Department for Environment Food & Rural Affairs

Illegal Wildlife Trade (IWT) Challenge Fund Annual Report

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Important note: *To be completed with reference to the Reporting Guidance Notes for Project Leaders: it is expected that this report will be about 10 pages in length, excluding annexes*

Submission Deadline: 30th April 2018

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 and 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	1st July 2017 – 31st March 2021
Reporting period (e.g. April 2016-Mar 2017) and number (e.g. Annual Report 1,2,3)	Annual Report 1: 1st July 2017 – 1st April 2018
Project leader name	Jackson Frechette
Project website	
Report author(s) and date	Jackson Frechette Trang Nguyen Regine Weckauf Alex Ball Helen Senn 29 April 2018

1. Project rationale

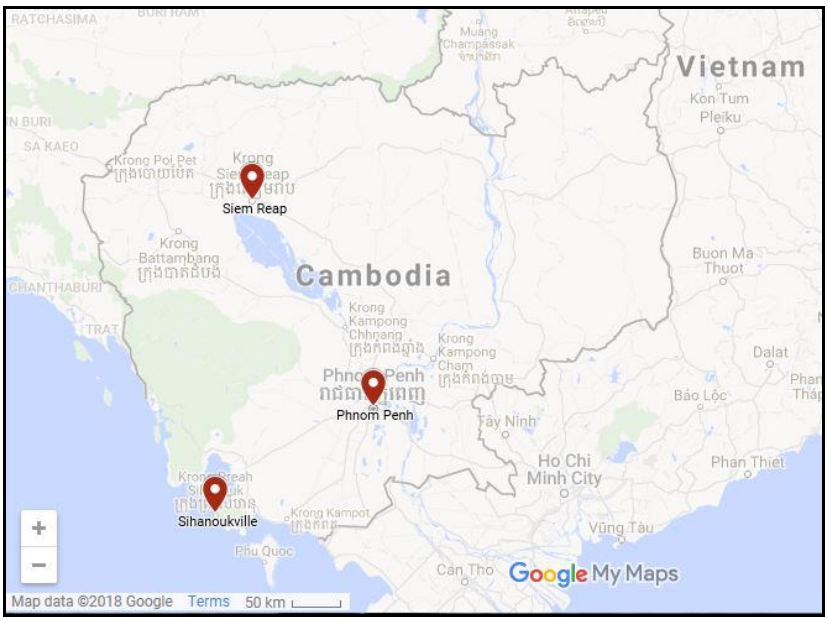
African elephant (VU) populations have declined by 30% between 2007 and 2014, primarily due to global increase in poaching for ivory. Illegal trade in ivory is also a threat to Asian elephants (EN), of which fewer than 52,000 remain. Global illegal ivory trade, driven by organised crime networks, benefits 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, Cambodian law does not prohibit the sale of African ivory nor have there been any market seizures of ivory. Therefore, there is risk of illegal ivory markets diverting to Cambodia from elsewhere; 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 ivory market surveys and ivory trade network surveys were 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 Government of Cambodia's Ministry of Agriculture Forestry and Fisheries (MAFF), the Royal University of Phnom Penh (RUPP), and the Royal Zoological Society of Scotland (RZSS).

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 at RUPP. RZSS is the technical lead in implementing Objective 2 in partnership with RUPP. RZSS is one of the few international genetics facilities that specializes 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.

A series of inception meetings occurred in late July between RZSS, RUPP and FFI. From these meetings it was decided a full-time lab technician was required. Delays occurred with signing agreements with RUPP, which delayed the hiring of the genetics lab staff until February. During this time, RZSS developed the ivory sampling protocol (Annex 4.1). RUPP

and RZSS worked together to recruit the new full-time lab technician. In-depth lab training was held by two RZSS staff training the two RUPP lab staff in February 2018 (Annex 4.2).

Specific partner relationships are summarised below:

FFI-RZSS: RZSS has continued to provide genetic expertise to FFI during project development and is in regular email contact with the FFI staff members to keep them updated on the genetic development, results and capacity building of the RUPP laboratory. RZSS staff members, Helen Senn and Alex Ball have met with FFI staff members at the Phnom Penh office to discuss ivory sample collection and storage and to provide details of the first training visit to RUPP. Trang Nguyen of FFI has also visited the RUPP lab to gain insight into the Ivory DNA extraction process during the first RZSS training period.

FFI-RUPP: RUPP has been a long standing partner of FFI and due to some staff members working for FFI as well as RUPP, there is a continuous positive exchange between the two institutions. Despite the fact that we have a long-term partnership with RUPP, the process of setting up an additional project was surprisingly long because of the bureaucracy within RUPP. Such bureaucracies will be fully taken into account of any future new developments, however the current agreement has been formulated so that it can be easily added on and therefore should prevent any similar, future delays. The staff and upper management at RUPP are extremely supportive of the establishment of a genetics lab and see the long-term benefits of such an entity. Now that the agreement is signed we are on track and the delays have not impacted the delivery of the project.

