is focused on resident raptors particularly the Philippine Eagle (*Pithecophaga jefferyi*) while studies documenting population and species diversity of other migratory raptors is limited. We herein fill this gap by reporting on the results of the a three-year study on migratory raptors passing by Glan, Sarangani Province, which is in the southern tip of mainland Mindanao. Migratory raptor monitoring was conducted daily for forty-five days from the month of September to October from 7:00 A.M. until 3:00 P.M. Population and species were determined through scanning techniques and estimation methods. Field guide were used to identify the species of raptors based on distinct bird features like wing shape, color, size, etc. We confirm that Glan is among the major migration route of at least 8 species of migratory raptors, the most abundant of which are Chinese Sparrowhawk (*Accipiter soloensis*; 96%) followed by Grey-faced Buzzard (*Butastur indicus*, 3.9%). The results were used by the local government unit in formulating conservation initiatives for the conservation and protection of these raptors and their roosting sites. Also, this study can be used to increase the awareness of the local community on the importance of these birds in the ecosystem.

Keywords: Raptors, Migratory Raptors, Sarangani Province, Chinese Sparrowhawk, Grey-faced Buzzard



Migration Behavior of Eastern Buzzard *Buteo japonicus* Revealed by GPS-GSM telemetry

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Long-distance migratory raptors face challenges during flying through different geographical regions throughout the annual cycle. Knowledge about their seasonal distributions and migration strategies is essential to understand their ecological requirements. This study focuses on migration behavior of Eastern Buzzard, a migratory raptor that distribute across the Eastern Palearctic and Indomalayan. Three Eastern Buzzards were trapped in their wintering grounds and tracked by GPS-GSM telemetry between 2015 and 2018. All the buzzards summered in the Eastern Siberia taiga region and wintered on Kinmen island in subtropical Asia. Rather than moving straight between summering and wintering grounds, the buzzards made detours during migration to avoid difficult habitats such as desert and dry steppe regions. One buzzard flew across Bohai Sea during spring and autumn migration, the other two buzzards avoided large over-water crossing. Two buzzards tracked at least one annual cycle spent longer migration time in autumn than in spring. They not only traveled longer distances in autumn, but also used more stopover sites during autumn migration. Repeated using of the same wintering grounds revealed their high wintering site fidelity. The relatively small wintering ranges predominantly covered forest-farm mosaic areas that provided their major prey resources. This study reveals, for the first time, the entire migration routes of long-distance migratory Eastern Buzzards along East Asian Continental Flyway and provides information on their migration behavior.

Keywords: *Buteo japonicus*, Eastern Buzzard, GPS-GSM telemetry, Migration, Site fidelity

Movement Pattern of Australasian Grass-Owl in Southern Taiwan Revealed by Satellite Tracking

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Australasian Grass-Owl (*Tyto longimembris*) is listed as Least Concern globally by IUCN but a rare resident species in Taiwan, and is facing serious threats due to the overlapping of its habitat and human disturbance. Understanding home range and the movement pattern of endangered

species especially in the context of habitat use in human disturbed habitats can provide critical information for conservation. We satellite-tracked 15 individuals from 2017-2019 in Southern Taiwan and focused on their roost sites use pattern and night movement. The total tracking days were 1160 days with 2130 valid positions. Total movement of daily roost sites were from 1.3 to 238.9 km while the largest daily movement was 26.5 km. The smallest 100% minimum convex polygon (MCP) was 12.6 ha while the largest was 22595.7 ha. Only three owls have been tracked in the evening for the night movement pattern, and the average daily night movements were from 1.1 to 3.9 km while daily night 100% MCPs were between 8.1 ha and 80.5 ha. The home range varied greatly among individuals and had some degree of overlap. For the tracked individuals that we knew for sure they did not breed during the study period, they used roost sites repeatedly in both breeding and non-breeding seasons. The habitat use of roost sites varied among individuals but the grassland, military land and agricultural land were among the ones with highest frequency in southern Taiwan.

Keywords: Australasian Grass-Owl, satellite tracking, movement pattern, homerange, habitat use

Migration Ecology of Chinese Sparrowhawk in East-Asian Oceanic Flyway Using Satellite telemetry

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Chinese Sparrowhawk (*Accipiter soloensis*) is a small-sized, long-distance, and complete migrant in East-Asia Flyway. Although they are the most abundance migratory raptor in this flyway, limited information is available about their migration ecology. With the advance in satellite telemetry technology, we deployed twelve Microwave 5g PTT and two Biotrack 6g Pinpoint Argos Solar-S on 14 individuals captured with mist-net at Kenting National Park in Taiwan from 2016-2018 to study their migration ecology. The migration distance and duration from Taiwan to wintering sites ranged from 1,519 to 3,719 km and 16 to 78 days, respectively. Six out of the 14 individuals wintered in central and south Philippines and 4 continued to east Indonesia, with the average daily distance of 188.8 km. The wintering areas were dominated by fragmented forests mosaic with human-disturbed habitat such as farmland, oil palm, and coconut plantation. The northbound migration started in late March, and they took similar routes compared to their southbound migration. Based on their data, the 6 individuals breed in central and north China in forests mosaic with farmland and small villages. The distances between breeding to wintering sites ranged from 2,783 to 5,423 km, with over 1,000 km over-water flight. Future studies should compare data from continental counterparts and population breeds in Korea to understand their migration patterns among regions and flyways, and their relationships with meteorological conditions.

Keywords: Chinese Sparrowhawk, migration, satellite telemetry



Flight Behavior of Raptors during Migration in Cape San Agustin, Governor, Davao Oriental

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Every year, thousands of raptors fly hundreds of kilometers to warmer climates in the tropics such as Philippines to escape from the harsh winter of north. Cape San Agustin is one of the main sites in sighting migrating raptors in Philippines due to the abundance of thermal pockets in the area that is utilized in thermal flight mode of raptors. The main objective of this study was to describe the updraft and thermal flight behaviors of raptors spotted on the site during migration in Cape San Agustin, Governor Generoso, Davao Oriental and describe the environmental parameters that affect the flight behavior of different species of raptors such as Chinese Sparrow Hawk (*Accipiter soloensis*), Brahminy Kite (*Haliastur indus*), Crested Honey Buzzard (*Pernis ptilorhynchus*), Grey-faced Buzzard (*Butastur indicus*), Philippine Serpent Eagle (*Spilornis cheela*), Pied Harrier (*Circus melanoleucos*), Western Osprey (*Pandion haliaetus*), White Bellied Sea Eagle (*Haliaeetus leucogaster*) and Common Kestrel (*Falco tinnunculus*). The data was gathered on the first week of October 2018 by utilizing ad libitum sampling method and raptor identification acquired through visual observations. It has been found out that updraft is a significant flight mode of raptors and results showed that the environmental factors that affects the different species of raptors during updraft is the wind direction specifically the west direction, one of the known migration flyway of most species of raptors are located at the Sarangani, Glan located west of Cape San Agustin, Governor Generoso, Davao Oriental. Therefore, this study is significant and beneficial to the environment, bird watchers and bird enthusiasts as they monitor and count them for conservational efforts throughout the years.

Keywords: Chinese Sparrow Hawk, Brahminy Kite, Crested Honey Buzzard, Grey-faced Buzzard, Philippine Serpent Eagle, Pied Harrier, Western Osprey, White-Bellied Sea Eagle, Common Kestrel, Updraft, Thermal.

"Manna from Heaven": Is this Why Amur Falcon *Falco amurensis* Stop-Over in Nagaland?

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Amur falcon *Falco amurensis*, a long-distance, trans-equatorial migrant, travels up to 20,000 km one way from its breeding grounds in North-east Asia to wintering grounds in Southern Africa and back. On their southbound migration during October and November, Amur Falcons congregate in very large numbers at select sites in northeast India specifically in Nagaland where they stop-over. Why specifically in Nagaland do Amur falcons stop-over to roost and/or forage and not elsewhere in India is not known, and why only during their southbound migration? To understand this, a study on diet of the migrating Amur Falcons was carried out during the stop-over period in 2017 and 2018, and at the three major sites in Nagaland: Pangti, Yaogyimchen and Hakhizhe. Amur falcons regurgitate undigested parts in the form of a pellet and these pellets were collected at the roost sites, then examined for prey remains in the lab using a dissecting microscope. Only fresh and whole pellets were collected and across different sessions from the time of arrival to departure of falcons to assess differences in prey items in their diet. Prey items were identified to the Order level and percentage frequency of prey occurrence (number of items of each taxon divided by the total number of all items identified in that pellet) was calculated. A total of 1530 pellets: 810 in 2017 and 720 in 2018 were collected and examined. The prey remains observed across the two years were only of insects and belonged to five Orders with Isoptera (termites) being the most dominant item (89%). The other prey item in the diet in the order of their frequency of occurrence were Hemiptera (6%), Coleoptera (3%), Orthoptera (2%) and Hymenoptera (1%). Across the two years, frequency of occurrence of Isoptera was found to be not significantly different (Mann-Whitney U Test = 233650, $p = 0.073$). Across the three roost sites termite contribution was found to be significantly different (Kruskal-Wallis Test = 115.47, $df = 2$, $p < 0.05$). The arrival of Amur falcons in Nagaland appears to coincide with mass emergence of termites in the region leading to their dominance in the diet. The termite species occurring in the region and their emergence pattern is currently being studied so as to understand further the reason for Amur falcon stopping over in Nagaland.

Keywords: migration, raptor diet, Isoptera, termite emergence

Raptor Migration Dynamics in Semarang Landscape, Indonesia

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Research on raptor migration in Indonesia is already done in some areas. But for Java is still inadequate in ecological data and lack for the period of spring migration. Semarang landscape previously allegedly not as raptor migration route. This study aims to assess the dynamics of raptor migration in the Semarang landscape, include: 1) dynamics during migration season



through the year 2006 to 2013, include: species composition and individual count. 2) temporal dynamics of the movement behavior, include: style, height, time, groups, flight direction. 3) pattern of raptor migration route along Semarang landscape, associated with the condition of land use and geomorphology. Data of species, individual, behavioral movements and habitat conditions collected every day during the peak migration season in March. Individual count among species were analyzed with Kruskal Wallis test. The pattern of population dynamics were analyzed by polynomial regression method. Behavioral movement between species were analyzed by Chi-square test. Analysis of responses between raptor communities to habitat conditions by using Canonical Component Analysis (CCA). Raptor migration route pattern in the landscape is analyzed by the mapping method. On the path along the landscape, geomorphological conditions and land use data was extracted. The results showed that the Semarang landscape is one of main raptor migration route for Central Java. This is supported by continuity data of number and frequency. Populations of raptor migrants passing through the Semarang landscape have individual fluctuations both daily and years. Association pattern of individual fluctuations with environmental factors showed variations between years, but has major trends related to wind speed, precipitation, and temperature. Raptor migration movement behavior has variation of style, height, group, and flight direction. Style and flight height related to thermal conditions across the landscape. Raptor tends to choose flight strategies in a single group. Flight direction tends to influenced by the wind direction along the landscape. Main pattern of raptor migration route in the Semarang landscape characterized by specific geomorphological conditions and land-use characteristic. The route has variation in altitude and a moderate degree of slope. Land use characters dominated by vegetation cover.

Keywords: birds of prey, spring migration, population dynamics, migration route

Serial Monogamy of the Lanyu Scops Owl (*Otus elegans botelensis*)

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Western literature reports that most raptors breed in monogamous pairs. Most diurnal raptors that have been studied typically remain mated for life, while many typical owls also have long lasting pair-bonds. Because nocturnal raptors are more difficult to study than diurnal species, understanding of the reproduction of owls is very limited. My long term study on Lanyu Scops Owl (*Otus elegans botelensis*) showed this species follows serial monogamy. A breeding owl may have multiple mates during its life time, although it has only one partner at any one time. My study illustrates the necessity for long term monitoring of color-marked individuals, before the details of a species' mating system can be understood.



Spring and Autumn Raptor Migration through Pulau Padang and the Kampar Peninsula, Riau

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A variety of raptor species are known to migrate between the Southern and Northern Hemispheres, famously being recorded while passing through well known sites in South East Asia. However, the entire 'fly-way' is not well documented, especially in Indonesia. Since 2016, Restorasi Ekosistem Riau (RER) has been carrying out annual migratory raptor observations on the Kampar Peninsula in Sumatra. RER is a private sector initiative that aims to protect and restore 150,000 ha of lowland peat swamp forest on the Kampar Peninsula and Padang Island in eastern Sumatra. During the four years of survey, species composition and numbers of individuals counted, differed: Most records from 2016 and 2017 were dominated by Oriental Honey Buzzards (*Pernis ptilorhynchus*), while some species like the Chinese Sparrow Hawk (*Accipiter soloensis*) was only recorded from 2018 onwards. The 2018 results from both the Kampar Peninsula and Padang Island found 654 Oriental Honey Buzzards, 674 Chinese Sparrow Hawks, 1 Black Baza (*Aviceda leucophotes*) and 2 Gray-faced Buzzards (*Butastur indicus*). On March 2019 a 5 day count of raptor migrants at RER Padang Island resulted in 277 Oriental Honey Buzzards. We discuss raptor numbers and species composition compared to neighboring sites along suspected fly-way routes. We propose that coordinated raptor counts, across neighboring sites may have the potential to provide a more accurate picture of raptor migration across Sumatra, Indonesia.

