



**Orangutan
Veterinary
Advisory
Group
Workshop
2019
Report
Of
Proceedings**



© Copyright 2019 by Orangutan Conservancy

Prepared with organizing committee of the Orangutan Veterinary Advisory Group: R. Commitante, S. Unwin, F. Sulisty, R. Jaya, Y. Saraswati, C. Nente, S. Sumita, Soedarmanto Indarjulianto, P. Nagalingam, Nancy Lung (Editors).
Orangutan Veterinary Advisory Group Workshop 2019 Proceedings.

Copies of all the *Orangutan Veterinary Advisory Group (OVAG) Workshop Report of Proceedings* can be found on the *Orangutan Conservancy website*, www.orangutan.com and the official OVAG website: www.ovag.org

All complete PowerPoints from 2019 as well as past workshops can be found on the OVAG website www.ovag.org

Photos provided by OC/OVAG participants

Orangutan Veterinary Advisory Group new logo courtesy of Ricko Jaya and Emma Wood

Participating Organizations:

Orangutan Conservancy, United States
Chester Zoo / NEZS, United Kingdom

Animal Sanctuary Trust Indonesia

Asliqewan, Indonesia

Aspinall Foundation - Indonesia Program

BBKSDA, Riau (Balai Besar)

BBKSDA, Kaltim

Borneo Orangutan Survival Foundation, Nyaru Menteng, Palangkaraya, Central Kalimantan, Indonesia

Borneo Orangutan Survival Foundation, Samboja Lestari, Samboja, East Kalimantan, Indonesia

Borneo Orangutan Survival Foundation, HQ, Bogor, Indonesia

Borneo Nature Foundation

Center for Orangutan Protection (COP) Indonesia

Cikananga Wildlife Center

Chimfunshi Wildlife Orphanage Trust

Endangered Primate Rescue Center, Viet Nam

Faculty of Veterinary Medicine, Gadjah Mada University, Jogjakarta, Indonesia

FORINA, Indonesia

Frankfurt Zoological Society/Jambi - Sumatra, Indonesia

Gibbon Protection Society, Malaysia

International Animal Rescue, Indonesia (IAR Ketapang)

International Animal Rescue, Indonesia (IAR Bogor, Ciapus)

IUCN SSC Primate Specialist Group Section on Small Apes

Javan Gibbon Center

Jejak Pulan (Vier Pfofen Indonesia)

Journal of Zoo and Wildlife Medicine

Matang Wildlife Centre, Sarawak, Malaysia

National Jewish Health Organization (NJH)

Orangutan Foundation United Kingdom (OFUK) Central Kalimantan, Indonesia

Orangutan Foundation International (OFI)

Orangutan Information Center, Aceh, Sumatera, Indonesia

Orangutan Species Survival Plan (SSP) National Zoo, USA

OVAID, United Kingdom

Paignton zoo, UK

Perhimpunan Kebun Binatang Se Indonesia

Philadelphia Zoo, USA

PT RHOI (BOSF)

Pusat Studi Satwa Primata, LPPM, Insitut Petanian, Bogor, Indonesia

Sabah Wildlife Department, Sabah, Malaysia

Semenggoh Wildlife Centre, Sarawak, Malaysia

Sepilok Orangutan Center, Sabah, Malaysia

Singapore Zoological Garden

Sintang Orangutan Center, West Kalimantan, Indonesia
 Sumatran Orangutan Conservation Programme (SOCP), Medan, Indonesia
 Sumatran Orangutan Conservation Programme, Jantho, Indonesia
 Sumatran Orangutan Conservation Programme Batang Toru Program
 Sunway Lagoon Wildlife Park, Malaysia
 Taman Safari Indonesia
 Universiti Putra Malaysia, Selangor, Malaysia
 Universitas Gadjah Mada, Veterinary Faculty, Jogjakarta, Indonesia
 University of Birmingham, UK
 University of Liverpool, United Kingdom
 University of Minnesota
 Wildlife Rescue Centre, Jogjakarta, Indonesia
 Wildlife Rescue Unit, Sabah, Malaysia
 Wildlife Trust of India
 Yayasan Kalaweit Indonesia
 Zoetis

Supporting Organizations



Orangutan Conservancy, United States

Chester Zoo/ NEZS, United Kingdom

The Orangutan Project (TOP) Australia

Fort Wayne Children's Zoo, United States

Arcus Foundation Zoetis

HOSTED BY: Gadjah Mada University





Orangutan Veterinary Advisory Group Workshop

28 July – 1 August 2019

Table of Contents

Section One

Executive Summary

Budget

Section Two

Letter of Invitation

Agenda

Participants Contact List OVAG 2018

Section Three

Proceedings

Section Four

Appendices:

Evaluation / Participant's Feedback / Quiz Review



Orangutan Veterinary Advisory Group Workshop

28 July – 1 August 2019



Section One

Executive Summary

Budget

Executive Summary

Hello everyone!

2019 marked our 11th Orangutan Veterinary Advisory Group (OVAG) Workshop. This year, we were back at our Indonesian home base of Jogjakarta, Indonesia with our in-country collaborators Gadjah Mada University (UGM), Faculty of Veterinary medicine. This year we had 60 organizations with 13 countries represented – 90 participants in all from 54 different organizations (WOW!!!!!!!!!!). Was this too large a group? Yes! No! Perhaps... – but we made it work!

This year we welcomed back gibbon vets from various parts of the Asia region (once again courtesy of Dr. Susan Cheyne and the IUCN Small Ape Specialist Group), as well as managers from various orangutan and gibbon facilities so that they may begin to build their own network!

Also back was Liz Ball from Chester Zoo (ZIMS) and our Chester Zoo OVAG website webmaster, Rob Eagle joined us as well.

We also had our very first African primate representatives attend – soon to be Doctor George Omandi Paul and Thalita Calvi (both veterinarians from the Pan African Sanctuary Alliance - PASA). Our hope is to have some OVAG representatives attend the planned 2021 PASA meeting in Africa. Having both of these amazing vets join us this year was truly amazing and allowed us to continue to build relationships but also enabled us to understand the mutual problems that are shared by conservationists and veterinarians in all non-human primate regions. We are all struggling and working hard to save our nearest living relatives – and working together will only increase our impact!

New issues covered this year were fire prevention and preparedness (a yearly dire struggle regionally), and wildlife forensics. On a more serious note, a new topic added was addressing the issue of emotional burn out and compassion fatigue that often is experienced by wildlife veterinarians and conservationists. Most wildlife vets and researchers work in isolation and in remote areas. This can be quite stressful and is a topic that needs to be addressed and brought to the forefront.

Continuing topics were an amazing nutrition session, informative respiratory and anesthetic sessions, One Health, scientific writing for publication session, and various individual case studies were presented. Separate one day sessions were held for Gibbon vets and our manager group.

We also arranged a much-requested practical session covering the topic of general anesthesia and a health examination demonstration for orangutans and gibbons. This session was done in collaboration with the Jogja Wildlife Rescue Center, a local center that houses multiple species, including orangutans and gibbons. (This practical session was ethically cleared by the Faculty of Veterinary Medicine at UGM (who were present) and was conducted as part of their normal operations for health management.) The whole procedure was documented and filmed which will serve as an invaluable teaching source.

We also continued our one-on-one sessions at the two Borneo Orangutan Survival Foundation locations on anesthetics and respiratory issues given by Nancy Lung and Jennifer Taylor-Cousar. OVAID (Orangutan Veterinary Aid, UK) joined us again bringing with them much needed donated supplies for our vets. Supplies were also sent by a new ally, Worldwide Veterinary Services, UK.

Steve Unwin, Nancy Lung and Raffaella Commitante were invited to speak at a UGM pre workshop seminar hosted by the faculty of Veterinary Medicine and moderated by Dr. Hery Wijaynto and Fransiska Sulistyono (both part of OVAG)! We spoke to students as well as many faculty members from various departments within the University.

In early June, Steve Unwin, Raffaella Commitante, Fransiska Sulisty, George Omondi Paul and Thalita Calvi were invited to join and present at a conference held at University of Liverpool, England entitled: The Influence of Diet and Other Drivers upon Gut Microbiome Characteristics and Gastrointestinal Disease: Parallel Perspectives Across the Primate Spectrum. While there, we ran into Jennifer Taylor-Cousar who was there for a different conference and we celebrated her becoming the first African American female full professor at her job!!!!

Our personal favorite bonus to come out of OVAG meetings...getting our vets recognition for their skills and sharing and learning and increasing their impact by getting further training and education!

- Our own drh. Ricko Jaya (OVAG committee and formerly OIC) who has been working on his master's at Kent University in the UK, has been accepted to continue on to his PhD at Birmingham University!!!!!!
- Yenny Saraswati Jaya, Ricko's wife, (OVAG Committee and SOCP) will be going to the U.K. to do orangutan gene sequencing work with Steve Unwin.
- Fransiska Sulisty (OVAG Committee) has become OVAG's official in country representative as well as starting work with Susannah Thorpe and Jackie Chapell and their Exhibit Design Tool.
- Pandu (SOCP) and Arga (BOSF), went to the U.K. for their continuing education training under the care of OVAID, Chester Zoo and Steve Unwin.
- Wahyu Hananto (Cikananga Wildlife Rescue Center) and Imam (IAR Ciapus West Java) were the winners of the Indianapolis Zoo scholarship (U.S.) for training and have just returned. Thank you to Dr. Rob Shumaker and Melissa Fayette for that incredible opportunity!!!
- AND, a very special congratulations to Andhani Widya Hartani, of Jambi, Frankfurt Zoological Society, Indonesia for applying to and winning best proposal with a grant of 50,000 Euro at the Frankfurt Spring School on Conservation Project Management, through the Fellowship Program of the KfW Foundation in Germany – Wow!!!!

Steve Unwin along with George Omandi Paul and Thalita Calvi spent some time at SOCP and Raffaella Commitante was able to spend time at SOC (Sintang Orangutan Center).

So much is happening and so many great relationships and opportunities are continuing to be developed allowing all of us to work together to do what we can for primate conservation... remember.... **together we are truly mighty!**

With warm regards and respect,

Raffaella Commitante, PhD (Cantab)

Steve Unwin, B.Sc., B.V.Sc., Dipl ECZM, MRCVS

Ricko Laino Jaya, drh.

Yenny Saraswat Jayai, drh.

CitraKasih Nente, drh., MVS (Conservation Medicine)

Fransiska Sulisty, drh., MVS (Conservation Medicine)

Sumita Sugnaseelan, DVM (UPM), PhD (Cantab)

Pakeeyaraj Nagalingam, DVM

Nancy Lung, DVM

Soedarmanto Indarjulianto, drh. PhD

Gavo (our mascot)

2019 Budget

Itemized Budget:		US Dollar (converted and rounded up from multiple currencies)
	International Air	14,500.00
	Local	7,700.00
	Tshirts/Bags	1,000.00
	Stationary	300.00
	Jogja WRC	1,340.00
	WRC Video	200.00
	Hotel	22,000.00
	Food (extra)	675.00
	Ground Transport	250.00
	Misc (bank fees, IVMA, etc.)	400.00
	Tips (bus drivers,hotel staff)	230.00
	Subtotal	48,595.00
	<u>Steve Unwin Consultant Fee (Provided by Chester Zoo)</u>	4,000.00
	<u>Siska Sulistyoyo Salary (In Country Representative provided by Arcus)</u>	5,000.00
	TOTAL	\$ 57,595.00



Orangutan Veterinary Advisory Group Workshop

28 July – 1 August 2019



Section Two

Letter of Invitation

Agenda

Letter of Invitation



Orangutan Veterinary Advisory Group

OVAG 2019

RE: Orangutan Veterinary Advisory Group Workshop 2019

To Whom It May Concern:

This letter shall serve as an invitation for _____ to attend the Orangutan Veterinary Advisory Group (OVAG) Workshop 2019 sponsored by the Orangutan Conservancy, a United States not-for-profit organization, Chester Zoo (a zoological park in The United Kingdom) and in collaboration with Universitas Gadjah Mada in Jogjakarta, Indonesia.

The workshop will be held in Jogjakarta, Indonesia, July 28-August 1 2019 (Arrival: July 27 / Departure: August 2).

The 2019 OVAG Workshop will be held at:

The Hotel Mercure, Jogjakarta, Indonesia

Contact information for OVAG:

Orangutan Conservancy/OVAG: Raffaella Commitante (rcommitante@gmail.com),
For Chester Zoo/OVAG: Steve Unwin (s.unwin40@googlemail.com)
Jogjakarta /OVAG: Fransiska Sulisty (siska@orangutan.or.id)

This will be our 11th international workshop and will continue work begun in 2009 to improve the work we collectively do to ensure orangutan conservation and health.

Full funding for travel and accommodation will be paid by: OVAG

We thank you for allowing your staff to attend.

Respectfully,

Raffaella Commitante, PhD
Orangutan Conservancy/Orangutan Veterinary Advisory Group

Founders

Raffaella Commitante
Steve Unwin

Committee

Raffaella Commitante
S. Indarjulianto
Ricko Laino Jaya
Yenny Saraswati Jaya
Nancy Lung
Pakeeyaraj Nagalingam
Citrakasih Nente
Sumita Sugnaseelan
Fransiska Sulisty
Steve Unwin

OVAG In Country

Representative
Fransiska Sulisty



Agenda

 11th OVAG WORKSHOP AGENDA Grand Mercure Hotel & FKH UGM, Yogyakarta 28 July - 1 August 2019						
TIME/DATE	27-Jul	28-Jul at Hotel	29-Jul at UGM	30-Jul at Hotel	31-Jul at WRC	1-Aug at Hotel
Note				Gibbon vets to hold a separate meeting (IUCN - SSA) Managers to hold a separate meeting (FORINA)	Leaving day for managers (unless stay at own expense)	
7:00		Breakfast	Breakfast transport to UGM	Breakfast GROUP PHOTO	Breakfast	Breakfast
7:30		Opening Ceremony- Ovag Committee and UGM			transport to Jogja WRC (1 hour)	
8:00		Ice breaker and introduction of Delegates - Committee	Nutrition: Barbara Toddas (Philadelphia Zoo)	Scientific writing 2: study design: Nancy Lung		Principles of intensive care - theory: Nancy Lung/Jennifer Taylor-Cousar
8:30		Evaluation Session - Committee				Principles of intensive care - Jopardy game: Nancy Lung/Jennifer Taylor-Cousar
9:00		Break	Break	Break		Break
9:30	OVAG committee visiting Jogja	Health effect from smoke inhalation: Agus Fahrani-BOISF NM	Nutrition: Barbara Toddas (Philadelphia Zoo)	EDT wetlab - Jackie Chappel	Split to 2 groups (vets only): Group 1 (Orangutan Vets): general examination on 2 orangutans. Group 2 (Gibbon vets): discussion at meeting room.	Wildlife forensic - basic: Raffaella Comitante and case study from COP- drh. Felisitas Flora
10:00		Disaster Preparedness at Orangutan Centers - Kevin Cooper	Case Studies 1 (Moderator: Yenny Jays & Pakeyara) Nagalingam			Mental Health, life/work balance: Steve Unwin
10:30		Lunch	Lunch	Lunch	Lunch	Lunch
11:00		Disaster Preparedness at Orangutan Centers - Kevin Cooper	Case Studies 1 (Moderator: Yenny Jays & Pakeyara) Nagalingam	Case studies 2 (Moderator: Sumita & Indarjullianto)		Creative Competition: designing next year's OVAG T-shirt: Raffaella & committee
11:30		Disaster Preparedness at Orangutan Centers - Kevin Cooper	Vet role, input in an organization, managing expectation, managerial recommendation: Steve Unwin		Split to 2 groups (vets only): Group 1 (Orangutan Vets): Discussion at meeting room. Group 2 (Gibbon vets): General examination on 1 gibbon.	Evaluation session
12:00		Disaster Preparedness at Orangutan Centers - Kevin Cooper	Break	Break		Break
12:30		Disaster Preparedness at Orangutan Centers - Kevin Cooper	Peat Fire Response in Central Kalimantan: Susan Cheyne BNF	Orangutan anesthesia & general examination - theory, discussion & planning for next day: Nancy Lung/Siska		OVAG Strategic Meeting (OVAG Committee)
13:00		Disaster Preparedness at Orangutan Centers - Kevin Cooper	PASA regional disease investigation - TB (George Paul Omond)	end of day 3	Bus back to hotel	preparation for conference dinner
13:30		Disaster Preparedness at Orangutan Centers - Kevin Cooper	Bus back to hotel	end of day 2	Dinner at hotel	Conference Dinner
14:00		Disaster Preparedness at Orangutan Centers - Kevin Cooper	end of day 1	Dinner at hotel	Dinner at hotel	
14:30		Orangutan Action Plan 2019-2025: Aldrianto Pradjati FORINA				
15:00		Participant arrival				
15:30		PDH / Adhigawar (drh, Sugeng) / OVAG website (Rob Eagle): 20 minutes each				
16:00						
16:30						
17:00						
17:30						
18:00						
18:30						
19:00						

OVAG 2019 Participant Contact List

	Name	Affiliation	EMAIL
1	Adi Irawan	IAR (International Animal Rescue)	adi@internationalanimalrescue.org
2	Agnes Pratamiutami S.	BOSF Samboja Lestari (Borneo Orangutan Survival Foundation)	agnes@orangutan.or.id
3	Agus Fahrni	BOSF Nyaru Menteng	agusfahrni@orangutan.or.id
4	Aldrianto Priadjati	RHOI / FORINA (Rehabilitasi Habitat Orangutan Indonesia)	Aldrianto2005@yahoo.com
5	Alfarisa	FKH UGM	
6	Ali Anwar Bin Ahmad	Singapore Zoological Garden	ali.anwar@wrs.com.sg
7	Andhani Widya Hartanti	Frankfurt Zoological Society	andhani_widya@yahoo.com
8	Andi Sofyan	Yayasan Kalaweit Indonesia	sopyvet@gmail.com
9	Andini Nurillah	Jejak Pulang Foundation	Andininurillah13@gmail.com
10	Anne Dawydowa	Jejak Pulang Foundation	Anne.Dawydowa@vier-pfoten.org
11	Anton Nurcahyo	BOSF Samboja Lestari	anton@orangutan.or.id
12	Arista Ketaren	Sumatran Orangutan Quarantine Center	ariesta.ketaren@yahoo.com
13	Arvendi Rachma Jadi	FKH UGM	
14	Atina Unwin	independent	atinasin@hotmail.com
15	Azhari Purbatraptsila	OF-UK (Orangutan Foundation-United Kingdom)	trap.azh@gmail.com
16	Baerbel Koehler	Zoetis	baerbel.koehler@zoetis.com
17	Barbara Todd	Philadelphia Zoo	Todd.Barbara@phillyzoo.org
18	Bong Ai Yin	Wildlife Rescue Unit	bong.ai.yin@gmail.com
19	Caroline Rowley	Endangered Primate Rescue Center	caroline.rowley@eprc.asia
20	Citrakasih Nente	Sumatran Orangutan Conservation Programme / OVAG	citrakasih@gmail.com
21	Dimas Yuzrifar	OF-UK	dimas@orangutan.org.uk
22	Elizabeth Riana	IAR	elizabethriana1994@gmail.com
23	Eryan Hidayat	Javan Gibbon Centre	jgc_owajawa@yahoo.com
24	Estherina Iswati	Yayasan Kalaweit Indonesia	sopyvet@gmail.com
25	Fadilah Rashidah Misrom	Matang Wildlife Centre (Sarawak Forestry)	fadilahrm@sarawakforestry.com
26	Fajar Saputra	FORINA (Forum Orangutan Indonesia)	
27	Felicitas Flora Sambe Mambela	COP Borneo (Centre for Orangutan Protection)	Felice.flora@gmail.com
28	Fernando Alegre	Matang Wildlife Centre	fernandoalegre84@gmail.com
29	Fransiska Sulisty	OVAG	siska@orangutan.or.id
30	Galih C. Setiwan	Gembira Loka Zoo	galihcsetiawan@gmail.com
31	George Omondi Paul	University of Minnesota	paulx176@umn.edu
32	Hannah Gray	OVAID (Orangutan Veterinary Aid)	hangray4@yahoo.co.uk
33	Hery Wijayanto	UGM	herykh@ugm.ac.id
34	Hoang Thi Thu Thuy	Endangered Primate Rescue Center	thuyhoang@eprc.asia
35	Ida Masnur	Aspinall Foundation - Indonesia Program	idamasnur@gmail.com
36	Irhamna Putri R.	Jogja WRC	irnairhamna@gmail.com
37	Jackie Chappell	University of Birmingham	J.Chappell@bham.ac.uk
38	Jennifer Taylor-Cousar	National Jewish Health	TaylorCousarJ@njhealth.org
39	Kevin Cooper	independent	kcchook@ozemail.com.au
40	Ligaya Tumbelaka	Perhimpunan Kebun Binatang Se Indonesia	tigressgaya@gmail.com
41	Liz Ball	Chester Zoo	l.ball@chesterzoo.org
42	Louise Ellis	Cikananga Wildlife Centre	louiseellis898@gmail.com
43	Lydia Smith	Ind. Vet	lpsmith33@yahoo.com
44	Mariani Binti Ramli	Gibbon Protection Society Malaysia	bamarrogancia77@gmail.com
45	May Sumarna	BOSF Nyaru Menteng	may@orangutan.or.id

46	Meuthya Sr	Sumatran Orangutan Quarantine Center	meuthyasr@gmail.com
47	Muh Aqshar Marsani	IAR	muh Aqshar@internationalanimalrescue.org
48	Muhtadin Wahyu	BOSF Samboja Lestari	muhtadin@orangutan.or.id
49	Nancy Lung	Orangutan SSP / OVAG	nancylung2@gmail.com
50	Nigel Hicks	OVAID	orangutanveterinaryaid@gmail.com
51	Nor Emel Farnida bt. Jaddil	Semenggoh Wildlife Centre (Sarawak Forestry)	emelf@sarawakforestry.com
52	Nur Purba Priamboda	IAR Ciapus	Purba@internationalanimalrescue.org
53	Pakeeyaraj Nagalingam	Sunway Lawoon Wildlife Park / OVAG	pakeeyaraj@gmail.com
54	Patrick Flaggellata	RHOI - BOSF	patrick@orangutan.or.id
55	Popowati	OFI (Orangutan Foundation International)	iccaros@yahoo.com
56	Pristiani Nurantika	Javan Gibbon Centre	nurantika@yahoo.com
57	Raffaella Commitante	OC/OVAG	rcommitante@gmail.com
58	Rafika Akhtariana	Jantho Reintroduction Center	akhtariana.rafika@gmail.com
59	Randy Kusuma	Gembira Loka Zoo	randykusuma47@gmail.com
60	Ray Clement Madius	Wildlife Rescue Unit	cheslyray88@gmail.com
61	Reza Dwi Kurniawan	COP Borneo	Reza@orangutan.id
62	Rini Deswita	BBKSDA Riau	drh_rinideswita@yahoo.com
63	Riris Prawesti S.	Animal Sanctuary Trust Indonesia	ririsps@gmail.com
64	Rob Eagle	Chester Zoo	r.eagle@chesterzoo.org
65	Robert Ferdinand Yappi	OFI	rfyappi@yahoo.com
66	S. Indarjulianto	UGM / OVAG	indarjuliantos@yahoo.com
67	Samshul Ali	Wildlife Trust of India	samshul@wti.org.in
68	Sara Hicks	OVAID	orangutanveterinaryaid@gmail.com
69	Sheila Kharismadewi	SOCP - Batang Toru program	sheilasilitonga@lawalataipb.org
70	Silvia A. Prabandari	PSSP, LPPM IPB	viviarin@yahoo.com
71	Siti Fatimatazzahra	Frankfurt Zoological Society	siti.fatimatazzahra@gmail.com
72	Slamet Raharjo	FKH UGM	raharjo_vet19@yahoo.com
73	Sonya Gadhia	Paignton zoo	sonyagadhia@hotmail.com
74	Steve Unwin	Univ of Liverpool / Chester Zoo/OVAG	s.unwin40@googlemail.com
75	Sugeng Dwi Hastono	Asliqewan	drh_sugengdwiastono@yahoo.co.id
76	Sumita Sugnaseelan	University Putra Malaysia / OVAG	sumi@upm.edu.my
77	Susan Cheyne	IUCN SSC PSG Section on Small Apes	section.small.apes@gmail.com
78	Sylvia Alsisto	Sepilok Orangutan Reintroduction Centre	sorcsylvia@gmail.com
79	Tengku Jeni Adawiyah	HOCRU - OIC (Orangutan Informaiton Centre)	t_jeni2005@yahoo.com
80	Thalita Calvi	Chimfunshi Wildlife Orphanage Trust	thathacalvi@icloud.com
81	Tim Georoff	Philadelphia Zoo	Georoff.Tim@phillyzoo.org
82	Venisri Prithivi Raj	Acres Wildlife Rescue Centre	venisri.prithivi.23@gmail.com
83	Vidi Saputra	BKSDA Kaltim	pendekarvidi@gmail.com
84	Wahyu Hananto	Cikananga Wildlife Centre	wahyuhananto@live.com
85	Waluyo Jati	Sintang Orangutan Centre	jati.moloch@gmail.com
86	Warih Pulung Nugrahani	Jogja Wildlife Rescue Center	warih.nugrahani@gmail.com
87	Yayan Oki Istyan	Taman Safari Indonesia	yistyan@gmail.com
88	Yenny Saraswati Jaya	SOCP / OVAG	yenny.jaya@gmail.com
89	Yuli Akmal	Frankfurt Zoological Society	akmal.yuli@yahoo.co.id
90	Zulhildi	HOCRU - OIC	vet.oic@orangutancentre.org



Orangutan Veterinary Advisory Group Workshop

28 July – 1 August 2019



Section Three

Proceedings

REPORT OF PROCEEDINGS OVAG 2019

Opening Day – July 28, 2019

Fransiska Sulisty, OVAG Committee and In-Country Representative – Opening Welcome to all:

A special thank you to our in country collaborators, UGM. Thank you also to those who had to cope with a long trip to get here! This will be a very busy workshop – people from all five continents – US, Australia, Europe, Africa, Asia, which includes our OVAG group, IUCN Gibbon group, and managers. Welcome to a place where we can all make new friends and share knowledge: participants, orangutan and gibbon rescue centers, zoo keepers, primate researchers, academics, human doctors etc. Thank you for coming from all of us on the OVAG committee: Steve, Raff, Siska, Citra, Sumi, Pakee, Indar, Nancy, and Yenny (Ricko is away studying!).

Opening of workshop: **Dean Prof. Dr. Siti Isrina Oktavia Salasia, UGM**

Thank you to all the OVAG Committee, all the many participants –to all the speakers and participants who have joined this workshop for the orangutan. UGM serves as one of the largest and oldest universities in Indonesia. There are 57,000 students in Jogjakarta. Veterinary medicine began in 1946 – one of the oldest faculties. I am happy to know that there are many people here that are aware of the problems with orangutan, along with other great apes because they share so much with humans, high cognitive ability, ability to use tools – orangutans have a lot of personality, as well as serving as key components of their eco system – we need to work together to save the orangutan for if we save the orangutan many other species will benefit. They also act as guardians of the forest. We must conserve the eco system! There are three species of orangutans – the newest Batang Toru is the most endangered at less than 800 apes. Through capacity building we can help (especially vets who are on the front lines). The faculty for veterinary medicine is committed to wildlife conservation - rhino, Komodo dragon, elephant and many other wild animals. We hope to improve education, community involvement, and better training for wildlife in vet medicine. We hope this workshop will have a positive impact – we need to develop more ways to collaborate in the work we can do together. I officially open the 2019 OVAG Workshop.

Introduction from **Steve Unwin** (OVAG Committee)– opening Welcome – Contemplation, Thinking and Working Together

Video of OVAG over the years

OVAG has become: A place to learn- a place to share – a place to grow

Ice breaker - tent pole exercise

Though this exercise may seem silly, it does allow us to see how important it is to work together. Working together is very important and hopefully throughout this week we will figure ways to do that better – OVAG hopes to provide information and opportunities that are useful, relevant and that we are successful in doing that! In order to validate that we are doing just that – there is a quiz that we will continue to use – it is not designed to test your knowledge - only to see how well we all do over the course of this week.

Quiz administered

Nancy Lung, OVAG Committee: Anesthesia equipment: what do you have? – what do you need?
(Smithsonian grant)

Be sure to check out and post at: #OVAG2019 Gavo Instagram and the OVAG website www.ovag.org

Presenter: Agus Fahroni, BOSF, NM

Abstract

RESPIRATORY PROBLEM POST FOREST FIRE AND FOREST FIRE MANAGEMENT IN BOSF NYARU MENTENG

Agus Fahroni¹, Gregg H Poetra¹, Lia Kristina¹, Arga S Kusuma¹, Vivi D Santi¹, Maryos V Tandang¹, Fiet H Patispatika¹, Ahmat Suyoko¹, May Sumarnae¹

1 Borneo Orangutan Survival Foundation, Central Kalimantan, Indonesia

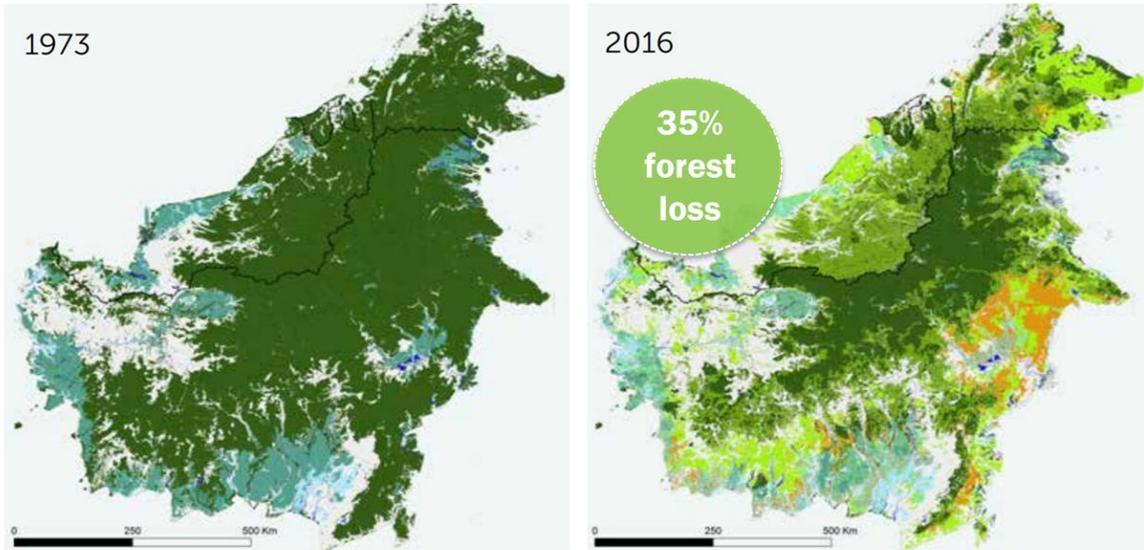
Forest fires are one of the natural catastrophes that occur nearly annually on the island of Borneo, Indonesia. In the last 15 years, based on Ministry of Forestry and Environment data, there have been two great forest fires, which occurred in 2006 and 2015. In 2015, the land loss from the fire exceeded 500,000 ha (http://sipongi.menlhk.go.id/hotspot/luas_kebakaran). A major side effect from the fire, the haze, was recorded to shroud the land for almost three months straight, covering the sunlight and hampering the ability of living beings to breathe air normally. At the Borneo Orangutan Survival Foundation (BOSF), Nyaru Menteng, Central Kalimantan, the orangutans have also suffered from the haze. It has led to respiratory problems that spiked from the moment the haze appeared. The problems included pneumonia, air sacculitis, and acute respiratory problems.

Based on the forest fire report and the disease trend in rehabilitated orangutans at BOSF Nyaru Menteng, there is a correlation that showed an increased respiratory disease incidence rate, specifically during the years of 2006 (30.94%) and 2015 (20.38%). This report suggests that fire disasters may cause not only acute respiratory problems, but also some long-term respiratory diseases such as recurrent air sacculitis or Chronic Respiratory Disease of Orangutan (CRDO).

BOSF has made some strategic decisions to protect the center from fire damage and protect the resident orangutan population. The decisions included rescheduling forest school daily activities, providing an adequate indoor area for young orangutan groups during the daytime, giving multivitamin supplements to the orangutans, and providing extra water sprays for the orangutans to reduce the heat and stress level inside cages. BOSF is developing a prevention strategy to fight future fires that includes cultivating employee awareness about forest fires, building a trained fire-fighting team, creating an evacuation plan for both employees and animals (the orangutans will be transferred to pre-release islands when the fire is predicted to affect the center), routinely patrolling the surrounding areas with drones and with human patrol teams, monitoring existing boreholes and making new boreholes, and improving partnerships with related stakeholders to fight the fires.

In Borneo alone, 35% of all primary old-growth rainforest was lost between 1973 and 2016 and there are many drivers of deforestation in Indonesia such as clearing for crop production (ex. palm oil), mining, and of course forest fires.