FFI-Cambodian Government: FFI has been working in partnership with the Royal Government of Cambodia since 1999. The partnership, especially with MAFF, hasn't evolved much over the past year as it is already well established and strong. We are also actively engaged with the Ministry of Environment (MOE) in the drafting of its new environmental code which establishes legislation covering all aspects of the environment, including IWT. The process has been very collaborative across NGOs and the government, but being mired in bureaucracy has made the process also very slow. There is little we can do to do deal with the slow moving government aside from patience and perseverance.

RZSS-RUPP: RZSS has provided advice during the interview and recruitment process of a new laboratory technician for the RUPP Conservation genetics laboratory. An initial 2-week training workshop for the two technicians at RUPP has been conducted by RZSS staff. During this training the protocols for ivory DNA extraction and species identification testing were transferred to RUPP (see Annex 4.1 for a copy of the Ivory DNA extraction protocol). During this time discussion with senior management also occurred and it is hoped that a contained ivory drilling cabinet will be installed within the laboratory soon. Currently access to a separate room is being provided for ivory drilling until the laboratory cabinet is completed.

RZSS-WWF & Elephant Valley Project (EVP): Staff from these organisations based in the Mondulkiri Province, home to one of the remaining population of wild Asian elephants in Cambodia, have provided advice on the collection of reference samples from Cambodian elephants. EVP are providing samples from wild-caught domesticated Cambodian elephants for use by the project to validate the ivory DNA tests and provide reference material for generating data that could potentially trace Asian elephant ivory samples back to Cambodia.

RZSS-Science and Advice for Scottish Agriculture (SASA): Staff at these government facilities advised RZSS on ivory DNA extraction techniques during a visit to their laboratories.

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

We have identified key sources and compiled data on the ivory trade in-line with our proposed timetable. We conducted two market-level surveys for ivory, compiled data from existing media outlets on ivory seizures, and surveyed Facebook to identify the scale of the online trade (Annex 4.3).

In October and November 2017, we identified a total of 51 shops selling ivory and found that Phnom Penh and Siem Reap were the largest ivory hubs in Cambodia, accounting for 90% of shops selling elephant ivory in the country. While an equal number of shops (45% each) were found in Phnom Penh and Siem Reap, the ivory found in shops in Siem Reap equated to 53% of all ivory sold country-wide while Phnom Penh only held 39%. 40 out of the 51 shops named Chines nationals as their main consumer group. Over 60% of shops selling ivory were general jewellery shops, the rest was found in souvenir shops (27%) and carving shops (10%). Ivory was mainly offered as carved ivory items with Buddha figurines the most prominent one (37%). While in total 30% of shops owners selling ivory were Chinese citizens, interestingly all shops found in Sihanoukville were Chinese-owned. It is important to note that during our surveys in 2015 – 2016, no ivory shops were found in Sihanoukville. 71% of shops reported their ivory to be from Asian elephants while 29% claimed it came from African elephants. We estimate the **total value of ivory recoded during this survey as US$ 1,418,059.00 (on average 28 USD/gr), 11 times higher than what was recorded in our 2015 survey. This shows that the ivory market is rapidly growing.**

In February 2018, we conducted undercover surveys (Annex 4.3) with an external Chinese-speaking specialist team in 38 shops in Phnom Penh, Siem Reap, and Sihanoukville to understand more about trade routes and trading networks. 46% of surveyed shops were owned by Chinese nationals, this came up to 59% amongst large-scale shops (operated from overseas or wholesale within country). 28% of shop owners reported to import their ivory from other Asian countries such as Thailand, Vietnam, Laos, and Indonesia while 26% imported their ivory from Africa. The rest (46%) reported to receive their ivory from within Cambodia. 54% of shops admitted to smuggling worked ivory into the country, 26% to receive raw tusks, the rest received both. 85% claimed to either own a carving factory or had a close relationship with a Cambodian ivory carving factory. Almost ¾ of shops said to import ivory into Cambodia by shipping containers, 60% claimed to use shipping containers to export ivory out of Cambodia. Vans and busses were said to be used to smuggle ivory from and to neighbouring countries by 20% of shops. 47% of exports were reported to go to China, while only 16% reportedly go to Thailand and Vietnam; the rest (37%) stays in the country and is traded domestically. **The undercover survey also confirmed that shops selling ivory are very well connected with, and therefore protected by, authorities;** 70% mentioned to have a good connection with the authorities why 2 shops admitted to directly receive confiscated ivory from the government.

