Illegal Wildlife Trade (IWT) Challenge Fund
Final Report

To be completed with reference to the "Project Reporting Information Note":
(https://iwt.challengefund.org.uk/resources/information-notes/).

It is expected that this report will be a **maximum of 20 pages** in length, excluding annexes.

Submission Deadline: no later than 3 months after agreed project end date.

Submit to: BCF-Reports@niras.com *including your project ref in the subject line.*

IWT Challenge Fund Project Information

Project reference	IWT057 - 437
Project title	Building capacity to reduce illegal trade of shark products in Indonesia.
Country(ies)	Indonesia
Lead Partner	Cefas
Project Partner (s)	Ministry of Marine Affairs and Fisheries (MMAF), Rekam Nusantara Foundation, University of Salford
IWTCF grant value	£353,832
Start/end dates of project	01/07/2018 – 31/03/2023
Project Leader's name	Joanna Murray
Project website/blog/social media	Blog - https://marinescience.blog.gov.uk/ Social media – @Joanna_M_Murray @cefasGovUK @dhika_fishery
Report author(s) and date	Joanna Murray, Efin Muttaqin, Charlotte Jessop, Andhika Prasetyo, Firdaus Agung June 2023

1. Project summary

Indonesia is the world's largest shark fishing nation and the third largest trader in shark and ray (elasmobranch) products (e.g., fins). It is also a country with a fishing industry dominated by small vessels and where people have a high dependency on fisheries products to support livelihoods and food security. As such, it is a global priority for elasmobranch management and conservation. With the increasing trend for listing elasmobranchs to CITES Appendix II (almost tripling at CoP19), it has become increasingly difficult for Indonesian authorities to identify and monitor CITES-listed species in trade and ensure that use is sustainable. Unless capacity for species-specific monitoring improves, there is a risk that unregulated trade could threaten CITES-listed elasmobranchs with local extinction.

The Ministry of Marine Affairs and Fisheries (MMAF) have acknowledged that the greatest challenge for product traceability and CITES implementation is species identification, especially where partially processed products (e.g., fins, meat, gills) make it difficult to determine source and legality. Through advanced training programs and improved customs procedures, this project is working to increase the capacity of monitoring and enforcement agencies to identify CITES-listed elasmobranchs in trade. This in turn will strengthen law enforcement by increasing the detection probability and prosecution rate of IWT, therefore deterring the unregulated targeting and trade of protected species.

The project is being implemented throughout Indonesia, with coordinating government staff based in Jakarta, and technical verification teams at six regional government (Marine and Coastal Resources Management Units, BPSPL) offices (Denpasar, Makassar, Padang, Pontianak, Serang and Sorong).

A visual summary of the project is shown in Figure 1.

2. Project Partnerships

Project partners

In 2015, a UK-Indonesia Government to Government Maritime MoU was initiated and one area of collaboration was the desire to 'cooperate in sustainable management of marine fisheries resources'. This IWT Challenge Fund project developed between MMAF and Cefas through their implementing arrangement under that MoU. MMAF introduced the Wildlife Conservation Society (WCS) as a partner prior to project design due to their ongoing collaboration (since 2003) to combat illegal wildlife trade. Professor Stefano Mariani at the University of Salford was identified as an academic partner with world-leading expertise in conservation genetics. Nominated leads from all partner organisations were actively involved in the design of the project during the application stage, communicating regularly including through a project WhatsApp group. They have shown a personal investment and dedication to ensuring the project has been a success and have been instrumental in conducting engagement activities. A formal Collaboration Agreement between all partners was drawn up in the six months following the award of funding and signed in December 2018.

Due to the COVID-19 pandemic, the implementation of our project's activities was delayed extending the project's completion date (until March 2023). At the original end date (March 2021), WCS were no longer able to continue the project partnership. Rekam Nusantara Foundation, a national NGO, who have a track record of working with MMAF on shark and ray trade issues were well-placed to assume the role provided previously by WCS and a formal change to the project team was agreed through the Change Request process (in March 2021). A revised collaboration agreement was also drawn up and signed between Cefas, MMAF, Rekam and the University of Salford for the remainder of the project.

Government departments/agencies: Representatives from government departments attended the Project Inception Workshop (Y1) including; Marine and Coastal Resources Management Units (BPSPL), Directorate General (DG) of Marine Spatial Management (DJPRL), DG of Marine and Fisheries Resource Surveillance (PSDKP), DG of Customs, Ministry of Finance, Fish Quarantine Inspection Agency, Marine Research Centre Fisheries Research Centre; and research centres and NGOs including; Oceanography Research Centre, and the Indonesian Institute of Sciences (P2O LIPI). Customs officers from Batam, Soekarno-Hatta, and Tanjung Priok Customs and Excise Offices attended a WCS-lead training workshop, and the National Training Centre was involved in the development of the training modules for the training team, both in Y2.

NGO's: Conservation International (Y1 – Project Inception Workshop), WWF Indonesia (Y3 – Zoom bycatch workshop).

Industry: Trade stakeholders through visits to processing and exporter facilities for focus group discussion (Y1) and to undertake field training during the 'Train the trainer' workshop in January 2020 (Y2). Association of Tuna Longline Indonesia and the Marine Stewardship Council, Indonesia attended the Zoom bycatch workshop (Y3)

International research specialists: Provision of training at the 'train the trainer' workshop by world experts (Dr Debra Abercrombie and Dr Rima Jabado) in CITES implementation training; Skype calls, email exchange and presentation/discussion at scientific conferences with world experts in DNA analysis of sharks and shark products through the projects PhD studentship network.

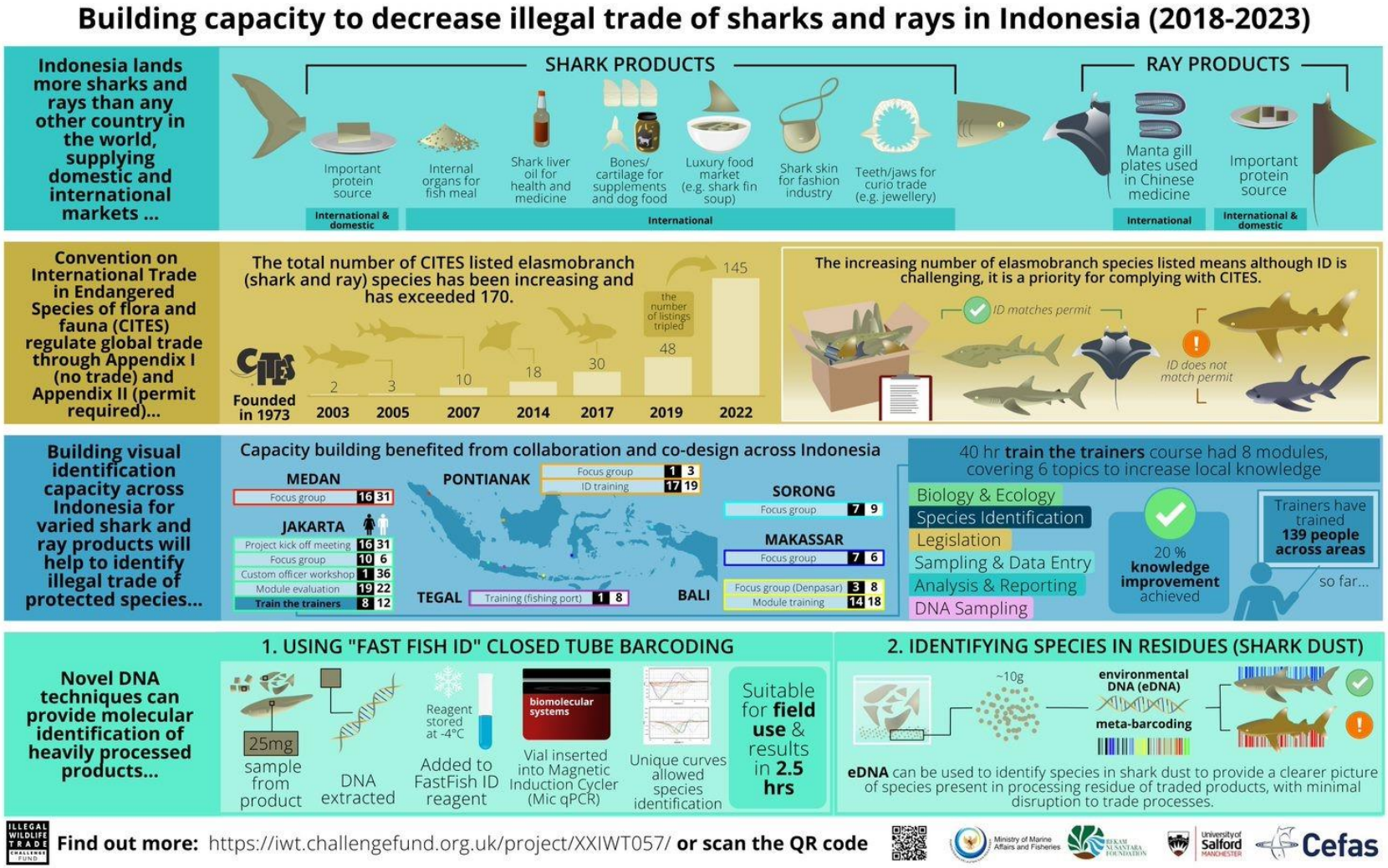

Figure 1. Visual summary of 'Building capacity to decrease illegal trade of sharks and rays in Indonesia (2018-2023) designed by Kirsty Bradley, Cefas.

3. Project Achievements

3.1 Outputs

Output 1. *A comprehensive understanding of the political and operational landscape of elasmobranch trade has been documented, including the identification of all key stakeholders, their resources and unification of commitments to reducing illegal trade.*

During the first year of our project, we engaged with key trade stakeholders through national workshops and regional focus groups to map elasmobranch trade structure and governance. In November 2018, 47 key trade stakeholders including BPSPL verification staff, customs, quarantine, surveillance, and NGOs, came together for the first time at our project inception workshop in Jakarta (Indicator. 1.1; Supp info 1). Defining the legal and illegal aspects of the trade, gaps in current trade regulations, poor communication of existing regulations, and the lack of designated international export points were identified as key challenges for effectively managing Indonesia's shark trade.

Regional focus groups increased understanding of region-specific challenges and the practical interventions developed by BPSPL offices to improve shark and ray trade management (including visual species identification guides, posters, and leaflets to educate traders and exporters and databases for storing information derived from the Letter of Recommendation process). Project partners visited all six BPSPL (Indicator. 1.3; Supp info 1) regional technical units (Serang, Denpasar, Makassar, Pontianak, Padang, and Sorong), rather than the three planned, to collect information using a guiding questionnaire (Supp info 2) on operational processes and localised understanding of CITES. Regional differences in the scale of trade and human resources available to manage it, highlighted the need to standardise, as much as possible, the training delivered by our project. This was considered when selecting expert trainers for the 'train the trainer' team with at least one representative from each of the six technical units being chosen.

Building on an increased understanding of shark trade management in Indonesia through stakeholder engagement (documented in Supp 3), the first published paper of Dr Prasetyo's research investigated the elasmobranch trade flows (Supp 4) in and out of Indonesia to examine patterns and drivers of the current trade. Substantial discrepancies between reported landings and declared exports were identified, and between Indonesian exports in elasmobranch fin and meat products and the corresponding figures reported by importing countries. The paper highlighted the need to improve data transparency to support trade regulations and governance actions, by improving inspection measures, and conserving elasmobranch populations without neglecting the socio-economic dimension of this complex system.

Output 2. *Improved capacity of MMAF to deliver advanced, on-going training to effectively identify and monitor the trade of CITES-protected elasmobranch species, thereby increasing the detection rates of attempted illegal trades.*

A comprehensive 40-hour training programme for a stepwise approach to identifying shark and ray products has been developed (including 8 modules, Supp info 5). The training programme was developed in collaboration with the national training centre to ensure the programme has the required backing, standardisation and certification for its longevity and success in delivering increased capacity to effectively identify and monitor the trade of CITES-protected elasmobranch species.

