



2022

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ANNUAL REPORT

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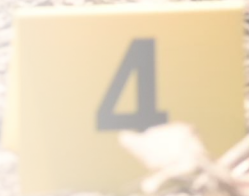
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# WELCOME

Welcome to this year's TRACE annual report. 2022 has been another fantastic year for TRACE, as we expand our project work across Africa and Southeast Asia.

Highlights include the first forensic casework conducted at the Ugandan wildlife DNA forensics laboratory, implementation of our TigerBase project in Vietnam and Lao PDR, and the graduation of wildlife crime scene awareness instructors in Cameroon.

As the only international organisation dedicated to promoting the use of forensic science in wildlife law enforcement, TRACE continues to deliver capacity from crime scene to courtroom, providing expert instruction and resources to investigators, scientists and prosecutors.

TRACE has maintained steady organic growth, with fifteen staff, representing eleven nationalities, working with partners in over a dozen countries to improve wildlife law enforcement. This report presents just some of the project activities we've led this year, courtesy of increased grant income from our global supporters. As ever, we are very grateful to all of our donors and partner organisations for facilitating our work.

One of my favourite activities of the year is the African Wildlife Forensics Network meeting. This year saw a return to an in-person meeting after two years of covid-restricted online events. Although these

arguably reached a wider audience than usual, there's nothing better than getting together with colleagues from across Africa, face-to-face, meeting old friends and establishing new relationships.

Our visit to Mabula Lodge, South Africa, in July, was a fantastic experience for all, with crime scene and laboratory training workshops during the meeting followed by a dedicated ivory identification course run by Dr Ed Espinoza of the US Fish and Wildlife Service National Forensic Lab in Ashland. It was great to feel the energy generated by the group, with ideas for enhancing wildlife forensics fizzing as much as the local beer – that said, the plummeting temperatures of South Africa in July meant that mulled wine would have been a good option too!

We continue to focus our efforts on addressing gaps in law enforcement capabilities, delivering what is most needed to ensure that our work and donor funding have maximum impact. As a small non-profit organisation, working with local partners, we are able to rapidly adapt to changing circumstances on the ground to achieve our aims. As ever,

many thanks to all of our staff at TRACE for their dedication and enthusiasm to the cause; teamwork is at the centre of all we do.

As director of TRACE Wildlife Forensics Network, it gives me a huge amount of pleasure to provide this annual update. Thank you for your interest in our work, please read on for some inspiring examples of wildlife forensic science in action!



**Prof. Rob Ogden**  
TRACE Director

## Key Numbers for 2022

31

The number of government institutions we collaborated with

14

The number of countries we worked in

201

The number of people trained



# HOW WE BUILD CAPACITY

TRACE specialises in helping countries use forensic evidence in wildlife law enforcement. This involves a combination of training and capacity building throughout the evidential journey, from crime scene to courtroom. In the world of forensics, everything depends on the previous link in the chain: the prosecutor needs an accurate lab report, the lab needs correctly preserved evidence, the evidence needs correct documentation and these records need to link seamlessly back to the crime scene, where the whole process begins. Any breaks in evidence security or gaps in expertise will lead to evidence being rejected and cases potentially lost.

When developing wildlife forensic capability, this means that we have to focus on every aspect of forensic evidence production and management. TRACE employs specialists with years of international experience at each stage of the process, ensuring that all of our trainee crime scene officers, instructors and laboratory analysts are taught by experts in their fields.

Aside from technical support, TRACE is also committed to supporting practitioner networks that promote wildlife forensic community development and ensure that quality assurance standards are shared, implemented and maintained. This overall capacity building model can be tailored to country requirements and promotes sustainable solutions for wildlife forensics in global law enforcement.



## Crime Scene

Typically considered the start of the forensic evidence process, wildlife crime scenes can include poaching sites, vehicles, buildings or shipping containers. Crime scene roles vary from the first responder on site, to a crime scene investigator, requiring a range of tailored trainings and equipment provision. TRACE works with partner agencies throughout Africa, Southeast Asia and Latin America to develop national capacity for enforcement agencies to correctly secure and process wildlife crime scenes. In addition to direct officer training, we train instructors and institutionalise crime scene courses through wildlife schools and ranger training facilities.