Our media survey (Annex 4.3) analysed data publicly available through media outlets. It found that, between 2013 and 2017, 40% of ivory and rhino horn seizures took place in Phnom Penh, 30% were seized in the port town Sihanoukville, 20% in Siem Reap and only 10% at the border to Vietnam. 80% were seizures of elephant ivory and other elephant products while the rest was rhino horn. This amounted to a total of 6310kg of ivory and 57kg of rhino horn seized. Half of the ivory products were smuggled with tiger products, while ¼ each was trafficked with pangolin and other wildlife products. **Half of the seized ivory was trafficked out of Mozambique, 25% came from Angola, and the rest was trafficked from other African countries. The arrested offenders were Vietnamese (80%) and Chinese (20%)** and over half (60%) were male.

Currently, Facebook is the most popular social media platform in Cambodia; 4.8 million users were recorded in 2017. Young entrepreneurs use the platform to advertise and sell products unregulated. Between November 2017 and April 2018, we surveyed 20 personal Facebook accounts offering ivory, analysing 1114 advertisements, 3179 products, and 2207 comments (Annex 4.3). We found that 93% of online shops were operated from Phnom Penh, with 55% of shops opened in 2017. 90% of online shop owners were male and 50% online owners aged above 30 years old. Among those advertised for elephant products, 96% were advertisements for elephant ivory items, others were elephant skins, tails, molar teeth and bone products. A majority of online adverts were carved ivory items (80%), with 76% of carved ivory being Buddha figurines. Other items were also found such as Chinese figurines, and beads and jewellery. 94% of comments were posted by males and 31% of people that interacted with elephant ivory adverts were married. 69% of comments showed interest in purchasing the

items, 23% admired the beauty of ivory products. No comments were made to show concern for the elephant welfare, or awareness that these products could come from an illegal source.

1.2 Produce national map of trading hotspots and networks

Currently in preparation using the data from Activity 1.1, to be completed by Y2Q3.

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

Results from this survey show 43% shop owners selling ivory are females (5 shops did not identify the owner). The recorded total price of ivory for sale in these female-owned shops came to US$ [redacted] (547 ivory items) while male owned shops (57%) showed a comparable higher total price value of US$ [redacted] (2127 ivory items). We have enlisted a MSc student from The University of Kent who will lead the collection of data investigating underlying relationship of poverty to the illegal wildlife trade in ivory as her MSc thesis: ''Evaluating the social and economic drivers of elephant ivory trade in Cambodia: a study of three Cambodian cities''. The project will commence 1st of May 2018.

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

Currently in preparation using the information from Activity 1.1, to be completed by Y2Q3.

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

See below, Activity 2.2.

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

2.1 Establishment of species identification testing (Asian/African) and testing of samples to establish species provenance (mtDNA test)

Protocols for the extraction of DNA from ivory, elephant species identification and determining the geographical origin of African samples have been developed and tested by RZSS. These techniques have been transferred to RUPP technical staff via a 2-week training workshop (For protocols and workshop schedule see Annex 4.1 and 4.2). A Real time (RT) PCR machine has also been set-up at the RUPP conservation genetics laboratory during this workshop. This has allowed the extraction of DNA from ivory samples by the RUPP laboratory. The new RTPCR machine allows rapid in-country genotyping of SNP assays that can identify the elephant species from DNA extracted from ivory samples. This assay has been run on ten ivory samples found for sale within Cambodia, revealing that 80% (8/10) are of African origin (see Appendix 4 for RTPCR results). Mitochondrial DNA sequences have been generated from four African samples to locate the geographic origin of the ivory. This currently shows that the ivory has diverse origins and comes from Forest elephant samples from west/central Africa and Savannah elephant samples from eastern/southern Africa (see Appendix 5 for results). This has been ascertained via comparison with the Loxodonta Localiser dataset (https://www.loxodontalocalizer.org/). The SNP assay theoretically identifies Mammoth ivory samples and this capacity will be tested during Y2, once reference mammoth samples are obtained.

2.2 Production of Cambodian elephant reference genetic data from existing samples testing

A 130bp DNA sequence of the mitochondrial d-loop has previously been produced from 335 faecal samples collected in two wild Cambodian elephant populations. Permissions to

produce sequence data from an additional population have been received as well as the permission to sequence an additional DNA fragment for samples from all three populations. This will be conducted to produce a ~250bp DNA fragment that overlaps with previously published mitochondrial sequences that have been collected from wild Asian elephants across eight countries. RZSS will trial the feasibility of this method to triangulate the origin of Asian ivory samples found in Cambodia. Additionally, a panel of nuclear SNP genotyping assays has been ordered to test their potential use for identifying geographical origins of Asian ivory. Two SNP genotyping chemistries will be trialled and compared for accuracy and consistency before potential transfer to RUPP.