Keywords: raptor, migration, Riau Ecosystem Restoration, monitoring, flyway

Status of Raptor in Batu Hijau, Sumbawa, Indonesia

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PT Amman Mineral Nusa Tenggara conducts bird monitoring survey twice a year in the end of wet season (April-May) and end of dry season (September-October), based on integrated EIA document 1996. Bird monitoring survey are carried out at 2 primary forest, 2 reclamation forest and 5 disturbed areas. A several survey and birding trip also conducted outside mandatory monitoring sites and monitoring schedules. Raptor sightings from all bird surveys, birding trips and opportunity sightings, since baseline survey 1994-1995 at Batu Hijau were compiled and analysed to study the status of each raptor species. A total of 23 species raptor are recorded for Batu Hijau, consist of Accipitridae (16 species), Falconidae (4 species), Tytonidae (1 species) and Strigidae (2 species). Brahminy Kite (*Haliastur indus*) is most populated raptor at Batu Hijau, mostly found at Mine site and Reclamation sites, followed by Brown Goshawk (*Accipiter fasciatus*) and Spotted Kestrel (*Falco moluccensis*). Critical species, Flores Hawk-eagle (*Nisaetus*



floris) with population estimation 15-20 pairs, were recorded at various locations in Batu Hijau included at Reclamation area. White-bellied Sea-eagle (*Haliaeetus leucogaster*) has a good success breeding in last 3 years (2016-2018) at Townsite, with 2 juveniles in each breeding season. No specific survey for Owl, but some unscheduled night birding shows the Moluccan scops-owl (*Otus magicus*) is common, especially at Townsite, Benete, and lowland forest. Wallacea Scops-owl (*Otus silvicola*) is rare, inhabit riparian forest at Kanyolo, nearby mining site. Barn Owl (*Tyto alba*) is frequently sighted hunting at park at Townsite. Oriental Honey-buzzard (*Pernis ptilorhynchus*), Chinese Sparrowhawk (*Accipiter soloensis*) and Japanese Sparrowhawk (*Accipiter gularis*) were spread at all sites during raptor migration period. Migrant raptors are usually found flying solitary or flying in small group (less than 5 individuals), no record of big flock like observed at Karang Asem Bali and North Lombok. It presumed entering Batu Hijau follows route Pulau Panjang to Mantar Hills.

Keywords: Raptor, Batu Hijau, Amman Mineral Nusa Tenggara, Sumbawa

Bird of Prey Migration Watch Festival to Promote Biodiversity and Conservation Awareness among Young Generation in Bali

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Indonesia is fortunate to be blessed with a high biodiversity on its flora and fauna, including its raptors diversity. However, Indonesia is also facing a major threat in order to preserve its valuable mega biodiversity. This study aimed to find out whether such festival could promote awareness among young generation toward their valuable biodiversity. The young generations were targeted since it is believed that they can act as the agent for the positive changes in the neighbourhood. During the Bird of prey migration watch festival that was conducted in 2017 and 2018, series of activities were conducted, namely on site migration watch at Segi Hill of East Bali, seminar and workshop series for students and public communities. Publications were made through social media and conventional method such as poster/flyer and newspaper columns. Questioners were distributed among the participants to understand the motivation of their participation. It can be understood from collected data that the number of participants increased markedly from 2017 to 2018 festival, and they acknowledged that the new perspective for embracing the high raptor diversity in Indonesia was grown from the fact they observed the high number of migratory raptors flying above Segi Hill.

Keywords: raptors, public awareness, biodiversity, conservation

Migratory Raptor Counting in Tanjung Tuan, Peninsular Malaysia

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Tanjung Tuan is one of the primary sites for watching migrating raptors in Malaysia. Raptors can be seen crossing from the island of Sumatra in Indonesia to west Malaysia during the northbound migration. Every year, from mid-February to mid-April, raptor counts are conducted in Tanjung Tuan to estimate the population health of migrating raptors. As one of the volunteer counters in 2019, counting duration designated was from 24 to 26 February 2019. The count was conducted daily from 0900-1800. Only point count was used and counters used sight observation. Wind speed, temperature, air pressure, rate of precipitation and humidity were also recorded at the beginning of every hour. Within the three days, a total of 27 hours was dedicated to point counting and a total of 1668 migrating raptors of two species were observed. Out of the 1668 raptors counted, 1665 were Oriental Honey-buzzard and three were Japanese Sparrowhawk. This suggests that Tanjung Tuan is an important site in the East Asian-Australasian flyway, especially for Oriental Honey-buzzards. Information such as this is essential to better understand migratory raptors and for effective conservation work.

Keywords: Tanjung Tuan; migratory raptors; northbound migration; east Asian-Australasian flyway; Malaysia; Oriental Honey Buzzard; *Pernis ptilorhynchus*

DNA Barcoding of Four Families (Accipitridae, Falconidae, Tytonidae and Strigidae) of Indonesian Raptors Using Cytochrome C Oxidase (COI) Gene

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DNA barcoding using the cytochrome c oxidase I (COI) marker is widely used to identify bird species. Here, we determined the COI sequences of 43 individuals belonging to 15 species of Indonesian raptors. We combined these sequences with previously published sequences of 45 individuals from 27 species. A total of 88 sequences from 42 species were analyzed. Our results showed that the phylogenetic tree based on COI data sequences demonstrated the species assemblages were clustered according to their order (Falconiformes and Strigiformes) which is congruent with current taxonomy. Those species were also clustered based on family (Falconidae, Accipitridae, Tytonidae and Strigidae), except for *Ketupa ketupu* within the order of Strigiformes. The current phylogenetic tree revealed that *Ketupa ketupu* is not in a clade of family Strigidae, but instead an outgroup of family Tytonidae and Strigidae. Genetic diversity of each genus varies from $\pi = 0.15 \pm 0.0687$ to 10.94 ± 0.8022 depending on number of species and individual used in this study. Even though our study could categorize and cluster most of the birds according to family by using COI as a marker, another gene such as cytb and ND2 need to be used to resolve the relationship of species within the Strigiformes.

Keywords: DNA Barcoding, Indonesian raptors, COI, Accipitridae, Falconidae, Tytonidae, Strigidae

Phylogenetic Study of Changeable Hawk-Eagle (*Nisaetus cirrhatus*) Based on Cytochrome-c Oxidase Subunit I (COI) Gene as One of the Conservation Effort in Genetic Diversity

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As a widely spread hawk eagle in Asia, Changeable Hawk-eagle (*Nisaetus cirrhatus*) forms several subspecies distributed all around Asia. Those subspecies are *N. c. cirrhatus*, *N. c. ceylanensis*, *N. c. andamanensis*, *N. c. limnaetus*, and *N. c. vanheurni*. Indonesia hosts two of



the subspecies, namely *N. c. limnaetus*, and *N. c. vanheurni*. Despite the declining population trend due to anthropogenic causes such as illegal wildlife trade and deforestations, this species is categorized as Least Concerned by IUCN RedList. With the race against extinction in the recent years, there is a dire need in collecting as many genetic data as possible for this least known species. But, subspecies variability of *Nisaetus cirrhatus* based on the previous works which used Cytochrome-b (Cyt-b) as marker are not clearly resolved; thus, a thorough phylogenetic research on Changeable Hawk-eagle based on molecular marker such as COI gene is necessary. This research aims to obtain the sequence of COI gene out of 5 individuals of Changeable Hawk-eagle including 4 individuals in the intermediate phase; 1 individual in the dark phase and to construct phylogenetic tree based on the respective gene. This research was conducted by DNA extraction of blood cells from Changeable Hawk-Eagle with High Pure PCR Template Preparation Kit (Roche, 11796828001), DNA quantitative test, gene amplification through PCR using forward 5'-TTC TCC AAC CAC AAA GAC ATT GGC AC-3' and reverse 5'-ACT ACA TGT GAG ATG ATT CCG AAT-3' primers; gel electrophoresis using 0.8% of agarose gel and DNA sequencing by FirstBase Laboratories, Malaysia. The DNA sequence analysis was carried out using MEGAX software with Neighbour Joining (NJ) method. Analysis of phylogenetic tree based on COI gene shows that *Nisaetus cirrhatus* formed complex clades with different bootstrap values but still belongs to the same species and they are very closely related to *Spizaetus philippensis*. In addition to enrich the genetic data of *Nisaetus cirrhatus*, this paper could be as the one of conservation genetic effort.

Keywords: *Nisaetus cirrhatus*, cytochrome-c oxidase subunit I (COI), DNA barcoding, genetic conservation, phylogenetic.

Surgical Management of Malunion Fracture of The Proximal Third of Ulna and Radius in Two Species of Eagle (*Nisaetus cirrhatus* *limnaetus* and *Haliaeetus leucogaster*)

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A juvenile White Bellied Sea Eagle (*Haliaeetus leucogaster*) and a Changeable Hawk Eagle (*Nisaetus cirrhatus limnaetus*) were presented to the Veterinary Teaching Hospital, Universiti Putra Malaysia with unilateral misaligned and droopy wings. Physical and radiographic assessment revealed malunion fracture of the proximal third of ulna and radius in both birds. The White Bellied Sea Eagle had right wing malunion concurrent with synostosis between the ulna and radius. In the Changeable Hawk Eagle, both ulna and radius maintain separate anatomical position. In both fractures, axial deviation of the ulna and radius were recorded with significant angulations of more than 60 degree deviation. Both birds exhibited abnormal positioning and affected wings were non-functional. These malunion fractures require open reduction and osteotomy to realign the distal and proximal fragments into their natural anatomical position. The White Bellied Sea Eagle's fracture was stabilized with Figure of 8 bandage (external coaptation) alone, due to the synostosis of ulna and radius which is beyond repair. Anatomical restoration and realignment of the wing served only as cosmetic purpose due to its endangered species status. In



the Changeable Hawk Eagle, wing stabilization techniques were combination of intramedullary pin (internal fixation) and Figure of 8 bandage. Postoperative management including surgical wound assessment, bone healing through radiographic evaluation, antibiotics, supportive therapy and rehabilitation were carried out. As an outcome, the Changeable Hawk Eagle is now able to fly, whereas the White Bellied Sea Eagle wing continue to serve as cosmetic purpose.

Keywords: malunion, eagles, radius and ulna, osteotomy, realignment

Secondary Poisoning Might be the Reason Caused Black Kites Endangered in Taiwan

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The Black Kite (*Milvus migrans*) is endangered in Taiwan due to a dramatic population decrease during the late 20th century. Prompted by some poisoning incidents of Black Kites and other farmland birds, we hypothesized that poisoning may be an underreported yet important threat. Thus, we created a citizen-science Facebook group in 2014 in order to receive more information about possible poisoning incidents. By 2018, we had received reports of 250 poisoning incidents (totally 5,957 dead birds) in agricultural areas. Dead birds were mostly Eurasian Tree Sparrow (*Passer montanus*, 67%) and Columbidae (20.9%). We tested tissues from 40 dead birds, each came from different incident, for pesticide residues. Thirty-eight birds were detected Carbofuran, and two birds were detected Terbufos, both highly toxic insecticides which can cause bird death immediately. After interviewing farmers and reviewing old agricultural literature, we concluded that most of these incidents represented intentional poisonings by farmers attempting to control avian pests. In addition, the Taiwanese government had provided hundred tons of rodenticide to farmers for free annually since 1980s. Anticoagulant rodenticides are easily transmitted in the food chain and lethal by internal bleeding in several days. Between 2010-2018, nineteen weak or dead Black Kites were found. Seven of them recovered and were released; the rest were detected either rodenticides ($n = 6$), Carbofuran ($n = 5$), or both ($n = 1$) in liver. We suggest that the Black Kites were the victims of inadvertent secondary poisoning by scavenging poisoned dead birds or rats. The dramatic decrease of the Black Kite in the 1980s coincided with the widespread use of Carbofuran and rodenticides. The Taiwanese government has adjusted some pesticide-use policies, and the Black Kite population slowly recovered in recent years.

Keywords: citizen science, Carbofuran, rodenticide, pesticide, scavenger

Use of Swab for DNA Sampling from Confiscated Raptors for Molecular Sexing

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The objective of the study was to evaluate the feasibility and efficiency of using swab to collect buccal and cloacal epithelial cells of confiscated raptor bird for genetic studies. Commercial swab

kits were used to collect samples from 34 individuals of 10 raptor species, and as comparison blood samples from the same individual were also analyzed. FavorPrep™ Blood Genomic DNA Extraction Mini Kit dan FavorPrep™ Tissue Genomic DNA Extraction Mini Kit were used respectively to extract DNA from blood and epithelial cells. All DNA extracted from blood were successfully amplified for assignment of sex. On the other hand the DNA extracted from buccal and cloacal swabs were only respectively 71% and 9% successfully amplified. This results suggest the potential used of buccal swabs for genetics studies of raptor, with further optimisation for a better result.