Deforestation in Borneo 1973-2016



Visual legend:

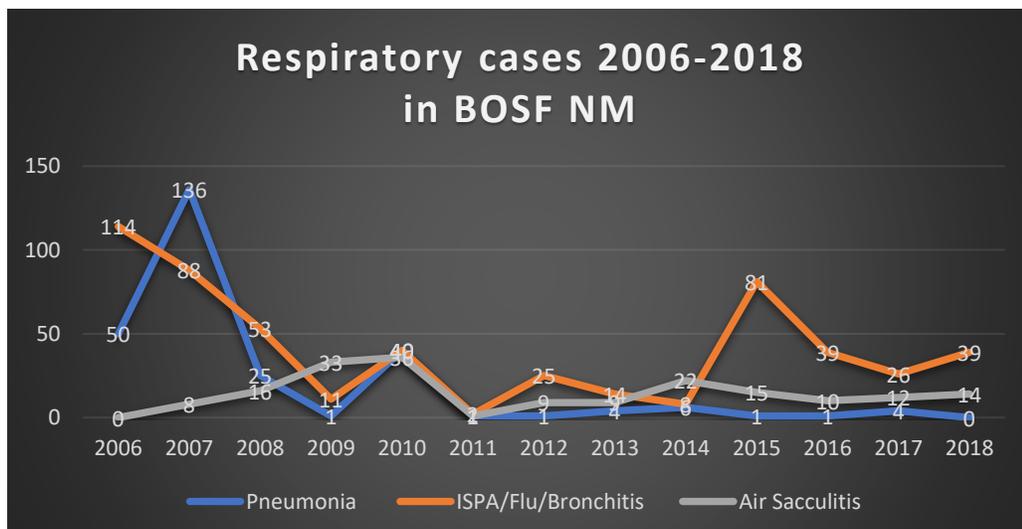


Problems from forest fires and smoke have caused many problems for orangutans. There has been long lasting effects from the haze. Infants have a more difficult time breathing (need nebulizing) when haze is strong – many babies get sick, the larger ones appear stronger, but issues could be cumulative and hidden. Percentage of respiratory cases in 2007 was very high – but that could be due to the large population. NM currently has 376 orangutans (down from 631 in 2007).

Management Approaches and Clinical Treatment: Forest schools normally leaves at 7:30 but if haze they go out at 9 -9:30 – they also get multivitamins to help their immune system, more water is provided, and if needed nebulizer treatments are administered.

NM employees are also fire fighters – they get training and equipment – and are prepared to fight day and night (sometimes all night) in order to control the fire.

Respiratory issues:



For more information, please refer to power point on OVAG website.

Discussion:

Peat swamp is particularly difficult as fires can move underground – what can be done? Usually Nyaru Menteng works together with other organizations in order to get help. It is often unpredictable – moving orangutans is not really an option but we keep monitoring what is happening – that is all we can do – MAWAS program tries to block the fires by creating buffer zones and blocking canals in peat swamp areas.

Were original animals exposed to haze earlier affected again as more haze came in later years? That could be but it is unknown if cases persist because of renewed haze. As Borneo is mostly peat swamp, it is very difficult to control fires. In Ketapang there is a program to talk to people that burn to clear land. If there is good agricultural management, that could reduce fires in the area.

Is there any move to invest more in fire forest prevention by the central and local governments since the cost of fires is very high? Fires have been happening in Borneo for centuries, so it is very common to burn every year people feel it is okay as it provides ownership – if they leave it alone then someone will think it is abandoned.

Presenter: Kevin Cooper, Emergency management

Kevin has held leadership roles for preparedness and prevention activities across most of Australia, and response for biosecurity emergencies and exercises in Australia and overseas - since the early 1990s. Biosecurity hazard areas include production animals and plants, the terrestrial and marine environment and wildlife and fish.

Preparedness for Disasters:

1. Hazards, disasters and disaster risks
2. Managing disaster impacts using all hazards approach, prevention, preparedness, response and recovery
3. The 5 elements of good preparedness
4. Explore the 5 elements of good preparedness in the local situation
5. Strategic risks for good preparedness and risk treatment
6. Monitoring and reviewing preparedness
7. Communications and consultation

Hazards: Natural or human-made process / Potential to cause harm / Defined by location, size, scale, intensity, magnitude, frequency and probability.

Natural hazards: Geological – earthquake, tsunami, volcanic eruption / Metrological – cyclone, tornado, drought, lightning strike fires / Biological – disease epidemic

Human-made hazards: Fires – industrial, forest fires / Mining consequences / Environmental degradation

What is a disaster? An Interaction between: Exposure of a community to a hazard, *Vulnerability* of a community to a hazard and *Inability* of a community to cope with impacts of a hazard.

In disaster impact there are 4 environments: social, built, economic, and natural.

Disaster term and emergency are interchangeable – when there is an inability to cope there should be a significant coordinated response – most countries have legislation that uses similar terminology. An

emergency response will require a significant coordinated response to mitigate potential impacts of the strategic risks on the all environments including economy, social / community and political engagement and support for the response, operational effectiveness and efficiency and expenditure / cost.

Disaster risk – Disaster risk comes from: Probability or chance of interactions with hazard / Vulnerability to the hazard / Exposure to the hazard / Frequency and intensity of the hazard / Condition of the four environments

Level	Criteria	
	Death	Injury or illness
Catastrophic	Deaths directly from emergency greater than 1 in 10,000 people for population of interest	Critical injuries with long-term or permanent incapacitation greater than 1 in 10,000 people for population of interest
Major	Deaths directly from emergency greater than 1 in 100,000 people for population of interest	Critical injuries with long-term or permanent incapacitation greater than 1 in 100,000 people for population of interest or Serious injuries greater than 1 in 10,000 people for population of interest
Moderate	Deaths directly from emergency greater than 1 in 1,000,000 people for population of interest	Critical injuries with long-term or permanent incapacitation greater than 1 in 1,000,000 people for population of interest or Serious injuries greater than 1 in 100,000 people for population of interest
Minor	Deaths directly from emergency greater than 1 in 10,000,000 people for population of interest	Critical injuries with long-term or permanent incapacitation greater than 1 in 10,000,000 people for population of interest or Serious injuries greater than 1 in 1,000,000 people for population of interest

Prevention Preparedness Response and Recovery – before you get to preparedness you need to think about prevention – but with preparedness you need to be non-reactive – you need to anticipate and plan – then the response, and hopefully recovery (a return to a new normal) and hopefully the new is better than where you were before.

Whatever is left unprepared can become a complex problem – a problem anticipated is a problem solved!!!!

A well-prepared community will be able to provide and sustain a timely effective and appropriate response to a disaster.

5 elements of good preparedness:

1. Governance (who is in charge?) having multiple agencies in place and develop structures for contact before chaos arrives –needs a good contact person – need the correct person for the job – who are the best people... organizational tree to outline chain of contact, hard to find good planners – only about 15% of population are good planners – so where are you going to find good planners? This takes planning to find a good planner to find the expertise needed – everything needs to be incorporated into a plan
2. Systems (what equipment is needed, is there money for it) - who manages systems now? Evolution and development, is your system shareable? Can you review and monitor? What are system managers doing? A good system should allow you to turn information into intelligence as you need

intelligence to make a good decision – collect and collate. There should be no personal bias, need high level of confidence in personnel to get the job done...you need to know when you run out of resources and plan for how you use them...you need a system to follow and have documented so whoever comes in new can still learn the system that has been set up – link resource management to your budget -

3. Documentation planning, everyone is in agreement and knows the procedures - is there a manual already in place for bio security? No need to start from scratch – there is stuff around on the internet or elsewhere – are there procedures in place – some sort of protocol is in place (SOP) – does everyone in your organization know what they are? There should be an emergency procedure – do you know what is the disaster plan for your community? There should be one and you should know it – if there are things in place – it will support you through many instances – what is important to you? Need to know what your budget – have a resource plan
4. Capacity and Capability – resource management – everyone has the ability to speak up – training/challenging to get better so you get it right through local teams, and up - building relationships and trusts so you can get things done faster – everyone needs to be trained so they know what to do in the case of an emergencies – in order to train you need steps 1, 2 and 3!!!!
5. Usage – drills, exercises, rehearsal – this is where you find out if what you have written down works – this is when reality hits home – you need to exercise in small groups – start in small groups and then slowly incorporate them together – build relationships as we all work on trust – review lessons learnt – identify them and then imbed them in the system – use staged rehearsals as well as surprise exercises....good to run them before fire season so information is fresh – they know who all the people are and information is current.

Strategic Risks: PEESTOLM

Political/Economic/Environmental/Social/Techincal/Operational/Legal/Media and Communication

Discussion: You are going to have to think about all these risks and plan for them before anything occurs. In a fire situation, as your body temperature increases your ability to make decisions decreases – if orangutan body temps go up they may make poor decisions as well....if humans work 12-14 hours a day fighting fires or reacting to any emergency, after 5 days we become ineffective.

(Preparedness Worksheet is in Appendix)

Sentinel Hotspots – real time website for fires in Indonesia <https://sentinel.ga>.

Break out Groups: 5 Elements of Good Preparedness

The participants were divided into five groups and chose a leader (documenter) – the task was to develop a plan for what you might do for the 5 elements. Each group to address each of the 5 elements.

Reporting Back:

Governance:

Forest Fire at a center...worrying about fate of center and orangutans and workers...all of the people who needed to be involved...stakeholders: governmental bodies, forestry depart, fire dept, local comm, NGOs, private companies, some of these private companies should have some responsibility in the system – civil workers to help, needed a specific plan for all stakeholders

Orangutan release...mapping who are the actors or stakeholders, the first: Balai (BKSDA – forestry dept), local and central government, manager of center, manager of release site, vet, communications, local and international community, orangutans and researchers and development – trail of communication – proper paperwork – many discussions with government – fund raising

Fire in Samboja...one point person (fire coordinator from management) single point of authority, protocols for who is contacted, govt and local authorities, communities, vets

Orangutan escape...coordinate with BKSDA, public participation and law enforcement, then NGO, then prepare for equipment, evaluation of facilities that caused escape, human error?, and then orangutan

Flooding in Kalaweit – near a huge river floods often...small NGO limited resources...manager and coordination with manager: local people, village officers, district level, then BKSDA when animals are involved, disaster relief team in district area, Search and Rescue National teams, hospitals, red cross. Managers use communication person to spread the word, support from staff and local people, if evacuation needed: everyone – should be a district counterpart that contacts the same people

David Cooper: it needs to be clear who is in charge – governance needs to be clear on who has the power and control

Systems:

List of communications chains...resource management – different groups of people

Orangutan escape group: keeper is part of response team – villages should know what to do if they see an orangutan in their village, center manager assesses the information, then keeper and vet make evaluation. If the orangutan trusts the keeper it will be easier for everyone to get orangutan back, but equipment (blow darts and such) may be needed (RRT – Rapid Response Team)

Samboja team...point person in Bogor and one on site – on site would communicate in both directions – the response is the responsibilities of each department; two SOPs are needed – preparedness and response. Record keeping: maintenance record, running and documenting practice drills, updates on where animals are

Orangutan release – systems and what is involved – evaluate problem - any mitigation needed? Communicate with the various teams involved – state of animal, locals, protected (safety), accessibility of area, information, vet on site, translocation team, where would money come from for the whole thing to occur

Emergency procedure, alarm warning system which is tested every 3 months. Working with BKSDA, weather service, each location needs a system, work with government and fund raising, emergency budget in place, periodic maintenance of water system, keep everyone safe.

You want the community to own your preparedness – this will need a lot of time and effort, the more you put into your preparedness the better you will get to recovery. This can be useful on many different levels and in many situations.

Kevin Cooper is available via email to assist in issues you may need help with kcchook@ozemil.com.au +61 427 235 917 and you can get further details from this presentation on the OVAG website.

Presenter: Aldrianto Priadjati - FORINA

ORANGUTAN INDONESIA: CONSERVATION STRATEGIES AND ACTION PLAN 2019 – 2029

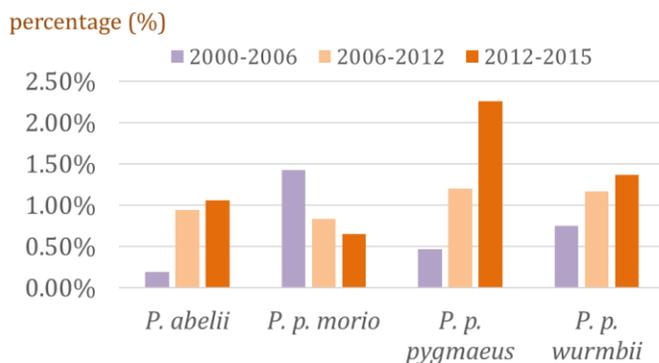
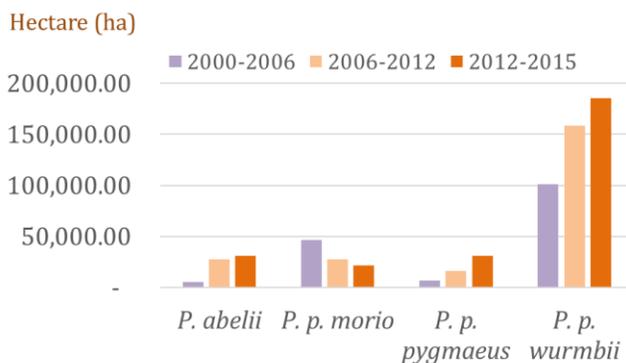
Who is FORINA? Forum Orangutan Indonesia. An Orangutan Forum started in 2009 and includes members from government/private sector/NGO/Academic and Observers (Including OVAG). Board of Member Representatives/MPA : Wahjudi Wardoyo / Head of FORINA: Aldrianto Priadjati.

VISION: To realize orangutan and their habitat sustainability through synergetic the role of stake holders

MISSIONS:

- To promote Indonesian orangutan conservation
- To increase the awareness of orangutan conservation constituents
- To facilitate policy advocacy on orangutan conservation
- To facilitate synchronizing and synergizing on the orangutan conservation efforts
- To facilitate the supports on the orangutan conservation activities

Orangutan status (PHVA 2016) – all three species are endangered. Species: *Pongo pygmaeus* (Orangutan Kalimantan) 3 sub species / *Pongo abelii* (Orangutan Sumatra) / *Pongo tapanuliensis* (Orangutan Batang Toru). Conservation Status: - Protected (PP No. 7 Year 1999) - Critical Endangered; IUCN Red List 2017 - Appendix 1 CITES (2009). It should be noted that the government regulation protecting orangutans only protects *Pongo Pygmaeus*, and does not include *Pongo abelii* and Batang Toru species.



Deforestation Rate per year at Orangutan Habitat

(Source: Land cover map from KLHK)

78% of orangutans are outside of conservation areas – only 32% are inside conservation areas and this needs to be monitored carefully.

Orangutan Conservation Management: Distribution, population, threat / Local adaptation (behavior), life history / Ecology (habitat, feeding, home range), monitoring / Genetics, health (parasite, diseases, medicines) / Physiology (stress, reproduction) / Education, Awareness, Policy, Training younger generation, Reintroduction, Release.

There are currently 60,060 orangutans living in 15,640,754 hectares. Sumatera: 13,710 individuals in 2,053,276 ha / Tapanuli: 577-760 individuals in 105,132 ha / Kalimantan: 45,590 individuals in 13,482,346 ha. Only 23% of these meta populations in Indonesia will be sustainable for 100-500 years.

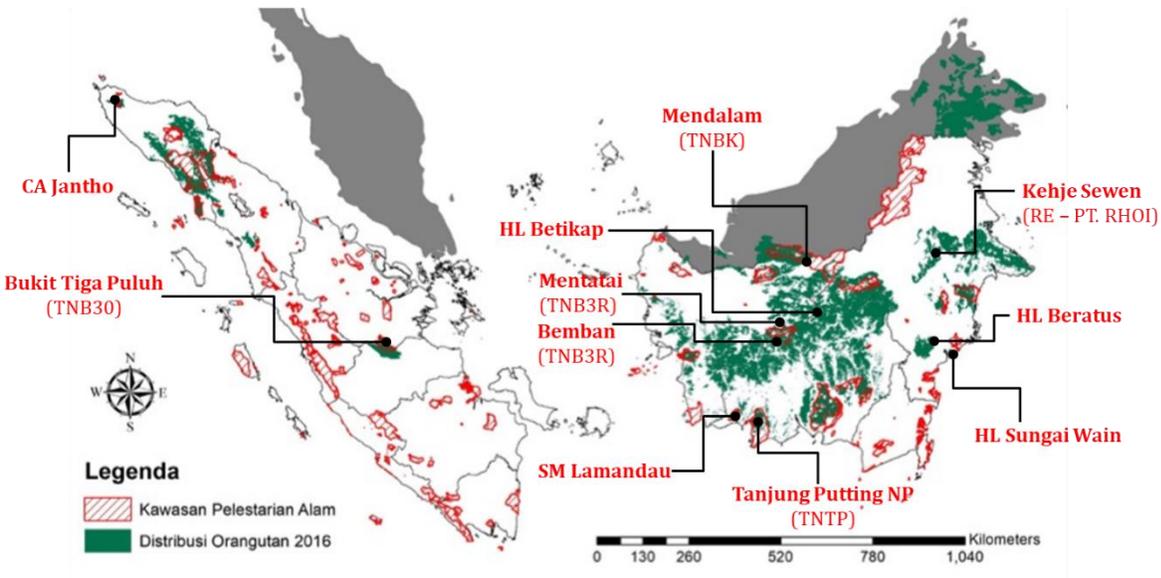
VISION 2019-2029: Ensuring the sustainability and increasing of the orangutan population and its habitat through participation of all stakeholders.

MISSION 2019-2029: To summarize the consensus and commitment between various stakeholders into a series of recommended actions and the implementation that hopefully will guarantee the survival and increasing of the orangutan population and its habitat in harmony with a fair and sustainable economic, social and local wisdom development.

GOALS 2019-2029: As a guideline for all stakeholders to determine priorities for *in situ* and ex orangutan conservation activities, awareness, policy, funding, partnerships, cooperation and design development programs that support the sustainability and increase of orangutan populations, so that orangutans and their natural habitat conditions will be better in years to come.

One of the objectives wanting to be achieved by 2029 is that all orangutans in rehabilitation centers that are 3 years or older by 2019 and are able to be released, should be released into wild habitat by 2022.

ORANGUTAN RELEASE AREA



New Action Plan for 2019-2029 will be available soon. For more details on this presentation please refer to OVAG website.

Orangutan Strategy and Action Plan (SRAK) 2019-2029 set up the standards for orangutan care following OVAG recommendations as target indicator for implementation for the action plan (Chapter A-point 2 SRAK 2019-2029).

Presenter: Dr. Sugeng Dwi Hastono for Dr Munawarroh – IVMA (Indonesian Veterinary Medical Association)

IVMA seeks to apply science and technology to veterinary medicine for the development of animal health, that the supply of animal products and foods are safe, healthy, whole and lawful; protection of animal health, human, social and environmental as well as maintaining the balance and sustainability of ecosystems, with due regard to the principles of animal welfare. The Indonesian Veterinarian's motto: "Manusya Mriga Satwa Sewaka" (Dedicated to human welfare through the animal (welfare) world).

There is a global challenge to be met in regard to: Judicial, One health and Animal Welfare.

Judicial aspect: legalities of conservation sites/legalities for vets/medic conservation competency.

One Health: emerging and re-emerging diseases/70% of zoonotic diseases come from wildlife/human-wildlife contact.

Animal Welfare: there are laws and rules for wildlife and there are ethics and animal welfare provisions in place.

Presenter: Dr. Sugeng Dwi Hastono - ASLIQEWAN (Association of Indonesian wildlife, aquatic, and exotic animal veterinarians)

ASLIQEWAN members are veterinarians who have interest, expertise and field work on wildlife (both wildlife in-situ and ex-situ conservation), aquatic animals (fish, aquatic mammals and others aquatic animals) and exotic animals (originally wildlife and then be cared as a pet, as well as snakes, birds, ferrets, turtles, etc.) and as such sets out the following statements regarding a veterinarian's basic function: Safety, Security, Assurance, Animal Welfare and Veterinary Medical Services (2S 2A 1VMS). Safety is the function of veterinarians in ensuring that live animals / animal products are transported in a healthy way, good for animals, humans and the environment. Security means the veterinarian ensures that the live animals / animal products are transported in a safe way (not as source of disease transmission, zoonotic diseases), good for animals, humans and does not pollute the environment. Assurance means to guarantee animal health certificates, by conducting safety and health underwriting to issue a certificate of veterinary health, supported by various tests and holding ethics and vows. Animal Welfare means veterinarians will carry out the implementation and advocacy of the animals in their care. Veterinary Medical Services is a function of a veterinarian as a healer and the medical profession, by committing acts to promote, prevent, cure and rehabilitate live animals.

For specific fields:

Veterinarians in the conservation: To solve wildlife conflict with human, establish the health status of the confiscated or rescued wildlife, Wildlife immobilization and transportation Promote wildlife health status - treatment surgery - medical rehabilitation - other medical treatment - Establish animals health status prior

to return to wild - The maintenance and strengthening of wildlife both in-situ and ex-situ conservation - Consultation and assessment of animal welfare - Wildlife forensic activities for law enforcement of wildlife crime etc.

As a wildlife veterinarian : Monitor behavior and eating habits of animals - Develop meal plans for animals to meet the nutritional needs of each species, - Examine all animals in the facility yearly and as needed throughout the year (include physical exam, blood work, x-ray, etc.) - Monitor and participate in breeding program of endangered species, - Perform surgery as needed on animals, often in the animal's housing, - Develop innovative treatment for exotic animals ☑Work closely with animal care staff in all aspects of the animal care.

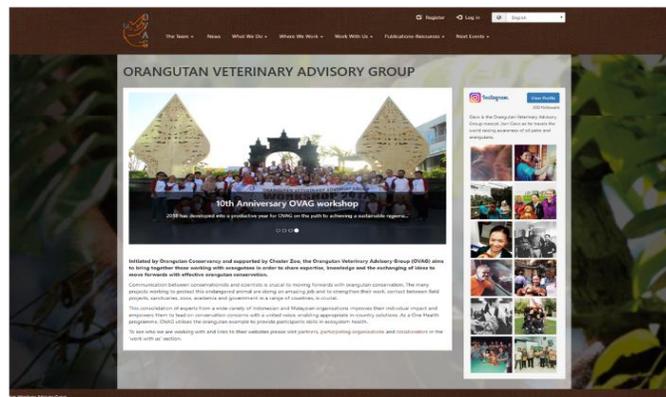
As a zoo (ex-situ) veterinarian : Plans, directs, and participates in health care program of veterinary clinic in zoo (establishes and conducts effective quarantine and testing procedures for all incoming animals to ensure health of collection, prevent spread of disease, and comply with government regulations), - Conducts regularly scheduled immunization and preventive care programs to maintain health of animals and guard against communicable diseases, - Provides immediate medical attention to diseased or traumatized animals, - Participates with other personnel in planning and executing nutrition and reproduction programs for animals in zoo - Develops special programs to encourage reproduction among animals designated as endangered species (based on knowledge of native habitat and instincts), - Participates in employee training in handling and care of animals, conducts postmortem studies and analyses - Cooperates with zoo and aquarium personnel to exchange information concerning care of animals, - To arrange transfer, sale, or trade of animals, and to maintain nationwide inventory of animals of every species, including notation of live births

For more details of this presentation please refer to OVAG website.

Presenter: Rob Eagle – .NET Developer at Chester Zoo

The Role of Software Development in Conservation

At Chester Zoo: Develop software systems for Chester Zoo and some associated partner organisations/ Specialize in Microsoft .NET Development / Develop and maintain Chester Zoo online booking system / Various types of systems such as websites, animal management applications and interactive interpretation/signage AND developed and manages OVAG website.



OVAG website developed by Chester Zoo

OVAG website features:

- Multi-lingual (Indonesian and English)
- User accounts
- News/Blog section
- Instagram feed
- Members only resources
- Content Management System

Impact for OVAG: Provides a focal point for our supporters - including links to our partners helping to raise profile / Provides a technical resource for participants to easily access and download orangutan health material / Provides a platform for OVAG's activities that will help with our own profile and evaluation of our services

What's next...

- Further development and maintenance of existing software
- Expand involvement with Chester Zoo's mission delivery teams
- Research and develop new ways of delivering/sharing information

Future Conservation Technologies: Field Programs / Machine Learning/AI – Animal recognition (counting, camera traps) / Mobile apps for data collection / Websites and services to collect/share data / Education / Augmented Reality/Virtual Reality / Interactive media experiences – touchscreens, digital signage / Animal and plant care / Internet of Things (IoT) devices (e.g. Wi-Fi temperature sensors) / Data gathering (injury monitoring, habits, data recording) / Public apps / Education (Games) / Information / Whistle-blowing (Wildlife Witness) / Citizen Science (Maldives Whale Shark Research Programme)

All the material covered by OVAG is freely available to all – you only need to register on the OVAG website www.ovag.org

July 29 – at UGM

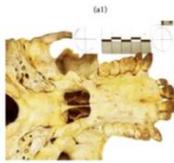
Barbara Toddles – Nutrition Program Director, Philadelphia Zoo

**Orangutan Digestive Morphology and Nutrient Review
Bornean Orangutan (*Pongo Pygmaeus*)**

Important part of digestion is the mouth – you need to understand the morphology of the mouth, the teeth, the skull, the jaw – how they get the food, the hardness etc. The big issue with jaws is that we have not been respectful of the musculature of orangutan jaws. There has been loss of muscle with captive animals because of lack of enough hard foods for them to work their muscles adapted to hard foods. This also changes how they bite, how they swallow when the texture of the food is not correct for that animal. We must respect the design given to them by nature.



Skull



Maxillary Arch



Mandible Arch

For orangutans, the dental enamel is very thick, they have very strong mandibles, are resistant to teeth fractures during the mastication process. Maxillary and mandibular teeth average enamel thickens from the anterior to the posterior teeth. Enamel thickness in their central incisors is due to bark gouging or incisal biting of the mechanically demanding foods. The maxillary molars tend to be broader in a buccolingual dimension compared to the mandibular molars (Nambiar et al. 2013). Males' have larger dentine cores and therefore have larger teeth than females.

Lack of hard foods that require manipulation has been shown to cause muscle atrophy of the masseter muscles in captive animals. Many orangutans have gingivitis and tooth decay in captivity. Understand the tooth eruption schedule and offer foods consistent with tooth development (Oram 2016). Avoid sticky foods such as raisins and high sugar fruit. Offer foods that require substantial mastication. For captive animals - monitor oral health. Raisins are particularly bad – stay away from sticky food – you need food that requires a lot of mastication (chewing) – once the animal's food is compromised so is their health. Keepers like to feed out food that they themselves like – but apes have a very different gut morphology – they have small, small intestines.

Digestion and Nutrient Absorption – digestion begins in the mouth with salivary glands - Orangutan have 14 pepsins – what that means we do not know but they have mechanisms to extract protein from their diet. People do not often think of other organs that are very important for digestion – such as the pancreas – so if there are any issues with the pancreas will affect the animal's health. The pancreas also releases hormones into the blood which is vital for digestion. The liver is also important for maintaining health and good digestion – it secretes bile – it detoxifies as well – which helps keep a healthy liver – it also produces proteins in combination with vitamin K which is important for blood clotting. The Biliary system – works together to emulsify fat in the diet – there are some triglycerides that can be digested without bile but most of them need the biliary system to break fats down.

The small intestine in orangutans is not as substantial as it is in humans, so we need to feed them properly so as not to overwork their small intestine. The lining has microvilli, when an animal's diet is compromised the microvilli start to shrink and begin to lie flat – so they cannot absorb nutrients properly – so you can feed and feed and if they cannot absorb properly – you will not be successful.

The large intestine is very important to orangutans as this is three times the size of a human – so it is very important – there is a lot of fermentation going on inside the colon – matching this with feeding ecology of orangutans is crucial to their health. Fibrous foods and seeds are very important as their diet is very seasonal – so fruit is only available for a certain number of months then they are using their fallback foods. They also

eat a lot of unripe food – this is important because there is less sugar - they contain structural starch – which goes straight to the colon where is fermented. Fatty acids (there are acetic acid, probiotic acid, butyrate) without butyrate humans have a higher rate of colon cancer – so orangutans need these fatty acids in order to have a healthy colon.

Orangutans need between 8 and 11 amino acids which contain nitrogen...Amino acids are the building blocks of protein so you need to be sure orangutans have the proper amino acids (when they are out of balance problems can occur).

There is literature available about amino acids, suffice to say that each has a specific function, and each has a role – nutrition is a puzzle and you need to make sure that all the puzzle pieces are there in order to have good health.

Animals need essential fats (which means that it is not produced by the body)- Fat supplies the most energy regarding macro nutrients. Carbohydrates are also important as they make up the bulk of an animal's diet. There are simple sugars and then starch – starch is the plants way of storing energy.

Fiber: two general categories, soluble and insoluble – soluble fiber is what feeds the digestive tract – insoluble fiber needs water.

Micronutrients – vitamins and minerals which need to be added to the diet (as usually the body does not make enough) so we need to include food that includes all the vitamins and minerals that an animal needs. B vitamins are water soluble (needs to be supplied every day as body cannot store it) foods which contains them are: sunflower seeds, nuts, beans, among others (see PowerPoint on OVAG website). B-12 comes from animal protein – very difficult for the body to absorb – it does get stored in the body – it is important for the nervous system – can cause problems if there is a B12 deficiency. Vitamin C – water soluble does not get stored by the body – needs to be given every day (bone structure and collagen) can cause fractures, gum issues, if not enough C is in the diet. Citrus fruits are not the best source of vitamin C – sweet bell peppers, papaya, kale, broccoli are better.

Most minerals are only needed in trace amounts. There is a higher need for Calcium, Phosphorus, Magnesium, Sodium, Potassium, Chloride and Sulphur. Needed in trace amounts are: Iron, Manganese, Copper, Iodine, Zinc, Fluoride and Selenium. Be careful to not overdo mineral content.

An animal will eat what is in its environment – the digestive tract does not dictate what it eats.

Orangutan Energy: they do not consume the same amount of energy throughout the year = ketones are produced in the liver when there is low food intake. When an orangutan has a lot of energy it uses it – when there is not enough – it uses stores from the body.

Does the presence of ketones in the urine mean there is a problem? – for the wild population it is more a matter of the length of time you see ketones not the presence of the ketones themselves – lactating females may have higher ketone levels.

What is a fruit? A fruit is a seed-bearing structure in flowering plants. Eggplant is a fruit. Peppers are a fruit. Corn is a fruit and a vegetable, cucumber is a fruit, squashes are all fruit. When researchers report that an animal is eating fruit – they mean botanical fruit not common fruit. There are no bad foods, only human bad management of food!

Sugar and Fiber: Need to know sugar levels – you need sugar balanced with fiber.

Apes have the same five taste receptors as humans do – and each taste receptor has a meaning: bitter (foods that contain toxins), Sour (spoiled foods), salty (minerals present), Umami (savory protein fat), sweet

(carbohydrate). Primates love sweet foods and they will eat it over other foods. Glucose when it is readily available and fast energy source. Glucose stimulate release of insulin – if insulin is being over produced so they become insulin resistant which can cause type 2 diabetes. Sugar is not bad, but it does need to be controlled.

When orangutans eat like humans, they will become obese as well as getting periodontal disease, caries, cardiovascular disease, diabetes, microbiome shift, etc.

Feed food out whole – do not cut it up – make them work for it. In order to improve an animal's general welfare: Consider foods they eat in the wild / Reduce simple sugars and increase fibers (recognizing what a fruit is – there are many low sugar fruits out there) / Consider the types of fiber (soluble vs insoluble) / Balance sugar with fiber – proteins, fat and carbohydrates (fiber)

Nutritional Health:

Dysbiosis – any alteration of what is normal microflora for that animal – the diet affects this along with toxins, drugs and pathogens -this is the most problematic – when you change the microflora you also change the environment of the gut which allows for keeping good stuff in and letting bad stuff pass through – leaky gut syndrome – causes relaxation between cells and causes allergies and auto immune diseases (you are not feeding the animal you are feeding the bacteria that exists in the gut) – humans carry 3 pounds of bacteria so it is very important and it needs taken care of – we need to be respectful of gut bacteria.

Obesity - gut- brain axis (hypothalamus) regulates energy balance. The hormone leptin tells the brain you have enough to eat – obese individuals do not have the shut off mechanism, energy intake exceeds energy expenditure – this is what causes obesity. If adipose tissue increase it can cause inflammatory reactions, this causes damage to the surface of the cells causing oxidative stress. Lessens antioxidant levels -How to prevent it? match energy intake with energy expenditure. Use visual assessment (BCS), weigh them (difficult in centers), if you need to reduce, increase low sugar high fiber fruits and decrease high sugar fruits. Meet dry matter intake ability.

