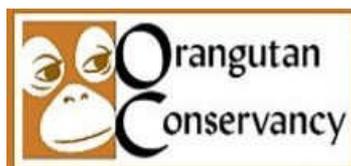


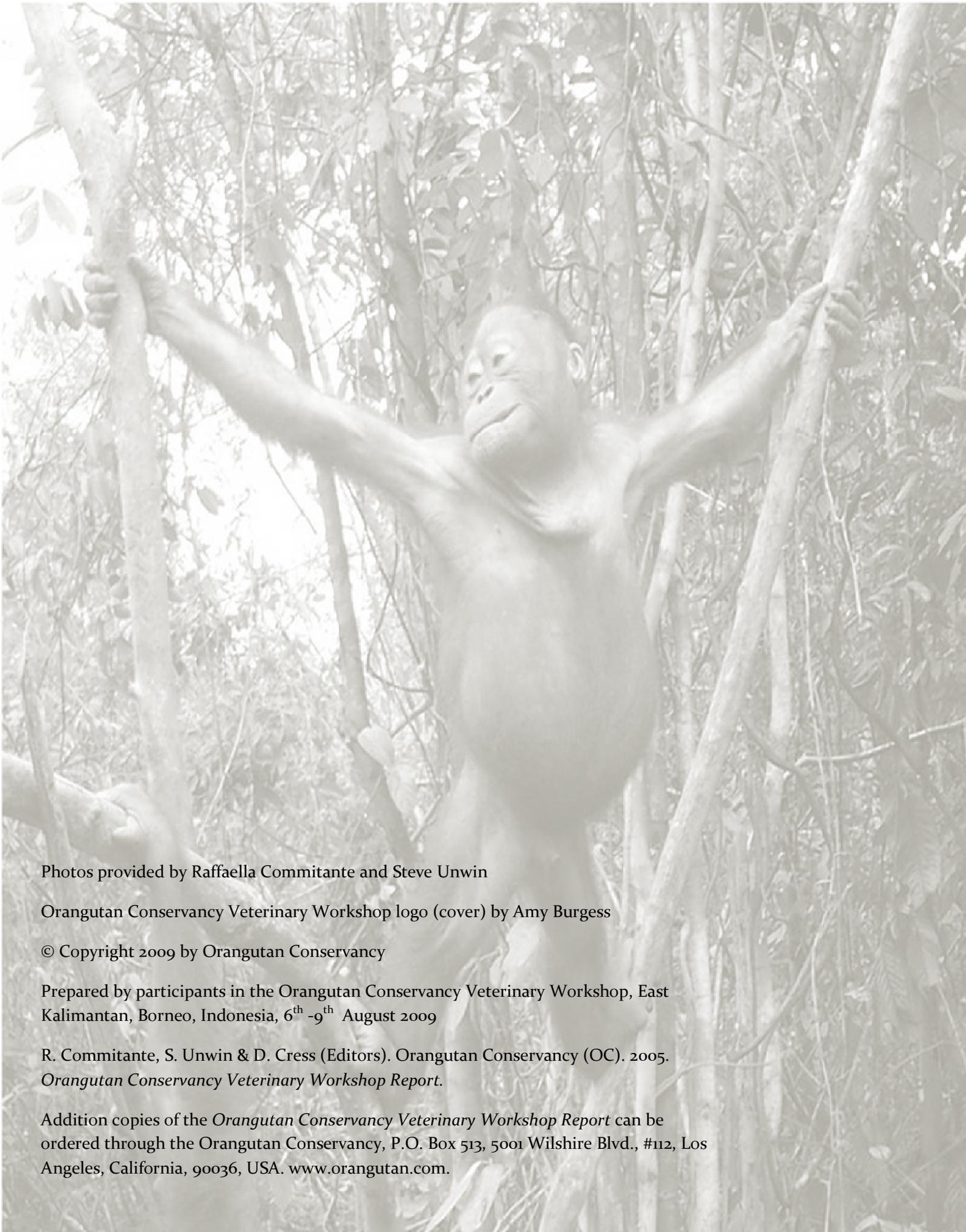


# Orangutan Conservancy Veterinary Workshop

August 6 – 9, 2009

Samboja Lestari, Margo Mulyo, Balikpapan , Kalimantan Timur  
Indonesia





Photos provided by Raffaella Commitante and Steve Unwin

Orangutan Conservancy Veterinary Workshop logo (cover) by Amy Burgess

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Prepared by participants in the Orangutan Conservancy Veterinary Workshop, East Kalimantan, Borneo, Indonesia, 6<sup>th</sup> -9<sup>th</sup> August 2009

R. Commitante, S. Unwin & D. Cress (Editors). Orangutan Conservancy (OC). 2005.  
*Orangutan Conservancy Veterinary Workshop Report.*

Addition copies of the *Orangutan Conservancy Veterinary Workshop Report* can be ordered through the Orangutan Conservancy, P.O. Box 513, 5001 Wilshire Blvd., #112, Los Angeles, California, 90036, USA. [www.orangutan.com](http://www.orangutan.com).

# **Orangutan Conservancy Veterinary Workshop**

**August 6 – 9, 2009**

**Samboja Lestari, Margo Mulyo, Balikpapan Indonesia**

## **Participating Organizations:**

Orangutan Conservancy, United States  
Chester Zoo / NEZS, United Kingdom  
Liverpool School of Tropical Medicine, United Kingdom  
Murdoch University, Australia  
Quarantine Palangkaraya, Indonesia  
Sumatran Orangutan Conservation Programme (SOCP), Indonesia  
Orangutan Foundation International (OFI), Indonesia  
Syah Kuala University, Indonesia  
Gadjah Mada University, Indonesia  
Nyaru Menteng Orangutan Rehabilitation Center, Indonesia  
BOS Wanariset, Indonesia  
Syah Kuala University, Indonesia  
Gunung Palung Orangutan Conservation Project (GPOCP), Indonesia  
BOS Switzerland, Switzerland  
Orangutan Foundation, Indonesia

## **Supporting Organizations:**

Orangutan Conservancy  
Chester Zoo  
American Association of Zoo Keepers (Birmingham, AL)  
Oregon Zoo's Future for Wildlife  
Fresno Chaffee Zoo

## **Hosted by:**

Samboja Lestari, Margo Mulyo, Balikpapan , Kalimantan Timur Indonesia

# **Orangutan Conservancy Veterinary Workshop**

## **2009 Workshop Report**

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## **Orangutan Conservancy Veterinary Workshop**

### **2009 Workshop Report**



## **Section 1**

# Orangutan Conservancy Veterinary Workshop

August 6-9, 2009

## Executive Summary

The orangutan rescue and rehabilitation centers in Indonesia are few and greatly over-burdened, and the thin line they straddle between captivity and the wild makes it even more imperative that they offer the best possible veterinary healthcare. Unfortunately, that is not currently the case. These centers are compromised by a difficult set of obstacles, including a lack of training, resources, and time, among others. But equally confounding is the lack of coordination and cooperation among the rehabilitation centers in Sumatra and Borneo, which often exist in direct competition with – or at the least independently from -- one another.