Keywords: raptor, swab, molecular sexing

A Phylogenetic Analysis of Crested Serpent Eagle (*Spilornis cheela*) based on *Cytochrome-C Oxidase Subunit I (COI)*: A Stepping Stone towards Genetic Conservation of Raptors in Indonesia

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Becoming one of the most widespread raptors in Asia, Crested Serpent Eagle (*Spilornis cheela*) forms several subspecies. However, due to the limited studies on genetic aspects, the clear boundaries between each subspecies are difficult to define. A thorough phylogenetic analysis is needed to create a coherent taxonomic definition from each subspecies for the sake of conservation; and the approach for this endeavour starts with phylogenetic analysis based on *cytochrome-c oxidase subunit I (COI)* gene as the standardized genetic marker to define species. This research aims to obtain *COI* gene sequences out of 3 individuals of crested serpent eagle to construct a phylogenetic tree based on the respective gene. The DNA isolation was conducted using DNA materials extracted from blood samples. The gene amplification was performed through PCR using forward primer BirdF1 5'-TTCTCCAACCACAAAGACATTGGCAC-3' and reverse primer BirdR1 5'-ACGTGGGAGATAATTCCAAATCCTG-3' and visualized through gel electrophoresis using 0.8% agarose gel. The sequencing process was performed by third party at FirstBase Laboratory Malaysia and the entire phylogenetic analysis was conducted using MEGA7 along with the other members of *Spilornis* genus and genus *Terathopus*, also *Haliastur* and *Falco* as the outgroup. Using Neighbor Joining method and Kimura-2 parameter, the phylogenetic tree confirmed the divergence between the three subjects of this research and the other crested serpent eagles from other regions respective to their geographical distributions. The amplified *COI* gene from samples was ± 760 bp length. Based on phylogenetic analysis, the samples are indeed *Spilornis cheela* but different subspecies with another *Spilornis cheela* that used as comparison due to differences habitat and biogeographic distribution. The result shows genetic distance between *S. cheela* samples and another *S. cheela* is numbered 0.014, between *S. cheela* and another species among genus *Spilornis* is 0.015. The phylogenetic tree shows samples are closely related to *Spilornis holospilus* and genus *Terathopus*. This DNA barcoding results are expected can be used as data to enrich genetic data of *Spilornis cheela* from Indonesia and determine its subspecies, also can be used as basis for decision making in its conservation efforts.

Keywords: DNA barcoding, *COI*, Crested serpent eagle, *Spilornis cheela*, genetic conservation



Brief Report on Exposure of Newcastle Disease and Avian Influenza Virus on the New Recent Eagle at the Pusat Konservasi Elang Kamojang Seen from the Serological Test of HA/HI ND and AI

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Pusat Konservasi Elang Kamojang is an institution that carries out eagle conservation effort in Indonesia. The process of rescue, rehabilitation and release has been carried out throughout the operational time. The eagles are come from illegal market, illegal kept and wild nature rescue. The eagles being handled, then got a medical check-up both physically and laboratory test then are screened and quarantined based on the result of the initial health check. Serological test to determine whether or not that the eagles has been expose to dangerous pandemic diseases in Indonesia, Newcastle disease (ND) and Avian Influenza (AI). Serological test was carried out in the government's veterinary laboratory. From 125 eagles that has been examined in the period of late 2015 until early 2019, there were 43.20% of eagles are indicate have been exposed to the New Castle Disease virus, which 29.60% of antibody titers were high (256 to 512). From the test, it was also seen that 15.20% of eagles were indicate have been exposed to the Avian Influenza virus (H5N1) * with 57.90% titer of moderate protective antibodies (36-64).

Keywords: Serological Test, New Eagle, New Castle disease, Avian Influenza, Pusat Konservasi Elang Kamojang

Phylogeny of Crested Serpent Eagle (*Spilornis cheela*) Based on DNA Mitochondrial Gene with Emphasize on the Utilization of Museum Material

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Crested serpent eagle (*Spilornis cheela*) is one of the most complex species group within Accipitridae. Currently, there are twenty-one subspecies distributed from East Asia, South and South East Asia. Indonesia has the most subspecies as ten subspecies is recognized among which some of them are lifted to species level by some authorities. Here, we assessed phylogenetic relationships among sub species of crested serpent eagle (*Spilornis cheela*) using molecular sequence from NADH dehydrogenase sub unit 2 (ND 2) gene of mitochondria (831 bases). We

sampled 16 fresh specimens from unknown population and 15 specimens from museum collection representing 7 subspecies. All fresh specimens worked well whereas it was only 2 specimens from museum collection applicable for the analysis i.e *S.c. bido* and *S.c. batu*. We also include 4 sequence references from gene bank representatives of 2 subspecies. Phylogenetic reconstructions based on maximum parsimony, maximum likelihood, and Bayesian methods produced similar results and suggest further investigation as it revealed significant genetic differentiation. The current phylogenetic proposed here is necessary to be evaluated by involving another gene such as Cytochrome b and nuclear genes (RAG1 and b-fibrinogen) to get better resolution. The use of museum material as source for DNA is promising although in general is not as reliable as fresh material due to contamination. Nevertheless, since museum material is the only available option for certain Crested serpent eagle population, more sophisticated technic is needed to improve the results from old specimens.

Keywords: *Spilornis cheela*, Indonesian, raptors, ND2, Accipitridae

Breeding Records of Flores Hawk-Eagle (*Nisaetus floris*) at Wolojita, Ende, East Nusa Tenggara, Indonesia

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Flores Hawk-eagle (*Nisaetus floris*) is one of the critically endangered raptors that endemic to Lesser Sunda. Its biological information is little-known, and only a few breeding records have been reported. This study aims to monitor the breeding behaviour of Flores hawk-eagle in buffer zone of Kelimutu National Park, Flores, from 2014 to 2019. In total 16 visit were made with every stage of breeding cycle. Our observations indicate that the breeding cycle of Flores Hawk-Eagle was occurred from 5-6 months, starting with nest building in October then pair bonding from January until March. Egg-laying and incubation were from April until end of May for about 40-45 days with the eggs hatching in early June. The parental care period lasted from June to August. A pair used different trees each year for nesting spot, i.e. Dita Bark tree (*Alstonia scholaris*), Albizia tree (*Paraserianthes falcataria*), Candlenut tree (*Aleurites moluccana*). Several natural factors affected the succeed of the breeding, such as a weather condition, migratory raptors that crossing the territory and also the competition with another resident raptors.

Keywords: flores hawk-eagle, breeding, critically endangered, raptor



Increase Barn Owl Population with Mutual Assistance Base for Rat Population Control

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Since 2010, the farming area of Cancangan (village) has been seriously overwhelmed by rat (*Rattus argentiventer*) infestation. It was happening like in any other villages, with the total crop damage as much 80-90 % (during 1960s and 1980s). The utilization of rat poison and sulfur fogging has not been able to overcome the rat infestation problem for years. In fact, the use of poison has also affected the survival of rat-eating predators. In 2013, a group of farmers namely "Margo Mulyo", has initiated a meeting with Raptor Club Indonesia and decided to start a program "Burung Hantu Sahabat Petani" which literally means "Barn Owl are Friend of Farmers.". The project was started by introducing a pair barn owl, prohibiting hunting activities, and also to ban the use of rat poison in Cancangan. In the same year, a wooden nest box for the owl was lent to the farmers of Cancangan. The population of owl was calculated by the increasing number of barn owl pair which were nesting by the surrounding farming area of Cancangan. It was recorded only a single pair in the end of 2013, but now there has been an addition of 9 pairs of owl (18 individuals) in the early 2019. The production of wooden nest box was done communally and continuously. In 2014, there has been 8 nest boxes, in which by 2019 the number has increased to 18 nest boxes. The nest box provided was added to support the increase of owl population and also to replace the broken nest box due to weather. Besides, there were also distribution of nest boxes to outside of Cancangan which were lent by other group of farmers. The consistency of barn owl conservation based on ecosystem has proven to decrease the number of rat infestation from 80 – 90 % in 2013, to only 50% in 2014. The figures has keep lowering to 10-15% in 2015. The success story of keeping crop production safe from rat infestation has made Cancangan a role model. There were many representatives of farmer, university, local government, agriculture agency, and also farming enthusiast, who came to Cancangan for a research study and consultation.

Keywords: barn owl, *Tyto alba*, predator, nestbox, mutual assistance

The Population and Home-range of Javan Hawk-Eagle (*Nisaetus bartelsi*) in Gunung Ciremai National Park, West Java

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Javan hawk-eagle are classified as top predator in forest ecosystem. Javan hawk-eagle played a role in controlling other wildlife populations that become their prey. The existence of Javan hawk-eagle in Gunung Ciremai National Park (TNGC) is very important to maintain the balance of ecosystem. This study aims to (1) determine the Javan hawk-eagle population, age structure and distribution in TNGC area; (2) knowing the homerange. This study was conducted from 2015 to



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May 2019 in TNGC region. There were ten monitoring site, namely Cipari, Sigedong/Bintangot, Lambosir, Sayana, Cilengkrang, Legok Imah, Sangiang, K8, Cicangkrung and Gunung Larang blocks. The method used to estimate the Javan hawk-eagle population was to combine all observation results; namely by identifying each individual based on physical characteristics, time and location observed, and taking into account the total data of individual observations previously. Estimation of homerange area was done by calculating the minimum area of a closed polygon. Observations at TNGC have identified as many as 29 individuals of Javan hawk-eagle consisting of ten families. There are seven families consisting of adult male-female couples; one family consists of adult male-female couples, two teenagers and one saplings; one family consists of adult male-female couples and two teenagers; and one family consisting of adult male-female couples with four teenagers. The homerange size of Javan hawk-eagle in TNGC area are between $\pm 3.578 \text{ km}^2$ (Cilengkrang block) and $\pm 10.237 \text{ km}^2$ (Cicangkrung block).

Keywords: Javan Hawk-Eagle, population, homerange, Gunung Ciremai National Park

A Study on Amplification of Mitochondrial *COI* Gene of *Nisaetus cirrhatus* Gmelin,3 JF, 1788

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Cytochrome *c* oxidase 1 (*COI*) gene is a mitochondrial gene commonly used in population genetics, systematics and phylogeography. The *COI* gene has also been employed in DNA barcoding of animal species. Successful amplification of *COI* gene requires optimal condition of all amplification reagents including DNA template. This study aimed to evaluate the DNA source and DNA concentration for amplification of *COI* gene of changeable hawk-eagle (*Nisaetus cirrhatus* Gmelin, JF, 1788). DNA was extracted from single fresh plucked feather and from cloacal swab of five individuals. The DNA extraction was conducted using Geneaid™ DNA Isolation Kit (Tissue). Amplification of *COI* gene was done in a reaction mixture containing 1x PCR buffer, 0.2 mM dNTP, 3 μ M MgCl₂, 1 μ M of each forward and reverse primers, 3.5 μ l DNA template, 1 U taq polymerase and H₂O to reach a total volume of 20 μ l. The PCR cycles were 95°C for 1 min followed by 5 cycles of 95°C for 1 min, 45°C for 1.5 min, and 72°C for 1.5 min. This was followed by 30 cycles of 1 min at 95°C, 1.5 min at 50°C, and 1.5 min at 72°C. One cycle of a final extension was for 5 min at 72°C. The amplification products were visualised using agarose gel electrophoresis. The results showed that DNA extracted from plucked feather demonstrated better amplification product compared to cloacal swab, with the fragment size of 750bp. The volume of



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DNA template from plucked feather that resulted in reproducible amplification product was 3.5 µl. When similar volume of DNA template from cloacal swab was used, only one sample produced amplification product. Further optimization is needed both for DNA extraction from cloacal swab and amplification of *COI* gene using DNA template from cloacal swab.

Keywords: cloacal swab, *COI* gene, feather, *Nisaetus cirrhatus*

The Existence of *Escherichia coli* and Total Bacteria in Brahminy Kite (*Haliastur indus*) in Bali Birds Park

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Escherichia coli is one of flora normal bacteria that usually lives in the intestines of humans and animals. *Escherichia coli* bacterial infection is an infection that can occur due to contaminated water or food, especially raw vegetables and undercooked meat. The Brahminy kite is one of the birds of prey that feed on small mammals and fish. Bali Birds Park is one of the attractions in Gianyar Bali which has 1000 birds from 250 different bird species including the Brahminy kite (*Haliastur indus*). The purpose of this study was to determine the presence of *E. coli* bacteria and total bacteria from the Brahminy Kite feces, hairball, and its drinking water. The method used to detect the presence of *E. coli* was the Most Probable Method, whereas the Plating method was used to calculate the total bacteria. The results showed that *E. coli* bacteria were not found in drinking water and hairball, but were present in all birds feces studied (12 eagles). Total bacteria found in feces sample tested were 100 to 3600 (colony/g), hairball sample 12 to 365 (colony/g), and the drinking water was 160 to 3600 (colony/g). It can be concluded that the health condition of the Brahminy kite in Bali Bird Park was considered as in good health, since the total presence of bacteria in all samples tested were in a reasonable amount as normal flora bacteria in the digestive tract of the bird.