Never ever change an animal's diet quickly – they can produce a lot of gas from the excitement of the bacteria in the gut – with an obese animal that has specific likes, change it slowly – cut back slowly the high sugar and add less sugar. Need gradual loss of body weight – different strategies for those still growing versus adults – you do not an orangutan to be too fat or too thin – being 10% underweight is better than being 10% overweight – the best strategy is to develop a weight range through visual assessment – in group situations, try target feeding (handing directly to the animal) but hard to monitor if you cannot target.

Malnutrition – starvation: lack of proper nutrition – does not need to be thin to be malnourished and may just need tweaking of the diet.

Several phases of starvation:

Phase One – fat stores are being used (not that dangerous)

Phase two – fat begins to be used for the brain (the body will preserve the brain over everything else) – so the digestive track is not being used and all microvilli are retreating – orangutans can stay at this stage for a very long time, but their body is reacting

Phase three – dangerous – all reserves are depleted and have no resistance

Refeeding syndrome – introducing too much food too quickly – the digestive tract needs time to bounce back – happens very slowly – (days) about 10 kcals per kg body weight per day over 10 days

Feeding Plan Design

A simple way to feed orangutans correctly. Make a feeding strategy:

1. Provide a diet that is respectful of the animal's gut – it developed a digestive track in the while making the best use of what was available
2. Develop a diet that is appropriate for the stage the animal is in –
3. include food exploration – a diet that stimulates natural feeding – copying what is done in the wild
4. provide key foods that the animal eats
5. provide something that you can afford to feed out and is practical – there should be no prepping – leave food whole

Define the plan:

1. Long term care – animals that cannot be released may have different food sources as they do not need what a released orangutan will need
2. Must be eto implement, flexible and sustainable

How do you assess success:

Health evaluation / visual evaluation / body weight / health exams

Feeding plans should be evaluated on an ongoing basis – animals grow and progress – so may need modification over time

Base your diet on the needs of a wild orangutan: Seasonality of their diet

Feeding Long Term Care Orangutans: We do not want to feed them at the highest level or the lowest – take an average.

20% carbs, 1.2 fats, 4% protein, 75% water – water makes an animal feel full – so you have to pay attention

Simple equation: 50 kg male, needs 4% of diet from protein (for essential amino acids) usually eating 3.5% of their body weight (water included). $50 \times 0.035 = 1.75$ kg food

$1750 \text{ grams} \times 0.04 = 70$ grams essential amino acids (calculated intake not what is offered)

Best to mix and match foods so you make combinations – you do not need to meet all the protein needs of an orangutan in one day – you might be able to meet it in one week...so you can take the entire diet of the week and have a high protein day and a low protein day – you do not want to feed the same foods everyday

Carbohydrate (largest percentage of animal's diet) it does not have to be consistent, change it up – use all kinds of different foods and really enrich and vary their diet.

Remember Mix and Match – feed them things you can acquire and feed consistently, if you can

Proportions: structural fiber: 8% / Soluble fibers/Resistant: 80% / Simple Sugar 7%, Starch: 5% - feeding out unripe fruit will let you meets this guide easily

Use high sugar foods for medical procedures/training

Feed banana and mangos before they are ripe – much better

Coconut in husk structural fiber

Leaves and twigs, banana leaves (structural fiber) – be aware of plants that may be high in toxins

Make sure you are getting the complete protein into the animals

Some tips: feed out unripe food, add beans, but feed out slowly – if animal is gassy – food is the problem – if orangutans love tempeh – good – offer foods that they may not like when they are at their hungriest – avoid sweet produce – use it only as a management tool and not part of their daily diet. Initially food needs to be weighed – from there you can then develop a visual system initially then you can stop weighing.

Data collection and Use – you are the ones monitoring to ensure they are doing what they should behaviorally and health-wise - it will take some time for orangutans to take lower sugar foods – the microbiome takes 21 days to adapt (may be a bit faster or a bit slower – monitor changes – review a diet monthly as part of visual assessment – make note of severe weight drops or weight gains.

Social group can really affect energy needs to animals, changes in life stage (a pregnancy).

Barbara is in the process of putting together a data base of foods – but USDA has a lot of information on foods.

Once you get the proper food set up – then you have to figure out how to feed it out more than measuring it – the only important measure amount is the protein – the rest can be visually added. It is not as important to modify what you are doing as changing the food you are feeding out.

Thoughts on milk. In mother's milk there is Moisture: 88.1 / Energy: 52.2 / Protein: 0.7 / Carbs 2.2 / Sugar (lactose) 7.4. Cow milk is too high in fat and lipids. Evaporated milk: too high in protein. Sheep milk: too high, Goat milk – too high. Rice milk is a little bit better match to protein (slightly lower than mother's milk) mix and match milk as well – use rice milk as a base with powdered Similac (for lactose sensitive babies) – maybe incorporating coconut milk. Soy milk – read label carefully as there can be additives but high in protein low in carbs so may not be the best choice.

Again, for more exact information please refer to Power Point on OVAG website.

Case Study Session – Yenny Saraswati Jaya (SOCP, OVAG Committee) Moderator

Do not be nervous – this is a supportive environment and we want to hear what you have to say – when you are speaking consider that you and your presentation are a team – you are telling a story – so you need to interact with your environment – the presentation is a tool – while many slides have much information on it – during the talk – you are the focus – not the slide – be part of the conversation as people will look at you first – then if they need to the slide it is there – from a technical point – keep to the time which is good practice for a professional conference – why do you think this happened should be added to the end discussion – feedback will be provided

Presenter: Muh Aqshar Marsani – (with Karmele Llano Sanchez, Joost Philippa IAR) Ketapang-Kalimantan Barat, Indonesia

PREVALENCE AND TREATMENT OF PLASMODIUM SPP. INFECTION IN ORANGUTANS AT INTERNATIONAL ANIMAL RESCUE

ABSTRACT

Malaria, a clinical disease associated with Plasmodium spp. infection, is commonly diagnosed and treated at rescue centers in Indonesia. Peters et. al. (1976) reported that orangutans infected with either one of the

two orangutan-specific Plasmodium species, namely *P. pitheci*, and *P. silvaticum* may show only minor transitory disease signs, with little discomfort associated with the infection. It is unclear if infections with other Plasmodium species can cause more serious disease like is sometimes seen in rescue centers. Published data on orangutans infected with “human” or “macaque” Plasmodium strains has been highly disputed after phylogenetic analysis.

At IAR, clinical manifestation of malaria in orangutans with microscopically confirmed non-specified Plasmodium infection (diagnosis was made to genus level) ranges from completely asymptomatic (chance finding during annual health check, or investigation of conspecifics during an outbreak) to presentation of severe clinical signs which include pyrexia, anaemia, leucopenia, thrombocytopenia, lethargy, anorexia and dehydration. Morbidity seems to be correlated with parasitaemia level in these animals, and parasitemia persisted at low levels for long periods of time in several individuals, as previously described. Antimalarial treatment (artemeter and doxycycline combination) generally lowered the parasitaemia rapidly, with a rapid decrease in the severity of presented clinical signs. There have been no fatalities associated with Plasmodium infection during this time (both treated and untreated groups).

The decision to start antimalarial treatment was made on an individual basis, using severity of clinical signs (e.g., inability to control severe fever with antipyretics), with a concurrent increase in parasitaemia in daily collected blood samples. Since September 2017, in eleven cases (N=111) orangutans received antimalarial treatment at IAR. During this time, the prevalence of Plasmodium infection was between 38-44% by microscopy. Preliminary in-house PCR and RT-PCR data suggest that some animals have chronic very low level parasitaemia, which may go undetected by microscopy and therefore actual prevalence is likely to be higher.

Antimalarial drug resistance has emerged as one of the greatest challenges facing human malaria control and eradication. To minimize the risk for the emergence of drug resistance in Plasmodium strains which infect orangutans, we therefore recommend to carefully consider a combination of aspects before starting antimalarial treatment: mainly based on a combination of parasitaemia level and severity of clinical signs. The majority of Plasmodium infections in orangutans appear to have a chronic, self-limiting nature, which do not require antimalarial treatment in addition to supportive treatment.

Keywords: Orangutan, Malaria, Plasmodium

Malaria: Is a disease transmitted by mosquitoes from humans and other animals caused by parasitic protozoa (a group of single-celled microorganisms) in the Plasmodium type. There are various types of plasmodium species such as knowlesi, malariae, vivax, falciparum and ovale (which are pathogens found more in humans and maybe in orangutans too).

Peters et al (1976) reported that orangutans infected with either one of the two orangutan-specific Plasmodium species, namely *P. pitheci*, and *P. silvaticum* may show only minor transitory disease signs, with little discomfort associated with the infection. It is unclear if infections with other Plasmodium species can cause more serious disease like is sometimes seen in rescue centers.

At IAR, clinical manifestation of malaria in orangutans with microscopically confirmed non-specified Plasmodium infection (diagnosis was made to genus level) ranges from completely asymptomatic (chance finding during annual health check, or investigation of conspecifics during an outbreak) to presentation of severe clinical signs which include pyrexia, anemia, leucopenia, thrombocytopenia, lethargy, anorexia and dehydration.

Symptoms

Parasitemia: Malaria cases: average 22.800 parasites/microliter (MIN= 13.000; MAX=47.000). Asymptomatic cases: average 1.202 parasites/microliter (MIN=57; MAX=19.651)

For 2017-2019: The prevalence of Plasmodium infection (asymptomatic or mild clinical signs) was between 38-44%.

Malaria Cases (symptomatic): 2010-2017: 10 cases (parasite density not calculated) / 2017-2019: 11 cases (treated with antimalaria, 2 potentially co-infections).

Treatment: Antimalarial treatment (artemether and doxycycline combination) generally lowered the parasitaemia rapidly, with a rapid decrease in the severity of presented clinical signs. There have been no fatalities associated with Plasmodium infection during this time (both treated and untreated groups). Antimalarial drug resistance has emerged as one of the greatest challenges facing human malaria control and eradication. To minimise the risk for the emergence of drug resistance in Plasmodium strains which infect orangutans, we therefore recommend to carefully consider a combination of aspects before starting antimalarial treatment: mainly based on a combination of parasitaemia level and severity of clinical signs.

Presenter: Meuthya Sr. (with Yenny Saraswati Jaya) Sumatran Orangutan Conservation Programme- Yayasan Ekosistem Lestari

EVALUATION OF SUMATRAN ORANGUTAN AIR RIFLE VICTIMS AT SUMATRAN ORANGUTAN QUARANTINE CENTER, BATU MBELIN-NORTH SUMATRA

ABSTRACT

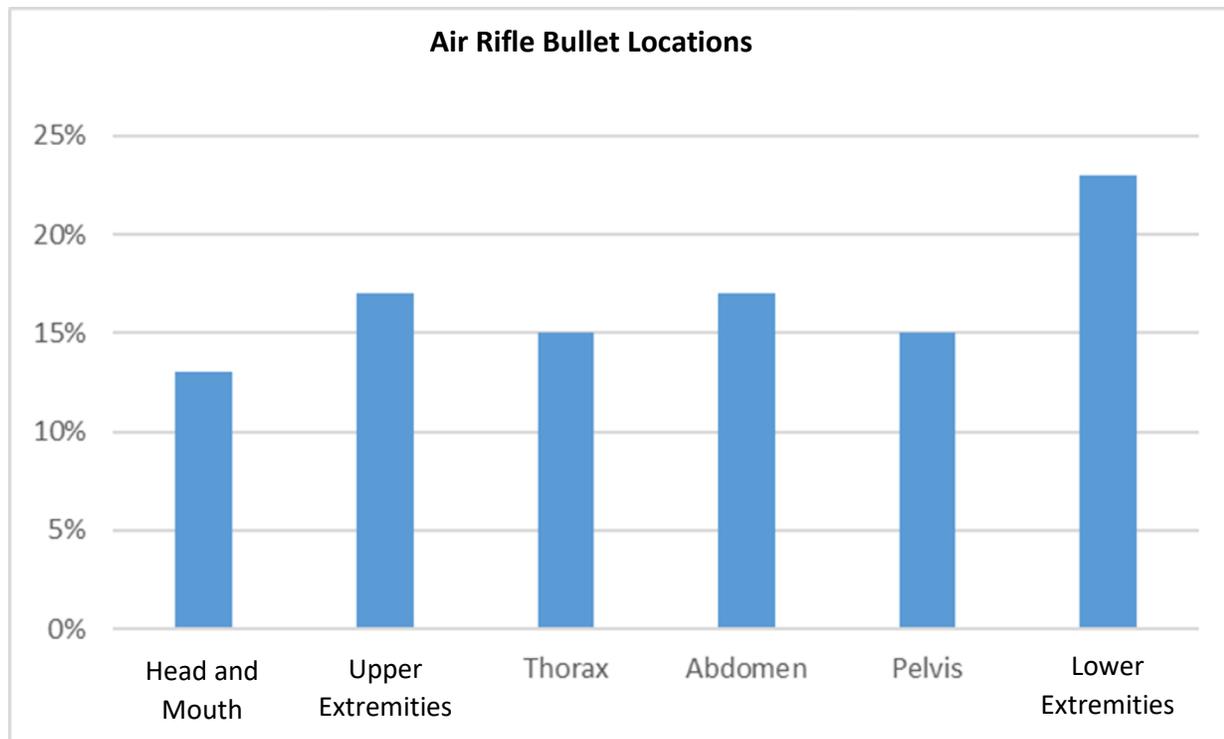
The shooting of orangutans using air rifles have recently received national and international attention and has become one of the worst animal welfare issue. The injuries sustained from air rifle shooting may vary in the degree tissue and/or organ damage and may even cause animal deaths. This evaluation study aims to provide an overview of the condition of orangutans shot by air guns at the Sumatran Orangutan Quarantine Center, from December 2010 to April 2019. The method of this evaluation study is retrospective descriptive using all the number of cases of orangutans shot by air rifles at the Sumatran Orangutan Quarantine Center by evaluating the results of clinical examinations on orangutans to see injuries that occur and are supported by the results of diagnostics imaging (x-rays), that find the position and number of bullets that exist. The results of the study showed that 19 orangutans who were shot by air guns in had the highest target of firing position in the lower extremities (thighs to the soles of the feet) by 23% with skin tissue damage ranging from mild infections to moderate. The two main criteria used as guidelines for deciding if an orangutan is worth release are: the degree of tissue damage after shooting and the degree of disability caused by the trauma of the shooting. So that of the 19 orangutans who were shot, as many as 37% had been released back into the forest, 21% had died, 16% were declared unable to be released and 26% were still in the recovery phase in Quarantine Center.

Keywords: Sumatran Orangutan, Air rifle gun, Diagnostic Imaging.

Deforestation has increased human-wildlife conflict. Villagers use air guns to repel orangutans. There are no strict rules for air guns in Indonesia. Orangutan Hope was shot 74 times by air rifles. Hope's case is in the courts, but it will be hard to prosecute – she will most likely not be released as her injuries have left her blind. Air rifles are weapons that use pneumatic principles that fire bullets, using air power or a kind of compressed gas. Air rifles are usually used for support and hunting small animals such as birds, rabbits, wild pig and squirrels, the size of the bullets used is usually not too large, 177 or 4,5 mm and 4,5 mm caliber are usually made of lead. This riffle can kill if the use procedures are wrongly used.

This evaluation aims to provide an overview of the condition of orangutans shot by air rifle at the Sumatran Orangutan Quarantine Center, from December 2010 to April 2019. All cases will be evaluating from: Clinical examination / Diagnostic imaging (X-ray).

Air Rifle bullet distribution in body:



Medical procedures: Removed bullets from the body with minor surgery for when the position of bullets were subcutaneous, the procedure:

1. Surgical site prepared aseptically and linear incision.
2. Subcutaneous tissue was separated by blunt dissection and the bullet embedded in fibrosed tissue.
3. Incision was closed routinely.
4. Given antibiotic, and analgesic, antiinflammation

Conclusion: Orangutan unreleaseable due to blindness (bullets imbedded in eye were not removeable). Bullets did not strike vital organs, and other than blindness, orangutan is in good health. A different case of an orangutan rifle victim who died was due to the bullet position penetrated vital internal organs.

Hunting bullets are designed to expand, although air weapons are considerably lower power than other firearms there is still increasing concern of serious injuries. (Tarinongga ana, 2012). The injuries produced by an air gun can mimic those injuries produced by handguns. Within the penetrating range, the injury produced by an air gun will be an oval or round entry wound (Di maio, 1985). Successful surgical treatment of gunshot wounds in elephant, initial treatment should include antibiotic to fight against the gram positive and negative bacteria. (Sharma, 1997)

The two main criteria used in SOCP as guidelines for deciding that an orangutan can be released are: the degree of tissue damage after shooting and the degree of disability caused by the trauma of the shooting.

Further research is needed on the effects of air rifle bullets (long term lead toxicities) in orangutans.

At SOCP, and SOP will be made about the future of orangutans who are victims of air rifles.

For more details on this presentation, please refer to OVAG website.

Presenter: Sheila Kharismadewi, Sumatran Orangutans Conservation Programme (PanEco-YEL) – Batang Toru Program

A GENERAL INTRODUCTION TO *Pongo tapanuliensis* AND CAMP MAYANG AS A CONSERVATION PROJECT TO PRESERVE THE ORANGUTANS' POPULATION AND ITS REMAINING HABITAT AT BATANG TORU ECOSYSTEM

ABSTRACT

This third species of orangutans was first described in 2017 and inhabited the southernmost ranges of Sumatran Orangutans' habitat at the south of Lake Toba. *Pongo tapanuliensis*, as it names, was endemic to the Tapanuli districts, North Sumatra. Based on the cranio-mandibular, dental character, and genomic marker, this isolated population was classified into a different species from the other extant Ponginae. The deepest-split in the evolutionary history of orangutans occurred approximately 3,38 mya between *Pongo tapanuliensis* and *Pongo abelii*, while populations of *Pongo tapanuliensis* and *Pongo pygmaeus* were separated about 674 kilo years ago. Therefore, Batang Toru population of orangutans, of which *Pongo tapanuliensis*, is an ancestral population to all existent orangutans' populations. Tapanuli orangutans mostly lives in highland forest and were recorded on feeding on large amount of unusual fruits from the family Araucariaceae, Podocarpaceae, and Casuarinaceae. Tapanuli orangutans' activity budget consist of 47.8% feeding, 20,8% resting, 29.9% moving, and 1.6% doing other activities such as nesting and social activities. Their dominant food items are fruits, followed by pith, leaves, and bark as fallback foods options. The population of Tapanuli orangutan within the study area of the monitoring station is 0.29 ind/km². In 2005, Sumatran Orangutans Conservation Programme (PanEco-YEL) established a monitoring station in Batang Toru Ecosystem which intent to conserve the population of orangutans and the remaining habitat in that area. This monitoring station was named "Camp Mayang" and located on the west block of Batang Toru Ecosystem (1°41'9.1" N/ 98°59'38.1" E). This station is actively doing behavioral monitoring of the wild population of tapanuli orangutans, as well as the phenological and climatological of the forest within the study area.

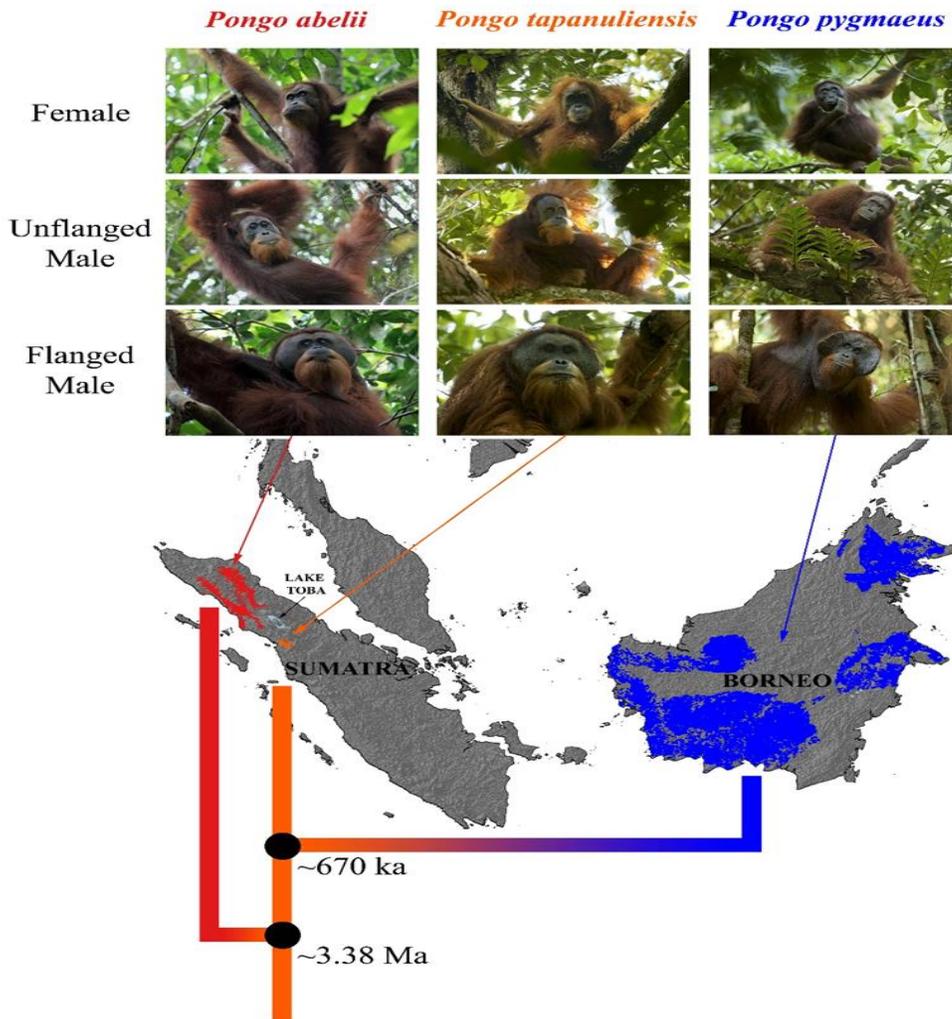
Orangutan comparison:

Paper was published comparing the new species with other species – Tapanuliensis has a smaller skull, and a higher frequency of male long call. Dominant food item is fruit, followed by pith and leaves. Recorded to feed on unusual type of fruits from the families: *Araucariaceae*, *Podocarpaceae*, and *Casuarinaceae*. Lives at Higher elevation – slightly lower temps – 21-22 degrees Celsius (others higher than 25 degrees) – spend more time traveling – traveling further to find food perhaps – they do not eat many figs – they eat small fruits with little flesh and seeds – staying in the same food patch for the entire day.

Nesting behavior: Dominant nest position: 2 (on the tip of branches) / Average nest height : 16.21 m / Average nesting tree height : 18.35 m / Average nesting tree diameter: 24.52 cm / Dominant nesting tree species: Fagaceae.

Currently, there are 767 individuals on three blocks: 0.29 individuals/km² at Batang Toru Monitoring Station

Threats: Habitat loss (deforestation) / Human-orangutan conflicts / Habitat Fragmentation



Presenter: Anwar Ali – (co-authored with Abraham Mathew, Guillaume Douay, Heng Yirui, Hsu Chia Da, Charlene Yeong, Sonja Luz1and Dr Calvin Chin from Singapore Zoo)

ORANGUTAN HEALTH ASSESSMENT IN SINGAPORE ZOO

ABSTRACT

There is a total of 23 orangutans (12 Bornean, 8 Sumatran and 3 Hybrid orangutans) in the Singapore Zoological Gardens collection. Health assessments were conducted on all these orangutans except for one

young Bornean orangutan. The objectives of the health assessment were to determine their health status and to conduct opportunistic research projects for disease surveillance, genetic and nutritional studies.

The health assessment included a physical examination, dental assessment, body measurements and chest radiographs. A thorough cardiovascular examination involving an echocardiogram and electrocardiogram was further conducted by a visiting human cardiologist from the National Heart Centre Singapore. The data obtained were shared with the Great Ape Heart Project, Ape Heart Project and International Primate Heart Project. Blood samples, pouch aspirates and urine samples were also collected for analysis. All the orangutans were anaesthetized with tiletamine/zolazepam (5 mg/kg) (Zoletil, Virbac, France) administered via blowpipe or by intramuscular injection with operant conditioning. Three of the orangutans with chronic pouch infections were anaesthetized with a different anaesthetic drug protocol involving premedication with tiletamine/zolazepam (1 mg/kg) and medetomidine (0.02 mg/kg) (Ilium Medetomidine, Troy Laboratories, Australia) intramuscularly, followed by ketamine (1 mg/kg) (Ceva Ketamine Injection, Ceva Animal Product Pty Ltd, Australia) intravenously when the animals were approachable. The orangutans were anaesthetized at the section and transported to the hospital except for two adult male orangutans for which the procedure was conducted at the back of house area due to logistical reasons. All the animals were intubated and maintained under isoflurane throughout the examination. The animals were reversed with Flumazenil (0.01 mg/kg) (Anexate, Pharmaco Ltd, 4 Fisher, New Zealand) intravenously once the health assessment was completed. Three orangutans were diagnosed with dental disease and required repeated anaesthesia for treatment. One orangutan had mild regurgitation of the mitral, possibly related to a severe periodontal disease. Animal had been treated for the periodontal disease and its currently under monitoring for the mild regurgitation.

Proactive health assessments are essential in determining the health statuses of the animals as early detection of disease and intervention provide better outcomes. Operant conditioning is essential to ensure animal receive full volume of the anaesthetic drug during the assessment.

Assessments began in 2016 began after having met Nancy Lung and Jennifer Taylor–Cousar at Seminar for Advanced Husbandry Techniques by Orangutan Species Survival Plan (SSP) in Melaka Zoo. Singapore Zoo knew that there were certain bloodlines of orangutans that have air sacculitis – many are obese with diabetes and heart condition – did they have gene for cystic fibrosis? The plan was to collect blood samples in all Singapore Zoo orangutans when they were anaesthetized to collect the samples.

The opportunities were: Conduct full health assessment / Disease surveillance / To conduct a heart scan / To determine the heart status of all zoo orangutans / To provide data for the GAHP (Great Ape Health Project) / Opportunistic Sampling / Orangutan Health Assessment Initiated.

Examined were a total of A total of 23 orangutans: 12 Borneans / 8 Sumatrans / 3 Hybrids

Anesthesia:

For animal without air sacculitis

Induction: Zoletil 5mg/kg Top up: Ketamine IV Maintenance: Isoflurane

Reversal: flumazenil 0.01mg/kg IV

For animal with air sacculitis:

Premedication: Zoletil 1mg/kg + medetomidine 0.02mg/kg Induction: ketamine 1mg/kg IV

Maintenance: Isoflurane Atipamezole 0.1mg/kg IM + Flumazenil 0.01mg/kg IV

Health Check:

Physical Examination, Dental check, Thoracic radiograph and blood work

Morphometric Measurement

Sample Collection

Blood, urine, pouch swab and hair samples

Pending/On-going: Cystic Fibrosis, Genetic Study, EMCV surveillance and vaccination response study / Analyzing / Anesthesia / Shared with GAHP: Morphometric, Echo, ECG.

Results:

5mg/kg zoletil provide sufficient anesthesia for transport

Require supplement with isoflurane for intubation

Recovery time: had been reduced to 30 to 45 minutes with reversal of zolazepam with flumazenil

4 animals required top up of ketamine / Dart bounce or animal pull the dart

Animal injected via operant conditioning / Did not require top up doses

Disease Findings:

3 orangutans (2 Borneans and 1 Hybrid) detected with severe periodontal disease

Repeat anesthesia for dental treatment

One of the Bornean orangutans with periodontal disease has mild mitral and tricuspid valve regurgitation. Three Bornean orangutans (all males) were detected with chronic air sacculitis. One Sumatran orangutan detected with lung consolidation.

Summary: Health Assessments are important to determine the health status of collection animals. If resources and technical expertise are available to conduct opportunistic sampling and operant conditioning to assist with medical work are important.

Tips: Used only zoletil because other drugs can change heart parameters. When orangutans lay flat they can regurgitate – so they sit them in a chair for transport. Heart monitoring through Great Ape Heart project, Took about 70 ml of blood from adults for the multiple tests.

Presenter: Nancy Lung – presenting, Orangutan SSP/OVAG Committee (with Fransiska Sulisty, Agnes Pratamiutami, Nancy Lung, Jennifer Taylor-Cousar)

PRELIMINARY RESULT OF CYSTIC FIBROSIS-BASED TREATMENT PROTOCOL IN ORANGUTANS WITH CHRONIC RESPIRATORY DISEASES AT AN ORANGUTAN REHABILITATION CENTER IN EAST KALIMANTAN

ABSTRACT

Orangutans (*Pongo* spp.), unlike other species of great ape, have a high incidence of chronic respiratory disease that can reduce quality of life, shorten lifespan, prematurely eliminate individuals from the gene pool, and drain institutional resources. This devastating clinical syndrome, Chronic Respiratory Disease in Orangutans (CRDO), affects orangutans at zoos as well as those at rescue/rehabilitation centres in their respective range countries. It consists of chronic, recurrent, progressive infection of the sinuses, air sacs,

cranial bones and lungs. Symptoms and signs can include nasal discharge, headache, air sacculitis, coughing, and wheezing.

In 2018-2019, we received a research grant from the Wild Animal Health, AAZV to conduct a study on the effectiveness of Cystic Fibrosis (CF) treatment in orangutans with CRDO symptoms at The Bornean Orangutan Survival Foundation (BOSF) rescue center in Samboja, East Kalimantan.

To date we have been treating 15 animals with a protocol modified from CF treatment. Evaluation was made based on pre-and post-treatment CT scan on several selected individuals, as well as clinical performances. In this presentation we will share our preliminary results from this project.

Keyword: orangutan (*Pongo sp.*), Chronic Respiratory Disease in Orangutans (CRDO), cystic fibrosis, treatment

Project Update: Investigating treatment strategies for CRDO

CRDO – Chronic Respiratory Disease in Orangutan– do not isolate air sacculitis – it is all connected to CRDO.

We have been focusing mostly on air sacculitis because it is visible – but there are many other issues and what they actually have is sinusitis in addition to air sacculitis – another is mastoiditis – chronic inflammation in ears, neck, lungs. CT scan is not the best image for air sacculitis but you can see thickness of air sac wall, what we did not know enough about was cystic fibrosis – and orangutans develop inflammatory processes that weakens the wall – so respiratory issues are not always air sacculitis but part of the CRDO complex.

Orangutan do not handle respiratory ailments the same way as other great apes – much of what is happening with orangutans is similar to cystic fibrosis.

Applied cystic fibrosis methodology to CRDO in orangutans – a treatment trial was done – 25 orangutans at Samboja are being followed – those diagnosed will be plagued with problems for the rest of their lives and most likely need treatment.

What should we do with these chronic cases? We still do not know if we catch it early, that they can recover– yes, they can but there is not certainty in that – but what to do is a difficult question – is it feasible to continue care? Euthanize? Let the disease run its course? It is not contagious – should they be released?

IUCN – suggests that if data is insufficient about a disease – then do not release.

Presenter: Steve Unwin (Independent Wildlife Veterinary Consultant (Chester Zoo), OVAG Committee University of Liverpool)

THE VETERINARY ROLE IN REHABILITATION CENTRE, ZOO AND CONSERVATION MANAGEMENT SITUATIONS. Part 1. Preventative Health Program development

ABSTRACT

Health management in a wildlife setting requires integration of veterinary skills in the decision-making process. In any preventative health program, (PHP) the aim is to reduce reactive and increase preventative reactions to health issues. In some aspects of a PHP, the vet and veterinary team will take the lead.

Sometimes, due to limited resources, the vet needs to take the lead in all aspects of the PHP, even if their expertise is not that broad. This is especially likely in a field situation.

This talk is designed as a back to basics session for vets and center managers to remind everyone what role the vet team should be taking in management decisions, and why that decision-making process should never be in isolation. Examples will be used from the vet and sanctuary arenas, including examples from participants, to generate discussion and actions to improve both understanding and effectiveness of vets in wildlife management decisions.

Goals of a PHP

- prevent disease entering facility maintain health of animals under your care
- prevent dissemination of disease to other institutions or to local human and wildlife populations
- Protect staff health

Importance of a PHP

- Difficulty of diagnosis and treatment of overt disease
- Often too late once show signs of overt disease
- Difficulty in eliminating many organisms once established in the facility
- General improvement of condition of animals under your care

A PHP therefor needs to follow risk-based principles by:

- Being science/ evidence based.
- Be able to highlight data gaps.
- Accurately assess Cost-benefit
- Be effective in improve communication between stakeholders on health matters. This improves understanding and therefore compliance with mitigation strategies.

Components of a preventative health program include:

1. Animal Observations and Record Keeping
2. Animal Identification
3. Safe Handling
4. Safe transport to minimize disease spread
5. Nutrition
6. Behavioral Management/ Social/ Enrichment
7. Enclosure Design
8. Contraception
9. Vaccination
10. Routine Health Assessments

11. Disease Surveillance
12. Necropsy
13. Biosecurity (elsewhere)
14. Medical Management (vets only)
15. Staff Training (vets only)

Keywords: Preventative Health Program; wildlife veterinary management

Overview Vet management

Wildlife disease risk analysis, the conclusions:

1. The combination of complexity and data deficiency associated with wildlife diseases results in a high level of uncertainty in estimating risk.
2. This uncertainty can be reduced through trans-disciplinary collaboration (One Health networks), data sharing and use of DRA analytical tools
3. Transparency re methodology, assumptions and limitations is essential for this to work and to enable refinement over time.
4. The Manual was designed as a 'go-to' resource to guide the DRA process in an evidence/science-driven systematic way

Usually vets react to emergencies and operate at that level. To fulfil the animals' health and welfare needs we can be:

REACTIVE –reacting to a set of circumstances that requires emergency action or PREVENTATIVE – investigating issues before they occur or controlling them before they become serious. This is linked to how the animals are cared for and managed.

