Illegal Wildlife Trade (IWT) Challenge Fund
Annual 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: 30th April 2024

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

IWT Challenge Fund Project Information

Project reference	IWT114
Project title	Harnessing technology to end the illegal trade in succulent plants
Country/ies	South Africa and Namibia
Lead Partner	Royal Botanic Gardens, Kew
Project partner(s)	TRAFFIC
IWTCF grant value	£513,567
Start/end dates of project	Kew – July 2022 – July 2025 TRAFFIC – July 2022 – September 2024
Reporting period (e.g. April 2023-Mar 2024) and number (e.g. Annual Report 1, 2, 3)	April 2023 to March 2024 – (12 months) Annual Report 2
Project Leader name	Dr David [redacted], Project Leader, Royal Botanic Gardens, Kew.
Project website/blog/social media	TRAFFIC: https://www.traffic.org/what-we-do/thematic-issues/promoting-sustainable-trade/succulent-plants/ Kew: https://www.kew.org/science/our-science/projects/technology-illegal-trade-succulents
Report author(s) and date	David [redacted] and Dominique [redacted] - 30/04/2024

1. Project summary

The illegal trade in Southern African succulent plants is resulting in extinctions. Addressing the supply and sale of illegally trafficked plants faces regulatory and enforcement challenges. Multidisciplinary research, from use of Artificial Intelligence (AI) tools to personal interviews, will identify points of intervention and inform strategies to improve regulation and law enforcement actions. Development of chemical fingerprinting and marking techniques will enable traceability and transparency in trade, while aiding the reintroduction of confiscated plants to their original locality in the wild.

In the short-term, the project will empower and capacitate communities and enforcement personnel to tackle the illegal trade in succulent flora, reducing illegal harvesting and helping to protect local communities from exploitation by syndicates. At the same time, it will support key community-led conservation jobs, most notably guides and rangers. This will aid in the prevention of criminal activities by community members which perpetuates the poverty cycle. Longer-term, reduced poaching activity and increased protection for wild populations will create the conditions for community-based conservation to thrive. A map of the regions of South Africa most affected by succulent poaching is provided in Figure 1, Annex 4.

At the time of writing (April 2024), the poaching of succulent plants continues at pace and scale, with more than 1 million plants now seized by authorities in South Africa, with even greater numbers thought to have been trafficked from the country. The objectives of the Project therefore remain highly relevant, with the risk to wild plant populations from poaching appearing likely to affect Southern African countries including South Africa, Namibia and Madagascar for the foreseeable future.

2. Project stakeholders/ partners

Our project is international, multidisciplinary and highly collaborative in nature. While only Kew and TRAFFIC undertake the primary monitoring and evaluation for the project, input from other Project Partners and consultants relating to specific project objectives also provides valuable additional feedback and support.

Summary of Partnerships:

Project Board Partners

- Kew-TRAFFIC: As co-leads on the project, Kew and TRAFFIC meet regularly and are in constant contact to provide updates and discuss the monitoring, planning and implementation of all joint activities.

Other Project Partners and Consultants

- South African National Biodiversity Institute (SANBI): The team are in regular communication with SANBI, whose staff are among those on the front line of the poaching crisis. SANBI's staff have provided invaluable advice regarding the dynamics of poaching activity, illustrative materials for use in presentations, provision of plant specimens for use in the laboratory work, and advice and on-the-ground support to facilitate fieldwork planned for Y3. Our discussions around fieldwork have led to detailed discussions relating to priority species for collection and potential collection locations, logistical considerations such the temporary storage of samples within South Africa prior to their shipment to the UK, the collection of complementary soil samples for potential future project work, and potential synergies between South African projects specifically exploring strontium isotopes within succulent plant material, which would complement the suite of stable isotopes that we will be analysing ourselves. We really appreciate the support of SANBI with our project work, with this close collaboration essential to the success of Output 4, the results of which will be shared with SANBI, to hopefully enable these techniques to be scaled as a continuing aid to the conservation of succulent plant populations in the

future. TRAFFIC is a part of the Sensitive Species Support Group which aids with succulent plant identification and valuation statements.

- Department of Forestry, Fisheries and the Environment (DFFE): TRAFFIC's partnership with DFFE has been effective as DFFE is one of the organs of the state that employ Environmental Management Inspectorates (EMIs), a network of environmental enforcement officials from various national, provincial and municipal government departments created by National Environmental Management Act (NEMA) of 2008. DFFE created the current training for EMIs. The succulent training developed under this project is intended to complement this training.

