

# WOAH Collaborative Centre Reports Activities 2025

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## CENTRE INFORMATION

<b>*Title of WOA Collaborating Centre</b>	WOAH Collaborating Centre for Wildlife Trade and Wildlife Health
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<b>Website:</b>	<a href="https://www.nparks.gov.sg/avs/who-we-are/our-centres/centre-for-wildlife-forensics">https://www.nparks.gov.sg/avs/who-we-are/our-centres/centre-for-wildlife-forensics</a>
<b>*Name Director of Institute (Responsible Official):</b>	Dr Charlene Judith Fernandez (Group Director, Professional & Scientific Services & Director, Centre for Animal & Veterinary Sciences)
<b>*Name (including Title and Position) of Head of the Collaborating Centre (WOAH Contact Point):</b>	Dr Anna Wong (Group Director, Community Animal Management & Senior Director, Wildlife Trade of NParks)
<b>*Name of the writer:</b>	Dr Anna Wong

## TOR 1 AND 2: SERVICES PROVIDED

1. Activities as a centre of research, expertise, standardisation and dissemination of techniques within the remit of the mandate given by WOA

Category	Title of activity	Scope
Wildlife (true)	Development of templates to encourage registration of WOA collaborating centres and reference laboratories as CITES scientific institutions for expedited movement of diagnostic samples	Provided a template for WOA CCs and WOA RIs to write to their national CITES MAs and for the CITES MAs to write to the CITES Secretariat for the registration of the CCs/RLs as CITES institution. As CITES institutions, they are able to carry out the Scientific Exchange Exemption when transporting CITES diagnostic samples between CITES institution, providing faster transfer of CITES diagnostic samples across borders.
Wildlife (true)	Development of sampling procedures for molecular species identification of wildlife products and sharing of best practices at CITES CoP20.	Short reference guides on sampling procedures and best practices for sample collection for molecular species identification were shared during the CITES 20th Conference of the Parties (CoP20).
Wildlife (true)	Sharing of biosurveillance efforts and	Sharing of the following at a side event at CoP20: i. WOA highlights in support of safe wildlife trade by Dr Alexandre Fediaevsky, Head of Preparedness and Resilience Department, WOA ii. Singapore's Biosurveillance efforts iii. . Sharing of sampling

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	dissemination of techniques	procedures and best practices iv. Sharing of international movement of CITES wildlife diagnostic samples
Wildlife (true)	Sharing on Singapore's Animal Health Strategy and Regional Support Networks	<p>1. This session showcased Singapore's collaborative, integrated approach to animal and wildlife health management through a One Health lens. Explored how this framework drives our local biosurveillance efforts and examine Singapore's comprehensive multi-disciplinary strategy for mitigating disease risks and building preparedness against threats such as highly pathogenic avian influenza (HPAI). The session also highlighted Singapore's Centre for Wildlife Forensics and its unique role in strengthening cross-border collaboration across the Asia-Pacific region. As the world's first World Organisation for Animal Health Collaborating Centre specialising in Wildlife Trade and Wildlife Health, the Centre leverages local and regional expertise to improve animal and wildlife health outcomes while building capabilities to sustain safe and legal wildlife trade.</p> <p>2. Shared on regional collaborations of the other CCs, Wildlife Health Australia and Mahidol University as well as the work they have done.</p>

## TOR 3: HARMONISATION OF STANDARDS

2. Proposal or development of any procedure that will facilitate harmonisation of international regulations applicable to the main focus area for which you were designated

Proposal title	Scope/Content	Applicable Area
Establishment of standardised genetic testing protocols for non-traditional sample types	Wildlife products frequently present themselves in various form (such as dried or processed animal parts, decorative household items, eDNA etc). These items usually contain DNA of low quality that can impede downstream genetic analysis. These samples may also be highly contaminated with human DNA that may confound genetic sequencing. Various genetic testing protocols have been published by different research institutes, however, protocols vary and may not have been standardised and validated for forensics purposes. The use of Next-Generation Sequencing (NGS) for analysing wildlife DNA samples highly contaminated with human DNA has also not been validated for forensics use. Our laboratory aims to establish and validate genetic testing protocols for different non-traditional sample types, such as dried seafood, decorative products made of horns, tusks and/or shells, eDNA etc. for forensics purposes.	Laboratory Expertise
Detection and pathogen characterisation of tick-borne diseases found in native wildlife and wildlife involved in illegal wildlife trade	The prevalence of various tick-borne diseases present in the native wildlife found in Singapore has not been well studied. Tick-borne diseases can also be carried by wildlife that are smuggled into Singapore. It is important to understand the risk of transmission of these tick-borne disease via the smuggled animals. The laboratory aims to utilise both traditional genetic analysis and NGS to the prevalence of tick-borne diseases carried by ticks and other ectoparasites found on native wildlife and seized wildlife.	Wildlife Health and Biodiversity
	Sunda pangolins can be found in Singapore and various	