## Evidence Management

Once recovered, evidence items must be fully documented, securely transferred and stored to allow their subsequent analysis and submission to

court. Evidence security and management require organisations to develop and follow robust Standard Operating Procedures (SOPs). TRACE works with a wide range of wildlife enforcement agencies to support the design and implementation of institutional SOPs, including role-specific train-the-trainer programmes and the provision of secure evidence storage facilities.



## Laboratory

Wildlife forensic science is focused on addressing key investigative questions concerning the identity of animals, plants, their parts and products. Forensic analysis can include physical, chemical and biological methods, ranging from morphology to DNA testing. TRACE works with laboratories around the world to help local scientists develop and apply forensic science to support wildlife crime investigations. This includes laboratory design, research and development, quality management and casework advice. We have helped establish over fifteen national wildlife DNA forensic laboratories since 2009.



## Courtroom

During this final stage of the enforcement process, it is critical that forensic evidence is correctly interpreted and presented in a court of law. As wildlife forensic science is relatively new to many countries, it is important to raise awareness of the science and techniques involved among prosecutors and the judiciary, to ensure evidence is admitted at trial. TRACE partners with experienced wildlife prosecutors to provide training to the legal profession and forensic expert witnesses.



## Networking

A key component of our regional capacity building work is the formation of networks of wildlife forensic scientists and crime scene investigators. Establishing partnerships within and among countries promotes knowledge exchange, creates training opportunities, builds communities and advances the development of professional standards. Through initiatives such as the African Wildlife Forensics Network, TRACE supports meetings and activities that link international experts with national practitioners and help maintain the relationships that enable wildlife forensics to impact investigations.



## Quality Assurance

Quality is an essential component of forensic science, controlling how it is conducted and also in how it is taught. TRACE helps countries implement quality management systems that comply with international best practice including relevant ISO standards for evidence management and laboratory testing, and the Standards and Guidelines of the Society for Wildlife Forensic Science.





# CRIME SCENE

**When a wildlife crime has been committed, it is important that evidence linking any potential suspects back to the victim and the location is collected.** If this evidence is not collected following legal and scientific guidelines, it may not be suitable for downstream laboratory analysis or be rejected by the court. Therefore, it is essential that personnel responding to wildlife crime scenes have the knowledge and skills to safely, efficiently and correctly identify, document, and collect all potential evidence.

In every country in which TRACE operates there are dedicated men and women working as wildlife law enforcement officers. The actions of these officers form the foundations of all wildlife crime prosecutions, so they need to receive adequate training to fulfil this role. However, each country has potentially thousands of officers responding at wildlife crime scenes making it impractical for TRACE to directly train all personnel. For this reason TRACE implements a three-stage train-the-trainer programme to institutionalise both the knowledge and the ability for wildlife law enforcement



Officer collecting evidence in Malawi

agencies to continue to provide training to their officers.

In 2021, following the training provided by TRACE to the College of African Wildlife Management (CAWM) in Mweka, Tanzania, Crime Scene Awareness Training has been embedded into the curriculum for the CAWM Wildlife Management degree, which is prior training for most Tanzanian wildlife officers.



Officers learning how to sub-sample biological material in Zambia

We are now building upon our experiences at CAWM by helping embed Wildlife Crime Scene Awareness and Evidence Management courses into training undertaken by established officers in Cameroon, Malawi, and Zambia.

## Case Study - Cameroon

This year, TRACE delivered a Train the Trainer programme in Wildlife Crime Scene and Evidence Management Awareness, at the Garoua Wildlife School (École de Faune de Garoua) in Cameroon.

The first phase of this six-week training programme saw 13 students undertake the basic Wildlife Crime Scene and Evidence Management Awareness course that they will eventually instruct

themselves. This course has been developed by TRACE based on the real-world crime scene investigation experience of our staff and utilises pedagogical teaching approaches to ensure the most effective learning outcomes for all participants. The training was delivered by a team led by our lead crime scene investigator, Dr Grant Thomson, who brings experience from non-wildlife CSI and intelligence gathering, alongside wildlife crime scene training expertise.