- Namibia's National Botanical Research Institute (NBRI): NBRI's mission is to promote the understanding, conservation and sustainable use of Namibian plants for the benefit of all. Their involvement was driven by the country's need to better understand its trade in illegal succulent plants. They completed their consultancy in Y2 as described under section 3.1 Output 1 Activity 1.5.

- Plant Mentor: TRAFFIC brought on a consultant as the "Plant Mentor" to develop a one-day curriculum comprising presentations to provide awareness and a better understanding on the illegal trade in succulent plants to junior EMIs in South Africa. The successful candidate has nearly 30 years' experience working as a professional ecologist, primarily in the Succulent Karoo. He has a robust knowledge of the succulent flora and extensive experience in developing and running training programs (curricula) in non-academic environments, plus providing the critical support and mentorship that will be necessary to develop the proficiency, understanding and confidence required for Environmental Management Inspectors (EMIs) to flourish at their job. The Plant Mentor delivered the curriculum at four physical trainings in three provinces in South Africa and one virtual training and also provided succulent plant identification and other relevant guidance to mentees either via email or Whatsapp post-training. The Plant Mentor's involvement was driven by the need for speciality knowledge on succulent plant identification for EMIs. He completed his consultancy in Y2 as described under section 3.1 Output 2 Activities 2.1.1 and 2.1.2.

- eCommerce Consultant: TRAFFIC brought on an eCommerce consultant to (1) identify strengths, weaknesses, and gaps in the current trading policies with regards to succulent flora for >15 ecommerce platforms/companies/online marketplaces, (2) draft a "best version" external-facing policy or framework that these platforms could customise or simply add to their sites to make traders aware of what plants are prohibited, what plants are allowed to be traded, how compliance with this will be monitored and enforced, etc., and (3) draft an internal-facing policy for an ecommerce company to share with their staff that monitor advertisements for prohibited items and are responsible for their subsequent removal. The eCommerce consultant's involvement was brought about by the need for a professional with an understanding of legal jargon and knowledge of wildlife protection legislation in South Africa. She completed her consultancy in Y2 as described under section 3.1 Output 3 Activities 2.1.1 and 2.1.2.

- University of Southampton: Southampton's School of Electonics and Computer Science provides consultancy for the development and use of FloraGuard. During the project, we have arranged two computer science internships which have successfully developed our web crawling technology and training resources. This collaboration has proved very successful, particularly as FloraGuard is originally a University of Southampton creation, and so working with their team ensures continuity in the development of this software. In Y3, we intend to recruit a further computer science consultant also in collaboration with the University, to ensure continued technical support for the web crawler and to assist with the delivery of training in these techniques to third party organisations.

- UK Centre of Ecology and Hydrology (UKCEH). During Y2, we have worked closely with the team at UKCEH to refine our methodologies and approach to plant sampling. This has involved regular calls and the sharing of images of our work with laboratory experts, who have advised on aspects of the methodology such as minimum sample sizes, the drying and storage of samples, and techniques for milling the samples prior to processing in the laboratory. Due to a project staff shortage, we were unable to deliver our initial batch of samples to the laboratory for processing before the end of Y2, and are grateful for the support for our December 2023 Change Request which will enable these samples to now be processed at the start of Year 3. Following the successful recruitment of a Project Officer in April 2024, we are discussing with the laboratory the next steps in processing the samples and delivering them to the laboratory for SIRA and trace element analysis.

- Project Consultant – Dr Carly Cowell (BGCI). As detailed in our September 2023 Change Request, the project team continue to work closely with Carly on the planning and execution of work under Output 4. While the delay to the processing of samples at the laboratory has slowed our progress under this Output, we look forward to a productive year ahead, involving the execution of fieldwork and preparation of a minimum of two journal papers to disseminate our results. The Project Consultant's experience of working in South Africa provides invaluable support to achieving the aims of Output 4, and we believe will naturally lead to further developments to help with the Project's impact, for instance through the sharing of our work with BGCI's global network of botanic gardens, who may wish to explore the use of these techniques for provenance and traceability purposes.