Twenty participants (12 men, 8 women), who were selected for the expert trade training team (with representation from MMAF and the six regional BPSPL offices), were trained by national and international experts during a five-day event in January 2020 (Indicator 2.1, attendees Supp info 1). Dr Rima Jabado delivered visual identification training and our projects PhD student, Andhika Prasetyo, delivered training on DNA-based tools to species identification as part of the stepwise approach to species-specific identification of elasmobranch products. Visual identification accuracy of all participants was tested in a pre- and post-training assessment (designed by Rima Jabado, Supp info 6) which aimed to determine if participants had increased their visual ID skills following training. A twenty percent improvement in knowledge was achieved following training (66% correct answers in pre-test, 86% correct answers in post-test).

Following training in January 2020, the project experienced delays in the further roll-out of the training programme to verification staff in regional BPSPL offices (Indicator 2.2) due to national lockdowns and social distancing limitations. A blog documenting the implications of Covid-19 on our project was published in March 2022 and can be found here. Roll-out planning was re-established in August 2021 and considering the on-going restrictions, the decision was made for the first workshop in the series to be

hybrid with the trainers meeting in person, but with all participants joining remotely via Zoom. In October 2021, the expert trainers delivered three identification training workshops in Jakarta, Tegal fishing port and Denpasar, to a total of 96 participants. Participants included verifiers from each BPSPL/LPSPL, fisheries surveillance officers, fish quarantine officers, and fishery extension officers. Pre-and post-training tests were carried out to assess the effectiveness of the training programme (Indicator 2.2, Table 1).

A total of 213 individuals have received shark and ray identification training during the project (Table 1, Indicators 2.2, 2.4). Whilst we have focused on building capacity of trade authorities, we recognise the need to improve identification skills across the supply chain and in response, we have begun to conduct training at the point of landing (Tegal fishing port), with private fishing companies and with quarantine, surveillance, and fisheries research staff.

Table 1. Summary of training in the stepwise approach to shark and ray product identification disaggregated by gender, including pre-post-test average scores.

Training	Delivery method	No. participants	Gender	Pre-Test Score	Post-Test Score
'Train the trainer' workshop, January 2020	In-person	21	9 F, 12 M	66	86
ID training with BPSPL Pontianak, February 2020	In-person	36	17 F, 19 M	-	-
Jakarta, October 2021	Hybrid – participants online	62	22 F, 40 M	53	89
Tegal fishing port, October 2021	In-person	9	1 F, 8 M	31	98
Denpasar, December 2021	In-person	36	19 F, 17 M	55	87
Rembang, June 2022	In-person	30	8 F, 22 M	54	85
Jakarta, July 2022	In-person	25	11 F, 14 M	68	94
		213	**80 F, 133 M**		

In addition to delivering the stepwise training programme which includes modules on visual identification and DNA sampling of shark and ray products (Supp info 5), research and innovation into the development of rapid and portable molecular techniques to enable DNA testing at borders was delivered by the projects PhD studentship with Salford University.

Over 579 elasmobranch tissue samples were collected from multiple locations (export hubs, processing plants, collectors, authority offices and landing sites) across Java Island which have diverse processing facilities. As portable genetic techniques are urgently required to improve traceability, we tested a recently developed universal assay (known as FastFish-ID) which is based on real-time PCR (FastFish-ID was originally developed for teleost's in the seafood industry). By combining visual and deep learning assignment methods, we were able to successfully validate the method on 25 out of 28 species, 20 of which were CITES listed. However, as the illicit trade may be concealed from inspection, using this method could be a challenge for individual tissue-based genetic approaches. The 'shark-dust' metabarcoding approach offers an innovative application of metabarcoding to reveal the diversity of sharks being traded based only on the processing residues i.e., the dust found at the bottom of a bag of fins. This technique revealed 27 more taxa than individual tissue-based techniques and found that over 80% of the reads belonged to CITES-listed species. These approaches are likely to become a powerful, cost-effective, and applicable monitoring tool wherever marine wildlife is traded globally.

A pilot study was initiated at two of the largest BPSPL offices to collect baseline data on seizures within the first year of the project. Data were collected for 2 months (December 2019 -January 2020) to estimate restricted products being inspected to develop further protocols for inspection. From 6 B/LPSPLs, 5 returned the data with approximately 1,600 records collected within the 2 months. Inspection of approximately 3,000 tonnes of products was requested, and from the sampled 1,000 tonnes only 21.6 kg of restricted products were found. In 2022, a total 568 recommendation/domestic transportation permits (SAJI DN) for CITES-listed sharks and rays have been released by the six BPSPL offices. Of these, only 5% (less than 3 letters from the 6 BPSPLs) were rejected each month, primarily due to administrative

reasons such as inaccurate species identification, or erroneous volumes of products within the letter. These rejections did not lead to criminal cases or prosecutions.

Output 3. *Improved capacity for law enforcement agencies to effectively respond to incidences of illegal trade using evidence-based approaches creates stronger disincentives for illegal trade of elasmobranch products.*

To improve capacity of law enforcement agencies to respond to incidences of illegal trade, WCS (2018 – 2021) worked closely to support Customs, BPSPL, PSDKP and other law enforcement through capacity building on shark and ray identification, technical assistance on investigating the illegal trade cases and on-site collaboration marine patrol with law enforcement agency (Indonesia National Police, PSDKP) in a high-risk manta hunting area (Lamakera East Florest – East Nusa Tenggara [NTT]). In 2021 when Rekam joined the project team, the Natural Resources Crime Unit (NRCU), was established by Rekam Jejak Nusantara Foundation (RJNF) to support investigations and prosecutions of traders in CITES-listed sharks and rays and fulfil the role previously held by WCS's Wildlife Crime Unit. The unit publicises Indonesia's government response to combatting illegal trade of CITES-listed sharks and rays and supports MMAF in reducing unsustainable fishing and combatting destructive fishing and illegal marine wildlife trade in Indonesia.

During the project, two training sessions on shark and ray identification designed for customs officers were delivered. A total of 37 customs staff from 12 harbours and airports that have a key role in the international trade hub attended a training event on "Preventing the Smuggling of Protected Wildlife in Airports and Seaports" (Indicator 3.1). Representatives included Customs of Bitung, Customs of Makassar, Customs of Dumai, Customs of Kualannamu, Customs of Ngurah Rai, Customs of Tanjung Perak, Customs of Belawan, Customs of Batam, Customs of Tanjung Priok, Custom of North Sulawesi, South Sulawesi and Jakarta. Twelve were customs offices from three major exit ports; Batam, Soekarno Hatta, and Tanjung Priok (Supp info 1). The training was focussed on regulation surrounding surveillance and law enforcement of illegal wildlife trade, identification of derivative products of wildlife, *modus operandi* and the pattern of smuggling from catch until exit port. In February 2020, MMAF law enforcement (Marine surveillance) and Quarantine Agency staff participated in shark product (fins and skin) ID training in Pontianak. A total of eight law enforcement staff attended.

Since the project began there have been 11 cases of illegal trade in CITES-listed shark and ray species which have been investigated and closed. Five cases have resulted in sentencing and up to 2 years and 9 months in prison, and 6 cases have resulted in administrative sanctions (payments for losses incurred by the taxpayer to the state) (Table 2). In 2018, an individual was found to have committed forgery of a Letter of Recommendation from BPSPL Serang, receiving 1.5 years in prison (Table 2, case 1). In 2019 there were three cases in total; two cases of illegal trade of fins from protected species resulting in; a one-month prison sentence and a fine of IDR 20 million (Table 2, case 2); five months in prison and a fine of IDR 50 million (Table 2, case 3); and illegal trade in a sawfish rostrum where the individual received a two-year prison sentence and a fine of IDR 50 million (Table 2, case 4.)

In 2021, there were two cases of illegal trade in CITES-listed shark and ray species that were investigated (Table 2, case 4, 5 and 6). For case 5, LPSPL Serang collaborated with quarantine and marine surveillance agencies to seize 374.5 kg of illegal shark products which were being delivered from Natuna-Kepulauan Riau Province to Jakarta through Tanjung Priok Harbour. The products consisted of 5 protected and CITES-listed species including silky sharks, hammerheads, wedgefish, giant guitarfish, and protected freshwater rays. The case is still going through the judicial process and is incomplete. BPSPL Denpasar were involved in an incident involving a sawfish rostrum at a restaurant in Bali (case 6). The response unit of BPSPL Denpasar, with coordination with the PSDKP-MMAF followed-up reports and seized the rostrum from the owner. No further legal action will be taken. Throughout the project, there have been 5 cases of illegal trade that have effectively being brought to judicial trial (Indicator 3.2).

The largest case in 2022 was in Bau Bau, Southeast Sulawesi (case 8, Table 2). A total 4,030 kg of Appendix II CITES-listed shark fins was smuggled from Bau Bau to Manado (an international hub) by a company without an official permit (SIPJI) and transportation permits (SAJI-DN). The BPSPL discovered that of the total 4,030 kg of shark fin being transported, only 2,500 kg of the shark fins have the correct permits while the rest (estimated 1,500 Kg of shark fins) were without the legal permits. In another case in Surabaya (case 9, Table 2) there was illegal trade of Appendix II CITES-listed shark fins which resulted in a 2 year and 9 months prison sentence, and a fine of IDR 100 million. Two cases are still under

investigation by surveillance agents in coordination and supervision from BPSPL staff as identification experts and the Indonesian Police department.

Table 2. Legal cases for illegal trade in CITES-listed and protected shark and ray species investigated (2018-2023) including year, location, case details, species, status and deterrent. Value of penalties based on product specific reference price determined by MMAF annually (according to MMAF decree No 13 2022).

Case no.	Year	Location	Case details	Species	Status	Deterrent
1	2018	Tangerang	Document forgery of recommendation letter	NA	Closed	1.5 years in prison
2	2019	Sidoarjo	Illegal trade of protected species (fins)	Sawfish	Closed	1 month in prison IDR 20 million
3	2019	Rokan ilir	Illegal trade of protected species (fins)	Mixed	Closed	5 months in prison IDR 25 million
4	2019	Denpasar	Illegal trade of protected species (rostrum)	Sawfish	Closed	2 years in prison IDR 50 million
5	2021	Jakarta	Illegal trade of protected and Appendix II CITES species (fins)	Hammerhead shark, Silky shark, Wedgefish, giant guitarfish, freshwater ray	Closed	Administrative sanction with 5000% penalty.
6	2021	Denpasar	Illegal trade of protected species (rostrum)	Sawfish	Closed	Administrative sanction with 5000% penalty.
7	2022	Rembang	Illegal trade of protected and Appendix II CITES species (fins)	Mixed	Closed	Administrative sanction with 5000% penalty.
8	2022	Bau bau	Illegal trade of protected and Appendix II CITES species (fins)	Mixed	Closed	Administrative sanction with 5000% penalty. Permit revocation for 6 months.
9	2022	Surabaya	Illegal trade of protected and Appendix II CITES species (fins)	Mixed	Closed	2 years 9 months in prison IDR 100 million
10	2022	Bulungan, North Kalimantan	Illegal trade of protected and Appendix II CITES species (fins)	Wedgefish and Giant Guitarfish	Closed	Administrative sanction with 5000% penalty.
11	2022	Tarakan	Illegal trade of protected and Appendix II CITES species (fins)	Wedgefish and Giant Guitarfish	Closed	Administrative sanction with 5000% penalty.

The project set out to investigate at least 30 cases of illegal trade in CITES-listed shark and ray species, with at least 10 of those effectively being brought to judicial trial. Although there have been 11 investigations of illegal shark and ray trade compared to the 30 set out in the original lo framework, all 11 cases resulted in action, five investigations resulted in a prison sentence and fine and 6 cases resulted in administrative sanctions such as bans from trading for 6 months. During the project MMAF, through regional BPSPL offices, have intensively socialised and educated traders about the mechanisms of utilisation of shark products which has increased compliance with trade monitoring systems.

During the project, 97 articles have been published in local, national and international media highlighting the Indonesian government's response to illegal trade in marine products (Supp 7). Twelve international blog pieces have been published, two by WCS on trade regulations for manta rays and 10 by the project team on the marine science blog website. Thirty-three local news articles on destructive fishing, bomb

fishing, whale shark and manta ray protection have been published and 52 pieces on illegal trade cases, quota and trade controls, and government training on shark and ray trade management have been published in national media.