A preventative health program provides the animals with a clean, safe environment, healthy and nutritious diet, and healthcare. At the same time, it provides for a working environment for wildlife protection staff which protects their health and welfare. The program aims to PREVENT animals getting sick.

This section introduces the preventative health program that will need to be implemented to undertake wildlife confiscation and rehabilitation. This program is focused on maintaining the health and welfare of the animals under your care.

Underpinning a preventative health program is clear understanding of what you are trying to achieve. You need to know what the end result will be.

Goals:

Prevent disease entering facility / maintain health of animals under your care / prevent dissemination of disease to other institutions or to local human and wildlife populations / protect staff health

Importance:

Difficulty of diagnosis and treatment of overt disease / Often too late once show signs of overt disease / Difficulty in eliminating many organisms once established in the facility / General improvement of condition of animals under your care

This system tries to: Be Science/ Evidence Based. Be able to Highlight Data Gaps. Accurately assess Cost-benefit. Improve communication = improve understanding = improve compliance

What do we ask?

What question(s) are we trying to answer?

Can we interpret the data we get?

How are we going to manage health situations?

How are we going to learn from what we find to improve the situation into the future?

Your goal is to be as preventative as possible, while being prepared to be reactive. You are doing this by being collectively responsible for the animals wellbeing from when they arrive with you to when they die. The graphic below highlights components of a preventative health program. No single person can do all these things. So, to be effective, the program requires participants to work together and likely will require many different inputs from people with wildlife husbandry, behavior, veterinary, animal welfare, public relations and educational skill sets. As well showing a wide range of procedures, the graphic highlights the need for you to monitor the whole program to confirm that the animal's welfare is optimal – a 'welfare audit'. The Welfare Audit refers to dynamic assessment of the animals throughout their time in your care and is based on their responses to their environment.

Preventative health program for confiscated wildlife



- 1a and 1b. Animal Observations and Record Keeping
2. Animal Identification
3. Safe Handling
4. Safe transport to minimise disease spread
5. Nutrition
6. Behavioural Management/ Social/ Enrichment
7. Enclosure Design
8. Contraception
9. Vaccination
10. Routine Health Assessments
11. Disease Surveillance
12. Necropsy
13. Biosecurity inc quarantine/ pest control/ contingency planning (covered elsewhere)
14. Medical Management (vets only)
15. Staff Training (vets only)

ANIMAL OBSERVATIONS: Monitor animals daily and note down what you see – even if it looks like the animals are behaving normally. Note how much the animal drinks. Excessive amounts could indicate dehydration. Monitor social groups daily for aggression, injuries, and other anti-social behavior. While animals are feeding, observe them for injuries and anti-social behavior and to ensure all individuals receive appropriate amounts of food. Ensure that animals are actually eating what is being fed (i.e. not preferentially taking certain items). Visually account for each individual at each feeding. Link this to record keeping. When attempting to reduce disease spread in wildlife systems, disease risk analysis (DRA) is internationally recognized as the most effective way to minimize risk.

RECORD KEEPING: This is a fundamental requirement to allow us to keep track, review and improve the confiscation process. The following basic data must be recorded upon arrival at a rescue center, as completely as possible, and collated in a single, easily searchable, preferably electronic, database.

Date of arrival / Number of animals and species confiscated / Confiscation location (including GPS if available) / Origin (suspected or confirmed / Full identification details of the animal(s) including description, body condition, age, sex, distinguishing characteristics, microchip number and location if implanted (see below), and photographic identification. / Basic information about the animal(s) including area(s) of origin, weight, temperamental characteristics, whether mother- or hand-reared, current diet, and any physical abnormalities even if not a clinical entity. / Any significant evidence or history of disease. Note what you see. If animal appears healthy ask if any recent evidence of: Diarrhea, Nasal or oral discharge/ respiratory difficulty, Lethargy or dullness, Length of time in captivity.

Microchip transponders should be inserted at the same time as initial inspection, OR as soon as it is safe to do so, to minimize the number of times that animals are handled. If any animals die, become unwell or are injured record their microchip numbers.

Behavior: Medical observations and treatments, Disease surveillance, Necropsy results, Diet, Mating, Response to enrichment.

We need to know all this information to allow us the best opportunity to make the situation right when things go wrong.

Quarterly husbandry, health and welfare audits: External experts from Liverpool and Nottingham Universities, as well as exotic and zoo specialist veterinarians join with Chester Zoo directors, vets, curators and scientists to help prioritize actions to continually improve health and welfare. This may be through changes in husbandry practices and/or alteration in facilities. This committee maps clinical, pathological, dietary and behavioral trends to highlight health and welfare issues. Recommendations are made on the risk management of diseases of strategic significance as required. The quarterly summary and minutes of the committee meeting forms a written record of the health, welfare and husbandry status for the archives. It also forms the basis for a report to keepers summarizing any health issues on their sections.

By combining these processes, we are able to spot potential poor health and welfare issues in species and enclosures early and respond in a coordinated, timely multi departmental fashion.

By collecting information and placing it in your records, the clearer the picture can become and so help in the successful management of your charges in your facility.

Animal Identification: A subcutaneous transponder microchip (or closed leg band in certain birds) must be inserted at the earliest opportunity to allow confirmed, permanent identification. There are many different transponder readers. Discover what is available in Angola and use accordingly.

Capture and Handling: When capturing and handling wildlife, safety for both the animal and the handler is paramount. You should not attempt wildlife capture if you cannot guarantee this safety.

Use nets or towels to capture small mammals. Minimize the time each animal is chased and handled to avoid stress, which can kill them. If you have not caught an animal by AT MOST, a couple of minutes, STOP and try another time or rethink how you are attempting to catch and why you need the animal caught,

At least two people should be involved while inspecting the animal: one to hold and one to evaluate.

Once an animal is caught, follow the following recommendations by species. Once in hand covering of the eyes with a towel is useful to calm many NON primate species. As a general rule, monkeys are sensitive to stress, and, except for younger animals or smaller species, are very strong and able to inflict severe injuries on human handlers. Handling is a compromise between human and animal safety in a situation where stress levels must be kept as low as possible. Physical handling without tranquilization is possible for smaller individuals, but chemical tranquilization is necessary for larger individuals, or for major procedures. Monkeys weighing less than 3 kg can easily be handled and manipulated by one person. However, most of these species are agile and will not hesitate to bite if they feel threatened. Always handle primates with protective leather gloves. Rapid capture is essential. Chasing an animal around an enclosure is psychologically stressful to the animal. Physiological stress can also be induced, which can lead to hyperthermia (overheating), which can rapidly lead to death.

Small monkeys should be grasped just under the arms, with the fingers encircling the upper chest. For larger animals (up to 3kg), the arms are held together behind the animal's back in the same fashion as that used with larger primates (figure below). A second person is always required to carry out procedures, and restraint should be kept to as short a time as possible to minimize stress. Prolonged handling of small primates is extremely stressful, and we recommend considering anesthesia if the animal is going to be in hand for longer than a couple of minutes.

Animals weighing 3-10 kg can be caught in a heavy net (or blanket or piece of fabric) and held by pinning the arms back. The two arms are held together with one hand behind the primate's back whilst the two feet are held together with the other hand (see figure below). Never hold the animal by only one arm, as this could result in fracture or dislocation of the humerus.

Transport crates should be: Large enough for an animal to stand and turn around in. Strong enough to safely contain the animal. So, a wooden crate is not suitable for an adult chimp or even large monkey, where metal or metal re-enforcing would be needed, but would be fine for a pangolin or small antelopes or baby chimp or monkey. Made out of materials that are easily cleanable. Be provided with appropriate bedding, food and water. Allows for easy observation of the animal without disturbing it. Allows for easy access and egress for the animal to minimize handling by people when the crate is placed in the temporary enclosure. This allows the animal to choose when it moves from the crate, and the crate could temporarily be used as a short-term bed area. If access to the animal while in the box is required, provides safety for people by having doors at both ends.

Nutrition: Food provided will be based on species, behavior and life stage. Food should be provided in correct quantities, ingredients and with good freshness. The basic rule is, it should be something a human would eat - you wouldn't eat it, don't give it to the animals. Food should be always free from mold and dirt. Food and water bowls should be washed daily with soap and rinsed well with water. Food should be provided each day according to species normal routines as much as possible. For example, adult primates can be fed at least twice per day – for example at 0700 and 1600. Small antelope and pangolins should be allowed to forage at their leisure. The food should be provided in at least 2 locations to be sure of access, and to minimize aggression if there is more than one animal in the enclosure. Larger groups will need more locations. Distributing small items of food (scatter feeding) across the enclosure is an excellent way to promote foraging behavior in those species that exhibit it.

Behavioral management/Enrichment: This is one of the most vital aspects of a preventative health program and will be extensively discussed during the practical sessions. Here we will begin to look at recognizing normal species behavior. Human interference and contact should be minimal. Non-human primates are housed in social groups at all times. The only exception is during quarantine in the weeks after arrival or if an individual is injured or suspected to harbor an infectious disease.

Monitor social groups daily for aggression, injuries, and other anti-social behavior. While animals are feeding, observe them for injuries and anti-social behavior and to ensure all individuals receive appropriate amounts of food. Ensure that animals are actually eating what is being fed (i.e. not preferentially taking certain items). Visually account for each individual at each feeding.

Primate abnormal behavior: Stereotypic behavior / Coping mechanism / Look for the cause / What you might see: Hair plucking, Self-mutilation, Rocking, Isolation from the group, Aggression (to humans or other animals).

Enclosure design: In general, enclosure designs must consider the following:

The ability to integrate new arrivals with conspecifics in a way to reduce aggression and provide for separation again if absolutely required. This usually means AT LEAST two entrances/ exits to any space that would be very obvious to the animals. All mammal enclosures must have a porch area – a double door system from the outside to prevent animal escape and provide for staff safety. Promote normal species behavior. Be easy to clean. This is most easily affected by use of easy to move cage furniture and having the enclosure split, so one side can be cleaned while the animal is in the other side. Enclosure and equipment maintenance. Provide for pest control: Unwanted species such as rats, mice and cockroaches will be attracted by food. As they could carry disease for your animals, finding and removing them from enclosures should be a priority. Rodents can be trapped (DO NOT use poison as this can pose risk to other wildlife, animals you are caring for, and your staff).

Human contact should be kept to a minimum. Notices requesting people to stay away from the animal and to be quiet at all times should be obvious and enforced. NOTE: VIP's/ Officials are NEVER exempt from these rules and must also follow quarantine procedures. Any structure built should be as big as possible, that fits into species requirements as below. The top of the enclosure should be partially covered with waterproof material to provide shelter from heavy rain and provide shady areas. If the enclosure is on a concrete pad for durability, place a soft bedding at the bottom of the enclosure such as cut grass or layers of palm leaves. Replace weekly or when look dirty. These items can be used as bedding by the animals as well. See examples by species below.

Unwell animals should be kept in a separate enclosure or at the very least the enclosure should be partitioned to prevent disease transmission. Injured or very unwell animals should be housed individually or in pairs small groups so they are not tempted to run around too much and can be closely observed and treated.

For indoor enclosures: Each room should be large enough to contain four individuals together overnight. Indoor enclosures should be large enough to contain 4 individuals together overnight and be no less than :

Great apes: 3m(H) x 5m(W) x 4m(L) (60m³)

Baboons: 2m(H) x 3m(W) x 4m(L) (24m³)

Small monkeys: 2m(H) x 2m(W) x 2m(L) (8m³)

For outdoor areas/enclosures:

Great apes: 250m² per individual (no less than 1000m²)

Baboons: 60m² per individual (no less than 250m²)

Small monkeys: 30m² per individual (no less than 120 m²)

Watering mechanisms: All rooms should have water access. Use of bowls is not acceptable as it is more difficult to maintain a good level of hygiene. While water can be offered via hose or hand, particularly in areas that do not have running water, it is not an ideal practice for it to be the only source of drinking water. The use of drinking nipples often referred to as “pig nipples” is affordable and easy to install and are widely available in Africa.

Enclosure design minimizes direct and indirect contact between different primate species and prevent direct and indirect contact (other than visual) with visitors. Enclosures provide adequate shelter to protect the animals from strong sun and heavy rain, as appropriate.

Enclosures include a double door system for staff entry in which both doors are never open simultaneously, to reduce the risk of escapes. The inside and outside of enclosures do not have sharp edges on which animals and staff could cut themselves. Inside or satellite cages/enclosures are designed to facilitate safe anesthesia and access by the veterinarian. Drains are external to primate access points. If tunnels are used to transfer primates from one enclosure to another, the minimum required height of the tunnel is species dependent. In general, the interior height is no less than top of head to ground when primate is standing in normal quadrupedal position. In other words, primates do not need to crouch down or crawl to pass through the tunnel. Tunnels are made of the same material as cages, except for wider external tunnels in which electric fencing can be used. In addition, there should be at least two tunnels linking areas to avoid conflict between individuals.

Furniture: All rooms provide sleep space for all primates off the floor. Depending on the species these can be sleeping benches, platforms, hammocks, rope, bamboo, nest boxes or branches.

Where primates are housed indoors, there is sufficient ventilation to provide ample fresh air and prevent accumulation of odor and noxious gases. Sufficient space is provided, both horizontally and vertically, to enable the animals to exercise, to protect individuals from undue dominance or conflict, and to provide for their social and behavioral needs. Climbing structures or other furniture are provided if needed and will vary in design and type depending on whether the primate species is arboreal, semi-arboreal or terrestrial.

Sturdy enclosures are needed even for juvenile chimpanzees, preferably with a secure outdoor area. Outside areas for apes require electric fencing – either a double line, at least 4 meters high, or an arrangement like this, from an East African facility. Inside areas for apes (photo from a facility in East Africa) – must be secure, easily cleanable, have at least 2 exits for the animals and have raised areas off the floor for the chimpanzees to nest build and sleep on. Enrichment Devices: Rooms used for daytime or prolonged containment should have/utilize enrichment devices.

Where possible, holding facilities should be no less than 3m in height (preferably 4m for apes). Adjoining rooms should facilitate separation of individuals into smaller compatible parties. Ideally all rooms should have two access doors for primates to enter/exit from which are on different walls and preferably at different heights. This allows for easy circulation of individuals and provides escape routes for submissive individuals in times of aggression or integration. Caregivers should have a clear view of all rooms and doors when opening doors or operating tunnels for primates; avoidance of blind spots is highly recommended. This should be a consideration at the design stage.

Bricks: Cement blocks or ordinary bricks (double bricked) can be used (with render or plaster on the inside to facilitate easy cleaning). High gloss paint that is waterproof is highly recommended if a satin finish render is not possible.

Internal walls: Solid walls made from bricks or concrete need to have a smooth finish to allow for easy cleaning. Paint can be used, either high gloss or water resistant if available. Otherwise a satin finish render with oxide pigmentation will suffice. Tiles can also be used if available and affordable.

Bars: Bars are generally not acceptable with monkeys, although they may be appropriate for ape species, especially adults. For apes, bars should be no less than 12mm thick. The spaces between bars should be no more than 8cm wide and 1m in length, and preferably smaller. For monkeys, the spaces should be much narrower and no wider than the diameter of the head of the smallest primate.

Welded mesh: For apes, the wire should be no less than 5mm thick and preferably thicker than 5mm. For most monkey species, 3mm thick is sufficient. The spaces between wires should be no more than 5cm x 8cm.

Chain link: Chain link mesh can be used for most monkey species although it is not suitable for apes. Care should be taken to ensure that the point of fixture to either timber poles or steel poles (angle iron or hollow section) is well fastened and there are no sharp edges or ends that could cause injury to either the monkeys or the caregivers. The size of the spaces in chain link is important and must be small enough to prevent young infants from passing through.

Furniture: Attachment points for hammocks and rope should be installed in all rooms during construction. Platforms and benches should be arranged at varying heights to allow primates to avoid eye contact with co-inhabitants. Tires can also be used in rooms that are sufficiently large enough for the tire to swing around without hitting the walls. Tires should be strung with chain and not rope. If using rope, care must be taken to avoid accidental hanging due to frayed rope. Rope ends must be secure (melting the ends of the rope can prevent unravelling). When available, marine rope is ideal. If possible, nylon strapping such as that illustrated in the next picture, is preferable to rope if it is available, or old fire hosing discarded from the fire service.

All padlocks in the same building, or for all holding facilities, should use a master key, for convenience and to reduce risks in emergency situations. It is advised that all shanks of the padlocks that are exposed to the weather be made of brass, or in high risk areas, of reinforced steel. Training in padlock maintenance is advised to ensure longevity and security of the locks.

Caregiver corridors: For apes, internal corridors utilizing mesh or bars should be no less than 2m wide to prevent animals from reaching out and injuring staff. The width can be less for many monkey species if the mesh is small enough to prevent monkeys reaching through. If walls are solid, corridors can be 1.5m wide. Where bars are used on both sides of the corridor and primates have full reaching ability, corridors should be 3m wide.

Contraception: refers to the use of artificial methods or other techniques to prevent pregnancy as a consequence of breeding. Reasons for contraception include: Limited space and the impact on limited resources. Temporary contraception is the best method to stop breeding to prevent overcrowding in limited enclosure space or biological needs for many with limited funds. Contraception methods can also assist with maintaining social cohesion in a captive space, by reducing excessive aggression. Lack of potential for release into the wild. If animals are not going to be released back to the wild, then stopping them breeding also reduces pressure on limited resources in captivity. To prevent hybridization. Sub speciation is not always obvious visually. Stopping animals breeding will stop this.

Permanent methods of contraception (require veterinary care) - Male: Castration Female: Ovariohysterectomy.

Reversible methods of contraception - Male: Vasectomy (occasionally), medical implants (requires veterinary care). Female: Tubal Ligation (potentially); IUDs (requires veterinary care); Medications via pill or implant (may require veterinary care). Husbandry (abstinence): Separating animals.

Vaccines are: Used to stimulate the production of antibodies and provide immunity against one or several diseases. Prepared from the causative agent of a disease, its products, or a synthetic substitute. Just like in human medicine, vaccines can be a useful part of a captive wildlife preventative health program if there is a clear risk of a disease locally that the animal is susceptible to. Note that although there are a few examples of vaccines being used in wild populations, unless there is a clear danger to the health and welfare of the confiscated animals, vaccination is not usually recommended UNLESS the animals are to remain in captivity. Treated to act as an antigen (so produces a protective antibody response from the person or animal) without causing the disease.

Routine Health Assessment: As part of the preventative health program, health checkups are recommended to highlight health issues before they become irreversible. The timings of these assessments is based on species needs, previous health experiences in the facility and known pathogen flow in the local environment. In otherwise healthy animals and groups, these should be conducted during quarantine then every 1 to 2 years from then on.

To check our animals are healthy / To check weights are stable / To find problems early and start any treatment needed. Includes: Full body examination / Heart rate / Respiratory rate / Body temperature / Body condition / Body weight / Dental check.

Disease surveillance – what you might see. External Parasites / Hair loss / Scratching / Hair plucking. Internal Parasites: Diarrhea / Weight loss / Vomiting.

Internal and External Parasites / Routine testing and assessments / Routine treatment / Quarantine and testing of new animals / Good cleaning protocols / Healthy animals / Reporting sick animals immediately

Fecal collection and testing. Feces can tell us an awful lot about the health of an animal. We can tell diet, internal parasite burden, gut dysfunction and genetic information from this easily obtained sample. Samples must be representative of the individual or group

If the stool cannot be analyzed on the day of collection, and there are no refrigeration facilities where they can be stored for a couple of days before examination, small samples can be placed in 10% formalin in one tube and 90% ethanol in another tube and mixed thoroughly. These samples can be kept for analysis for up to a year.

Blood sampling: Manual restraint / Under anesthesia / With training as facilities allow.

Urine collection: Direct stream best / Beware of contamination if urine is collected from ground/floor / Under anesthesia, abdominocentesis or a urethral catheter (bottom picture) can be used to obtain a sample directly from the bladder.

Tissue sampling – this can only be performed by a trained vet / Important to get fresh samples / Stored in 10% formalin.

Necropsy: Examination of an animal that has died - why? To find the cause of death / To determine if it is necessary to medicate or treat other animals that might have been exposed to disease / To check for zoonotic diseases. A thorough post-mortem examination should be carried out by a competent and experienced pathologist or veterinarian without unnecessary delay on all animals dying (it is recommended to do this on those in Park care and those that die in the wild). In the absence of refrigeration, the necropsy should be undertaken within a few hours of death. Necropsies on a an older

carcass is possible but requires specialist knowledge and skills to be able to get samples from a decomposing body. Care should be taken with primates dying in quarantine as these animals must be assumed to be of high zoonotic potential until proven otherwise.

For further details, refer to presentation on OVAG website.

Presenter: Susan Cheyne and Mark Harrison – Borneo Nature Foundation (with B. Ripoll Capilla, C. H. Cosmopolis-Del-Carpi, S. J. Husson, S. Mang, S. E. Page, A. Purwanto, F. Siegert, S. A. Thornton & M. J. Struebig – not present)

Impacts of Wildfires on Forest Biodiversity in Indonesian Borneo

There are hundreds of different species in Indonesia – there is huge biodiversity and includes the superstar of conservation... the orangutan. They are all subject to a variety of different threats...logging, conversion to farming, medical trade, pet trade, and just killing – these are already driving the loss of numbers and then add fires and the losses increase. Peat fires have been getting worse – it is now an annual event and are linked to dry weather – which are worse in El Nino years – the most recent event was in 2015 which was a very bad season – over half of those fires were found on peat swamp areas. These fires are globally important in terms of carbon emissions. Fires are damaging to animal as well as human health due to exposure inside and outside Indonesia – related to that there is high economic loss. We do not know the impact on non-human animal health. If haze affects humans, it affects orangutans – and the impact on biodiversity as a whole.

Kalimantan 2015 season: Jun-Oct: 51,661 hotspots, 53% on peat. Kalimantan, Sumatra and Papua (Loberger et al., 2017): Est. 46,046 km² burned. 37% on peat / 3.2% land area.

Fire Impacts

Carbon: 1997/98, Indonesia: 810-2,570 Mt C, equiv. 13-40% fossil fuels (Page et al., 2002) / Kalimantan + Sumatra + Papua, 2015: 0.89 Gt CO₂e (Loberger et al., 2017) / England's peat store ~ 300 Mt C

Health: 1997/98: 20 million respiratory probs.; 19,800-48,100 premature deaths (Heil, 2007) / 2015: 43 million people in "haze zone"; up to 17,200 premature mortalities from short-term haze exposure (Crippa et al., 2017)

Impact on human health: unknown

Economic losses: 1997/98: USD 20.1 billion (Varma, 2003) / 2015: ~USD 30 billion (Gol, 2015; World Bank, 2016)

Case study: Sebangau, Central Kalimantan

Many orangutans live in peat swamp forest (the largest population of all orangutans live in the Sebangau). There is also a significant change for sun bears in that during fire season they became almost entirely nocturnal (they are normally crepuscular).

Fishing is important to the local people; the PH balance of the river is more acidic during fires which changes fish populations – so catch rates are dropping. Surveys are being conducted now to see if catch rates have increased since fires died down after 2015.

Orangutan nest sites decrease during fires and then increased because they may be being compacted into small areas because of the fires. For gibbons, their singing dropped due to fire affects – long term impacts of this are not known.

Habitat restoration: Dry peat burns – if wet, less likely to burn so habitat restoration is critical – the seed layer under the peat is incinerated during fires – so re-seeding stops – also areas are more prone to flooding without trees due to the burn.

Canals have been dug into the peat forest which drains the peat, increases tree fall, dams are being built which still allow fish to move through the canal system – water flow and discharge is being monitored. Dams are being built every 50 meters which reduces the water discharge. People break the dams in order to have access to the canal but blocking the canals is critical to the health of the forest – dams will help the water table as well as ground water.

Replanting can work but needs to be monitored to be able to see what is working what is not – what are the best species? What species are of benefit to the non-human primates in the area. If something goes wrong, we need to know and then modify it for success in the future. BNF also does a lot of education outreach to the local community via their education outreach team – from lower to senior high school. There are conservation clubs which bring children to the forest. They even wrote a book about smoke inhalation and a gibbon.

Conclusion:

Major negative impacts of Borneo peat/forest fire on biodiversity, affecting large numbers of species from Kalimantan-wide to site scale. Lots of other known/suspected impacts too such as: Respiratory ailments in animals, e.g. orangutans (BOSF) / Reduced gibbon territorial singing (Cheyne, 2007) / Reduced bioacoustic activity in Singapore (Lee et al., 2017) / Reduced visibility to < 10 m ... impacts on site-dependent hunters, etc. / High peat-swamp forest fish and odonate endemism ...esp. high impacts. Fires worse in dry years, but human behavior underlying cause: peat drainage and mismanagement, fire use patterns.

Impacts expected to continue and worsen unless underlying causes can be tackled, adding an additional major threat to biodiversity and increasing extinction risk for many species.

Urgent peat-swamp forest protection, (hydrological) restoration and enforcement of burning bans required.

Solutions: needs a multi-level approach with multiple stakeholders – needs local leadership – keep our peat wet!!!!!!

For graphs and maps, and further details, please refer to OVAG website.

Discussion: Do you do anything about prevention? Have you approached companies? – there are 6 local fire fighting teams which engage in community engagement – during the wet season, they are digging bore holes to access water table to fight fires. They are not directly working with any palm oil companies, but a local Indonesian organization is working with them. There has been an increase all over the world and fires are much, much bigger than the past and getting worse (Kevin). When replanting, any effort to plant more delicate trees is very difficult and needs lots of time and investment so you need to consider if money and time is best spent with hardier species. Have you seen anything else in terms of impact of smoke on orangutans -if anyone has any more information please relate to BNF – mostly we do not know but certainly with respiratory issues it must make an impact on orangutans.

**Pan-African Sanctuaries Alliance Regional Disease Investigation:
Tuberculosis**

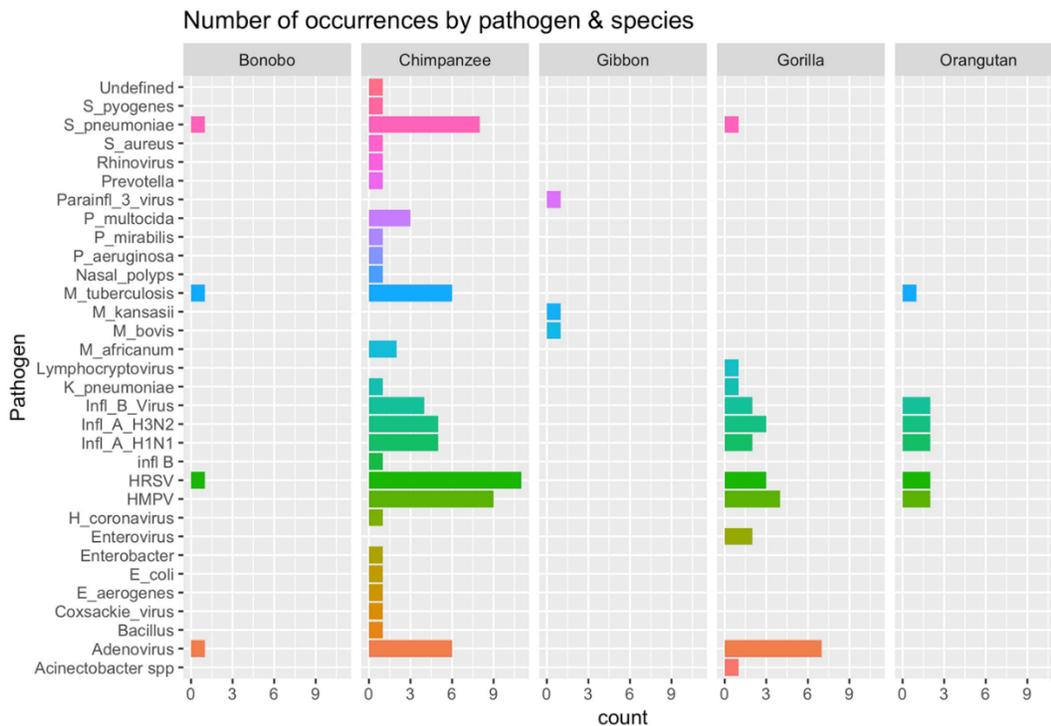
PASA has quite a range of primates throughout its sanctuaries. The thought process: one must consider the people, the animals, the environment etc. Human beings are both a friend and foe to primates whether outside or inside a sanctuary.

Questions to ask: What does a health exam contain? Why are you doing those exams? There must be a reason as to why you are doing what you are doing. A risk analysis needs to be done. All primates share many diseases, especially respiratory ones. What pathogens cause respiratory infections in great apes?

What are the components of a health examination?

Testing for hemorrhagic fever, parasitology, CBC, blood chemistry, TB, physical body exam, dental checks, eye check	TB test, feces for parasites, general health checks (hematology, urinalysis, and general examination).
General examination - check gait, demeanor, hair coat. Physical examination - check temperature, heart and respiratory rates, capillary refill time, mucous membranes, any lesions on the body. Samples - blood samples for hematology & biochemistry, skin scrapping for parasitology or microbiology. All these are done at different facilities, as we are not equipped to perform them ourselves.	Animal anesthetized, weight taken, biometrics done, implant done if required, microchip done if required, blood and stool samples taken, thorough physical health check including dental check, TB test done, de-worming done, vaccine against tetanus given.
Physical exams with CBC/Chemistry, 3 fecal, TB test	Temperature, blood analysis, stool analysis
Only Fecal analysis	Testing for tuberculosis, hepatitis A and B, SIV, STLV, malaria and other blood parasites, feces analysis, etc.
GA for detailed physical examination + CBC + Biochemistry + parasitology + fecal culture + Skin Tb test + Hepatitis B test + EKG + Chest x-ray + Abdominal ultrasound. +/- gastric lavage for TB culture and PCR	General health check (3 times once months), Stools sampling, blood sampling, TB test

Respiratory Infections in non-human primates:



TB: how do you get TB? You inhale it; if your body kills it there is no infection. If your body does not kill the TB, you get the infection. At that point, at what stage is the illness?

Origin of TB was in East Africa and moved as people migrated out of Africa. As long ago as 6,000 years ago, there is evidence of TB in India, China, South America, and Europe. By the end of the 19th century, it began to be identified; by the 20th and 21st centuries – we began to control TB.

TB is present in a variety of species. Questions: what happens when you inhale a TB particle? How does the body respond? When you use a TB skin test, what are you testing? What happens to the body? Why do we wait three days to read a skin test? (*because that is the time it takes for delayed sensitivity so it can be read, you can also use interferon test*).

How do you choose a diagnostic test?

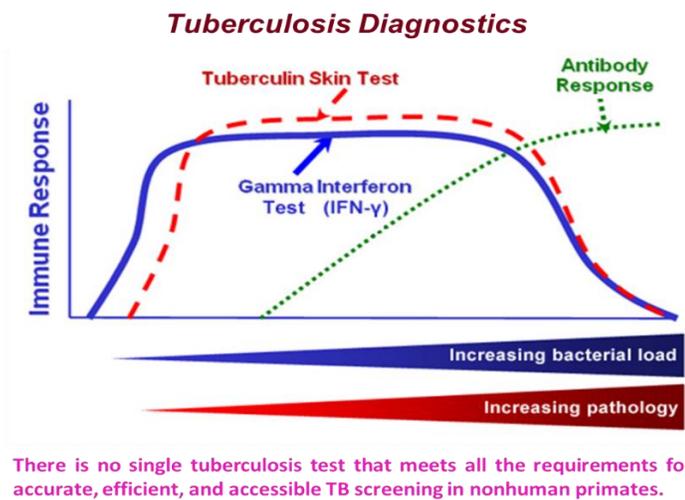
Standard Test	Mechanisms	Limitation
Intradermal Tuberculin test	Detects delayed-type hypersensitivity (DTH) to tuberculin antigens	Low sensitivity and specificity
Interferon Gamma Assay	Is based on detecting release of response of IFN- γ following stimulation by tuberculin/ TB specific antigens	Varying results over the course of infection
ELISA	Antibody Detection	Always has issues with cross reacting organisms
Lateral Flow Immunoassay	Detect antigens (ESAT-6, CFP-10, and MPB83)	Has conjugation worked? Stand alone?
PCR/Molecular Techniques	Detects organism's DNA	Technology Constraint/Training/Cost
Microscopy	Detects the bacilli	Sensitivity/Specificity issues
X-ray	Pathognomonic changes	Sensitivity issues
Culture	Detects organism	Time/Technique/Equipment

When you say a test is not very good, you are saying that the specificity and the sensitivity is poor.... Infection must be there from 3 to 4 weeks before antibodies can be detected.