Other Key Stakeholders in South Africa and Namibia

- The Department of Agriculture, Environmental Affairs, Rural Development and Land Reform (DAERL): As the conservation body in the Northern Cape Province, TRAFFIC's first training was conducted in Kimberley for DAERL EMIs. Refer to 3.1 Output 2 Activities 2.1.1 and 2.1.2 for more information. At their request, TRAFFIC assists EMIs here regularly with succulent plant cases, specifically online adverts for value statements, as and when needed.

- CapeNature: As the conservation body for the Western Cape Province, TRAFFIC has worked with WC's CapeNature on the EMI mentee training in the Cedarberg and Hermanus. Refer to 3.1 Output 2 Activities 2.1.1 & 2.1.2 for more information. After this training, CapeNature approached TRAFFIC and requested assistance with another training for law enforcement officials including traffic officials in the WC on the illegal succulent trade issue. TRAFFIC could not support this training directly but TRAFFIC's LE Mentor under the INL Mentorship Project attended the training using some of TRAFFIC's materials created under the succulent curriculum. TRAFFIC has secured support from CapeNature for future proposals to support LE trainings in the future.

- The Special Investigation Unit and Compliance and Enforcement Unit from the Province of the Eastern Cape's Department of Economic Development, Environmental Affairs and Tourism (DEDEA): As the conservation body in the Eastern Cape province, TRAFFIC worked with DEDEA on the EMI mentee training in Gqeberha previously named Port Elizabeth. Refer to 3.1 Output 2 Activities 2.1.1 & 2.1.2 for more information.

- Organisations that developed the South African National Response Strategy / Succulent Expert Groups: TRAFFIC and Kew continue to actively engage with stakeholders working on South Africa's National Response Strategy to Address the Illegal Trade in South African Succulent flora. TRAFFIC and Kew attended two online meetings of stakeholders contributing to the Strategy and Action Plan to address succulent poaching (10/08/23 and

02/10/23). TRAFFIC and/or Kew are members of various Task Teams, which have been set up to support each objective, e.g.: Succulent Enforcement Task Team, which met on 29/01/2024, the Communities Task Team, which met on 27/02/2024, and the Communications Task Team, which met on 08/08/2024.

- Namibia's Protected Plant Task Team: In mid-2022, Namibia's government formed a task team to deal with the threat of the illegal trade in succulent plants. This task team comprises officials from Namibia's Department of Forestry (DoF), the Ministry of Environment, Forestry and Tourism (MEFT) Intelligence and Investigation Unit (IIU), the Namibian Police Force (NAMPOL) Protected Resources Division, Directorate of Wildlife and National Parks (DWNP), and NBRI with support from Namibia Nature Foundation (NNF) and US Forest Service (USFS). TRAFFIC has since engaged closely with individuals implementing the task team's strategy and action plan to ensure that this project can complete or contribute to those activities.

Interactions with Other Stakeholders:

There have been several opportunities to provide updates on the project and receive feedback from key stakeholders, including:

- In mid-2023, Kew and TRAFFIC contributed via interview and a validation workshop to a study conducted by the Institute for Security Studies in South Africa, evaluating responses to the South African National Response Strategy and Action Plan to the succulent poaching crisis. The study was published in late 2023. On 6 March 2024, TRAFFIC presented at their report launch webinar called "Growing, growing, gone: safeguarding SA's illegally traded succulents" that showcased some insights from the ISS report, which explored the illegal market for ornamental succulents, focusing on South Africa's multistakeholder efforts to counter the trade. Speakers highlighted key challenges and opportunities, and put forward recommendations to improve responses. These lessons will offer valuable insights into safeguarding plants from illegal trade in South Africa and across the globe (See Annex 5 for webinar advert).
- TRAFFIC was invited to present on the project and its preliminary results at United For Wildlife's Southern African Chapter Strategy Session in Johannesburg, South Africa, in August 2023 (see Annex 4 Figure 2). United for Wildlife (UfW) was created by Prince William and The Royal Foundation in 2014 to protect endangered species from the illegal wildlife trade. Their mission is to foster cross-sector collaboration to make it impossible for traffickers to transport, finance, or profit from illegal wildlife products. UfW acknowledges that the illegal harvesting and trade in Southern Africa's succulent plants is a concerning issue and are supportive of raising awareness among their members to assist in combating this.
- The project team gave input on a proposal for the creation of a Succulent Plant Illegal Trade Task Force (SCITTF) under IUCN's Species Survival Commission (SSC) to address the illegal succulent plant trade, which requires urgent attention due to the devastating impact this trade is having on many succulent plant species and their ecosystems (See Annex 6 for proposal). TRAFFIC and Kew are members of the SCITTF, with our project work aligning well with many of the aims and objectives of this new expert group. The first meetings of the Task Force were held in January 2024. with the group meeting monthly to share information and to strategise future potential initiatives to support global succulent plant conservation.
- In October 2023 with the help of match funding from Kew, members of the project team attended the Arid Zone Ecology Forum (AZEF) to deliver a keynote speech based on project work. TRAFFIC's Project Manager presented on preliminary findings of their research into the trade dynamics of the trade in Southern African succulent plants as well as Objective's 1 to 3 of the project while Kew's Project Manager presented on Objective 4 and provided an update on the stable isotope analysis. (See Annex 4 Figure 3 for