2.3 Investigation of geographic origin of Asian ivory found in Cambodia

Two out of the 10 ivory samples found for sale within Cambodia have been positively identified as from Asian elephant. A previously published reference mitochondrial database is available for African elephants however less focus has been placed on triangulating Asian elephant ivory. It is likely this will be more difficult due to large historical movement of domesticated Asian elephants. This potential greater genetic mixing may make mitochondrial DNA sequences less geographically isolated and therefore with limited capacity to triangulate origins. Once the Cambodian reference genetic data has been collected we will test the potential of mitochondrial DNA sequences for this. However, a nuclear SNP based test is an alternative option. To develop a SNP based method for investigating geographic origin a sample set from across the wider Asian elephant range will be required. We currently have contact with a group with samples from Myanmar and Sri Lanka for potential collaboration and will need to gain access to a larger reference data set in years 2 & 3 for this to be successful. This final aim is likely to be the most difficult as transfer of elephant samples across borders is hugely restricted and politically difficult. It will require the collaboration of multiple parties to back the production of an interlinked regional database. A key component for success could be developing protocols that are compatible with methods already being developed within SE Asia (e.g. Thailand & Malaysia).

2.4 Establishment of individualisation and sexing tests to allow for seizure inventory

A sub-set of nuclear SNP genotyping assays has been ordered and the potential of these to identify individuals will be trialed at RZSS before further use. An elephant sexing test has been designed and ordered that should theoretically sex all elephant species. This test will be verified at RZSS in Y2 and transferred to RUPP for further testing of the collected ivory and Asian elephant faecal samples.

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

A standard operating procedure is being drawn up for the receipt, archiving and storage of ivory samples in the RUPP laboratory. Training workshops for enforcement will teach potential seizure operatives the principles of chain of custody protocols. This activity is scheduled to be fully implemented in Y3.

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

During the 2-week training workshop, Trang Nguyen who is also working on completing her PhD on the illegal wildlife trade, visited the RUPP conservation genetics laboratory to gain an overview of the genetic techniques and meet the two technicians. The new RUPP staff member, Darith Sieng, has completed a Masters in genetics at Mahidol University, Thailand, where he has made links with researchers who work in the field of wildlife genetics. It is planned that he will increase his network by attending conferences and training visits to wildlife forensic and genetic laboratories internationally as part of this project.

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

Activities 3.1, 3.3, and 3.4 are based on outputs 1 and 2, completion of these is on-track with the originally proposed timeline.

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

Members of the project team have supported the Ministry of Environment in the development of the new Environment and Natural Resources Code (ENR Code). Most recently, we provided comments and feedback on the 10th draft, which was submitted to the Technical Working Group 22nd March 2018. Specific language banning the sale and purchase of ivory is part of the legislation. The government is now revising the code again, and we are awaiting their feedback for the next steps. We will continue to work with the government and all other stakeholders though this process, and through the implementation of the newly adopted law.

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 the ivory markets and trading networks in Cambodia. Additionally, interventions addressing the trade were (and still are) minimal and ineffective, as law enforcement lacked the basic knowledge pertaining to the ivory trade. During the first year of this project we conducted extensive surveys to determine the size and scale of the ivory trade in Cambodia. Our results indicate that Cambodia's ivory market is large and growing. Our initial market surveys in 2015 and 2016 (Annex 4.4) found 16 shops in Phnom Penh and Siem Reap, selling a total of 1,116 items with a total estimated value of US$[redacted] By 2017, we found 51 shops in Phnom Penh, Siem Reap and Sihanoukville (where previously there was no ivory for sale) selling 2,907 pieces of ivory estimated at over US$1.4 million. In one year, the number of outlets selling ivory tripled, the number of ivory items nearly tripled and the total value of the market increased by 3.5 times.

Aside from a few media reports (Annex 4.3), there was virtually nothing known about the international ivory network connection to Cambodia. To address this, we conducted additional surveys aimed at identifying the trade network. Our results show a complicated network of international ivory smuggling facilitated by governmental connections. Most of the ivory appears to have been brought in on shipping containers, although there is quite a bit of transborder smuggling from Thailand and Vietnam (Annex 4.3). Our early results using DNA to identify the origin of the ivory (see activity 2.3) indicates much of ivory comes from Africa, although 20% of the samples do show Asian origin. The scale of the market and the connections with government officials indicate very little of this market in Cambodia is driven by poverty. To further elucidate this, we have enlisted an MSc student to lead a comprehensive study on ''Evaluating the social and economic drivers of elephant ivory trade in Cambodia: a study of three Cambodian cities'' starting 1st of May 2018.

Our market surveys indicate that the presence of Chinese consumers drives much of the end-user ivory market in Cambodia. Adding more complexity, Facebook, which had never before been surveyed for ivory, has emerged as a significant marketplace for the sale of ivory. We found 20 online vendors, operating almost exclusively in Khmer, selling a total of 3179 elephant products. It is unclear if these products are ultimately for Cambodian customers or for retailers selling openly to Chinese consumers, or some combination. This troubling online market requires more research and we will continue to monitor it.