Keywords: Brahminy Kite, *E. coli*, total bacteria, sanitation

Species Diversity of Migratory Raptors in Lavigan, Governor Generoso, Davao Oriental

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Migratory raptors are good indicators of environmental integrity. The goal of this study was to determine the diversity of migratory raptors in Governor Generoso, Davao Oriental. Focused only on the distribution of migratory raptors and its diversity in a given location and did not encompass the other raptor species residing in the said locale. Based from the result, the researcher found out that Governor Generoso, Davao Oriental has a drastically low diversity of migratory raptors species. The raptor species present in the site are Chinese Sparrowhawk (*Accipiter soloensis*), Grey-faced Buzzard (*Butastur indicus*), and Crested Honeybuzzard (*Pernis ptilorhyncus*). Human activities such as poaching and weakening of natural habitat by development of paddy fields are some of the contributing factors in the vast disparity of the result.

Keywords: Species Diversity, Migratory Raptors



Topic: Local perceptions, threats and community-based conservation, including ethnobiology; Raptor in human modified landscape

Accelerating the Habitats Restoration of Javan Hawk-Eagle (*Nizaetus bartelsi*) Functions through Proper Management of Landscapes Involving Local Stakeholders in Cibodas Biosphere Reserve, West Java, Indonesia

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The Javan hawk-eagle *Nizaetus bartelsi* is globally endangered species which exclusively occupies the last remnant forests of Java islands, Indonesia. Cibodas Biosphere Reserve (CBR) in West Java province of Indonesia, with a total area of approximately 114,779 hectares, is one of the most important biosphere reserves of Indonesia due mainly to its rich and unique biodiversity. However, these reserves have not been adequately managed; has not fully fulfilled the conservation function of the Javan Hawk-Eagle because of various management problems. We present data from a 2015 till to 2019 on the study of Accelerating the Habitats Restoration of Javan Hawk-eagle Functions through Proper management of Landscapes Involving local stakeholders in Cibodas Biosphere Reserve. The objectives of this study was to improve the biodiversity conservation and sustainable management in Cibodas Biosphere Reserve through implementation of the integrated management plan with AQUA DANONE Company. During the study revealed that the AQUA DANONE Company commitment for the effective biodiversity and watershed conservation management increased, integrated management plan, sustainable development, and community awareness in the conservation.

Keywords: Javan Hawk-Eagle, Cibodas Biosphere Reserve, Aqua Danone, management plan

Survey, Identification and Protection of Nesting Sites and Food Management are the Key Roles to Restore the Endangered Species of Vultures (Gyps) Species In the Raigad District, India

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Since in 1997 to 1999 SEESCAP have been carried out various surveys in the 106 km region of western ghat in the state of Maharashtra using monitoring research programmes of identification



The 11th Asian Raptor Research and Conservation Network International Symposium, Bali - Indonesia | 10-11 October 2019

of nesting sites of oriental white backed vultures (*Gyps bengalensis*) and the long billed vultures (*Gyps indicus*). We have identified three surviving colonies of *Gyps* species in the district with 22-28+ population struggling for their last existence. Conservation strategies and threats were noted. In 1999 to 2000 action plan was operated on respective criterion. It included the fixing of traditional feeding ground, strictly monitoring the nesting activities to avoid the starvation of fledglings, protection of nesting habitats from human disturbance and conducting local 'Save Vultures' awareness programmes. The We got good stabilizing or even recovering results in one of the vulture conservation pocket (*Gyps bengalensis*) among the rest pockets. It was small reserve forest box and undisturbed by human activities have been proved the most successful nesting site. The rest two conservation pockets also shown the average success in recovering the declined population to its normal states. The percentage of nesting success observed higher in protected and nearest distance feeding ground rather than the rest of two vulture colonies.

Keywords: *Gyps bengalensis*, *Gyps indicus*, nesting sites, feeding grounds, Raigad district

Habitat Analysis of Sunda Scops-Owl (*Otus lempiji*) in Urban Environments at Universitas Negeri Malang Indonesia

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Urban areas in Malang have long become home for Sunda scops-owl (*Otus lempiji*). As one of the major campuses in Malang, Universitas Negeri Malang has provided shelter for this adaptive species. Nonetheless, with developments going on the campus as well as poaching to fulfill the demand in wildlife trade, this species population is also threatened. Thus, this study aims to describe the habitat analysis of Sunda scops-owl by mapping their roosting sites at Universitas Negeri Malang and measuring the density of this species at each point, the abiotic factors such as light intensity, temperature, air humidity, wind velocity and also canopy trees as well as food availability. The observation was conducted by the interval of 7 days for one month (one observation each week) at each roosting site starting from 7.30 pm to 00.00 am simultaneously. The observation results suggest that 5 individuals of owl is frequently found at point 1 and 2. Most of the owl prefers a habitat with low light intensity and quieter places with fern tree (*Filicium decipiens*); and feeds such as cricket, gecko and lizard. Previous studies were only limited to forest areas; thus provide habitat analysis of Sunda scops-owl in urban areas is necessary as the lack of Sunda scops-owl research in Indonesia. By knowing habitat and food preference Sunda scops-owl in urban areas, conservation efforts can be undergone through planting more trees which are preferred by owl in order to maintain the urban ecosystem where they thrive as top predators thus saving the species.

Keywords: Sunda scops-owl, habitat analysis, urban areas, Universitas Negeri Malang



The 11th Asian Raptor Research and Conservation Network International Symposium, Bali - Indonesia | 10-11 October 2019

Vegetation Characteristic around Changeable Hawk-Eagle (*Nisaetus cirrhatus* Gmelin, 1788) Nest Location at Taman Buru Gunung Masigit Kareumbi Tourist Area

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Changeable Hawk-eagle (*Nisaetus cirrhatus* Gmelin 1788) was one of four raptor species that can be found at Taman Buru Gunung Masigit Kareumbi (TBGMK). Raptors are important bird that sensitive to environmental change and can be used as indicator for ecosystem condition. Existence of raptor species depend on specific condition in certain area, especially if the area used as nesting habitat. The purpose of this study is to determine the characteristics of vegetation around Changeable Hawk-eagle nest at TBGMK tourist area. From this study, we found 3 nest location. All of location are located at tourist area. There are two plant species that Changeable Hawk-eagle choose to build nest, at first nest location, nest tree species are *A. Excelsa* and at second and third nest location, nest tree species are *P. Merkusii*. Method that we used for data collection are kuadrat method with descriptive analysis. We collect vegetation characteristic data to acquire representation about nest tree characteristic, vegetation composition and vegetation structure around nest tree. Nest tree at all of nest location belong to vegetation architecture Rauh model. Total height of nest tree at nest location 1-3 are 31,76 m (1); 38,87 m (2); 37,69 m (3). From every nest location, we always found *A. excelsa*, *P. Merkusii*, *E. Hemisphaerica*, and *Sterculia* sp. as vegetation composition characteristic. *P. merkusii* was species that have highest FR (relative frequency), DR (relative dominance), and SDR (summed dominance ratio) value at all of nest location. Based on stratification, vegetation at all of nest location dominated by vegetation from stratum B. There are 6 vegetation architecture model that can be found at all nest location, but most of vegetation that we found belong to Rauh model. Changeable Hawk-eagle nesting habitat selection at TBGMK tourist area may be influenced by vegetation architectural model rather than presence of certain vegetation species.

Keywords: Changeable Hawk-eagle, vegetation characteristic, vegetation architectural model, TBGMK

Assessing Potential Habitat of Javan Hawk-eagle (*Nisaetus bartelsi*) Based on Landscape Characteristic in Banten Province

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Javan Hawk-eagle, JHE (*Nisaetus bartelsi*) is a raptor on natural rainforest in Java island which status is endangered. Banten province has six potential habitat patches based on previous research obtained from the update of JHE habitat suitability models in Banten province. The objectives of this study were to analyze the characteristic of actual habitat for JHE based on previous researches, to compare the characteristic between potential and actual habitat in Banten province,

and to validate potential habitat for JHE in Banten province. Assessing potential habitat quality for JHE was used as an information that will help decisions-makers design the development plans that in line with JHE's conservation plans. General assessments of habitat quality were size of habitat area, quality of vegetations, connectivity with other habitat area, and levels of human disturbance. The characteristic of actual habitat for JHE based on previous researches were land cover, landform, slope, elevation, nest vegetation, corridor movement, human activity intensity, river, and home range. Data was collected by ground check activities and interview in potential habitat patches, then the data is scored based on the characteristic of actual habitat for JHE. Result showed that two patches were very suitable liked the actual habitat of JHE there were Mt. Karang and Mt. Asepun in Pandeglang district. Three patches were suitable liked the actual habitat of JHE there were Gunung Tukung Gede Nature Reserve in Serang district, Mt. Pulosari and Mt. Honje in Pandeglang district. Then, one patch was quite suitable liked the actual habitat of JHE in Pantai Selatan. Land cover that has the largest area in potential habitat patches of JHE was forest with total area 136.35 Km² or 71.09 %. Three potential habitat patches of JHE in Banten province were located in protected forest with total area 20.84 Km² or 9.54%, while 197.58 Km² or 90.46% outside the protected forest. Based on these fact, landscape management recommendation for JHE should be monitored continuously, increased the landscape quality, and offered conservation activities in each patch of potential habitat in Banten province.

Keywords: Banten, habitat assessment, *Nisaetus bartelsi*, patch, potential habitat

Nutritional Evaluation of Raptors at Pusat Suaka Satwa Elang Jawa (PSSEJ)

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Pusat Suaka Satwa Elang Jawa is a rehabilitation center that focuses on raptors. Raptor rehabilitation center management have to provide nutritional needs of each raptor. Nutritional status affects health, growth, reproduction, and longevity. Raptor were fed a domesticated species such as guinea pigs, rats, and mice. Three individuals from each species were measured the proximate composition. Proximate analysis was performed to determine energy (kal/g), protein (%), fat (%), calcium (%), and phosphorus (%). Comparison of the nutritional value based on proximate composition, reference of raptor nutrition needs, and measuring maintenance metabolic rate of each raptor. The data collected were amount of diets given (g) and body weight (Kg) of each eagles. The average daily raptor diet were 195 g guinea pigs, 217 g rats, and 69 g mice. The total diet consumed by each raptor were 168±38 g guinea pigs, 189±22 g rats, and 69±14 g mice. Maintenance metabolic rate of the raptor were 126-189 Kcal. The average energy consumed showed high values for guinea pigs (223±17 Kcal) and rats (313±26 Kcal). Meanwhile, mice showed ideal range in the result (138±14 Kcal). Based on the analysis, rats have a protein content of 16.19±0.16% was close to ideal range while mice have a fat content of 3.64±1.62% was in the ideal range. Calcium (Ca) and phosphorus (P) contained in all prey showed the ideal results. The nutrition has been fulfilled. Energy consumed might be high, but the activity of raptor are still active, so it's still on ideal body weight.

Keywords: Nutrition, raptor, diet, maintenance metabolic rate, proximate analysis



The 11th Asian Raptor Research and Conservation Network International Symposium, Bali - Indonesia | 10-11 October 2019



The 11th Asian Raptor Research and Conservation Network International Symposium, Bali - Indonesia | 10-11 October 2019

Successfull Hand-Rearing of Javan Hawk Eagle (*Nisaetus bartelsi*) at Taman Safari Indonesia - Important and Significant Milestones in Chick Development

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The Javan hawk eagle (*Nisaetus bartelsi*) is listed as Endangered in the IUCN Redlist with wild population numbers of between 300 and 500 mature birds. This raptor is found only on Java, Indonesia, distributed from Gunung Gede Pangrango National Park in the west to Alas Purwo National Park in the east. Taman Safari Indonesia (TSI) undertook a Javan hawk eagle research, breeding and conservation program to increase the population of this endangered species. Hardly any information is available on ex-situ breeding of this species. Several handraisings were conducted and produced important and significant milestone informations in the Javan hawk eagle development. The chick was maintained in a brooder with temperature setting at 31-33°C and humidity at 45-55%. Feeding schedule and diet varied according to the age and development stage of the chick. Keystone events recorded during the hand-rearing process included emergence of flight feathers, first independent feeding attempt and first fledging flight. These hand-rearing techniques and data are important for headstarting Javan hawk eagles to eventually produce sufficient individuals to increase the exsitu population and for eventual introduction into the wild.