Output 4. *MMAF have increased capacity to utilise their improved scientific evidence from the implementation of the step-wise detection methods to better inform national policies on elasmobranch trade management and CITES compliance.*

In the final year of the project, five online regional outreach events and a hybrid core stakeholder conference were held by MMAF to engage with beneficiaries of elasmobranch fisheries and trade, and to communicate the results and associated benefits of this project to local communities (Indicator 4.1). With co-funding from the Shark Conservation Fund and USAID-BIJAK Project, regional workshops on CITES implementation and traceability for the CITES Management Authority (the Directorate of Fisheries Resources Management, Coastal, and Marine Resources Management Agency – Balai Pengelolaan Sumberdaya Pesisir dan Laut – BPSPL) offices were conducted. Workshops focused on disseminating new procedures of permit issuance mechanisms and trade monitoring which aim to strengthen the legal aspect for CITES-species trade: (i) licensing requirements for utilisation of CITES Appendix II species using Fish Species Utilisation Permit (Surat Izin Pemanfaatan Jenis Ikan - SIPJI), and (ii) standard operating procedures SOPs to ensure traceability using e-SAJI, an electronic system for monitoring trade volumes which is currently in use by all six BPSPL offices across Indonesia.

Five online workshops (covering Jakarta, Denpasar Makassar, Padang and Pontianak were conducted due to COVID restriction (in-person workshops were originally planned in Jakarta, Semarang and Surabaya) and attended by BPSPL staffs and 184 representatives from fisheries businesses (supp info 1). Following these workshops, we have collaborated with MMAF to update the training modules by adding two components: (i) the new procedure of utilisation and trade permit process, and (ii) a new shark and rays identification guide (wedge fish and carcass ID). Those modules were trialled in trainings for BPSPL, law enforcement agencies, and private sector in Depok (October 6-7, 2021), Tegal (October 21, 2021), and Bali (December 14-15, 2021).

On April 1, 2022, a one-day conference on 'Lessons learned from MMAF and Cefas collaboration; Building capacity to reduce illegal trade of shark products in Indonesia' took place. There were 20 participants and another 163 online participants from multiple agencies and project partners (including the Fish Quarantine Agency, Quality Control and Safety of Fishery Products; MMAF Training Centre, Tuna Fishery Research Agency, and NGOs) attended the event (supp info 1). This event aimed to: (i) share and report project outcomes to MMAF and other stakeholders (delivered by Rekam Foundation), (ii) disseminate the improvement of Indonesia's policy and regulation on shark-ray CITES in Indonesia (delivered by MMAF), and (iii) discuss future development of capacity building program by MMAF related with shark-ray CITES implementation in Indonesia. Key achievements from the last 4 years of project implementation are: (i) capacity building on shark and rays' utilsation and trade monitoring, (ii) capacity building on shark and ray identification, and (iii) standardised of module on shark and ray identification.

From the series of workshops, key recommendations to MMAF were documented (Supp info 8) and focused mainly on improving the capacity building training programme: (i) develop a more systematic, tiered skillbase, and provide regular training especially for new staff; (ii) provide training to wider range of stakeholders who are involved in shark trade management such as private sector (licensed shark exporters), customs, quarantine agency, and other law enforcement agencies; and (iii) develop a standardised national competency which include shark and ray ID and trade permit process. This feedback has been communicated with the MMAF's Directorate of Marine Biodiversity Conservation (KKHL) and the MMAF's Training Centre. As a follow-up to the recommendations, MMAF's Training Centre have conducted a series of workshops (April to September 2022) to improve the shark and ray training modules, as well as to finalise the training materials for the national standard competency. The formal report document is currently being finalised (Supp info 8).

Following a Covid-19 related delay and travel restrictions, in September 2022, a delegation of 11 project partners and collaborators from Indonesia visited the UK for a weeklong knowledge-exchange visit with a programme of presentations, workshops and field visits focused on implementing science-based policies (Indicator 4.2, 4.3). Staff from the Directorate of Marine Biodiversity and Conservation, MMAF (Direktorat Konservasi dan Keanekaragaman Hayati Laut; KKHL), the Centre for Management of Coastal and Marine

Resources MMAF technical unit (Balai dan Loka Pengelolaan Sumber Daya Pesisir dan Laut; BPSPL and LPSPL), and Rekam Nusantara Foundation attended (Supp info 1).

From 12-13 September 2022, the Indonesian delegation visited the Cefas laboratory in Lowestoft for a two-day workshop including presentations from Cefas' senior scientific advisors on how science and evidence feeds into UK based fisheries management decisions. Representatives from MMAF and PSPL technical units presented information on how sharks are caught and landed Indonesia and outlined conservation initiatives in place for their protection. Fruitful discussions were had on potential support needed for Indonesia to improve data and research on capture fisheries, an area that we plan to scale up in our future collaboration to tackle illegal fisheries and trade. On Wednesday 14 September 2022, participants visited Heathrow's Animal Reception Centre to share knowledges and experiences about the import process of flora and fauna from around the world including live fish and coral, and for a tour of the reception centre where live animals can be detained. PSPL technical units presented on the inspection process for shark and ray products prior to export. The diversity of products and animals encountered, and their accurate identification was a major challenge to both teams.

On September 15-16, 2022, participants visited the Department for Environment, Food & Rural Affairs (Defra), London to meet policy teams including the CITES team and Marine Species Protection team, as well as staff from the UK's scientific authority, JNCC. Presentations included; a IWTCF project overview including achievements and lessons learned during the project; a PhD thesis presentation by Dr Andhika Prasetyo on molecular approaches to reduce illegal wildlife trade of shark and ray products in Indonesia; a presentation by Defra on fisheries management policies for Spurdog; a presentation on the UK's NDF for Mako sharks by JNCC and a joint presentation by MMAF and PSPL on existing procedures for the inspection process for shark and ray products, and the newly implemented online traceability system (e-SAJI online application) (Supp info 10).

High level recommendations on next steps towards improved fisheries management and research were developed between MMAF, Rekam and Cefas in the preparation for an IWTCF Extra application for Round 9 of the challenge fund. The proposal sought to align domestic fisheries management with international trade regulations by; (i) continued capacity building in product identification through scaled training and the implementation of molecular approaches in the field; (ii) scaled collaboration between government authorities and industry stakeholders (fishers, traders, businesses) to increase of awareness of and compliance with trade monitoring systems; (iii) improved fisheries data collection of elasmobranchs to develop stock assessments and non-detriment findings and (iv) increased institutional capacity and coordination from capture to international export to support implementation of domestic fisheries management which supports Indonesia in meeting its international treaty commitments. Although unsuccessful at Stage 2 of Round 9, project partners have addressed feedback and reapplied for funding (Round 10) as a route to further the recommendations made.

3.2 Outcome

In November 2018, 47 key trade stakeholders attended the project inception workshop in Jakarta where we mapped shark trade stakeholders and identified current trade monitoring processes. Regional focus groups were then undertaken to understand local level challenges (Indicator 0.1). In addition, Andhika's Marine Policy paper documenting elasmobranch trade flows in and out of Indonesia communicates these complexities to the scientific community.

During the first two years of the project, 21 (rather than the planned 15) "trainers" were trained from MMAF in elasmobranch identification techniques and have documented significant increases in the accurate identification of products in pre and post training tests (Indicator 0.2). The project worked closely with the National Training Centre to ensure that the 8-module training programme meets the standards required to be a nationally recognised course. In 2022, the Marine and Fisheries Training and Extension Centre were allocated budget to continue the development of the national standard of competency for shark and ray identification and Rekam will continue to collaborate on this task.

During the project there have been 11 cases of illegal trade in CITES-listed shark and ray species which have been investigated and closed. Five cases have resulted in sentencing with up to 2 years and 9 months in prison, and 6 cases have resulted in administrative sanctions (payments for losses incurred by the taxpayer to the state) (Table 2) (Indicator 0.3).

In the final year, the project focussed on science-policy implications of the work which has been achieved to date. A large part of which took place during an intensive weeklong knowledge exchange visit to the UK in September 2022. Here the overall recommendations from the project were brought together and

improvements discussed to current policies to support the implementation of those recommendations (Indicator 0.4). Recommendations for the next 5 years in tackling Indonesia's illegal shark and ray trade formed the basis of the IWTCF Extra submission (Stage 2, Round 9, resubmitted Stage 1, Round 10) (Indicator 0.4). Post-project the team will continue to write a joint peer-reviewed paper (draft title "Implementing CITES shark listings in Indonesia: Challenges, progress, and future priorities" with the aim to submit to Marine Policy.

3.3 Monitoring of assumptions

Assumption 1: *Maintain strong partner engagement and staff changes do not prevent continuation of progress*.
Strong partner engagement has been maintained throughout the project even with a formal change to the project partnership in 2021 when WCS was replaced by Rekam. The success of this handover to a new partner was the strength of the collaboration between MMAF and both WCS Indonesia staff and Rekam, in addition to clear agreement on which elements of the work would become the responsibility of Rekam (detailed in a new collaboration agreement between Cefas, MMAF, Rekam and Salford University). As the project was two thirds of the way through when the Covid-19 pandemic occurred, strong working relationships had already been established and communication between all partners during face-to-face working in the first two years which could be more easily maintained during the restrictions.

Assumption 2: *Maintain strong engagement from government staff receiving training*.
As well as strong partner engagement, excellent engagement was maintained from government staff with 213 individuals trained between October 2021 and March 2023. Both the training team and staff receiving training are highly engaged, evidenced by the increase in post test scores following their training workshops.

Assumption 3: *The work from this project generates sufficient media interest locally, nationally and internationally so that the progress of this work can be communicated throughout*.
Communication of our project is integral to all activities undertaken, and we are fortunate to have some excellent science communicators in the project team. There have been 97 international, national and local media articles in Indonesia on illegal shark trade, utilisation, and conservation and illegal fishing. This includes 11 blog pieces documenting the journey of the project within the Marine Science Blog series. the project has gained international interest primarily though this blog series and social media platforms where we Tweet about all elements of the project from training workshops to lab analysis, to presentation of scientific conferences.

Assumption 4: *The implementation of the improved customs procedure will increase the capacity for BPSPL officers to investigate suspected IWT and increase the accuracy/confidence in detecting CITIES listed species*.
Our system of pre and post training tests have enabled us to quantify the increase in verification staff's capacity to correctly identify CITES-listed shark and ray species from products in trade. In 2022, a total of 568 recommendation/domestic transportation permits (SAJI DN) for Appendix II CITES listed species of shark and ray were released from the 6 BPSPL offices. Of these, only 5% were rejected each month due to administrative errors (e.g., incorrect species identification, inaccurate volumes of project with the letter. None of the rejections proceeded into criminal cases as most were due to administration errors. However, the number of criminal cases against illegal traders of shark and ray products was at its highest in 2022 (Table 2) following the training of 213 trade staff.

Assumption 5: *Government and law enforcement agencies support the implementation of the proposed custom procedure and agree with the benefits that this will offer in the long-term as it significantly enhances the effectiveness of trade control processes and addresses resource gaps and deficiencies within law enforcement. This collaborative effort aims to combat illegal wildlife trade more effectively in Indonesia.*

and

Assumption 6: *MMAF are in the position to dedicate time and resources to the continued managing of the IWT detection program. This team can continually monitor the trade, engage with stakeholders to ensure awareness of processes, and are able to provide educational training in schools and/or local communities.*
The dedication of the Indonesian government for the implementation of capacity building and on-going training of shark and ray trade management staff has exceeded what we set out to achieve when designing

the project. One example of the dedication of resources and time is the design of an 8-module training programme which was developed alongside the national training centre to ensure it meets national standards. Additional support for continued working with the national training centre was awarded in 2022. Further outreach on the outputs of our project continued in the final year.

3.4 Impact: achievement of positive impact on illegal wildlife trade and poverty reduction

Strengthened monitoring and enforcement of elasmobranch trade decreases illegal wildlife trade, reduces exploitation of threatened species, and promotes sustainable management of fisheries, safeguarding biodiversity and livelihoods through improved legal frameworks.

Our project has had direct impact on the trade of protected shark and ray products through the work of WCS Wildlife Crime Unit and Rekam's Natural Resources Crime Unit (NRCU) and their collaborations with enforcement agencies. The establishment of a large collaborative effort within Indonesia to tackle illegal marine wildlife trade has been made possible through this project, with proven results (Section 3.1).

