Department for Environment Food & Rural Affairs

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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
Lead organisation	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 2019-Mar 2020) and number (e.g. Annual Report 1, 2, 3)	Annual Report 4: 1st April 2020 - 31st March 2021
Project Leader name	Lisa-Marie Newth
Project website/blog/social media	https://www.fauna-flora.org/projects/elephant-conservation-cambodia https://www.rzss.org.uk/conservation/our-projects/project-search/applied-conservation-genetics/conservation-genetic-capacity-building-in-cambodia/
Report author(s) and date	Alexander Ball, Neil Furey, Lisa-Marie Newth, 21st May 2021

1. Project summary

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

This project seeks to reduce the 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 in 2015–2016 suggested Cambodian ivory trade networks are linked to other IWT networks, amplifying unsustainable harvest of domestic wildlife species. Little was 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 in late 2017, there was real risk of illegal ivory markets diverting to Cambodia, since FFI documented that buyers of worked ivory are mostly from China, where ivory trade is now illegal.

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 (Output 1). We also build capacity for genetic analysis of ivory to determine provenance and regional trade networks, further informing regional efforts to stop IWT (Output 2). Finally, building on FFI's long-standing relationships with government partners, we address legislative weaknesses and support implementation of the Cambodian National Ivory Action Plan (NIAP) to strengthen effective enforcement and prevent trade in African and Asian ivory (Output 3).

Our ivory market surveys were carried out in the three cities most frequented by international and domestic tourists, namely Phnom Penh, Siem Reap, and Sihanoukville (Fig. 1). The Conservation Genetics Laboratory is located in the country's capital Phnom Penh.

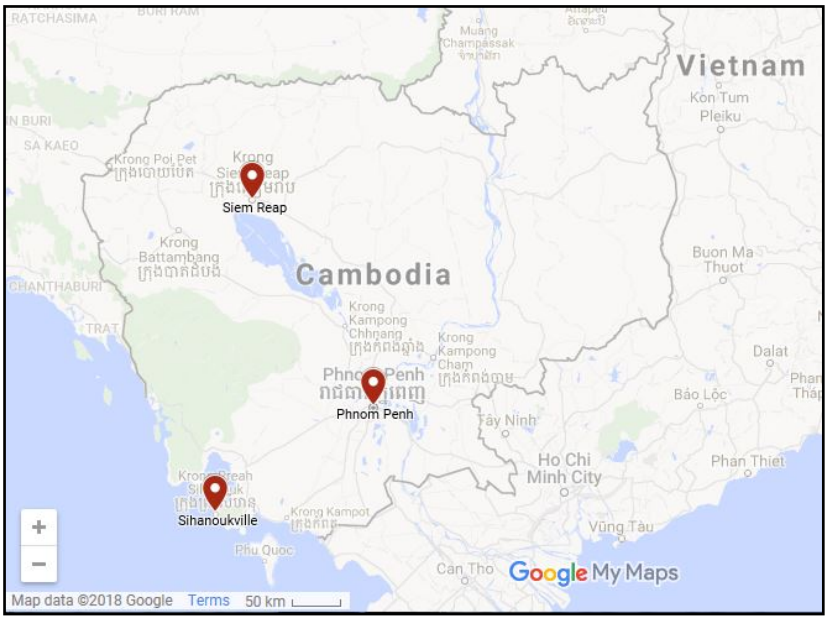

Fig. 1: Location of Conservation Genetics Laboratory (Phnom Penh) and ivory market surveys (three cites) undertaken by the project.

2. Project partnerships

As the lead institution for the project, FFI convened all discussions with partners on design and subsequent implementation. FFI's specific roles and responsibilities included management and financial oversight, responsibility for ivory surveys and practice-oriented research (Output 1), and co-development of legislative frameworks and strengthening law enforcement in liaison with government authorities (Output 3). The main project partners were 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 worked in partnership with RUPP since 2005 and in 2016, FFI partnered with RZSS to support the creation of the country's first Conservation Genetics Laboratory, which is housed in the RUPP Faculty of Science. RZSS was the technical lead for all activities under Output 2 of the project in partnership with RUPP who provided facilities and staff and directly managed the

laboratory and its activities in liaison with RZSS. RZSS is one of the few genetics facilities that specialises in supporting underserved institutions and it's RZSS WildGenes Lab has extensive experience in IWT work and capacity-building of genetics facilities.

The Forestry Administration (FA) is a government authority in charge of forest management in Cambodia according to the National Forestry Sector Policy and the Forestry Law. FFI and FA have collaborated since 2000 under an ongoing MoU, particularly on conservation activities concerning both wild and domesticated elephants in Cambodia. The CITES Management Authority and CITES Scientific Authorities of Cambodia also sit under MAFF, within the FA, and have existing relationships with FFI. The roles of FA in the project included permissions for testing at the RUPP genetics lab (Output 2) and co-development and implementation of legislative frameworks and law enforcement (Output 3).

All three partners were involved heavily in planning and decision-making for the project and contributed to the report. Specific relationships and challenges are summarized below.

FFI-RUPP-RZSS: RUPP is a long-standing partner of FFI and as several staff work for both institutions, there was continuous exchange throughout Year 4 of the project. Despite this, the COVID-19 pandemic and changes in staff have impacted the project partners and the exchange of information. In person training of RUPP staff has been a key part of the project and in Year 4 an in-country training session by RZSS was planned and at least one RUPP technician would visit the RZSS WildGenes lab for further training. Instead, the weekly virtual meetings to supervise progress and mentor lab staff throughout the project became even more crucial (Annex 5.1). A virtual training session was also provided to RUPP staff using videos and live skype sessions to support the new staff member in their first month. In-country meetings did not occur between the wider project team but regular skype catch-ups between FFI and RZSS occurred when needed.

Though not related to the partnership per se, staff changes in the RUPP genetics lab was a challenge during Year 4 with delays in the recruitment of a new lab technician. This was time-consuming due to the chronic shortage of qualified lab technicians in Cambodia. They were also being recruited into an unexperienced team with the other two technicians having only started in the lab during Year 3. The presence of three staff members was implemented in response to the loss of staff during Year 2 & Year 3 which lead to painstaking efforts to re-train staff and re-build networks. This was mitigated by additional recruitment to ensure that multiple staff had the required competencies to guard against future staff changes, which continues to pose a threat to the sustainability of the initiative. As a result, the lab will require continued support for longer than originally envisioned. Nevertheless, as there is substantial interest among in-country NGOs in using the lab, the continued need for its services is evident. As such, staff training during Year 4 emphasized DNA extraction and PCR techniques which are also transferable to other sample types to allow the lab to diversify its services.

FFI-FA/CITES Management Authority: FA is a long-standing partner of FFI and the focus of the collaboration was to ensure the development and enforcement of national legislation regarding ivory, which has been successful. The reports from this year's market vendor, and online vendor surveys have been shared with the FA (Annex 5.14, 5.16).

