



Illegal Wildlife Trade (IWT) Challenge Fund Annual Report

To be completed with reference to the “Writing a Darwin Report” guidance: (<http://www.darwininitiative.org.uk/resources-for-projects/reporting-forms>). It is expected that this report will be a **maximum** of 20 pages in length, excluding annexes)

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IWT Challenge Fund Project Information

Project reference	IWT044
Project title	Critical evidence to drive a reduction in Cambodia’s ivory trade
Country/ies	Cambodia
Contract holder Institution	Fauna & Flora International
Partner institution(s)	Royal Government of Cambodia Royal University of Phnom Penh Royal Zoological Society of Scotland
IWT grant value	£ 334,735
Start/end dates of project	1 st July 2017 – 31 st March 2021
Reporting period (e.g. April 2017- Mar 2018) and number (e.g. Annual Report 1,2,3)	Annual Report 1: 1 st April 2018 – 31 st March 2019
Project leader name	Regine Weckauf
Project website/blog/social media	http://www.fauna-flora.org/explore/cambodia/
Report author(s) and date	Regine Weckauf, Alexander Ball 29 April 2019

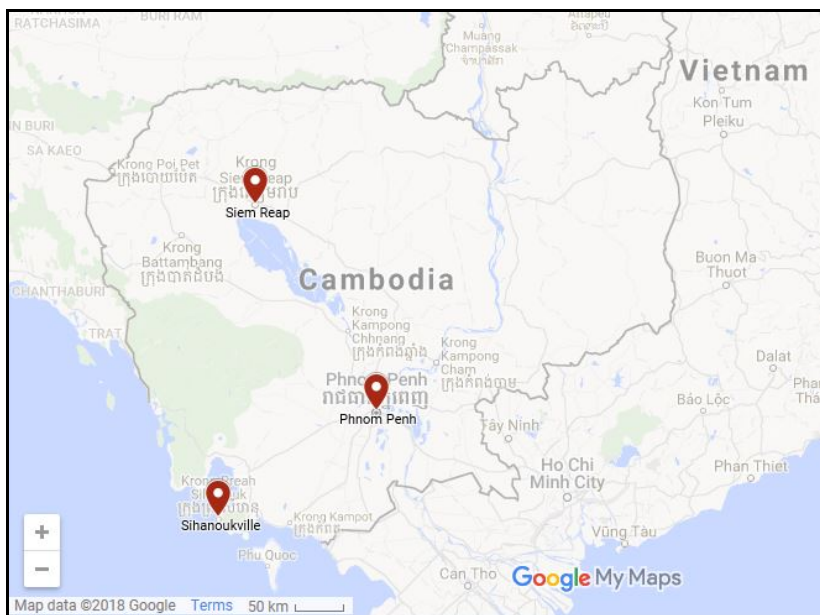
1. Project rationale

African elephant (VU) populations have declined by 30% between 2007 and 2014, primarily due to global increase in poaching for ivory. Illegal trade in ivory is also a threat to Asian elephants (EN), of which fewer than 52,000 remain. Global illegal ivory trade, driven by organised crime networks, benefits the few whilst impoverishing communities local to source populations who bear the costs of poaching activities and enforcement responses, e.g. insecurity, ecosystem degradation.

This project seeks to reduce illegal ivory trade in Cambodia, a country at risk of becoming a driver of the global trade, by enabling more effective enforcement. FFI market surveys suggest Cambodian ivory trade networks are linked to other IWT networks, amplifying unsustainable harvest of domestic wildlife species. Little is known about these networks, but many of Cambodia’s poorest, most natural resource-dependent communities live closest to source populations and are likely being impacted by poaching and wildlife depletion. Critically, with the closure of China’s ivory markets, there is real risk of illegal ivory markets diverting to Cambodia; FFI documented that buyers of worked ivory are mostly from China, where ivory trade was recently banned.

We provide essential evidence for urgent policy improvements, by tackling the lack of knowledge of Cambodian ivory markets and trading networks through research, including identifying links to communities living closest to source populations. We will build capacity for genetic analysis of ivory to determine provenance and regional trade networks, further informing regional efforts to stop IWT. Finally, building on FFI's long-standing relationships with government partners, we will address legislative weaknesses and support the implementation of the Cambodian Elephant Conservation Action Plan and National Ivory Action Plan to ensure effective enforcement that prevents illegal trade in African and Asian ivory.

Our annual ivory market surveys and ivory trade network surveys are carried out in the three cities most frequented by international and domestic tourists, Phnom Penh, Siem Reap, and Sihanoukville, indicated in below map. The conservation genetics lab is located in the country's capital Phnom Penh.



2. Project partnerships

The main partners on this project are the Royal University of Phnom Penh (RUPP), the Royal Zoological Society of Scotland (RZSS) and the Royal Government of Cambodia's Forestry Administration (FA) of the Ministry of Agriculture Forestry and Fisheries (MAFF).

FFI has been working in partnership with RUPP since 2005 in the development and support of Cambodia's first and only MSc in Biodiversity Conservation. In 2016, FFI established a partnership with RZSS in support of the creation of the first conservation genetics lab in Cambodia housed in the Faculty of Science of RUPP. RZSS is the technical lead in implementing Objective 2 in partnership with RUPP. RZSS is one of the few international genetics facilities that specialises in building the capacity of international underserved institutions. RZSS WildGenes Lab has extensive experience globally in IWT work and building the capacities of genetics labs; currently it provides technical and capacity building expertise to elephant conservation in Africa and Asia.

RZSS has conducted two training workshops within the RUPP, Cambodia during Year 2 of the project. The first workshop (2nd July – 24th July 2018) included a focus on trouble-shooting problematic ivory samples (Annex 4.1) and testing of elephant markers for the genetic database of Asian elephants (Annex 4.2) as well as identifying and working with non-ivory products that are also found within the illegal wildlife trade. Training on the analysis of genetic data was also initiated; with RUPP staff using the genetic software program Geneious for the first time (Annex 4.3). The second training workshop (3rd Feb – 19th Feb 2019) focused on genetic tests for mammoth ivory (Annex 4.4), and the genetic sexing of elephants (Annex 4.5). In addition to training the RUPP staff, a PhD student studying wild Cambodian elephants was also in attendance. Both RZSS training sessions have also facilitated meetings between the three main partners (FFI, RZSS and RUPP) in country, to discuss progress and plan for the next phases of the project. The second workshop of Year 2 involved a meeting with the fourth

partner, the Royal Government of Cambodia, with a senior staff member of the Ministry of Environment (MoE) visiting the laboratory facilities at RUPP. In addition to the training workshops a weekly skype meeting is conducted between staff at RUPP and RZSS to ascertain progress and trouble-shoot any difficulties in the laboratory.

Data agreements have been signed between the project partners and two NGOs working in wildlife conservation within Cambodia (excerpts in Annex 4.6). The World Wildlife Fund (WWF) and Wildlife Conservation Society (WCS) have made DNA samples available to the laboratory staff at RUPP for generation of the Cambodian wild elephant genetic database. The laboratory staff at RUPP have also started to create links with laboratory equipment, reagent and consumable suppliers within South East Asia. This included visiting representatives from a Cambodian based supplier (Unique Medical distribution) and staff attendance at an international trade fair for laboratory supplies in Ho Chi Minh, Vietnam.

As knowledge of the Conservation genetics lab at RUPP has travelled, links have been forged with other conservation NGOs. WWF conservation staff within Cambodia and Vietnam have approached with interests in using genetics to tackle other conservation priorities. The Elephant Valley project (EVP) and Wildlife Alliance, both based within Cambodia, have provided elephant blood, hair and faecal samples for use within the RUPP laboratory. This has been instrumental in developing and testing genetic protocols for use with the ivory samples. Contacts have also been made with other institutions working on projects related to Cambodian wildlife, from both an illegal trade (Angkor Centre for Conservation of Biodiversity) and animal/human health (Cambodian Pasteur Institute) perspective.

Additionally, FFI has formed a close relationship with the Ministry of Environment (MoE) who is not an official partner on the project, but has a high interest in reducing elephant ivory marketed in Cambodia. This collaboration has included drafting an Ivory Awareness Reduction Campaign suggested by FFI and a National IWT demand reduction strategy initiated by MoE.

FFI hired a Chinese-speaking consultant to complete our Year 2 ivory market survey. The consultant has experience in leading research of ivory/IWT trade and markets in neighbouring countries, including China, Thailand, and Vietnam, and was able to obtain crucial information on existing traders and their networks.

Since late 2018, we have been corresponding with TRAFFIC. TRAFFIC are starting a regional ivory market monitoring project to compare ivory markets and corresponding fluctuations in trade amongst the five lower-Mekong countries: Laos, Thailand, Myanmar, Cambodia, and Vietnam. In an effort to not duplicate efforts as well to strengthen our collective impact, FFI and TRAFFIC will share research findings and coordinate to strengthen the response of the Cambodian government, e.g. working with TRAFFIC's direct engagement with CITES authorities. This relates to indicator *1.2 Findings of research into ivory trade networks and the links between IWT and poverty are used by key stakeholders (e.g. government, NGOs) to inform policy and intervention.*

Internally, FFI holds regular quarterly review meetings including Project Lead, relevant FFI Cambodia staff, and Senior Technical Specialist, Wildlife Trade to review progress against the log frame and annual work plan, and to enable wider technical input. Several additional meetings of this team have also been held to address specific technical elements of project delivery, as required, and also supported by FFI's Policy Advisor (IWT).