photographs and Annex 7 for AZEF presentations). The presentation was well received and generated interest from a number of other researchers attending the event, who were interested in techniques to apply web crawling technology in different settings, and potential synergies between our isotope provenance testing work, and research involving plant DNA which we will follow up on once results under Output 4 are in hand. This trip also provided an opportunity to develop relationships with project partners in support of in-country fieldwork planned for 2024 under Output 4 (see notes under SANBI, above).

- In recent months, the project has also been represented in several other fora relating to the monitoring of online wildlife trade, both UK and EU based, where Kew's experience in this field has been sought. Without sharing too many details of these new initiatives, they reflect an increasing amount of effort that is being applied to address online IWT, and have provided opportunities to share insights from our project work and highlight the threat to plant species posed by online trade, along with the challenges that must be overcome to effectively regulate this online space (Please see Annex 21).

3. Project progress

3.1 Progress in carrying out project Activities

Please note the names of nurseries and botanical gardens visited and the agencies to which interviewees belong are not specified in this report. This is for their own protection given the severity of the illegal succulent trade.

Output 1 - Greater understanding of trade dynamics informs law enforcement strategy and action.

Activity 1.1. - Analysis of online marketplaces based on data captured by web crawler (FloraGuard). This activity has been delayed due to a staff shortage at Kew during the latter half of Y2. The successful recruitment of a new Project Officer who started in post in late April 2024 will enable these Logframe objectives to be met within Y3 Q1 and Q2.

Activity 1.2 - Enhancements to web crawling algorithm technology, and the creation of a simulated IWT marketplace. This activity was completed in Year 2, with functional improvements made to the installation and operation of the web crawler. Two online marketplaces have also been created, for training purposes.

Activity 1.3. Collection of supplementary trade information collected from other relevant data sources. This activity was completed in Y2.

Activity 1.4. Fieldwork and interviews with relevant stakeholders in South Africa. This activity was completed in Y2.

Activity 1.5. Two field trips are undertaken to survey areas in Namibia. This activity was completed in Y2.

Activity 1.6 - Reports with findings of investigatory work under 1.1. - 1.5. produced and published. This activity is due for completion. Reports comprising results from the activities above will be completed in Y3.

Output 2: Technical skills of law enforcement officers in identifying and intercepting illegally traded succulent plants are improved, supported by innovative technology.

Activity 2.1.1. - Design and production of information and training materials to share with enforcement personnel. This activity has been completed.

Activity 2.1.2. - Training and mentorship of South Africa's junior Environmental Management Inspectors (EMIs). This activity was completed in Y2.

Activity 2.2. Awareness and training of an AI web-crawler tool (FloraGuard) given to law enforcement analysts within South Africa. This activity has been delayed due to a staff shortage at Kew during the latter half of Y2. The successful recruitment of a new Project Officer who started in post in late April 2024 and further planned recruitment of a computer science consultant will enable this Logframe objective to be met within Y3 Q2. A shortlist of organisations

who have expressed interest in receiving the training has been compiled, and instructional materials relating to the installation and use of the software have been created.

Output 3: Internet companies are aware of their responsibility to police and deter illegal trade in succulent flora and adopt and implement effective monitoring frameworks.

Activity 3.1 - Evaluation of online trading policies to identify gaps or weaknesses relating to the trade in succulent flora. This activity has been completed.

Activity 3.2 - 3.4. Engage with Internet companies directly and in collaboration with the Coalition to End Wildlife Trafficking Online. This activity commenced in Y2 where we commenced the pilot study/engagement with eBay. Please see Indicator 3.2 for further details.