The second phase of the training is to transition the students through 'Learning and Co-teaching' into the 'Takeover' stage, where they are guided to develop the learning materials to suit their own teaching styles. This readies them for the final phase, where the trainee instructors take responsibility for delivery of the 5-day Crime Scene and Evidence Management Awareness training course to a group of test students, repeated over two weeks. At Garoua, this 'Deliver' stage involved 30 second-year ranger students, 14 qualified rangers and 6 personnel from the CITES MIKE (Monitoring the Illegal Killing of Elephants) programme.

**Garoua Wildlife School and the Ministry of Forestry and Fauna in Cameroon now has a team of trained and knowledgeable Instructors that teach current**



Students being taught by the new trainers during the third phase of the Train-the-Trainer programme, Cameroon

**and future generations of wildlife officers and rangers in Wildlife Crime Scene and Evidence Management Awareness; knowledge that is essential to enhancing national capability in Cameroon for combatting wildlife crime.**

## The 'Yellow Guide'

2022 saw the role out of the revised 'Wildlife Crime Scene Guide for First Responders', affectionately known as 'The Yellow Guide'. The initial version of the guide has been adopted by practitioners across not only Africa, but also Asia, South America, and Europe. To date, over 500 guides have been distributed by the United Nations Office on Drugs and Crime (UNODC) to trainers and their students. The latest update incorporates three years' worth of appraisals, feedback, and development by TRACE and partners, including extensive additional new material.





# EVIDENCE MANAGEMENT

One of the biggest factors leading to the rejection of evidence and consequent failure of wildlife prosecutions is a breakdown in the evidential ‘Chain of Custody’.

Chain of Custody is the auditable record of each exhibit, detailing every person and every place that evidence has passed through, from the crime scene until it reaches court. This is probably the most vulnerable part of the forensic process and is almost always scrutinised by the defence.

Ensuring that law enforcement officers correctly document, transport and securely store evidence, following its collection at a crime scene, is essential

to maintaining the chain of custody. In practice, these processes should be controlled by organisational standard operating procedures (SOPs). Such SOPs ensure consistent good practice in the management of exhibits and provide confidence to the court in the integrity of the evidence; however, SOPs are often lacking or inadequate in wildlife law enforcement agencies.

TRACE has been collaborating with both the Malawian and the Zambian Departments of National Parks and Wildlife (DNPW) to develop their Evidence Management SOPs, documenting how officers should process every piece of evidence along the Chain of Custody. This year we are pleased to report that the final ‘Wildlife

Crime Exhibit Management and Security’ SOPs were formally signed off by DNPW Executive Directors in Malawi and Zambia.

This paved the way for TRACE to conduct role-specific SOP training in each country, targeting what each type of officer, needs to know, from field rangers, to evidence storeroom managers. Once again, we used a train-the-trainer approach, to institutionalise the SOPs within national parks departments in Zambia and Malawi, enhancing the overall effectiveness of wildlife crime investigations and prosecutions.

Feedback has been extremely positive, with instructors and field officers showing great enthusiasm for adopting the SOPs and putting them into practice.

**Evidence storage facilities - Zambia**  
One requirement of the Chain of Custody is that evidence is securely stored at the various points in the chain between crime scene and courtroom. Secure storage facilities are not present in Zambia, despite the large volume of wildlife crime related evidence being

seized. To rectify this situation, TRACE, along with our local NGO partner, Wildlife Crime Prevention, set about procuring, fabricating, and installing evidence storage containers at six strategically selected DNPW sites across Zambia.



An evidence storage unit in Zambia

Each evidence storage unit is constructed from a shipping container and incorporates appropriate shelving, cold storage, and ventilation. For added security, the containers are re-enforced and equipped with CCTV. Solar panels ensure continuity of the power supply, which can be unreliable in remote areas. At each location, an Evidence Security Custodian was identified from within the DNPW and trained in how to implement new storage protocols, following the

**“Following a nation-wide roll-out of this training, evidence collected at wildlife crime scenes should now be able to withstands legal scrutiny and be able to contribute to effective and just convictions.”**





# LABORATORY

**In many instances, items and samples collected at a crime scene require scientific analysis to determine their evidential value.**

TRACE works with government mandated agencies to build and improve their institutional forensic laboratory capacity. For example, in 2022, TRACE scientists worked with the Institute of Ecology and Biological Resources in Vietnam to implement a DNA profiling technique known as SNP genotyping. This technique is being used to genetically register captive tigers across the region and contributes to the broader vision of creating a unified, region-wide DNA database for captive tigers, known as TigerBase.