Improved management of shark fisheries and trade at the national-level, and successful implementation of existing shark/ray regulations (e.g., protection of manta rays and whale sharks) will help to better protect livelihoods and food security for small-scale fishers, who are highly dependent on marine resources for their well-being. Also improved the trade monitoring system could improve enforcing laws against illegal trade, governments can protect their natural resources, ensure sustainable use, and promote legal trade. This helps to safeguard income-generating activities and protect the economic interests of local communities, thereby reducing poverty. It is hoped that the increase in publicity of illegal trade in marine species through local and national media (Supp info 7), will support and raise public awareness about the strengthening of management systems and illegal trade detection. This in combination with efforts to engage with core stakeholder throughout the project (e.g., Indicator 4.3) has resulted in an increased number of permits (SAJI DN) for CITES-listed sharks and rays being issued with good compliance of the trade monitoring system (5% submissions rejected each month, primarily due to administrative reasons).

4. Contribution to IWT Challenge Fund Programme Objectives

4.1 Thematic focus

Our project focused on strengthening the law enforcement of shark and ray trade regulations through the dissemination of these regulations to various stakeholders, and through development of a national standardised training programme for verification and enforcement staff in the identification of protected shark and ray species. However, we recognise that successful efforts to suppress the illegal trade in sharks and rays must also be supported by the private sector. Therefore, our project has engaged with business actors (Indicator 4.1) to disseminate the regulations on the shark and ray trade, which has encouraged an increasing number of traders in Indonesia to correctly apply for a shark and ray products trade license to MMAF (Indicator 2.3).

While our project was designed to increase the capacity and awareness of law enforcement authorities (PSPL, PSDKP, Quarantine Agency, and Customs) in preventing the illegal trade of shark and ray products in Indonesia, the knowledge and tools which have been made available, support the effective implementation of the legal frameworks which are currently in place. The impact of this capacity building can be seen from the 11 cases of illegal trade in sharks and rays during the project. Awareness among traders of such arrests for illegal trade (communicated through national news stories) and a record of prison sentences and sanctions for these wildlife trade crimes is likely to act as a deterrent to other potential illegal traders.

4.2 Impact on species in focus

Training designed to improve the identification of species in focus was undertaken at the end of year two through the 'train the trainers' event (Indicator 0.2) and further roll-out of the training programme resumed in October 2022 following easing of Covid restrictions in Indonesia. Post-test scores from species identification modules of the trainers found a 20% improvement in species identification following the training, with 86% of species identified correctly (Table 1), with similar increases in post test scores of participants who were trained by those trainers between October and December 2022 (Table 1).

Molecular identification methods developed through the PhD programme have yielded incredibly exciting results which have the potential to be highly impactful in monitoring and managing trade in the CITES-listed shark and ray species in focus into the future. Tissue samples and trade 'residues' were collected from product processing plants across Java to generate sequences using DNA metabarcoding. Using high throughput barcoding on 559 shark samples we discovered 69 different species of sharks, 71.9% of which (402 of the samples) were from CITES-listed species (listings post CoP19) including hammerhead sharks (*Sphyrna* sp.), silky shark (*Carcharhinus falciformis*), oceanic white-tip shark (*C. longimanus*) and CITES-listed giant guitarfish (*Glaucostegus typus*).

Using a recently developed portable method (known as FastFish-ID) we found the method could detect 25 out of 28 species, and 20 of these were CITES- listed. However, the illicit trade may be hidden from inspection, and that is a challenge for testing individual tissue samples. The 'shark-dust' approach developed by Andhika and team, tests dust or processing residues which revealed 27 more taxa than individual tissue-based techniques and found that over 80% belonged to CITES-listed species (listings post CoP19). The 'shark dust' approach is likely to become a powerful and cost-effective monitoring tool wherever marine wildlife is traded.

4.3 Project support to poverty reduction

While our project is focused on strengthening law enforcement and ensuring effective legal frameworks and not directly on alleviating poverty, it has provided the Indonesian Government with the tools needed to manage marine resources in line with international commitments of CITES-legislation. This in turn will provide additional support towards improving Indonesia's sustainability objectives, including advice on stock assessments, quotas and applicability of non-detriment findings in the future, promoting sustainable elasmobranch fisheries, therefore safeguarding biodiversity and livelihoods.

Furthermore, economic benefits can be yielded by the presence of a healthy marine ecosystem in Indonesia (often signified by the presence of sharks and rays as 'top predators'), both directly and indirectly. Indirectly, the loss of key predators from the ecosystem due to overfishing will have knock-on consequences down the food chain as fishing effort is displaced to smaller fish species which are often relied upon for artisanal fisheries income and food. Direct benefits can be realised by having good numbers of top predators and threatened shark and ray species through the increase in ecotourism through scuba diving.

4.4 Gender equality and social inclusion

The Cefas, MMAF and Rekam teams working on this project are of mixed genders, and throughout the project we were successful in ensuring that the stakeholders we engaged with have been represented by both men and women (Table 3). During the design of our project, we anticipated that we might see fewer women attend the centralised workshop in Jakarta due to family commitments restricting travel. To mitigate this, the regional focus groups provided another platform for the project to engage with these staff members more locally, and indeed we did see increased attendance by women. At three of the six regional focus groups we had higher numbers of women attend and where online attendance was available (e.g., core stakeholder workshop).

Table 3. Composition of genders at engagement activities during year 1, 2 and 3.

Activity	Female	Male
Project Inception workshop	16	31
Focus group – Satker Jakarta	10	6
Focus group - Denpasar BPSPL	3	8
Focus group - Makassar BPSPL	7	6
Focus group - Pontianak BPSPL	1	3
Focus group - Loka Sorong	7	9
Focus group - Satker Medan	4	2
Custom officer wildlife trade workshop (WCS)	1	36

Module evaluation workshop November 2019	19	22
'Train the trainer' workshop January 2020	8	12
ID training with BPSPL Pontianak	17	19
Advanced module training (hybrid workshop) in Jakarta	22	40
Advanced module training (in person workshop) in Tegal fishing port	1	8
Advanced module training (in person workshop) in Bali	14	18
Core stakeholder workshop	76	87
UK research exchange visit	4	7

In 2019, Cefas established an Equality Diversity and Inclusivity (EDI) Steering Group and gender equality was the first 'protected' characteristic defined in the EDI handbook for staff. Cefas' commitment to gender equality has been exemplified by applying to the Athena SWAN Charter. This recognised accreditation scheme advances EDI providing representation, progression and success for all, although was originally established in 2005 to encourage and recognise commitment to advancing the careers of women in science, technology, engineering, maths and medicine. Cefas submitted their application in November 2020 and were awarded accreditation in April 2021. The action plan will be a living document, and we will continue to monitor the impact of the actions and adjust course if necessary. As it stands, there are 47 actions in total, covering topics from recruitment to participation in committees and wellbeing initiatives. Implementation of the action plan is ongoing.

Cefas has reinforced our commitment to race equality by signing the 'Race at Work Charter'. In signing the charter, we have joined Defra and many other government organisations in committing to make race equality a priority. This is an important step towards achieving our objective to be an inclusive anti-racist organisation that provides equal opportunities for all and reflects the diversity of the UK.

Please quantify the proportion of women on the Project Board[1].	
Please quantify the proportion of project partners that are led by women, or which have a senior leadership team consisting of at least 50% women[2].	

5. Monitoring and evaluation

Cefas follows ISO 9001:2015 project management structure. As part of this commitment, we have implemented fortnightly project management and budgeting meetings between project lead and Cefas PM and have regular partner communication via email, WhatsApp and Teams. This ensures that monitoring of activities and associated expenditure is tracked closely throughout the project, and ensures we receive partner claims and receipted expenditure in a timely manner. Attendance records, workshop minutes and visit reports, photographs and media engagement (see Supp info) are generated by all partners and shared via email and have successfully been used to monitor and evaluate activities undertaken.

6. Actions taken in response to Annual Report reviews

In 2020/2021 we received two actions in the review of our previous annual report and address them specifically here:

1. *What is the level of knowledge within fishers/traders of the legality of species to trade?*

Although we have not conducted a perception survey to fishers and traders as part of this project, the in-country project team have witnessed an increase in the perception and compliance of shark and ray

[1] A Project Board has overall authority for the project, is accountable for its success or failure, and supports the senior project manager to successfully deliver the project.

[2] Partners that have formal governance role in the project, and a formal relationship with the project that may involve staff costs and/or budget management responsibilities.

business actors in Indonesia to existing regulations. This can be seen from the increasing number of traders who apply catch permits for CITES Appendix II species to MMAF (more than 100 permits have been issued by MMAF to date), and by good acceptance levels of submitted Letters of Recommendation (less than 5% rejected). This may also be an effect from the strengthened policy and regulation on the use of CITES Appendix II species in Indonesia. MMAF has been actively conducting intensive socialisation, assistance, and training related to the implementation of Ministerial Regulation No. 61/2018 concerning the use of protected fish and CITES listed species.

2. *Please measure progress by reporting against indicators more in the body of the report.*

Through this annual report we have made sure that we report against the Measurable Indicators set out in our logical framework in addition to activities undertaken.

In 2021/2022 we received one action in the project review:

3. *Reduce your reporting burden by cross referencing to material in other sections*

We have tried to use that approach within this final report.

7. Lessons learnt

A change to our project partnership from WCS to Rekam in March 2021 was one of the more significant changes to our project during its lifetime. We communicated this change to LTS as soon as we were aware and began working with both WCS and Rekam to agree the elements which could be handed over. This agreement was then formalised within a new collaboration agreement between Cefas, MMAF, Rekam and the University of Salford. Despite the potential disruption to the project a change in partner could cause, the communication and handover between WCS and Rekam staff was exemplary, resulting in negligible changes to the project plan and implementation. Having project collaboration agreements in place is something we recommend to other projects to have clear agreement on roles and responsibilities in delivering the project.

During the outbreak of Covid-19, we had two delays to our project agreed by LTS on the basis that we hoped to implement the roll out of training in person rather than using online platforms. In 2021 we did trial online species identification training but feedback from participants supported our original concerns that for visual training of this type, it is important to have the products in your hands to see and feel.

8. Risk Management

Over the last year of the project the main risk was the delegation visit to the UK not being achieved due to having rescheduled twice because of Covid-19 and once due to the visa application process. This was mitigated by constant communications between the partners and identifying suitable dates and timeframes to plan the visit.

The Principal Investigator and Project Manager had regular meetings, at least bi-weekly, for project planning purposes to ensure risks were continually monitored, measured and mitigated and recorded, where appropriate on project risk registers. Any risks, e.g postponing the delegation visit were communicated in a timely manner, by the partners, to ensure enough time allowed for re-planning.

9. Sustainability and legacy

A project communication strategy was designed to promote the profile and gain public interest in the project. This includes the creation of a project blog series (https://marinescience.blog.gov.uk/), the use of Twitter to generate interest during key activities and to promote the blog, and discussion with the Defra IWT communication team on promoting the project going forwards. The project also gained profile when it was announced alongside UK commitments at the Our Oceans global summit in October 2018.

We are confident in our exit strategy given that the project supported the formation of a team of 21 expert trainers who continue to deliver training of a nationally standardised programme across Indonesia. Furthermore, the Minister Decree No. 61/2018, which is critical for the implementation and continuation of project outputs was issued during the project, ensuring policy instruments are in place to support its sustainability. The decree was translated into English during year one of the project to allow all project partners to ensure we are working alongside this piece of legislation.

A standout example of project legacy has been the PhD studentship scheme. Our candidate Andhika Prasetyo submitted his thesis in July 2022, and has now returned to Indonesia to a position at the Research Centre for Conservation of Marine and Inland Water Resources, National Agency for Research and Innovation (NRIA) as an authority on molecular approaches to identifying elasmobranchs. He has also joined the task force on Bioinformatic and Sequencing Centre at Genomic and Cryo-EM Facilities within NRIA, who are responsible for molecular approaches to animal specimens, including elasmobranch products. Dr Prasetyo continues to work with MMAF and Non-Governmental Organisations (NGOs) to support management and conservation of fish resources, particularly shark and ray population.