Our research this first year has made considerable progress in filling the knowledge gaps of the Cambodian ivory market. Our data reveals Cambodia as a growing, internationally connected transit and end-user market for ivory. This information will be further compiled into reports that will be presented to the government and other national stakeholders during the next few years in order to strengthen law enforcement and reduce the trade (Output 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 extraction of DNA from ivory and a species identification test have been conducted in Cambodia for the very first time. This is a huge milestone for the RUPP laboratory and the project's progress towards providing knowledge on Cambodian ivory trade networks. The installation of the RTPCR machine at RUPP also opens-up access to a range of cutting edge techniques that can be fully realised within country. There is still a long-way to go in training the RUPP staff in its use and the full potential of projects that it can be applied to, but it equips them with the potential to take on a diverse array of projects in the future. Regarding geographical information on ivory sample origin, as the reference genetic database is produced we will gauge its ability to triangulate the origins of Asian ivory. The large previously published repository of mitochondrial DNA of African elephants has proved useful for triangulating the African ivory samples. RZSS and the RUPP lab have successfully identified the regional origins of four samples to date (Annex 4.5 and 4.6). Nine further samples are currently in process and further samples from within Cambodia will help build up a picture of ivory trade networks with which to inform interventions. As part of increasing capacity of the lab in dealing with easily contaminated samples, the specifications of a contained ivory drilling cabinet have been agreed for installation within the RUPP facilities.

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 year of the project. Data and evidence on ivory has been gathered, and will continue to be gathered, and is to be shared and discussed with the government. Our survey data led to the first ever market-level seizures of ivory from two shops in Cambodia. This seizure showed a significant lack of capacity by law-enforcement officials to identify ivory and process these sorts of crimes. A workshop on ivory identification will be held in the second quarter of year 2 and train officials of the Forestry Administration, the Royal Police, and staff of Wildlife Alliance. Genetic analysis revealed that African Elephant ivory is present in Cambodian markets, something that has never been proven before and this is a substantial step towards closing the existing loopholes surrounding African elephants in legislation and prosecution.

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.

The project has successfully collected and compiled market survey data. Results have shown that ivory items available for sale in markets have almost tripled from what was recorded by us in 2016. This confirmed our prediction and very much the reasoning for carrying out the current project. The focus this year was information gathering, but the fact that two shops were raided by law enforcement officials based on our yet-to-be presented data instills us with confidence that we can progress towards a 50% decrease in sold ivory items in the markets by year 4.

The generation of species identification of 10 ivory samples found for sale within Cambodia suggests that the largest proportion of ivory traded within Cambodia is of African origin (Annex 4.6). Of this, at least 2 samples have most likely originated from elephants in West/Central Africa (Annex 4.5). As the international trade in almost all African ivory is under Appendix 1 of CITES legislation (including all ivory from West/Central Africa), there is high likelihood that ivory has been illegally imported into Cambodia. The presence of African ivory within Cambodia also highlights the need for national legislation covering the prosecution of trade in this illegally imported product. In addition, the two genetically identified Asian elephant ivory samples, being sold openly in the domestic market place, is already illegal under Cambodian law. This provides evidence of the need 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.

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 surveys we were able to capture the scale of the market through questions and photos at all three locations without difficulty.

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.

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 2 and 3.

Output 1 assumptions:

Assumption 1.1: Potentially sensitive information is shared

Comments: It has been comparable easy to collect sensitive information from shop owners. One of our team members has been recognised when re-visiting a shop which we have reacted to by excluding her from at the time ongoing survey.

Assumption 1. 2: Government supports strengthened law enforcement

Comments: Still holds. We have had the first seizure of ivory items taken place from a shop in Phnom Penh, which has been supported by a prosecutor.

Output 2 assumptions:

Assumption 2.1: Government is open to continued testing of ivory

Comments: Still holds. The government has shown an interest in testing ivory they seized for the first time in Phnom Penh.

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. We have already supported their first seizures of ivory from shops in Phnom Penh and Siem Reap.

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 Y1, our main 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. But our data will go far to inform the national and international community, and thus can be used to improve law enforcement.

The main contribution of our project is providing data concerning the impacts and drivers of poverty on the illegal wildlife trade. We have early indications that livelihoods of impoverished people are not dependent on the ivory trade. These connections to poverty, especially in the global context, will further explored in the next few years.

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 starts building national understanding and evidence of Cambodian ivory markets and trade networks, information that the criminal justice system is lacking currently. This ongoing effort has already documented 2097 ivory items openly sold in 51 shops across the country, valuing at US$ 1,418,059.00, after its first year which will be shared with the government over the next coming months. The establishment and ongoing technical and institutional capacity building of the conservation genetics lab not only supports but amplifies this effort in that it proofs the origin of ivory sold in Cambodian markets. At the end of the project, the lab should have the capacity to act as a forensic lab to be used by the criminal justice system.

Notable achievements supporting this objective are:

- Genetic analysis confirmed 80% of our ivory samples as African ivory and 20% as Asian ivory; this is the first time this has been tested in Cambodia;
- The project team has been called to a suspected ivory shop raid by Wildlife Alliance to support their police officers in identifying ivory items. Our IWT Technical Advisor later served as witness verifying the authenticity of the seized ivory;
- The project has been approached to host 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.