The training was meticulously designed to transfer the technical protocol for SNP genotyping and ensure its effective implementation. TRACE scientists guided the lab team through each stage of the process, from initial preparation to final execution, providing hands-on supervision and support.



This immersive approach ensured that the staff gained both the theoretical knowledge and practical skills necessary to carry out the genotyping process with precision and confidence. Two dedicated laboratory staff are now equipped with the skills to independently genotype captive tigers at 19 DNA markers, contributing to a regional DNA profiling system that will play a critical role in enhancing the conservation and management of tigers, enabling better tracking, monitoring, and investigation.

Across Southeast Asia this year, our TigerBase project was also rolled out in Lao PDR, with 311 captive tigers successfully added to the database.

Laboratory training was provided in Thailand, to the national wildlife forensic laboratory, known as WIFOS, to improve the efficiency of their forensic elephant ivory DNA extraction. We also provided advice in genetic sequence analysis, interpretation, and case reporting procedures for forensic investigation, improving how the WIFOS lab scientists conduct casework.

Looking beyond Asia we are also thrilled to report the successful completion of the first wildlife DNA forensic casework in Uganda, at the laboratory we have been helping develop with the Uganda Wildlife Authority and UNODC for several years. This represents a huge step forward in investigative capacity in Uganda; in total, by the end of 2022 the laboratory has completed 20 cases, involving 82 evidence samples, supporting investigations into illegal bushmeat, including hippopotamus, antelope, pangolin and leopard. There were also three cases consisting of larger seizures of ground pangolins scales, white rhinoceros horns, and African elephant ivory and bones.

We are confident this success will only continue!

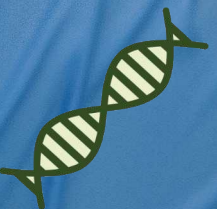
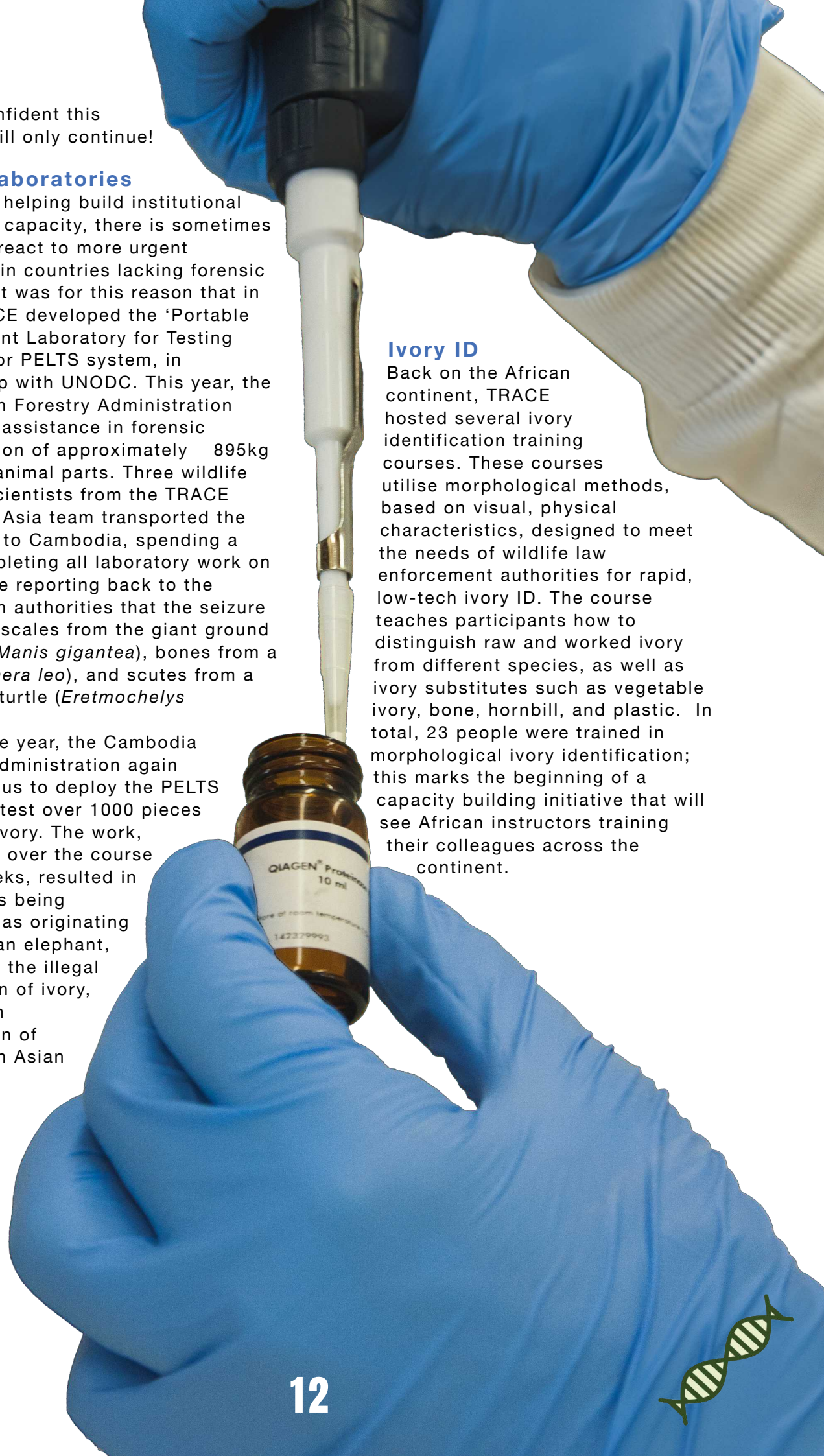
## Mobile laboratories