When you combine tests to look for something, what are you increasing? Both sensitivity and specificity.

You need to know and answer: What test did you use? Why did you choose that test? What did you find? What decision are you making as a result of your tests?

Use of biomarkers – being tested now – can be detected within a few days to one week.



PASA One Health Initiative

Aim – Capacity building for veterinarians in wildlife sanctuaries and validate and optimize tuberculosis diagnostics for evidence-based health management.

➤ **Objectives:**

- A. Create a partnership between PASA, US and African Universities, and an advisory panel of international ape health experts to a) conduct a needs assessment, using a modified Delphi Survey technique, to characterize long term priority training needs and preferred method of delivery; and b) develop a “train-the-trainer” program for sanctuary veterinarians and health personnel encompassing primate medicine, occupational health and evidence-based medicine.
- B. Optimize a tuberculosis diagnostic protocol for PASA sanctuaries: This will involve a comparison and validation of two commonly used (with often conflicting results) tests in captive apes – tuberculin skin tests and a blood based gamma interferon. In addition, we will include two novel diagnostic tests; a) a non-invasive fecal based PCR screening test and b) detection of tuberculosis specific biomarkers that will help determine stage of infection.
- C. Build evidence-based medicine and disease risk management capacity in PASA sanctuaries. Evidence based medicine is the coupling of clinical experience and scientific evidence to elicit better health outcomes.

For more information and charts, please refer to the OVAG website.

July 30 – Concurrent sessions: OVAG / Managers / Gibbon

OVAG Session:

Nancy Lung, Editor-in-Chief Journal of Zoo and Wildlife Medicine, Orangutan SSP, OVAG Committee

Publishing in a Scientific Journal...Peer Review: What is it and how does it work?

There are so many case reports that could be easily converted into papers. We have been working with several vets to write up their information, because, this group has been under represented in the scientific literature and we need to fix that! We are going to try to make it less scary for you... how many of you would like to publish? A good way to begin is by being a co-author.

We are going to try a new approach, where you will be the peer reviewer so you will be able to make your own decisions on what is good and bad about a paper. In that way, you can then use that knowledge as a guide to write your own paper that will be peer reviewed.

How does it work?

1. The purpose of peer review is to make papers better
2. To validate the science and methods, to make sure the science was appropriate
3. As author you control the quality of the work

Who are the players?

1. YOU!! The author is the most important, as you control the quality of the work and its presentation.
2. The Editor
3. The Associate Editor
4. The Reviewers
5. The Publisher

An editor reads it first to get it peer review ready, then it is passed on to the appropriate peers with your area of expertise and then they will send comments to the associate editor, and then it goes back to the author for revisions.

General Info: is the paper interesting? Did you like it? Would others want to read it? Based on what you know, does the paper expand our knowledge? If the research has never been reported then that is very significant ... if it is research that has been published many times, then harder to get published unless it is new or different in some way.

Title: Is it appropriate? Does it match the paper?

Abstract: condensed version of the paper in 200-300 words

Introduction: this lays the framework of why this work is important, why it is relevant, why the reader should care

Case Description: Keep this organized, follow a timeline, does it make sense, is all content relevant? Is there too much information? Are there enough details to explain to the reader?

Discussion: this should not simply repeat either introduction or case description/methods – it needs to be a true summary, to include other studies, how your work adds to the literature already out there

Tables and Figures: they must contribute and add to the understanding of the information

As a review: Accept – no changes / Minor Revisions – a few changes but the basic science is sound / Major Revisions: problems with the science and needs substantial changes / Rejected- bad paper, not a good fit for the journal, bad science, etc.

Note: Open Access – you must pay to have them published – then when they are published it is open to all to read.

Break Out Session: Reviewing a Case Report

Review two articles – one that was accepted and one that was rejected, and you are the reviewer. You will review:

General: Is the information novel, interesting, intriguing? Based on existing literature, does this paper expand our knowledge? Was the case managed at the current standards of care? Are there any ethical concerns? Is the English usage of publication quality?

Title: Truly describes the core message of the case / Identifies the species / Covers the scope of the manuscript content

Abstract: Should be a concise summary of the entire manuscript, including purpose, pertinent findings, and conclusions / Does it present a comprehensive but concise summary of the case that leaves the reader understanding the "take home message"? / Does it include "extra" information that doesn't need to be there?

Introduction: Does it tell the reader why he/she should care what is in this paper? The introduction should provide the reader with a framework of why this case is important, but it is NOT the literature review. (That goes in the discussion.)

Case descriptions: Is the case presented in a methodical way that is easy to follow? Have enough case details been included to allow you to assess the quality of the clinical investigation and clinical management? Is all content relevant and necessary for understanding the case?

Discussion: The discussion should not simply repeat the introduction or case information. Does the discussion do a good job of showing how this case contributes to existing literature? When putting this case into the context of current literature, does the author properly cite related literature. Do the authors mention the limitations related to the case? Next best steps?

References: Does the reference list seem thorough? Are the references appropriate to this case? Are there unnecessary references?

Tables and Figures: Does each table and figure contribute to the manuscript? Should any be removed? Can the tables and figures be improved?

Recommendation to the Editor: ACCEPT—the manuscript is suitable for publication. Peer review is complete. The authors may be asked to make some minor final corrections.

MINOR REVISIONS—The manuscript is scientifically sound. There are minor edits that can improve the flow, presentation and clarity of the work. If the revisions are made to the satisfaction of the editorial team, the manuscript is likely to be accepted for publication.

MAJOR REVISIONS—The manuscript has scientific flaws or significant challenges with the presentation that, if left uncorrected, will result in rejection for publication. The manuscript may ultimately be rejected.

REJECT—The manuscript has fatal flaws that cannot be corrected. It has been rejected for publication. Peer review ceases.

Case Studies Session (5)

Sumita Sugnasselan, UPM, OVAG Committee: Moderator

Case Study 1:

Yenny Saraswati Jaya(Presenter) , Meuthya Sr. Sumatran Orangutan Conservation Program - Sustainable Ecosystem Foundation, OVAG Committee

Rectal Prolapse in the Sumatran Orangutan at the Sumatra Orangutan Quarantine Center, Batu Mbelin-North Sumatra

Abstract

In 2016, 2 adult male Sumatran Orangutans were evacuated from isolated locations in North Sumatra, due to rectal prolapses, of unknown aetiology. Orangutan Kuta, male, 40 years old; had a 5 cm long prolapse outside the rectum with a functional sphincter and did not show neurologic complication. The prolapse was successfully repaired using the anal purse-string suture method, with a treatment time (recovery?) of 5 months. The second orangutan, Tengku, male, 25 years old; presented with a rectal prolapse with a length of more than 20 cm, with sphincter conditions not functioning optimally, and monitoring with neurologic complications. Orangutan Tengku failed to improve by using the anal purse-string suture so a trans abdominal approach (Colopexy / Rectopexy) method was used which was done 6 times for 2 years. So that it worsens the condition by causing chronic persistent rectal prolapse. Surgical techniques used to repair rectal prolapse are generally categorized into perineal or abdominal approaches. The rectal prolapse in Orangutan Tengku is quite difficult to repair as performed of chronic persistent rectal prolapse.

The perineal repair of a full-thickness rectal prolapse used Delorme`s procedure has been done in Orangutan Tengku with less invasive than abdominal approaches and reported successfully recovery.

Choice of methods for rectal prolapses repair in Orangutans at the Sumatran Orangutan Quarantine Center will be chosen based on the degree of occurrence of prolapses, degree of damage to anal tissue (sphincter) and the degree of nerve damage in the pelvis.

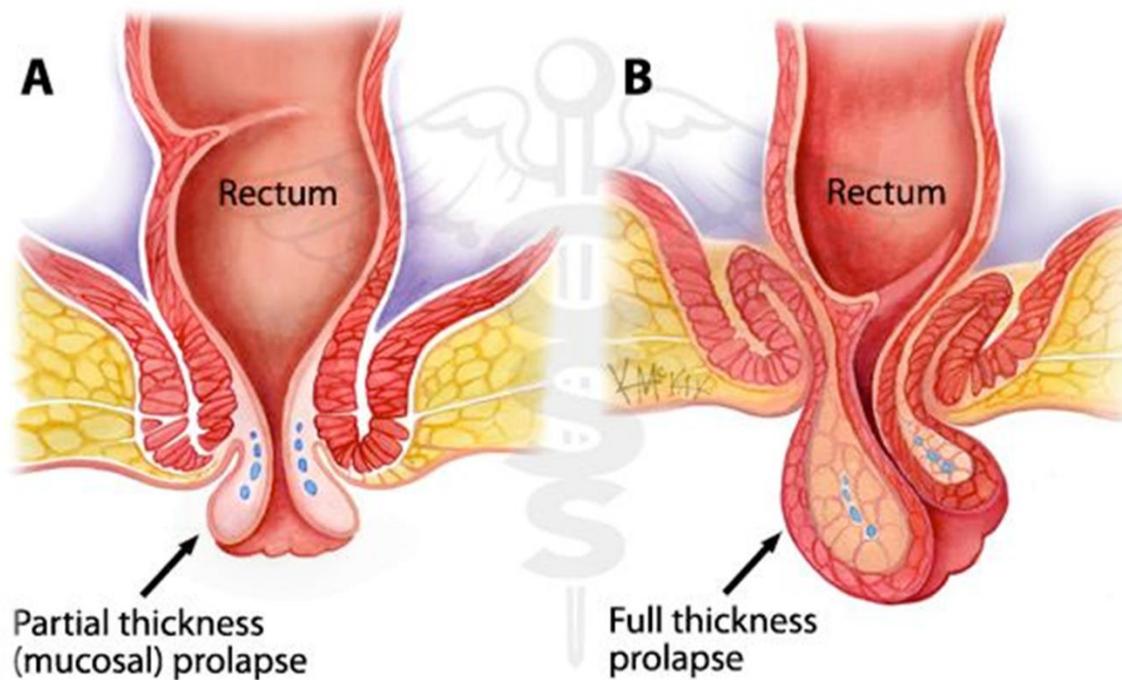
Keywords:

Rectal Prolapse, Sumatran Orangutan, Delorme`s Procedure.

Rectal Prolapse in two Sumatra orangutans

RECTAL PROLAPSE is uncommon, the causations obscure, and surgical procedures for correction are legion and a condition with a substantial impact on patient`s quality of life (Placer, 2015)

Two kinds of Rectal Prolapse: Mucosal Prolapse and Complete Prolapse. Rare in humans, painful for orangutans. Occurs when inner tissue is outside anus.



Male Case Study 1 – Kuta, 40-year-old male, rescued from national park. He was dehydrated, malnourished, very rough and dull hair, cloudy unresponsive left eye, open wound on left arm (human orangutan conflict area) with small damage to rectal sphincter (rectal mucosal, estimated at about 5cm on outside). Anal purse string suture performed - common in small animals but it can work in orangutan. Antibiotic (Amoxicillin Clavuliclate 10 mg/kg BB for 14 days) / Meloxicam 15 mg once per day for 14 days / Lactulose 26.7 to 60 g/day (40 to 90 mL) orally daily divided in 3 to 4 doses for 5 day. After a one-year recovery time, he was released back to the National Park.

Male Case Study 2 – Tengku, 25-year-old male, confiscated near Leuser National Park. Was in full prolapse (20 cm), had no fat deposits, damage to right eye (cataract), under his skin, had 66 air rifle bullets in his body – most likely to chase him away from palm oil plantation. Tried anal purse string suture, but it did not work. Tried to repair the damaged tissue with simple suture, but then relapsed. The third time – colopexy surgery with tissue repair surrounding anus. Fourth time, fixed tissue around area with steel wire – also did not work. Fifth time, key hole surgery, endoscopy-colopexy – also failed. Sixth time, Delorme’s Procedure (rectal/perineal repair approach) with only the inner lining of the fallen rectum is removed. The outer layer is then folded and stitched, and the cut edges of the inner lining are stitched together so that rectum is now inside the anal canal. After final procedure he was released six months later.

Conclusion: Choice of methods for rectal prolapses repair in Orangutans at the Sumatran Orangutan Quarantine Center will be chosen based on:

- a. Degree of occurrence of prolapses,
- b. Degree of damage to anal tissue (sphincter),
- c. Degree of nerve damage in the pelvis,
- d. Evaluation of the degree of wildness from each Orangutan greatly determines the postoperative success.

For more information and lists of medications, please refer to OVAG website.

Case Study 2:

Patrick Flaggellata (PT RHOI) and Agnes Pratamiutami Sriningsih (BOSF)

A SURVIVAL CASE OF MELIOIDOSIS IN A BORNEAN ORANGUTAN (*Pongo pygmaeus*)

ABSTRACT

A 13-year-old female orangutan had been moved to a BOSF pre-release island, located in palm oil plantation area, for 10 months. In July 2018, she showed weakness, loss of appetite, fever (40°C), swollen vulva and an enlarged left inguinal lymph node. After given supportive therapy for two days, she did not show improvement. She was returned to Borneo Orangutan Survival Foundation Samboja Lestari. She got NaCl 0,9% infusion, Ringer Lactate infusion, glucose 5% infusion, KCl infusion, ceftriaxone 1 gram sid iv, ranitidine 50 mg tid iv, tramadol 50 mg tid iv, iron supplement 1 ml sid im, albumin supplement 2-4 caps bid po, liver supplement 1 cap sid po, paracetamol 500 mg sprn po, and metamizole 1 ml sprn iv. After 3 days, she had same condition. The blood result showed moderate anemia (6,9 g/dL), increase SGOT (147 U/L), low total protein (4.83 g/dL), low albumin (2.43 g/dL), and low Kalium (1.4 mmol/L). The treatment was changed to be Amoxicillin 500 mg iv tid, Metronidazole 225 mg iv tid, Malarone 2 tablets and Ivermectin 6 mg po. The left lymph node inguinal looked bigger and like an abscess. From the aspiration, there was white yellowish thick pus. Subsequently, the pus was sent to microbiology laboratory for bacterial culture. After 5 days, *Burkholderia pseudomallei* was cultured. Antibiotics were changed to Ceftazidime 1,2 gram iv/im tid for 17 days. However, she showed 'tripod' position, so she was treated with methyl prednisolon 30 mg sid for 5 days. By the 14th day of Ceftazidime treatment, her fever and other clinical signs (?) were resolving. The treatment was continued with antibiotic combination of Trimethoprim/sulfamethoxazole 120/600 mg bid and Doxycycline 60 mg bid for 3 months. However, a month after the treatment finished, she showed further clinical signs that included weakness, diarrhea, fever (38.8°C) and loss of appetite. The blood test showed normal result, feces examination showed positive *Balantidium* sp. trophozoite and Hookworm egg, and tracheal wash bacterial culture showed *Pseudomonas aeruginosa* and blood culture showed *Staphylococcus xylosum*. The treatment was paracetamol 500 mg po sprn, ivermectin 9 mg po and Trimethoprim/sulfamethoxazole 180/900 mg bid for 10 days. Afterwards, she did not show better condition, except for the diarrhea. So, we assumed that she had melioidosis relaps. Ultimately, she was treated with Ceftazidime 1,6-gram iv tid for 14 days and followed by antibiotic combination of Trimethoprim/sulfamethoxazole 180/900 mg bid and Doxycycline 90 mg bid for more than 6 months.

Keywords : orangutan, melioidosis, survive case

There have been 6 or 7 deaths in orangutans from melioidosis. Last year there was another case, but the orangutan survived. She was released to a prerelease island, but then her condition worsened and she was returned to the clinic at Samboja Lestari. She had a high fever, low appetite but did something. She was tested for several diseases, but results were negative. There was some pus from anus, but no malaria. She recovered and was sent to forest school but then relapsed again.

Case Study 3:

Thalita Simoes Calvi – Chimfunshi (PASA)

Respiratory Disease in Chimpanzee - Case Series Overview

The Pan African Sanctuary Alliance (PASA) is the largest association of wildlife centers in Africa. It is a 23-member organization in 13 countries and is working toward securing a future for Africa's primates and their habitat.

Respiratory illnesses have caused significant mortality in African great ape populations. While much effort has been given to identifying the responsible pathogens, little is known about the factors that influence disease transmission or individual susceptibility. Although simultaneous infections of apes and people with the same respiratory virus have rarely been confirmed directly

The mechanisms underlying post-viral bacterial infections are complex, and include multifactorial processes mediated by interactions between viruses, bacteria, and the host immune system. Studies over the past 15 years have demonstrated that unique microbial communities reside on the mucosal surfaces of the gastrointestinal tract and the respiratory tract, which have both direct and indirect effects on host defense against viral infections.

Antiviral immune responses induced by acute respiratory infections are associated with changes in microbial composition and function ("dysbiosis") in the respiratory and gastrointestinal tract, which in turn may alter subsequent immune function against secondary bacterial infection or alter the dynamics of inter-microbial interactions, thereby enhancing the proliferation of potentially pathogenic bacterial species.

Recent research has made it evident that a variety of chronic lung disorders, including asthma, COPD, and cystic fibrosis, are strongly linked to a dysbiotic airway microbiota. This is usually the result of a loss in bacterial diversity due to the outgrowth of certain pathogenic bacteria. The airway microbiota of patients with chronic lung disorders presents a disease-specific phenotype. In contrast to healthy individuals, those with asthma or COPD demonstrate an overrepresentation of Proteobacteria (in particular Haemophilus, Moraxella, and Neisseria spp.) and Firmicutes (Lactobacillus spp.), whereas the proportion of Bacteroidetes (specifically, Prevotella spp.) is significantly decreased (15, 24). The lung microbiota of patients with cystic fibrosis is characterized by a strong increase in typical cystic fibrosis pathogens of the Proteobacteria phylum, including Pseudomonas, Haemophilus, and Burkholderia, along with an additional outgrowth of the Actinobacteria phylum (37, 38). However, not only is the airway microbiota altered during these chronic lung disorders but shifts in the composition of the intestinal microbiota have also been noted, particularly within the context of asthma and cystic fibrosis. (The Gut–Lung Axis in Respiratory Disease, Benjamin J. Marsland, Auré lien Trompette, and Eva S. Gollwitzer. Ann Am Thorac Soc Vol 12, Supplement 2, pp S150–S156, Nov 2015).

Cultured- Klebsiella pneumoniae bacteria which is known to asymptotically colonize the skin, mouth, respiratory and GI tracts, although few studies address this specifically. Using culture-free methods, K. pneumoniae was detected in approximately 10% of Human Microbiome Project samples from the mouth, nares, and skin, and 3.8% of stool samples. Using bacteriological culture, a 2010 study detected nasopharyngeal carriage in 15% of Indonesian adults and 7% of children [8], whereas a 2014 study detected nasopharyngeal carriage in 2.7% of Vietnamese adults and throat carriage in 14%.

Knowledge gaps: Therapeutic Impacts / Resistance / Impact on Individual and Population Health / Environment?

Case Study 4:

Testicular Tumor in orangutan at Jejak Pulang Foundation

ABSTRACT

Orangutans Robin was rescued by the Jejak Pulang Foundation Team on April 8, 2017 at Palaran Zoo Samarinda together with BKSDA. Estimated birth was 2009. Was living with humans since the age of 2 years. Health condition was the left testicle greater (hypertroph) than the right. Since December 2017, periodic hair loss has occurred which was initially suspected because of hormonal factors (common in male orangutans) and nutrient adaptation due to feed changes. However, in September 2018, Robin experienced a bit of anomaly by frequently rubbing the testicles on the cage and there was little avoidance response when palpated. Observation of the testes is done more periodically and there is an increase in the size of the left testis, but the right testis does not change from the first time it is done a general examination. In November 2018 a general examination was carried out with a FNA (Fine Needle Aspiration), Urethral Catheter, USG and Biopsy. The results of the examination were no presence of sperm (infertile) and on the ultrasound found a heterogeneous mass that was diagnosed temporarily for testicular tumors and he was then castrated in March 2019. Left and right testicular samples were examined for histopathology at the IPB PSSP Laboratory and Pathology Laboratory FKH UGM with different results namely Sertoli tumors and seminomas. Based on literature reviews from research journals of testicular tumor cases in humans, dogs and other primates, this case is the first case found in orangutans.

Keywords: Seminoma, Sertoli cell tumors, Castration, Orangutans

References:

Jr. Hayes, HM dan Sass B, 2018. Testis Neoplasia in Captive Wildlife Mammals: Comparative Aspects and Review. *The Journal of Zoo Animal Medicine*, Vol. 18, No. 4 (Dec. 1987), pp. 162-165 Published by: American Association of Zoo Veterinarians.

Lowenstine, L.J., McManamon, R., Terio, K.A. 2016. *Veterinary Pathology* 2016, Vol. 53(2) 250-276 ^a The Author(s) 2015 Reprints and permission: sagepub.com/journals Permissions. Nav DOI: 10.1177/0300985815612154 vet.sagepub.com.

Algaba, F dan Sesterhenn, I.A. 2010. M.P. Laguna et al. (eds.), *Cancer of the Testis*, DOI: 10.1007/978-1-84800-370-5_1, © Springer-Verlag London Limited.

The problem was first noticed in December 2017 when orangutan Robin had areas on his body with increased hair loss, even looking bald at times (areas: head, shoulders, arms and chest). The hair eventually started to grow back but would then fall out again.

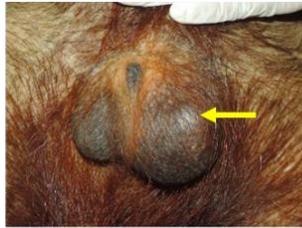
During physical examination, it was noticed that the testicles were oddly shaped.

- a) Shape of the testicles: The left testicle was oval shaped and was the size of goose egg. The right testicle was a lot smaller (size of quail egg)

- b) Consistency: Palpation showed a harder texture of the left testicle (similar to an elastic rubber ball) compared to the right testicle (more like a boiled egg)



(17th May 2017)



(15th November 2018)

Along the yellow arrow a small swelling is visible that wasn't seen in May 2017.

With urethral catheterization, no semen was found. FNA (Fine Needle Aspiration) - neither in the left nor in the right testicle was semen found. Biopsy - no accurate results. Serum Testosterone level - 393,3 ng/dL (*what are references in orangutans?*). Blood biochemistry - NAD (no abnormality detected). Hematology – NAD.

Castration was performed in March of 2019.

MACROSCOPIC PATHOLOGICAL FINDINGS

- Measurements of left testicle

Length = 6,5 cm

Width = 5 cm

Weight = 85,7 gr

- Measurements of right testicle

Length = 2,9 cm

Width = 1,8 cm

Weight = 7,9 gr



Diagnosis: Sertoli cell tumor, Seminoma, or Seminoma like Sertoli cell tumor or mix?

To find out what kind of tumor it is we would need immunohistochemistry (expensive and tumor markers are limited).

Prognosis: The prognosis of this tumor case depends on the type of tumor. Benign tumors and tumors with low tendency to metastasize have better healing chances if quick medical therapies are performed. It still needs further research and diagnostics about what kind of tumor Robin had (immunohistochemistry) and regular medical checkups will hopefully make sure we do not miss the moment when further treatments are needed. In addition, the results of histopathology and FNA showed no semen which indicated that orangutan was infertile.

The treatment of choice of most testicle cancers is castration, as Robin is infertile anyway. Unfortunately, this fact also makes Robin unreleasable back to the wild.

Conclusion: The castration surgery for Robin needed permits! Other issues, Robin will never develop cheek pads, he probably will be less aggressive and easier to socialize with other orangutans due to no testosterone production. If socialized with a female orangutan, no need to worry about the contraception in the female.

Important: Unique case - There are no reports of cases like this in other orangutans or other primates before. Robin is very special.

For more information, please refer to OVAG website.

Case Study 5: (Not a case study - sharing experience)

Andhani Widya Hartani, Jambi, Frankfurt Zoological Society, Indonesia

**Frankfurt Spring School on Conservation Project Management
The Fellowship Programme of the KfW Foundation
Goethe University, Frankfurt, 4th March-11th April 2019**

ABSTRACT

The Frankfurt Spring School provides courses on conservation project management. The aim of this program is to support young, dynamic, up-and-coming conservation professionals by providing additional skills about project management to give them additional edge in their career development. After going through the selection process, I managed to become one of 6 students included in the Fellowship Program sponsored by the KfW Foundation. As one of the students of the program, we have to prepare a project proposal that will be selected to get project funding of 50,000 Euros.

The course was held on 4-29 March 2019 at Uni Campus Riedberg, Goethe University and was attended by 30 scholars who have experience working for conservation. The instructors are professionals who have experience in management and conservation projects. They taught several topics which : project management, human resources and personnel management, financial management, performance skills, communication and Public Relations, and organizational development.

After the course is complete, we (6 students from the Fellowship Program) are given two weeks to perfect their proposal under the guidance of an external consultant and mentor. We must compile a complete project proposal based on the logframe framework. The project proposal I submitted was titled:

"Improving survival chances of reintroduced mother and infant Sumatran orangutan (*Pongo abelii*) in Bukit Tigapuluh Landscape, Indonesia". The aim of this project was to increase the chances of survival from Sumatran orangutans and orangutans which were reintroduced in Bukit Tigapuluh National Park.

We present our proposals in the presence of judges (Representatives of KfW Foundation, Goethe University, WWF, FZS, and external consultants) on 11 April 2019. The judges provide questions and evaluate related proposals, project implementation plans, and topics learned during the course. After the final evaluation, the jury announced 3 winners who received funding of 50,000 Euros and I managed to become one of the winners. The success that I achieved was inseparable from the Orangutan Veterinary Advisory Group (OVAG) which has provided inspiration to develop soft skills and enthusiasm in working in the field of conservation. Therefore, I would like to share my experience during the program to OVAG participants this year.

FSS support young, dynamic, up-and-coming conservation professionals by providing additional skills on project management to give them an additional edge in their career development. This year, 30 participants came from overseas including 6 participants (the fellows). They are part of the fellowship

programme of the KfW Foundation and each of them will prepare a specific conservation project proposal (later to be potentially funded by the KfW Foundation). The programme focusses on candidates from the field (in a protected area/national park administration or NGO).

I was selected to be one of the fellows from South East Asia after selection process. During the four weeks on conservation project management training, I design and structure my project proposal: Improvement of monitoring and evaluation standards of reintroduced sumatran orangutan in the Bukit Tigapuluh Landscape. FSS provided all the necessary skills to be a successful and professional future manager and leader of conservation projects. They also invite lecturer and facilitator who has experience working in conservation program to teach the scholars.

The main topics are: Project management, human resources and personnel management, financial management, performance skills, communications and PR, organizational development.

Two weeks after the Spring School, finally, the scholars presented their dream conservation project to the KfW Foundation Selection Panel. Representatives of the KfW Foundation, Goethe University, WWF, FZS as well as an external consultant put the project proposals to the acid test and drilled the scholars with questions. Three proposals were selected to receive funding 50.000 Euro from the KfW Foundation and will be implemented by the Spring School scholars.

Through this spring school, expert knowledge, skills, and practical experience related to conservation project management will be taught to advanced students of biology and related subjects, to biologists at the beginning of their professional career, and to junior project managers from Asia, Africa and Latin America. The teachers are professionals and practitioners of biodiversity-related institutions of the Goethe University Frankfurt am Main but also from other institutions.

Frankfurt Spring School on Conservation Project Management The Fellowship Programme of the KfW Foundation

From 4 -29th March 2019, Andhani went to the Goethe University Frankfurt & Frankfurt Zoological Society Headquarters in Germany for a workshop on Conservation Project Management. This was held to support young conservation professionals and was sponsored by the Fellowship Program of the KfW Foundation The workshop was designed to teach how to prepare a project proposal (funding of 50,000 Euros to the winner).

Participants for the 2019 workshop included 30 students and 6 fellowship students who were all working in conservation programs. In order to participate, the following was needed: Passport, Visa, CV, Letter of Recommendation, Interview and IELTS certificate, The fellowship program form, Diploma/transcript records, Motivation Letter, Project Proposal idea, and Mentor/consultant.

The course covered learning things not taught at University such as Project Management (Log frame, Proposal, Fundraising, Reporting, Monitoring & Evaluation); Human resources & Personnel Management (Capacity Development, Leadership, Recruitment, Performance Management, Mediation, Coaching); Financial Management (Financial Administration, Accounting, Balance Sheet); Performance skills (Communication, Writing, Presenting, Time and Self-Management); Organizational Development (Strategic & Business Planning, Growth and Risk Management). Other activities were: Communication (website, photos, video, social media, newspaper); Conservation Speed Dating; Excursion to Kellerwald National Park, Visit Frankfurt Zoo.

Andhani/s project: Improving survival chances in reintroduced mother and infant Sumatran orangutan (*Pongo abelii*) in Bukit Tigapuluh Landscape, Indonesia – and she WON!!!!!!!!!!!!!! For best proposal and a 50,000 Euro grant to accomplish that work!!!!

What she learned:

Selection: Read the grant information / Pay attention for your document

Project planning: Need a mentor/consultant / Build a team / Discuss together

Proposal Writing: Structure, clear, positive, strong, connection, logic, active sentence / SMART indicators

Be careful about risk and assumption

Budget: Follow the rules! / Exchange rate, tax, bank account

Presentation: Clean and clear slide / Font, background, <6 sentences (6 words) / Keep practice, ask your mentor or friends opinion / Duration

Never give up Don't be afraid You have "the dream job" Keep practicing

Support your team Ask to someone who knows better

The next Frankfurt Spring School will take place from 24.02. – 20.03.2020.

<https://frankfurtspringschool.de/> Learn more at Frankfurt spring School is <https://youtu.be/Umjc4RfdZTc>

Jackie Chappell (presenting) Susannah Thorpe, University of Birmingham / Fransiska Sulisty, Ricko Jaya, OVAG Committee

Enclosure Design Tool (EDT): The Next Chapter

USING THE ENCLOSURE DESIGN TOOL (EDT) TO SUPPORT EVIDENCE-BASED CARE DECISIONS FOR ORANGUTANS IN REHABILITATION CENTRES: A HANDS-ON TRAINING SESSION

ABSTRACT

Managing orangutans in rehabilitation centers to ensure they have the skills they need to survive and thrive in the wild when released is an extremely challenging task. While centers have extensive experience in caring for captive orangutans, the natural behavioral profile of wild orangutans is complex, subtle and varies over time. Ensuring rehabilitant orangutans have acquired all the skills they need to return to the wild can only be properly assessed by collecting detailed quantitative data on their behavior over a period of time. Working with Samboja Lestari Orangutan Rehabilitation Center (BOSF), we have developed and tested our Enclosure Design Tool (EDT). The EDT is a framework of data collection protocols with a web-based tool. It enables rehabilitation centers to collect quantitative data on the behavioral ecology of their orangutans and upload it to the EDT, which compares the data to wild orangutans and recommends enclosure modifications to encourage any missing or under-represented wild-type behaviors. This enables centers to understand which elements of the natural behavioral profile of orangutans need to be enhanced in each individual ape and provides methods to elicit these behaviors to ensure species-typical physical and cognitive development and maintenance to optimize reintroduction success.

Our hands-on training session will have three parts:

- We will present an update on our EDT project, including new results from our work on chimpanzees partnering with Ape Action Africa. While this involves a different species, these results show the positive changes which can be elicited using the EDT, even when constrained by small cage sizes. We will also explain our future plans for the EDT. Finally, we will explain what attendees will be doing in the training task.
- Attendees will be divided into three groups, each with a laptop, access to the online EDT web application, data collection templates and training manual, and to a sample 30-minute long video recording of an orangutan in a zoo enclosure. Each group will view the video to collect and record data

using the one of the data collection frameworks (either for locomotor or cognitive behaviors). Using a video recording will enable attendees who have not collected behavioral data before to pause or rewind the video to check details, and for those leading the training to answer questions about the behaviors and resolve uncertainty.

- When the three groups have finished collecting and recording data, these will be combined with example data and uploaded to the EDT so that attendees can see how data they have collected translates to the analysis and recommendations in the EDT.

Quick Overview: a framework of behavioral measurements that are collected and then uploaded to the EDT on line site and the tool automatically analyzes the data and compares it to behavior in the wild. It also suggests where there are differences and offers suggestions on how to modify the enclosure to encourage the orangutan to engage in those behaviors – then you can continue to upload behavior to see if changes made have been successful – more of an enclosure modifying tool

New grant from Arcus of 4 years to further the use of EDT – to extend and refine it.

Siska: will be going around to mentor people on EDT

Ricko : will be doing his PhD at Birmingham University with Susannah and Jackie

Challenge 1 for orangutans: Learning what will take their weight or not – released orangutans spend more time on the ground so we need to get them up in the trees more – Learning how to make nests, move through trees and how to exploit multiple food resources in the forest.

Challenge 2: Build resilience – mostly in human literature but now being realized it is applicable to non-human species as well – how to manage frustration - orangutans will encounter things they cannot immediately solve but they need to learn to stay with a challenge.

Challenge 3: Relationships – social learning – as they have no mother they must learn from others in the center or from humans.