There have been a number of staff changes within each of the partner organisations. This has created challenges in terms of continuity and timings of deliverables. We are currently seeking to recruit a replacement technician in the RUPP laboratory. However, there has been a core team that have remained constant throughout the project and the movement of staff has allowed new links to be created with other organisations; the previous lead, Dr Jackson Frechette, continuing work within Cambodia at the NGO, Conservation International.

3. Project progress

3.1 Progress in carrying out project Activities

Output 1. Improved understanding of Cambodian ivory markets and trading networks – including exploring links between drivers of IWT and poverty – informing policy and interventions to address ivory trade.

1.1 Biannual ivory surveys of markets, vendors, and intelligence gathering to identify the supply chain networks – drawing on data mining of national reports and surveys, informant networks and triangulated interviews

Market surveys: As mentioned in the Annual Report 1 and the Half year report 2, we have decreased our biannual market surveys to once per year due to staff being recognised. Our ivory surveys across Phnom Penh, Siem Reap, and Sihanoukville in March - April 2019 by a Chinese-speaking consultant experienced in conducting similar research identified a total of **67 shops (16 more than in 2017, and 43 more than in 2016)** selling ivory, and found that **Phnom Penh accounted for the most shops (63%)**, before Siem Reap (30%), and Sihanoukville (7%). However, ivory items found in Siem Reap equated to 59% of all ivory sold country-wide, while Phnom Penh only held 34%. Total ivory items were estimated to approximately 3840. Similarly, **Siem Reap markets held 71% of the total ivory value estimated (US)** across all markets, the **total ivory value being US\$**. 74% named Chinese nationals as main consumer group, followed by 21% naming locals as buyers. Most items on sale were Pendants (35%), followed by discs, necklaces, small figurines and beads. Due to a delay in recruiting of a qualified consultant, we were only able to finalise the market survey in April and the above account is a summary of results, a much more detailed account of results will be presented with the next report.

Online survey (Annex 4.7): Facebook is still the most popular social media platform in Cambodia; 8.1 million users were recorded in December 2018, 49% of the total population¹. Young entrepreneurs use the platform to advertise and sell products unregulated. Between **1 August and 30 September 2018**, we repeated our online surveys of Facebook accounts selling elephant products. **Analysing 382 advertisements, 351 products, and 753 comments**, we found that **online shops offering elephant ivory had increased from 20 to 33**. Out of a total of **34 Facebook shops selling elephant products, 22** were identified as operating from Phnom Penh (6 opening after August 2018), **1** from Kampong Speu province and **11** from an unknown location. Among posts advertising elephant products, 98% were advertisements for ivory items (the remaining 2% advertising elephant molars). The majority of online adverts were for carved ivory items (**92%**), including Buddha figurines (**71%**), pendants, beads and jewellery. 85% of online shop owners were male and 50% were aged above 30 years old. **83%** of comments on these advertisements showed interest in purchasing the items, **98%** of which were identified as for self-consumption; none of the comments demonstrated concern for elephant welfare or legality. Of those commenting on online adverts, **93%** were posted by males and **97%** were Cambodian (**73%** of whom were identified as living in Phnom Penh, **22%** as living elsewhere in Cambodia, and 5% living abroad). We are currently analysing data representing accounts selling ivory for the period March-April which we will include in the next report.

Media survey (Annex 4.7): We continued surveying media outlets for information on ivory seizures (Dec 2017 to March 2019), **recording a minimum of 3200kg of elephant ivory**, most of which were raw tusks, alongside other IWT products predominantly from sun and black bears, and domestic ungulate species. All four reported seizures took place in Phnom Penh, with three of them reporting Cambodian nationals as the offenders, and taking place at shops or individuals homes. One seizure, **the largest one in Cambodian's history at 3.2 tonnes, found elephant tusks hidden in an abandoned shipping container, trafficked out of Mozambique**. This further reinforces our past media survey which concluded that at least half of the ivory seized in Cambodia comes from Mozambique.

1.2 Produce national map of trading hotspots and networks

We delivered a first version of our national map of trading hotspots and networks in our Annual Report 1 in April 2018. Our recent market surveys have documented the changes of ivory present in markets in Cambodia and a full analysis of this additional information, capturing trading hotspots and networks, is still underway. Initial analysis suggests that trading hotspots and networks are highly transient and fluid.

¹ <https://napoleoncat.com/stats/facebook-users-in-cambodia/2018/12>

1.3 Gendered surveys of consumers and vendors to better understand the links between poverty and the ivory trade

Our ivory market surveys showed that about 54% of vendors were female, while about 40% were male, 5% was owned by a male-female couple. Our online market survey found that **85% of online shop owners were male**, and **93% of comments were posted by males**.

In Year 2, we finalised our research investigating the underlying relationship of poverty to the illegal wildlife trade in ivory (Annex 4.8). The data collection, analysis and write up of results were led by an MSc student from the Durrell Institute of Conservation and Ecology of the University of Kent. The specific aims of the study were: (1) to develop a socio-demographic profile of ivory vendors operating in Cambodia's major ivory markets (2) evaluate vendors' perceptions, level of knowledge, and attitudes towards ivory trade, consumers, and market trends (3) identify cultural, social and economic values of ivory (4) assess the degree and nature of local- and foreign- demand for ivory in Cambodia. Key findings indicate that a growing number of Cambodians are buying ivory, alongside the main Chinese market, and that rarity and expense are the values most associated with ivory among all consumers. **Wealth, regardless of nationality, appears to be a shared trait among buyers**. Gender was evenly divided, with slightly more female ivory vendors (55%).

A Gender Training has successfully taken place for all project and partner staff (RUPP), including the wider FFI Cambodia programme (5 female participants out of 14 people total). Post-training evaluation showed a raise in the team's gender awareness scores (Annex 4.9).

1.4 Provide intelligence to law enforcement on ivory trade networks to facilitate effective enforcement;

As stated in our second half-year report, we shared the information gathered during our surveys in Year 1 (see Annual Report 1) with the Forestry Administration (FA) (through soft and hard copies of the report via emails and personal meetings), and Cambodian customs officers (through hard copies of the report distributed during a UNODC led 3-day training on "Risk profiling to enhance interception of Illegal Wildlife Trade" in August 2018) (Annex 4.10). Specific intelligence on shop owner details, individual's identities identified as complicit in the trade, as well as general data collected through our undercover surveys have been shared with the Immigration and Customs Enforcement unit of the U.S. State Department Homeland Security. These data as well as the sting camera recordings have also been shared with WCS Cambodia to be added to the WCS IMB i2 Analyze system.

Information gathered during the market and undercover surveys is also fed to the investigation unit of the Wildlife Rapid Rescue Team (WRRT) of the Forestry Administration, national police and Wildlife Alliance (complete for Year 1 surveys data, to be scheduled for our very recent Year 2 survey data to disconnect potential seizures to our survey), while our Facebook trade data is shared with the WRRT investigation team on an ongoing regular basis before finalisation and while data is collected.

In July 2018, we provided an Ivory Identification Training to the WRRT (Annex 4.11), which included an informative sharing session discussing specific shops, workshops, and emerging new products, as well future training needs. We are in constant contact with the WRRT to ensure additional information feeds directly into enforcement wherever possible. Both market level ivory seizures reported in our Media survey (Annex 4.7) are a direct result of our surveys (undercover survey and online survey) and our close collaboration with the WRRT in sharing these data. Specifically, the WRRT operation targeting the online sale of ivory has resulted in two wildlife traders being successfully prosecuted, a first case for Cambodia.

1.5 Use existing Asian elephant population genetic data from 250-300 previously collected quality-screened DNA faecal samples to generate genotype data on a genetic marker system, which will enable Cambodian elephant population-level data to be used as a reference resource by laboratories within the ASEAN Wildlife Forensic Network

Data sharing agreements are now in place between the project partners and two other NGOs with previously collected Cambodian wild elephant genetic samples, WWF and WCS (Annex 4.6). Therefore, the RUPP laboratory now has access to 360 DNA samples for

generating a wild Cambodian elephant population-level dataset. Previously sequenced elephant samples have been used to create a SNP based marker system consisting of 20 nuclear markers for population-level analysis within Cambodia. This is currently being combined with mitochondrial sequencing to create a Cambodian reference genetic dataset based on two complementary marker systems. A total of 346 samples have been sequenced for the mitochondrial database and the generation of the SNP database will continue into Year 3 as part of activity 2.2.

Output 2. National and international capacity for collaborative IWT management and enforcement is built

2.1 Establishment of species identification (Asian/African) testing from initial 30 market survey ivory samples and testing of samples to establish species provenance (mtDNA test);

The species identification protocol developed by RZSS and transferred to RUPP in Y1 has now been used to test 15 ivory samples obtained within Cambodia by FFI, 2 of which were known fakes. The protocol uses 2 testing methods both based on mitochondrial DNA. The SNP based test can be completed in the RUPP laboratory using the qPCR machine, and allows determination of species level, African or Asian. A second SNP based test also allows differentiation between mammoth and elephant ivory samples. Subsequent mitochondrial sequencing that is prepared in RUPP and completed at RZSS has confirmed the accuracy of all within country SNP tests and also allows the establishment of geographical origin of African ivory samples via the previously published *Loxodonta Localizer* database. The results of the tests have revealed that the majority of samples are of **African elephant origin (69%; 9/13 samples)**. Two were **Asian elephant ivory (15%)** and two were identified as **mammoth ivory (15%)**. The two fake ivory samples were visually identified as being made of plastic and bone respectively, the first gave negative results in all genetic tests and the second was identified as **African elephant bone**.