This project has attracted additional UK government funding to support interventions which were identified during the project but were not included in the project plan. This work led to the development of additional resources for Indonesia – translation of existing ID guides into Bahasa, as well as the development of a trunk identification guide which is part of a three volume series of shark and ray identification guides coordinated by WCS and officially launched during the CITES Standing Committee (March 7th 2022).

Networks forged during the project have led to additional UK government funding to support a small project in collaboration with a current Darwin Initiative funded project on compensation-based incentives in small scale fisheries. Cefas are supporting the development of fish handling guides which aim to increase the condition of wedgefish and hammerhead sharks which are caught as bycatch and released, to add value to ongoing initiatives in Indonesia.

Although at the end of our project, all partners are motivated to build on our established partnership and go on to more ambitious targets to better manage our fisheries and trade to protect our sharks and rays. We plan to scale up our approach; train more implementing staff and expand current training to include new species of sharks and rays that were added to CITES in November 2022, increase awareness of trade monitoring systems and regulations among fishers, processes, and traders, and increase institutional capacity to meet CITES commitments and other relevant international agreements.

10. IWT Challenge Fund Identity

We ensured that the UK government funding logo and IWT Challenge Fund branding (when available) was used in project presentations, meeting invites and on workshop banners throughout the project. Our project also had a strong social media profile on Twitter and through a blog series. We have effectively linked the project back to the IWTCF identity throughout.

The UK governments funding contribution to the production of the trunk identification guides and acknowledgement of the IWTCF project in the identification of needing a trunk ID guide is also written within the introductory text of the guide. As such, the IWTCF identity was widely associated with these international resources. We have included the @iwtcf tag in select Tweets since its initiation in July 2021.

11. Safeguarding

Has your Safeguarding Policy been updated in the past 12 months?	No
Have any concerns been investigated in the past 12 months	No
Does your project have a Safeguarding focal point?	Yes/No [*If yes, please provide their name and email]*
Has the focal point attended any formal training in the last 12 months?	No – We don't run or attend any safeguarding as we don't normally have any need for it.
What proportion (and number) of project staff have received formal training on Safeguarding? No safeguarding challenges raised.	Past: % [and number] Planned: % [and number]

Has there been any lessons learnt or challenges on Safeguarding in the past 12 months? Please ensure no sensitive data is included within responses.

12. Finance and administration

12.1 Project expenditure

Project spend (indicative) since last Annual Report	2022/23 Grant (£)	2022/23 Total actual IWTCF 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)				
Audit				
TOTAL	**£63,332.00**	**£63,332.00**		

[redacted]

12.3 Value for Money

The project has been great value for money. As demonstrated in section 3, the outputs and outcome have been mostly achieved and, in some areas, have been exceeded including the number of government trained staff in the national training programme. [redacted]

13. OPTIONAL: Outstanding achievements of your project (300-400 words maximum). This section may be used for publicity purposes

I agree for the Biodiversity Challenge Funds Secretariat to publish the content of this section.

Our project was focused on building the capacity of shark trade inspectors to better identify which sharks products are coming from. We developed an intensive five-day 'train the trainer' programme made up of eight modules with both taught and practical elements. Module topics include shark and ray conservation

legislation, biology and ecology of sharks and rays, sampling statistics and reporting, visual identification of CITES listed sharks and rays, and DNA sampling techniques. This workshop marked the first step for standardised training for MMAF's shark and ray training agenda and has been adopted by the National Training Centre as part of the annual standardised training for new employees (including government staff from regional trade offices and quarantine, as well as participants from universities and the private sector). Since the 20 expert trainers were trained in January 2020, they have gone on to deliver the standardised programme to over 200 of their colleagues, all of whom have achieved higher post-training test scores in the number of species they could correctly identify from products moving through their region.

During the second year of the project, additional UK government funding was obtained to support the development of the first shark trunk visual identification guide for CITES-listed species by two shark identification experts. To increase international uptake and use of the trunk guide, we joined a global collaboration with governments, non-governmental organisations, and other partner and funding organisations (including the CITES Secretariat, the United Nations Food and Agriculture Organization (FAO), the European Union, the Pew Charitable Trusts, and Shark Conservation Fund) to include the guide in a three-volume series that covers whole animals, shark trunks and dried products such as shark fins and devil ray gill plates. The guides were officially launched on the 7th of March 2022 to align with CITES Standing Committee and were discussed at the meeting and presented at a Defra hosted side event at CITES CoP19. These guides simplify the training process for customs officials by covering all CITES listed species, and the major products in trade, in one set of guides which are freely and widely available.

File Type (Image / Video / Graphic)	**File Name or File Location**	**Caption, country and credit**	**Online accounts to be tagged (leave blank if none)**	**Consent of subjects received (delete as necessary)**
Graphic	Project ref_project summary infographic	Project summary infographic Designed by Kirsty Bradley, Cefas	@CefasGovUK @rekam_nusantara @kkpgoid @Joanna_M_Murray @dhika_fishery	Yes
Photo	Project ref_ Dr Rima Jabado_visual training	Training the trainers in visual species identification, Indonesia, © Marine Cusa	@CefasGovUK @rekam_nusantara @kkpgoid @Joanna_M_Murray @dhika_fishery	Yes
Photo	Project ref_ DNA extraction practical	Training the trainers in DNA extraction, Indonesia, © Marine Cusa	@CefasGovUK @rekam_nusantara @kkpgoid @Joanna_M_Murray @dhika_fishery	Yes
Photo	Project ref_ wedgefish	Wedgefish at the landing site, Indonesia, © Marine Cusa	@CefasGovUK @rekam_nusantara @kkpgoid @Joanna_M_Murray @dhika_fishery	Yes
Photo	Project ref_ wedgefish processing	Processing wedgefish for fins, Indonesia, © Marine Cusa	@CefasGovUK @rekam_nusantara @kkpgoid @Joanna_M_Murray @dhika_fishery	Yes
Photo	Project ref_ During fins	Processing wedgefish for fins, Indonesia, © Marine Cusa	@CefasGovUK @rekam_nusantara @kkpgoid @Joanna_M_Murray @dhika_fishery	Yes

Annex 1 Project's original (or most recently approved) logframe, including indicators, means of verification and assumptions.

Note: Insert your full logframe. If your logframe was changed since your application and was approved by a Change Request the newest approved version should be inserted here, otherwise insert application logframe.

Project summary	Measurable Indicators	Means of verification	Important Assumptions
Impact: Strengthened monitoring and enforcement of elasmobranch trade decreases illegal wildlife trade, reduces exploitation of threatened species, and promotes sustainable management of fisheries, safeguarding biodiversity and livelihoods through improved legal frameworks.			
Outcome: Indonesia has capacity to effectively trace, monitor and control trade in sharks and rays to support CITES legislation and provide a risk-based approach to legal and sustainable resource use.	0.1 By end of year one, a key partner workshop has been delivered in Jakarta, engaging with >25 key elasmobranch trade stakeholders, including governmental bodies, academic experts, regulatory bodies and representatives from regional NGO's, identifying the interventions necessary to improve elasmobranch trade monitoring processes. Three local focus groups will be run in Jakarta, Semarang and Surabaya to collate input from fishers, processors and traders.	0.1 Attendee lists from stakeholder events; surveys and photos from stakeholder workshop; national and social traditional and social media records; organogram	0.1 Indonesian governmental regulatory agencies (MMAF/BPSBLs) and regional trade stakeholders (fishers, processors and traders) actively engage in workshops and are willing to share views and opinions. *MMAF have actively pursued support from Cefas in improving elasmobranch trade. WCS have a demonstrated success in delivering stakeholder workshops.*
	0.2 By the end of the project at least 15 individuals from MMAF have been successfully trained in elasmobranch identification techniques, with a significant increase in accurate identification of products of all trained staff in comparison to Y1 baselines.	0.2 Training records for all BPSPL officers and MMAF training staff; staff surveys on training capabilities/confidence in detecting species-specific elasmobranch products before and after training; independent validation of trade assessments (visual vs genetic identification).	0.2 - 0.4 Management authority staff engage in centralised training, standardisation of shark and ray product identification and improved customs procedures. *Improvement of elasmobranch detection methods will be tailored to MMAF requirements and are easily integrated into current operations at minimal cost.*
	0.3 By the end of the project, increased capacity and efficiency of MMAF and law enforcement officers increases prosecution rate of illegal shark and ray traders (and reports to CITES committees), as determined against	0.3 Seizure record trends from Customs Agency available from project duration; intelligence database built on illegal wildlife traders; documented evidence of successful prosecutions including	0.2 – 0.4 Staff changes does not prevent continuation of improved process to detect elasmobranch IWT. *Training a team of 10 core Elasmobranch Trade Training Team will ensure improved procedures can be dynamic around changing workforces*

	baseline data (7 cases 2015, 6 cases in 2016, 2 (large) cases in 2015). 0.4 By 2020, a five-year plan is delivered to MMAF outlining recommendations for integration of innovative customs procedure, improved detection of elasmobranch IWT, advice on trade monitoring, and draft improvements to current policies.	police records and court documents; copies of CITES committee reports. 0.4 Recommendation reported presented to MMAF, draft policies, renewed implementation agreement signed between MMAF and Cefas.	*and evolving trade dynamics. All training materials will be held and manged by MMAF.* 0.2 - 0.3 The results of the improved customs procedures do not improve the detection capabilities of trade regulators. *MMAF have expressed much needed training requirements and by using the world's leading experts on elasmobranch ID and fisheries management that have a proven track record in regulatory improvements, the likelihood of successful outcomes are maximised.*
Output 1 A comprehensive understanding of the political and operational landscape of elasmobranch trade has been documented, including the identification of all key stakeholders, their resources and unification of commitments to reducing illegal trade.	1.1 By end of year one, all key trade stakeholders (MMAF officers, BPSPL staff, NGO's, academic researchers), have been identified, contacted, and invited to attend primary stakeholder workshop on elasmobranch trade management and species identification methods, ensuring non-gender discrimination. 1.2 Following a two-day inception/consultation event with key partners in Jakarta with at least 25 participants, the commitments (resources, geographic coverage, skills, responsibilities) of the core stakeholder groups (identified in 1.1) have been mapped, and the gaps and streamlining opportunities have been identified by year one. 1.3 By end of Y1 three one-day regional focus groups (Jakarta, Semarang and Surabaya) will collate information on operational processes, local knowledge and understanding of CITES	1.1 Organogram of governance structure and trade routes; scoping report; stakeholder meeting invitation list. 1.2 Photographs from workshop; attendee lists; workshop minutes; media engagement. 1.3 Feedback forms from attendees; photographs from the event; focus group minutes; media engagement	1.1 All active scientists, NGOs, and charities working on elasmobranch conservation are willing to collaborate on this project. *Many key stakeholders (WWF, PEW, IUCN Shark Specialist Group, scientist) have already been contacted and have shown enthusiasm and interest in contributing to this work.* 1.2 – 1.4 Stakeholders involved with workshops and focus groups will be prepared to share local knowledge, resources, and opinions on the current elasmobranch trade chain. *WCS have a proven track record in successful engagement with fishers and traders, which was demonstrated through their previous Darwin funded project. Ensuring participation of communities directly involved with the trade chain will maximise the likelihood of buy in to the project.* 1.2 – 1.3 The work from this project generates sufficient media interest

	commitments from fishers, processors and traders which relate to their fishery/trade routes. 1.4 By end of year one, a consultation report, which consolidates information from the core stakeholder event and regional focus groups, outlines a unified and sustainable approach to a national-level elasmobranch trade and monitoring program.	1.4 Consultation responses; consultation report; participant feedback surveys	locally, nationally and internationally so that the progress of this work can be communicated throughout. *Cefas have a dedicated communications team that has demonstrated success in media engagement. Likewise, WCS have recently had strong media engagement from their Darwin funded projects and wider initiatives in country.*
Output 2 Improved capacity of MMAF to deliver advanced, on-going training to effectively identify and monitor the trade of CITES-protected elasmobranch species, thereby increasing the detection rates of attempted illegal trades.	2.1. By the end of Q2 Y2, a training programme for a step-wise approach to species-specific identification of elasmobranch products has been designed utilising the existing resources identified during the consultation workshop (i.e. expertise, documentation, guides), which can be used to build capacity for detection and reporting of illegal shark and ray trade (i.e. shipment documentation, CITES reporting). 2.2 By end of Y2, >25 individuals (of equal gender where possible) from MMAF offices in Java and Bali) have been effectively trained during a two-day workshop in the step-wise approach. By the end of the project, these staff will have the capacity to independently train other officers across the country as directed by an appointed training lead in MMAF.A further 15 law enforcement officers and legal specialists will have also been simultaneous trained in the new procedures.	2.1 Training programme agenda; supporting resources; 2.2 Training workshop attendee list; training certification; results of pre-and post-training assessments and confidence survey; press releases and social media engagement from the event.	2.1 Consultation with identification and genetic experts has allowed the sharing of resources needed to develop an effective step-wise detection protocol for improved CITES compliance. *Having already connected with several experts (WWF, WCS, PEW, IUCN Shark Specialist Group) in country regarding this project, all have expressed strong interest in participation and support.* 2.2 & 2.3 The implementation of the improved customs procedure will increase the capacity for BPSPL officers to investigate suspected IWT and increase the accuracy/confidence in detecting CITIES listed species. *Current means of species-level detection is poor and staff confidence is low. It is therefore highly likely that increased training in visual methods will improve staff abilities to detect illegal products. Furthermore, the availability to innovative genetic procedures will increase the chances of detected illegal species. Evaluating the new procedure half way through implementation allows*