Keywords: Javan Hawk Eagle, Hand raise, Captive breeding

Analysis of Serak Jawa (*Tyto alba*) feed at the Fields Ecosystem in Cancangan, Yogyakarta

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The existence of predator at the habitat being an important benchmark for some species survival at their ecosystem. Serak Jawa (*Tyto alba*) is one of nocturnal predator which hunting target is a small mammals like rodent and shrew. As time goes by, some farmer at that certain place take the advantage of this species for controlling pests in the fields ecosystem, and then they made a nestbox for *Tyto alba* to live, so that, this bird can being a natural predator continuously. This research was held from July until August 2019 at fields Cancangan area, there are 16 nestbox that we found over there. The purpose of this research is to know the types of prey from Serak Jawa according to prey's skull shape analysis which is obtained from the pellet. According to the identification result that have been done in pellet at 8 nestbox, we found that, most of the prey is field mouse (*Rattus argentiventer*).

Keywords: Serak Jawa (*Tyto alba*), prey, fields, nestbox



The 11th Asian Raptor Research and Conservation Network International Symposium, Bali - Indonesia | 10-11 October 2019

Conservation Research: Raptors-Early Education in 3rd Elementary School in Malang, East Java, Indonesia

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Raptor is a group of prey birds which consists of eagles and owls. The decline in the number of raptors that live in nature, due to poaching is the background of this research. The subjects in this study were 3rd grade elementary school students because of the suitability of the research topic with one of the Basic Competencies of Thematic Subjects at this level. The first location of the study was on elementary school in the Malang City area, and the second was on elementary schools in the closest area (radius ± 5km) to the forest in the Malang Raya-Batu area. The raptor early educational research method was by presenting a drama that appeals to elementary school children with the theme of the important role of Raptor in life, entitled of the drama "The Suffering of an Eagle". Data collection techniques in this study were in the form of questionnaires (adopted from Diwanata, 2016) and short stories of students' experiences about raptor. The results showed (a). The 3 species of raptor most widely known to students are *Otus lempiji*, *Nisaetus bartelsi*, *Tyto alba* based on observations of students in the surrounding environment, whether they are nurtured or seen freely in nature; (b). The percentage of students' level of knowledge about raptor preservation is 42.2%; (c). The percentage of students' attitudes towards raptor preservation is 74 %; (d). The average percentage of students who get learning about raptor from parents amounted to 43.3%, from the others people amounted to 9.1%, from the mass media amounted to 22.1%, and others; (e). The percentage of students who have not yet learned about bird preservation is 27.8%; (f) Students who live-schooling in the City area don't have seen raptors (wild), don't poaching and also don't sold their hunts but 9.1% students maintained raptors. But students who live-schooling in areas near the forest 52.3% students have seen raptors (wild) around their homes, 1.2% students poaching raptors, 2.4% students sold their raptors hunts, 3% students maintained raptors. Based on the results of this study required continuous raptors early education especially at students at the elementary level or maybe at the kindergarten level as early knowledge about raptors conservation, not only in near forest's school, but also in the city's school.

Keywords: early education, raptor, elementary school, conservation



The 11th Asian Raptor Research and Conservation Network International Symposium, Bali - Indonesia | 10-11 October 2019

Raptor and Skipjack Tuna *Katsuwonus pelamis* in the Perspective of Local Fishermen for the Sustainability of Waters Ecosystem Bunaken National Park

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Bunaken National Park is identical marine national park, there are 2000 species of fish, one of which is Skipjack Tuna (*Katsuwonus pelamis*), which falls prey raptor – Brahminy Kite (*Haliastur indus*). Publication about raptor in Bunaken National Park are still lacking. Collection of potential data, behavior, and fishing activities, with observation and literature studies. Data analysis used tabulation, VAC and described in a descriptif. The results showed that the raptor was often found in Bunaken National Park is Brahminy Kite (*Haliastur indus*) and Spotted Kestrel (*Falco mollucensis*), including diurnal raptor. Type of raptor Skipjack Tuna (*Katsuwonus pelamis*) is Brahminy Kite, often appearing in the Utilization Zone and the Traditional Zone. Raptor Spotted Kestrel, Skipjack Tuna is not yet the first choice. Raptor Skipjack Tuna based on perception of fishing communities is 1) natural code for fishing season; 2) fishing location; 3) harvest season for Skipjack Tuna and other pelagic fishes; 4) direction of currents, wind and waves; 5.) ecological balance and environmental pollution. This perception influences behavior of the fishing community that is 1) social systems forming fishing groups; 2) sharing roles and profit; 3) enhancing communication and trust between; 4) traditional fishing gear is still function; 5) the catching location arrest in the Coastal area. This behavior is a local wisdom, that has implications for the protection of the Bunaken National Park ecosystem. The technique of "catch by kite" is a local wisdom still maintained until now and is not owned by other local communities.

Keywords: Raptor, Skipjack Tuna, Local Wisdom

Community Based Conservation for Raptors in Mount Slamet, Central Java

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Mount Slamet is home of at least 13 species of raptors, including the endangered Javan hawk-eagle, which make this area is classified as Important Bird Area (IBA). Mount Slamet also being the important flyway for migratory raptors. However, bird poaching activities that happened for decades makes the future of birds population in Mount Slamet is waiting for its crush, including raptors population. Biodiversity Society has been working with local communities to conserve



raptor since 2002 through periodical population monitoring, protecting nest, restoring the habitat, as well as to combat poaching and illegal trafficking. In 2012, supported by Suaka Elang Foundation, one individual of Javan-Hawk eagle was successfully released in southern side of Mount Slamet. This program was able to promote Mount Slamet as one of national site for Javan Hawk-eagle. In order to get more supports from local government institution, a MoU signed by local police officer, local army commander, village governments and local community leaders was signed. The MoU is useful to empowering local communities to take direct action while poaching and illegal trafficking happened. At least 7 cases of poaching and illegal trading has thwarted, and one individual of crested serpent-Eagle saved and released directly to the forest by local community. In 2019, supported by Copenhagen Zoo, Biodiversity Society releases education program to develop more local champions in conservation. Together with an Islamic School, species conservation is taught to the students through directly in the field. The students have birds conservation programs. One of the activity is to monitor eagle nest using camera trap to record and study breeding progress. Long term programs with local communities in Mount Slamet is expected to be a fruitful process that can change perception of communities and many other parties in conservation, and able to secure the raptor population sustainability in the future.

Keywords: Mount Slamet, Community Based Conservation, Biodiversity

Raptors of Iran and the Recent Conservation Efforts

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Approximately, 550 bird species have been listed to be seen in Iran of which, 45 species are categorized into Falconiformes or Accipitriformes order. These include various birds of prey families such as: pandionidae, accipiteridae and falconidae. In addition, 12 species of Strigiformes, linked to two families of tytonidae and strigidae, are residing in Iran. According to the IUCN red list of threatened species, eight of these raptors are considered threatened and saker falcon (*Falco cherrug*) is of great importance as an endangered species, as well as being resident in a few countries including Iran. Illegal trapping of the live birds in order to sell them in the black market is the main reason of rapid population decline of this species. A thriving breeding population of the saker falcon was reported in 1993 and 2003, but only 10-100 of individuals are estimated to reside only in north-eastern borders of Iran where poachers cannot trap. Unfortunately there is not any specialized rehabilitation centers for the wild raptors in Iran. However, a number of activities have been done in recent years. These include the implementation of the saker falcon task force global action plans in Iran and also the formation of Iran Bird Records Committee whereby researchers and members tackling the monitoring and conservation problems related to the endangered birds. Reports and researches on raptors form a limited number of ornithology studies in Iran and most of them are from conservation and veterinary medicine perspective in which habitat usage and metal toxicity are mostly assessed.

Keywords: saker falcon, raptors, birds of prey, conservation, veterinary medicine



The Behavior Comparison of the Five Types of Eagles during Rehabilitation at Pusat Konservasi Elang Kamojang

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Eagle is one of the protected animals in Indonesia, but their existence in nature is increasingly threatened with the rise of trade and hunting. Releasing the rehabilitated eagle is one of the efforts to increase the population in nature. Pusat Konservasi Elang Kamojang (PKEK) is an institution that facilitates the rehabilitation and release of Eagles. Before the eagles were released, it had to go through a rehabilitation stage until it deserves to be released. The purpose of this research is to determine the behavioral comparison of five species of eagles at the rehabilitation stage. The eagles observed were Crested serpent eagle, Changeable hawk-eagle, Red-backed sea-eagle, Javan hawk-eagle, and black eagle. the method used in this research is the scan sampling method. Data analysis is conducted by assessments of hunting behavior, social behavior, and general behavior as release criteria. The result of the assessment showed that the hunting behavior of the five species of eagles classified as a good category, while the social behavior of Javan hawk-eagle and Changeable hawk-eagle is still lacking in good. On the common behaviour especially flying, only Red-backed sea-eagles and black eagles that capable of maneuvering in the rehabilitation cage.

Keywords: Behaviour, Kamojang, Rehabilitation, Scoring

A Community-Based Conservation as a Key for Succeeding Raptor Release Program in Jogja Wildlife Rescue Centre, Yogyakarta, Indonesia: A Crested Serpent Eagle Release at Jatimulyo Village (2019)

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Jogja Wildlife Rescue Centre (JWRC) is a rehabilitation for raptors from Indonesia. Run in a total 14 hectare area, JWRC houses 29 raptors comprising of six different species. Most of the raptors are either confiscated or previously kept as pet bird. This year, JWRC managed to release four individuals in Yogyakarta area: three crested-serpent eagles and one crested goshawk. Two crested-serpent eagle were released in Jatimulyo Village. Release program involved pre-release procedure (release site survey, health examinations, socialization, marking, habituation), release, and post-release monitoring. A community-based conservation concept was applied in every raptor release program, as it brings many benefits for the centre with limited human resource.



The 11th Asian Raptor Research and Conservation Network International Symposium, Bali - Indonesia | 10-11 October 2019

This was done by working together with a conservation cadre in Jatimulyo Village who will then mobilising citizen of Jatimulyo, and by involving conservation organisations in Yogyakarta region. Those communities helped the pre-release procedure like socialization and preparation of habituation cage, preparation of release ceremony, and post-release monitoring. JWRC also gave opportunity for people with no conservation background but interested in conservation to help running this program. A social media was used to invite and select volunteers who were interested in the program. A total of 15 volunteers from various backgrounds was selected as post-release monitoring team. A two-day training on post-release monitoring procedure was conducted prior to release. Release was able to run smoothly. Many Jatimulyo people understood the function of release program. We took opportunity to raise conservation awareness towards Jatimulyo people and all volunteers of release program. Until now JWRC still received a help from the communities to share the message to their surroundings, as well as helping JWRC in compiling data to make a release report. This community-based concept benefits JWRC in a way of organisation-branding, thus can help increasing income opportunities for running another release program. In addition, this concept is a good medium to raise conservation awareness. With a strong coordination and commitment during running the program, JWRC believe the community-based conservation concept should be applied in many of its conservation program.

Keywords: community-based conservation, raptor, release, conservation awareness

No Variation in Speed and Accuracy of Raptors toward Prey Target during the Midday and the Afternoon Basic Instinct Show at Bali Bird Park

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Basic instinct performance is an appearance of the natural basic abilities of various types of raptors in Bali Bird Park. This performance takes place twice every day, at midday and afternoon. Some raptor species have the ability to grab prey while flying, or perch and then grab their prey (sit and wait predator). This study aimed to determine whether there was a variation in speed and accuracy of raptors to respond the prey target differed between the midday and the afternoon performance. The speed of the birds flying to grab the prey target was recorded using a stopwatch by three observers, and later was analyzed by using SPSS oneway Anova ($P \leq .05$). Scoring method was used to record the accuracy of the response. The data collection was conducted in September 2019.



The 11th Asian Raptor Research and Conservation Network International Symposium, Bali - Indonesia | 10-11 October 2019

There was no variation in the speed and the accuracy toward the prey target was observed between the midday and the afternoon shows in Bali Bird Park when the study was conducted. The mean speed was $3.07 \pm SE .38 \text{ msec}^{-1}$ and $3.03 \pm SE .32 \text{ msec}^{-1}$ in the morning and the afternoon shows, respectively. All attempts that the birds performed was successful. No variation in speed and accuracy was presumably related to the fact that the birds were only perform once in a day.

Keywords: raptors, flight, behaviour, display, response

POSTER PRESENTATION ABSTRACTS

Topic: Raptor ecology and climate change; Forest and raptors

Prey Item Selection and Prey Delivery of Indian Spotted Eagle during Chick-Rearing Period in Nepal

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The Indian Spotted Eagle (*Clanga hastata*) is a vulnerable species and distributed largely limited within the Indian sub-continent. This species is recently separated from Lesser Spotted Eagle (*Clanga pomarina*) and little information exists on the species' ecology and prey item selection. Here we present the first ever study on the diet of Indian Spotted Eagle during breeding season in lowlands of Nepal. In 2018, we conducted 720 hrs. observation on active nests ($n = 3$) during chick-rearing period (June – August) to record prey items delivery. In each day, observation was conducted from dawn to dusk that allowed us to record all deliveries of the day. We reported a total of 132 prey deliveries; frogs contributed the highest (70.3%) proportion among the selected prey items, followed by small mammals (14.41%), birds (7.58%), lizards (0.73%), and a small proportion of unidentified (6.93%) prey items. Male Indian Spotted Eagle delivered most of the prey items (94.70%) and female mostly fed the eaglets. The most preferred feeding time to the eaglet was between 16:00 – 17:00 hrs, followed by 08:00 – 09:00 hrs. Average daily delivery rate of prey was 2.21 ± 0.73 (range = 0 – 3). Binomial test showed no significant difference in the deliverance of prey items before and after the noon time among in all active nests. Although this area is rich on several species of prey items, their preference of frogs in a diet during breeding season could have two possible reasons. First, in our study area chick-rearing period of Indian Spotted Eagle occurs in the middle of monsoon season that favors the growth of frogs in the flooded fields making them easier to be hunted. Second, frogs' meat is softer than other prey items and nestlings of Indian Spotted Eagle might have preferred than others.