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Population genomic analysis of Singapore's native wildlife	countries across Southeast Asia. The laboratory aims to study the population genetics of Singapore's native Sunda pangolins and compare it with the genetic information of the Sunda pangolin from our neighbouring countries to understand the genetic diversity and sustainability of this CITES importance species	Wildlife Health and Biodiversity
Establish parentage testing for animals of trade importance	Songbirds are popular pet birds in Southeast Asia. Our laboratory aims to establish and validate STR analysis to be used in the parentage testing of two songbirds of listed in CITES appendices – straw-headed bulbul and white-rumped sharma.	Laboratory Expertise

3. In exercising your activities, have you identified any regulatory research needs\* relevant for WOA?H?

No

4. Did your Collaborating Centre maintain a network with other WOA?H Collaborating Centres (CC), Reference Laboratories (RL), or organisations designated for the same specialty, to coordinate scientific and technical studies?

Yes

Name of WOA?H CC/RL/other organisation(s)	Location	Region of networking Centre	Purpose
WOA?H Regional Wildlife Health Network (RWHN) for the Asia Pacific	Asia and Pacific	Asia y el Pacífico	This network aims to provide a platform to facilitate the effective sharing of information, expertise and advocacy to promote the wildlife health agenda in the Region.
WOA?H Collaborating Centre Network for Wildlife Health	Global	África América Asia y el Pacífico Europa Oriente Medio	This new network was developed in 2023 via the WOA?H Wildlife team. Comprised of WOA?H Collaborating Centres for wildlife health and interested specialised centres, this Network aims to support WOA?H in enhancing global wildlife health by leveraging the network's skills and expertise to address Members' needs. It is designed to be flexible and responsive. . In 2025, the team provided a proposal for the review of Chapter 1.1.2 Collection, Submission and Storage of Diagnostic Specimens which has been submitted to the BSC and also worked on coming up with a SOP on outbreak investigation.
International Union Conservation Nature (IUCN) Species Survival Commission (SSC) Conservation	Global	África América Asia y el Pacífico Europa Oriente Medio	Member of the SSC through membership of the otter, crocodile, freshwater plant, marine turtle and freshwater crustacean specialist groups.

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WOAH Working Group on Wildlife (WGW)	Global	África América Asia y el Pacífico Europa Oriente Medio	The WOAHP WGW informs and advises the WOAHP on all health problems relating to wild animals, whether in the wild or in captivity. It has prepared recommendations and oversees numerous scientific publications on the surveillance and control of the most important specific wildlife diseases.
Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)	Global	África América Asia y el Pacífico Europa Oriente Medio	Served as Co-Chair of the Intersessional Working Group on the role of CITES in reducing risk of future zoonotic disease emergence associated with international wildlife trade, to prepare the report submitted and endorsed at the 20th meeting of the Conference of the Parties (CoP20). The report aimed to operationalize and coordinate the role of CITES and its Parties in safeguarding One Health and reducing zoonotic disease risks in international wildlife trade.

## TOR 4 AND 5: NETWORKING AND COLLABORATION

5. Did your Collaborating Centre maintain a network with other WOAHP Collaborating Centres, Reference laboratories, or organisations in other disciplines, to coordinate scientific and technical studies?

Yes

Name of WOAHP CC/RL/other organisation(s)	Location	Region of networking Centre	Purpose
Australian Centre for Disease Preparedness (ACDP)	Australia	Asia and Pacific	Part of trainer laboratory network supporting the Asia Pacific Placements and Laboratory Leadership (APPLLe) Project.