To continue its support for effective legislation, the project this year seconded an FA member of the inter-ministerial taskforce to investigate, prevent and supress illegal ivory (Annex 5.9), Ms. Thi Sothearen, to directly support areas of project delivery that strengthen relevant and effective legislation

The project collaborated with several other institutions, through the sharing of our research for the purposes of law enforcement and to deepen collaborative knowledge of ivory trade networks, which included the Ministry of Environment, Wildlife Alliance and TRAFFIC International (Indicator 0.3, 1.2, 3.4).

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

The project has been successful this year in delivering activities 1.1-1.5 under Output 1.

Activity *1.1 Conduct annual surveys of markets to monitor and quantify ivory, and consumer profiles (Y4) in Siem Reap, Phnom Penh, and Sihanoukville, 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, and consumer surveys in the final year of the project informed by data gathered in the previous years*

Physical market survey

Utilising the methodology established in this project's previous market surveys, the aim of this research was to monitor trends in physical ivory markets in Phnom Penh, Siem Reap & Sihanoukville, Cambodia (Annex 5.14). This survey demonstrated that ivory products continue to be sold by vendors in all three cities, despite legislation banning the trade in and possession of elephant parts in 2018 (Prakas No. 020 PR., Annex 5.8), a total of 631 items of ivory were recorded for sale in Phnom Penh, Siem Reap & Sihanoukville in the February 2021 survey. This represents a decrease of 43% against the 2016 baseline (Annex 5.11, 5.14, Indicator 0.1).

Nevertheless, the continued vending of ivory despite the absence of international tourism since the 2020 Covid-19 regulations, points to the existence of a domestic consumer market for ivory, and the importance of addressing this in the context of reducing the illegal trade in ivory globally. Indeed, whilst the majority of vendors surveyed (65%, 17 out of 24 respondents) reported that their ivory customers had been primarily Chinese prior to the Covid-19 pandemic, many (qualitative data) had since perceived a shift towards Khmer consumers of ivory (Annex 5.14). The existence of a domestic market for ivory confirms previous research conducted during this project (Annex 5.13) and will be investigated further through the postponed consumer behaviour research.

Given that it was found that the majority of ivory items on sale were Buddhist figurines (45%, 284 of 631 items; Annex 5.14), understanding the motives and drivers behind the purchasing of these items will provide the focus for the postponed consumer behaviour research. This research will be used to inform future consumer behaviour change strategies and campaigns in order to reduce the demand for ivory consumption in Cambodia.

On-line vendor survey

Conversely, whilst our physical market surveys of ivory vendors have shown a decrease in the number of ivory items being openly sold over the duration of this project, our surveys of online vendors marketing ivory via Facebook accounts in Cambodia, suggest an opposite trend. Facebook is the most popular social media platform in the country with entrepreneurs using the platform to advertise and sell products unregulated and vendors of ivory products were surveyed in February and March 2021 (Annex 5.16). Indeed, our on-line Facebook surveys whilst indicating a decrease in the number of accounts selling ivory during the survey period, show a significant increase in the number of ivory products being offered for sale, from 437 items of ivory in 2019 to 1535 in 2021 (Annex 5.15, 5.16). This represents an increase in ivory items being sold on-line through Facebook during February and March 2021 of 251% from the project's 2019 survey.

The majority of the on-line vendors (79%) in the 2021 survey were registered as operating from Phnom Penh, a pattern also reflected in the physical market vendor survey (Annex 5.14, 5.16).

This year's physical ivory market vendor survey and on-line Facebook vendor survey are, in conjunction with the project's previous years' survey data, currently being analysed for a joint publication with TRAFFIC International on regional ivory markets (Laos, Thailand, Myanmar, Cambodia & Vietnam Annex 5.10).

Activity 1.2 Produce national map of trading hotspots and networks

A national map of trading hotspots and networks was undertaken in Year 1 (Indicator 1.3). However, given subsequent survey findings suggested trading networks were highly transient and fluid and because the purpose of the collaboration with TRAFFIC International was to undertake in-depth analyses of regional ivory markets and report publicly, it was felt that efforts to regularly update the map would not represent the most productive use of the project's finite time and resources.

Activity1.3 Conduct gendered surveys of consumers and vendors to better understand the links between poverty and the ivory trade

The on-line Facebook market surveys found that the majority of accounts were registered to male owners (71% of 24 accounts), with only 8% (2 out of 24 accounts) being registered to female owners (Annex 5.16). Conversely, the physical market ivory vendor surveys undertaken this year found that the majority of shops surveyed selling ivory were owned by women (73%, 19 out of 26 shops). This represented US$ (of US$ total) and 467 items (of 631 total) being offered for sale at the point of survey in female-owned shops, whereas solely male-owned shops accounted for five shops, US$ and 75 items respectively (Annex 5.14). This marks an increase in the percentage of female owned shops selling ivory from our 2017 survey (43%, Annex 5.12). Nevertheless, the possible increasing trade in ivory towards on-line vending and away from physical markets in Cambodia, as indicated by our surveys (Annex 5.20, 5.14, Indicators 1.1, 1.2), suggests the potential for changing roles of gender in the vending of ivory from the market being primarily female owned to becoming male owned.

The majority of vendors (69%, 18 out of 26 vendors) selling ivory in physical markets this year however reported that most of their ivory consumers were male; whereas only 31% (8 out of 26 vendors) reported these were female (Annex 5.14). Consumer profiles and the triggers, motivations and drivers for purchasing ivory will be explored further in the postponed ivory consumer research.

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

The project's research this year was shared with the Forestry Administration (FA), and additionally to the investigation unit of the Wildlife Rapid Rescue Team (WRRT) of the FA, Ministry of Environment and Wildlife Alliance (WA), the latter of which undertakes around 90% of all investigations into wildlife offences in Cambodia. The research reports were also distributed to NGOs including World Wildlife Fund (WWF), TRAFFIC International and Wildlife Conservation Society (WCS) (Annex 5.14, 5.16, Indicator 1.1).

In addition, we provided online training on Crime Prevention to FFI and Wildlife Alliance staff over two days in September 2020, building capacity to counter the illegal trade in ivory.

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

The project has generated genetic data using two complimentary genetic marker systems. The first, using mitochondrial sequence data has been generated using 320 Asian elephant samples collected from four protected areas in Cambodia. The second, based on 20 nuclear SNPs, has been generated for 310 of the samples. The completion of the second marker system occurred during Year 4. The second marker system was developed by RZSS and validated by the RUPP laboratory during Year 1 to Year 3. Forty nuclear SNPs were screened before refining the 20-marker system. The laboratory now has 20 genetic probes as well as synthetic DNA controls which allows equivalent datasets to be produced in other laboratories within the ASEAN Wildlife Forensic Network.

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 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 results of species identification testing of 15 ivory samples from the Cambodian domestic market was reported at the end of Year 2. In Year 4, 18 samples were confiscated from an illegal ivory workshop. All 18 samples were genetically identified as ivory from African elephant (Annex 5.2 shows the RUPP lab test results). So in total 33 Cambodian ivory samples have been screened by the RUPP laboratory. Two were fakes (1 plastic replica and one was African elephant bone), two (6%) were woolly mammoth ivory, two (6%) were Asian elephant ivory and 27 (82%) were African elephant ivory. Due to COVID-19 travel restrictions the two RUPP technicians were supported via email and video calls by RZSS staff during the Year 4 ivory testing in July. The new technician employed during December of Year 4 has also had training of the ivory DNA extraction and testing process by the other RUPP technicians and subsequently performed a replicate test on two of the previously tested samples. Due to travel restrictions in Year 4 RZSS ran an online training session over two weeks with 12 accompanying practical videos. Detailed written protocols have also been a key feature of the training sessions throughout the project and an update to the ivory testing protocol was made in July of Year 4 (see Annex 5.3).