Overview from Ape Action Africa: Not ideal sex ratio – but they were known as escape artists – natural enclosure with electric fence – but the 7 chimps can get out and are in an enclosure all the time (5 x 5 m x 3 m tall) Lots of supports and platforms – they spent a lot of time on the ground – so EDT added webbing – this group also showed aggression – EDT put in plastic barrels which chimps used as if they were tree buttresses – by banging them around, it lessened the aggression.

Collecting behavioral data: in order to see how an orangutan spends his/her time – follow an animal around every hour of the day (but this is difficult) – use interval time sampling – at every interval record what the animal is doing right then – then over time you will get a clear picture of what behaviors are present.

Group Work – watch a 15-minute video of an orangutan and enter data (onto sample EDT online) of what you see – cognition data – on the form provided – 20 second intervals – copy what you collected into the dummy data sheet – upload and view data in the EDT. Record data at longer intervals until you get used to shorter time frame.

Fransiska Sulisty – OVAG Committee

This session is held to give an overview and share the plan for the next day practical session at Jogja WRC.

All orangutan centers should have a plan for routine general health check, which is an important part of preventative health management.

How do you do health check in your center?

- Time: on arrival, every 1-4 years, and before moving out (pre-release island, released, translocated)
- What examinations do you do?
 - ✓ Body weight
 - ✓ Body measurements
 - ✓ Dental condition
 - ✓ Respiratory tract: auscultation, chest x-ray, ultrasound, bronchoalveolar wash
 - ✓ Gastrointestinal tract: auscultation, palpation, ultrasound, fecal sampling
 - ✓ Eyes, ears, skin
- What samples do you collect?
 - ✓ Blood
 - ✓ Fecal
 - ✓ Swab (from lesion)
 - ✓ Urine
 - ✓ Hair
- What diseases are you testing/covering?
 - ✓ GI parasites (helminthiasis, protozoa)
 - ✓ Blood parasites (malaria)
 - ✓ External parasites
 - ✓ Hepatitis A
 - ✓ Hepatitis B
 - ✓ Hepatitis C
 - ✓ HIV
 - ✓ Herpes 1 and 2
 - ✓ Tuberculosis
 - ✓ Typhoid fever

While doing general health check in the animals, it is also a good opportunity to give routine treatment such as deworming and vaccination.

As human and primates are sharing a lot of diseases and pathogen, it is also a good practice to consider staff/human health in your preventative health management. For example, when you are deworming the orangutans, you might as well give appropriate deworming medicine to the caretakers who are sharing the same environment with the animals.

Practical Day at Jogja WRC:

This opportunity is made possible in accordance with the management plan of Jogja WRC that is going to send 3 orangutans to Centre for Orangutan Protection for rehabilitation. These individuals will need general examination and testing. There are also two gibbons who need routine health examination.

OVAG has agreed to assist Jogja WRC with providing expertise, support, and donation, while making this procedure part of the workshop. We also collaborate with FKH UGM, to create teaching material by recording all the procedures. We have cleared the Ethical approval from FKH UGM

Procedures to be done are:

- ✓ Body weight
- ✓ Body measurements
- ✓ Dental condition
- ✓ Respiratory tract: auscultation, chest x-ray, ultrasound, bronchoalveolar wash
- ✓ Gastrointestinal tract: auscultation, palpation, ultrasound, fecal sampling
- ✓ Eyes, ears, skin
- ✓ GI parasites (helminthiasis, protozoa)
- ✓ Blood parasites (malaria)
- ✓ External parasites
- ✓ Hepatitis A
- ✓ Hepatitis B
- ✓ Hepatitis C
- ✓ HIV
- ✓ Herpes 1 and 2
- ✓ Tuberculosis
- ✓ Typhoid fever

The animals:

1. Ucokwati:
 - Signalment: Bornean Orangutan, female, adult, + 53 kg
 - History: in WRC since 2011 (brought , confiscated by COP and BKSDA Jogja)
 - Health record: diarrhea (no parasites found).
 - Treatment record: activated charcoal, deworming every 4-5 month.
2. Mungil
 - Signalment: Bornean Orangutan, female, juvenile, + 15-17 kg
 - History: born in WRC on May 2013
 - Health record: diarrhea (no parasites found), have alopecia in her back, a little bit jaundice.
 - Treatment record: activated charcoal, deworming every 4-5 month.

Logistics & Schedule for the day:

- Leave at 7.15 from hotel to WRC
- 1 hour trip
- How many of you coming / not coming?
- Morning – lunch : 2 orangutans
- Lunch – afternoon: 1-2 gibbons
- Discussion with PKBSI

Team to do the Procedure:

- WRC VETS
- OVAG SENIOR VETS/COMMITTEE
- OBSERVERS FROM FKH UGM

The rest of the participant will watch a live streaming video in a meeting room at WRC

Gibbon Session

Discussion on future topics

GIBBON WORKSHOP 2020 IDEAS FOR SPEAKERS AND TOPICS

1. Managers to come to G-OVAG
2. Invite zoo vets
3. Trauma surgeons (broken bones)
4. Anesthesia experts
5. Gibbon behavior experts (wild and captive)
6. Case studies on different primates e.g. lorises, macaques and langurs
7. Disease risk analysis
8. Enclosure design
9. Post-release monitoring technology
10. Pathologists
11. Animal trainers
12. Animal welfare experts

OVAG and the SSA (IUCN Primate Section on Small Apes)

1. There is no coordinated vet forum for gibbon projects.
2. The SSA works with OVAG to bring gibbon vets from in situ and ex situ organizations to the annual OVAG meeting.
3. Identify actions to tackle emerging diseases in wild and captive gibbons and siamang.
4. The SSA will ensure this meeting is regularly attended to ensure maximum knowledge exchange for gibbon vets.
5. Plans for 2020 in Thailand?

Plan for Today:

Talks from each project represented here.

Q&A session after each presentation.

General discussion at the end e.g. What do we need to improve gibbon veterinary care in the future?

How can the SSA help? Would you come to OVAG again?

FUTURE 2019:

More zoo vets to attend? Gibbon specific meeting out with OVAG? Outside Indonesia? Students to study gibbon health? Funding/training? Publications? Sharing of case studies especially TB? Tracking gibbons post-release (transmitters)? Please give me suggestions!

Susan M. Cheyne (Vice Chair), The Section on Small Apes

GIBBONS IN THE WILD: 20 recognized species of gibbon in 10 countries (4 genera):

5 - Critically Endangered 14 – Endangered 1 – Vulnerable

At least 3 species have no captive breeding (Hainan, Cao Vit and Skywalker)

Skywalker gibbon – newest species - Found only in China and Myanmar. Not yet assessed for IUCN Red List.

Hainan Gibbon (*Nomascus hainanus*) - Most endangered gibbon (primate?) in the world - 29-33 individuals only in the world, none in captivity.

WHY A SECTION ON SMALL APES? 20 recognized species of gibbon in 10 countries (4 genera):

4 - Critically Endangered 14 – Endangered 1 – Vulnerable 1 – Data Deficient

The SSA is a group of more than 80 gibbon experts globally, with a shared vision of conserving the world’s gibbons. All habitat countries are represented.

MISSION FOR THE SECTION ON SMALL APES:

1. Strengthening coordination among gibbon conservation projects worldwide;
2. Increase awareness of scientifically-sound practice in gibbon conservation;
3. Provide IUCN-endorsed guidelines to conservationists, field scientists and decision makers;
4. Develop Conservation Action Plans that clarify priorities in gibbon conservation for practitioners, decision makers and donors;
5. Ensure the IUCN Red List of Threatened Species as a decision tool is thorough and up-to-date and
6. Provide direct technical support to implementing projects engaged with gibbon conservation.

ACTIONS AND PLANS 2017-2018:

SSA Working Groups:

Executive Committee: 11:6

Captive Working Group: 9:4

Vet and Disease Working Group: 7:3

Funding Working Group: 6:2

A communications team to help the vice-chair gather and disseminate stories about gibbons across social media.

GIBBONS AND REHABILITATION: Most rescue centers have had, or currently have, gibbons. Gibbons require specialist vet treatment and behavioral rehabilitation – not the same as orangutans. Gibbons do not go to forest school (they would run away!). Enclosure Design Tool – perfect for gibbons! (?)

GIBBONS AND HEALTH: Lack of knowledge about gibbon health issues and diseases. Malaria – unknown issue / TB – unknown issue / Hepatitis B – is there a wild gibbon strain? / Herpes simplex – kills gibbons (as far as we know) / Emerging diseases?????

What we know – literature (mainly labs and captive):

Viruses	Parasites
Herpes simplex	Ascaris
Hepatitis B	Baylisascaris
Hepatitis D	Malaria
Gibbon Ape Leukemia Virus	
Bacteria	Other Diseases

Shigella	Cerebral Infarction
Streptopharagus pigmentatus	Myocardial Fibrosis

(other lists please refer to OVAG website)

Gibbon projects which have vets exits in: Indonesia, Malaysia, Thailand, Cambodia, China, India, Vietnam

Rehabilitation and Translocation Guidelines for Gibbons (2014) – can be found on SSA website

GIBBON HUSBANDRY MEETING 2020 HANOI, VIETNAM 18-22ND APRIL 2020

PLEASE EMAIL ME IF YOU WANT TO BE INVOLVED There are costs to register so please do not agree to come until you are sure. SSA will pay for you.

DISCUSSION POINTS FOR THIS AFTERNOON:

Staff training for gibbon vets? Bringing managers to OVAG? TB in gibbons – is it a problem? How can the SSA help your center? Any other topics to discuss?

Do you work with gibbons? Wild or Captive the SSA wants YOU! BE INVOLVED:

section.small.apes@gmail.com www.gibbons.asia facebook.com/GibbonSSA | Twitter @IUCN_Gibbon

Presentation Abstracts:

Ida Masnur, The Aspinall Foundation – Indonesia Program

HEALTH MANAGEMENT FOR JAVAN GIBBON (*Hylobates moloch*) AT JAVAN PRIMATE REHABILITATION CENTER THE ASPINALL FOUNDATION – INDONESIA PROGRAM

ABSTRACT

Health management is a part of rehabilitation process which could identify suitable animals for releasing in the future. All gibbons at rescue and rehabilitation center should undergo for health screening during quarantine period upon arrival at the center (IUCN SSC Guidelines, 2015). All new arrived gibbons at Javan Primate Rehabilitation Center The Aspinall Foundation Indonesia Program (JPRC TAF-IP) are kept in quarantine facilities for at least 90 (ninety) days. Medical check-up (MCU) new arrival is conducted between 1 to 2 weeks upon arrival animal to the facility. Animal is sedated for identifying with microchip, general physical examination (include dental examination, eyes, bones, nails, coat condition, check for bullets, deformities, dehydration, diarrhea, respiratory difficulties, general condition and bodyweight), tuberculosis testing, blood collection for general blood profile (hematology and biochemistry), deworming, fecal parasite screening and bacterial culture. There are several viral disease screening tests need to be done for Hepatitis B virus (should be identified gibbon specific strain), Hepatitis A and C virus, Herpes simplex (HSV1 and HSV2), simian immunodeficiency virus (SIV), simian retrovirus (SRV) and simian T-cell leukemia (STLV). The animal will undergo for MCU post quarantine with almost the same procedures as new arrival. If animal is clear, then could go to socialization cage for pairing and further rehabilitation process preparing before releasing in to the wild. Animals should undergo for MCU prerelease before releasing to the wild with almost the

same procedures as post quarantine and including hair samples collection for genetic study purposes. JPRC – TAF IP start releasing gibbons on 2011 with total number are 37 gibbons (until July 2019). Physiological data for body temperature, heart rate and respiratory rate are compiled from released animals and could be used as baseline data including general blood profile.

Keywords: Javan gibbon, health screening, physiology data, hematology, clinical chemistry

Pristiani N. Notosoediro, Adi Winarto, Ligaya I.T.A. Tumbelaka

Histological Development of Neonate and Juvenile Javan Gibbon (*Hylobates moloch*) Ovaries

ABSTRACT

Reproductive success is one of the biggest challenges for the existence of Javan gibbon (*Hylobates moloch*) in the future. Basic biology information of main reproduction female organ of the species is yet unknown. The research aimed to provide information of female ovary development through histological examination. Two pairs of ovaries were collected from a neonate and a 3-year-old female cadaver at Javan Gibbon Center. Histological techniques (cross and longitudinal sections) were applied to the collected samples that embedded in paraffin and stained with hematoxylin eosin (HE) and Masson's trichrome (MT). The follicles are spread evenly in the left and right cortex ovary. The number of primordial follicles within the neonate and infant ovary was 80 815 and 34 622, respectively. In a 3 year old Javan gibbon ovaries, the development of primordial into primary, pre-antral and antral follicles were observed. The average diameter of the follicles and oocytes were, respectively; 25 μ m and 20 μ m for primordial follicle, 48 μ m and 21 μ m for primary follicle, 79 μ m and 25 μ m for pre-antral follicle, 315 μ m and 32 μ m for antral follicle. The size of primordial and primary oocyte and follicle of Javan gibbon is smaller than those of *Macaca fascicularis* at the same age. The connective tissue of neonate ovary was being developed while in the 3 years old female ovary, it was well-developed and clearly seen in the capsula, cortex, and medulla. Javan gibbon follicle development is strongly influenced by age.

Keywords: follicles, histological method, Javan gibbon, ovary

Samshul Ali (presenter), Bhaskar Choudhury, Ashraf NVK, Daoharu Baro, Abhijit Bhawal & Nupur Buragohain

ANAESTHETIC MANAGEMENT OF EASTERN HOOLOCK GIBBONS (HOOLOCK LEUCONEDYS) USING KETAMINE HYDROCHLORIDE DURING WILD TO WILD TRANSLOCATION IN ARUNACHAL PRADESH, INDIA

ABSTRACT

Gibbons are small arboreal mammals found predominantly in the tropical and sub-tropical forests they are social, territorial and vocal. Habitat fragmentation, conversion of natural habitats to cultivation, artificial change of landscape and poaching have caused a great reduction in their range eastern part of India. Gibbons that live as stranded population in degraded and fragmented landscapes in Arunachal Pradesh, India are ideal candidates for a holistic conservation translocation program. IFAW-WTI undertook this task

of translocating stranded populations of gibbons to safer habitats from 2012 to 2017 in Eastern Arunachal Pradesh.

The gibbons were physically captured as per a set protocol developed locally based on previous experiences. Twenty-three (23) individuals of nine (9) families consisting of nine (9) adult males, six (6) adult females, five (5) sub adult and three (3) juveniles were translocated to nearest suitable habitat. The adults and sub adults (18) were anesthetized using Ketamine HCl for examination, blood collection and microchip implantation prior to the translocation. Three different anesthetic protocols were used: 11 individuals were anesthetized at a dose of 8 mg/kg; 4 individuals at 10 mg/kg and 3 individuals at 5-7 mg/kg. The body weights of the animals were measured in the crates prior to the anesthesia to ensure correct dosage. The average body weight of the males was 4.92 ± 1.54 kg and of the females was 5.24 ± 0.99 kg. There was no major difference seen in the anesthetic parameters across the two sexes; Induction was achieved in $3:36 \pm 1:66$ min in males and $3:43 \pm 2:08$ min in females after administration, and both sexes achieved surgical plane of anesthesia within 5-8 minutes of administration regardless of the dosage. Total anesthetic time in both sexes ranged from 15-45 min ($18:40 \pm 14:42$ min). However, the anesthetic parameters varied with the different dose rates: Induction was achieved in 4 ± 2 min when dosage was 10 mg/kg, in $3:16 \pm 1:16$ min when it was 8 mg/kg and in $3:40 \pm 3:47$ min when it was 5-7 mg/kg body weight. Surgical plane of anesthesia was achieved with dosage of 10 mg/kg of body weight ($2:15 \pm 3:18$ min) than with 8 mg/kg body weight ($5:22 \pm 5:58$ min). The duration of anesthesia also prolonged at dosage of 10 mg/kg (34 ± 17 min) when compared lower dosage of 8 mg/kg body weight ($14:22 \pm 13:03$ min). Literature suggests ketamine alone is not ideal drug for parenteral anesthesia in primates and gibbons and the recommended dose is 4.3-15.6 mg/kg. However, it was noticed that using 8 mg/kg of ketamine alone after a physical capture of gibbon is enough to facilitate physical examination and perform basic clinical procedures in the wild as all the anesthetized gibbons in this study showed uneventful recovery.

S. M. Cheyne (presenter), M. E. Harrison, B. Ripoll Capilla, C. H. Cosmopolis-Del-Carpi, S. J. Husson, S. Mang, S. E. Page, A. Purwanto, F. Siegert, S. A. Thornton & M. J. Struebig Borneo Nature Foundation

Impacts of Wildfires on Forest Biodiversity in Indonesian Borneo

The Sebangau National Park is the largest non-fragmented area of lowland rainforest remaining in Borneo and supports the largest protected population of the Bornean orangutan (*Pongo pygmaeus*) and southern Bornean gibbon (*Hylobates albibarbis*). Prior to formal protected-area status being granted, the area was logged extensively, firstly by legal controlled logging and then by intense illegal logging. Illegal loggers used purpose-built canals to extract the timber, which has resulted in peatland drainage which puts the whole ecosystem at risk from peat degradation and, more immediately, from forest fires. These fires cause huge public health problems, are a major cause of increasing atmospheric CO₂ levels and destroy large swathes of rainforest. Borneo Nature Foundation (BNF) is addressing the causes of these fires in the critical Sebangau region by restoring drained and deforested peatlands, and encouraging behavior change amongst local communities, while simultaneously tackling fire impacts by improving local fire-fighting capacity and developing fire-prevention networks. We present data on the impacts of the fires on both wildlife and the forest as well as impacts on local livelihoods. All are negatively affected by the fires and present solutions to mitigate some of these effects.

Gibbons at the Endangered Primate Rescue Center

The Endangered Primate Rescue Center (EPRC) works to rescue, rehabilitate, and participate in conservation breeding of Vietnam's endangered and critically endangered primates. The EPRC currently houses 180 primates. This includes two species of loris, eight species of langur, and four species of gibbon. The EPRC has six *Nomascus leucogenys*, eight *N. siki*, six *N. annamensis*, and six *N. gabriellae* gibbons. I will speak about the origin of these gibbons, general trends of confiscation and barriers to rescuing gibbons in Vietnam. I will discuss the gibbon's daily husbandry and enrichment at the EPRC, and our goals to improve care. The EPRC is currently at capacity for gibbons. I will speak about the EPRC's long-term plans for our current gibbons and future rescues, and the challenges to accomplishing these. Furthermore, I will speak about the EPRC's role in conservation education and awareness, and how we can increase our capacity and effectiveness in educating visitors and local people. Finally, I will discuss the potential of creating a release program for the gibbons at the EPRC. The goal of this talk is to give an overview of the gibbons at the EPRC so that we can receive feedback from the members of the workshop.

Hoang Thi Thu Thuy (presenter) Endangered Primate Rescue Center (EPRC), Cuc Phuong National Park, Nho Quan District, Ninh Binh Province, Vietnam

A case report on enteric disease caused by *Escherichia coli* in an individual of the northern white cheeked gibbon (*Nomascus leucogenys*) at the Endangered Primate Rescue Center (EPRC), Cuc Phuong National Park, Vietnam

Abstract

Escherichia coli (E.coli) is a gram negative bacteria species, appearing commonly in humans and warm blooded animals. The transmission of E.coli to animals is via raw food and water. Most of the strains are harmless, but some serotypes can cause serious illness in animals with various symptoms such as watery diarrhea, hemorrhagic colitis, vomiting, fever, and abdominal cramps. A 7-year-old male northern white cheeked gibbon (*Nomascus leucogenys*) was confiscated from the illegal pet trade in Lang Son province, northern Vietnam in June 2018. After 6 months housed at the EPRC, the gibbon had watery diarrhea, loss of appetite and fever, and he was treated with antibiotics and recovering well within a week. However, the symptoms returned with bloody diarrhea, and an anal swab was collected. The results of the fecal culture indicated the causative organism was E.coli, an unknown strain, which was resistant to most antibiotics except Enrofloxacin. Finally, after receiving the right antibiotic therapy and probiotics, the gibbon is doing well so far. The purpose of this article is to discuss the clinical signs and symptoms of this strain of E.coli, review relative literatures, and improve veterinary understanding of the diagnosis and treatment of E.coli infection in gibbons.

Caroline Rowley (presenter), Sofia Blue Endangered Primate Rescue Center, Cuc Phuong National Park, Ninh Binh, Vietnam

Acoustic Analysis of Female Great Calls at the Endangered Primate Rescue Center

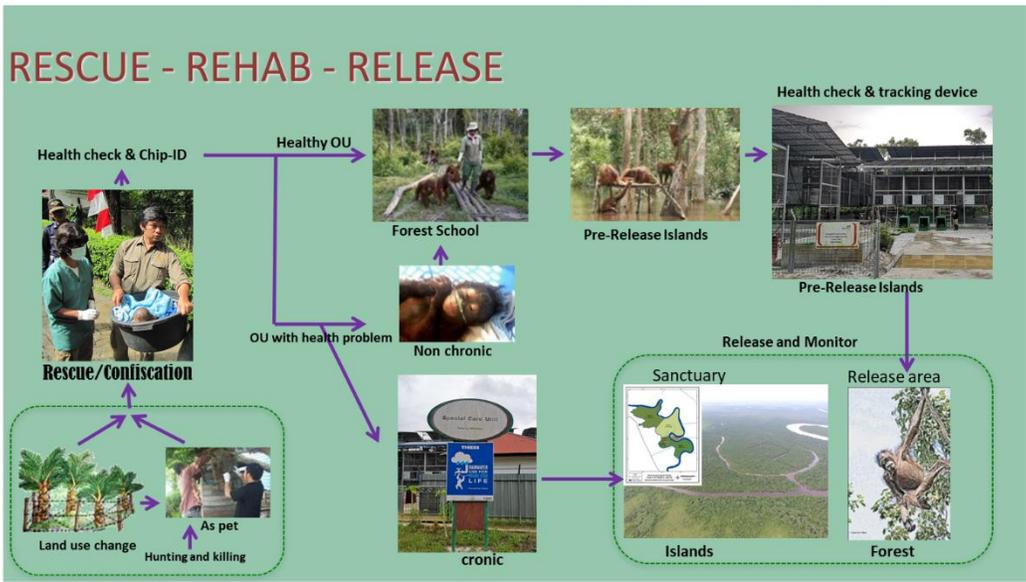
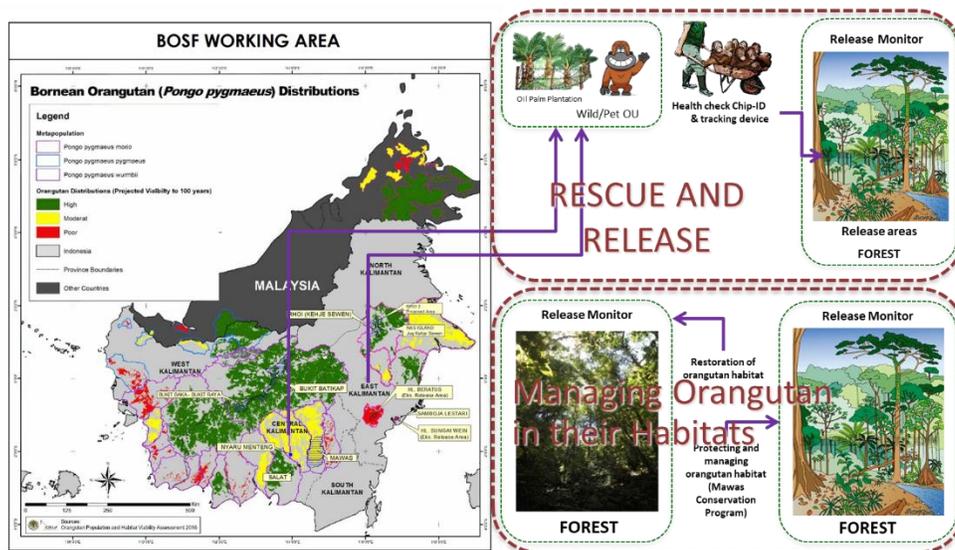
Gibbon duets are in part genetically determined, however, learning may also play a role in song acquisition and development. The songs of gibbons may indicate the resource holding potential of an individual, and it remains unclear how captive versus wild environments affect song quality and acquisition. To explore how captivity could impact singing, the great calls of six individuals from three *Nomascus* species were recorded

from rehabilitated gibbons at the Endangered Primate Rescue Center (EPRC) in Cuc Phuong National Park, Vietnam. The first song bout from each day was used for analysis. We extracted 23 parameters from 101 great calls (n=10-25/gibbon). A Principle Component Analysis showed that three principle components accounted for 71.81% of the variance in the data. PCI was interpreted as the number of bark notes, and was related to acoustic variables from the bark phase. PCII was interpreted as the number of 'Oo' notes and could be summarized with acoustic variables related to the 'Oo' phase. PCIII was interpreted as the duration of the entire great call and was related to general temporal parameters. A correlation was then conducted to explore how these principle components related to age, weight, behavior, age at confiscation, and general health.

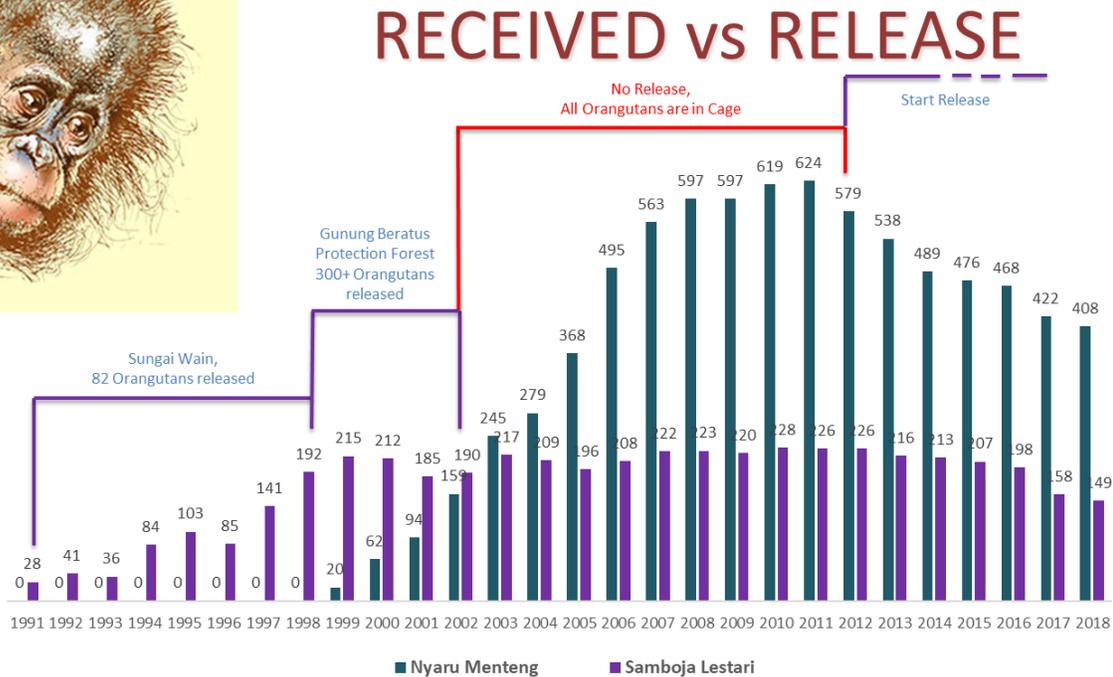
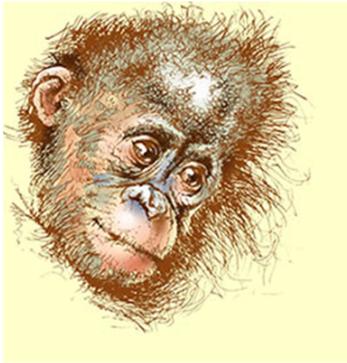
Manager Session

Anton Nurchayo, BOSF

BOSF OVERVIEW



In the two BOSF rehabilitation centers there are currently 403 orangutans. 138 in Samboja and 365 in Nyaru Menteng. Once the orangutans are ready (age, skills, behavior, health), we reach the ultimate goal of returning them to their true home in a suitable and secure forest. This is what we call “release” or “reintroduction”.



Releasing orangutan isn't just a matter of opening a cage. We have set up camps and Post-Release Monitoring (PRM) teams in all release sites to follow the released orangutans every day and monitor their adaptability in the new environment, for at least 1 year. During 2012 – 2017, 11 wild-born babies in the forest, 12 from Batikap Protection Forest, one from TNBBBR and 4 from Kehje Sewen Forest.

Unreleasable:

PROGRAM	Handicap	Ex. TB	Other
Nyaru Menteng	8	9	17
Samboja Lestari	2	38	15

Back in Samboja Lestari, we conduct land rehabilitation on around 1,800 ha of land as a place for our orangutan rehabilitation activities. The area used to be a damaged land; only grass, weeds and bushes grew there. After over a decade of land rehabilitation activities, it is now a thriving new forest, just 1 hour from the city of Balikpapan. There are still many areas to be planted!

On July 31, 2002, the Mawas Conservation Program was established by the BOS Foundation in Central Kalimantan. Because saving orangutans is meaningless if we do not save their habitat. The working area covers 309,000 hectares.

In 2009 BOSF established RHOI. Why did we establish a private company? Ecosystem Restoration Concession is a government-approved scheme to “lease” a forested area for ecosystem restoration purposes, and now, is the best scheme to provide a suitable and secure environment for rehabilitated orangutans. But private companies—NOT NGO—can apply for such a permit. Thus, BOS Foundation establish PT. Restorasi Habitat Orangutan Indonesia for this sole purpose. We obtained the first ERC permit for Kehje Sewen Forest in 2010, for which we had to pay US\$ 1.4 million (Rp. 14 billion) to government for the right to own and manage the forest for 60 years (with the option to extend for another 35 years). We received money to pay for it from various donors in Europe and Australia.

Salat island has:

suitable intact natural forest □ isolated from the mainland all year-round, has no wild orangutan population, sufficient orangutan foods, adequate carrying capacity to support large numbers of orangutans as they adapt to life back in the forest.

On September 5th, 2017, BOS Foundation officially commenced activities on new island (Jug Kehje Swen in Dayak Language means Island for Orangutans); 82.84 hectare orangutan pre-release island in Wahau sub-district, East Kutai regency, East Kalimantan. The utilisation of the island has been made possible through cooperation between BOS Foundation and PT. Nusraya Agro Sawit (PT NAS). We have moved 10 orangutans from Samboja Lestari rehabilitation center to the island with the purpose of preparing them for their release into the forest.

Center For Orangutan Protection Overview



Orangutan

Jenis Kelamin	Jumlah
Jantan	10
Betina	7

unreleasable	Jumlah
Jantan	1
Betina	1

Umur	Jumlah
1-2 tahun	4
3-5 tahun	5
6-10 tahun	2
11-20 tahun	5
> 20 tahun	1

Releasable (5 tahun kedepan)	Jumlah
Jantan	8
Betina	3

Robert Ferdinand Yappi Orangutan Foundation International Overview

1971: Birute Galdikas starts activities: research and rehabilitation of orangutans at TNTP

1998: Orangutan Care Center and Quarantine care and rehabilitation center equipped with medical facilities

Currently: Unreleasable 9 males, 6 females. Releasable 265: 142 Males / 124 Females

Sumatran Orangutan Conservation Programme – Overview

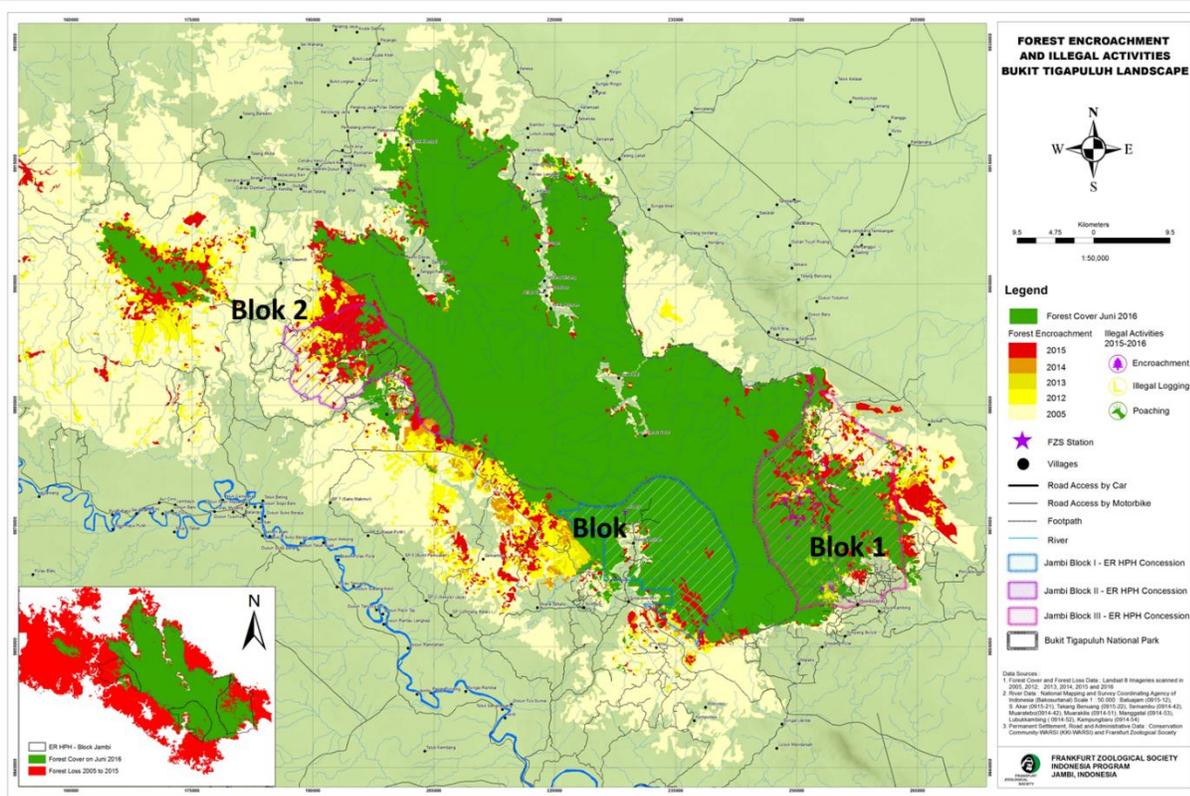
Started in 2002. Location in Batu Mbelin Village , Sibolangit District, Deliserdang , North Sumatra



Currently in Quarantine: 54 orangutans (26 males, 28 females). Releasable: 48 orangutans (22 males, 26 females). Unreleasable Orangutans: 6 (4 males, 2 females) – to Orangutan haven.