FFI Cambodia and our FFI global programme through this project has also partnered with Liberty Asia, an NGO that prevents human trafficking through legal advocacy, technological interventions, and strategic collaborations with NGOs, corporations, and financial institutions in Southeast Asia. As of 2016, they are pursuing the same approach for the illicit trade in wildlife.

As a result, over the first project year, our activities specifically linked to the London Declaration commitments VII., X., and XI., as well as to the Kasane Statement commitments Number 3 and 5.

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 being monitoring the domestic market we can show that Cambodia may become a key end-user destination for ivory, thus it could become a country that drives 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 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.

We are also actively engaged 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.

To develop regional markers, a protocol has been finalised (Annex 4.1), and permissions have been granted to use previously collected DNA samples from three wild Cambodian Elephant populations to begin the testing of potential SNP markers as soon as the ordered SNP assays arrive. These results, along with the compiled key findings of the ivory undercover survey (Annex 4.3), are to be presented to the government in the second year of the project. Filling those current gaps of understanding, including evidence of African ivory (Annex 4.5 and 4.6) 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. This will also reduce the threat of poaching for ivory to elephant populations in African source countries.

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 have received an intense 2-weeks training (Annex 4.2) as well as are receiving an 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 projects first year (Annex 4.3) and targeted training. This will include staff from the Forestry Administration concerned with laws and policies regarding forest resources (including staff from the CITES Management and Scientific Authority) but will also target governmental officials from the Ministry of Environment who are overseeing the management of protected areas. The project team is currently preparing a workshop for Wildlife Alliance and their law enforcement officers on ivory identification to be held in the second quarter of 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.

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.

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 43% shop owners selling ivory are females (5 shops did not identify the owner).The recorded total price of ivory for sale in these female-owned shops came to US$ [redacted] (547 ivory items) while male owned shops (57%) showed a comparable higher total price value of US$ [redacted] (2127 ivory items).

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.

RZSS has published a blog to coincide with the International Day of Women in Science (http://www.rzss.org.uk/news/article/13977/rzss-wildgenes---international-day-of-women-and-girls-in-science/). 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 4.7).

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.

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.

10. Lessons learnt

The biggest lesson learned in this first year pertained to our relationship with RUPP. Despite a long partnership and their apparent interest in setting up the genetics lab they were surprisingly slow getting the agreements signed in order to get staff in place. We recognized later in the year that we had to take a strong initiative and drive the entire process every step of the way, or else nothing would happen. Luckily everything fell into place, albeit a bit late, but still well on track to ensure project delivery. The takeaway is to build more upfront managerial and oversight time in projects such as these that require governmental support to initiate.

The survey aspects of our project went very smoothly, as we relied on our very experienced IWT Technical Advisor. Working off our previous partnership with RZSS also helped to move into this project with ease. Thus using experienced staff and working on trusted partnerships has allowed us to quickly and efficiently deliver this project from the beginning.

One of our biggest problems though is that our survey team is now being recognized in the markets. This is a significant issue, and presents a very difficult problem as there is almost no in-country capacity to conduct these sorts of ivory market surveys. We will now have to

rethink our strategy going forward as to how effectively monitor and survey markets. The solution is not clear, and we will have a series of team meetings to determine our options. Balancing expertise with overexposure and the need for high quality data means that we may need to bring in outside help. This may result in a change in strategy or approach, thus we may submit a change request form in early Y2.

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

NA

12. Other comments on progress not covered elsewhere

Unfortunately, one of the RUPP technicians who worked on the genetic study on wild Cambodian elephants relinquished her involvement with the Conservation genetics laboratory last year. This did impact the start time of the RUPP laboratory training as a new technician was required in place before RZSS could begin. However, the overall project objectives have not been unduly delayed and the new technician has quickly grasped the techniques and shown great enthusiasm for the project.

13. Sustainability and legacy

Our original exit strategy is still seemingly valid. There appears to be significant buy-in and interest in engaging with our project from relevant law enforcement entities. The environmental code appears close to being approved, thus there could be even stronger legal underpinning to support our work. International stakeholders such as UNODC and the US State Department have also expressed interest in working together to stop the ivory trade in Cambodia.

The genetics lab at RUPP, now up and running 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.

14. IWT Challenge Fund Identity

We have published one news piece marking the onset of the project: https://www.fauna-flora.org/news/cambodias-first-conservation-genetics-lab-to-tackle-illegal-ivory-trade.

An “International Day of Women in Science” blog published on the RZSS website (http://www.rzss.org.uk/news/article/13977/rzss-wildgenes---international-day-of-women-and-girls-in-science/) about women around the globe that work in conservation genetics included input from the RUPP technician, Chansorphea Srey, mentioning her role on the DEFRA funded IWT project (Annex 4.7).