The nine African elephant samples have all been sequenced at a mitochondrial gene region for comparison to the *Loxodonta Localizer* database. These results have revealed a diverse origin of the samples, with the ivory matching **elephant lineages in Central, Eastern, Western & Southern Africa** (Annex 4.12).

2.2 Production of Cambodian Elephant reference genetic data from existing samples collected from wild elephant surveys to assist with global traceability of ivory (mtDNA, SNP based or microsatellite testing);

The RUPP laboratory now has access to 360 genetic samples collected from wild elephants in four protected areas in Cambodia. They additionally have genetic samples from 8 captive Cambodian elephants. With the help of RZSS they have now sequenced 346 Cambodian samples at a mitochondrial gene region that has also been sequenced across wild Asian elephants in other eight countries. In Year 3 an analysis of these data will be conducted to ascertain the most likely origin of the two Asian elephant ivory samples obtained within Cambodia.

A panel of 20 SNP markers have been developed by RZSS and RUPP that amplify in the wild Cambodian elephant samples. All 360 genetic samples will now be tested with these markers in RUPP to create a database of nuclear genetic markers for comparison to the ivory samples. These SNP markers could form the basis of a traceability test for Asian elephant ivory and access to wild elephant samples in other countries is currently being sought.

2.3 Investigation of geographic origin of Asian ivory found in Cambodia;

An analysis in Year 3 will involve the comparison of mitochondrial sequences of the seized ivory samples with the sequences of wild elephants across 9 different countries to test for the geographic origin of the samples. Preliminary analysis of these sequences suggests that mitochondrial DNA may not allow accurate determination of geographic origin (Annex 4.13). Mitochondrial haplotypes appear diverse and mixed throughout the Asian elephant range, perhaps as a consequence of trade in captive elephants throughout history. In Year 3 an attempt will be made to improve the ability to improve geographic assignment by sequencing a larger region of DNA.

SNP markers are likely to have higher accuracy for geographic origin assignment. Once the database of SNP markers has been completed for wild elephant samples in multiple countries, its ability to assign origin of the ivory samples will be evaluated. RUPP is in the process of creating a database of SNP markers for wild Cambodian elephants and permissions are being sought for access to wild elephant samples in additional countries.

2.4 Establishment of individualisation and sexing tests to allow for seizure inventory (SNP-based or microsatellite testing);

An elephant sexing test protocol has been transferred to RUPP during the 2nd Year 2 training workshop lead by RZSS. This has proved successful in sexing the captive elephant samples and 53% of the wild elephant faecal samples. However, it has currently been unsuccessful in the tested ivory samples. RUPP are attempting to troubleshoot this problem with the help of RZSS.

In addition to allowing geographic assignment, the SNP panel should allow individual identification of each elephant, effectively creating a genetic fingerprint for each wild Cambodian elephant in the RUPP sample-set. If the panel is successfully genotyped in the ivory samples it will allow the identification of carved ivory that has originated from the same elephant.

2.5 Establishment of seizure sampling, data-basing and chain of custody protocols;

Scheduled for Year 3.

2.6 Strengthen professional links of the lab with regional and international wildlife forensics/ elephant genetics network.

During the Ivory ID Training, the full-time RUPP staff member, Darith Sieng, and Trang Nguyen of FFI presented the initial results of the ivory genetic testing to the attendees, and answered questions in regards to forensic processes and procedures.

RUPP hosted its first conservation lab open day in July 2018. Conservation NGOs working within Cambodia were invited to a presentation session in the RUPP Biology Department, which included talks from the two RUPP staff members working on the IWT project. The staff gave updates on the ivory and elephant population genetic work that has occurred in the lab with the aim of showcasing the laboratory's capacity and develop contacts with other NGO's who may require the use of genetic resources in the future. The visitors were also taken on a tour of the Conservation Genetics laboratory providing an opportunity to ask questions about the ongoing projects (Annex 4.14).

In August 2018, the full-time RUPP laboratory technician and FFI staff collected mouth and faecal swabs from the 4 captive elephants of the Phnom Tamao Wildlife Rescue Centre in Phnom Penh. Phnom Tamao is engaged with caring and rehabilitating animals, including those rescued from the illegal wildlife trade, and is the head-quarters of Wildlife Alliance involved in seizures of illegally traded wildlife within the country, and is an important link for the Conservation Genetics laboratory to maintain (Annex 4.14).

The 2nd Year 2 training visit also involved the training of a PhD student studying Human/elephant conflict within the eastern plains landscape of Cambodia, allowing the RUPP to gain knowledge of elephant field conservation and a WWF member of staff that has been involved in previous sample collection for genetic projects.

FFI and RZSS staff have also attended multiple conferences to disseminate and highlight the IWTCF project work and findings (Annex 4.14):

- European Congress of Conservation Biology in Jyväskylä, Finland (June 2018). Dr Alex Ball presented a talk on the initial IWT project developments, highlighting the establishment of the first Cambodian conservation genetic laboratory. This additionally facilitated networking with elephant biologists from both Africa and Asia.
- 55th Annual Meeting of the Association for Tropical Biology and Conservation (ATBC) in Kuching, Sarawak, Malaysia, Southeast Asia (July 2018). The project was presented in the main session and conference room on Wildlife Trade by Trang Nguyen.
- IWT Roundtable discussion by USAID Wildlife Asia office and TRAFFIC in Bangkok, Thailand (August 2018). The discussion was joined by Jackson Frechette and Regine Weckauf and the Year 1 findings shared as hard copies and through discussions

amongst attendees from various NGO's and stakeholders such as the CITES Secretariat.

- 2018 Evidence to Action: Research to Address Illegal Wildlife Trade (IWT) event, organised by five UK IWT research institutions, ZSL, London, UK (October 2018). The event was attended by Regine Weckauf who gave a poster presentation about the project, and Alex Ball from RZSS. (Annex 4.14)
- Illegal Wildlife Trade (IWT) London Conference 2018, London, UK (October 2018). The conference was attended by Regine Weckauf who answered questions about the project at the FFI stall and the Defra IWTCF stall. (Annex 4.14)
- Free The Bears and SanDiego Zoo provided a 5-day workshop on Demand Reduction and Behaviour Change in March 2019, which was joined by Samet Sok, FFI IWT officer. (Annex 4.14)

Output 3. National legislation regarding ivory is in place and effectively enforced

3.1 Produce official report to the government with results from Outputs 1 and 2 highlighting the need for laws banning the sale of ivory;

This is on track for delivery in Year 4. On-going coordination and sharing of info with the government takes place to support action that can be taken.

3.2 Engage with Ministry of Environment to ensure that laws banning ivory sale and purchase are incorporated into the development of legislation

The project team has continued to support the Ministry of Environment (MoE) in the development of the new Environment and Natural Resources Code (ENR Code). The ENR Code is now in its 11th draft. Specific language banning the sale and purchase of ivory is part of the legislation. The government is still reviewing the latest draft, and we are awaiting feedback for the next steps. We will continue to work with the government and all other stakeholders through this process, and through the implementation of the newly adopted law.

Additionally, we have had regular meetings (about every two months) with the MoE General Directorate of Administration for Nature Conservation and Protection (GDANCP), who has shown much enthusiasm in countering the illegal ivory trade in Cambodia. Meetings included His Excellency Chea Sam Ang, Director General of GDANCP and Mr. Peov Somanak, Deputy Director of Department - Terrestrial Protected Areas Conservation. We additionally met His Excellency Say Samal, Minister of Environment, in January 2019. These ongoing discussions have focused on the need to curb the demand of ivory, specifically from the growing Chinese tourist market, and we have been asked to support the development of an Ivory Awareness Raising Campaign targeting the Nation's airports, and more broadly the development of a National IWT Demand Reduction Strategy and establishment of National IWT Technical Working Group. While our research on ivory vendors elucidated that the market is driven by demand from Chinese tourists, it also indicated a growing number Cambodians are buying ivory, which justifies demand reduction strategies targeting both Chinese tourists and Cambodian consumers.

First Steps have included meetings with the CEO and Senior Management Team of the Vinci Airports Group and the development of drafts of ivory posters for two target groups (Annex 4.15). The FFI team is working towards the launch of the awareness campaign in three of the Nation's airports; Siem Reap, Phnom Penh and Sihanoukville, and scheduled to launch on World Environment Day (5 June 2019). Through ongoing engagement with Vinci Airports Group, the FFI team is creating an interactive traveller experience to raise awareness of the ivory trade in Cambodia, which will expand upon the drafts and take into account an array of channels available through the airports. There is also scope to build upon the campaign, including the placement of longer term signage and training of customs officials.

It is planned that Mr. Peov Somanak will be joining our project team in their daily work more regularly, which will directly shape the MoE's development of legislation around ivory (Indicator 1.2). Peov Somanak has already joined a full day of DNA analysis at the RUPP lab early this year.

Additionally, we garnered support in our efforts of engaging the MoE in their commitment to combat the Cambodian ivory trade through a meeting with British Ambassador

Tina Redshaw, in September 2018, ahead of London Conference. Due to her strong interest and influence on this topic, she hosted an IWT embassy reception that was attended by the highest ministers of MoE and MAFF and showcased our project (Annex 4.16).