With approximately 63,000 orangutans remaining in the wild - and the captive population in rehabilitation centers rapidly expanding to 1,500 and beyond - it is clear the current system cannot be sustained. The orangutans that are judged fit to return to the wild are reintroduced through a long, complex process, but the overwhelming majority continue to reside in the rehabilitation centers, where issues of husbandry, disease control, and welfare take center stage.

Therefore, the Orangutan Conservancy (OC) staged the inaugural Orangutan Conservancy (OC) Veterinary Workshop from August 6-9 at the Samboja Lestari facility in Borneo. Led by OC vice-president Dr. Raffaella Commitante and facilitated by Dr. Steve Unwin, and underwritten by support from the Birmingham (AL) chapter of the American Association of Zoo Keepers (AAZK), the Oregon Zoo's Future for Wildlife Fund, the Fresno Chaffee Zoo, and the Chester Zoo, the workshop focused on the latest health and veterinary issues among primates, both in captivity in rehabilitation centers and in the wild. The workshop also strived to ensure that each facility can work from a baseline of minimum standards and best practices. Using a questionnaire that had been sent to the veterinary staffs of each rescue center almost a year earlier, Dr. Unwin designed an ambitious agenda that accommodated the baseline skills and knowledge of each participant, even as it asked them to work harder and stretch further than perhaps ever before.

The OC 2009 Veterinary Workshop was the first of its kind in Indonesia or Malaysia, a gathering specifically targeted at not the leaders or visionaries who founded the rescue and rehabilitation centers, but rather the national staff members who play no less an important role in the orangutans' survival. The gulf that exists between the rescue centers is very real - much of it a result of egos, politics and finances, a terrible cocktail at the best of times - but that same gap has left the Indonesian and Malaysian nationals that work directly with these animals at a disadvantage. They lack the tools and resources to either sustain or improve at their jobs, and the inability to work with neighboring facilities has created a dangerous vacuum.

The OC 2009 Veterinary Workshop broke down many of the traditional barriers and set the stage for a new era of communication and respect among rehabilitation veterinarians. The lack of coordination among the orangutan conservation efforts in Southeast Asia has always left each working in relative isolation, which had made any coordinated efforts impossible. But the Orangutan Conservancy believes a workshop like this can lay an important foundation for future workshops, and future conservation efforts.

The OC 2009 Veterinary Workshop focused on three main objectives:

1. Raise the level of care and welfare for orphaned orangutans at rehabilitation centers
  - o Define minimum standards
  - o Identify best practices
  - o Teach basic skills
2. Create community of support and trust among rehabilitation center staffs
  - o Encourage sharing of ideas
  - o Develop mutual respect
  - o Exchange support
  - o Present case studies that promote discussion
3. Raise capacity of national staffs
  - o Import training and facilitation from UK, Australia and U.S.
  - o Encourage accountability
  - o Establish foundation for future exchanges

In addition to those main areas, the OC 2009 Veterinary Workshop touched on other topics as well, such as:

**a) Education**

While the OC 2009 Veterinary Workshop is geared towards creating a set of protocols and standards that can be utilized at all rescue and rehabilitation centers, that is not realistic in the course of a four-day workshop. But the process can begin there, and can inspire Indonesian and Malaysian veterinarians and healthcare workers to become better. The lack of capacity training and authority afforded the national staffs is traditionally low at these facilities, even though the ultimate responsibility for the running and management of the centers will one day be theirs. The Orangutan Conservancy is mindful of the obstacles to such empowerment - including language skills, cultural sensitivity, and outdated management practices, among others - but believes that this process is long overdue. By giving these veterinary healthcare workers the tools and the inspiration to improve, the Orangutan Conservancy believes that positive change can be effected.

**b) Conservation**

Ultimately, the conservation outcome will be the successful reintroduction of endangered orangutans and back into the wild, a process that can take years to complete. But short-term conservation benefits must also be considered, including a.) increasing the capacity and training of Indonesian and Malaysian veterinarians and healthcare workers at both rehabilitation centers and in surrounding wildlife offices, national parks, and universities; b.) raising awareness within Indonesia of the importance of orangutan and primate health issues; c.) strengthening the mutual support and respect between veterinarians and healthcare workers at rescue centers in Malaysia and Indonesia; and d.) presenting and discussing case studies from each rescue center that might head off a future disease or health crisis. But the OC 2009 Veterinary Workshop maintained as its ultimate conservation goal the creation of a network of respect and trust that can play a pivotal role in the rescue and rehabilitation of orangutans.

**c) Animal Welfare**

The Orangutan Conservancy and the projects it supports in Malaysia and Indonesia are dedicated to the protection of orangutans and their rainforest homes. As a result, animal welfare is paramount, as is a determination to provide the best possible veterinary care.

Clearly, the current cycle of confiscation and long-term care cannot continue without an ulterior goal, and the Orangutan Conservancy hopes that by refining the veterinary care, encouraging a network of mutual respect and support, formalizing the protocol, and creating national participation, we can reverse the growing trends toward extinction.



# Orangutan Conservancy Veterinary Workshop

August 6-9, 2009

## Workshop Budget

<b>ITEM</b>	<b>TOTAL COST (IDR)</b>	<b>TOTAL COST (USD)</b>
Transportation (Air)	89,141,910	\$9,438
Transportation (Ground)	6,611,500	\$700
Visas	236,125	\$25
Accommodation	44,145,930	\$4,674
Food	1,208,960	\$128
Communications	255,015	\$27
Equipment	56,670	\$6
Printing	4,637,495	\$491
Office	141,675	\$15
Logistics	11,995,150	\$1,270
Administration	18,926,072	\$2,000
<b>TOTAL</b>	<b>177,659,039</b>	<b>\$18,774</b>

## NOTE

The Orangutan Conservancy covered the cost of airfare and accommodation for all invited delegates and facilitators.