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 mtDNA reference database for the Cambodian elephant samples is complete, the lab now has sequences for 320 samples collected from 4 protected areas across Cambodia. The SNP based database which is the more robust method of determining origin has been completed during Year 4, consisting of 310 samples genotyped at 20 SNP markers. In total 40 SNP markers were originally tested and a panel of 20 were selected for their variability in the Cambodian elephants, using the genetic samples provided from 14 captive elephants within the country. Wild elephant samples from across 8 range countries have previously been sequenced at the same mtDNA region used on the Cambodian elephant samples, creating a combined database of 854 sequences. During Year 4 Asian elephants from 3 additional populations outside of Cambodia were also genotyped using the 20 SNP marker system for potential inclusion in a global traceability database.

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

The RUPP laboratory identified 2 ivory samples that originate from Asian elephants during Year 2. The main method of determining a more defined geographic origin will rely on the SNP reference database, currently consisting of samples from 3 Cambodian regions, and 3 additional populations in South-East Asia, with plans to incorporate samples from Nepal in the future. However, the mtDNA reference database already includes samples from 9 countries – Cambodia, Vietnam, Malaysia, Indonesia, Bhutan, Laos, India, Sri Lanka and Myanmar. Our

results show that neither of the ivory samples match elephant haplotypes in Cambodia (Annex 5.4). One sample is identical to a mtDNA sequence only observed in central India and the other ivory sample is likely from South-East Asia, matching a haplotype found in wild elephants in Peninsula Malaysia, Myanmar and Laos. The SNP based test also shows that the two ivory samples are outliers when compared to the current dataset. The 20 SNP marker database completed during Year 4 only contains genetic data from South-East Asia. There are plans to increase the database as nuclear markers are more likely to provide robust origin information compared to mtDNA. Currently, a comparative analysis reveals that neither of the 2 samples is a good match to the elephants in the database (Annex 5.5). A future aim, as COVID-19 restrictions ease, is to now build on this critical database as it is only by increasing the genetic representation in the database that precise geographic origins will be obtained. There are currently plans to expand the database to include elephants in Nepal.

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

RZSS have transferred a gel electrophoresis-based sexing test to the RUPP laboratory. This has been shown to correctly assign the sex of 14 captive Cambodian elephant samples of known sex. It has subsequently been used to sex 8 of the ivory samples (6 Male and 2 female). Due to the low quality of DNA obtained from ivory samples it has not been possible to sex all samples. The sexing test has also been used to sex wild Cambodian reference samples. This has revealed equal sex ratios in an elephant population in the Cardamom mountains and in the Eastern plains of Cambodia. Equal sex-ratios are expected in populations that have not been severely affected by ivory poaching, as it is the male elephants that are targeted for their tusks. This is good news for these two Cambodian populations and supports the field data which has found little evidence of elephant poaching. A total of 364 faecal samples have been sexed.

The SNPs in the 20 SNP panel have been selected based on their variation within Asian elephant samples. Our tests on the 14 captive elephant samples from Cambodia show that the SNP panel is able to provide unique genetic signatures for each individual and can accurately discriminate between closely related individuals with >99% accuracy. In Year 4 all genotyped samples from each of the 3 wild populations in Cambodia were screened for duplicates (i.e. dung samples collected from the same elephant). This allowed us to identify individuals within the database with the South West, South East and North-East sample collections having 27,19 and 98 individuals respectively. Both Asian elephant ivory samples were genotyped and compared to the wild elephant databases generated by the RUPP laboratory, see 2.3 above. The SNPs panel produced can therefore be used to identify samples originating from the same individual and during Y4 the RUPP technicians have demonstrated that it can be used to genotype Asian elephant ivory samples.

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

Only one ivory seizure occurred during Year 4 of the project and the two lab technicians at RUPP who had been trained using the 15 samples from the Year 1 market survey were ready to obtain and work with samples from the seizure (July 2020). All 18 samples were identified as from African elephants and this was reported back to the enforcement agency (Annex 5.6 for example report). The staff at RUPP recorded all sample details and test results in access databases. Gel electrophoresis test results are stored electronically in excel files and also physical photographs of each gel are stored in a laboratory folder. Chain of custody protocols were set-up in the RUPP laboratory during Year 2, involving the photographing and cataloguing of each sample that enters the laboratory. All visitors to the laboratory must sign a guest book and any samples that are received must be accompanied by a signed sample transfer form (Annex 5.7). All ivory samples are kept within a locked safe and the time and date that each sample leaves and returns to the safe is recorded.

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

Unfortunately, due to COVID-19, plans in Year 4 for the RUPP lab staff to visit another conservation genetics lab first-hand for increased training opportunities and to strengthen links with researchers internationally was unable to occur. A number of conferences were cancelled or postponed, including the IUCN World Conservation Congress, further limiting collaborative opportunity. Discussions with genetic laboratories in Vietnam and Nepal continued online but visits or exchange of samples has not occurred due to changing priorities of the researchers and impacts of the pandemic. The RUPP biology department were able to instigate meetings with other elephant researchers within Cambodia and the laboratory continued to host a PhD student conducting research on Asian elephants and affiliated with the Victoria University of Wellington, New Zealand.

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

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

Originally intended for this year, this aim of this activity was effectively precluded when we presented the project's initial findings which contributed to the ivory ban in June 2018 (Indicator 3.2, Annex 5.8). As such, the project shifted its subsequent focus to highlighting the need for strengthened enforcement, as demonstrated by its survey results in 2019–2021 (Annex 5.14, 5.16, 5.19. Refer also to previous annual reports). In addition to regularly sharing these findings, formal presentations will be made to a wide variety of government agencies attending two national IWT events hosted by the FA and MoE in 2021 (currently postponed –refer to activities 3.2 and 3.3, Annex 5.29).

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

During this project, in 2018 the MAFF ratified a new law (Annex 5.8) banning the domestic trade and possession of ivory, extending legal protection to African elephants (*Loxodonta africana Sensu Latto*). This closed a legislative loophole (Indicator 3.2) highlighted by our research which had indicated the domestic trade in both African and Asian elephant ivory, including genetic evidence of African ivory in seizures (Activities 1.1, 1.3,2.1-2.5). The project therefore shifted its subsequent focus to highlighting the need for strengthened enforcement. As such, the project this year has engaged with the MoE to convene a national workshop entitled "*Strengthening the Effectiveness of Law Enforcement for Countering Ivory Trafficking in Cambodia*", which was due to take place in March 2021, but has been post-poned due to Covid-19 regulations (Annex 5.29)

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

To continue its support for the NIAP, the project seconded an FA member of the taskforce (Ms. Thi Sothearen) to its activities in Year 4. As noted earlier (Activity 1.4), the project in support of the NIAP shared actionable intelligence and analyses generated by the project's surveys (Annex 5.14, 5.16).