3.3 Work with the Forestry Administration/CITES Management Authority to encourage implementation of the National Ivory Action Plan, and close legislative loopholes to facilitate arrest and prosecution of ivory traders;

Key findings of our first year ivory surveys have been presented during a CITES Secretariat visit to the Cambodian CITES Management Authority in June 2018, following the expression of concern by the CITES Standing Committee (SC) over Cambodia's limited progress in the implementation of their National Ivory Action Plan. Key findings presented included the increase in ivory availability and carving activities, evidence of African ivory, export activities to China, and the suggestion that sold ivory might originate from government seizures. Having been threatened with suspension of all commercial trade in CITES-listed species if no demonstrable progress would occur by the next SC meeting in October, the MAFF ratified a new law under proclamation No. 020 Prakas (Annex 4.17) prohibiting domestic trade and possession of ivory (punishable by one to five years in prison and/or fines of up to \$25,000), effectively extending protection to African elephants and 11 other non-native species including rhinos and pangolins. Listing of the African elephant critically closes the legal loophole (Indicator 3.2) we have highlighted during our research and marks an important milestone. We will continue to work with the Forestry Administration to ensure that this step will be implemented effectively on the ground.

The recent CITES Elephant Trade Information System (ETIS) report (CoP18 Doc. 69.3 (Rev. 1)) stated that Cambodia has a "growing ivory market with a high domestic ivory market score, and ivory manufacturers" directly referencing FFI ivory market research (Nguyen & Frechette, 2017). The Cambodian government sought to remove this statement, but CITES has since rejected this. *[Please do not share the following publicly: We have received similar feedback from the upper levels of the Forestry Administration (FA) concerning our Year 1 research results. After a lengthy request to meet the new Director General of FA, H.E. Keo Omaliss, to present our findings (January 2019), the legitimacy of our data as well as our timely effort in actioning this into law enforcement was questioned. We re-assured him that we have shared information with his officers of the WRRT team who have acted on it and that our interest lies in supporting the government. There seems to be a worry about how our findings will put in question the FA's reporting of the National Ivory Action Plan (NIAP) delivery (of which implementation is directly supported by FFI), and we have been asked to not share our findings widely. Since then, we have therefore only shared our research informally with key informants and are keeping an open and supportive ongoing discussion with the FA.]*

We have also had meetings with the ETIS focal point and TRAFFIC's Senior Director of Asia Pacific who have since met with the CITES Management Authority to discuss Cambodia's comments on the ETIS analysis. The meeting re-emphasised how ETIS, and global standards such as stockpile management, can assist Cambodia in predicting and stemming regional shifts in ivory trades that might implicate Cambodia. Since late 2018, we have been corresponding with TRAFFIC who is starting a regional ivory market monitoring project on comparing ivory markets and corresponding fluctuations in trade between the five lower-Mekong countries Laos, Thailand, Myanmar, Cambodia, and Vietnam. In an effort to collaborate, our findings will support this research and further drive government response through TRAFFIC's direct engagement with the CITES authorities.

3.4 Engage and train airport border controls and the Forestry Administration/CITES Management Authority to improve airport screening for ivory products entering and leaving Cambodia.

See 1.4 regarding the Ivory Identification Training we hosted for the Forestry Administration in July 2018, and the support we provided for the training on IWT risk profiling targeting customs officers. The Ivory Identification Guide that was designed by the project team alongside the training has been shared through governmental agencies and with the two NGOs (WCS and WA) engaged in direct law enforcement. All 12 members of the WRRT, made up of

representatives from the Gendarmerie and FA, seconded to Wildlife Alliance, attended the training.

3.2 Progress towards project Outputs

1. Improved understanding of Cambodian ivory markets and trading networks – including exploring links between drivers of IWT and poverty – informing policy and interventions to address ivory trade.

At the onset of this project there was very little known about ivory markets, hotspots and trade networks in Cambodia. Additionally, interventions addressing ivory trade were (and still are) minimal, as law enforcement authorities lack knowledge of ivory trade and how to address it. During the second year of this project we have shared key findings and actionable information with the government and other key stakeholders involved in informing and delivering law enforcement actions, including sharing intelligence on ivory vendors which has resulted in prosecutions (Indicator 1.1-1.2).

Our results using DNA confirmed much of the ivory comes from African Elephants, and the scale of the market and the connections with government officials indicate very little of this market in Cambodia is driven by poverty, but that the presence of Chinese consumers drives much of the end-user ivory market in Cambodia. We have used our findings to put forward recommendations to the MoE that lead to the first steps of an ivory awareness raising campaign. This collaborative work is planned to be built into a larger national strategy to reduce demand for ivory and other IWT products in Cambodia (see 3.2). We have also started discussions with the FA and CITES MA around delivering on the NIAP (see 3.3).

2. Strengthened national capacity for genetic analysis of ivory and regional collaboration for mapping of ivory trade to inform interventions to address ivory trade.

The successful extraction of DNA from ivory was conducted for the very first time in Cambodia during Year 1 of the project. This has allowed the laboratory to extract DNA from all ivory samples provided by FFI. In Year 2 the laboratory has been trained in DNA extraction from multiple different sampling material allowing them to build up a genetic database of Asian elephant DNA that is required if they are to triangulate the origin of seized ivory samples. As the amounts of DNA extracted from ivory are extremely small, now that the laboratory is working with high quality blood samples it has been necessary to isolate the ivory extraction to avoid contamination issues. RUPP have invested in an ivory drilling cabinet that allows ivory samples to be processed in isolation, a key requirement for work on forensic-type samples.

A new PCR machine has also been obtained for the RUPP laboratory, doubling the throughput capacity from the ability to run 96 to up to 192 samples at any one time. This adds to the acquisition of a qPCR machine in Year 1. This machine has been critical for the generation of results in Year 2 and will remain in almost constant use throughout Year 3 as it provides the ability to generate the Asian elephant reference database to which seized ivory samples will be compared.

Regional collaboration is going to be one of the most difficult challenges of this project. During Year 2, RZSS has provided assistance to an elephant genetic study in Vietnam and it is hoped that the generation of data that is directly comparable to the Cambodian data will be possible in Year 3 and Year 4. Other researchers with access to wild Asian elephant samples have been approached and progress in Year 3 will hinge on testing the developed SNP panel in populations across the Asian elephant range. Regional collaboration will be instrumental in the success of this output.

3. National legislation regarding ivory is in place and effectively enforced

The groundwork to effectively leverage governmental commitment for strengthening national legislation and law enforcement has been laid in the first 2 years of the project. Data and evidence on ivory has been gathered, and will continue to be gathered, and is shared and discussed with the government (Indicator 3.1). Our survey data led to the first ever seizures of market-level and online-traded ivory, resulting in successful prosecution of at least 2 traders, in

Cambodia (Indicator 3.4). We have trained officials of the Forestry Administration, the Royal Police, and staff of Wildlife Alliance in ivory identification, and are planning to hold trainings for customs officials (Indicator 3.4). Genetic analysis revealed that African Elephant ivory is present in Cambodian markets, something that has never been proven before and has critically supported the closing of the existing loophole surrounding African elephants in legislation and prosecution (Indicator 3.2).

3.3 Progress towards the project Outcome

Outcome: Effective enforcement of illegal ivory trade in Cambodia, through improved knowledge of Cambodian ivory markets and trading networks, increased national capacity for genetic analysis of ivory, and strengthened legislation.

In year 2, the project has successfully shared the results that were collected and compiled during the first year. Additional results from our surveys in year 2 have shown that ivory items available for sale in markets have more than tripled from what was recorded by us in 2016. This confirmed our predictions and very much the reasoning for carrying out the current project. Within the first year two shops were raided by law enforcement officials while at least two traders have been prosecuted in the second year. This instills us with confidence that we can progress towards a 50% decrease in sold ivory items in the markets by year 4 (Indicator 1 & 3).

Our DNA findings confirming the presence of African elephant ivory in Cambodian markets for the first time has supported the critical step that the government has taken to close the legal loophole that existed for African Elephants (Indicator 2). In addition, the genetically identified Asian elephant ivory samples, being sold openly in the domestic market place, is already illegal under Cambodian law. This further provides evidence of the need and pressure for increased law enforcement on the trade in ivory within Cambodia.

The ability of the conservation genetics laboratory at RUPP to conduct the species identification tests for ivory samples found within Cambodia is the first step toward improving national genetic capacity not just for ivory analysis but future conservation genetic analysis of other threatened species. In the future if the laboratory is to transition into an accredited forensic laboratory capable of handling DNA forensic case work, it will first need to be established whether the local enforcement bodies are capable of appropriate crime scene management and if legislative frameworks are capable of handling DNA data, additionally the laboratory will need to comply with international standards for wildlife forensic analysis https://www.wildlifeforensicscience.org/wp-content/uploads/2016/07/swgwild-standards_and_guidelines_2-0_12192012.pdf. In the training of the staff at RUPP and development of protocols we are attempting to put in the groundwork in the early phases of development so that this may be achievable in the future. In Year 2 we have leveraged considerable interest and support through publicising of our findings and will now be focusing more on training. We are optimistic that these efforts, alongside efforts carried out by other external partners will lead to an increase in airport confiscations of ivory by 50% from Y1 baseline (Indicator 4).