The exchange rate was 1 USD = 9,445 IDR.



## **Orangutan Conservancy Veterinary Workshop**

### **2009 Workshop Report**



## **Section 2**

# Orangutan Conservancy Veterinary Workshop

August 6-9, 2009

## Letter of Invitation



P.O. Box 513  
5001 Wilshire Blvd. #112  
Los Angeles, CA 90036

**Honorary Patrons:**  
Dr. Jane Goodall  
Dr. Edward O. Wilson  
Dr. Suwanna Gauntlett  
Djamaludin  
Suryohadikusumo

**Advisers:**  
Dr. Tim Laman  
Dr. Mark Leighton  
Dr. Amory B. Lovins  
Dr. Cheryl Knott  
Lori Perkins  
Dr. Herman Rijksen  
Dr. Anne Russon  
Dr. Robert Shumaker  
Dr. Willie Smits  
Dr. Carel Van Schaik

**Directors**  
Norm Rosen, Chair  
Shirley Randolph  
Dr. Anne Russon  
Dr. Rob Shumaker  
Michael Sowards  
Wayne Sowards

**Officers:**  
Dr. Raffaella Commitante  
Doug Cress  
Linda Keenan  
Juanita Kempe  
Vanessa Rogier  
Barbara Shaw  
Sarita Siegel  
Dr. Stacey Sowards

June 23, 2009

RE: Orangutan Conservancy Veterinary 2009 Workshop

To Whom It May Concern:

This letter shall serve as an invitation to attend the Orangutan Conservancy 2009 Veterinary Workshop sponsored by the Orangutan Conservancy (OC), a United States non-for-profit organization and its Orangutan Crisis Coalition (OCC), and hosted by The Borneo Orangutan Survival Foundation at the Samboja Lodge, Balikpapan- Kal Tim.

This very important workshop will bring together experts working closely with orangutans in Indonesia and Malaysia in the international community to allow for the sharing of information and the creation of long lasting friendships and contacts. It will be held the following dates:

August 6 – August 9 2009

Participants should plan to arrive on August 5 and leave on August 10.

We thank you for your participation in allowing your staff to attend.

Travel expenses to the workshop and home again as well as accommodation will be paid for by the Orangutan Conservancy for the following person/s:

We will reimburse monies spent during the workshop.

Respectfully,

Raffaella Commitante  
Vice President  
Orangutan Conservancy

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The Orangutan Conservancy is a nonprofit organization dedicated to  
the conservation of orangutans and their habitat

[www.orangutan.com](http://www.orangutan.com)

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# **Orangutan Conservancy Veterinary Workshop**

**August 6-9, 2009**

## **Agenda**

### **Wednesday, August 5**

Delegate Arrival/ Set Up of Practical Sessions

### **Thursday, August 6**

8 a.m. -- Welcome to delegates

9 a.m. – Preventive Health Care Programmes and an Introduction to Risk analysis (Steve Unwin)

10:30 a.m. – Coffee / Tea

11 a.m. – Tuberculosis Diagnostics Update (Steve Unwin / Kris Warren)

11:30 a.m. – Roundtable Discussion: Veterinary Questionnaire Responses

1 p.m. – Lunch

2 p.m. – Parasitology / Part One (Wendi Bailey)

3:30 p.m. – Coffee / Tea

4 p.m. – Parasitology Investigations in Orangutans (Elisabeth Labes)

5 p.m. – Roundtable Discussion: Veterinary Minimum Standards

6 p.m. – Dinner

7 p.m. – Evening Activity: An African Sanctuary Perspective

### **Friday, August 7**

8 a.m. – Case Studies – Part One (Arthritis-SOCP; Pneumonia – SOCP; Cerebral Malaria – BOS)

10:30 a.m. – Coffee / Tea

11 a.m. – Hepatitis Seminar and Discussion (Kris Warren / Steve Unwin)

12:30 p.m. – Feeding Ecology of Orangutans (Signe Preushoft)

1 p.m. – Lunch

2 p.m. – Nutrition Basics and Information Exchange

3 p.m. – Case Studies – Part Two (Blood Transfusion – BOS; Chronic Air Sacculitis – Unwin; Tuberculosis and Hepatitis – Wanariset; Confiscation, Rescue & Rehabilitation – BOS)

6 p.m. – Dinner

7 p.m. – Evening Activity

### **Saturday, August 8**

8 a.m. – IUCN Great Ape Guidelines for Release / Veterinary Implications

8:30 a.m. – Blood Typing Research – Video Presentation (Jill Moyse)

9 a.m. – Field Programme Updates (KOCP)

10:30 a.m. – Coffee / Tea

11 a.m. – Material on Disease Contingency Planning / Exploring the Site

1 p.m. – Lunch

2 p.m. – Gastrointestinal Parasitology Practical (Wendi Bailey)

6 p.m. – Dinner

7 p.m. – Evening Activity

### **Sunday, August 9**

8 a.m. – Anesthesia Anecdotes (All)

10 a.m. – Coffee / Tea

11 a.m. – Case Studies – Part Three (Urgent Veterinary Needs and Biosecurity; Veterinary Strategy Guidelines; Loose Ends)

1 p.m. – Lunch

2 p.m. – Blood Parasitology – Malaria Practical (Wendi Bailey)

3:30 p.m. – Introduction to PASA Veterinary Healthcare Manual and How It Can Help