As well as helping build institutional laboratory capacity, there is sometimes a need to react to more urgent situations in countries lacking forensic facilities. It was for this reason that in 2019 TRACE developed the 'Portable Enforcement Laboratory for Testing Seizures' or PELTS system, in partnership with UNODC. This year, the Cambodian Forestry Administration requested assistance in forensic identification of approximately 895kg of seized animal parts. Three wildlife forensic scientists from the TRACE Southeast Asia team transported the PELTS lab to Cambodia, spending a week completing all laboratory work on site, before reporting back to the Cambodian authorities that the seizure contained scales from the giant ground pangolin (*Manis gigantea*), bones from a lion (*Panthera leo*), and scutes from a Hawksbill turtle (*Eretmochelys imbricata*).

Later in the year, the Cambodia Forestry Administration again requested us to deploy the PELTS system to test over 1000 pieces of seized ivory. The work, conducted over the course of two weeks, resulted in all samples being confirmed as originating from African elephant, confirming the illegal importation of ivory, rather than exploitation of Cambodian Asian elephants.

## Ivory ID

Back on the African continent, TRACE hosted several ivory identification training courses. These courses utilise morphological methods, based on visual, physical characteristics, designed to meet the needs of wildlife law enforcement authorities for rapid, low-tech ivory ID. The course teaches participants how to distinguish raw and worked ivory from different species, as well as ivory substitutes such as vegetable ivory, bone, hornbill, and plastic. In total, 23 people were trained in morphological ivory identification; this marks the beginning of a capacity building initiative that will see African instructors training their colleagues across the continent.





# COURTROOM

**The objective of forensic science is to generate analytical results to be presented in a court of law, where the evidence will be scrutinised, challenged and interpreted to help determine the guilt or innocence of the suspect.**

When forensic evidence is used in the courtroom, it is common for the forensic scientists to be called as expert witnesses to explain their findings. For the defence team, during cross-examination, this is an opportunity to question the science or scientist and attempt to discredit the evidence presented by the prosecution. To prepare scientists for cross-examination, TRACE offers Expert Witness Testimony Training and, during 2022, we ran a dedicated course for Malaysian wildlife forensic scientists.

The event brought together 15 wildlife forensic scientists from Peninsular Malaysia, Sabah, and Sarawak for a unique learning experience that aimed to equip participants with the essential skills needed to provide compelling expert witness testimony and craft precise witness statements, all tailored

to the requirements of the Malaysian courts.