Output 4: Development and testing of innovative tools and technology to improve and facilitate identification and intervention of illegally traded succulent flora.

Following delays to the acquisition of experimental plant material in Y1, a shipment of plants donated by project partners in South Africa arrived at Kew in June 2023. This initial batch of plants has enabled samples to support several Logframe objectives to be taken, and we look forward to processing these in the laboratory during Y3 Q1.

Activity 4.1.1 - Determine naturally occurring stable isotopes/elements within wild *Conophytum* spp. and identify which plant parts provide the best chemical signatures. This activity commenced in June 2023 and is ongoing. Samples from 60 *Conophytum* spp. plants supplied by project partners in South Africa have been taken and dried, preserving them until we are able to deliver these to our UK laboratory partner in May 2024.

Activity 4.1.2 - Determine turnover rate of stable isotopes/elements within wild plants, once transferred to cultivated settings. This activity commenced in June 2023 and is ongoing, with repeated sampling of a sub-set of our initial batch of plants underway, and due to be completed by September 2024.

Activity 4.2.1 - Create geographical origin maps based on the stable isotope/elemental profiles at genus level and develop a stable isotope/elemental profile from 50-100 specimens. Due to a delay to fieldwork detailed in our September 2023 Change Request, this Activity has not yet been completed. The fieldwork to collect samples to contribute to this study is expected to take place in June 2024.

Activity 4.2.2 - Test isotope/elemental profile against plants from marketplaces to determine origin of material. This activity has not yet been completed and will draw on the results obtained under Activity 1.1. We are in the process of acquiring cultivated specimens of known provenance for use in a comparative study of wild vs cultivated plants, with the processing of samples expected to take place in July 2024.

Activity 4.3.1 - Using isoscape maps to reintroduce confiscated material back to the wild. Due to a delay to fieldwork detailed in our September 2023 Change Request, this activity to create isoscape maps has not yet been completed. The fieldwork to collect samples to contribute to this study is expected to take place in June 2024.

Activity 4.3.2 - Contribute to development of in-country reintroduction strategy for succulent species. Due to the delay to fieldwork, this activity has not yet commenced, although will be the logical next step with Project Partners in South Africa following the analysis and write up of results during the remainder of Y3.

Activity 4.4. - Nursery trials to test isotope watering to mark plants under cultivation with a traceable isotope marker. This activity commenced in December 2023. An isotope marker has been applied to 5 different species of succulent plants, with repeat samples to be drawn from these plants over the course of 12 months.

Activity 4.5.1 - Enforcement workshop for strategy development and implementation. This activity has not yet been completed. We will aim to schedule this in Year 3 Q3, when preliminary results from Activities 4.1 and 4.2 will be ready to share.

Activity 4.5.2 - Presentation at industry conferences. As 4.5.1 above.

3.2 Progress towards project Outputs

Please see below a summary of our progress towards our Project Outputs, which in some expand on our previous baseline and means of verification information to address some of the Y1 Annual Report Reviewer's feedback:

Output 1: Greater understanding of trade dynamics informs law enforcement strategy and action. Much knowledge on succulent plant illegal trade dynamics has been obtained so far through TRAFFIC's data collection and site visits. By end Y2, all data collection (excluding automated searches of online marketplaces) were completed. Data will be analysed, and results will be compiled into reports for sharing with law enforcement and other project stakeholders in Y3. The data collected will create a reference point that quantifies the impact of the illegal trade on many threatened South African plant taxa, including through comparison with the 1998 TRAFFIC Succulent Trade report which provides a baseline for this work.

Indicator 1.1. By end Year 1, use of an AI led methodology for web crawling (FloraGuard), aids the identification and trade profiling of South African and Namibian priority species, traded on ≥ 30 e-commerce marketplace platforms and ≥ 20 online forums relating to relevant horticulture and trade. While the web crawling algorithm was improved in Y1, during Y2, we encountered some unexpected technical issues relating to the installation process and with the export of captured data, where some data loss was suspected. During Y2, a Computer Science intern from the University of Southampton worked to resolve these issues while also making further improvements to the functionality of the crawler itself. Following a ground truthing exercise to verify the performance of the improved version of the software, the crawler is ready to be deployed for live data capture. While this was intended to commence within the latter stages of Y2, a staffing shortage has caused delays to the capture and processing of data which requires time and attention to adhere to a specific workflow. Following the recruitment of a Project Officer in April 2024, we still expect to achieve and surpass our Logframe objectives, during Y3 Q1 and Q2 (please see Annex 16 for further details).