6 p.m. – Free time

7 p.m. – Conference Dinner

## Orangutan Conservancy Veterinary Workshop

August 6-9, 2009

### Participant Contact List

Dr Steve Unwin	Chester Zoo	s.unwin@chesterzoo.org
Dr Raffaella Commitante	Orangutan Conservancy	rcommitante@gmail.com
Dr. Wendi Bailey	Liverpool School of Tropical Medicine	jwbailey@liverpool.ac.uk
Dr Kristin Warren	Murdoch University, Perth Australia	K.Warren@murdoch.edu.au
Drh Heru Susilo	Quarantine Palangkaraya	Pithix_dv@yahoo.com
Drh Rachmad Wahyudi	YEL/ SOCP	wahyudirachmad@yahoo.com
Drh Yenny Saraswati	YEL/ SOCP	Misoca2003@yahoo.com
Drh Arief Febriwan	SOCP-FZS	Ariev_vets1402@yahoo.co.id
Drh Erdiansyah Rahmi	Syah Kuala University	Erdian.ersan@gmail.com
drh. Popowati	OFI	iccaros@yahoo.com
Drh Zulfiqri	OF	fikri_boda@yahoo.co.id
Drh Antasiswa W. Rosetyadewi	Gadjah Mada University	antarosetyadewi@yahoo.com
Drh Citrakasih M. Nente	BOS Wanariset/Independent	citrakasih@gmail.com
Dhr Siswiyani	BOS Wanariset	siswiyani@yahoo.com
Reckie Anggraini	BOS Wanariset	2_q@plasa.com
Ahmad Faisal	BOS Wanariset	sync_vets@yahoo.com
Ruslan Haji	BOS Wanariset	ruslanhaji_09@yahoo.com
Drh Fransiska Sulistyoy	Nyaru Menteng	fransiska_liz@yahoo.com
Drh. Agus Fahroni	Nyaru Menteng	Agoes_fhr@yahoo.com
Heldy Setia	Nyaru Menteng	
Toriin	GPOCP	yayasanpalung@gmail.com
Dr Edi	GPOCP	yayasanpalung@gmail.com
Winda titi pratiwi	Independent	wynd4_tp@yahoo.com
An Pas	Primate veterinarian	anmeel2002@yahoo.es
Rico Jaya	Syah Kuala University	rickerjaya@gmail.com
Elisabeth Labes	BOS Switzerland, Vet	elabes@bluewin.ch



## **Orangutan Conservancy Veterinary Workshop**

### **2009 Workshop Report**



### **Section 3**

# **Orangutan Conservancy Veterinary Workshop**

## **2009 Workshop Report**

### **Day by Day Proceedings**

#### **Day One: August 6 2009**

(Participants received welcome bag containing writing tablet, pen, pencil, OC Veterinary Workshop 2009 t-shirt, CD from Dr Kristin Warren of her doctoral thesis and Orangutan Conservancy Insert)

Nanang (Samboja Lestari Orangutan Project): Welcome Speech

“Welcome to all the vets from the east, central and west parts of Borneo, Sumatra, and all over Indonesia and a welcome to participants from outside of Indonesia – a special thanks to Raffaella, our friend who has always helped the project, and to Steve for organizing this workshop. Success to all for this very important workshop to help us better understand the management of the orangutan and the diseases that we must deal with.”

#### **OPENING GONG**

Raffaella Commitante presented Nanang with OC Veterinary Workshop t-shirt

Raffaella (Orangutan Conservancy): Welcome Speech

“Welcome to all – thank you for coming. I hope this workshop will allow you to make many, many friends and give you many people to contact as we try to make a better life for ourselves and the orangutan. My hope is that we can do this every year, improving the work we do and making conditions better for the orangutans in our care.

Steve (Chester Zoo): Welcome Speech

“Welcome to all participants, and like Raffaella, I hope you make many friends to help you in the future. Though I am leading this workshop, it is my hope that one of you will take the lead in future workshops.”

Introduction / presentation of film, “Dear Mr. President”

Round the room self-introduction of participants

Steve: All contents of the workshop will be transferred to a DVD for all participants before the end of the workshop. With this DVD and future DVD's it is hoped that a Veterinary Manual will emerge as it has with the African Vets working with the Pan African Sanctuary Alliance.

Explanation of materials and handouts – what resources will be on the DVD

Overview of workshop schedule

Suggestion to accumulate a diet list from each facility – as there is very little on orangutan diet requirements it would be good if by the end of this workshop something could be put together

Parasitology/Blood parasites/Disease Contingency Planning

**Steve –**

Preventative Health Plan

Basic emergency surgery – reactionary – traditional ‘ambulance at the bottom of the hill’. Preventive measures are in place to limit incidents – use of wild orangutan samples for disease investigation – as in finding Hep B virus in wild populations

Compile list of disease concerns/Quarantine and pre import protocols/Endemic diseases: to be able to see them and manage them

Health Management in Your Sanctuary (Refer to full notes on the workshop DVD)

**Animal/Environment Based**

**Human Based**

<b>Animal/Environment Based</b>	<b>Human Based</b>
Worm control	Staff training in hygiene
Regular monitoring: fecal, behavior(active or not)	vaccinate staff
Boiling river water before giving it to orangutans	Giving worm meds to local people as well as staff
Contraception – implants/separation	Animal training for vet procedures
	Staff training in hygiene
	Staff health and disease monitoring

Breakout groups to discuss basic vet procedures at each facility:

**Nyaru Menteng Orangutan Rehabilitation Center:**

Disease testing:

test for TB screening: TST/MOT done yearly, Xrays, PCR sputum and clinical signs

check blood for malaria (blood film), typhoid tubex test, de-worming

Pest control: seasonal depending on mosquitoes –an anti-mosquito spray is used around the cages

Anesthetic: Emergency response:

24/7 vet or paramedic on standby,

There is an emergency medical kit standby in the project car

Identification and record keeping:

Orangutan names are recorded in the Database with any information upon arrival – for older or wild orangutans a micro chip (TROVAN) can be used as a possible transponder ( between shoulder blades), medical file on each orangutan

Nutrition:

vitamin supplement given to each OU especially infant (Hemopoetic vitamins), eggs are also given to add protein for orangutans on the pre-release islands, Milk is given everyday- especially so for infants

Vaccination for staff only

Contraception:

implant of females on islands where there are mixed sex groups (Levonogestral), for others – males and females are separated in cages

Parasite control:

De-worming every 1-3 months or upon individual orangutan condition

**Sumatra Orangutan Conservation Project (SOCP):**

Enclosure design – each cage has its own septic tank for bio-filtration - cleaning of cages to rid floor of fecal matter because the orangutans can reach it,

Nutrition:

Various fruits, eggs, milk every morning and fruit included in diet every 2 hours, last feeding at 16:00 – eggs

Routine treatment – medical check up

Every 3 months

Pest control:

Rodent traps are used

Required Disease Testing

HJV / Salmonella / TB / meanbux test, x ray

Emergency Response:

Identification and Record Keeping

Monthly behavior and medical report, finger printing, hair sampling, blood serum

Tattoo and micro chip for identification and monitoring when they are sent to release forest,

Human based:

There is Hepatitis, TB, HIV, with x-ray

Hygiene: coverall, boots,

Staff training

### **Orangutan Foundation International:**

Enclosure design:

Cages are high off the floor / cages are made from iron wood

Quarantine is far away from resident population

Pest Control:

Cats to control the mice

Wash cages with disinfectant

Required Disease Testing:

TBC – screening rapid test APPV- intra-dermal skin test

Hepatitis (HbsAg)

Salmonella

Malaria

HIV

Anesthetic Emergency Response

Ketamine-Medetomidine using blow dart

Emergency pack available with emergency drugs

Identification and Record Keeping:

Micro chip ID implant

Daily behavior and health monitoring

There is an individual care book which is updated daily during illness

Nutrition:

Fruit is washed before it is fed out

Milk and baby porridge

Multi vitamin for young orangutans

Vaccination:

None

Contraception:

Separate males from females

Routine Treatment:

Deworming every 3 months

General health check every year

Routine blood check yearly

Health check and measurements and quarantine for new arrivals

Body weight is taken the 1<sup>st</sup> of each month

Staff:

Frequent hand washing

Deworming every 6 months

Foot bath with antiseptic and disinfectant

Valeria / Hep B

### **Jambi – Sumatra**

Before coming to Jambi (release site) orangutans are quarantined in Medan

There are emergency procedures in place for sick orangutans

Wild forest fruits are given in the cages

Contraception is not used

### **Wanariset (Samboja Lestari):**

Routine:

No pest control

Disease Testing: annual TB, annual HBV, always at intake or if any sign of symptoms

Malaria, typhoid, HCV, HIV

Anesthesia: combination ketamin and dylazin (zoletil for sun bears)

Record is kept of response and dosage but not situation

**Steve:**

Risk Analysis- PREVENTION– hand out of African Vets – IUCN Guidelines for Reintroduction

Exposure/Vulnerability/Hazard/Risk

Making the correct diagnostic choices when you do not know what you might have

Minimizing the risk of Infectious diseases – Risk Management – Zero risk not an option

Risk of Hepatitis B may vary over time

What level of risk is acceptable – Is it acceptable to release a Hep B orangutan – 20 years ago – the answer would have been no – but now there is a form found in wild orangutans and there is the human form – if it is the same as what is found in the wild then it may be possible to release those orangutans

Non infectious diseases are also important to be aware of - Mal nutrition does not mean thin – it means being fed the wrong nutrition

Disease Contingency Planning

Risk Assessment – Risk Management (How do you manage the risk) – Risk Communications

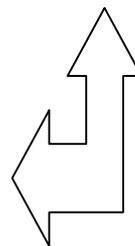
Releasing Orangutans: Initiating Event – Policy

Science Based decision

Risk Analysis

Model → Outputs and Decision

Model – input data



Surveillance/Monitoring

Public Health /conservation projects, agricultural projects

Data – qualitative vs quantitative

Risk Analysis

Identifying the hazards - Asking questions – the right questions

Risk management

Getting answers – from literature, from other facilities

Risk Communication

Spreading the word

Variability/Uncertainty/Subjectivity

Shows where the gaps in our knowledge are – signal for more data/research/communication

Reducing the uncertainty

Risk Management:

Critical Control Points for Pathogen Introduction/Release

Quarantine length of time: 90 days minimum to be able to test and wait and possibly re-test

Risk Communication: you must communicate with ALL the people who matter

### **Kris Warren – TB and Hep B findings at Wanariset**

1 case of TB out of 12.9 orangutans – prevalence of 0.8% over 4 years

Suspected cause of death – 2 out of 96 (2.1%)

3 individuals out of 339 between 1991-1997 confirmed or suspected TB – prevalence 0.9% over the 7 year period

TB is major disease of concern with difficult diagnosis with about 60% positive/suspicious reactions – high levels of false positives (intradermals)

Thoracic radiography

10% of individuals were PCR positive to MTB complex organisms – none showed clinical or radiographic evidence of disease

42.3% study population positive to nontuberculosis myobacteria

If an individual truly has TB – it should be euthanized

Even with treatment – you can never know that it is gone

**Orangutans should not be introduced where there is an existing wild population (wild populations must be protected at all costs)**

### **Steve: Diagnostics – and a case study (Anta translating)**

When collecting samples from orangutans – take enough samples for repeat testing so you can test the same sample different ways (and not have to stress out the orangutan again)

Overview:

Mycobacterial biology, epidemiology and pathogenesis (primate centric)

Diagnostic challenges

Testing based on Detection of mycobacterial organisms

Testing based upon immunologic response

TB caused by mycobacterium TB Complex, *M. bovis* and *M. africanum*

There are more than 40 species of mycobacteria

*Mycobacterium tuberculosis* is the most common

*M. bovis* more common in ungulate species

All primates are susceptible but quite difficult to transmit unless of course when housed together

Characteristics of bacterium:

Aerobic non spore forming bacilli

Intracellular pathogens

Cell wall – rich in lipids

Acid-fast staining characteristic

Very slow growing culture – up to 6-8 weeks

Transmission:

Coughs / Sneezes

Clinical Signs:

Cough lasting more than 3 weeks (not responding to antibiotics)

Purulent +/- blood tinged nasal discharge or sputum

Fever or night sweats

Weight loss

Lethargy

Loss of appetite - vital

Poor doer – vague signs in animals

Pathological changes:

Multifocal granulomas in various organs (liver, spleen, lung, lymph nodes)

If GI, thickened intestinal tract

Histopathology – acid fast bacilli usually present in granulomas

## Diagnostic Challenges:

Detection of latent and active TB

Detection of pulmonary and extra-pulmonary TB

Anergy

TB in immune-compromised hosts

Immunologist cross-reactivity among mycobacterial species

BCG- induced immune-reactivity – vaccination – can give false positive

## Testing Based On Detection of Mycobacteria organisms

Microscopic examination

Mycobacteriology laboratory tests for detection of organisms

AFB (Ziil-Neilsen) stained slides – follow same protocol as humans

But It does pick up other positives as it is a screening test

Not a confirmation of TB

Culture – ID of isolate – confirmed positive but it can be missed

Antimicrobial susceptibility testing – suspect and use different antibiotics – humans only

Rapid, direct tests

Acid fast staining – rapid results – simple – not diagnostic for mycobacterial Tb - lots of false positives – good screening test but need to go further

## Culture and Identification of Isolate

Gold standard for TB diagnosis

Usually complete in 4+ weeks

Results not final until 8 weeks for negative sample

Traditional identification based on growth characteristics, biochemical tests

## Imaging Diagnostics

Thoracic radiographs

Needs to be an advanced case

Upper lobe or bilateral infiltrates

Cavitation

Pulmonary fibrosis

Hilar lymph nodes are early site of disease (cardiac silhouette makes diagnosis difficult)