Guided by an international team of legal advisors consisting of two prosecuting officers and two wildlife forensic experts, with extensive experience in Malaysian wildlife crime cases, the sessions aimed to train scientists in delivering authoritative expert testimony based on forensic data. This helped refine their ability to write witness statements, and to create a collaborative platform for Malaysia's wildlife forensic community to exchange ideas and insights.

Participants engaged in discussions about their approaches to processing seizures, maintaining chain of custody, drafting witness statements, and gaining a clearer understanding of what to expect when testifying in court. The lab experts also seized the opportunity to delve deeper into discussions with legal advisors, concerning courtroom expectations and identifying ways to enhance their expert testimony for more successful prosecutions.

The event was considered a great success; participants left with a stronger

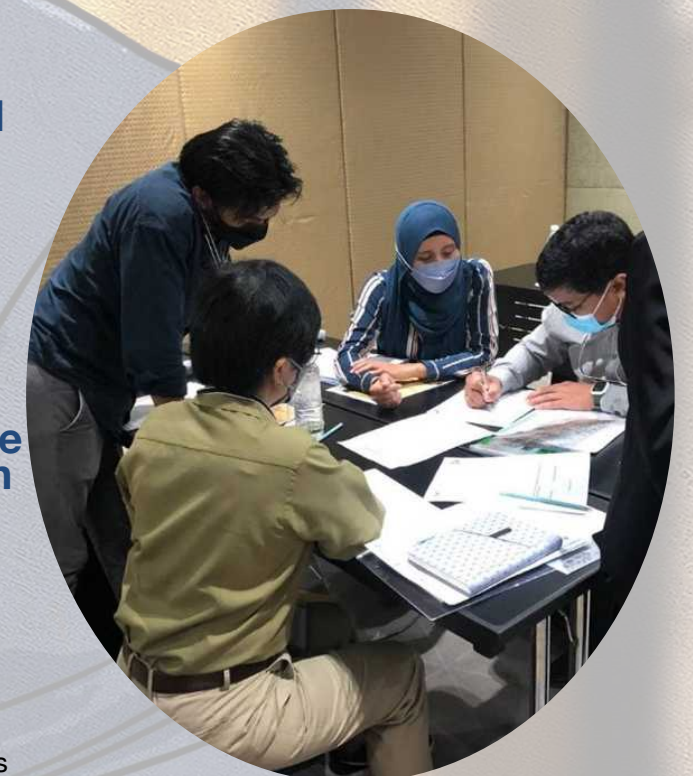


grasp of courtroom process, the nuances of preparing witness statements, the types of questions to anticipate during testimony, and the critical importance of chain of custody in handling exhibits.

to take the stand and working with prosecutors to help provide greater awareness of the role of wildlife forensic science.

**In addition to strengthening technical and legal knowledge, the workshop also laid the groundwork for future collaborations between the legal and wildlife forensic communities in Malaysia, ensuring that the fight against wildlife crime is backed by both robust science and compelling legal expertise.**

Following this year's training, TRACE intends to continue engaging with courtroom focussed capacity building in other countries, preparing scientists





# NETWORKING

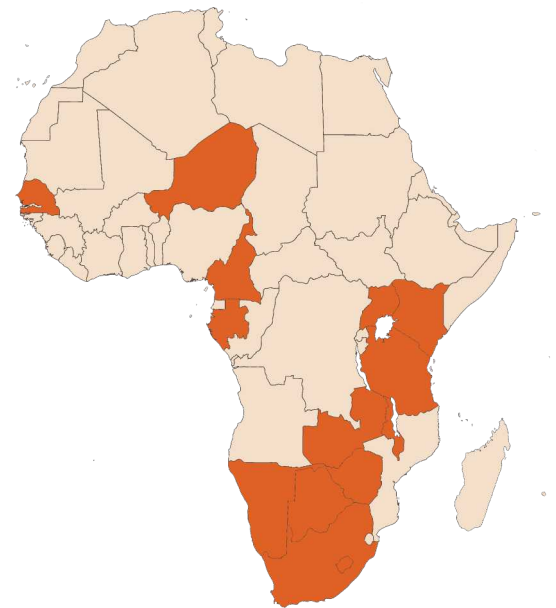
**Everyone who works in wildlife law enforcement, from crime scene to courtroom, is a small part of a larger network attempting to protect wildlife from illegal activities. It is the collective actions of this community that lead to successes, be those prosecutions or as a deterrent to criminal activity. For this reason, it is crucial that these people come together to share and discuss ideas from different countries and with different experiences.**