Indicator - 1.2. By end of Year 2 the ease and scope of applying the FloraGuard web crawler is enhanced due to functional enhancements made to AI algorithms. Among the improvements that have been made, the operational interface has been updated to improve user-friendliness, with new installation guides and training materials, including simulated online marketplaces, developed to allow for simpler installation requiring less support from IT specialists. This will help with both the operation of the crawler by project staff and better facilitate the training of new users of the software under Indicator 2.2 (please see Annex 16 for further details).

Indicator 1.3. By end Year 1, trade data secured from complementary sources (CITES data, nurseries, court cases) to further determine source, routes, pricing, and destinations for South African and Namibian succulent flora. TRAFFIC collected and analysed the following data in Year 2, the results of which will form part of TRAFFIC's report under 1.6 due for completion by mid-Year 3:

- In July 2023, TRAFFIC completed an analysis that focuses on the legal trade in CITES and EU Annex D listed succulent species exported from South Africa and Namibia to the rest of the world. The analysis covers years of reported trade from 1995 (the date of a

previous TRAFFIC report on legal trade in succulents exported by South Africa) to the most recent year of reported trade by the majority of CITES Parties (2021).

- TRAFFIC received data on 185 court cases involving illegally obtained succulent plants that took place between 2019 and 2023 from the Northern Cape Province (NC). As of end Q2, TRAFFIC has uploaded these into TRAFFIC's Wildlife in Trade Information System (WiTIS). TRAFFIC also collated information on 267 seizures involving illegally obtained succulent plants that took place between 2019 and 2022 – 123 occurred in the NC and 144 occurred in the Western Cape Province (WC). A map of the seizure data for both provinces was developed (see Annex 4 Figure 5).
- In TRAFFIC's 1998 succulent trade study, TRAFFIC obtained succulent price lists between 1982 and 1994 from 133 traders using their physical catalogues. TRAFFIC has searched for these traders online to obtain their most recent price lists as physical catalogues are hardly used any more. Of the 133 traders, succulent plant price lists were obtained from 22 traders. The other traders are either no longer active (13) or we could not locate their websites or any information on them (46) or require us to contact them for their price lists through mail order (49) or no longer trade in succulent plants (3). To supplement this, TRAFFIC obtained price lists from another 20 online stores as well as from four Whatsapp group sales. All this information will be collated and analysed for a comparison with the 1998 succulent trade study findings.
- TRAFFIC continued to monitor online advertisements of succulent plants this year, with input from another TRAFFIC project called Reducing Trade Threats to Africa's wild species and ecosystems (ReTTA) forming part of the matched funding arrangements for the project. On a monthly basis, TRAFFIC takes screenshots of advertisements of specific succulent species and converts the foreign currency to South African Rands. These screenshots were uploaded into a secure online folder for various law enforcement officials to use for their valuation statements for court cases.

Indicator 1.4: By end Year 1, in person interviews conducted with South African and Namibian enforcement officers (>5), nurseries (>5) and private landowners (>5). TRAFFIC completed all interviews in Year 2. TRAFFIC was granted ethical clearance for this human research from the University of the Witwatersrand (Wits) in South Africa (Annex 9). TRAFFIC received their research permit from South African National Parks (SANParks) for interviews with SANParks employees, such as those at Namaqua National Park and |Ai-|Ais/Richtersveld Transfrontier Park in the NC (Annex 10). TRAFFIC completed 24 interviews in South Africa with the following participants: law enforcement officers (7), protected area managers (7), private landowners (5), and nurseries (5). The results of these interviews will form part of TRAFFIC's report under 1.6 due for completion in Year 3.

Indicator 1.5: By end Year 2, two field trips conducted in Namibia to determine hotspot poaching localities and genera/species targeted. TRAFFIC's Consultant, Namibia's National Botanical Research Institute (NBRI), conducted field trips to Namib Naukluft Park, the Tsau //Khaeb (Sperrgebiet) National Park and the Ais Ais / Richtersveld Transfrontier Park in southern Namibia to record colonies of succulent plant species that are deemed at risk of being illegally harvested for the illegal trade (See Annex 4 Figure 6). NBRI finalized their field trip report, which will be incorporated into a final research report shared with Namibia's Protected Plants Task Team upon completion.