Testing based on intra-dermal TB test - new standard for interpretation – handout

False Positive reactions – contaminated material, too frequent testing (wait at least 45 days), sensitization to the adjuvant, trauma, cross reaction with other mycobacteria

False negative reactions: S/Q injections, anergy,

In TB infected animals, the skin test was negative in all animals 100 days after infection

More information on Molecular methods are in the handouts

Gamma Interferon Test – experimental use only – perhaps in the future

Sensitivity vs specificity – initial test should have higher sensitivity, later testing should have higher specificity

ChemBio Prima TB Stat-Pak

20 minute results – detect antibodies for M.tb (in macaques)

Test can pick up responses over a broader course of the disease

Results for positive and negative in terms of specificity are good

Being now tested on chimps – a population of 45 – all are still coming up negative

Easy to read – one line negative/ 2 lines positive

\$15 US per test – preliminary tests

Screening and testing for Mtb becomes very important as recommendations are made to reinforce wild populations of primates with rehabilitant counterparts

Ultimately, with positive individuals come some difficult decisions to be made

Complete presentation on the Workshop DVD

### **Wendi Bailey – Diagnosis of gastrointestinal parasites**

The stool sample:

Has enough of a specimen been collected to make a thorough examination

How many samples should be examined – depends on why you are looking: is the animal sick, is it a pre-release exam, etc. 2 samples are minimum in order to detect >90% of parasites in a patient

Has specimen been collected soon after defaecation? – how old is the specimen?

Some parasites need 30:00 old stool – no later

Collecting samples:

30:00 samples to a few hours or FIX the sample as soon as possible – looking for protozoa – 10% formol saline as a fixative

Whole worms are better fixed in 70% ethanol

Faecal examination for parasites:

Direct smear – small amount on a slide with water or salt water – chances of finding anything are slim – used only if sample less than 24 hours old and fluid as a first test for trophozoites

For *E. histolytica* trophozoites – examine within 30 minutes

The larger the sample, the better the chances of finding something

If the sample is put in Formalin – the sample is fixed and can be examined later for parasites

Flotation solutions take more than one solution in order to identify all the parasites

Sedimentation is better – works for any ova, cyst or larvae

Formol ether (or ether acetate/petrol) sedimentation technique will work on faecal sample

2 methods – traditional with a bottle/gauze and tea strainer and pre made kit which filters the sample of vegetation – the cleaner the sample the easier to see parasites

Then take ether and shake up solution really well – then use centrifuge and spin 2-3 minutes 2,500-3,000 or leave standing for 3-4 hours

Separation then occurs – with parasites on the bottom

Full presentation is on workshop DVD

## **Day Two: August 7, 2009**

Raffaella presented Workshop t-shirt to Pak Aldrin (Executive Director, BOS Foundation) and Pak Bungaran (Head of Board of Directors, BOS Foundation)

### **Steve– Vervet Monkey TB outbreak**

No resident vet – and monkeys were unchecked for 12 months – lots of monkey-monkey-human contact in that time with local and foreign workers/volunteers

Enclosures were small and close to each other and escapes were quite common

65 monkeys died before vet presence but it was not known why – Once a PASA vet was sent to the sanctuary *M.tuberculosis* was identified in all 65 by PCR

Department of Agriculture of South Africa was notified of outbreak and closed the center under veterinary quarantine

All staff was tested and will continue every 6 months (chest x-ray and ZN stain of sputum) and then ordered euthanasia for all - new and short term staff given chest x-ray before and after stay

All contact with monkeys prohibited – gloves, face masks, and protective clothing

For monkeys – no arrivals/no departures

Round up of all escapees and cages fixed

Government ordered Euthanasia of all positive/suspected animals and contact animals

All monkeys were tested for TB every 2 months until group tested negative for 3 times

All monkeys coming up positive were euthanized at each phase of testing until you had a group that tested negative three times

#### TB Testing

TST skin test

Bovine PPD (left eyelid)

Avian PPD (right eyelid)

Delayed type IV hypersensitivity reaction

Observations at 24/48/72 hours after injections

Any swelling/drooping of eyelid was positive

PRIMA TB STAT PAK – 700 kits were donated

Full blood, serum or plasma – results in 20 minutes

#### Testing

Ketamine IM (10 mg/kg)

Clinical Examination

Preliminary results: so far 190 monkeys have been tested

61 monkeys (32%) tested positive in TST and/or Prima TB Stat Pak

Some advanced stages of TB can give false negatives in the TST test

Antigens from the environment can be identical to *M. avium* complex giving false positives

Cultures need to be made to confirm TB –do not simply go by what you see as abscesses may be caused by other bacterial genera

#### Conclusions:

*M. Tuberculosis* has a devastating effect in non-human primate populations

Continued testing to investigate the prevalence and spread of infection

Euthanasia and necropsies of all positive/suspected and contact animals

ZN stain, culture, histopathology and PCR

Re-test each group every 2 months until group tests negative 3 times

DNA fingerprinting and epidemiological studies

Strict guidelines developed

Details of this presentation are on the workshop DVD

During TB discussion many felt that they had no support from government or center managers to euthanize. Many felt that they needed to present a united front to the government with TB/suspected cases, deaths, necropsy results in a center by center report in order to present statistical findings to the government authorities to allow for the development of SOP in dealing with TB/suspected orangutans to include standard guide for euthanasia.

### **Individual Case Studies by Each Center**

Input given by all participants making suggestions to each individual case study

All case study presentations are on the Workshop DVD

**Steve: Air Sacculitis Case History** – on the workshop DVD

### **Nutrition**

**Signe: Implications of Orangutan Feeding Ecology for Rehabilitation** (Citra translating)

Sanctuaries hold two populations: those that can be released and those that cannot (for a variety of reasons)

The goal is to be able to release orangutans that are both physiologically and psychologically fit

They do not have these competencies on their own – they need our help to become competent

In terms of feeding ecology – it is feast or famine causing fluctuating energy intakes

Details on wild versus orangutans in centers are on the workshop DVD

**Anne Russon: Wild Orangutan Diet**

Presentation is on the workshop DVD

Short discussion on orangutan diet

**Day Three: August 8, 2009**

Group Photo!