Each year, TRACE organises the African Wildlife Forensics Network (AWFN) meeting, bringing together crime scene and forensic practitioners from across the continent, as well as experts from other regions of the world. 2022 was the network's 7th successful year and, to expand the networking even further, AWFN invited 7 forensic scientists from Southeast Asia - Malaysia, Sabah, Thailand & Vietnam - to attend the meeting in South Africa. As many species of native African wildlife are illegally trafficked to Southeast Asia, it was of huge benefit for African and Asian colleagues to be able to share their perspectives from different ends of these trade routes.

As part of the meeting, the Asian scientists participated in four

workshops alongside their African counterparts, learning about evidence receipt and examination, DNA sequence analysis, result interpretation, and submission of case reports.

This year's AWFN meeting was also attended by timber forensic expert, Dr. Ed Espinoza, from the United States Fish and Wildlife Service's National Forensic Laboratory, who was able to provide insight to questions regarding ISO17025



accreditation, an international quality assurance standard that many of the laboratories in SEA are interested in obtaining.

## **Joint lab and crime scene activity**

As well as facilitating country-to-country networking within specialist subjects, one advantage of having practitioners from both laboratory and crime scene present in the same place at the same time is the ability for different disciplines to share their experiences. Evidence collected incorrectly at a crime scene often cannot be analysed by the laboratory, and if the laboratory doesn't tell the personnel responding to crime scenes what they need, the crime scene practitioners may not know what or how to collect certain samples. To counter such issues, we ran a joint lab and crime scene practitioner exercise. This highly enjoyable, relaxed activity consisted of demonstrations and participatory activities, led by members from each discipline and resulted in a cross pollination of experience and knowledge - and a huge amount of lively discussion! Ultimately, every person involved came away learning how their activities impact on the ability of others to succeed in their respective roles, and how understanding each other's needs can really help to overcome casework challenges.

## **Society for Wildlife Forensic Sciences**

In October this year, the Society for Wildlife Forensic Science Conference was held in Ashland, Oregon. The event was attended by 144 wildlife forensic scientists and researchers from 16 different countries. The conference provides a valuable platform for exchanging expertise, discussing potential collaborations, and opportunities to connect with partner laboratories globally. TRACE was able to fund 9 participants, from Malaysia, Vietnam, and Thailand, to attend the conference and exchange of information on current research, wildlife seizures, and laboratory developments. It was particularly beneficial to the Southeast Asian delegates, where the wildlife trafficking networks are often interconnected, making cross-border collaboration essential.

Participants from Thailand and Vietnam took the opportunity to share news on the development of their forensic laboratories, helping raise awareness within the international community of the diverse types of cases that their wildlife forensic laboratories are facing and the unique challenges they encounter.

One significant milestone was the Institute of Ecology and Biological Resources in Vietnam receiving its Certification of Compliance to the SWFS Standards and Guidelines; a noteworthy achievement that TRACE has been proud to strongly support!