3.4 Monitoring of assumptions

Outcome assumptions:

Assumption 0.1: The market surveys capture the actual existing ivory market

Comments: The domestic trade of ivory in Cambodia is still very open; throughout our recent survey the team was able to capture the scale of the market through questions and photos at all three locations. The consultant was also able to triangulate amounts by specific types of worked ivory products which represents a more complete picture as ivory products are known to be passed through shops from the same whole seller/workshops.

Assumption 0.2: The government and enforcement authorities are open to creating and enforcing strengthened laws concerning ivory trade

Comments: Still holds; the progress on the Environmental Code further supports this as does the recent inclusion of the African Elephant to the national protected species list (Annex 4.17).

Assumption 0.3: The government and airport authorities release ivory confiscation figures

Comments: Still holds. We will keep this in mind when engaging in more depth with the government in year 3.

Output 1 assumptions:

Assumption 1.1: Potentially sensitive information is shared

Comments: It has been comparably easy to collect sensitive information from shop owners. Due to team members having been recognised in past surveys, we employed a new consultant for our Y2 survey that had no problem extracting sensitive trader information beyond documenting ivory for sale.

Assumption 1.2: Government supports strengthened law enforcement

Comments: Still holds. We have had the first seizures of carved ivory items taking place in shops and the online trade, out of which a minimum of two have resulted in prosecutions. See 3.3 for challenges around FA engagement, but we remain confident that there is still a shared interest in strengthening law enforcement.

Output 2 assumptions:

Assumption 2.1: Government is open to continued testing of ivory

Comments: The government has shown an interest in testing ivory they seized for the first time in Phnom Penh. While we are still positive that the government has a high interest in the testing of ivory, recent heightened political sensitivity around ivory has led the government to being more closed off around seizure and stockpile procedures. The fact that there are still little legislative and often confusing processes around ivory is stifling individuals from making decisions.

Output 3 assumptions:

Assumption 3.1: Engaging with our existing partners at the Forestry Administration, and feeding information to Wildlife Alliance will have an impact on improving law enforcement

Comments: Wildlife Alliance undertakes 90% of investigations of wildlife offences in Cambodia through 12 governmental officers under their Wildlife Rapid Rescue Team and we have no doubt that our information will have an impact on their work. Our information has supported seizures of ivory from shops in Phnom Penh and Siem Reap, and backed up investigations of online traders.

Assumption 3.2: Wildlife Alliance will continue to have resources and the will to improve law enforcement.

Comments: We are working closely with Wildlife Alliance and believe there is a strong will to make resources available to improve law enforcement.

4. Impact: achievement of positive impact on illegal wildlife trade and poverty alleviation

Our proposed impact is a reduction of the illegal ivory trade in Cambodia contributing to decreased threat to elephant populations from IWT globally. By the end of Y2, our contribution is our work to fill critical knowledge gaps of the status of the ivory trade in Cambodia, and building the capacity of Cambodia to actively reduce the international trade. Before this project, very little was known about Cambodia's place in the international ivory trade, and it was widely considered unimportant. Since then, our data has been referenced in national and international discussions around ivory trade, specifically in what role Cambodia plays, e.g. the recent ETIS report, as well as international attention in media and discussion pieces (see 14). Within its second year it has supported critical steps by the government in closing legal loopholes, something we only predicted to happen by year 4. Our research in year 2 furthermore

confirmed that livelihoods of impoverished people are not dependent on the domestic ivory trade, but that the ultimate driver of the trade are wealthy and connected parties that contribute to the widening economic gap between rural and urban areas in Cambodia.

5. Project support to the IWT Challenge Fund Objectives and commitments under the London Declaration and Kasane Statement

The project directly works towards strengthening law enforcement and the role of the criminal justice system in Cambodia, IWT Challenge Fund's 2nd key objective. Through ivory market surveys and surveys on ivory trade routes, the project started building national understanding and evidence of Cambodian ivory markets and trade networks, information that the criminal justice system is still widely lacking, and which has been shared with the government. This ongoing effort documented **3840 ivory items openly sold in 67 shops across the country, valuing at US\$**, in its second year which will again be shared with the government. The establishment and ongoing technical and institutional capacity building of the conservation genetics lab not only supports but amplifies this effort in that it proves the origin of ivory sold in Cambodian markets. At the end of the project, the lab should have the capacity to be able to act as a forensic lab if the government puts into place needed international standards around seizure and prosecution of ivory.

Notable achievements supporting this objective are:

- IWTCF Objective 1: We finalised our research investigating the relationship of poverty to the illegal wildlife trade in ivory, confirming that wealth is the main driver.
- IWTCF Objective 2: The project has hosted a workshop on ivory identification for Wildlife Alliance which currently undertakes 90% of investigations of wildlife offences in Cambodia through 12 governmental officers under their Wildlife Rapid Rescue Team.
- IWTCF Objective 2: Our market surveys and online trade surveys has led to at least two prosecutions of wildlife traders;
- IWTCF Objective 3: Our DNA analysis confirming African ivory in domestic markets has supported the action of listing the African Elephant on the national protected species list, ultimately closing this legal loophole;
- IWTCF Objective 4: Grounded in our findings, we have started close collaboration with the MoE to support their development of a national demand reduction strategy focused on IWT products, and lead the development of ivory awareness raising posters at airports.

FFI Cambodia furthermore collaborates closely with TRAFFIC in their upcoming effort to monitor regional ivory markets.

As a result, over the second project year, our activities specifically linked to the London Declaration commitments I., V., VII., X., XI., XII., XVII., to the Kasane Statement commitments Number 2, 3 and 5, as well as to the Hanoi Statement commitments A, B, and C.

6. Impact on species in focus

Even though it is hard to quantify the project's impact on a species level, we have taken steps to reduce threats to the global elephant populations. Our goal is to reduce the global trade in ivory, and thus reduce threats to elephants. Our results provide a critical first step, as we have begun clarifying the scale of the ivory market in Cambodia and thus its role in driving the global trade. By monitoring the domestic market we can show that Cambodia has potentially grown into an end-user destination for ivory, thus becoming a country that plays a role in driving the international trade in ivory. We will use our data to support the government and other stakeholders to actively reduce the ivory market, thus reducing the threats to elephants globally. The building of capacity in-country for genetic analysis of ivory samples (Indicator 2.1-2.4) and the subsequent development of regional genetic markers as well as the undercover market surveys will lead to an understanding of ivory trade networks in Asia which will in turn safeguard regional elephant populations. (Indicator 1.1-1.4)

We are also actively engaged in monitoring one of the most important wild Asian elephant populations in Indochina, in the Cardamom Mountains. The population is currently stable, and has had no incidences of poaching in over a decade. But we are actively monitoring any emerging threats, especially the possibilities of poaching driven by the demand for ivory.

Filling those current gaps of understanding, including the evidence we provided of African ivory openly sold in Cambodia, will enable as well as press the government to respond to the illegal trade by enforcing laws that disrupt trade networks and reduce Cambodia's role in the transit and marketing of ivory. We have seen a first achievement in the inclusion of the African Elephant on the protected species list of Cambodia, which will reduce the threat of poaching for ivory to elephant populations in African source countries (Indicator 3.2).

7. Project support to poverty alleviation

Primary beneficiaries of the project are the project's government and academic partners, whose capacity is built on collaborative IWT management and enforcement and who will acquire knowledge of ivory trading networks, including links to poverty. Within the RUPP, the two lab technicians are receiving bi-annual 2-weeklong in-country trainings as well as ongoing weekly coaching from RZSS. This ongoing training does not only include genetic analysis but covers broader subjects such as conservation issues, research skills, and lab management to ensure the long-term sustainability of the lab and the greatest benefit to the University. In addition to direct training, the RUPP is benefiting from improved and established collaborations and communication channels to project partners such as the RZSS beyond the project life cycle. The establishment of a conservation genetics laboratory in RUPP will hopefully have far reaching benefits for (i) the university's knowledge and teaching of conservation issues (ii) the research and analytical skills of staff and (iii) future in country conservation initiatives. Governmental capacity will be built through disseminating key findings from the project and targeted training. This includes staff from the Forestry Administration concerned with laws and policies regarding forest resources (including staff from the CITES Management and Scientific Authority), but is also targeting governmental officials from the Ministry of Environment who are overseeing the management of protected areas. For example, the project team has held a workshop for Wildlife Alliance and their law enforcement officers on ivory identification during year 2. It is expected that this capacity will keep growing after the project ends, through dissemination of training materials and end results. Overall this will increase the capacity of the Royal Government of Cambodia to respond to and address wildlife crime, helping them to uphold national laws and meet international commitments (Indicator 1.2).

Our research investigating the relationship of poverty to the illegal wildlife trade in ivory (see Output 1.3 and Annex 4.8) revealed that rarity and expense are the values most associated with ivory among consumers, and that wealth, regardless of nationality, is a shared trait among buyers. This confirms previous research which showed that the demand for high-value wildlife products in Asia is principally driven by wealth. Key findings also indicate that a growing number of Cambodians are buying ivory, alongside the driving Chinese market. While the research did little in revealing a detailed socio-demographic profile of ivory vendors, it suggests that vendors are part of a wealthier and influential network, which is supported by findings from our market and undercover market surveys. This further illustrates that banning of ivory is highly unlikely to impoverish local vendors. Vendors however provided considerable insights into the consumption of ivory in Cambodia in terms of degree and nature of local- and foreign- demand, further highlighting the need that interventions need to include efforts around demand reduction. The research (Annex 4.8) has been shared with stakeholders but it is planned to synthesise it into a more accessible format over the next year.