## **Kristin: Hep B virus at Wanariset**

As part of her PhD research, she studied the origins of the Hep B virus outbreak at Wanariset

As well as collecting samples from wild orangutans

At Wanariset, of 55 infected HBV, 40 cleared the infection and 15 remained positive for over 1 year – labeled chronic carriers – 18.1% of all orangutans exposed to Hep B virus became chronic carriers

OuHV (Hepadnavirus) is distinct from human HBV – they are DIFFERENT

There are also 2 genome groups for orangutan and gibbon

African Chimps and Gorillas are classed as 1 genome group – needs more research

Wooley monkeys are also in a separate genome group – more research needed

Among Orangutans, the Borneo populations are different

All from East Kalimantan were OuHV<sub>1</sub>

Other Ous from outside KalTim, were either OuHV<sub>1</sub> or OuHV<sub>2</sub>

Co evolution of the virus in both forms of the virus

This is an old infection that has evolved over time – it is not a human infection that has been spread to apes – indicating a common ancestor

1.2 mya Bornean and Sumatran orangutan split –

In order to be considered different forms of the virus – strains must differ by at least 8%

Orangutan and Gibbon (OuHV and GiHBV) do differ more than 8% from other hepadna viruses

OuHV is an indigenous viral infection – all orangutans tested at Wanariset tested positive for this ‘wild’ form. None had Human HBV

PCR-RFLP assays can be used to distinguish from OuHV and HBV

There was no evidence of disease in the chronic carriers – and so far there has been no sign of disease in any of the positive OuHV individuals – it is a naturally occurring virus –

### **Research indicates that there is no cause for concern with the OuHV !!!!**

Human vaccinations were not recommended as the OuHV virus is naturally occurring

Though in zoos, there has been vaccination of silvery gibbon in captive breeding programs – but that is an isolated situation very different from the orangutan situation

In order to effectively manage your population, you MUST be certain to do the PCR-RFLP test to determine if what you are dealing with is OuHV or HBV

If it is HBV (which is rare) then different protocols need to be used – either permanent quarantine for educational purposes or possibly even euthanasia – though HBV positive orangutans have successfully been used and managed as education ‘tools’ – as it can never be released

The majority may test positive to OUHV – they do not need permanent quarantine and they can be released – however, if they are released in areas where they be remnant wild populations, released orangutans must be returned to their areas of origin due to the fact that there are two forms of OUHV<sub>1</sub> and <sub>2</sub> and we to mix like with like as our first concern must be to keep the wild population as healthy as possible.

Rachmad: Case study of orangutan infected with HBV

Details of this presentation as well as Kristin Warren's PhD thesis are on your Workshop DVD and in a separate CD.

Many questions about having OUHV orangutans join the negative populations – but testing MUST be done to determine which HB virus they have – if it is OUHV, then they can join the rest of the population and can be released

HOWEVER the sub species should be kept separate even in the centers – so that they should be released together with their same sub species

Hep A and C are not thought to be a problem – test to be certain

Recommendation from this workshop is that orangutans with OUHV can be released INTO THEIR AREAS OF ORIGIN!!!!!! And mixed into the main population of the center – however, it must be determined beforehand that they do indeed have OUHV and not HBV

PCR-RFLP test can be done at Eichman Institute but that can be very expensive - but it may be cheaper to do the testing at IPB (Primate Center in Bogor)

### **Wendy – Lab Practical – Techniques**

At the Samboja Clinic

### **Elisabeth – Parasites at Wanariset**

At the Samboja clinic

### **Day Four: August 9, 2009**

#### **Discussion:**

Outcomes from the workshop and future workshops – yearly!



## **Orangutan Conservancy Veterinary Workshop**

### **2009 Workshop Report**



### **Section 4**

# Orangutan Conservancy Veterinary Workshop

## 2009 Workshop Report

Orangutan Veterinary Advisory Group / Kommunitas Dokter Herwan Orangutan

### Action Plan:

Issue	Action	Champion/Contact	Time Scale
Animal Identification – standardized micro chipping	Institute standardized microchipping (Iso-International Standard) – Commitment to all use the AVID Chip chip location for apes is on the top side of the left wrist – if it is put elsewhere is fine but it must be written down so that it can be located by anyone Possibility in the future of instituting the TAD INFO System – in order to have it be Indonesia specific – it must be in cooperation with the Government and FAO	Drh Citra – Ministry of Forestry – AVID chips – Steve will check microchip manufacturers in Europe for Indonesian distributor of universal microchip readers	ASAP. TadInfo (and similar data systems) to be presented and discussed at next year’s workshop
Tuberculosis Diagnostics	Contact Chembio/Center for TB StatPaks Steve will try to see if the StatPak company will agree to giving the test for free to use on 1,000 orangutans	Steve Unwin and drh Siska Perhaps all the vets could cooperate in a massive testing of all animals in centers during a 6 months period and turn all data over to Citra for analysis and possible publication with Citra as lead author and center vets as so authors – this will help get the testing kits for free	By end of 2009
Tuberculosis Recommendations (based on the 2002 Orangutan Workshop)	Reiterate the recommendations from the 2002 workshop		

<b>Hepatitis B diagnostics</b>			
Hepatitis B Recommendations	See below		
PCR testing	Contact the Center for Tropical Disease in Surabaya	Drh Winda will follow up	
Topics for the next Vet Workshop	What makes an orangutan releasable medically? Blood chemistry/blood hematology normals	Developing a Risk Analysis Chart	Behavior and Enrichment and how they affect orangutan health
Equipment and/or expertise requests from the rehab centers			
Field Diagnostics tests: (Cheeseborough and Bench Aids)	OC funding to purchase- SU to approach OC about this	Steve Unwin	
Where will we have it next year – Sumatra won the vote	Talk to Ian about SOCP being the host		

### Future Workshops

Both Sumatra (SOCP) and Jakarta have offered to host a second Orangutan Conservancy Veterinary Workshop in 2010.

## TB Testing

TB Testing: all information is on the DVD from past Orangutan Workshops

In the UK they use the skin test at the same time take sputum sample – if skin test is positive,

they send off sputum – if PCR is positive, a skin test is taken again in two months – if it is positive a second time – the animal is euthanized and a complete necropsy is done to be certain diagnosis was correct.