	2.3 By end of Y3, the step-wise approach to species detection has been implemented at BPSPL Denpasar (Bali) and Serang (Java), with at least a 5% visual assessment of a random subsample (e.g. 1 in 20 sacks/boxes), and a sample of 200 individual products selected for independent genetic verification. These methods result in at least a 30% increase in the detection of IWT compared to Y1 baselines. 2.4 By end of Y3, the remaining four BPSPL offices have received training in the step-wise approach, with improved capacity of all 6 BPSPL offices to detect CITES-listed in trade.	2.3 Monthly seizure records submitted from BPSPL office to MMAF and Cefas; results from genetic verification; academic paper drafted on results of dual identification techniques by Ph. D student 2.4 Training reports and certificates from remaining BPSPL offices; pre- and post-training survey assessments; feedback from the MMAF training lead.	*adaptions to be made to improve implementation and efficiency of processes.* 2.2 - 2.4 BPSPL will have the capacity and enthusiasm to collect and submit regular qualitative and quantitative data on traded elasmobranch products . *Longstanding working relationships between MMAF and WCS (Darwin Initiative grant 22-008) demonstrate the ability for both parties' commitment and capabilities to collect high quality data. Furthermore, Cefas's demonstrated ability to work with national/international fisheries data will ensure there are sufficient processes at BPSPL and MMAF to collect and report pilot study data* 2.3 & 2.4 The BPSPL offices and genetics facilities will remain committed to delivering the customs procedure within allocated timeframes and provide sufficient feedback to ensure improvements can be made for the final procedure. *Working agreements*
Output 3 Improved capacity for law enforcement agencies to effectively respond to incidences of illegal trade using evidence-based approaches creates stronger disincentives for illegal trade of elasmobranch products.	3.1: By end of Y3, at least two customs representatives from at least four major exist ports for shark and ray products (8 individuals in total) have been trained in shark and ray species identification protocols, in collaboration with MMAF. 3.2: By the end of Y3, at least 30 cases of illegal trade in CITES-listed shark and ray species have been investigated, with at least 10 of those effectively being brought to judicial trial (baseline: 7 cases 2015, 6 cases in 2016, 2 (large) cases in 2015).	3.1: Training records from all customs representatives; test scores from independently verified assessments 3.2: Law enforcement records from cases; i2 intelligence database	3.1 Government and law enforcement agencies support the implementation of the proposed custom procedure and agree with the benefits that this will offer in the long-term. *WCS's Wildlife Crime's Unit has a successful track record of collaboration with customs agencies and other law enforcement institutions to combat illegal wildlife trade. Customs directors have stated their support for this project during proposal development discussions. Cefas's longstanding experience in project management and protocol design within fisheries management will ensure high*

	3.3 By the end of Y3, at least 50 media articles have been published in the national and international media highlighting the Indonesian government's response to illegal trade in marine products.	3.3 Media articles; social media impact metrics including engagement and retweets	*quality deliverance of product and continued sup.* 3.2 & 3.3 Improved capacity of Customs Agency to detect IWT leads an increased detection rate of IWT and a decrease in the level of IWT attempts from traders who are now more aware and compliant to current regulations. *The Indonesian government has already shown a strong commitment to combatting illegal shark and ray trade, with 29 legal cases against illegal elasmobranch traders since April 2014, leading to 19 successful prosecutions with over US$70,000 levied in fines and 122 months of jail time. WCS's monitoring data indicates that high profile arrests in enforcement hotspots had a strong deterrent effect and led to a decline in illegal trading. Therefore, we anticipate that expanding and intensifying the WCU approach to strategic locations will continue to deliver these results. Further, WCS and MMAF have existing relationships with major industry players who are willing and eager to receive support to ensure their businesses are compliant*
Output 4 MMAF have increased capacity to utilise their improved scientific evidence from the implementation of the step-wise detection methods to better inform national policies on elasmobranch trade management and CITES compliance.	4.1 At end of Y3, closing ceremonies including a core stakeholder one-day conference and a three one-day regional outreach events at (Jakarta, Semarang, Surabaya) that engage with beneficiaries of the elasmobranch fishery/trade have been led by MMAF to communicate the results and associated benefits of this project to local communities. 4.2 At the end of Y3, three key members from MMAF have visited Cefas and DEFRA in the UK to shadow	4.1 Photographs and media engagement from the event; attendance lists; event feedback surveys on understanding of topic and value of the communication. 4.2 Visitation reports from the three MMAF employees providing feedback	4.1 & 4.3 Field officers collect necessary data needed to quantify results and produce recommended documentation. *Effective project management and delivery by project team will ensure collation and appropriate documentation of this process. Interim evaluations and monitoring of the data and implementation are conducted monthly.* 4.2 The provided recommendations are applicable to current Indonesian

	scientific advisors and policy makers on the interpretation of scientific evidence into policy and knowledge sharing on marine product traceability systems. 4.3 By the end of the project, in addition to improvements to elasmobranch trade regulation, high level recommendations on next steps towards improved fisheries management and research will be presented to MMAF in a five-year plan	on training; photographs and media engagement; 4.3 Final five-year report delivered to MMAF during closing seminar; renewed implementation agreement between MMAF and Cefas.	regulations and policy and MMAF are in the position to propose amendments to the government. *MMAF have already committed to enforcing new trade restrictions on up listed CITES prohibited species. These new processes will be designed to support these efforts and there will be strong incentives to adopt the improvements.* 4.3 MMAF are in the position to dedicate time and resources to the continued managing of the IWT detection program. This team can continually monitor the trade, engage with stakeholders to ensure awareness of processes, and are able to provide educational training in schools and/or local communities. *MMAF have already demonstrated an ability to engage with local communities through their collaboration with WCS.* *This project, with the addition of long-term commitments from Cefas and the British Government, will ensure these activities are supported into the future.*

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 Desk-based study on collation of current knowledge, political and legal frameworks and data on Indonesian elasmobranch trade
1.2 Ph. D student to compile global overview on elasmobranch trade and current trade regulations adopted by other nations, which will support stakeholder events and ultimately the production of an academic paper on an overview on current elasmobranch trade
1.3 Key stakeholders identified and contacted regarding involvement of project and attendance at the opening stakeholder workshop
1.4 Design of core stakeholder workshop and regional focus groups
1.5 Letter of invitation and agendas circulated to workshop and focus group attendees.
1.6 Two-day workshop hosted by MMAF in Jakarta for core stakeholders (NGOs, researchers, Governmental representatives)
1.7 Regional focus groups for fishers, processors and traders held at Jakarta, Semarang and Surabaya.
1.8 Production of consultation document from the workshop minutes (1.6, 1.7) from core stakeholder event and focus groups
1.9 Consultation document sent to all key workshop participants to review and comment.
1.10 Finalisation and sign-off of report and submission to MMAF and other relevant Governmental bodies.

2.1 Gather existing learning resources from key partners on elasmobranch identification methods

2.2 Design training programme and improved customs procedure, and structure of the training event
2.3 MMAF to identify an Elasmobranch Trade Training Team that will manage future training programs and compliance of CITES detection at BPSPL offices.
2.4 Invitation to MMAF, two major BPSPL offices from Bali and Java, customs officials and genetic laboratory facility for training in step-wise approach to IWT detection
2.5 Two-day training event in visual detection methods and then subsequent genetic material collection.
2.6 Assessments on the accuracy of BBPSL officers to effectively identify CITES protect species following training.
2.7 Improved customs procedures refined and agreed with MMAF and trade regulators (BPSPL officers/WCS WCU) following feedback from 2.6.
2.8 Monthly submission of seizure records collated and analysed by MMAF, WCS and Cefas staff to inform the effectiveness of the training against baseline confiscations
2.9 Academic paper drafted by Ph. D student on the duel identification of elasmobranch products.
2.10 MMAF deliver advanced training programme to reaming four BPSPL offices.
2.11 Cefas follow up visit to assess implementation of improved customs procedure and gather feedback on efficiency.

3.1 WCS to conduct training of customs officers in species identification protocols for at least four major exit ports
3.2 Provide law enforcement agencies with evidence and support to conduct investigations and arrests of illegal traders of elasmobranch products.
3.3 Publicise Indonesia's response to marine wildlife crime by publishing cases in national and international media.
3.4 Collect, collate and analyse intelligence and law enforcement data, and use for monitoring and informing enforcement action

4.1 Three directorate staff visit the UK for a week to shadow Cefas and DEFRA staff on science based policy advice
4.2 Directorate staff produce visitation report
4.3 Three regional workshops delivered in Jakarta, Semarang and Surabaya to communicate the improved trade procedures of MMAF to detect illegal wildlife trade
4.4 One-day conference with core stakeholders from 1.6 to share project outcomes and knowledge sharing.
4.5 Feedback following the engagement workshops is consolidated and fed back to MMAF on potential improvements in a report
4.6 Five-year plan produced that summarise the results from the project, lessons learned and future directions for improvements to elasmobranch trade management
4.7 Sign revised implementation agreements between MMAF and Cefas.

Annex 2 Report of progress and achievements against final project logframe for the life of the project

Project summary	Measurable Indicators	Progress and Achievements
Impact Strengthened monitoring and enforcement of elasmobranch trade decreases illegal wildlife trade, reduces exploitation of threatened species, and promotes sustainable management of fisheries, safeguarding biodiversity, and livelihoods through improved legal frameworks.		Indonesian government have made demonstrable progress in strengthening trade monitoring through large scale training and capacity building, increased business compliance with permitting systems and the investigation of illegal trade cases which have resulted in prison sentences, fines and administrative sanctions.
Outcome Indonesia has capacity to effectively trace, monitor, and control trade in sharks and rays to support CITES legislation and provide a risk-based approach to legal and sustainable resource use.	**0.1** By end of year one, a key partner workshop has been delivered in Jakarta, engaging with >25 key elasmobranch trade stakeholders, including governmental bodies, academic experts, regulatory bodies and representatives from regional NGO's, identifying the interventions necessary to improve elasmobranch trade monitoring processes. Three local focus groups will be run in Jakarta, Semarang and Surabaya to collate input from fishers, processors and traders. **0.2** By the end of the project at least 15 individuals from MMAF have been successfully trained in elasmobranch identification techniques, with a significant increase in accurate identification of products of all trained staff in comparison to Y1 baselines. **0.3** By the end of the project, increased capacity and efficiency of MMAF and law enforcement officers increases prosecution rate of illegal shark and ray traders (and reports to CITES committees), as determined against baseline data (7 cases 2015, 6 cases in 2016, 2 (large) cases in 2015).	Indonesia has developed a standardised national training programme in shark trade management which has been delivered to over 200 participants across the country by a team of 20 expert trainers. This in combination with stakeholder engagement regarding shark utilisation and the national trade permitting system has resulted in an increased compliance by businesses. Cases of illegal trade of shark products investigated was at its highest number (throughout the project) in 2022 following training and stakeholder engagement, with half of those resulting in a prison sentence and the remaining cases, receiving administrative sanctions such as suspension of trading activities for 6 months. Project partners have produced recommendations for the next 5 years which have been included in funding applications to scale up activities and are committed to continuing the strengthening of law enforcement.