Keywords: Indian Spotted Eagle, Nepal, Chick-rearing period, prey items frogs



Diet of Osprey in Coastal Area, Japan

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In Japan, Osprey (*Pandion haliaetus*) were categorised as Near-Threatened species (NT) and their main habitat was in coastal areas, but the population has been increasing in recent years mainly in dam lakes in inland areas. It has been found that the increase was due to the construction of a dam lake, became a good hunting habitat for them, and the introduction of alien fishes (for example by anglers) into inland. The future management of dam lakes and alien fishes may pose a threat to the maintenance of Osprey's population inland, and the conservation of coastal habitats that utilize more natural food resources than inland is important. In this study, we studied the diet of the chicks by identifying fish species being fed by adult Osprey in coastal area. We set up CCD cameras in 2 pairs of Osprey's nests in the coastal area of Iwate Prefecture, and the fish brought to the nest in the chick rearing stage was examined. Based on the recorded images, the fish species were identified by measuring the approximate total length. In addition, we calculated the estimated weight from the total length of the fish. In the breeding season in 2018, we obtained data on a total of 428 for 2 nests. The top 5 types of fish included Belontiiformes, Scombridae (inhabits in packs on the surface), Cyprinidae (inhabits a gentle in the stream environment), Ascidae (inhabits reefs in shallow waters), and Mugilidae (inhabits inner bays and estuaries). These fishes are considered to have been easy to feed for Osprey because of their habit. The number of feeds was highest Belontiiformes for each pair, while the top of the estimated weight percentage was Mugilidae and Scombridae, respectively. Therefore, it is considered that the Mugilidae and the Scombridae, which were heavier than the Belontiiformes, which were fed in many times, important to the growth of chicks. Fed fish suggested that the main foraging sites for both pairs were the estuaries and inner bays where the water flow was gentle. Our study area was damaged by Tsunami (2011) and flood (2016). So, it is possible that reconstruction projects such as bank protection work have caused changes in the habitat of fish and hunting habitats of Osprey. It is desirable to balance the conservation of coastal area's Osprey with reconstruction projects.

Keywords: coastal area, diet, habitat evaluation, nesting camera, *Pandion haliaetus*

Analysis of Osprey Hunting Grounds in Dam Lakes by Environmental Characteristics

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Construction of dams has a significant impact on the surrounding ecosystem, including the river fragmentation, the effecting a change in river structures, and the formation of a dead water region. It can be said that knowledge on the actual condition of dam lake utilization by various organisms is important in order to appropriately evaluate the effect. In recent years, the distribution of Osprey (*Pandion haliaetus*) has expanded from coastal areas to inland areas in Japan. In particular, its increase is significant in dam lakes. The factors of which are pointed out that the formation of dead and open water regions, and the invasion of fishes which are suitable for the bait of Osprey (such as carp and largemouth bass) into the dam lakes. Therefore, in this study, we focused on the environmental characteristics of the dam lakes, the purpose of this study was to evaluate dam lakes as hunting grounds for Osprey. Study site dam lake was Lake Gosho, located in the inland area of Iwate Prefecture. Approximately 10 Ospreys are found every year in this lake. Therefore, it assumed to be a suitable environment for Osprey hunting grounds. April to October 2018. We measured water depth, flow velocity, and transparency at the survey points established based on the results of the observation of Osprey hunting and at the survey points randomly set using GIS software (QGIS 2.18.15), and compared each points. From the analyses, the hunting grounds for Osprey were significantly shallower in the dam lakes. On the other hand, there was no significant difference in flow velocity and transparency, indicating that there may be no significant difference whole the dam lake. The flow was sufficiently slow and the transparency was sufficiently high in all the sites, compared with the values in the past literature concerning hunting locations for Osprey. In addition, although the water level of the dam changed by a maximum of about 6 m during the survey period, the hunting areas of Osprey also changed with the change in water level. The results showed that water depth and lake water level were important factor for Osprey hunting in dam lakes, while flow velocity and transparency did not limit osprey hunting. In other words, this study showed that dam lakes may provide more hunting grounds to Osprey depending on the water level.

Keywords: Dam lake, Ecosystem, Hunting grounds, Piscivore, *Pandion haliaetus*

Correlation of Diet and Prey Abundance of Philippine Scops Owl (*Otus megalotis*: Walden, 1875) in the Threatened Species Arboretum, University of the Philippines Diliman

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A shift in the diet composition of resident Philippine Scops Owls, *Otus megalotis*, in the Threatened Species Arboretum of the University of the Philippines has been



previously observed. However, the factors affecting this change in diet have not been studied. This study answers the question of whether the dietary shift of Philippine Scops Owls reflected in owl pellet collections is related to the abundance of a specific prey type within the area in a given time. Prey abundance surveys on small non-volant mammals, bats, birds, squamates, anurans and Orthopterans were conducted across one breeding season (February-March 2019) and one non-breeding season (August-October 2018). Afterwards, the resulting prey population densities were compared with owl pellet contents from the study of Espanto (2019). Results show that Philippine Scops owls exhibited changes in their diet composition. Nonetheless, Pearson's Chi-squared tests show that the owls' diet based on pellet analysis is directly related to the relative abundance of prey within the Threatened Species Arboretum. Additionally, increases or decreases in the availability of some preferred prey (anurans, small non-volant mammals and squamates) across the two survey periods also reflected increases in the frequencies of the respective prey items in the owl pellet collections. The diet of the owls might therefore be reflective of the status of the ecosystem and biodiversity of the Threatened Species Arboretum in UP Diliman, making it a good candidate as an ecological indicator of Philippine biodiversity.

Keywords: owl diet, prey abundance, prey preference, correlation, ecological indicator

Homerange and Habitat Type Used by Post Released Changeable Hawk-Eagle (*Nisaetus cirrhatus*) Based on Monitoring Studies Using Satellite Tracker in Yogyakarta

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The use of tracking satellites in the monitoring studies of the post release confiscated Changeable Hawk-eagle (*Nisaetus cirrhatus*) has never been done before. This study aimed to provide monitoring data for the post released confiscated Changeable Hawk-eagle (*Nisaetus cirrhatus*) at the Taman Hutan Raya Bunder, Gunung Kidul, Yogyakarta. This study was a collaboration between BKSDA Yogyakarta and the Faculty of Vet Medicine Gadjah Mada University. This study found that the average flying distance of the Changeable Eagle-hawk was 1.197 km/day. The most widely used habitat type by this species at the Taman Hutan Raya Bunder was teak forest or mixed garden, which was 43.9%.

Keywords: raptor, changeable hawk-eagle, post release, confiscated, Yogyakarta



Population Dynamics of the Javan Hawk-Eagle (*Nisaetus bartelsi*) at Mt. Picis Natural Reserve and Mt. Sigogor Natural Reserve

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Javan hawk-eagle is one of the endangered priority animals whose natural population needs to be increased by 10%. Accordingly, East Java BBKSDA conducted routinely site monitoring observations to determine its population dynamics. The observations were conducted at the Mount Picis Natural Reserve (CA) and Mount Sigogor Natural Reserve (CA) in July-August during the period 2013 – 2018. The observation were conducted for seven days every year. The observations found that the Javan Hawk-eagle population in the region has increased markedly by the presence of young individuals and encounter records in new locations.

Keywords: Javan hawk-eagle, raptor, population, east Java

Encounter of the White Breasted Sea Eagle (*Haliaeetus leucogaster*) and Brahminy Kite (*Haliastur indus*) in The Labuan Bajo Manggarai Barat and Surrounding

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White breasted sea eagles (*Haliaeetus leucogaster*) and brahminy kite (*Haliastur indus*) are two species raptor (family Accipitridae) of 69 species of raptors in Indonesia. The status of the existence of these two eagles is categorized as a rare "Least Concern" (according to IUCN Redlist, 2016) and protected status (according to Indonesian Minister of Environment Regulation No. 20, 2018). The purpose of this study was to determine the presence of white breasted sea eagles and brahminy kite in Labuan Bajo and surrounding areas. Observations were carried out at 12 points with the technique "look-up method" and "look-down method" in May 2015. Data recorded at the time of observation were: species name, number of individuals, time of encounter and habitat type at time of encounter. The results showed that the number of individual of white



breasted eagles found 1-2 birds, at 8.00-13.25 am and 14.30-16.25 pm distributed in the area of Labuan Bajo, Pede Beach, Pulau Pengah sea, Pengah Besar Island, Batu Bolong sea. This eagle soaring above the beach, gliding above the savanna, above the mangrove forest and once found one perched on a waru tree (*Hibiscus* sp.) in the savanna of the island of Pengah Besar. Brahminy kite found 2 individuals, at 8.30-12.25 am and 14.30-16.25 pm, soaring above the beach, above the sea, gliding above mangroves, in the monsoon forest and in savannah, distributed in Labuan Bajo, Pede Beach, Pulau Pengah sea, Papagaran Island, Batu Bolong sea, Komodo Island and Komodo Nasional Park

Keywords: White breasted sea eagle, brahminy kite, Labuan Bajo area, distribution of encounters

Hunting Behaviour of Migratory Oriental Honey Buzzard (*Pernis ptilorhynchus*) to Migratory Giant Honey-Bee (*Apis dorsata dorsata*) (Hymenoptera: Apidae) on Java Island, Indonesia

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Both a Migratory Oriental Honey-buzzard (*Pernis ptilorhynchus*) and a Migratory Giant Honey-bee (*Apis dorsata dorsata*) can be found in South-east Asia. The bird is the main animal predator of the honey-bees, prey upon its honey comb, larvae, and honey. Its existence always follows the migration of the honeybees. They stay on Java island during migratory season. The honey bee live in a large colony and have a powerful sting that is useful to defence from the predator bird. The bee is as the most dangerous animals since their threatening defensive behaviour cause severe impact to the bird and frequently fatal to human being. Data collections on the hunting behaviour were based on incidental observations and reported cases between year 2003 and 2019. The safest hunting for the buzzard is to prey upon newly remaining empty nest left by the honey bee. When the nest was still occupied by the bee colonies, the buzzard should develop a strategy to avoid and reduce the risk of being attacked. It sometimes transfers the attack to the people nearby if the bee nest located in the suburb. Other efforts to reduce or avoid the attacks of the honey bee by the oriental honey buzzard and how people can manage it will be discussed.

Keywords: hunting behaviour, migratory giant honey bee, oriental honey-buzzard, Java

The First Pilot Survey of Satellite Tracking Device Use for Raptor Monitoring at a Wind Farm Site in Mongolia

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Flight height, flight direction and activity of raptors at wind farm sites are important parameters to evaluate the impact on raptors from wind mills. The accurate estimation of flight height, flight direction and daily activity of raptor species is a challenge for raptor biologists. In order to estimate flight height, flight direction and activity of raptors accurately, we used a satellite device, produced by KoEco, Korea, and 62 g weight and 66×38×33 mm (L×W×H) dimensions. The device can give flight height in every hour and daily flight pattern of a species. The telemetry unit was fitted on a fledgling Steppe Eagle (*Aquila nipalensis*) close to Wind Turbine Generator 21 (WTG21) on 11 August 2018. The bird stayed around the nest and down the valleys until its migration started on 08 October, 2018. The field data showed that the young bird with the transmitter did not fly closer to any other wind turbines and the closest range to WTG21 was 151 m. The eagle started to migrate to the south on 6 October 2018 and reached Annapurna Conservation Area in Nepal on 28 October, passing over the Himalayan Mountains. Unfortunately, signal transmission of the individual stopped by unknown reasons at Rampur Bushahr and along the river Sutlej in north western India since 04 November, 2019. From this pilot survey, we can conclude that relatively low risk of collision on fledgling of the species with WTG at the site. The satellite device is one of the very important tools to gather field data and assess accurately an impact on raptors from wind turbines at wind farm area.

Keywords: Mongolia, steppe eagle fledgling, satellite device, wind farm, monitoring.