Secondary beneficiaries are communities in source countries, including Cambodia. Loss of iconic elephants, and other wildlife species linked to the same trade networks, undermines their livelihood and income opportunities, deteriorates essential environmental services and destroys natural heritage, representing significant opportunity costs in terms of future development options foregone. This project contributes to addressing the global illegal trade in African and Asian ivory, and also to a greater understanding of wider wildlife trade networks, and poor natural-resource dependent communities. To maximise the impact of this project beyond the project location, the project will ensure that findings will be shared widely, both through FFI's global programmes (including critical elephant sites in Africa and Asia) and FFI's

global partner network, and shared externally with other partners and programmes through conference attendance and publication of results which were not available before. As such, it indirectly benefits local communities living closest to source populations in Africa, Asia, and in Cambodia specifically. A notable achievement over the last year benefitting source countries was the inclusion of the African Elephant on the protected species list of Cambodia, effectively criminalising African Elephant ivory in Cambodian markets.

8. Consideration of gender equality issues

We have documented gender throughout all of our surveys in order to be able to account for gender related issues in IWT. In Cambodia, women often have major roles in running small businesses and household finances but are under-represented in governmental and policy-making roles. Results from this survey show 54% shop owners selling ivory are females. Our research focusing on the socio-demographics of ivory vendors to understand underlying relationship of poverty to the illegal wildlife trade showed that gender was about evenly divided, with slightly more female ivory vendors. Our online market survey found that 85% of online shop owners were male, and 93% of comments were posted by males.

RZSS has published a blog to coincide with the International Women's Day: <https://www.rzss.org.uk/news/article/15467/rzss-wildgenes---international-women's-day/>. This highlighted female scientists that work on conservation projects with RZSS from around the globe, including Chansorphea Srey at RUPP. It provided a platform for them to impart their knowledge and advice to budding scientists of the future (Annex 4.18).

Operationally, this project seeks to ensure gender inclusiveness at all levels and ensures a gender inclusive environment in all hiring processes and selection for, and participation in, training opportunities. While it was planned that the RZSS and RUPP laboratory staff would be entirely female, due to changed commitments of previous staff and fair selection of most suitable candidates, the RUPP project team now consist of 50% female staff, while the RZSS team is 2/3rd female. The IWT project team of FFI also consist of 50% female staff. A notable achievement in year 2 was a Gender Training that was successfully carried out for all project and partner staff (RUPP) (Annex 4.9).

9. Monitoring and evaluation

The main indicator of our project outcome is the status of the ivory trade in Cambodia. This is being monitored through regular surveys, which still stands as the best approach. As we work closely with law enforcement stakeholders, all law enforcement actions made resulting from our work will be documented. As legal documentation of prosecutions is difficult to obtain, we have to rely on enforcement officers statements given to us verbally or documented by the media. We will keep engaging relevant people to improve documentation of official enforcement and prosecution successes.

The FFI Cambodia IWT team meets regularly to discuss progress and needed steps, specifically in regards to sharing information and meeting government officials. The Project lead has quarterly skype meetings with the Senior Technical Specialist IWT of the FFI Conservation Partnerships Team to review the overall project progress and discuss any challenges. The progress is tracked in a project workplan.

RZSS conducts weekly Skype meetings with the RUPP conservation genetics laboratory. This allows evaluation of progress, discussion of questions and plans for the next phase of work. Each week the technicians at RUPP fill out a work plan (Annex 4.9). A shared dropbox folder that is accessible to RUPP, FFI and RZSS staff on the IWT project allows everyone to keep up to date on the genetic ivory testing process and share relevant literature and data between all members. To be more streamlined, we have now agreed that FFI is joining these meetings once per month.

10. Lessons learnt

The biggest lesson learnt in our second year was the difficulty in recruiting a consultant to carry out our market surveys. The project has seen the departure of its IWT Technical Advisor, and the team has been recognised by vendors at the end of our year 1. These challenges meant that we had to hire an experienced Vietnamese- or Chinese-speaking consultant to carry out the surveys, something that proved much more difficult than anticipated.

As a result we were only able to hire and start the year 2 surveys in March this year, which has led to considerable delays in analysing of the data and means that our annual report only presents summaries of our ivory market survey. We will provide a much more detailed account with the next report. For our year 3 surveys we are already in touch with potential consultants to allow more time.

The ivory market survey went very well and the consultant was able to extract much crucial and new information, confirming that hiring a highly experienced and Chinese-speaking consultant was highly beneficial. Due to the consultant and the fact that our staff has been recognised we have developed a much more detailed risk assessment and mitigation strategy which has improved daily reporting lines during survey time as well.

See 3.3 for our challenges around engagement with FA. A valuable lesson here is that we need to report to the highest level of government instead of relying on reporting lines within the departments. Additionally, an ongoing discussion is needed to ensure that questions are answered timely. We will also be more cautious in publishing our findings, balancing the wish of the government to not publicise this with the need to ensure actionable information is shared.

Working off our previous partnership with RZSS also helped to move this project along. Thus using experienced staff and working on trusted partnerships has allowed us to efficiently deliver this project.

Obtaining CITES permits for elephant DNA samples within Cambodia has so far been unsuccessful and extremely time consuming. RUPP have yet to gain CITES permits for any samples previously and the bureaucracy involved has so far stymied any attempt to export two genetic samples. The ability to do this was at the centre of creating a key international link to a research institution working on elephant genetics and would have allowed the project to help create the first ever Asian elephant genome. To have a diverse origin of samples including a Cambodian elephant representative would have allowed the development of a huge number of genetic markers with which to triangulate the origins of ivory. We are hoping that in Year 3, the relationships with the government ministries will move this application forward.

11. Actions taken in response to previous reviews (if applicable)

N/A

12. Other comments on progress not covered elsewhere

N/A

13. Sustainability and legacy

Our original exit strategy is still valid. There appears to be significant interest in engaging with our project from relevant law enforcement entities. Our survey information has led to prosecutions, and our genetic analysis influenced the move of the Cambodian government to legally protect African Elephants. The Environmental Code also appears on its way to being approved, thus there could be even stronger legal underpinning to support our work. International stakeholders such as UNODC, the US State Department, and CITES/TRAFFIC are also expressing to continue in working closely to stop the ivory trade in Cambodia.

The genetics lab at RUPP also has a high probability of lasting. The technicians at RUPP are enthusiastic and capable; they have learnt the initial genetic techniques rapidly and show a keen interest in pursuing the outcomes of the project into the future. We hope to maintain this level of interest and skill acquisition as the project progresses. There is already a secondary project in place on the genetics of Siamese crocodile and projects are in development on the testing of other illegally traded wildlife products. This comes at an opportune time as FFI plans to transfer ownership of a long-term and highly successful University Capacity Building Programme, on which the genetics lab builds on, to RUPP.

14. IWT Challenge Fund Identity

We have presented the project in several conferences (see 2.6 & Annex 4.14), acknowledging the IWTCF under Defra.

RUPP and RZSS have written a blog entitled “Cambodian culture and the treatment of elephants”, released on International elephant day it was used to highlight the work of the conservation genetic laboratory in Cambodia and its potential to help conservation issues within country (Annex 4.18).

The BBC Scottish Science correspondent approached RZSS with an interest in covering the IWT project after hearing about the identification of mammoth ivory. This led to the filming and release of a story on national news in January 2019: <https://www.bbc.com/news/uk-scotland-edinburgh-east-fife-46649010>. The press release was picked up internationally and articles have been released in various media outlets within the UK and as far afield as Australia, leading to a reference in the international New Scientist magazine. There was wide coverage in South East Asia leading to enquiries from researchers and government officials.

The BBC article specifically inspired an article in the South East Asian Globe magazine, shining light on the Cambodian ivory market and the importance of our project, and with comments by RUPP and FFI: <http://sea-globe.com/how-can-cambodia-take-on-the-mammoth-task-of-fighting-its-illegal-ivory-trade/>.

In all of the above media we have attempted to acknowledge project partners and the UK government funders. There is mention in all three of DEFRA government funding and the newsletter refers to the IWT Challenge fund directly.

We also submitted an article to the IWT DEFRA January 2019 newsletter which focused on Innovation and Technology. We are pleased that the article was accepted and is now available for access on the Darwin initiative website:

<http://www.darwininitiative.org.uk/publications/newsletter>.