Our media survey suggested that less than 1kg of ivory was seized between March 2020 and March 2021 (Annex 5.19), which represents a decrease in ivory seizures reported in the media from previous years during the project; 3,200kg between December 2017 and April 2019 (Annex 5.17), 6.8kg between April 2019 and March 2020 (Annex 5.18) However, it should be noted that media figures for ivory seizures were lower (approximately 3,208kg between Dec 2017 and Mar 2021) than unreleased government data which indicate a total of 4,260kg of ivory was

seized over the same period *[Note: these data are not included, being the intellectual property of the Cambodian government]*.

Other activities included support for FFI's joint development of a 10-year National Elephant Conservation Action Plan which was adopted in May 2020. The project also engaged with FA to convene a national workshop on CITES enforcement issues in 2021, entitled "*CITES and Wildlife Law*", but as with the MoE workshop (above), this has been postponed due to Covid-19 safety measures in Cambodia (Annex 5.29).

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

The project supported several training events for Customs & Excise and FA/CITES officials to improve screening for ivory products in previous years of the project, as planned. The project will support further training for Customs, FA and CITES officials through the postponed individual events hosted by the FA (Annex 5.28) and the MoE (Annex 5.29). Because Cambodian borders and airports have been effectively closed since early 2020 (due to Covid-19) however, it is not possible to assess the impact of these activities, although unofficial government data indicates the most recent ivory seizure by airport customs occurred in October 2015.

3.2 Progress towards project Outputs

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

The project has been successful this year in achieving its first output as a result of Activities 1.1 to 1.5 (Annex 5.14, 5.16, 5.19). At the outset of the project, interventions addressing the ivory trade were minimal, as very little was known about ivory markets, hotspots and trade networks in Cambodia and law enforcement authorities lacked knowledge of the trade and how to address it. The links between IWT and poverty have been addressed by the project previously (Annex 5.13)

As surveys undertaken by FFI in 2016 recorded 1,116 items of genuine ivory for sale in physical ivory markets in Cambodia (Annex 5.11), this figure represented the baseline condition for subsequent change to be measured against. This year's physical market survey however recorded a total of 631 items of ivory, which represented a decrease of 43% against the 2016 baseline (Annex 5.14, Indicator 0.1). This suggests that informed by this project's research, the 2018 legislation prohibiting the trade and possession of any elephant parts (Indicator 0.2, 3.2) and the subsequent issuing of warnings to vendors by the MoE in September 2019 along with ivory seizures (Indicator 0.3) has impacted upon the quantity of ivory being sold openly in physical shops selling ivory (Indicator 1.1, 1.2). Whilst our physical market surveys have shown a significant decrease in the number of ivory items being openly offered for sale, the on-line ivory vendor survey this year showed the opposite trend. As such, there was an increase of 251% in the number of ivory items being sold on-line through Facebook during February and March 2021 from the project's 2019 survey (Annex 5.15, 5.16). These findings, indicating changes in the way ivory is being sold in Cambodia since the project's initial surveys, have been shared with the government to inform future policy and interventions and will be presented at the MoE and FA's postponed workshops this year (Indicator 1.1).

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

The RUPP laboratory has two technicians that have been trained to extract DNA from ivory samples and run a species ID test. A genetic database of wild and captive Cambodian elephants has been constructed that will allow the identification of ivory samples that have originated from elephants within Cambodia. The database now contains samples from additional populations in South-East Asia with hopes that groups in Vietnam and Nepal will add more samples to the database in the future (Indicators 1.4, 2.2, 2.3).

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

The project was largely successful in achieving its third output. The sharing of this project's research throughout (both the genetic evidence of African elephant ivory being traded as well as the market surveys indicating the extent and nature of the trade in Cambodia) has informed national legislation, policy and interventions during this project (Indicator 1.2, 3.2. See Output 1 above). Significantly, legislation in 2018 prohibited the sale and possession of all elephant parts, including African elephants (Annex 5.8, Indicator 3.2), and this was followed by the issuing of government warnings to vendors and subsequent ivory seizures in 2019. Our media survey however revealed that less than 1kg of ivory had been seized during Year 4 (March 2020 to March 2021, Annex 5.19). This represents a decline in ivory seizures reported in the media from Year 3's survey (April 2019 to March 2020), which reported the seizure of 6.8kg of ivory (Annex 5.18, Indicator 0.3). No ivory seizures were registered at airports during the project period (Indicator 3.3), although this may be partly attributable to their effective closure since early 2020 (in response to Covid-19). Whilst there has been enforcement of legislation through ivory seizures since the passing of legislation in 2018, this is an area which requires further attention. The postponed workshops with the MoE and FA will contribute to addressing this improvement of law enforcement (Annex 5.28, 5.29).

3.3 Progress towards the project Outcome

The intended project outcome was: *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*

Although our market and media surveys showed that domestic trade in ivory continues, the project this year has been successful in promoting effective enforcement in all three respects. The project's surveys and analyses made a substantial contribution to improving knowledge of Cambodian ivory markets and trading networks (Annex 5.14, 5.16, 5.19). They also suggest that quantities of ivory for sale in physical markets in early 2021 had declined 43% relative to the 2016 baseline (Indicator 0.1, Annex 5.12, 5.14). While this reduction is undoubtedly due in part to the national ivory ban in mid-2018, government warnings and increased enforcement actions, it is also possible that parts of the domestic trade may have become more covert in physical markets or have moved on-line. Indeed, our 2021 on-line Facebook surveys, undertaken in February and March, have indicated a 251% increase in the number of ivory items being offered for sale since the 2019 (Annex 5.16).

Our ivory DNA testing shows that the illegal ivory trade in Cambodia is having far-reaching effects, with ivory samples being trafficked from across the globe. The majority of the 33 samples tested are of African origin, from a diverse range of regions, including West, Central, East and Southern Africa. We have also identified two mammoth samples that are of likely North American origin and two Asian elephant samples that do not match any of the Cambodian elephant reference samples. This suggests that all the ivory samples tested are from outside of Cambodia, and that there are multiple illicit trade routes leading to the ivory that is being sold in the Cambodian market. There is now a laboratory at RUPP which has two technicians trained to extract DNA from ivory and test for species identity within Cambodia for the first time. 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 (Indicators 1.4, 2.1, 2.2).

The project continued to engage with FA/CITES officials through sharing of project findings and capacity-building for IWT seconded staff. However, the national workshop with the FA/CITES entitled 'CITES and Wildlife Law' and which was intended to address enforcement issues has been postponed due to Covid-19 regulations. Nevertheless, according to unofficial FA data, no ivory seizures were registered at Cambodian airports during this year (Indicator 0.4), although this may be partly attributable to the considerably reduced airport traffic since early 2020 in response to Covid-19 concerns. This highlights the continued need to engage with Customs and Excise and FA/CITES officials in order to facilitate the confiscation of ivory products at airports.