	0.4 By 2020, a five-year plan is delivered to MMAF outlining recommendations for integration of innovative customs procedure, improved detection of elasmobranch IWT, advice on trade monitoring, and draft improvements to current policies.	
Output 1. A comprehensive understanding of the political and operational landscape of elasmobranch trade has been documented, including the identification of all key stakeholders, their resources and unification of commitments to reducing illegal trade.	**1.1** By end of year one, all key trade stakeholders (MMAF officers, BPSPL staff, NGO's, academic researchers), have been identified, contacted, and invited to attend primary stakeholder workshop on elasmobranch trade management and species identification methods, ensuring non-gender discrimination. **1.2** Following a two-day inception/consultation event with key partners in Jakarta with at least 25 participants, the commitments (resources, geographic coverage, skills, responsibilities) of the core stakeholder groups (identified in 1.1) have been mapped, and the gaps and streamlining opportunities have been identified by year one. **1.3** By end of Y1 three one-day regional focus groups (Jakarta, Semarang and Surabaya) will collate information on operational processes, local knowledge and understanding of CITES commitments from fishers, processors and traders which relate to their fishery/trade routes. 1.4 By end of year one, a consultation report, which consolidates information from the core stakeholder event and regional focus groups, outlines a unified and sustainable approach to a national-level elasmobranch trade and monitoring program.	Stakeholders in shark trade management were engaged with at a national and regional scale through workshops and focus group meetings, sometimes coming together for the first time as a result of the project. Information gathered on key stakeholders, resources available and commitments and challenges to reducing illegal shark trade were documented in a summary report (Supp info 3) and detailed in section 3.1.

Activity 1.1 Desk-based study on collation of current knowledge, political and legal frameworks and data on Indonesian elasmobranch trade		A 40-page reference document including an overview of geography, products traded, current management and conservation actions and obligations, and available methods for identifying shark species was produced.
Activity 1.2. Ph. D student to compile global overview on elasmobranch trade and current trade regulations adopted by other nations, which will support stakeholder events and ultimately the production of an academic paper on an overview on current elasmobranch trade		"Shark and ray trade in and out of Indonesia: "Addressing knowledge gaps on the path to sustainability" is published in Marine Policy.
Activity 1.3. Key stakeholders identified and contacted regarding involvement of project and attendance at the opening stakeholder workshop		Fifty shark and ray trade management stakeholders from across government departments, academia and research and NGOs, were invited to attend the project inception workshop in November 2018 (Supp info 1).
Activity 1.4. Design of core stakeholder workshop and regional focus groups		The two-day stakeholder workshop and regional focus groups were collaboratively designed by all project partners.
Activity 1.5. Letter of invitation and agendas circulated to workshop and focus group attendees.		Workshop agendas were sent to stakeholders identified in activity 1.3.
Activity 1.6. Two-day workshop hosted by MMAF in Jakarta for core stakeholders (NGOs, researchers, Governmental representatives)		The project inception workshop took place on the 14th and 15th November 2018 in Jakarta, hosted by MMAF and Cefas. Forty-seven stakeholders attended (Supp info 1).
Activity 1.7. Regional focus groups for fishers, processors and traders held at Jakarta, Semarang and Surabaya.		Cefas and MMAF undertook an additional visit to inspection hubs BPSPL Serang, 13th November 2018 and BPSPL Denpasar, 16th November 2018. The three planned regional focus groups were conducted by Cefas, MMAF and WCS at BPSPL Serang (28th January 2019), BPSPL Denpasar (29th January 2019) and BPSPL Makassar (31st January 2019) with visits to exporter facilities at each. MMAF and WCS visited the three remaining trade hubs; BPSPL Pontianak, 26th February 2019; BPSPL Sorong, 4th March 2019; BPSPL Medan (Padang),12th March 2019) (Supp info 1).
Activity 1.8. Production of consultation document from the workshop minutes (1.6, 1.7) from core stakeholder event and focus groups		A 24-page consultation document was produced using meeting minutes and group exercises from the Project Inception Workshop and from the questionnaires and minutes from regional focus groups (Supp info 3).
Activity 1.9. Consultation document sent to all key workshop participants to review and comment.		Consultation document was discussed and actions to improve were made (including the additional information) with project partners in June 2019 at a bi-annual project meeting.
Activity 1.10. Finalisation and sign-off of report and submission to MMAF and other relevant Governmental bodies.		Finalisation and sign-off of the consultation document (Supp info 3).
Output 2. Improved capacity of MMAF to deliver advanced, on-going training to effectively identify and monitor the	**2.1.** By the end of Q2 Y2, a training programme for a step-wise approach to species-specific identification of elasmobranch products has been	MMAF have improved capacity to deliver advanced training in shark trade management and are able to detect more illegal species in trade due to the development the national standardised training programme and intensive training by national and international experts of 20 expert trainers who have gone on to

trade of CITES-protected elasmobranch species, thereby increasing the detection rates of attempted illegal trades.	designed utilising the existing resources identified during the consultation workshop (i.e. expertise, documentation, guides), which can be used to build capacity for detection and reporting of illegal shark and ray trade (i.e. shipment documentation, CITES reporting). **2.2** By end of Y2, >25 individuals (of equal gender where possible) from MMAF offices in Java and Bali) have been effectively trained during a two-day workshop in the step-wise approach. By the end of the project, these staff will have the capacity to independently train other officers across the country as directed by an appointed training lead in MMAF. A further 15 law enforcement officers and legal specialists will have also been simultaneous trained in the new procedures. **2.3** By end of Y3, the step-wise approach to species detection has been implemented at BPSPL Denpasar (Bali) and Serang (Java), with at least a 5% visual assessment of a random subsample (e.g. 1 in 20 sacks/boxes), and a sample of 200 individual products selected for independent genetic verification. These methods result in at least a 30% increase in the detection of IWT compared to Y1 baselines. **2.4** By end of Y3, the remaining four BPSPL offices have received training in the step-wise approach, with improved capacity of all 6 BPSPL offices to detect CITES-listed in trade.	deliver the standardised programme to over 200 of their colleagues. All training participants have achieved higher post-training test scores in the number of species they could correctly identify from products moving through their region. In additional, through the PhD studentship, two potential DNA-based methods for identifying shark species from highly processed products have been adapted or developed and are ready for operationalisation in the field (section 3.1 for details).

Activity 2.1. Gather existing learning resources from key partners on elasmobranch identification methods.	Resources gathered as part of desk-based study (activity 1.1) and during regional focus groups with BPSPL offices who have developed some of their own material. Additional funding was secured to have key ID resources (Pew Identifying shark fins guide (2017) and Shortfin and Longfin Mako (2019) and WCS wedgefish and giant guitarfish guides) translated into Bahasa.
Activity 2.2. Design training programme and improved customs procedure, and structure of the training event.	The five-day 'train the trainer' programme (Supp in 5), comprising of eight modules with taught and practical elements, was designed over a period of eight months through a series of 12 meetings between MMAF, WCS, the national training centre, other relevant departments of the ministry and Cefas. 41 participants from 6 BPSL, LIPI, Directorate of Marine Biodiversity Conservation, Research Centre of Fisheries, and Marine Surveillance attended a three-day workshop in Jakarta to evaluate the suitability of the modules and provide recommendations for improvement.
Activity 2.3. MMAF to identify an Elasmobranch Trade Training Team that will manage future training programs and compliance of CITES detection at BPSPL offices.	Selection of the participants for the 'train the trainer' team were identified during the design meetings detailed in activity 2.2 and include a representative from each of the six regional shark product verification offices in Indonesia (BPSPL Padang, BPSPL Pontianak, BPSPL Makassar, BPSPL Denpasar, BPSPL Serang, BPSPL Sorong) as well as representation from MMAF (KKHL).
Activity 2.4. Invitation to MMAF, two major BPSPL offices from Bali and Java, customs officials and genetic laboratory facility for training in step-wise approach to IWT detection.	Twenty participants from the six BPSPL offices and MMAF were invited to be members of the 'train the trainer' team and the trainer's workshop in January 2020 (Supp in 1).
Activity 2.5. Two-day training event in visual detection methods and then subsequent genetic material collection.	Twenty participants attended a five-day 'train the trainer' workshop in Jakarta between the 6th and 10th January 2020. The 40 hour training programme covered eight modules (Supp info 5) on the management of the shark and ray product trade and included; (1) Legislation on Shark and Ray Conservation, (2) Biology and Ecology of Sharks, (3) Biology and Ecology of Rays, (4) Sampling, Statistical Analysis and Reporting on Shark and Ray Utilisation, (5) Data Entry, Analysis and Reporting, (6) DNA sampling technique (7) Identification of Sharks listed on CITES, and (8) Identification of Protected Ray Species and CITES listed Species. Training involved taught and practical components as well as written and practical assessments before and after training. Training was delivered by national and international experts.
Activity 2.6. Assessments on the accuracy of BBPSL officers to effectively identify CITES protect species following training.	All 20 participants visual identification accuracy was tested in a pre-test (30 questions) and post-test (25 questions) assessment (designed by Rima Jabado) which was designed to determine if participants had increased their visual ID skills following training (Supp info 6). A twenty percent improvement in knowledge was achieved following training (66% correct answers in pre-test, 86% correct answers in post-test). Similar increases in post test scores were achieved by participants who were trained by the national training team between October and December 2022 (Table 1).

Activity 2.7. Improved customs procedures refined and agreed with MMAF and trade regulators (BPSPL officers/WCS WCU) following feedback from 2.6.		Evaluation of the training modules was conducted following the testing workshop in November 2019. The modules were finalised by team and used for the Training of trainer workshop in January 2020. This workshop is the first step for standardised training for the MMAF training agenda and will be adopted by the Training centre and become part of the annual standardised training for new employees. MMAF also propose these modules to Indonesian Ministry of Labour to become the new Competency Standard National Working in Indonesia which applies to other government staff such as quarantine, university, and the private sector.
Activity 2.8. Monthly submission of seizure records collated and analysed by MMAF, WCS and Cefas staff to inform the effectiveness of the training against baseline confiscations.		A pilot study collected for 2 months (December 2019 -January 2020) to estimate restricted products being inspected to develop further protocols for inspection. From 6 B/LPSPLs, there are 5 B/LPSPL that returned the data collection. About 1600 records have been collection within 2 months. About 3,000 tonnes of products were asked to be inspected, with more than 1,000 tonnes having been sampled and only 21.6 kg of restricted products being found. This finding will plug into analyses to examine the sampling power.
Activity 2.9. Academic paper drafted by Ph. D student on the dual identification of elasmobranch products.		Processed more than 500 tissue samples for the market assessment using high throughput barcoding; Developed a reference signature for lab-in-the-field that requires 3.5 hours to identify specific species using a universal marker and qPCR machine; Developed a novel approach to monitoring trade using shark dust and a metabarcoding which allows sampling of trade residues rather than tissues based samples.
Activity 2.10. MMAF deliver advanced training programme to remaining four BPSPL offices.		A total of 213 individuals (Table 1) received shark and ray identification training between January 2020 and July 2022. Training was delivered by the expert training team and participants included staff from all BPSPL units and from a major fishing port.
Activity 2.11. Cefas follow up visit to assess implementation of improved customs procedure and gather feedback on efficiency.		Following Covid, this activity was integrated into the one-day lessons learned workshop (Supp info 8).
Output 3. Improved capacity for law enforcement agencies to effectively respond to incidences of illegal trade using evidence-based approaches creates stronger disincentives for illegal trade of elasmobranch products.	**3.1:** By end of Y3, at least two customs representatives from at least four major exit ports for shark and ray products (8 individuals in total) have been trained in shark and ray species identification protocols, in collaboration with MMAF. **3.2:** By the end of Y3, at least 30 cases of illegal trade in CITES-listed shark and ray species have been investigated, with at least 10 of those effectively being brought to judicial trial	Capacity building of law enforcements officers has been delivered, and expected planned levels, through training programmes in both shark product identification but also through training on preventing smuggling of wildlife in airports and seaports. The number of articles published in local, national and international media are almost double the number (97) of the planned 50 and this along with the training provided has resulted in 11 cases of illegal trade of shark products being investigated, 5 of which have resulted in prison sentences (Table 2).