Osprey Don't Large Scale Migration in Japan?: The First GPS Tracking in Japan

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Osprey (*Pandion haliaetus*) is a fish-eating raptor and is widely distributed on five continents of the world. It is one of the most studied raptor in Northern Europe and the United States, but the ecology of Osprey in the Far East and Asia remains largely unknown. In particular, in the Far East, it is not known how and which population is moving. It is necessary to clarify the migration of Osprey in the Far East and Asia for the conservation of populations and international cooperation. Osprey does large scale migration. Northern European populations are known to migrate to Africa, and North American populations to South America. In Japan too, it is known that winter is more common in southern Japan and less so in northern Japan, and it is clear that population migration occurs. In Japan, only the tracking by the foot ring is carried out, but there are few observation examples and the actual condition of migration has not been clarified. Therefore, we captured 1 adult Osprey in Iwate Prefecture, Japan and mounted a GPS (Made in Koeco, 32 g). The GPS records 1 point of position information (latitude, longitude, altitude, and flight speed) every 1 hour and transmits position information twice a day. The transmitted records can be viewed at any time on the web. Based on the information recorded by GPS, the home range, migration route and wintering area were clarified. Osprey equipped with GPS did not large scale migration. The wintering place was Tochigi Prefecture in Japan, and the linear distance to the breeding place was about 400 km. Osprey moved this distance in two days. The home range calculated by Minimum Convex Polygon (MCP) was about 35 km² for both breeding areas and wintering areas, indicating that a very wide range of water was used. Even in the observation report by foot ring, there is no information from foreign countries, and the longest record is that Osprey was released in Hokkaido and observed in Kagoshima Prefecture (Approximately 1600 km). At present, it is highly likely that Japanese Ospreys do not regularly go abroad. We will add GPS and further investigate.

Keywords: Home range, Migration, *Pandion haliaetus*, Piscivore, Tracking

Using Occupancy Model to Develop Long-Term Monitoring Program For Forest-Dwelling Raptors In Taiwan

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Mountain Hawk-Eagle (*Nisaetus nipalensis*) and Black Eagle (*Ictinaetus malayensis*) are both endangered forest-dwelling raptors in Taiwan, facing serious illegal hunting pressure and habitat loss. To develop a long-term monitoring system, we used occupancy modeling framework to evaluate the occupancy probability, distribution and habitat use. Sixty sites were selected with stratified random sampling in 4 counties in Southern Taiwan. At each site, we conducted 3 repeated 1-hr point count survey from October to November in 2018. A total of 25 Mountain Hawk-Eagle occurrences were recorded in 18 sites. However, we failed to estimate the occupancy rate due to the low detection probability (0.11 ± 0.02). The results also indicated that the proportion of coniferous forests was positively associated with the probability of occupancy. The survey in the afternoon was frequently affected by weather condition, contributing to the low detection rate. On the other hand, a total of 84 Black Eagle occurrences were recorded in 39 sites. The detection probability was 0.28 ± 0.03 , but high naïve occupancy rate (0.65) also resulted in failure to estimate occupancy rate. In the recent decade, the records of Black Eagle have increased significantly. However, whether the phenomenon was contributed by the increase of survey effort or the population growth is still not clear. Our preliminary results could be applied for developing a monitoring program for the forest-dwelling raptors species in the future.

Keywords: Mountain Hawk-Eagle, Black Eagle, Long-Term Monitoring, Occupancy Modeling

Hawk Migration at Takatouyama, Kitakyushu City, Fukuoka Prefecture

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Kitakyushu city is the transit spot for the migrations of various hawks both in spring (mainly from southwest to northeast) and autumn (mainly from northeast to southwest). Our Kitakyushu Branch of Bird Society investigates these migrations for the whole month of September. Unlike a route of Grey-faced Buzzards, a lot of Oriental Honey Buzzards passes here. There is the day more than 2000 individuals in a day, too and counts 10000 individuals in total in autumn in a season. There may be, however, development plans that affect the migration path, so we are concerned about the harmful influence on migration. We would like to cooperate with other observation spots on the migrating path and do investigations into the actual circumstances of migration and work on conservation.



Trend of Raptor's Illegal Distribution within the Past Ten Years in Bali

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Wildlife trade poses a serious threat to the preservation of animals, after the threat of habitat destruction. This is because until now there are no breeders who have succeeded in breeding, animals are traded and many circulating in the community are catches from nature. The study was conducted using literature study methods and was strengthened by interviews with relevant agencies and observations in the field. This research was conducted with the aim of finding out trends towards the circulation / illegal trade of protected wildlife for raptor species in the province of Bali. Data on illegal raptor trafficking or distribution for the past 10 (ten) years found that there were 38 cases involving 66 raptor individuals. These conditions indicated that the level of demand for raptor as pets was still high and there were indications that some were smuggled abroad. The type of raptor that was widely traded or circulated illegally in the community was the Brahminy Kite (*Haliastur indus*). Lack of awareness, lifestyle, and lack of punishment given to the perpetrators of illegal trade in illegal wildlife become the significant factors that cause the illegal trade still continue to occur in Bali.

Keywords: Raptor, illegal trade, Brahminy Kite, wildlife trafficking

Raptors Record in Mount Ungaran Central Java

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Mount Ungaran is one area that has remaining natural forest in Central Java, Indonesia which has important value for biodiversity. Therefore, the area also determined as AZE (Alliance for Zero Extinction) site and IBA (Important Bird Area). Record data of bird species richness in Mount Ungaran from 2018-2019 showed total of 119 bird species has been identified include raptors (eight species, two sub species). The species of raptors that have been record : Javan Hawk Eagle (*Nisaetus bartelsi*), Changeable Hawk-Eagle (*Nisaetus cirrhatus*), Black Eagle (*Ictinaetus malayensis*), Crested Serpent Eagle

(*Spilornis cheela*), Black-thighed Falconet (*Microhierax fringillarius*), Peregrine Falcon (*Falco peregrinus*) Spotted Kestrel (*Falco moluccensis*), Chinese Sparrowhawk (*Accipiter soloensis*), also two sub species Crested Honey Buzzard (*Pernis ptilorhynchus ptilorhynchus*) and one migrant raptor *Pernis ptilorhynchus orientalis* was recorded.

Keywords: raptor record, Mt. Ungaran, AZE

Monitoring of Migratory Raptor Birds in Kuningan District, West Java Province, Indonesia

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Raptor is a species of bird that occupies the top position of predators and can act as an umbrella species. Besides having local species, Kuningan Regency is also one of the trajectories for migratory raptor birds. However, monitoring raptor that migrate in Kuningan Regency has not been conducted much and has not received much attention from the society. The purpose of this study is to monitor migratory raptor birds that cross the Kuningan District. Observations have been conducted every October from 2016 to 2018 at two points (Batu Luhu and Cibeureum) inside of the Gunung Ciremai National Park area and one point (Bukit Panenjoan) outside the area and involving students of nature lovers. It revealed that the type of migratory raptor has been successfully identified that crossed Kuningan District, starting from the most population to the least population, was elang alap china (*Accipiter soloensis*), sikep madu asia (*Pernis ptilorhynchus*), and elang alap jepang (*Accipiter gularis*). It also noted that several raptor individuals stopped in Kuningan District before continuing their journey. This shows that the forest area in Kuningan regency especially in the Gunung Ciremai National Park has an important role for the raptor population so that its ecosystem must be maintained even the quality is enhanced.

Keywords: birds, ciremai mount, conservation, national park, predatory



The Lone Suren: the Last Tree of White Bellied Sea Eagle Nest in Nusa Penida

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Nusa Penida is one of famous tourism destinations in Bali which land development growth rapidly in the past decade. Every land development would affect the natural ecosystem, not an exception for the existence of natural nest and habitat of raptor that might be disturbed by the land construction which supported the tourism activity. The latest data showed five diurnal raptors in Nusa Penida, there are White-bellied Sea-eagle (WBSE) (*Haliaeetus leucogaster*), Brahminy Kite (*Haliastur indus*), Crested Serpent-eagle (*Spilornis cheela*), Black Eagle (*Ictinaetus malaiensis*) and Spotted Kestrel (*Falco moluccensis*). WBSE is the only diurnal raptor found nested in Sekartaji Village. To prevent the loss of its natural nest, this research aimed to collect data about its natural nest in Nusa Penida, especially in Sekartaji Village. We use continuous recording method that compiled with interview from September until October 2018 to observe the WBSE's nest in Sekartaji Village. Plant identification confirmed through *Flora of Java* description. Based on the observation, the WBSE frequently soaring near the savanna and sea, and nested at the only one big suren tree (*Toona sinensis*). This tree growth at the sacred area near the Sekartaji temple, which indirectly provide its protection by traditional law (*awig-awig*). The protection of that suren tree and its habitat near the WBSE's nest would be comprehensively maintained to minimize the disturbance in WBSE key habitat.

Keywords: *Haliaeetus leucogaster*, *Toona sinensis*, Nusa Penida, raptor's nest, suren, White-bellied Sea-eagle

A Note of Diurnal Raptor Appearance above the Village in North Ceram, Moluccas

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Raptor is a top predator that easily disturbed by human activities. In Ceram Island – Moluccas, particularly in North Ceram, there are two villages with raptors that periodically soaring above the residential area, there are Besi and Sawai village. The raptor seems did not disturbed and tolerate with human activities, so this research aimed to find out the raptor species that exist near the village. The research has done on March-

April 2014. We used explorative method to observe the area in Besi and Sawai, then completed with interview about the appearance of raptor. The result showed three species of raptor that might be tolerate with human activities, there are Brahminy Kite (*Haliastur indus*), Black Eagle (*Ictinaetus malaiensis*), and Spotted Kestrel (*Falco moluccensis*). Brahminy Kite frequently appear near the residential area and soaring above the forest, plantation, or along the coast. The juvenile of Brahminy Kite seems prefer to soar near the coast, while the adult Brahminy Kite, Black Eagle, and Spotted Kestrel prefer soaring above the plantation. The appearance of raptor in Besi more frequent than Sawai that might be caused by the forest and vegetation pattern, although the two vegetations dominated by nutmeg, clove, sago, coconut, and durian.

Keywords: *Haliastur indus*, Moluccas, North Ceram, Raptor

Does the Bird of Prey Migratory Arrival Correlate with the Temporal Climate at Mt. Segi Karangasem, Bali?

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Bird of prey migration phenomena is a phenomenon that occurs every year. It has been widely studied that this phenomenon can be affected by climate change. However, many studies also found that various responses were occurred among species toward the change. This study aimed to determine whether the bird of prey migration arrival at Mount Segi, Karangasem Bali correlated with the temporal climate at that region. The study was conducted from 1 October to 30 November 2018. The bird arrival, i.e. species and its number were recorded daily. Climate parameters were recorded using Accuweather version 5.4.2. Data collected were analyzed using CANOCO version 5.0 and PRIMER version 6.0. This study found that the bird of prey migratory arrival at Mt. Segi Karangasem Bali correlated with the temporal climate at that region. The presence of the Chinese Sparrow-hawk correlated with the humidity, whereas the presence of the Crested Honey Buzzard correlated with the wind speed. Moreover, the presence of the Japanese Sparrow-hawk correlated with the precipitation and air pressure. This study provides database on how climate change might affect the migratory phenomena in bird of prey. Further inter-years studies are required to predict the fate of those species under the predicted climate change scenario.

Keywords: bird of prey, climate, migration, Bali



Distribution and Population of Javan Hawk-Eagle in Bromo Tengger Semeru National Park, East Java Province, Indonesia.

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Bromo Tengger Semeru National Park in East Java Province covered an area of 50.276 hectares and more than seventy per-cent of the land cover is the montane forest which resembles as an ideal habitat for the Javan-hawk Eagle. Some encounters of the Javan-Hawk-Eagle has been reported by local people, researchers, visitors and the park rangers themselves. Also, two sites in the park has been assigned as the Javan Hawk-Eagle long-term monitoring site since 2012, namely Coban Trisula and Bendolawang. However, an extensive survey into the vast forested area of the park to find out the current distribution and population number of this raptor has never been conducted. To address that, in 2018 we conducted surveys in 12 locations within the park, including the two long-term monitoring sites, and the other ten selected sites. The site selection is based on previous records from various sources. In total, we conducted 37 days of watching in Coban Trisula, 40 days in Bendolawang and 3 days for each of the 10 sites. The result shows that 30 individuals of Javan Hawk-Eagle was recorded in 9 sites including 8 adult and 1 juvenile in Coban Trisula, 3 juveniles and 9 adults in Bendolawang, 1 adult individual each in Ireng-ireng, Bunda Ratu, Sleman, Purbakala and Ranu Kuning and 2 individuals each in Kopirejo and Gucialit. The number of individuals recorded in Coban Trisula and Bendolawang is higher than other location due to the length of the survey day.

Keywords: *Bromo Tengger Semeru, Javan Hawk-Eagle, Distribution, Population*



Topic: Genetics, disease, and rehabilitation

Quick Brief of Percentage of Eagles that Cannot be Release Compared with the Eagles That Can be Release on Pusat Konservasi Elang Kamojang Garut

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Pusat konservasi Elang Kamojang as an eagle conservation in Indonesia, from the beginning its established at 2014 has been receive 235 eagles which is separated to 19 species. The eagles earn from BBKSDA KLHK law enforcement, Indonesian Police Institute, or handing over from the citizen. Almost those eagles were hunt object, illegal market and illegal kept. The final of the law process and rehabilitation is nature release to his natural environment. But in fact out of 235 eagles, there are 32 eagles or 13,6% from it will be never get out to his nature because they were disable. The anatomical disability on wings, foots, eyes, and beak is the main cause from why they can not be release in nature for survival matters. From the 32 eagles, there are 58% wing, 18% foot, eyes 12%, beak 9% and 3% the other crucial disability.