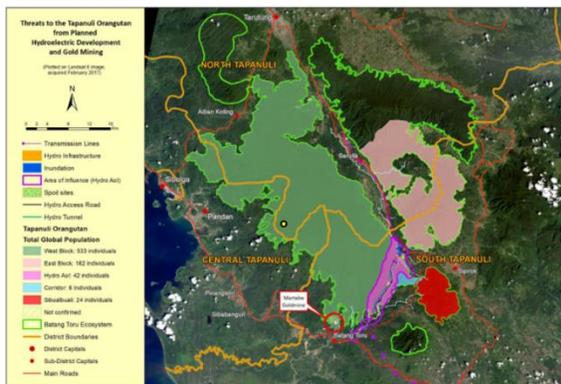
SUMATRAN ORANGUTAN CONSERVATION PROGRAM FRANKFURT ZOOLOGICAL SOCIETY
Lanskap Bukit Tigapuluh Jambi, Sumatra Overview

Release sites: Bukit tigapuluh and Jambi. Currently 105 males and 92 females.



YEL-SOCP BATANG TORU PROGRAM Overview

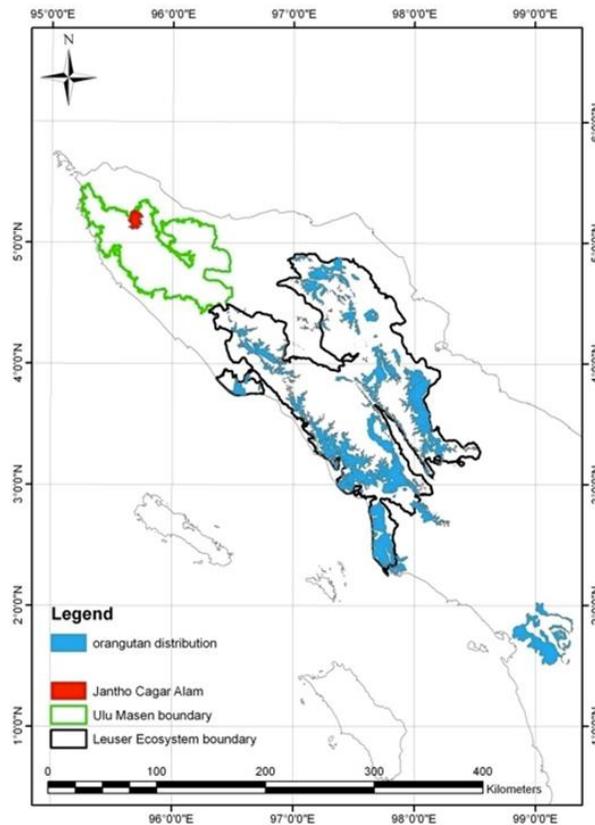
STASIUN MONITORING BATANG TORU



● Camp Mayang

1. Lokasi: western block, North Tapanuli, North Sumatra (1° 41' 9.1" N/ 98° 59' 38.1" E)
2. Ketinggian 908 mdpl
3. Populasi: 767 individu
4. Densitas di wilayah Stasiun Monitoring: 0.29 ind/km²
5. Threats:
 - Habitat loss (deforestation)
 - Human-orangutans conflicts
 - Habitat Fragmentation

Sumatran Orangutan Conservation Programme – Jantho Forest School and Release Site

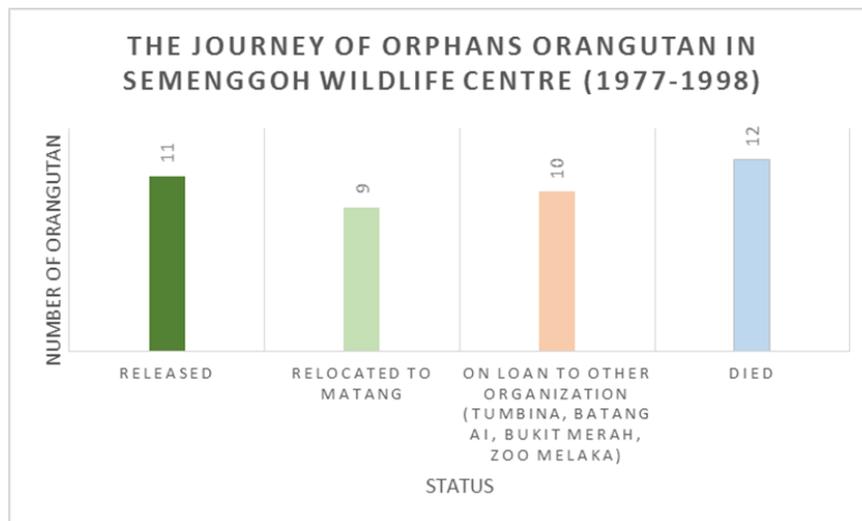


Semenggoh Wildlife Center Overview

Year of establishment: 1975 / Located 25 KM from Kuching Sarawak, Malaysian Borneo

Establishment objectives: holding facilities for animal / rehab work / education and awareness

Today, SWC continue to monitor the semi-wild orangutans, awareness and ECO-TOURISM.

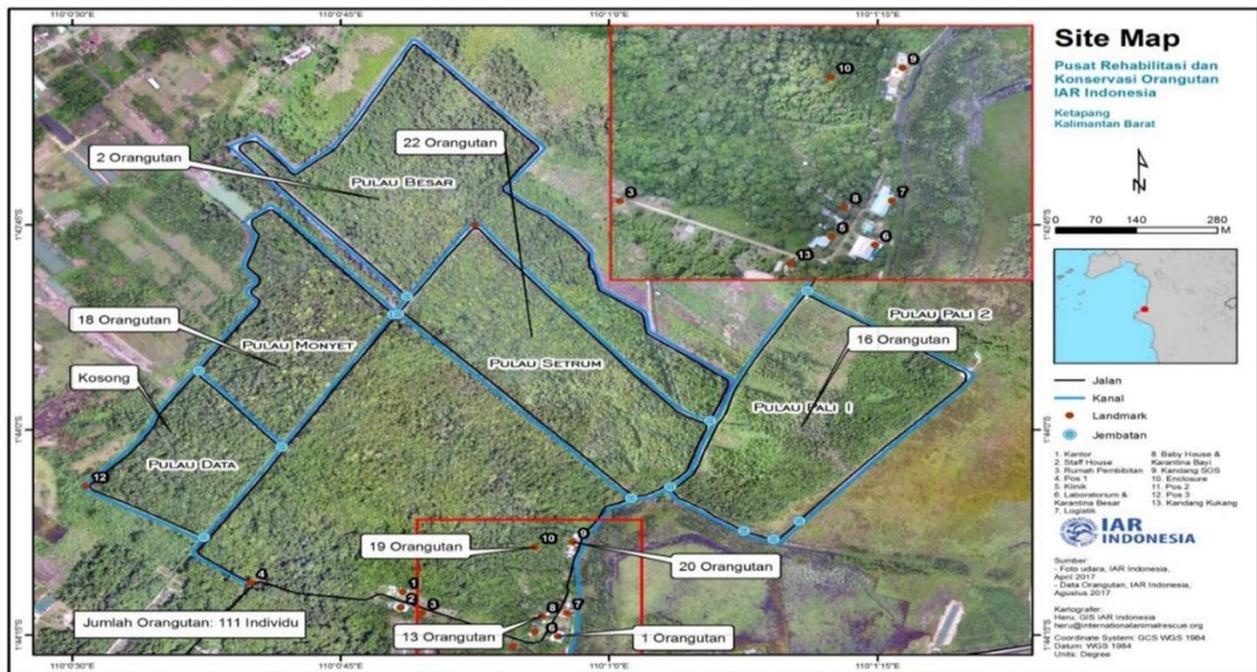


11 Rehabilitated Orangutans have been released in Semenggoh Nature Reserve (1980-1995) with 2nd Generation offspring and 3rd Generation offspring.

Wildlife Rescue Center Jogja Overview

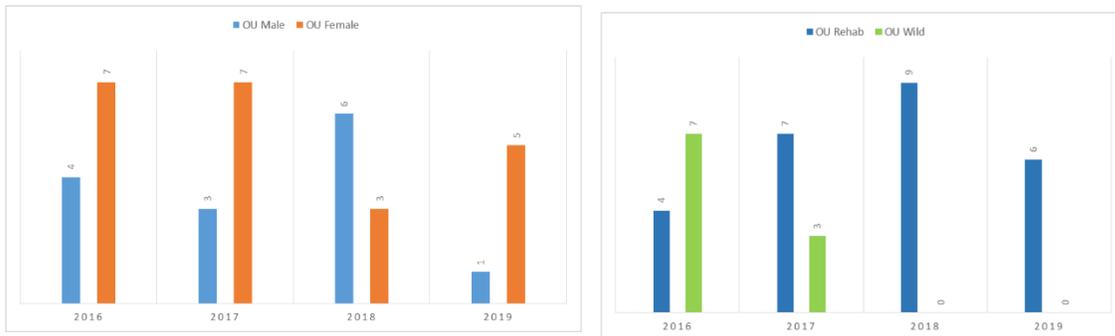
Established in 2003. Run as a non-profit NGO under Yayasan Konservasi Alam Yogyakarta (YKAY) since 2010. Most of the animals came from illegal trade, illegal ownership. Aim to rehabilitate and release the admitted animals back into their habitat. 150ish animals in our care (reptiles, bird, mammals, primates). There are 2 female orangutans and 5 males.

International Animal Rescue, Indonesia Overview



Tahun	Rescue			Release		
	Kukang	Macaca	Orangutan	Kukang	Macaca	Orangutan
2008	26	34	0	0	0	0
2009	74	24	13	0	29	1
2010	53	29	19	15	28	2
2011	21	23	23	5	20	0
2012	22	19	16	4	6	1
2013	315	20	11	91	17	12
2014	44	20	25	88	7	8
2015	63	6	22	59	22	26
2016	106	18	28	78	46	15
2017	106	9	19	109	24	14
Total	830	202	176	449	199	79

ORANGUTAN RELEASE di TNBBBR 2016 - 2019



For more details on the managers presentations, please visit OVAG website.

OVAID Presentation: www.ovaid.org Scholarship and medical supplies distribution

Worldwide Veterinary Service – medical supplies distribution



July 31, 2019 – All day at the Jogja Wildlife Rescue Center

Jogja Wildlife Rescue Center – Procedure on two orangutans and one gibbon – only experienced Indonesian vets participated on the procedure – everyone else in the workshop watched on a live feed set up in the center offices.

Dr. Ligaya – Indonesian Zoo Association

The Association is part of the Ministry of Environment and Forestry. They try to follow the 5 freedoms. Welfare issues are: Food, housing, good health (for animals and keepers), mental issues. Zoo licenses are given by the government. There is no separate association for zoo vets.

The Indonesian Zoo Association, represented by Dr. Ligaya, expressed their great interest in collaborating with OVAG, especially in terms of capacity building and expert exchange. There will be future discussions to detail the plans for this.

August 1 – last day

Raffaella Commitante, Orangutan Conservancy, California State University, Fullerton, OVAG Committee

Forensics For Wildlife Part 1 Orangutan Osteology

When thinking about Forensics, there are many subjects which sit within the field: Forensic Science / Forensic Anthropology / Forensic Everything else (there are many). For us, Forensic Science and Forensic Anthropology (which includes the study of bones) are the most relevant.

Forensic science is a blending of sciences (physics, chemistry, biology, computer science, engineering to name a few) and law enforcement. This blending is used by investigators to understand a crime scene in order to assist the laws that concern such crime scenes using a scientific perspective/methodology. This includes things such as blood spatter (physics), composition and source of drugs and trace materials (chemistry), determine identity of possible suspect(s) through DNA and other evidence (biology), weapon used etc. These are used to determine cause of death, time of death, and many other pieces of information involved in a crime scene.

Forensic Anthropology (Humans but also applicable to primates in general) analyzes human remains to assist in identifying those remains. This information is added to crime scene evidence to help identify possible age, sex, and damage from bone material for victim identification. Using the knowledge of bones, it may be possible to determine how a person died, the age of the individual, the sex, the height, even the work they did, and their overall health – just by examining bones.

Blending Forensic Anthropology and Wildlife Forensics: Wildlife Forensics involves multiple science disciplines to law enforcement involving non-human biological evidence. These sciences include: genetics, morphology, chemistry, pathology, and veterinary sciences.

Part 1 : Orangutan Morphology (Osteology): The human Form vs the orangutan form. In order to understand the orangutan skeletal system – it is necessary to understand the human skeletal system as they are very similar.



The adult human skeleton has approximately 206-208 separate bones (fused from about 300 bones at birth). The adult orangutan skeleton has a similar range.

Useful website:

<https://www.fws.gov/lab/>

<https://www.wildlifeforensicscience.org/>

<http://www.eskeletons.org/>

<https://www.pathwayz.org/Tree/Plain/APES+VS.+HOMININ+SKELETONS>

For more information and images, please refer to OVAG website.

Felicitas Flora, COP

Review of Legal Process of Borneo Orangutan (*Pongo pygmaeus*) Shooting Case

Beginning with February of 2018, there were 40 cases or orangutans shot with a total of 790 bullets spent. The use of air rifles has been regulated by the government since 2012.

In February of 2018 COP received information about a male orangutan (age 5-7 years with no left foot) who needed assistance from the Kutai National Park office. Physical examination during post mortem

revealed there were many air rifle bullets throughout the body. X-rays showed there were 130 foreign objects in the body, 48 of which were air rifle bullets. A press conference was held with BKSDA, Kutai national Park and the police. An investigative report was done by police and Law Enforcement of Ministry of Environment and Forestry. Several people were interviewed within 500 meters of the scene of the crime. After 10 days of investigation, 5 suspects were arrested (one under 17 years of age). Media was used to ensure the case was processed in the courts. People could follow the case on line. Shooting an orangutan is a crime as they are protected animals. It took 70 days to decide that the actual shooter was guilty. The sentence was 7 months imprisonment and 50 million rupiahs subsidiary of 2 months.

**Steve Unwin, OVAG Committee, Independent Wildlife Veterinary Consultant
(Chester Zoo), University of Liverpool**

DISCUSSING MENTAL HEALTH AND WELBEING IN THE VETERINARY PROFESSION: A CAUTIONARY STORY FOR OVAG

ABSTRACT

Recent research in Europe, USA and Australasia has highlighted growing concern with worsening (Weston et al 2017, Armitage-Chan and May 2018, <http://european-union-news.newslib.com/>).

This research indicates risk factors to positive mental outcomes including professional isolation and a lack of support in decision making. These risk factors are mirrored in those working in wildlife health in Africa and South East Asia namely:

- A feeling of isolation both physically and professionally from practitioners
- Enthusiastic practitioners but frequent inexperience and expertise in the area needed
- Unreasonable expectations from employers unfamiliar with veterinary training and the need for continuous knowledge sharing in the profession
- Poor remuneration from employers
- Issues of conservation 'Conservation' politics' – in practice, the main concern of veterinary practitioners is managing client expectations (RCVS unpublished data). For those of us in wildlife health work, we generally only have one client (our employer), or several client representatives.

In OVAG's recent survey (Unwin et al IN PRESS) Top five barriers to conservation health management role listed by the OVAG participants were:

1. Lack of possibility of progression in their organization
2. Rigid organizational structure
3. Patriarchal bias for senior level positions
4. Lack of continuing professional development
5. Lack of networks/ contacts

Top five barriers to improving wildlife clinical skills as listed were:

1. Lack of continuing professional development
2. Your vital skills (e.g. management/ communication etc.)

3rd equal: Your technical skills; lack of possibility for progression within the organization; Rigid organizational structure.

This discussion will explore the current situation in veterinary mental health, and ways OVAG can support our participants to mitigate or prevent negative mental outcomes including:

1. Not being afraid to discuss these issues, and providing a 'safe space' in which to do so
2. Being an effective support network as the OVAG family for individuals

3. Provide education to employers on mental health issues within the veterinary profession so they are aware of their responsibilities
4. Provide OVAG participants with information on where to find professional help as needed.

Keywords: mental health; wellbeing; risk factors

References

Armitage-Chan E, May S. (2018). Identity, environment and mental wellbeing in the veterinary profession. *Veterinary Record* doi: 10.1136/vr.104724

Weston J F, Gardner D, Yeung P. (2017). Stressors and Protective Factors among Veterinary Students in New Zealand. *Journal of Veterinary Medical Education* 44(1): 22-28.

RCVS and AVMA join forces to tackle veterinary mental health issues *European Union News*. (Sept. 13, 2018): COPYRIGHT 2018 Plus Media Solutions <http://european-union-news.newslib.com>

Burn out: 'Unintentional end point' for certain individuals who are exposed to chronic stress within their working environment. Burnout, if not managed in an appropriate way can have a negative effect on the mental and physical well-being of an employee, with the possibility of disrupting not only their professional life but also their personal life. Examples of work place stressors that may put an individual at risk from experiencing burnout are long working hours, conflict at work, work overload, high demand low control working environments and working in an environment in which there is little or no social support mechanisms (Maslach et al 2001; Lloyd and Campion 2017).

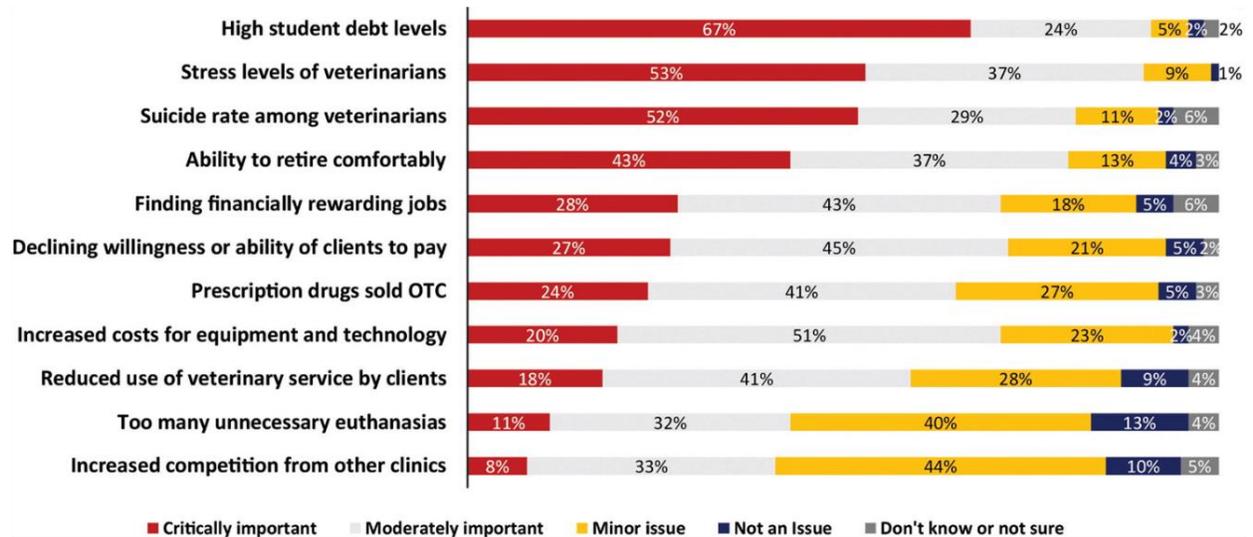
Compassion fatigue: Results from bearing witness to, and a need to relieve the suffering of others. When a person is suffering from burnout in a particular job, leaving that job will often be the solution, as it was the work place environment itself that was causing the stress. When a person is suffering from compassion fatigue, it is as a result of an emotional depletion due to the nature of their work, and therefore the solution is more complex (Yoder 2010, Faulkner et al 2016).

Amongst veterinarians in the U.K., one in four have experienced a mental health problem in the last year. 75.5% of vet students do not want anyone to know that they are struggling with a mental health problem when compared to only 41% of the general population.

RCVS Mind Matters and the AVMA's Wellbeing and Peer Assistance Initiative

"We believe that for veterinary professionals to realize their full potential and the global veterinary profession to remain sustainable, maintaining high levels of mental health and wellbeing for all members of the veterinary team is a priority. Improving veterinary mental health and wellbeing has a positive impact on individuals, the profession at large and, ultimately, animal health and welfare, and public health." Visit site: www.vetmindmatters.org

Veterinarians are three to four times more likely to die by suicide than the general population. 38.7% of vet students have experienced thoughts of suicide. <https://www.vetfutures.org.uk/resource/vet-futures-report/>



Many veterinary organizations and publishers offer resources in the form of seminars, brochures, and materials available via the Internet for veterinarians seeking help for mental health and wellbeing issues. However, as our results indicated, these resources were not widely used, and for the most part, those who did use them did not rate them very highly.

Volk, John O.; Schimmack, Ulrich; Strand, Elizabeth B.; Lord, Linda K.; Siren, Colin W.. JAVMA-MAY 15 2018; 252; 10; p1231-p1238

Qualitative evidence from OVAG

Top five barriers to conservation health management role listed by the OVAG participants were:

- Lack of possibility of progression in their organization
- Rigid organizational structure
- Patriarchal bias for senior level positions
- Lack of continuing professional development
- Lack of networks/ contacts

Top five barriers to improving wildlife clinical skills as listed were:

- Lack of continuing professional development
- Your vital skills (e.g. management/ communication etc.)
- Your technical skills; lack of possibility for progression within the organization
- Rigid organizational structure

Anecdotal evidence from OVAG

Sometimes own worst enemy – drive to do the best and compassionate/ empathetic, Isolation/ lack of support in decision making

- Inexperience
- Unreasonable expectations
- Poor remuneration

‘Conservation’ politics – in private practice it’s the clients who cause stress. For us, we generally only have one client/ or several client representatives, in a passionate industry.

Evidence from Indonesia?

In 2008, the Indonesian government recognized psychologists as health workers. But placement of a psychologist at a public health post, or Puskesmas, in Indonesia has not been considered crucial, in contrast to placements of doctors, nurses, midwives, nutritionists and sanitarians.

There are sporadic attempts to provide a psychologist in Puskesmas. The city of Yogyakarta, for example, has successfully placed a psychologist in all of its 18 Puskesmas since 2010. But no other cities or districts have similar policies.

NOVEMBER 2, 2018: 260 million people and less than 1000 psychiatrists: Indonesia's mental health worker shortage.

Steve: "I am not a therapist or a psychiatrist, but I do have mates who struggle with depression, and I have had several experiences of being thrown in the deep end as a vet (Thailand, Cameroon, first time anaesthetized an elephant etc., etc.). LISTEN, but also provide options – less 'what to you think? More 'I think we should do...'"

Helpful sites:

<https://www.bva.co.uk/Professional-development/Vets-TV/Veterinary-View/Mental-health-and-wellbeing-in-the-veterinary-profession/>

<https://www.vetlife.org.uk/mental-health/depression/>

<https://jobs.vettimes.co.uk/article/mental-health-and-the-veterinary-profession/>

https://www.vice.com/en_uk/article/xyk4xd/why-is-the-suicide-rate-among-vets-so-high

<https://myvetlife.avma.org/rising-professional/your-wellbeing/wellbeing-self-assessment>

<http://veterinarynews.dvm360.com/burnout-compassion-fatigue-depression-what-s-difference>

<https://www.avma.org/ProfessionalDevelopment/PeerAndWellness/Pages/assess-your-wellness.aspx>

Most people have an intuitive idea of what burnout is. From the research perspective, burnout is one of the elements of Compassion Fatigue (CF). It is associated with feelings of hopelessness and difficulties in dealing with work or in doing your job effectively. These negative feelings usually have a gradual onset. They can reflect the belief that your efforts make no difference, or they can be associated with a very high workload or a non-supportive work environment. Higher scores on this scale mean that you are at higher risk for burnout. From wellness assessment: scores 22 and below considers burnout. I was 42. Those 'happy and satisfied' – over 50. This made me more anxious :-/

What can OVAG do?

Collaboration and cultural understanding are key. Everyone is different and everyone responds to 'stress' in a different way.

OVAG can:

- Provide a place all feel comfortable discussing their issues
- Improve knowledge and technical abilities
- Suggest career paths
- Act as a service to employers and the IVMA to moderate expectations and to suggest remedies

Suggestions for you and your employer

How can employers of veterinary professionals provide bond-centered care yet prevent burnout and/or compassion fatigue? (Lovell and Lee 2013)

Effective health promotion strategies need to be implemented to reduce the risk factors for burnout and compassion fatigue and should include efforts from the organizational and individual levels (Deacon and Brough 2017).

Organizations can provide resources such as lifelong learning and continuing professional development workshops. Much can also be done by the individual to develop the resilience and emotional competence needed to keep compassion fatigue at bay (Barnett et al 2007).

Adaptive coping strategies are a key component of a health promotion strategy. A problem-focused strategy involves tackling problems that give rise to stress, and an emotion-focused strategy works on normalizing feelings that arise from stress (Hargrove et al 2015).

For example, emotion-focused strategies that Brenda frequently uses are to listen to music, burn incense, enjoy coffee/tea, turn on area lighting, stroke our pets, and walk outdoors, all of which stimulate the senses and help to minimize harmful stress.

Organizational Culture: imbalance issues between job demands such as sustained physical and/or psychological effort, and job resources, including organizational support structures, that assist the worker to achieve their work goals, reduce job demands and facilitate personal growth.

Building a good team environment acts as a good support mechanism and may include components such as promoting good communication skills among all members of staff, providing support to allow employees to progress in areas of further educational development and ensuring that all team members are orientated towards the same goals at work.

The provision of opportunities for ongoing learning and professional development, attention to planning and preparation, and appropriate acknowledgement of good work performance. Debriefing in the workplace can be an important component of stress reduction as it allows for events, such as euthanasia, which are perceived as stressful to be properly appraised. Cox et al 2000; Demerouti et al 2001; Moore et al 2014; Hewson 2014 <https://osha.europa.eu/en/themes/psychosocial-risks-and-stress>

Self-Care: A lack of self-care and the ability to be compassionate towards oneself during times of stress will have an effect on one's ability to provide care and compassion to others.

Some self-care strategies may not require lifestyle changes but rather a conscious decision to avoid being over-worked within one's job.

In reality many veterinary staff are not in control of their workload, as this is determined by their employer, and can include both normal and "on-call" work. Reduction in sleep hours may have a negative impact on personal performance and team effectiveness and may affect an individual's health, and therefore this may be a matter for management rather than the individual veterinary staff member.

Mindfulness-based training can help an individual to avoid negative emotion regulation strategies such as rumination and avoidance training at an early stage (e.g. undergraduate training) may better prepare an individual for the difficulties they may face in their forthcoming careers. Mills et al 2015, Cohen 2007, Bartram et al 2010, Swanson et al 2011, Dobkin and Hutchison 2013, Barnett and Curry 2011.

Psychological resilience: Characteristics of resilience are generally described as personal qualities or traits such as optimism, self-confidence, level headedness, hardiness, and having the ability to be resourceful during times of adversity.

It is important, however, that we do not only think of resilience in terms of it being a personality trait which is already present in people, but as a skill that may be improved upon over time. Veterinary examples are limited, but include a recent example of resilience training in undergraduate veterinary students: It is difficult to discuss self-care and resilience in isolation as they often work in tandem with each other, i.e. engaging in selfcare will ultimately promote a more resilient individual. Jackson et al 2007, Mealer et al 2012, Judkins et al 2005, Moffatt and Bartrum 2017.

Cognitive behavioral therapy (CBT) is a talking therapy that can help you manage your problems by changing the way you think and behave. It is most commonly used to treat anxiety and depression but can be useful for other mental and physical health problems.

How CBT works:

CBT is based on the concept that your thoughts, feelings, physical sensations and actions are interconnected, and that negative thoughts and feelings can trap you in a vicious cycle.

CBT aims to help you deal with overwhelming problems in a more positive way by breaking them down into smaller parts. You're shown how to change these negative patterns to improve the way you feel. Unlike some other talking treatments, CBT deals with your current problems, rather than focusing on issues from your past. It looks for practical ways to improve your state of mind on a daily basis.

Uses for CBT:

CBT has been shown to be an effective way of treating a number of different mental health conditions.

In addition to depression or anxiety disorders, CBT can also help people with: obsessive compulsive disorder (OCD) / panic disorder / post-traumatic stress disorder (PTSD) / phobias / eating disorders – such as anorexia and bulimia / sleep problems – such as insomnia / problems related to alcohol misuse

CBT is also sometimes used to treat people with long-term health conditions, such as:

irritable bowel syndrome (IBS) / chronic fatigue syndrome (CFS)

Although CBT can't cure the physical symptoms of these conditions, it can help people cope better with their symptoms.

What happens during CBT sessions?

If CBT is recommended, you will usually have a session with a therapist once a week or once every 2 weeks. The course of treatment usually lasts for between 5 and 20 sessions, with each session lasting 30 to 60 minutes. During the sessions, you'll work with your therapist to break down your problems into their separate parts, such as your thoughts, physical feelings and actions. You and your therapist will analyze these areas to work out if they're unrealistic or unhelpful, and to determine the effect they have on each other and on you. Your therapist will then be able to help you work out how to change unhelpful thoughts and behaviors. After working out what you can change, your therapist will ask you to practice these changes in your daily life and you'll discuss how you got on during the next session. The eventual aim of therapy is to teach you to apply the skills you have learnt during treatment to your daily life. This should help you manage your problems and stop them having a negative impact on your life, even after your course of treatment finishes.

Pros and cons of CBT:

Cognitive behavioral therapy (CBT) can be as effective as medication in treating some mental health problems, but it may not be successful or suitable for everyone.

Some of the advantages of CBT include:

it may be helpful in cases where medication alone has not worked

it can be completed in a relatively short period of time compared with other talking therapies

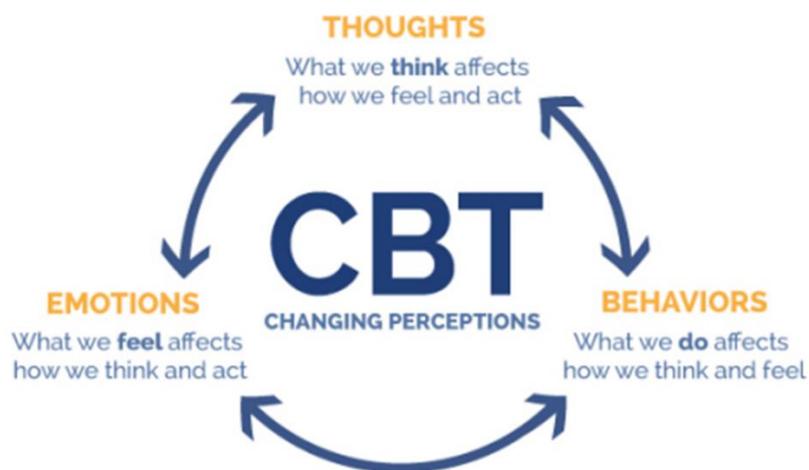
the highly structured nature of CBT means it can be provided in different formats, including in groups, self-help books and apps (you can find mental health apps and tools in the NHS apps library) it teaches you useful and practical strategies that can be used in everyday life, even after the treatment has finished

Some of the disadvantages of CBT to consider include:

you need to commit yourself to the process to get the most from it – a therapist can help and advise you, but they need your co-operation

attending regular CBT sessions and carrying out any extra work between sessions can take up a lot of your time - it may not be suitable for people with more complex mental health needs or learning difficulties, as it requires structured sessions - it involves confronting your emotions and anxieties – you may experience initial periods where you're anxious or emotionally uncomfortable - it focuses on the person's capacity to change themselves (their thoughts, feelings and behaviors) – this doesn't address any wider problems in systems or families that often have a significant impact on someone's health and wellbeing

Some critics also argue that because CBT only addresses current problems and focuses on specific issues, it doesn't address the possible underlying causes of mental health conditions, such as an unhappy childhood.