15. Project expenditure

Table 1: Project expenditure during the reporting period (April 2018-March 2019)

Project spend (indicative) since last annual report	2018/19 Grant (£)	2018/19 Total actual IWT Costs (£)	Variance %	Comments (please explain significant variances)
Staff costs (see below)				
Consultancy costs				
Overhead Costs				
Travel and subsistence				
Operating Costs				
Capital items (see below)				
Others (see below)				
TOTAL				

16. OPTIONAL: Outstanding achievements of your project during the reporting period (300-400 words maximum). This section may be used for publicity purposes

Annex 1: Report of progress and achievements against Logical Framework for Financial Year 2018-2019

Project summary	Measurable Indicators	Progress and Achievements April 2018 - March 2019	Actions required/planned for next period
<p>Impact</p> <p>Reduction of illegal ivory trade in Cambodia contributing to decreased threat to elephant populations from IWT globally.</p>		<p>The second year of the project has been a significant step in sharing the information collected in year 1 to inform work to strengthen legislation and law enforcement on the illegal trade in ivory.</p>	
<p>Outcome Effective enforcement of illegal ivory trade in Cambodia, through improved knowledge of Cambodian ivory markets and trading networks, increased national capacity for genetic analysis of ivory, and strengthened legislation.</p>	<ol style="list-style-type: none"> 1. 50% decrease from the 2016 baseline (1,116 pieces) of the recorded amount of ivory available for sale in markets in Cambodia by Y4 2. Legislation in place to close loopholes regarding ivory 3. Authorities begin confiscating ivory, and arresting/fining ivory market vendors by Y4 4. By the end of Y4 airport confiscations of ivory products increase 50% from Y1 baseline 	<ol style="list-style-type: none"> 1. In progress. As predicted, Y2 surveys showed an increase to 3840 ivory items available for sale in markets in Cambodia (see 1.1) 2. In progress, to be fully completed by Y4. The loophole for the protection of African Elephants has been closed (Annex 4.17). 3. In progress. Supported first market-level seizures of ivory (see section 3.2). 4. In progress. Gathering of data has been started (Annex 4.7). 	<ol style="list-style-type: none"> 1. Continued monitoring of ivory markets in Cambodia. 2. Continued engagement in development of the Environmental Code (see 3.2). 3. Engagement with local police and legal system to capture seizure and prosecution data. 4. Continuing monitoring of market and trade network data. Engagement of airport staff.
<p>Output 1. Improved understanding of Cambodian ivory markets and trading networks – including exploring links between drivers of IWT and poverty – informing policy and interventions to address ivory trade.</p>	<ol style="list-style-type: none"> 1.1 Results of biannual market surveys are shared and discussed with government and NGOs 1.2 Findings of research into ivory trade networks and the links between IWT and poverty are used by key stakeholders (e.g. government, NGOs) to inform policy and intervention 1.3 Existing wildlife trade data from government and NGOs are collated annually and mapped 	<ol style="list-style-type: none"> 1.1 Biannual market surveys data from Y1 have been shared and discussed with the government and NGOs. Y2 survey data is being analysed and summarised. Evidence provided in section 3.2 and Annex 4.7. 1.2 Ivory networks research from Y1 has been shared with key stakeholders. Y2 research is being analysed and summarised. Research on the links between IWT and poverty has been shared with key stakeholders and is currently being synthesised. Evidence provided in section 3.1 3.2, and 6, and Annex 4.7. 1.3 Data has been compiled. Evidence provided in section 3.1 and Annex 4.7. 	

	1.4 Cambodian elephant population genetics used to develop regional markers and used for law enforcement	1.4 A database of SNP markers is being created. Evidence provided in section 3.1 and Annex 4.2.
Activity 1.1 Conduct biannual surveys of markets to monitor and quantify ivory in Siem Reap, Phnom Penh, and Sihanoukville (target areas informed by prior research by FFI), including vendor surveys and intelligence gathering to identify the supply chain networks – drawing on data mining of existing national reports and surveys, informant networks and triangulated interviews;		<ul style="list-style-type: none"> Market surveys were carried out in March and April 2019 at Phnom Penh, Sihanoukville and Siem Reap to investigate the scale of the current market; The online trade survey was repeated for August and September 2018 – to evaluate the potentially important and understudied online trade market in Cambodia; Media surveys were continued from December 2017 – March 2019 to reveal the number of ivory seizures in Cambodia. <p>Evidence provided in section 3.1 and Annex 4.7.</p> <p><u>Plan for next year:</u></p> <ul style="list-style-type: none"> Continue conducting surveys and mapping of ivory trade hotspots in Cambodia; Updating database of media survey and online survey on ivory seizure for 2018.
Activity 1.2 Produce national map of trading hotspots and networks;		<ul style="list-style-type: none"> Data has been gathered and map is in progress. To be finished by end of project.
Activity 1.3 Conduct gendered surveys of consumers and vendors to better understand the links between poverty and the ivory trade;		<ul style="list-style-type: none"> Vendors gender survey were conducted in March and April 2019; Socio-economic survey with vendors was conducted May – June 2018 to better understand the links between poverty and the ivory trade; <p>Evidence provided in section 3.1, 3.2, and Annex 4.7.</p> <p><u>Plan for next year:</u></p> <ul style="list-style-type: none"> Vendors gender survey
Activity 1.4 Provide intelligence to law enforcement on ivory trade networks to facilitate effective enforcement;		<ul style="list-style-type: none"> Market, undercover, and online trade survey data from Y1 have been shared with law enforcement and led to at least two prosecutions. Evidence provided in section 3.1 and Annex 4.7.
Activity 1.5 Use existing Asian elephant population genetic data to generate genotype data on a genetic marker system.		<ul style="list-style-type: none"> DNA samples from wild Cambodian Asian elephant populations have been used to generate sequence and SNP data. Evidence provided in section 3.1 and Annex 4.2.
Output 2. Strengthened national capacity for genetic analysis of ivory	2.1 By Y2, the origin of an initial 30 independent samples of illegally	2.1 Currently only 15 ivory samples of which 2 are known fakes have been provided to the RUPP laboratory for testing. The species identification of these

<p>and regional collaboration for mapping of ivory trade to inform interventions to address ivory trade.</p>	<p>trafficked ivory is genetically determined</p> <p>2.2 By Y4, there is a genetic knowledge base to trace Asian ivory routes to Cambodia and the wider region by laboratories within the ASEAN Wildlife Forensic Network</p> <p>2.3 By end Y4, two female RUPP lab technicians and one local FFI senior staff are fully trained by RZSS to genetically test collected ivory</p> <p>2.4 By end of Y4, law enforcement officials from FA and Conservation NGOs (e.g. Wildlife Alliance) workers are genetically identifying ivory utilising the lab</p>	<p>samples is now complete (9 African, 2 Asian & 2 Woolly Mammoth). Additional testing had to be developed due to two challenging samples, which have turned out to be Woolly Mammoth ivory. The geographical origin of the African samples is now nearing completion and DNA analysis reports will be drawn up in Y3. More precise geographic origin testing of the Asian samples requires the production of an Asian elephant database which is continuing throughout Y3.</p> <p>2.2 The development of a 20 SNP panel for individual identification and population assignment is continuing within the RUPP laboratory. This will provide the capacity to produce a genetic database of wild elephant populations that can then be used to trace Asian ivory. We currently only have 2 Asian ivory samples to test against the database and understanding Cambodian trade routes will hinge on gaining access to seized Cambodian ivory. Links to a Vietnamese lab working on elephant genetics has been made and more links with genetic labs in Asia will be a focus in Y3.</p> <p>2.3 During most of Y2 there was 1 female and 1 male RUPP lab technician training to genetically test ivory. However, the female technician has left her position and a replacement is not yet in place. When more ivory samples are obtained it is planned that a member of FFI staff will also be trained by the current RUPP lab technician. It is imperative in Y3 that we get a replacement technician and train a member of FFI staff, as the RUPP lab capacity currently hinges on the knowledge of one staff member.</p> <p>2.4 We have yet to have submissions of any ivory from law enforcement officials' and RUPP staff have conducted an information session for law enforcement officials in July 2018. There appears to be a concern that the process is destructive to the sample. A key focus of Y3 will need to be continued communication with enforcement officials to better communicate the benefits of ivory The aim being to produce information on the origins of the ivory to better understand trade networks.</p>
<p>Activity 2.1 Establishment of species identification (Asian/African) testing from initial 30 market survey ivory samples and testing of samples to establish species provenance (mtDNA test);</p>		<p>A species identification test for ivory has been transferred by RZSS and is now in use within the RUPP conservation genetics lab. Fifteen samples have so far been tested and the provenance of the African ivory samples (n=9) is undergoing final mtDNA verification.</p>
<p>Activity 2.2 Production of Cambodian Elephant reference genetic data from existing samples collected from wild elephant surveys to assist with global traceability of ivory (mtDNA, SNP based or microsatellite testing);</p>		<p>A larger fragment of mtDNA has now been sequenced in 346 wild Cambodian elephant samples. These will be combined with datasets from other wild Asian elephant samples in range countries to ascertain the ability of mtDNA to assist with traceability. A panel of 20 SNPs is now in use within the RUPP lab for producing a nuclear DNA database (including these same 346 samples) that is likely to be more successful at tracing Asian elephant ivory if a representative set of wild elephants can be tested.</p>

Activity 2.3 Investigation of geographic origin of Asian ivory found in Cambodia;	This will hinge on the production of the reference genetic data produced in Activity 2.2. Currently 2 ivory samples have been sequenced at the mtDNA region and in Y3 it is planned for them to also be genotyped using the SNP panel.
Activity 2.4 Establishment of individualisation and sexing tests to allow for seizure inventory (SNP-based or microsatellite testing);	RZSS have transferred an elephant sexing test and the SNP panel to RUPP. The RUPP lab is currently using the SNP panel to generate data for individualisation of the wild elephant samples collected in 2015-2016, by FFI, WWF and WCS. The sexing test currently has a 53% and 54% success rate in the faecal and ivory samples respectively. This is the second sexing test to be trailed for the project and RZSS and RUPP will look into potential causes of the failures during Y3.
Activity 2.5 Establishment of seizure sampling, data-basing and chain of custody protocols;	Sample receipt and transfer forms have been introduced to the RUPP lab for obtaining chain of custody information. Database training and a protocol for seizure sampling will be focused on during Y3. A key priority will be to gain access to seized samples for implementation of the protocol.
Activity 2.6 Strengthen professional links of the lab with regional and international wildlife forensics/ elephant genetics network.	RZSS has links to genetic labs working on elephants in multiple countries and an exchange visit is envisioned for RUPP staff during Y3 to begin to build their own network and knowledge base of the wider conservation genetic community. Attendance at the International Convention of Conservation Biology (ICCB) in July 2019 is based in Malaysia and this will be a key opportunity for project staff to increase their networks within Asia. Currently a member of RZSS and RUPP have been accepted to present the findings of the IWT project.
Output 3. National legislation regarding ivory is in place and effectively enforced	<p>3.1 By Y3, the official report to Government incorporating data and evidence gathered on ivory trade to support law enforcement is disseminated through workshops to authorities, and utilised within 12 months from that point</p> <p>3.2 By end of Y4, government legislation makes the sale and buying of Asian and African ivory illegal</p> <p>3.3 By end of Y4, 50% increase of ivory seizures at the airports from 2017 baselines</p> <p>3.4 By end of Y4, arresting and/or fining wildlife criminals for ivory related crimes is effectively carried out</p>