3.4 Monitoring of assumptions

The project had three outcome assumptions. The first (0.1) was that "*Market surveys capture the actual existing ivory market*". The conduction of both physical market surveys and on-line market surveys via Facebook this year has been essential to capture changing trends in how ivory is being sold. Our market surveys indicated a decrease in the amount of ivory being sold in physical shops and an increase in the number of ivory products being sold on-line (Annexes 5.14, 5.16).These surveys however are indicative of trends rather than representing the actual ivory market, and it is possible that ivory being sold in physical shops could have become more covert, particularly given that all vendors surveyed in Phnom Penh mentioned arrest warnings given by the government and market authorities (Annex 5.14).

Output 1 of the project had two assumptions. The first (1.1) was "*Potentially sensitive information is shared*". After team members began to be recognised in market surveys, we employed experienced consultants this year to ensure subsequent surveys could extract sensitive trader information. All reports have been shared both with the government and NGOs working in the IWT sector.

Output 2 of the project had one assumption (2.1) which was "*Government is open to continued [genetic] testing of ivory*". While we believe officials have a specific interest in genetically testing ivory, its heightened political sensitivity has slowed progress on seizure and stockpile procedures. However, as the tasks of the NIAP and inter-ministerial taskforce include DNA testing of ivory, a significant interest and need for the government to make use of established resources remains.

Output 3 of the project had two assumptions. The first (3.1) was "*Engaging with our existing partners at the Forestry Administration, and feeding information to Wildlife Alliance will have an impact on improving law enforcement*". Through their Wildlife Rapid Rescue Team, Wildlife Alliance undertakes 90% of investigations of wildlife offences in Cambodia through 12 seconded government officials. We continue to share our reports with Wildlife Alliance. The second assumption (3.2) was "*Wildlife Alliance will continue to have resources and the will to improve law enforcement*". We believe that Wildlife Alliance continues to have a strong will to make resources available to improve law enforcement.

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

The proposed impact of the project was: *Reduction of the illegal ivory trade in Cambodia contributing to decreased threat to elephant populations from IWT globally*.

The research undertaken this year has provided critical information on the potentially changing nature of ivory trading in Cambodia, with a documented decrease in ivory being sold in physical markets and an increase in ivory being advertised on-line via Facebook during the survey period. This research, which has been shared with the government and NGOs in the sector, can be used to inform future law enforcement strategies and marks a significant contribution to global efforts to reduce African and Asian elephant poaching. Similarly, further insight into the demographic of ivory consumers in Cambodia contributes to research being undertaken globally and can inform future behaviour change campaigns. This knowledge will be further developed in the postponed ivory consumer surveys.

Through developing the capacity of government IWT staff, through a seconded IWT officer, and building national capacity to undertake genetic analysis of ivory with the training and support of laboratory technicians, the project this year has not only enhanced the in-country capacity to tackle IWT but has provided career opportunities that alleviate poverty into the long-term.

4. Project support to the IWT Challenge Fund Objectives and commitments under the London Declarations and Kasane Statement

The project directly worked towards strengthening law enforcement and the role of the criminal justice system in Cambodia, IWT Challenge Fund's 2nd objective. Through its research efforts, the project built national understanding and evidence of Cambodian ivory markets and trade networks, information that the criminal justice system lacked. The establishment and ongoing capacity building of the conservation genetics lab not only supported but amplified this effort in demonstrating the origins of ivory sold in Cambodian markets. Notable contributions in relation to IWTCF objectives included:

- IWTCF Objective 2: The project's research findings were shared with government agencies for use in IWT enforcement actions and the postponed MoE and FA workshops will focus on strengthening law enforcement (Activity 1.3);
- IWTCF Objective 3: Production of the first elephant genetic database for Cambodia will provide the government with a new resource for comparisons to illegally traded ivory samples, thus increasing the effectiveness of legislative implementation Activity 3.3);
- IWTCF Objective 4: Knowledge gained, through ivory vendor surveys, into the demographic of ivory consumers and the type of ivory product most commonly purchased will in conjunction with the postponed research into ivory consumer behaviour, inform future campaigns to reduce demand for ivory products (Activity 3.2.

In addition, the project directly supported TRAFFIC International in its national ivory surveys aimed at monitoring regional ivory markets. As a result, its 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.

5. Impact on species in focus

The potential shift in the ivory market from physical shops to the on-line market, which has been indicated by this year's research (Annex 5.14 & 5.16, Outcome Assumption, Indicators 1.1-1.3), will be vital in informing effective future law enforcement strategies and action. This research, which has been shared with government enforcement agencies, in conjunction with the capacity-building of IWT staff this year (Indicator 2.3), could have ramifications for the conservation of elephants globally given that our DNA analysis of ivory seizures showed the presence of both African and Asian elephant ivory in Cambodia. Despite vendors reporting that the majority of the ivory consumers prior to the 2020 Covid-19 pandemic were Chinese, the continued vending of ivory this year (both in on-line and physical markets) despite the effective absence of international tourism, indicates the existence of a domestic consumer market (including those of both Chinese-Khmer and Khmer ethnicity) and points to the role of Cambodia in the international illegal trade in ivory. (Annex 5.14, Outcome Assumption, Indicators 1.1,1.2) This will be investigated further through the postponed research into ivory consumer behaviour.

This project's research will be used to inform future behaviour change campaigns to reduce the demand for ivory products.

Continued training of lab technicians at RUPP via video and online calls during Year 4 has increased genetic capacity within the country, with three technicians trained to work in the laboratory during the latter part of Year 4 (Indicators 2.1–2.4). Working with elephant genetics not only increases knowledge of the ivory trade but provides the team with the knowledge to work on other conservation priorities of Asian elephants in Cambodia. Gaining population estimates for the remaining elephants is an important aspect of monitoring through time and during Year 4 the RUPP lab were able to use their experience to gain a contract to work on Asian elephant samples from a previously unsurveyed region of Northern Cambodia. This will add further genetic samples to the database but also increase the accuracy of population estimates of Asian elephants in Cambodia.

Further progress has been made towards conserving the Asian elephant, with the MoE, in collaboration with FFI and other stakeholders having adopted in this 4th year of the project, Cambodia's first National Elephant Conservation Action Plan (May 2020, Indicator 3.1).

6. Project support to poverty alleviation

The primary beneficiaries of the project were its government and academic partners, whose capacity was built in IWT management and who acquired knowledge of ivory trade networks. The project's surveys and analyses made a substantial contribution to improving knowledge of Cambodian ivory markets and wildlife trading networks. This increased 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). Likewise, the project made a significant contribution to increasing Cambodian capacity for genetic analyses of elephant ivory and other wildlife species (Indicator 2.3, 2.4). In establishing an in-country laboratory with two technicians trained to extract DNA from ivory and test for identity and origins in Cambodia for the first time, the project's efforts will 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 conservation initiatives in-country.

The project contributed to addressing the illegal trade in African and Asian ivory, and thus secondary beneficiaries of the project included communities in source countries, including Cambodia. Loss of iconic elephants, and other wildlife species traded via the same 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 lost. To maximise its impact, the project ensured that findings were shared widely, externally with the Cambodian government and NGOs, and also through FFI's global programmes (including critical elephant sites in Africa and Asia) and FFI's global partner network. As such, it indirectly benefitted local communities closest to source populations in Africa, Asia, and Cambodia specifically (Indicator 1.1, 1.2).