## TOR 6: EXPERT CONSULTANTS

6. Did your Collaborating Centre place expert consultants at the disposal of WOAHP?

Yes

Name of expert	Kind of consultancy	Subject
Dr Kelvin Ho and Dr Eileen Koh	Provided technical expertise sharing on eDNA surveillance	Mahidol University workshop 2025 (WOAHP Collaborating Centre Training on Sample Collection for Avian Influenza and Environmental Surveillance)

Dr Diana Chee and Dr Brian Tan	Provided technical insights on aquatic animal health for the Network of Aquaculture Centres in Asia-Pacific	24th Meeting of the Asia Regional Advisory Group on Aquatic Animal Health 24 - 25 Nov 2025. Dr Brian Tan presented on: "Advancing the Biosurveillance of Emerging Aquatic Pathogens in Singapore with Environmental DNA."
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## TOR 7: SCIENTIFIC AND TECHNICAL TRAINING

7. Did your Collaborating Centre provide advice/services to requests from Members in your main focus area?

Yes

*In August 2025, CWF provided advice to WOAHA Collaborating Centre for the Health of Marine Mammal in Italy on the requirements for a WOAHA CC to be registered as a CITES institution.*

8. Did your Collaborating Centre provide scientific and technical training, within the remit of the mandate given by WOAHA, to personnel from WOAHA Members?

Yes

a) Technical visit : 1

b) Seminars : 4

c) Hands-on training courses: 0

d) Internships (>1 month) : 1

Type of technical training provided (a, b, c or d)	Content	Country of origin of the expert(s) provided with training	No. participants from the corresponding country
D	1. Development and validation of protocol for rhino genotyping for provenance tracing 2. Development and validation of protocol for latent DNA in wildlife forensics	Singapore	2
A	1. Sharing by ShellBank on the tracing and tracking marine turtles for conservation research and law enforcement. 2. Handling and collection of marine turtle samples, ensuring proper evidential handling and chain of custody 3. Gain insights into turtle genetic sample analysis and use of the ShellBank database for identifying population origin. (Hands-on session)	Singapore	35
B	1. WIVIREIDS meeting in Cambodia. Presented on wildlife diagnostics sequencing with MinION. 2. Provided technical expertise sharing on eDNA surveillance and the use of advanced molecular technology	Cambodia, Indonesia, Lao PDR, Philippines	20
B	1. ICCWC Think Tank – Wildlife DNA Forensics 2. Provided insights and inputs at the meeting to explore ways to improve coordination between evidence and intelligence focused wildlife DNA forensics approaches. The goal is to enhance the use and integration of wildlife DNA forensics in efforts to combat wildlife crime more effectively. 3. To support the development of a wildlife DNA forensics 'seizure response model'. Once developed, this model can be applied to differing volumes of both elephant ivory and pangolin scale seizures	United States of America, South Africa, United Kingdom, Germany, Singapore, France, UNODC	20

	to evaluate the effectiveness of the model in enhancing the evidence and intelligence focused wildlife DNA forensics responses.		
B	1. UNODC Wildlife Inter-Regional Enforcement Meeting (WIRE) 2. As a panel speaker, she shared her knowledge on various aspects of handling live wildlife seizures, including potential health risks, proper containment procedures, species identification challenges, and the complexities involved in caring for seized animals whilst ensuring the safety of enforcement personnel.	Africa, Asia	80
B	1. IUCN side event 2. This session will showcase Singapore's collaborative, integrated approach to animal and wildlife health management through a One Health lens. We will explore how this framework drives our local biosurveillance efforts and examines Singapore's comprehensive multi-disciplinary strategy for mitigating disease risks and building preparedness against threats such as highly pathogenic avian influenza (HPAI). The session will also highlight Singapore's Centre for Wildlife Forensics and its unique role in strengthening cross-border collaboration across the Asia-Pacific region. As the world's first World Organisation for Animal Health Collaborating Centre specialising in Wildlife Trade and Wildlife Health, the Centre leverages local and regional expertise to improve animal and wildlife health outcomes while building capabilities to sustain safe and legal wildlife trade.	International	100

## TOR 8: SCIENTIFIC MEETINGS

9. Did your Collaborating Centre organise or participate in the organisation of scientific meetings related to your main focus area on behalf of WOA?H