The Role of Resort-Based Management Program in Determining the Monitoring Sites of Javan Hawk-Eagles in Gunung Halimun Salak National Park, West Java, Indonesia

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Since 2007, Gunung Halimun Salak National Park (GHSNP) Agency has been developing the "Resort-Based Management (RBM)" program, which is the implementation some activities and programs to support the national park management at the site/ground level, such as collecting data and information consist of the biodiversity, social economy of the local community, and environmental services. Within more than ten years of the implementation of the RBM program, GHSNP has gathered some of the important data and information of the biodiversity in GHSNP, including the potential and distribution of key species', particularly the Javan Hawk-eagle (*Nisaetus bartelsii*) (JHE). The park has successfully mapped the potential area, the point of nest trees and the distribution of JHE in GHSNP area. Some areas are identified as the concentration area of the JHE's distribution and the position of the nest trees. Based on the data and information,



GHSNP Agency, collaborated with multi-stakeholders, has determined seven sites as a permanent location for monitoring of JHE in GHSNP.

Keywords: Gunung Halimun Salak National Park, Resort-Based Management, Javan Hawk-Eagle

Javan Hawk-Eagle Release Program at Mt. Picis Natural Reserve and Mt. Sigogor Natural Reserve, East Java

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Mount Picis Natural Reserve and Mount Sigogor Natural Reserve has been chosen as location for releasing confiscated Javan hawk-eagle since 2016. Two individuals of Javan hawk-eagle were released in the area, in which one individual has moved to another location about 7 km away. While the other individual was still using the areas as their habitat. According to the monitoring observations that were conducted up to 2018, the population of Javan hawk-eagle at those natural reserves was estimated to between seven to eleven individuals.

Keywords: Javan hawk-eagle, release program, Mt. Picis, Mt. Sigogor

Sex Determination of Changeable Hawk-Eagle (*Nisaetus cirrhatus* Gmelinn 1788) from Pusat Konservasi Elang Kamojang Using DNA Sexing Method

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Changeable Hawk-eagle is a diurnal raptor from family Accipitridae which is protected in Indonesia. This eagle listed as Least Concern (LC) category on the IUCN Red List and Appendix II listed on CITES list. Changeable Hawk-eagle is one of the most common eagles that is often hunted and traded in Indonesia. Hunting and trading affect the behavior of eagles. Therefore, rehabilitation is needed to restore the eagle's behavior to fit its natural habits. In addition to the

rehabilitation stage, it's necessary to determine the sex of the eagles to be released, in terms of the importance of sex ratio in the release habitat. A balanced sex ratio is important for the successful management and conservation of endangered species. Morphometrics method is always used to determine the sex of eagles in Pusat Konservasi Elang Kamojang. This research aims to support morphometric data with DNA sexing method in determining sex of Changeable Hawk-eagle in Pusat Konservasi Elang Kamojang and show that molecular technology could help sex determination to be more accurate.

Keywords: Changeable Hawk-eagle, sex, DNA sexing, Kamojang

Identification of the Eagle Rehabilitation Process at Pusat Konservasi Elang Kamojang West Java

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The Indonesia government set the Javan Hawk-eagle (*Nisaetus bartelsi*) as the top priority species, one of the functions of an eagle is as an indicator of a healthy environment and controlling other animal populations. The problems are habitat destruction, hunting for illegal trade. One of the efforts to preserve the nature is through in-situ conservation and rehabilitation by Pusat Konservasi Elang Kamojang (PKEK). The purpose of this study was to determine the process of rehabilitation and rehabilitation facilities at Pusat Konservasi Elang Kamojang (PKEK). This research was conducted in July to August 2019. Data collection is done by field observations, document, searches, and interviews. There are 9 types and 119 eagles who are being rehabilitated comes from animal operations, submission from people, translocation from other PPS. The rehabilitation steps are medical examinations, treatments and behavior recovery. Facilities at Pusat Konservasi Elang Kamojang (PKEK) are, lodge, feed storage, clinics, transit cages, quarantine cages, treatment cages, observations cages, rehabilitation cages and display and education cages.

Keywords: Eagle, Rehabilitation, Process, Kamojang, PKEK



The Diversity of Eagles Based on Habitat Type in Conservation/ Natural Tourism Park of Kawah Kamojang

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The Kamojang conservation/natural tourism park forest have been fragmentation and degradation so its function as conservation area has largely been decreased to a nature tourism park. This condition caused differences in habitat types from natural forests to secondary natural forests, grasslands, plantation forests and plantations. The presence of eagle as the top predators in the food chains can be used as one of indicator in the environmental changes. Therefore, this study was conducted to determine the diversity and evenness index of eagle in different habitats. This research was conducted in May 2019 using descriptive methods and sampling using the IPA method. This study found 5 species of eagles, such as *Spilornis cheela*, *Ictinaetus malayensis*, *Spizaetus cirrhatus*, *Accipiter trivirgatus* and *Falco molluccensis* which are spread separately in each habitat type. The habitat that has a highest diversity index value is secondary forest ($H' = 1.434$) and the lowest is plantation forest ($H' = 0$). Besides, the diversity index in plantation and grassland habitats has almost the same value to the diversity index value in secondary natural forests, ($H' = 1.389$) plantations and ($H' = 1.386$) grasslands. The index value indicated that eagles are depended on the existence of secondary natural forests which are their habitat for foraging, resting and breeding. Evenness index value natural forests ($E' = 0.891$), plantations forest ($E' = 0$), plantations ($E' = 0.863$) and grassland ($E' = 1$). The index value indicates that the types of habitats of secondary forest, plantations and plantation forests have eagles that dominate.

Keywords: Diversity, Eagle, Kamojang, Habitat.



Identification of *Falculifer* sp Mite Parasites on Eagles in Captivity Cage of Bali Wildlife Rescue Center

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Eagle is one of the many raptors were rescued by the Bali Wildlife Rescue Center. This institution is a non-profit conservation institution in Indonesia. The salvated eagles were obtained from confiscated proceeds from the Bali Natural Resources Conservation Center. Health checks such as ectoparasite examination on eagles are important to maintain the quality of life. This study was aim to identify the ectoparasites present in several types of eagles in PPS Bali. The study was conducted from June to September 2019. Feather samples were taken from 15 caged eagles, including six brahminy kite (*Haliastur indus*), one changeable hawk-eagle (*Spizaetus cirrhatus*), three white belly sea eagle (*Haliaeetus leucogaster*), one gray-head fish eagle (*Ichthyophaga ichthyaeetus*), and four crested serpent eagle (*Spilornis cheela*). The Eagle feather samples are sent to the Denpasar Veterinary Investigation Center to examine the presence of ectoparasites. This research was an observative study, the data obtained were analyzed descriptively. The result showed that eight samples (two crested serpent eagle, two white belly sea eagles, two changeable hawk-eagles, one brahminy kite, and one gray head fish eagle) were found to be positively infected with mite external parasites from all examined eagles. These mites were further identified in the Medical Entomology Laboratory, FKH IPB Bogor, and these mites were identified belong to Arachnid class, the Astigmata order, the Falculiferidae family, and the genus Falculifer. The conclusions that can be drawn from this study are the confiscated eagles from the community that were housed in PPS infested by *Falculifer* sp.

Keywords: eagle, ectoparasites, arachnida, Bali



Topic: Local perceptions, threats and community-based conservation, including ethnobiology; Raptor in human modified landscape

The First International Summit on Grey-Faced Buzzard was Held in Japan

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Grey-faced buzzard (*Buteo indicus*) is a typical migratory raptor species in East Asia. It breeds in northeastern China, the Korean Peninsula, and Japan, while it winters in southwestern Japan and Southeast Asia. The buzzards are apex predator in Satoyama ecosystem. Recently, their population has been declining in many parts of breeding areas. Their decline is mainly caused by poaching and habitat destruction/deterioration in the breeding, staging and wintering grounds. The local community has developed a tradition of hunting buzzards in the wintering areas. In Taiwan, poaching of buzzards is reported every year in the media such as newspapers. However, hunting for this species is prohibited internationally. In many areas along the migration routes, various measures have been implemented to conserve the rapidly declining buzzards. In the northern Philippines, Japanese scientists, local conservationists, and governments cooperated in ceasing poaching after surveying the state of the poaching. International cooperation is required to conduct extensive studies and conserve migratory raptors, such as Grey-faced Buzzards. Therefore, we organized an international summit on Grey-faced buzzards held the first summit in Ichikai-town, Tochigi, Japan in May 2019. At the summit, conservation activities and research results of buzzards in each place. Finally, we received a message from mayors and made a summit declaration. Furthermore, the second will be held in October 2020 in Miyakojima-city, Okinawa, Japan, the third in the Philippines, and the fourth in Taiwan.

Keywords: *Buteo indicus*, International Summit, Conservation, Habitat, Flyway



Morphometry of Four Eagle Species from Family Accipitridae at Bali Bird Park

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Bali Bird Park (BBP) is a tourist destination with the most complete bird collections in Bali, including raptor species. This study measured the morphometry of four raptor species belong to Accipitridae family at BBP, namely *Nisaetus cirrhatus* (Changeable Hawk Eagle), *Elanus caeruleus* (Black Winged Kite), *Spilornis cheela* (Crested Serpent Eagle) and *Haliaeetus leucogaster* (White Bellied Sea Eagle). Measurements were conducted using a digital caliper and tape meter on resting birds. Raptors at BBP generally were rested for 6 months to complete their molting. This is followed by retraining process for 4-5 months before being involved in the bird show for the next 9-12 months. It was found in this study that *Haliaeetus leucogaster* was the largest bird with a total body length of 75 cm, wings length 83.5-85 cm, tail length 26 cm, head size (8 cm long and 7 cm wide), upper beak (8 cm long and 2.5 cm thick) and lower beak (3 cm long and 1 cm thick), lower limb length (femur 17 cm, tibia 9 cm, metatarsus 11 cm, middle toe 6.5 cm and grip 9 cm). The smallest bird was *Elanus caeruleus* with a total body length of 33 cm, wings length 39-45 cm, tail length 19 cm, head size (8 cm long and 5.5 cm wide), upper beak (2.5 cm long and 0.5 cm thick) and lower beak (1 cm long and 0.3 cm thick), lower limb length (femur 8 cm, tibia 4 cm, metatarsus 5 cm, middle toe 3 cm and grip 5 cm). The morphometry of the species *Nisaetus cirrhatus* and *Spilornis cheela* fell between the two bird species above.

Keywords: Accipitridae, raptor, morphometry, Bali Bird Park

The Importance of Introducing the Bird Conservation Education to the Primary School Students through Audio Visual Media, Games and Images Learning

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Indonesia is a country with a high level of biodiversity, therefore the conservation education need to be introduced early for the young generation. This study aimed to



initiate the young generation awareness on raptors conservation effort by using audio visual media, games and images learning. The subject of this study was the primary school students in year 5 and 6. The focus of the learning program was to introduce that Indonesia has a high bird diversity, with 72 species of raptor living in various islands across Indonesian archipelago. Audio visual medium used was video of Indonesian raptor species, then continued with games to match the name of the birds with the image of the birds. The result of this study indicated that the students had positive responses, showed high enthusiasm and curiosity to recognize the raptors diversity in Indonesia. This study confirmed the importance of conservation education introduced early for young generation.

Keywords: raptors, early education, audio visual, biodiversity, conservation

Types of Flying Performed for the Basic Instinct Show at Bali Bird Park

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Raptors have a variety of natural behaviors in nature. Certain species have the ability to fly continuously for long periods of time, while there are also others that spend more time perch and fly occasionally to catch their prey. In this study, observations were made on the appearance of several species of raptors along with the types of displays made on basic instinct shows at Bali bird Park. Direct observations, along with the interview method, were conducted in September 2019, during the midday and the afternoon show. Seven raptor species displayed on the basic instinct show were the White belly eagle (*Haliaeetus leucogaster*), the Changeable hawk-eagle (*Nisaetus cirrhatus*), the African vultures (*Gyps africanus*), the Brahminy kite (*Haliastur indus*), the Black kite (*Milvus migrans*), the Eurasian eagle-owl (*Bubo bubo*) and the spotted kestrel (*Falco moluccensis*). There were two types of display performed, which were short and long flight. Short flight displayed included dived flying to capture moving prey in the pond, as well as flying from one point to the other. Whereas the long flight displayed was captured the flesh in the air. The type of flight performed by each species at the basic instinct show at Bali Bird Park was based on their natural behaviour in the wild, i.e. its foraging behaviour.

Keywords: raptors, flight, behaviour, display, instinct