7. Consideration of gender equality issues

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. All interview panels for the RUPP lab technician positions have consisted of a gender mix and each recruitment drive has attracted female and male applicants. During Year 4, Sophorn Keath (laboratory technician) and Seanghun Meas (project manager) were recruited (Indicators 1.4, 2.1-2.3) and the RUPP project team now consist of 2/3rd female staff, the RZSS team is also 2/3rd female. The IWT project team of FFI Cambodia consists of 100% female staff, with the recruitment also this year of two women. RZSS continues to highlight

International Day of Women and Girls in Science; in 2021 a blog featuring the newest addition to the RUPP technician team, Sophorn Keath, was released, see here.

8. Monitoring and evaluation

The main indicators for the project outcome were the status of the ivory trade in Cambodia and legislative developments and subsequent enforcement actions in relation to this. The first was measured through quantiative on-line market vendor and qualitative and quantitatve physical market vendor surveys, including the quantification of both the number.of ivory vendors and the quantity of ivory on sale (measured in number of items) (Annex 5.14, 5.16, Indicators 0.1, 1.1,1.2). Our on-line and physical market vendor surveys however, whilst indicative of trends, may not be adequate in capturing the full extent of the domestic ivory trade should there have been a significant shift to vending underground. Further qualitative surveys, through consumer focus group discussions planned in this projecct, will provide further knowledge on the nature of domestic ivory consumption and the status of trade. The second regarding legislative developments was tracked through the assistance of the project's government partners and the secondment of a Forestry Administration official was helpful in this respect (Indicators 1.3, 3.2). The third indicator regarding enforcement actions was more challenging. Legal documentation of prosecutions was not available, so the project had to rely on media reports in this regard (Annex 5.19, Indicator 3.3, 3.4).

On an operational level, the FFI Cambodia IWT team met regularly to discuss progress and necessary steps, specifically in regards to information sharing and meetings with government officials. The Project lead had monthly skype meetings with the Head of Wildlife Trade and the Technical Specialist – Wildlife Trade of the FFI Conservation Partnerships Team, to review the overall project progress and discuss challenges. Progress was tracked in a project workplan. RZSS conducts weekly Skype meetings with the RUPP conservation genetics laboratory. These meetings are also used to plan the work schedule and the meeting minutes are circulated to the wider partnership so that the project team is up-to-date with developments and progress (Annex 5.1). 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. 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.

No major changes were made to the project design and log frame this year. Minor changes approved in Year 3 were implemented this year with 1) the appointment of an IWT officer seconded from the FA, 2) the changing of biannual physical market surveys to annual surveys on account of surveyors becoming recognised by vendors and 3) the inclusion of a survey to improve understanding of ivory consumers in Cambodia (the completion of which has been delayed due to Covid-19 regulations). Further minor changes were approved during Year 4 regarding staff replacement; a new Technical Advisor was appointed, and in the interim Country Director for FFI Cambodia Programme was Project Leader and a consultant was engaged.

9. Lessons learnt

There have been unprecedented challenges during Year 4 of this project, as a result of Covid-19 lockdowns being imposed across the globe. The RZSS partners have been under travel restrictions for the entire year, been in and out of furlough schemes, and were unable therefore to deliver in-country training to RUPP lab technicians. Nevertheless, through the provision of on-line training and weekly skype supervision, the training of new laboratory staff has made it possible to deliver the work. The FFI and RUPP teams in Cambodia have also undergone a number of lockdowns, closed land borders and travel restrictions within the country, which caused delays to research and the postponement by the MoE and FA of two national IWT workshops. The global pandemic has impacted not only travel but global supply chains. There have been significant delays in obtaining reagents for genetic work, items that usually take a

couple of days to arrive have taken months. Shipments via couriers to replenish RUPP stocks have also undergone delays. Despite these challenges the laboratory has continued to make progress and has completed the planned genetic work, although it is further from independence than we had hoped it would be at this point.

A key positive that has been crucial for the continuation of the laboratory was the employment of three technicians in the laboratory during Year 4. The high turnover of staff was highlighted during Year 3 as having a detrimental impact on progress, and recruitment for an additional technician was completed during Year 4. Although the scarcity of staff with the required technical skills is still presenting challenges, having 3 staff members did provide some redundancy in the team and the hope is to continue with 3 staff members going forward.

The recognition of team members in repeated ivory market surveys proved problematic, and thus the biannual surveys were reduced to annual surveys and external consultants were engaged.

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

1. To what extent can 'under-ground markets' now be monitored as it is not clear whether the online market is a full reflection of changing trends?

It was considered that the level of covert investigative research required to identify underground illegal ivory markets was beyond the technical and professional expertise of staff and which would have placed the safety of staff at too great a risk; such research was considered more akin to the investigations undertaken by specialised law enforcement agencies. It was decided therefore instead to focus research on ivory consumer behaviour, in order to inform future consumer behaviour change campaigns.

11. Other comments on progress not covered elsewhere

It is a testament to the project team that even during a global pandemic the RUPP laboratory and the FFI IWT team have continued to progress with the aims of the IWTCF project. Although there are still issues with knowledge transfer and the long-term continuation of the laboratory, steps have been put in place to counter this. With a change in staff members during Year 4 there has been extra time required for transfer of knowledge but this also provides opportunities and plans for increased laboratory management by RUPP staff which will hopefully help secure the long-term continuation of the genetics laboratory. A scientific paper is being drafted on the genetic data produced from the ivory samples with the hope that it will be accepted for publication during 2021.

12. Sustainability and legacy

The project attracted a great deal of interest within and outside Cambodia. This was partly due to the efforts it made to promote its work but primarily because of the seminal contribution it made to confirming and ensuring recognition that Cambodia had become an end-user destination for African and Asian elephant ivory and thus a country which actively contributed to the international ivory trade. Importantly, this project's research will be showcased nationally at the forthcoming MoE and FA workshops on law enforcement, thus stimulating discussion on the implementation of its findings amongst key governmental departments and NGOs.

Evidence for increasing long-term interest and capacity regarding IWT due to the project has included in Year 4 the formal adoption of a 10-year National Elephant Conservation Action Plan by the MoE. This in conjunction with legislation that was enacted during this project extending protection to the African elephant and prohibiting trade and possession of any elephant parts, suggests a longer-term commitment to tackling elephant IWT in Cambodia (Annex 5.8). In conjunction with the interest to engage with this project previously shown by other law

enforcement agencies such as UNODC, and TRAFFIC, collectively it bodes well for future inter-agency efforts to reduce Cambodia's role in IWT.