No

## TOR 9: DATA AND INFORMATION DISSEMINATION

10. Publication and dissemination of any information within the remit of the mandate given by WOA?H that may be useful to Members of WOA?H

a) Articles published in peer-reviewed journals:

7

1. Lim, R.B.H., Heng, Z.P., Ho, K., Koh, K., Lim, H.P., Lim, K., Sng, W., Tan, G., Teo, E. and Chua, T.H., 2024. Modeling Singapore's First African Swine Fever Outbreak in Wild Boar Populations. *Transboundary and Emerging Diseases*, 2024(1), p.5546893. <https://doi.org/10.1155/2024/5546893>

2. Chong, S.Q.Y., Yeo, D., Arceo, A.V.V. et al. *Cytauxzoon paradoxurus n. sp., a novel Cytauxzoon species identified in common palm civets in Singapore. Parasites Vectors* 18, 175 (2025). <https://doi.org/10.1186/s13071-025-06820-0>

3. Song, X.P., Tan, E.Y., Lee, R.S., Sim, H.J., Nai, J.K., Chan, J.Y., Hung, S.M., Ng, S.H., Goh, E.S., Tan, C.Y. and Chua, Y.K., 2025. A predictive approach to assess urban biodiversity and plan for future development scenarios. *Journal of Applied Ecology*.

4. Soh M. C. K., Tay L. S., Choo R., Khoo M. D. Y., Kong E., Chan Y. S., Neo W. H. Y., Ow S., Toh Y. H., Han L., Lee B. P. Y.-H., Loo A. H. B. Loo, and Er K. B. (2025). Wildlife crossing structures facilitate movement in an urban tropical protected area: a comparative study in Singapore. *International Congress for Conservation Biology 2025*.

5. Sajjadi NC, Abolnik C, Baldinelli F, Brown I, Cameron A, de Wit S, Dhingra M, Espeisse O, Guérin JL, Harder T, Ho J, Chua TH, Hussein K, Lyons N, Monne I, Okamuro Y, Pacheco DT, Pavade G, Poncon N, Prajitno TY, Rojas JG, Swayne D, & Stegeman A (2025). Vaccination and surveillance for high pathogenicity avian influenza in poultry—current situation and perspectives. *Biologicals* 91: 101840. <https://doi.org/10.1016/j.biologicals.2025.101840>

6. Koh, E.Y., Tan, A.K., Ip, Y.C.A., Lau, C., Ong, J., Ng, O.W., Chen, J., Lee, C., Fabbri, S., Chua, J. and Balakumar, S., 2025. Genetic Characterization of the First Case of Lumpy Skin Disease in Singapore, 2022. *Veterinary Sciences*, 12(11), p.1108. <https://doi.org/10.3390/vetsci12111108>

7. Soh M. C. K. and Neo W. H. Y. Navigating an urban matrix: home range and resource use of resident raptors in Singapore. 13th Asian Raptor Research and Conservation Network, and 7th Taiwan Raptor Symposium 2025

b) International conferences:

2

1. 19-21 June 2025: Asia-Pacific Wildlife Health Workshop 2025

Oral presentation: Nanopore-assisted species characterization in wildlife trade, pathogens and vectors

Speaker: Dr Darren Yeo

Oral presentation: *Cytauxzoon paradoxurus* n. sp., a novel *Cytauxzoon* species identified in common palm civets in Singapore

Speaker: Stacy Chong

2. 28 – 29 August 2025: 2nd Southeast Asia Ticks and Tick-borne Diseases Symposium in Singapore

Poster presentation: Tick-Borne Pathogen Biosurveillance in Singapore: Monitoring Threats at the Urban-Wildlife Interface

c) National conferences:

2

1. May 2025: HPAI briefings for wildlife, parks and natural reserves stakeholders

2. September 2025: Contingency preparedness exercise on High Pathogenicity Avian Influenza (HPAI) in Free Roaming Chickens (FRCs) scenario

3. September 2025: HPAI drill conducted by Mandai Wildlife Group, NParks as observer.

d) Other (Provide website address or link to appropriate information):

11. What have you done in the past year to advance your area of focus, e.g. updated technology?

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12. Additional comments regarding your report:

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