Hopefully OVAG can help you through this – dealing with stress is different for everyone – OVAG can provide a place where everyone feels they are comfortable enough to discuss this issue – it is not just everyone helping you but you also helping yourself – self care – we often forget about our self – save some compassion for yourself!

What we think affects how we feel and act – what we do affects what we think and fee – what we feel affects how we think and act - By talking through the issues, we can find solutions.

Promote potential of OVAG to relieve some of the issues

Discussion: This is especially important for vets working in the field – it is important to support each other – talk to someone if you feel you need help – it can be lonely work – if you have a senior talk to them – there are times when you feel you should tell someone just shut and get on with it – but that is wrong – we need to be more compassionate to ourselves – needs self-resilience – all of us has parts of our job that we cannot stand but we have to do them - but if you can find something that you really love and do more of that in your job – understanding that everyone has limitations and challenges – none of us is perfect – most of us doing rehab work is very emotional we want to make everyone happy and we are trying so hard – it takes a lot of

energy talking to managers etc., and you get more and more tired – but you need to speak to them – think about what you need to make your life better – be clear what it will take – say things like: we really need another vet, or I need a higher salary in order to perform better – never keep it in – let it out – talk it out – be a little selfish so you are mentally and physically healthy – every time I face rejection I use that as a challenge – and gives me more spirit – as a wildlife hero – ask yourself: what made me want to do this and it will make me strong.

Irhanma Putri R, Jogja Wildlife Rescue Center

Results from live feed session....x-ray: orangutan mother: pneumonia maybe – present for a long time
It is important to carry on the process after the procedure ends - we need to keep a close eye on the orangutans – making sure that team changes scrubs, and that everything gets disposed of properly – make sure instruments are cleaned and stored properly for the next time – pay attention to where your mask is – especially during intubation because you can easily get coughed in your face – as there may be transmittable viruses, we really need to protect ourselves as we do not know what we are dealing with.

Jennifer Taylor-Cousar, National Jewish Health / Nancy Lung, Orangutan SSP, Smithsonian Global Health Program, Journal of Zoo and wildlife Medicine, OVAG Committee

Topics in Intensive Care

Most likely cases:

“Found Down”

Severe respiratory disease

Infectious disease

 Meliodosis

 Malaria

Emaciation/malnutrition

Trauma

Regardless of diagnosis – there are some principals of patient care that can get you through the crisis portion
Homeostasis: “The state of stable internal physical and chemical conditions”.

Allow the patient to spend their energy healing.

When the body is in a severe depressed state – it wants to get back to homeostasis – and there are things you can do to support that need to get back.

Stabilize the animal so they can focus on the energy needed for healing

How can you then support homeostasis?

Fluid balance is known to be important but there is a whole science devoted to fluid management/therapy – there is more to it than having an IV line, the importance is getting electrolytes balanced and it needs to be done quickly – if they have not been eating they are in a negative energy balance and that delays healing – pay attention to body temperature, hygiene and body condition – physical comfort and provide a low stress environment

Fluid therapy – think of rescue fluid therapy as the true emergency – 20-40 ml/kg every 15 minutes – so it is a lot of fluid that is needed –

What do you do when you have an orangutan that is dehydrated and sick – what should you do?
 Optimization organ rescue – calculate the rehydration and add to that how much fluid you need in daily life - if they are urinating regularly then you are most likely meeting their fluid intake needs.

Calculate how much you need per hour, per minute or per second to reach maximum fluid intake – maybe 3 drops per second – will make a huge difference in patient outcomes if you administer enough fluids and proper amounts of fluids – knowing how to measure fluids is particularly important in babies as too much can be bad.

Fluid Therapy

	Rescue	Optimization	Stabilization
Principles	Lifesaving	Organ rescue	Organ support
Goals	Correct shock	Optimize and maintain tissue perfusion	Aim for zero or negative fluid balance
Time (usual)	Minutes	Hours	Days
Phenotype	Severe shock	Unstable	Stable
Fluid therapy	Rapid boluses	Titrate fluid infusion conservative use of fluid challenges	Minimal maintenance infusion only if oral intake inadequate
	20-40ml/kg Bolus (15min)	dehydration + maintenance over 4-6 hours	2-4ml/kg/hr

<https://www.fluidacademy.org>

Fluid Calculation

52kg adult female orangutan
 5% dehydrated

Replacement fluid:

$$52\text{kg} \times 5\% \text{ dehydration} = 2.6\text{kg fluid} = 2600\text{ml}$$

Maintenance Fluid:

$$50\text{kg} \times 3\text{ml/kg} \times 5\text{hr} = 900\text{ml}$$

$$2600\text{ml} + 900\text{ml} = 3500\text{ml over 5hr} = 700\text{ml/hr}$$

Infusion set = 15drops/ml

$$700\text{ml} \times 15\text{drops} = 10,500 \text{ dr/hr} = 175\text{dr/min} = \mathbf{3\text{dr/second}}$$

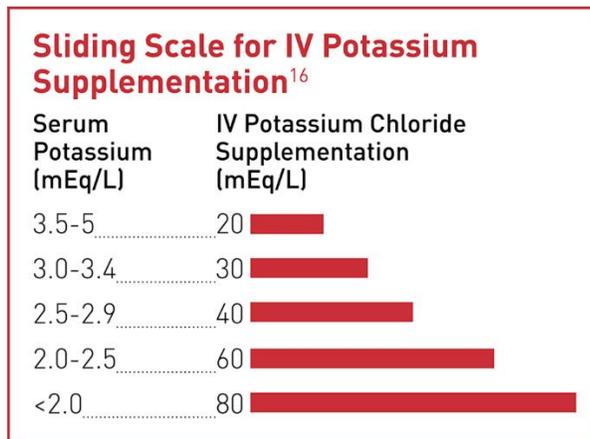


Hypokalemia – potassium must be managed properly as it is important for all cells

- Weakness and Fatigue
- Muscle Cramps and Spasms
- Digestive Problems
- Cardiac arrhythmia
- Muscle Aches and Stiffness
- Tingling and Numbness
- Breathing Difficulties
- Mood Changes

If potassium amounts go above 6 you may have cardiac issues and too low can also be problematic – sliding scale for potassium supplementation- stabilize them first then administer potassium – mix it well....if orangutan are obese, do not use a per kilo guideline – as it will be too much.

Normal serum level is 3.5-5.0 mEq/L



<https://www.cliniciansbrief.com>



Intravenous catheter management:

Why do we change catheters every three day – a new guideline for humans – recommendation is to leave it in until you need to change – not sure if this applies to orangutans as it is a different environment – a sign of inflammation – swelling and warmth (pink) – maybe adding antibiotic ointment to insert site before wrapping may help – if you know you are going to leave it in for a few days – make sure you do a really strong pre-prep of the site – needs to be flushed because you have blood cells present and it will clot – catheters do stop working and so you flush it which can be dangerous as you are pushing the clot into the body – the best way is to not allow clotting – heparin can be good to prevent clotting – keeping catheter in is always tricky.

Need good, aseptic placement

Must check the site regularly for swelling, inflammation

Important to prevent clotting in the catheter

Must keep the orangutan from pulling it out

Catheter choices:

Traditional catheters do not allow you to draw blood through – a new one (it is expensive) but do keep one or two around – they are a thick line and can be left in for months – and you can draw blood through it – very resistant to clotting – need only one flush a day – so no need to find a new vein each day – needs some practice – for ICU cases they are really great.

How do you keep a catheter in an orangutan? Need to have staff watching, positive negative reinforcement or even cast the site (in zoos this seems to work) – try sedatives – ambian works well – as they calm but can still eat and drink.

IV catheters

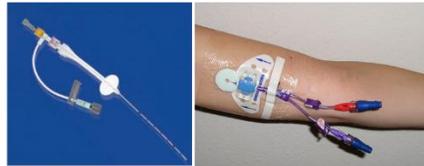
Traditional

- Fairly rigid polyurethane
- Tendency to kink at the base
- Should be changed every 4 days
- Prone to clots—need to be flushed q4hr. Flush with heparin 100IU/ml!
- Cannot draw blood through it



PICC Catheter

- Soft, flexible silicone
- Does not kink
- Can be left in for more than a month
- Does not clot easily—can flush once a day
- Can draw blood (double lumen type)



Nutritional support – in ICU conditions nutrition can often get lost – let them eat anything as long as they are eating – but the body is in a crisis state and needs to heal – so the metabolic rate is high (during illness can be 2-5x above basal) – so orangutans may need more calories per day to meet their needs and vitamins are needed and if they are water soluble they will be urinated out each day – so they need to keep administering them to help their immune system function better – give them B vitamins which will enhance immune function – vitamins, amino acids and dextrose when you need it – so if a patient does not want to eat protein it needs to be given through the IV via amino acid drip. Protein drinks can also be useful as well as hard boiled eggs – gummy vitamins work well too but not easily available - can use the ones for children.

Vitamin B12: B-cell synthesis and T-cell multiplication

Vitamin A: enhances the lymphocyte proliferation and mitogen stimulation.

Vitamin B6: enhances antibody production and communication between cytokines

Vitamin C: increases phagocytosis, lymphocyte proliferation and neutrophil chemotaxis

Intensive Care Procedures to Master:

Placement and management of long-term IV catheter

How to manage fluids and electrolytes

Thoracentesis

How to safely pass a gastric tube

Blood transfusion

Management of acute respiratory distress

Jennifer Taylor-Cousar, Professor of Medicine and Pediatrics, Divisions of Pulmonary, Critical Care and Sleep Medicine and Pediatric Pulmonary Medicine, Medical Director, Clinical Research Services, Co-Director and CF TDN Director, Adult CF Program National Jewish Health

Acute Respiratory Distress and Pleural Effusion Management

Tripod position –bent over is a good position to breathe easier as it helps suck in air.

Signs of Acute Respiratory Distress

•Vital signs

- Tachypnea
- Tachycardia
- Hypoxia

•General

- Change in body position to assist in breathing (tripod, head tilted back)

•Skin

- Pallor or cyanosis especially lips, nail beds
- Diaphoresis

•Affect

- Irritable, lethargic

•HEENT

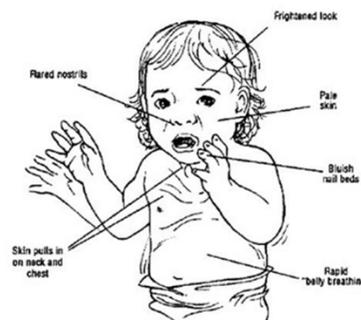
- Nasal flaring
- Accessory muscle use of the scalenes
- Noisy breathing (stridor, grunting)

•Chest

- Retractions
- Accessory muscle use of the intercostals

•Lungs

- Wheezing
- Absent breath sounds
- Crackles
- Prolonged expiratory phase



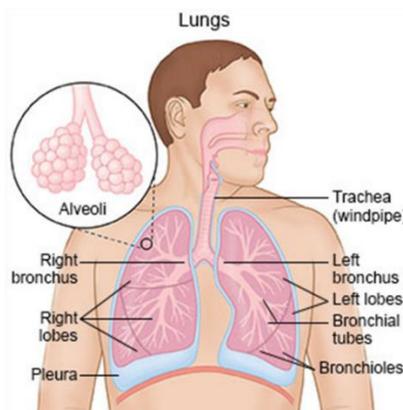
Picture 1 Some signs of respiratory distress.

Adapted from Nationwidechildrens.org

Where is the problem? Upper part of the airway? The lungs?

Differential Diagnosis of Acute Respiratory Distress

- Upper airway
 - Anaphylaxis
 - Infections of the pharynx and neck
 - Tracheal trauma
- Lower airway
 - Bronchiolitis
 - Asthma
- Lungs
 - Pneumothorax
 - Pleural effusion
 - Traumatic injury (pulmonary contusion, tension ptx, hemothorax)
 - Infection
 - Non-cardiogenic pulmonary edema (acute respiratory distress syndrome)



Evaluation of Acute Respiratory Distress

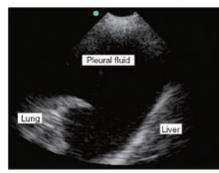
- History
 - Exposures (other sick animals/people, medications)
 - Trauma
 - Comorbid disease
- Exam
- Imaging
 - CXR
 - Ultrasound
 - CT scan



sm.stanford.edu



Radiologytutorials.com



nuemblog.com



pinterest.com/pin/352828952038007093/

Management of Acute Respiratory Distress

- Immediate
 - Supply O₂
 - Manually assist breathing
 - Make a decision about intubation
 - Subsequent
 - **DRIVEN BY CAUSE**
- Upper airway
 - Anaphylaxis
 - Infections of the pharynx and neck
 - Tracheal trauma
 - Lower airway
 - Bronchiolitis
 - Asthma
 - Lungs
 - Pneumothorax
 - Pleural effusion
 - Traumatic injury (pulmonary contusion, tension ptx, hemothorax)
 - Infection
 - Non-cardiogenic pulmonary edema (acute respiratory distress syndrome)

Non-Pulmonary Causes of Acute Respiratory Distress

- Cardiac
 - Cardiomyopathy
 - Tamponade
 - Pulmonary edema
- Neurologic
 - Neuromuscular disease
 - e.g. Guillain-Barré syndrome
- Toxic/metabolic
 - Poison
 - e.g. organophosphates, carbon monoxide
 - Toxin-related metabolic acidosis
 - e.g. methanol/ethylene glycol ingestion



pubs.rsna.org



safeproof.org

Carbon monoxide poisoning – Carbon monoxide is a potentially lethal toxin that impairs oxygen transport. Carbon monoxide poisoning may present with tachypnea and acute dyspnea in moderate cases and pulmonary edema in severe cases.

Animals can get anaphylactic shock as an allergic reaction to antibiotics. Anaphylaxis – steroids may help, bronchiolitis – needs lots of fluids – steroids do not help but bronchi dilators – neumo thorax – 100% oxygen but you may need to do a chest tube – very difficult to maintain – would need to sedate animal.

Pleural effusion: build up of fluid in space lining the lung – tapping along the back –you will hear a dull thud (practice) so you can tell the difference in sound between a hollow sound (no issue) and a dull sound (possible issue). Can occur with infection (e.g. pneumonia=parapneumonic effusion), sepsis (“third spacing”), heart failure (↑ oncotic pressure).

Size matters: Mild fluid accumulation=asx / Large effusions can greatly compromise breathing

When to Perform Thoracentesis:

Diagnostic

Determination if the effusion is transudative (fluid) or exudative (infection) (suggests etiology)

Provide culture data for treatment

Therapeutic

Dyspnea

Transudate versus Exudate:

Two-test rule

- Pleural fluid cholesterol greater than 45 mg/dL
- Pleural fluid LDH greater than 0.45 times the upper limit of the laboratory's normal serum LDH

•Three-test rule

- Pleural fluid protein greater than 2.9 g/dL (29 g/L)
- Pleural fluid cholesterol greater than 45 mg/dL (1.165 mmol/L)
- Pleural fluid LDH greater than 0.45 times the upper limit of the laboratory's normal serum LDH

Light’s criteria: •Pleural fluid protein/serum protein ratio greater than 0.5

- Pleural fluid lactate dehydrogenase (LDH)/serum LDH ratio greater than 0.6
- Pleural fluid LDH greater than two-thirds the upper limits of the laboratory's normal serum LDH

Tests to Order for Diagnostic Thoracentesis:

Gram stain and culture / LDH / Glucose / Protein / Cholesterol / (Cytology)

Therapeutic Thoracentesis:

Technique... Vacuum bottle.... Large volume syringe (stopcock)

Tips... Keep pleural space closed to air at all times... Use stop cock or clamp... Do not remove more than 1.5 L during a procedure.

Discussion: Is there a problem with gastritis in long term patients? There are many things we did not get to discuss today – no real treatment for it – for humans, gastric tube and drip in liquid food so they get the gut moving just a bit – erythromycin could work as well – to move things through the gut –

General Information:

New Book – Parasites in Great Apes

OVAG Jeopardy – three groups – Tapanuliensis / Bornean / Sumatran

Jati's team – Tapanuliensis won – prizes distributed

T shirt Design Contest – Winner's t-shirt will be made for OVAG 2020

OVAG Committee meeting – planning for the future

OVAG 2020: July 5-12 (this includes a possible 3 day pre workshop for limited vets from centers lead by Nancy Lung) Exact number of days to be determined.

Location: Possibly BOSF – Samboja or Nyaru Menteng





Orangutan Veterinary Advisory Group Workshop

28 July – 1 August 2019



Section Four

Appendices

- 1. Participant Evaluation**
- 2. Participant Feedback and Comments**
- 3. OVAG Participant Perception: Stress and Anxiety**
- 4. Preparedness for disasters**
- 5. UGM Ethical Clearance for Practical at Jogja Wildlife Rescue Center**

1. Participant Evaluation:

<u>EVALUATION</u>	<u>Strongly Agree</u>		<u>Agree</u>		<u>Neutral</u>		<u>Disagree</u>		<u>Strongly Disagree</u>		<u>TOTAL</u>
<u>New Knowledge:</u> Did I gain useful knowledge?	61	87%	9	13%	0	0%	0	-	0	-	70
<u>New Ideas:</u> Did I gain new ideas that will improve the way I do my job?	45	64%	24	34%	1	1%	0	-	0	-	70
<u>Applying the learning:</u> Will I use the information?	39	57%	30	43%	0	0%	0	-	0	-	69
<u>Applying the learning:</u> Have I been shown how to impart this knowledge to colleagues and managers?	27	39%	34	49%	8	12%	0	-	0	-	69
<u>Effect on results:</u> Do I think the ideas and information provided at this workshop will improve the way I do my job?	45	64%	24	34%	1	1%	0	-	0	-	70
<u>Effect on results:</u> Do I think the ideas and information provided at this workshop will improve the health of the animals under my care?	39	60%	21	32%	5	8%	0	-	0	-	65

2. Participant Feedback and Comments

Best things comments	
GENERAL	BEST SESSION
networking x30	general exam workshop with video streaming x8
learn from each other x15	mental health x3
upgrading professional skillsx14	nutrition x2
very interesting & varied topics x8	gibbon paralel session x2
very educative for managers, gaining new knowledge especially in orangutan health x8	anesthesia x2
friendly and open people, positive vibe, nice interaction among speakers, participants, and organizer x8	jeopardy
nice hotel facilities x4	diagnostic lecture (Tb)
organizing committee very helpful and up for suggestion to improve x3	intensive care
encourage participants on critical thinking ("change point of view", " learn to make responsible actions based on well-thought reasons" x3	sharing session, presentation
inspiring network/group x2	forensic
gives platform for Indonesian vets to speak up	OVAID bazaar
consistency and continuous training	topic related to the environment and human, linked with animals --> disaster preparedness
qualified speakers	

Things to improve comments

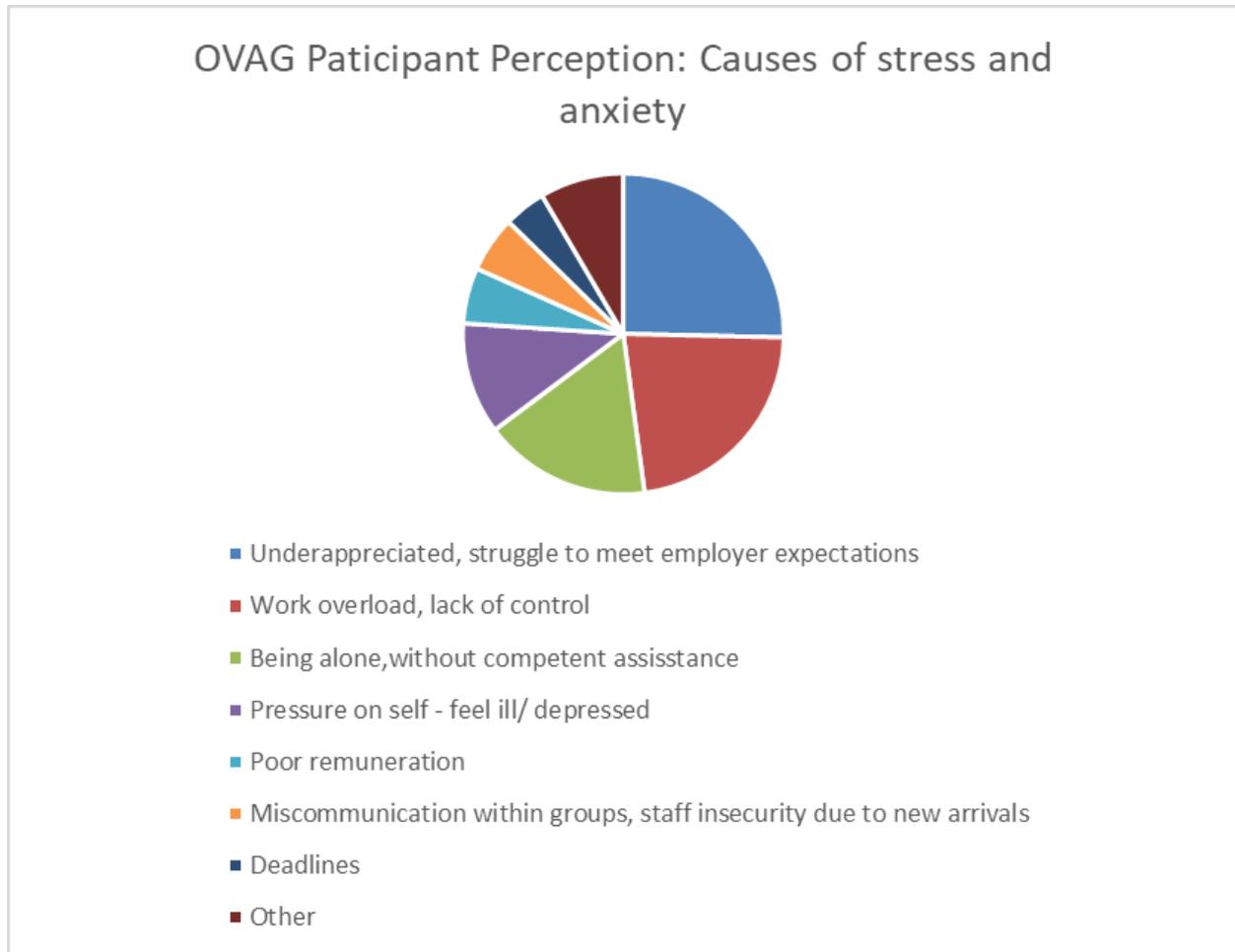
GENERAL	SESSIONS TO IMPROVE/SUGGESTION FOR NEXT YEAR
time management (schedule too intense, less time to rest, need more time/ for discussion, heavy topics to be put in the morning sessions) x16	practical in diagnosing/examination orangutan&gibbon x3
more workshop / practical x15	make a parallel round-table with ou vets/gibbon&others/management/behaviour etc so we can directly discuss with experts
more discussion time, especially during case studies presentation, would prefer more in-depth discussions x9	dentistry
free time x6	gather more info about small apes/primates (langur)
too many delegates x4	ultrasound and x-ray
language barrier, request indoensian translation, english too fast x3	
more games/outdoor activities x4	
Case studies sessions: need longer time, need categorization, make priority for cases that need immediate advice, and review as part of continuous training x3	
course notes / materials x3	
pre-workshop communication	
structured lectures (basic and advanced)	
collaboration among centres	
repeat summaries of previously covered subjects to emphasise importance	
training for speakers doing case presentation	
connect more with experts from Africa	
hold a similar workshop for keepers	
elaborate more for the managers session in regard to vet medicine, animal welfare, etc	
most rehab centres experience lack of governance from the political leaders. To ensure the long term and the future success of the orangutan programs, we should organize a session on how to influence and get support from political leaders	
update info on website	

How will I use the information I have gained comments

GENERAL	SPECIFIC TOPICS
implement in centre x 35	new ideas from general anesthesia
present/discuss to colleagues in centres x23	disease screening of animals
improve diet, enclosure x7	importance of biosecurity
support the vets x4	vet role and mental health, will be used in my daily work, hopefully I can be able to manage my difficulties x2
use the network x4	
explore possibilities of new treatments and ideas x4	
encourage and respect myselfx2	
to be better in providing advise/input/share protocols/SOPs to centres, based on the knowledge and the network gained at OVAG x6	
doing more research/area of study x6	
enhance ongoing management in disaster preparedness in wildlife	
use material to teach	
give ideas of things that can be done by non-animal people	
critical analysis and modify protocols when needed	
gaining a better understanding in ou conservation	
use information to compare what is done in other places	

3. OVAG Participant Perception: Stress and Anxiety

The following chart represents responses from the 2019 participants (number of respondents: 43, number of responses: 123). These responses are in agreement with previous responses to these issues and will be used to guide future efforts of OVAG to help mitigate the risks of stress in the workplace and to encourage positive mental health attitudes within OVAG participating organizations.



4. Preparedness for disasters

Workbook

Training workshop for OVAG 2019 Workshop

Name

Yogyakarta Java Indonesia

28 July to 1 August 2019



1. Hazards, disasters and disaster risks

Hazards

A. Fill in the blanks

A hazard is a natural or process

A hazard has the potential to

A hazard is defined by location, size and

frequency and probability

B. Examples of natural Geological hazards are

1. Volcanic eruption

2.

3.

C. Examples of natural Meteorological hazard

1.

2.

3. Lightning strike forest fire

D. An example of a biological hazard is

E. Examples of human-made hazards

1.

2.

3 Environmental degradation

Disasters

F. A disaster results from the interaction between

1. Exposure of a community to a hazard

2. of a community to a hazard, and

3. of a community to

with impacts of a hazard.

G. List the four (4) environments that may be impacted by a hazard

1.

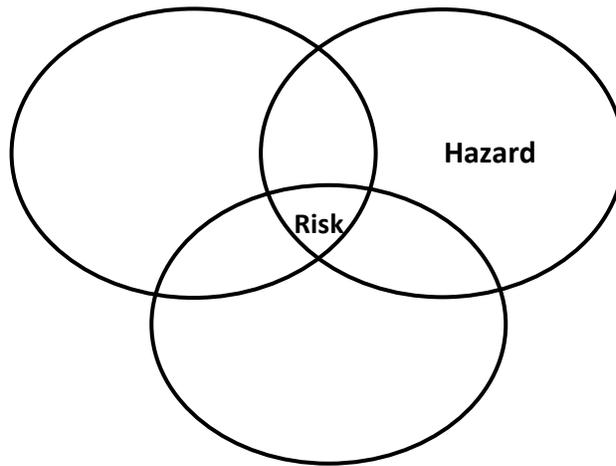
2.

3.

4.

Disasters and risk

H. Complete the diagrammatic representation of disaster risk by the addition of a word in each of the two circles without a label / word.



Managing disaster impacts using all hazards approach -

prevention, preparedness, response and recovery (PPRR)

I. Draw a line to match the word on the left with the meaning on the right

Prevention	prepare the community and responders to cope with disasters.
Preparedness	return of affected community to normal (new normal)
Response	eliminate or reduce the incidence or severity of disasters.
Recovery	minimise immediate consequences of disasters.

Preparedness

J. Complete the blanks

Good preparedness is

<ul style="list-style-type: none"> • founded on a good understanding of the <input type="text"/>
<ul style="list-style-type: none"> • abilities to <input type="text"/> a community to a predicted or known threat from a hazard

• coordination of response arrangements between organisations and communities
• development of systems of management,
• a wide array of <input type="text"/>
• <input type="text"/> including stockpiling of equipment and supplies.

k. Complete the list of five (5) elements of good preparedness

1. _____
2. _____
3. _____
4. Capacity and capabilities
5. _____

K. Explore the 5 elements of good preparedness in the local situation

Choose

- A Local hazard(s)
- Hazard impacts – four environments?
- Existing disaster measures
- Actions around each of the 5 elements of good preparedness
 - Governance
 - Systems
 - Documentation
 - Capacity and capability
 - Usage / rehearsal

Record notes in the following blank space

Strategic risks for good preparedness (PEESTOLM)

L. Complete the word for each of the eight (8) strategic risks described by the acronym, and a very short description for each of the risks where there is no description

1. P Risks at each level of official and senior managers of large corporations and agencies

2. Environment -

3. E

4. S

5. T Risks related to the hazards and interactions between the risks arising from the hazards and the proposed response measures.

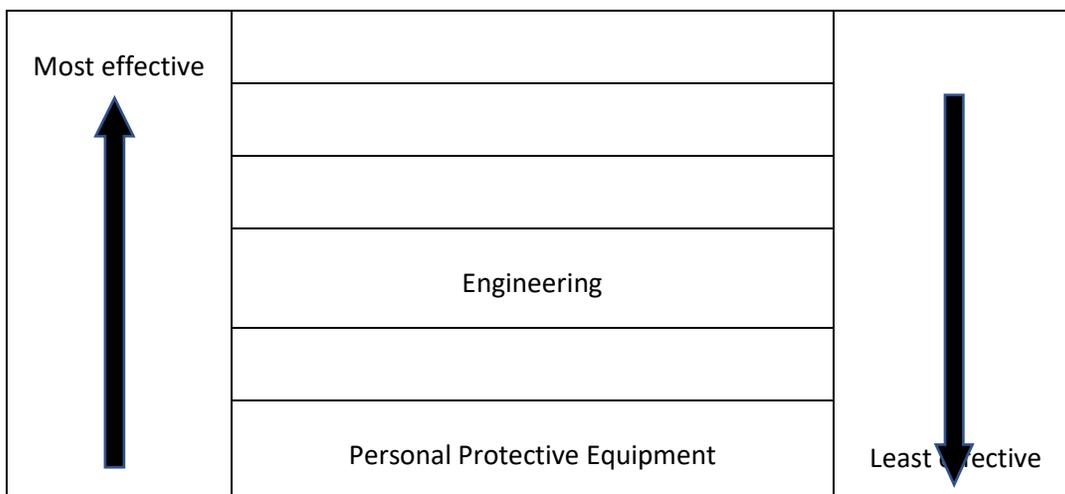
6. O

7. L Risks including those relating to the legal authority to complete the proposed response activities, and alignment between legal obligations

8. M

Risk treatment

M. Complete the hierarchy of control for risk treatments



Monitoring and reviewing preparedness

N. List three (3) reasons why monitoring and review should be undertaken or what are three (3) outcomes of completing monitoring and review.

1.

2.

3.

Communications and consultation

0. Undertaken as part of preparedness what will community engagement with the local community and responder result in if undertaken over time? Short answers only.

5. UGM Ethical Clearance for Practical at Jogja Wildlife Rescue Center



UGM ethical
clearance.pdf

UNIVERSITAS GADJAH MADA FAKULTAS KEDOKTERAN HEWAN KOMISI ETIK PENELITIAN
KETERANGAN KELAIKAN ETIK (Ethical clearance) Nomor: 0088/EC-FK/2019
Komisi Etik Penelitian Fakultas Kedokteran Henran, Universitas Gadjah Mada, Yogyakarta, setelah
mempelajari dengan seksama nncangan penelitian&egrakn yang diusulkan, deagan iai
menyatakan bahwa:

Judul : oraag utaa Advisory Group: Praktik Anestesi umum dan pemeriksaan Fisik pada Orang Utan
dsn Owa Feneliti Utama : drlr- Fraasiska Sulistyو Lembaga / Tempat Fenelitian : Fakultas
Kedokteran Hewan Universitas Gadjah Mada

Telah diayatakan memenuhi persyaratan stik untuk dilaksanakan. Komisi Etik Penelitian
mempunyai hak ur\$uk melakukan pemantauan selama penelitia*kegiatan berlangsung.

Yogyakarta, 29 JElI 20 19

Ksmisi EtikPenelitiai

,,:..ilriFstrns

GAn,, 'dd''t

UNIVERSITAS GADJAH MADA FAKULTAS KEDOKTERAN HEWAN KOMISI ETIK PENSLITIAN
KETERANGAN KELAIKAN Bfik (Ethieal ele*r*ncr) Nomor: 0088/EC-FK/2019

Kamisi Etik Peneliti*n Fakultas Kedokteraa Hewan, Universiti*n Gadjah Mada, yogyakarta setelah
mempelajari dengan seksama nmcengefl peaelitian/kegrataa yang diusulkan, dengan ini
menyatakan bahwa:

Judul : oraag utan Advisory Group: Praktik Aaestesi umum dan pemeriksaan Fisik pada Orang Utan
dan Owa Peneliti Utama : drh Fransiska Sulistyو Lembaga / Tempat Penelitian : Fakultas
Kedokteran Hewan Universitas Gadjah Mada

Telah dinyatakan memenuhi persyaratan etik untuk dilaksanakan. Komisi Etik Penelitian
mempunyai hak untuk melakukas pemantauan selama penelitimkegiatan berlangsung.

Yogyakarta 23 JluJiZAI,9

Komisi EtikPenelitian

Keflra,