High risk of False Positives, but in the UK they are willing to take that risk – however here

we want to be really certain

ID Skin Test <sup>1</sup>	Prima TB Statpak <sup>2</sup>	Thoracic Radiograph	PCR <sup>3</sup>	Culture <sup>3</sup>	AFB <sup>4</sup>	Recommendations
+	+	-	-	-	-	Strong suspect positive. Quarantine +/- Euthanase (once validated)
+	-	-	-	-	-	Quarantine. Retest in 2 months (full test range)
-	+	-	-	-	-	Quarantine. Retest in 2 months – OR MAPIA if available
-	-	+	-	-	-	Test for other causes (infections, neoplasia) but quarantine in case anergic and retest if other cause not found
-	-	-	+	-	-	PCR is very sensitive – CONFIRM WITH LAB – must be able to differentiate

<sup>1</sup> Mammalian Old Tuberculin (MOT) +/- Bovine PPD and Avium PPD comparative

<sup>2</sup> To be trialled in Rehab Centre Orangutans through 2010, to validate its use in this species as an improved screening test for TB (see above protocol/ recommendations)

<sup>3</sup> Conducted on Tracheal bronchial washes +/- Gastric lavage (10-30ML dependant on animal size)

<sup>4</sup> **Dr Wendi Bailey (Liverpool School of Tropical Medicine) is investigating a new, more specific AFB test utilising fluorescence. More information pending.**

						between M. tb complex and other mycobacteria. Quarantine for 6-12 months and retest.
-	-	-	-	+	-	Positive Euthanase -
-	-	-	-	-	+	Quarantine – Retest in 2 months
+	-	<b>If one or more of these are positive</b>			+/-	Positive Euthanase -
-	+	<b>If one or more of these are positive</b>			+/-	Positive Euthanase -

In Africa, a skin test is made, and sputum sample collected and if skin test and Stat Pak come back negative, the animal is then quarantined for 60 days and then tested again and a tracheal wash for PCR culture.....

If skin test is still positive but PCR negative, retest in 6-12 months.....

If second skin test is negative, consider the animal clear and is part of a release group – then retest in 6-12 months

If an animal has ever been treated for TB – it will never be released – because the risk is too great as it is very difficult to get an accurate reading on the TB status of that animal if it has been treated.

If skin test continues to be positive but all other tests are negative– they may not euthanize that animal but it will not be released.

If the first skin test is negative but PCR is positive – keep in quarantine and test in 42-60 days –if there is an outbreak – euthanize

If second test is negative – retest in 6-12 months

If both skin test and StatPak are positive, animal is euthanized but samples are sent for PCR and Culture

**All euthanized animals MUST be postmortemed and samples collected for PCR, Culture, Histopathology, virology, bacteriology, parasitology etc. (As should happen with any animal that dies in your center)**

Gold Standard would be the MAPIA test but as it is not available, the above procedures are used by African Vets

The procedures used by the African vets has been tested for chimps and gorillas – we can start using it for orangutans and isolate those that test positive to the StatPak until such time that it is verified that the StatPak has the same accuracy with the orangutan as it has with other apes –

PCR (must use tracheal wash +/- gastric lavage) is very sensitive and can pick up many bacteria – you need to ask the lab you use if they can differentiate between TB Complex and other mycobacterium

X- Rays – do x-rays at arrival – if there is a shadow on lung and no other cause is able to be determined then....

Other testing possibility: AFT using florescent dye but requires a special microscope attachments – Dr Wendy obtaining more information as it used in human medicine

Because of the unpredictability of testing accuracy post treatment it has been decided that any primate in PASA Sanctuary that has been treated for TB is not suitable for release

What are the thoughts on euthanasia in Indonesia?

Are we in agreement that it is best to euthanize an orangutan testing positive for TB?

**YES, we are in 100% agreement**

ChemBio needs to validate the results of their product as soon as possible – they also like to have independent research validating their product. They are then more likely to donate product – we contact them via letter, but it will strengthen our cause if we have some sort of research in place. As the data needs to be collected – each center should nominate a person in charge of collecting all that data – and all data can then be filtered through drh Citra in Perth. An article can then be written based on the work all the vets have collectively done to help validate the StatPak for orangutans.

In order to prepare for the PAK, if you are anesthetizing orangutans between now and when the test arrives, you can collect blood and freeze it at -80 degrees ( these can be used until up to a year)

All data can be entered on an excel spread sheet by each center and then sent on to Citra in Perth

**Hepatitis B discussion and Recommendation:**

Should an OU that has tested positive to OUHBV should it be included in any releases?

**YES! Are we all agreed? YES 100%**

Do we all agree that if releases are possible, that orangutan should be released close to their original habitat?

**YES! Are we agreed: Yes, as it follows the Orangutan Action Plan 100%**

Should orangutans testing positive to the Human HBV be released?

**No! We are agreed 100%, we will not release Human Hep B orangutans**

Serological testing first, then if positive, then the PCR-RFLP to determine if it is of human or Orangutan origin – Citra to see if lab in Bogor is able to provide the PCR-RFLP test by October 2009

Once the test can be obtained – ask the lab to reserve some of the DNA samples so that if there were a problem with the Government regarding wanting further verification, we can then send those samples in reserve to the government lab of choice (should the need ever arise)

## **Diets and Nutrition**

**Steve:** will email food spreadsheet to each center so that they can fill in required information for Steve to do a proper nutritional analysis (received the basics at the workshop)

**Primate Nutrition** – The Basics – presentation is on the workshop DVD

Steve co-author on the presentation – Andrea Fidgett is a wildlife nutritionist – and as she works at Chester Zoo which is the Center for Wild Life Nutrition – Andrea is happy to receive emails through Steve about any nutritional questions you may have!!!!!!

**Wendi: Making, staining and examination of blood films for malaria parasites**

Presentation is on your workshop DVD

## **Important things to remember....**

The Vet Manual for the PASA VETS on chimps and gorillas in on the DVD – in the coming year if everyone can review it and make recommendations on what needs to be changed and what can stay in order to use the PASA Vet Manual as a guide to an Orangutan specific Vet manual that we can create – Steve will be sending out emails during the year asking for your opinion on the Vet Manual

Also, throughout the year – if you need any help identifying parasites or anything – if you can email the photo to Steve or Wendi and they will try to help!

Also, keep the communications between you flowing! Keep in touch via email with other vets and also with everyone you met at this workshop - if you need help with a medical issue or if you just want to say HELLO!

The Sumatran Group from SOCP volunteered to be the host location for next year's workshop (assuming funds for it can be raised) and The Vet School at Gadjah Mada University in Jogjakarta have volunteered to be the host location for the year after that (again, assuming funds can be raised).