A poster has been designed and printed, to be displayed in the RUPP conservation genetics lab and the RZSS offices. It summarises the ivory project and includes the logos of the partner institutions and DEFRA (Annex 4.8).

15. Project expenditure

Table 1: Project expenditure during the reporting period (July 2017-March 2018)

Project spend (indicative) since last annual report	2017/18 Grant (£)	2017/18 Total actual IWT Costs (£)	Variance %	Comments (please explain significant variances)
Staff Costs	[redacted]			

	[redacted]
Consultancy costs	
Overhead costs	
Travel & Subsistence	
Operating costs	
Capital Equipment	
Other costs	
TOTAL	

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

I agree for the IWT Secretariat to publish the content of this section (please leave this line in to indicate your agreement to use any material you provide here)

Annex 1: Report of progress and achievements against Logical Framework for Financial Year 2017-2018

Project summary	Measurable Indicators	Progress and Achievements July 2017 - March 2018	Actions required/planned for next period
Impact Reduction of illegal ivory trade in Cambodia contributing to decreased threat to elephant populations from IWT globally		This first year of the project has been a significant step in compiling necessary data to inform work to strengthen legislation and law enforcement on the illegal trade in ivory.	
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.	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.	1. In progress. Y1 surveys showed an increase to 2907 ivory items available for sale in markets in Cambodia (Annex 4.3). 2. In progress, to be completed by Y4. Data gathered to inform legislation (Annex 4.3). 3. In progress. Supported first market-level seizure of ivory seizure (see section 3.2). 4. In progress. Gathering of data has been started (Annex 4.3).	1. Continued monitoring of ivory markets in Cambodia. 2. Continued engagement in development of the Environmental Code (see section 3.1). 3. Training/workshop with local police to improve elephant ivory identification skill. 4. Continuing monitoring of market and trade network data. Engagement of airport staff.
Output 1. **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 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	1.1 Biannual market surveys have been completed for Y1 and data has been analysed and summarised. Evidence provided in section 3.2 and Annex 4.3. 1.2 Ivory networks research has been completed for Y1 and has been analysed and summarised. Evidence provided in section 3.1 and 3.2, and Annex 4.3. 1.3 Data has been compiled. Evidence provided in section 3.1 and Annex 4.3.	

	annually and mapped 1.4 Cambodian elephant population genetics used to develop regional markers and used for law enforcement	1.4 Protocols of Cambodian elephant population genetics to develop regional markers are finalised and needed assays are ordered. Evidence provided in section 3.1.
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;		• Market surveys were carried out in November 2017 at Phnom Penh, Sihanoukville and Siem Reap to investigate the scale of the current market; • Undercover surveys were carried out in February – March 2018 to reveal the illegal ivory trade networks in Cambodia; • First phrase of online trade survey finished in April 2018 – to evaluate the potentially important and understudied online trade market in Cambodia; • Media survey to reveal the number of ivory seizures in Cambodia from 2012 – 2017. Survey were conducted in February 2018. <u>Plan for next year:</u> • 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		• 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;		• Vendors gender survey were conducted in November 2017 and February 2018; <u>Plan for next year:</u> • Socio-economic survey with vendors is scheduled for May – June 2018 to better understand the links between poverty and the ivory trade; • Consumer survey is to be conducted in 2018.
Activity 1.4 Provide intelligence to law enforcement on ivory trade networks to facilitate effective enforcement;		• To be started in Y2.
Activity 1.5 Use existing Asian elephant population genetic data from 250-300 previously collected samples to generate genotype data on a genetic marker system		• Permissions have been granted to use DNA samples from three wild Cambodian Asian elephant populations. They will be used to generate sequence and SNP data in Years 2 & 3.

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.	2.1 By Y2, the origin of an initial 30 independent samples of illegally trafficked ivory is genetically determined 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 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 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	2.1 The origin of 10 independent ivory samples has been genetically determined. Evidence provided in section 3.3 and Annex 4.5 and 4.6. 2.2 Training of lab staff has been started and is ongoing. Protocols have been developed. Evidence provided in section 3.3 and Annex 4.1 and 4.2. 2.3 One male and one female lab technician are receiving ongoing training. The FFI IWT Technical Advisor has started her training. Evidence provided in section 2, section 3.3 and Annex 4.1 and 4.2. 2.4 To be completed by Y4.
Activity 2.1 Establishment of species identification testing (Asian/African) and testing of samples to establish species provenance (mtDNA test)		• An RTPCR machine has been installed in the RUPP conservation genetics laboratory. • RZSS has developed and tested an ivory DNA extraction protocol, a SNP assay species identification test and an African Elephant mtDNA test that allows regional tracing of African ivory samples. • Training was provided by RZSS to the RUPP technical staff in ivory DNA extraction techniques, use of the RTPCR machine to perform a species Identification test of ivory samples for sale within Cambodia and a mtDNA test to determine geographic origin of African ivory samples (see Appendix 2 for the protocols). • Eleven ivory samples have been tested for species level identification by the RUPP laboratory (see Appendix 2 for example data). • The geographic origins of four African ivory samples found for sale within Cambodia have been established (see Appendix 4 for summary).
Activity 2.2 Production of Cambodian elephant reference genetic data from existing samples testing		• Permissions have been granted to use previously collected DNA samples from three wild Cambodian Elephant populations. • RZSS has developed a protocol for the generation of reference mtDNA sequence data from the Cambodian elephant DNA samples.