Activity 3.1 Produce official report to the government with results from Outputs 1 and 2 highlighting the need for laws banning the sale of ivory;	Results from Y1 have been disseminated in Y2 through workshops and reports to the government using the report provided in the Annual Report Y1. See section 3.1.
Activity 3.2 Engage with the Ministry of Environment to ensure that laws banning the sale and purchase of ivory are incorporated into the development of legislation;	We are collaborating with other NGOs in Cambodia and the Secretariat of the Technical Working Group to create Draft 12 of the Environment and Natural Resources Code (ENR Code).
Activity 3.3 Work with the Forestry Administration/CITES Management Authority to encourage implementation of the National Ivory Action Plan, and close legislative loopholes to facilitate arrest and prosecution of ivory traders;	We have engaged with FA in their delivery of the NIAP. Our findings have encouraged MAFF (FA) to close the loophole that existed around African Elephants. See section 3.1.
Activity 3.4 Engage and train airport border controls and the Forestry Administration/CITES Management Authority to improve airport screening for ivory products entering and leaving Cambodia.	To be commenced in the next period

Annex 2: Project’s full current logframe as presented in the application form (unless changes have been agreed)

N.B. if your application’s logframe is presented in a different format in your application, please transpose into the below template. Please feel free to contact IWT-Fund@ltsi.co.uk if you have any questions regarding this.

Project summary	Measurable Indicators	Means of verification	Important Assumptions
Impact: Reduction of illegal ivory trade in Cambodia contributing to decreased threat to elephant populations from IWT globally.			
Outcome: Effective enforcement of illegal ivory trade in Cambodia, through improved knowledge of Cambodian ivory markets and trading networks, increased national capacity for genetic analysis of ivory, and strengthened legislation.	<ol style="list-style-type: none"> 1. 50% decrease from the 2016 baseline (1,116 pieces) of the recorded amount of ivory available for sale in markets in Cambodia by Y4 2. Legislation in place to close loopholes regarding ivory 3. Authorities begin confiscating ivory, and arresting/fining ivory market vendors by Y4 4. By the end of Y4 airport confiscations of ivory products increase 50% from Y1 baseline 	<ol style="list-style-type: none"> 1. Market survey reports 2. Official legislation 3. Law enforcement records and CITES reports 4. Official airport seizure records and CITES reports 	<ul style="list-style-type: none"> - The market surveys capture the actual existing ivory market, i.e. do not miss large underground components which might grow as enforcement tactics tighten. (Market surveys will include monitoring and evaluation of available underground information throughout the project.) - The government and enforcement authorities are open to creating and enforcing strengthened laws concerning ivory trade. (Governmental relationships and the political environment will be analysed and monitored throughout the project.) - The government and airport authorities release ivory confiscation figures. (Awareness, capacity, and relationships will be built and monitored throughout the project.)
Output 1. Improved understanding of Cambodian ivory markets and trading networks – including exploring links between drivers of IWT and poverty – informing policy and interventions to address ivory trade.	<ol style="list-style-type: none"> 1.1 Results of biannual market surveys are shared and discussed with government and NGOs 1.2 Findings of research into ivory trade networks and the links between IWT and poverty are used by key stakeholders (e.g. government, NGOs) to inform policy and intervention 1.3 Existing wildlife trade data from government and NGOs are collated annually and mapped 	<ol style="list-style-type: none"> 1.1 Survey and data mining reports, meeting and workshop minutes, final report 1.2 Survey report, final report, statements from stakeholders 1.3 Map of wildlife trade network, workshop reports, presentations, records of law enforcement 1.4 Publications, conference presentations, records of law 	<ul style="list-style-type: none"> - Potentially sensitive information is shared. (The project will carefully build on the existing trust between project partners and monitor relationships to react and adapt to changes.) - Government supports strengthened law enforcement. (Capacity will be built and monitored throughout the project.)

	1.4 Cambodian elephant population genetics used to develop regional markers and used for law enforcement	enforcement	
Output 2. Strengthened national capacity for genetic analysis of ivory and regional collaboration for mapping of ivory trade to inform interventions to address ivory trade.	<p>2.1 By Y2, the origin of an initial 30 independent samples of illegally trafficked ivory is genetically determined</p> <p>2.2 By Y4, there is a genetic knowledge base to trace Asian ivory routes to Cambodia and the wider region by laboratories within the ASEAN Wildlife Forensic Network</p> <p>2.3 By end Y4, two female RUPP lab technicians and one local FFI senior staff are fully trained by RZSS to genetically test collected ivory</p> <p>2.4 By end of Y4, law enforcement officials from FA and Conservation NGOs (e.g. Wildlife Alliance) workers are genetically identifying ivory utilising the lab</p>	<p>2.1 DNA analysis reports and publications</p> <p>2.2 Reports and publications</p> <p>2.3 Training and work protocols of genetic lab</p> <p>2.4 Meeting and workshop reports, training materials</p>	- Government is open to continued testing of ivory. (Awareness, capacity, and infrastructure and networks are built to ensure sustainability of the project.)
Output 3. National legislation regarding ivory is in place and effectively enforced	<p>3.1 By Y3, the official report to Government incorporating data and evidence gathered on ivory trade to support law enforcement is disseminated through workshops to authorities, and utilised within 12 months from that point</p> <p>3.2 By end of Y4, government legislation makes the sale and buying of Asian and African ivory illegal</p> <p>3.3 By end of Y4, 50% increase of ivory seizures at the airports from 2017 baselines</p> <p>3.4 By end of Y4, arresting and/or fining wildlife criminals for ivory related crimes is effectively carried out</p>	<p>3.1 Project report, workshop and meeting reports</p> <p>3.2 Draft legal proclamation</p> <p>3.3 Data on ivory seizures at airports</p> <p>3.4 Data on prosecutions</p>	<p>- Engaging with our existing partners at the Forestry Administration, and feeding information to Wildlife Alliance will have an impact on improving law enforcement. (The project will build on and monitor existing relationships and capacity)</p> <p>- Wildlife Alliance will continue to have resources and the will to improve law enforcement. (The project will build on and monitor existing relationships)</p>

Activities (each activity is numbered according to the output that it will contribute towards, for example 1.1, 1.2 and 1.3 are contributing to Output 1)

1.1 Conduct biannual surveys of markets to monitor and quantify ivory in Siem Reap, Phnom Penh, and Sihanoukville (target areas informed by prior research by FFI), including vendor surveys and intelligence gathering to identify the supply chain networks – drawing on data mining of existing national reports and surveys, informant networks and triangulated interviews;

1.2 Produce national map of trading hotspots and networks;

1.3 Conduct gendered surveys of consumers and vendors to better understand the links between poverty and the ivory trade;

1.4 Provide intelligence to law enforcement on ivory trade networks to facilitate effective enforcement;

1.5 Use existing Asian elephant population genetic data from 250-300 previously collected quality-screened DNA faecal samples to generate genotype data on a genetic marker system, which will enable Cambodian elephant population-level data to be used as a reference resource by laboratories within the ASEAN Wildlife Forensic Network (Asian elephant SNP marker data currently available for the region was developed with the assistance of the RZSS staff named on this project).

2.1 Establishment of species identification (Asian/African) testing from initial 30 market survey ivory samples and testing of samples to establish species provenance (mtDNA test);

2.2 Production of Cambodian Elephant reference genetic data from existing samples collected from wild elephant surveys to assist with global traceability of ivory (mtDNA, SNP based or microsatellite testing);

2.3 Investigation of geographic origin of Asian ivory found in Cambodia;

2.4 Establishment of individualisation and sexing tests to allow for seizure inventory (SNP-based or microsatellite testing);

2.5 Establishment of seizure sampling, data-basing and chain of custody protocols;

2.6 Strengthen professional links of the lab with regional and international wildlife forensics/ elephant genetics network.

3.1 Produce official report to the government with results from Outputs 1 and 2 highlighting the need for laws banning the sale of ivory;

3.2 Engage with the Ministry of Environment to ensure that laws banning the sale and purchase of ivory are incorporated into the development of legislation;

3.3 Work with the Forestry Administration/CITES Management Authority to encourage implementation of the National Ivory Action Plan, and close legislative loopholes to facilitate arrest and prosecution of ivory traders;

3.4 Engage and train airport border controls and the Forestry Administration/CITES Management Authority to improve airport screening for ivory products entering and leaving Cambodia.

Annex 3 Standard Measures

Annex 4 Onwards – supplementary material (optional but encouraged as evidence of project achievement)