	(baseline: 7 cases 2015, 6 cases in 2016, 2 (large) cases in 2015). **3.3** By the end of Y3, at least 50 media articles have been published in the national and international media highlighting the Indonesian government's response to illegal trade in marine products.	
Activity 3.1. WCS to conduct training of customs officers in species identification protocols for at least four major exit ports.		Thirty-seven participants attended (Sept 2019) a training event on "Preventing the Smuggling of Protected Wildlife in Airports and Seaports". WCS also provided an update on the latest *modus operandi* of wildlife smuggling at airports and seaports and wildlife transportation from source to end market. Information on shark and ray trade regulation, species identification, and the traceability of legally traded wildlife products were also important subjects at the training event. This training event allowed participants to engage in a broader discussion on the differences and similarities in the issues that each agency faces and to share lessons learned, to enable a more collaborative approach to counter wildlife trafficking. In addition to these open discussions, the participants also learned about the results from the CITES CoP18 meeting and how it will affect their work in Indonesia. An informal communications group was created as an outcome of the meeting to facilitate WCS-Customs discussions and intelligence sharing. We predict that this will greatly improve communication amongst agencies and other partners in the handling of future cases.
Activity 3.2. Provide law enforcement agencies with evidence and support to conduct investigations and arrests of illegal traders of elasmobranch products.		WCS had an established Marine Wildlife Crime Unit which supported the government to target the illegal trade of marine species, including elasmobranch products through data and information collection. During their involvement in the project, WCS established an information source network in East Nusa Tenggara (14 people) and Java (3 people) to collect information on the illegal trade on elasmobranch products, and they provided information to law enforcement agencies resulted in three convictions. Since 2021, Rekam have developed a new program, the NRCU (Natural Resource Crime Unit) to continue law enforcement investigations. The NRCU has recorded a total of 82 marine wildlife crime cases involving 182 offenders of illegal fishing and trading activities, including 72 bomb fishing and 6 cases related to illegal use of potassium. Most of the incidents took place in West Nusa Tenggara (22 cases), North Maluku (14 cases), East Nusa Tenggara (13), Sulawesi (15 cases), Lampung (3 cases), and Papua (3 cases).

Activity 3.3. Publicise Indonesia's response to marine wildlife crime by publishing cases in national and international media.		During the project, 97 articles have been published in local, national and international media highlighting the Indonesian government's response to illegal trade in marine products (Supp 7).
Activity 3.4. Collect, collate, and analyse intelligence and law enforcement data, and use for monitoring and informing enforcement action.		Since the project began there have been 11 cases of illegal trade in CITES-listed shark and ray species which have been investigated and closed. Five cases have resulted in sentencing and up to 2 years and 9 months in prison, and 6 cases have resulted in administrative sanctions (payments for losses incurred by the taxpayer to the state) (Table 2).
Output 4. MMAF have increased capacity to utilise their improved scientific evidence from the implementation of the step-wise detection methods to better inform national policies on elasmobranch trade management and CITES compliance.	**4.1** At end of Y3, closing ceremonies including a core stakeholder one-day conference and a three one-day regional outreach events at (Jakarta, Semarang, Surabaya) that engage with beneficiaries of the elasmobranch fishery/trade have been led by MMAF to communicate the results and associated benefits of this project to local communities. **4.2** At the end of Y3, three key members from MMAF have visited Cefas and DEFRA in the UK to shadow scientific advisors and policy makers on the interpretation of scientific evidence into policy and knowledge sharing on marine product traceability systems. **4.3** By the end of the project, in addition to improvements to elasmobranch trade regulation, high level recommendations on next steps towards improved fisheries management and research will be presented to MMAF in a five-year plan	During the final stages of the project, we once again engaged with stakeholders on a national and regional scale through a core stakeholder conference on 'Lessons learned from MMAF and Cefas collaboration; Building capacity to reduce illegal trade of shark products in Indonesia' and through 5 online workshops attended by BPSPL staff and 184 representatives from fisheries businesses to communicate the update of shark trade training, procedures for trade permits, and to share new identification resources. These events reinforced the recommendations identified by the project team for scaling the work done within this project (see section 3.1 for details). From 12-16 September 2022, the Indonesian delegation visited the UK for a weeklong at Cefas Lowestoft, Heathrow's Animal Reception Centre and Defra, London discussions how science and evidence feeds into UK based fisheries and trade management decisions. During the visit project partners collaboratively developed recommendations for the future which directly fed into our IWTCF Stage 2 application.
Activity 4.1. Three directorate staff visit the UK for a week to shadow Cefas and Defra staff on science-based policy advice.		Eleven participants from Directorate of Marine Biodiversity and Conservation of the MMAF, Centre for Coastal and Marine Resources Management of the MMAF, and Rekam Nusantara Foundation visited Cefas Lowestoft, Animal Reception Centre Heathrow, and Defra London between the 12th and 16th September 2022.
Activity 4.2. Directorate staff produce visitation report.		Visitation report was produced following the visit (Supp info 10).

Activity 4.3. Three regional workshops delivered in Jakarta, Semarang and Surabaya to communicate the improved trade procedures of MMAF to detect illegal wildlife trade.	Five online workshops (covering Jakarta, Denpasar Makassar, Padang and Pontianak were conducted due to COVID restriction (in-person workshops were originally planned in Jakarta, Semarang and Surabaya) and attended by BPSPL staffs and 184 representatives from fisheries businesses. Following these workshops, we have collaborated with MMAF to update the training modules by adding two components: (i) the new procedure of utilisation and trade permit process, and (ii) a new shark and rays identification guide (wedge fish and carcass ID). Those modules were trialled in trainings for BPSPL, law enforcement agencies, and private sector in Depok (October 6-7, 2021), Tegal (October 21, 2021), and Bali (December 14-15, 2021).
Activity 4.4. One-day conference with core stakeholders from 1.6 to share project outcomes and knowledge sharing.	On April 1st, 2022, a one-day conference on 'Lessons learned from MMAF and Cefas collaboration; Building capacity to reduce illegal trade of shark products in Indonesia' took place. There were 20 in person participants and 163 online from multiple agencies (including the Fish Quarantine Agency, Quality Control and Safety of Fishery Products; MMAF Training Centre, Tuna Fishery Research Agency, and NGOs) attended the event (Supp info 8).
Activity 4.5. Feedback following the engagement workshops is consolidated and fed back to MMAF on potential improvements in a report.	Feedback included in the finalised training material for the national standard (This is being finalised and translated into English – due to be completed a the end of July 2023).
Activity 4.6. Five-year plan produced that summarise the results from the project, lessons learned and future directions for improvements to elasmobranch trade management.	High level recommendations on next steps towards improved fisheries management and research were developed between MMAF, Rekam and Cefas in the preparation for an IWTCF Extra application for Round 9 of the challenge fund; (i) Continued capacity building in product identification through scaled training and the implementation of molecular approaches in the field; (ii) Scaled collaboration between government authorities and industry stakeholders (fishers, traders, businesses) to increase of awareness of and compliance with trade monitoring systems; (iii) Improved fisheries data collection of elasmobranchs to develop stock assessments and non-detriment findings and (iv) Increased institutional capacity and coordination from capture to international export to support implementation of domestic fisheries management which supports Indonesia in meeting its international treaty commitments. Although unsuccessful at Stage 2, Round 9, project partners have addressed feedback and reapplied for funding (Round 10) as a route to further the recommendations made.
Activity 4.7. Sign revised implementation agreements between MMAF and Cefas.	Cefas visit to Jakarta in May 2023 to meet with MMAF and British Embassy to discuss our Round 10 Stage 1 application and future collaboration agreements.

Annex 3 Standard Indicators

Table 1 Project Standard Indicators

IWTCF Indicator number	Name of indicator using original wording	Name of Indicator after adjusting wording to align with IWTCF Standard Indicators	Units	Disaggregation	Year 1 Total	Year 2 Total	Year 3 Total	Total to date	Total planned during the project
IWTCF-D12	Articles published by members of the project team	Number of papers published in peer reviewed journals	Number	Men and women		1	2	3	4
IWTCF-A02	Number of people reporting they are applying new capabilities (skills and knowledge) 6 (or more) months after training.		People	Men and women Government staff				213 (80 F, 133 M)	> 25
IWT-A16	Number of training materials produced for use by host country	Shark and ray identification: technical guidance - Basic Level. Shark and ray identification: training of trainer module manual - Basic Level Training module for the identification of wedgefish, shark, and ray carcasses. Pocket book of whole sharks and rays, carcasses, and dry products identification guide Pocket book of wedgefish identification Shark and ray carcass product identification video Shark and ray product identification flow poster	Books			6 books 8 books 3 books 3 books 1 book 1 video 2 poster			10 1

IWTCF Indicator number	Name of indicator using original wording	Name of Indicator after adjusting wording to align with IWTCF Standard Indicators	Units	Disaggregation	Year 1 Total	Year 2 Total	Year 3 Total	Total to date	Total planned during the project
IWTCF-B01	Number of people trained in law enforcement skills.	Preventing the Smuggling of Protected Wildlife in Airports and Seaports	People	Men 36 Women 1	37			37	15
IWTCF-B07	Number of illegal wildlife products/shipments detected.	Illegal trade of shark and ray products	Number		4	2	5	11	30
IWTCF-B21	Number of policies and frameworks developed or formally contributed to by projects and being implemented by appropriate authorities	National standardised training competency for shark and ray trade monitoring.	Number			1			1

Table 2 Publications

Title	Type (e.g. journals, manual, CDs)	Detail (authors, year)	Gender of Lead Author	Nationality of Lead Author	Publishers (name, city)	Available from (e.g. weblink or publisher if not available online)
Shark and ray trade in and out of Indonesia: Addressing knowledge gaps on the path to sustainability	Peer-review	Andhika P.Prasetyo, Allan D.McDevitt, Joanna M.Murray, J on Barry, Firdaus Agung, Efin Muttaqin, Stefano Mariani	Male	Indonesian	Marine Policy, Elsevier	Shark and ray trade in and out of Indonesia: Addressing knowledge gaps on the path to sustainability - ScienceDirect
Shark-dust: High-throughput DNA sequencing of processing residues unveils widespread trade in threatened sharks and rays	Peer-review	Andhika Prima Prasetyo, Joanna Murray, Firdaus Agung, Naiara Sales, Stefano Mariani, Allan McDevitt	Male	Indonesian	Biorxiv	Shark-dust: High-throughput DNA sequencing of processing residues unveils widespread trade in threatened sharks and rays (biorxiv.org)
Universal closed-tube barcoding for monitoring the shark	Peer-review	Andhika Prima Prasetyo, Marine Cusa, Joanna Murray, Firdaus	Male	Indonesian	iScience	Universal closed-tube barcoding for monitoring the shark and ray trade in

Title	Type (e.g. journals, manual, CDs)	Detail (authors, year)	Gender of Lead Author	Nationality of Lead Author	Publishers (name, city)	Available from (e.g. weblink or publisher if not available online)
and ray trade in megadiverse conservation hotspots		Agung, Efin Muttaqin, Stefano Mariani, Allan McDevitt				megadiverse conservation hotspots: iScience (cell.com)

Checklist for submission

	Check
Is the report less than 10MB? If so, please email to BCF-Reports@niras.com putting the project number in the Subject line.	No
Is your report more than 10MB? If so, please discuss with BCF-Reports@niras.com about the best way to deliver the report, putting the project number in the Subject line.	Yes
If you are submitting photos for publicity purposes, **do these meet the outlined requirements (see section 10)?**	Yes
Have you included means of verification? You should not submit every project document, but the main outputs and a selection of the others would strengthen the report.	Yes
Do you have hard copies of material you need 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.	No
If you are submitting photos for publicity purposes, do these meet the outlined requirements (see section 13)?	Yes
Have you involved your partners in preparation of the report and named the main contributors	Yes
Have you completed the Project Expenditure table fully?	Yes
Do not include claim forms or other communications with this report.	