Though challenged by staff changes, the recent recruitment of 3 members of in-country staff directly related to the RUPP genetics laboratory will help ensure continued development of the facility and its ability to provide genetic support to NGOs and government agencies in country. The project has made a significant contribution to increasing Cambodian capacity for genetic analyses of elephant ivory and other wildlife species and products. In establishing the first in-country laboratory with two technicians trained to extract DNA from ivory and genetically test species identities and origins, the project's efforts will 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 conservation initiatives in-country. While the laboratory will require continued support for longer than originally envisioned, the continued need for its services is evident and there is substantial interest among in-country NGOs in using the lab. Further, the RUPP laboratory, in addition to undertaking work on the genetics of Siamese crocodiles, has started work on a new contract with FFI focused on the conservation of Asian elephants in Northern Cambodia, helping to provide population estimates using genetic data. There is also willingness from all main partners to continue support for the laboratory and a meeting to discuss shared future aims of FFI, RUPP and RZSS is scheduled in May 2021. In accordance with the exit strategy, these developments coincide with the transfer of ownership of a long-term and highly successful University Capacity Building Programme, on which the genetics lab builds, to the RUPP in 2022.

13. IWT Challenge Fund identity

The project publicised the IWT Challenge Fund as a UK government funding stream through reports shared with the Cambodian government and NGOs (Annex 5.14) and in correspondence. Further, the support provided by IWT Challenge Fund, UK government and project partners was acknowledged more widely in Year 4 through:

- It is featured on the RZSS website
- A blog released on international day of women and girls in Science.
- In the laboratory protocols (Annex 5.3)

These efforts collectively ensured the support provided by the IWT Challenge Fund was recognized as a distinct element of broader efforts being undertaken by FFI and its partners to address wildlife trade issues. As a result, all of the government officials and individuals from non-government agencies that the project interacted with will be familiar with the IWT Challenge Fund. The same should be true to a lesser extent of all the interested members of the public that the project reached through its activities.

14. Safeguarding

Fauna and Flora International abide the following safeguarding procedures, which are shared with and applied to all staff and volunteers and in our interaction with partners (Annex 5.21-5.27):

- Anti-bribery policy and procedure
- Anti-bullying and anti-harassment
- Due diligence
- Employee handbook (which also outlines health and safety)
- Equal opportunities
- Health and Safety
- Safeguarding children and adults at risk policy and procedure
- Whistleblowing policy

FFI's partner due diligence procedures include checking whether any safeguarding concerns have arisen with the partner concerned and the Safeguarding Children and Adults at Risk Policy & Procedure forms part of contracts and agreements with third party contractors and sub-

grantees. We monitor updates in the Government and Charity Commission guidance and review our policies and procedures accordingly.

No safeguarding issues have been reported during the reporting year.

15. Project expenditure

Table 1: Project expenditure during the reporting period (April 2020-March 2021)

Indicative figures - draft

Project spend (indicative since last annual report	**2020/21 Grant (£)**	**2020/21 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				

Please note that the above figures are provisional. The final costs will be confirmed in time for the Actual Costs Claim by 31st May.

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)

This project producted the first elephant genetic database for Cambodia, including wild elephants from four protected areas. This providing a new resource for comparisons to illegally traded ivory samples.

Annex 1: Report of progress and achievements against Logical Framework for Financial Year 2020-2021

Project summary	Measurable Indicators	Progress and Achievements April 2020 - March 2021	Actions required/planned for next period
Impact Reduction of illegal ivory trade in Cambodia contributing to decreased threat to elephant populations from IWT globally.		The physical market vendor survey (2021) revealed a significant decrease in the number of ivory items being openly sold in shops in the major cities/towns of Phnom Penh, Siem Reap and Sihanoukville) by 43% against the 2016 baseline. Given that the genetics laboratory found evidence of both African and Asian elephant ivory in the seizures, such a decrease in ivory vended openly in shops could contribute to the reduced threat to elephants globally. However, this year's on-line Facebook survey indicated an increase of 251% in the number of ivory items being offered for sale from this project's 2019 survey. This suggests that the nature of the ivory trade in Cambodia is changing from physical markets to the on-line market. The formal adoption of a 10-year National Elephant Conservation Action Plan (May 2020), developed by the MoE and FFI, shows promise for the future conservation of the Asian elephant in Cambodia.	
Outcome Effective enforcement of illegal ivory trade in Cambodia, through improved knowledge of Cambodian ivory markets and trading networks, increased	0.1 50% decrease from the 2016 baseline (1,116 pieces) of the recorded amount of ivory available for sale in markets in Cambodia by Y4	The project made a seminal contribution to improving knowledge of Cambodian ivory markets and trading networks and indicate that quantities of ivory for sale in domestic markets in early 2021 were 43% of the 2016 baseline (631 vs. 1,116	

Project summary	Measurable Indicators	Progress and Achievements April 2020 - March 2021	Actions required/planned for next period
national capacity for genetic analysis of ivory, and strengthened legislation.	0.2 Legislation in place to close loopholes regarding ivory 0.3 Authorities begin confiscating ivory, and arresting/fining ivory market vendors by Y4 0.4 By the end of Y4 airport confiscations of ivory products increase 50% from Y1 baseline	items). In confirming the presence of African elephant ivory in Cambodian markets (genetic evidence) they also supported the release of new legislation (June 2018) prohibiting the sale and possession of any elephant parts and extending full protection to African elephants, which closed important legal loopholes. This, coupled with capacity-building efforts including a seizure in Year 4 of ivory from a carving workshop. No ivory seizures were reported at airports during the project period, although this may be partly due to their effective closure in early 2020 due to Covid-19 (which remains in effect).	
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 Results of annual market surveys and consumer survey 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 1.4 Cambodian elephant population genetics used to develop regional markers and used for law enforcement	The project was successful in achieving output 1 as a result of activities 1.1 through 1.5 (see section 3.1 and below). At the onset of the project, very little was known about ivory markets, hotspots and trade networks in Cambodia. Interventions addressing the ivory trade were also minimal, as law enforcement authorities lacked knowledge of the trade and how to address it. This was comprehensively addressed by a series of surveys (Annex 5.14, 5.16-5.19) whose findings have been actively shared with government and NGOs to support interventions. Two genetic marker systems have been developed, a mtDNA sequence system and a 20-SNP marker system. Genotyping of Asian elephants from 10 range countries have been used to generate the systems.	
Activity 1.1 Conduct annual surveys of markets to monitor and quantify ivory, and consumer profiles (Y4) 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, and consumer surveys in the final year of the project informed by data gathered in the previous years		Annual physical market surveys and on-line market surveys were conducted this year and revealed significant findings regarding the possible movement of ivory trade in Cambodia from physical markets to on-line markets.	A consumer survey to identify drivers and motivations for ivory consumption will be completed once Covid-19 regulations permit.

Project summary	Measurable Indicators	Progress and Achievements April 2020 - March 2021	Actions required/planned for next period
Activity 1.2 Produce national map of trading hotspots and networks		A national map of trading hotspots and trading networks was provided in the project's first annual report (April 2018) and publication (English & Khmer versions produced) (Annex 5.12). As these suggested trading networks were highly transient and fluid and the purpose of a collaboration with TRAFFIC international was to undertake in-depth analyses of regional ivory markets, it was felt that creating regular updates of the map would not be the most productive use of the project's time and resources.	
Activity 1.3 Conduct gendered surveys of consumers and vendors to better understand the links between poverty and the ivory trade		Gendered surveys of vendors were conducted this year and indicated that whilst the majority of ivory vendors in physical markets is female (79%), the majority of on-line Facebook accounts selling ivory are registered to male accounts (71%). Whilst consumer surveys will be conducted in the following project year, the majority of vendors (18 out of 26) reported that most of their ivory customers are male (Annex 5.14, 5.16)	Consumer surveys will be undertaken once Covid-19 regulations permit.
Activity 1.4 Provide intelligence to law enforcement on ivory trade networks to facilitate effective enforcement		This year's research findings were shared with the Forestry Administration (FA), particularly the investigation unit of the Wildlife Rapid Rescue Team, the Ministry of Environment. A capacity-building workshop was undertaken for Wildlife Alliance on criminality.	
Activity 1.5 Use existing Asian elephant population genetic data to generate genotype data on a genetic marker system		Two genetic marker systems have been developed, a mtDNA sequence system and a 20-SNP marker system. Genotypes from Asian elephants in 10 range countries have been included.	