		• RZSS has ordered SNP assays to begin testing the potential of SNP markers for the generation of Asian elephant genetic reference data.
Activity 2.3 Investigation of geographic origin of Asian ivory found in Cambodia		• MtDNA has been used to identify the geographic origins of four African ivory samples found for sale in Cambodia. • Both SNP markers and mtDNA are being investigated by RZSS to establish the capabilities of each to determine geographic origin of Asian ivory. • RZSS still to investigate the use of microsatellites for origin verification of African samples.
2.4 Establishment of individualisation and sexing tests to allow for seizure inventory		• The SNP assays will be tested for their ability to act as individual identity markers for Asian elephants. • RZSS has designed a sexing test for all Elephant species and this will be tested and verified before implementation on the ivory samples at RUPP.
2.5 Establishment of seizure sampling, data-basing and chain of custody protocols		• A Standard Operation Procedure has been established at RUPP regarding the receipt and use of ivory samples.
2.6 Strengthen professional links of the lab with regional and international wildlife forensics/ elephant genetics network		• An academic research group working on elephants in Myanmar has been approached and future collaboration in the next year is being discussed.
Output 3. National legislation regarding ivory is in place and effectively enforced	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 3.2 By end of Y4, government legislation makes the sale and buying of Asian and African ivory illegal 3.3 By end of Y4, 50% increase of ivory seizures at the airports from 2017 baselines 3.4 By end of Y4, arresting and/or fining wildlife criminals for ivory related crimes is effectively carried out	3.1 Data collection has been started and is ongoing. First results have been compiled and will be presented in Y2 through workshops and reports to the government. Evidence provided in Annex 4.3. 3.2 Engagement continues with the Ministry of Environment on the Environmental Code. Draft 10 of the document has been recently submitted with input from FFI. See section 3.1 and 3.2. 3.3 No seizures in 2017. Ongoing monitoring of seizures and engagement with airport authorities planned to be started in Y2. Evidence provided in Annex 4.3. 3.4 Currently only data is gathered to inform activities related to strengthening law enforcement.

Activity 3.2 Engage with Ministry of Environment to ensure that laws banning ivory sale and purchase are incorporated into the development of legislation	• Collaborating with other NGOs in Cambodia and the Secretariat of the Technical Working Group to create Draft 10 of the Environment and Natural Resources Code (ENR Code) which were submitted to the Technical Working Group on the 22nd March 2018.
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	• To be commenced in the next period
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.	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	1. Market survey reports 2. Official legislation 3. Law enforcement records and CITES reports 4. Official airport seizure records and CITES reports	- 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.)
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.	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	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	- 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.	2.1 By Y2, the origin of an initial 30 independent samples of illegally trafficked ivory is genetically determined 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 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 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	2.1 DNA analysis reports and publications 2.2 Reports and publications 2.3 Training and work protocols of genetic lab 2.4 Meeting and workshop reports, training materials	- Government is open to continued testing of ivory. (Awareness, capacity, and infrastructure and networks are built to ensure sustainability of the project.)
3. National legislation regarding ivory is in place and effectively enforced	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 3.2 By end of Y4, government legislation makes the sale and buying of Asian and African ivory illegal 3.3 By end of Y4, 50% increase of ivory seizures at the airports from 2017 baselines 3.4 By end of Y4, arresting and/or fining wildlife criminals for ivory related crimes is effectively carried out	3.1 Project report, workshop and meeting reports 3.2 Draft legal proclamation 3.3 Data on ivory seizures at airports 3.4 Data on prosecutions	- 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) - Wildlife Alliance will continue to have resources and the will to improve law enforcement. (The project will build on and monitor existing relationships)

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

In future years it is our intention to develop a series of standard measures in order to collate some of the quantitative measures of activity, input and output of IWT projects. These will not be measures of the impact or effectiveness of IWT projects but will contribute to a longer-term dataset for Defra to draw upon. The collection of standard measures data will be important as it will allow us to understand the combined impact of all the UK Government funded Challenge Fund projects. This data will therefore provide useful information for the Defra Secretariat and for Defra Ministers regarding the Challenge Fund.

The standard measures for the IWT Challenge Fund are currently under development and it is therefore not necessary, at present, to complete this Annex. Further information and guidance about the IWT standard measures will follow.