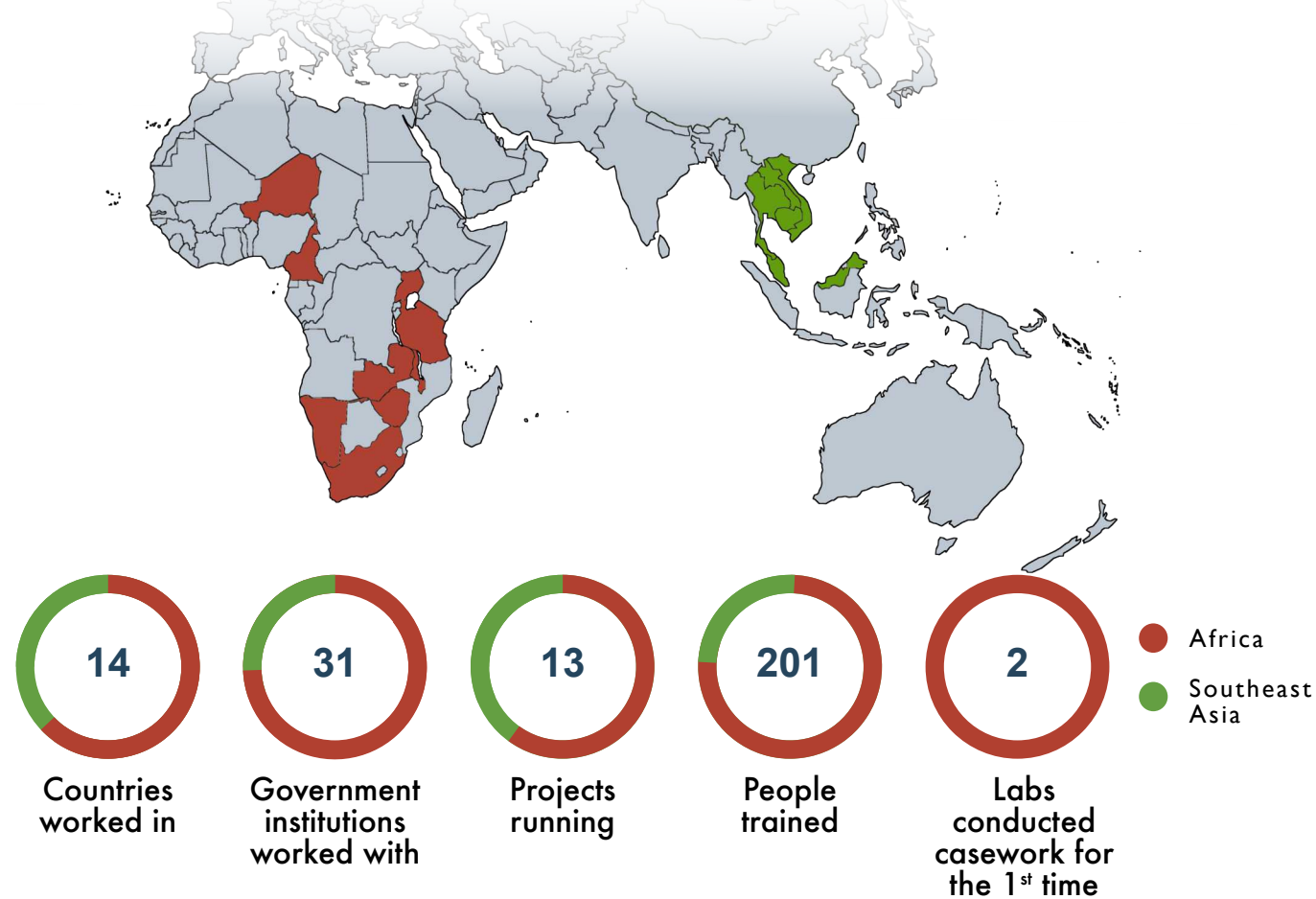
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16





# THE YEAR IN NUMBERS



Trace uses a train the trainer model to massively upscale its training and capacity building output. For example, in Zambia, **2 TRACE staff** ran a train the trainer programme for **8 Zambians** on their new Standard Operating Procedure for evidence management. **These trainees have gone on to train 130 more Zambians** with their new SOP.

Trainees who have previously undertaken TRACE training are now taking their knowledge, with the assistance of TRACE, to other countries and **facilitating the embedding of knowledge not only within institutions, but across the continent.**

**16 Malawians and 13 Cameroonians** have now been given the skills and knowledge to train **Crime Scene Management and Evidence Awareness** to their colleagues. We expect this to have a year-on-year increase in crime scene management capacity in these countries.

Following assistance from TRACE, **2022 saw new wildlife forensic laboratories in Uganda and Zimbabwe complete their first wildlife genetics based casework.**



## Financial Summary for 2022

All values in GBP (in thousands)	2022	2021
Income	1,208	969
Operational costs	943	698
Organisational Costs	263	133
Reserves	555	554

**A big thank you to all our funders!**



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