Project summary	Measurable Indicators	Progress and Achievements April 2020 - March 2021	Actions required/planned for next period
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 As mentioned in previous reports there were difficulties getting hold of ivory to complete this by Year 2 but in Year 4 a further 18 ivory samples were seized and were all identified as originating from African elephant. A total of 33 samples have now been evaluated. 2.2 The mtDNA reference database for the Cambodian elephant samples is complete, the lab now has sequences for 320 Cambodian samples, which creates a combined total of 854 Asian elephant sequences from 9 range countries. The more appropriate SNP-based database has been completed for 310 Cambodian elephant samples and has been combined with samples from another 3 SE Asian populations. Genetic Probes and synthetic controls have been produced for use by other labs within the ASEAN network. 2.3 Five RUPP staff have been trained in genetic techniques for ivory testing (2 female and 3 male). There is currently one female and one male technician at RUPP that have been trained to complete ivory extractions and species ID tests. 2.4 In Year 4 the laboratory received 18 seized samples from enforcement and were able to genetically identify all of them as originating from African elephants.	
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)		Species provenance has been obtained successfully for 18 additional ivory samples provided to the RUPP laboratory.	Produce scientific publication outlining ivory testing procedures and results.
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)		The mtDNA genetic database for Cambodian wild elephants was completed (n=320 samples). The SNP genetic database was completed (n=310 samples).	
Activity 2.3. Investigation of geographic origin of Asian ivory found in Cambodia		The two ivory samples identified as Asian elephant have been tested against the mtDNA database now consisting of 854 samples from 9 counties. This test shows that one sample matches elephants in central India and the other sample matches elephants in SE Asia (Peninsular	

Project summary	Measurable Indicators	Progress and Achievements April 2020 - March 2021	Actions required/planned for next period
		Malaysia, Myanmar & Laos). They have also been tested against the SNP database which also suggests they are unlikely to originate from Cambodian elephants.	
Activity 2.4. Establishment of individualisation and sexing tests to allow for seizure inventory (SNP-based or microsatellite testing)		A sexing test and SNP-based individualisation has been developed by RZSS and transferred to the RUPP lab. Sexing tests have been verified with known sex captive elephants and testing conducted on all ivory samples with 8 providing successful results. Sexing of the wild elephant samples has revealed an even sex-ratio in the wild Cambodian populations which is consistent with low levels of ivory poaching. The individualisation test was successfully run on the 2 Asian elephant ivory samples, confirming its use for seizure inventories.	
Activity 2.5. Establishment of seizure sampling, data-basing and chain of custody protocols		The RUPP lab technical had the first chance to put the established seizure sampling, databasing and chain of custody protocols into action during Year 4 with the testing of 18 seized ivory samples.	
Activity 2.6. Strengthen professional links of the lab with regional and international wildlife forensics/ elephant genetics network		Visit to lab of in-country elephant researcher occurred on multiple occasions during Year 4 with them also providing a talk to the RUPP MSc program in January 2021.	
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	The project was largely successful in achieving output 3 as a result of activities 3.1 through 3.4 (see section 3.1 and below). The significant research data, genetic evidence and actionable intelligence generated by the project (Annex 5.14, 5.16, 5.19) has been shared with law enforcement agencies this year. This in previous project years was instrumental in the ivory trade being banned in June 2018 (Annex 5.8) and was directly responsible for subsequent ministerial warnings to ivory vendors in three cities. Law enforcement was actively improved through this process. No ivory seizures were reported at airports during the project period,	

Project summary	Measurable Indicators	Progress and Achievements April 2020 - March 2021	Actions required/planned for next period
	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	although this may be partly attributable to their effective closure in early 2020 (in response to Covid-19 concerns), which remains ongoing.	
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			Planned for year 4 of the project, the aim of this activity was precluded by the legal ban on African elephant ivory in June 2018 (Annex 5.8) which the project's initial findings contributed to (Annex 5.12). As a result, the project shifted its focus to highlighting the need for strengthened enforcement, as demonstrated by its research findings in 2019–2021 (Annex 5.20, 5.14, 5.15, 5.16).
Activity 3.2 Engage with the Ministry of Environment [MoE] to ensure that laws banning the sale and purchase of ivory are incorporated into the development of legislation		Given the passing of legislation in 2018, the project subsequently focussed on law enforcement.	An MoE workshop is planned in this next year entitled 'Strengthening the Effectiveness of Law Enforcement for Countering Ivory Trafficking in Cambodia' (currently postponed due to Covid-19 regulations, Annex 5.29)
Activity 3.3 Work with the Forestry Administration/CITES Management Authority, including through secondment contracts in Year 4, to encourage implementation of the National Ivory Action Plan [NIAP], and close legislative loopholes to facilitate arrest and prosecution of ivory traders		A Forestry Administration official (Ms. Thi Sothearen) was seconded to the project in Year 4. FFI also supported the development of the 10-year National Elephant Conservation Action Plan which was adopted in May 2020. The project's research findings were also shared with the FA.	A workshop hosted by the FA will take place in this next year (currently postponed due to Covid-19 regulations), and is entitled: 'Critical evidence to drive a reduction in Cambodia's Ivory Trade' (Annex 5.28).
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		This was undertaken in previous project years.	

Project summary	Measurable Indicators	Progress and Achievements April 2020 - March 2021	Actions required/planned for 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.)

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 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 1.4 Cambodian elephant population genetics used to develop regional markers and used for law enforcement	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 enforcement	- 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.)
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.)
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	3.1 Project report, workshop and meeting reports 3.2 Draft legal proclamation	- 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

	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	3.3 Data on ivory seizures at airports 3.4 Data on prosecutions	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

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

Checklist for submission

	Check
Is the report less than 10MB? If so, please email to IWT-Fund@ltsi.co.uk putting the project number in the subject line.	
Is your report more than 10MB? If so, please discuss with IWT-Fund@ltsi.co.uk about the best way to deliver the report, putting the project number in the subject line.	X
Have you included means of verification? You need not submit every project document, but the main outputs and a selection of the others would strengthen the report.	X
Do you have hard copies of material you want to submit with the report? If so, please make this clear in the covering email and ensure all material is marked with the project number. However, we would expect that most material will now be electronic.	
Have you involved your partners in preparation of the report and named the main contributors	X
Have you completed the Project Expenditure table fully?	X
Do not include claim forms or other communications with this report.	