Indicator 1.6. By mid-end Year 2, reports with findings of investigatory work under 1.1. - 1.5. provides quantitative and qualitative understanding of the drivers behind legal and illegal trade in key South African and Namibian succulent flora, with recommendations on how to address IWT in succulent plants, including recommendations on changes to

legislative frameworks. TRAFFIC is in the process of compiling the first draft of a report based on the data collected above with a focus on describing legal and illegal trade dynamics involving succulent plants from South Africa and Namibia. The report is due for completion by Year 3.

Output 2: Technical skills of law enforcement officers in identifying and intercepting illegally traded succulent plants are improved, supported by innovative technology.

TRAFFIC, through matched funding with its Mentorship project (funded by the US State Department Bureau of International Narcotics and Law Enforcement), brought on two consultants – a plant mentor and law enforcement mentor – to develop a one-day training curriculum for Environmental Management Inspector (EMI) mentees. TRAFFIC along with the mentors ran four trainings for EMI mentees from various agencies such as the Department of Agriculture, Environmental Affairs, Rural Development and Land Reform (DAERL) in the Northern Cape Province, CapeNature in the Western Cape Province, and the Special Investigation Unit and Compliance and Enforcement Unit from the Province of the Eastern Cape's Department of Economic Development, Environmental Affairs and Tourism (DEDEA) in the Eastern Cape Province in South Africa (See Annex 4 Figures 7 to 10). A total of 13 EMI mentees in the three provinces received training on the following topics: i. Importance of succulent plant diversity in South Africa, ii. Basic succulent plant identification, iii. Introduction to national and provincial legislation that protect succulent plants, iv. Criminal penalties for convictions of cases involving succulent plants, v. Maintaining the chain of custody in the event of a succulent plant seizure, vi. The process of rehabilitating confiscated plants, and vii. Roles and responsibilities of EMIs in combating the illegal succulent plant trade. A video was developed to introduce mentees to the course. A short virtual training was hosted for EMIs from the other provinces. Therefore, a total of 23 EMI mentees received training (virtual and/or physical). 100 copies of the South African CITES Appendix 3 guide were printed and distributed to various LE officials across South Africa.

Indicator 2.1.1 By end Year 2, fourteen junior Environmental Management Inspectors have improved knowledge and skills to detect and effectively investigate the illegal trade in succulent plants. TRAFFIC along with the Plant Mentor and Law Enforcement Mentor ran four trainings for 13 EMI mentees in three provinces, which was well-received by mentees. The trainings were a big success especially the training materials developed, and guidebooks shared. The training materials were used by TRAFFIC's LE Mentor under the INL Mentorship Project to train traffic officers and police officers. Shortly after this training, a seizure was made by officers that attended the training. 10 suspects were arrested for illegal possession of flora. This seizure is evidence that technical skills of law enforcement officers in identifying and intercepting illegally traded succulent plants was improved. Over and above this, the mentors provided mentorship remotely via Whatsapp to assist with any guidance needed regarding succulent plant cases.

Indicator 2.2 By end Year 2, as a pilot, five law enforcement analysts are trained on how to use FloraGuard technology as a tool to detect and investigate the illegal trade in succulent plants online. Recipients of the Floraguard training have been identified and these include data analysts from South Africa's DFFE Environmental Enforcement Fusion Centre and Namibia's Ministry of Environment, Forestry and Tourism's Intelligence and Investigation Unit (MEFT–IIU). Kew and the University of Southampton have continued to refine a package of software downloads and training materials for AI led online search techniques, to be used in this training, with a focus on simplifying the installation and operation procedures to make the software more appropriate for non-expert users (see Indicators 1.1 and 1.2 above, and Annex 16). While there is no baseline for this work using the current version of the software, similar training was previously conducted by Kew with three staff members from different organisations in South Africa, as part of the 2021 Darwin Initiative funded project *Uncovering the Illegal Trade in South African Succulents.* Building on this, within the current project, we aim to train a minimum of six enforcement personnel from three different organisations, with means of verification including recordings of online training sessions, demonstrations by the participants to successfully configure the crawler to training and real websites, a training feedback questionnaire and – most critically – updates from the teams trained regarding their use of FloraGuard in

practice, which will inform the next steps in the development and potential wider roll out of the technique.

Output 3: Internet companies are aware of their responsibility to police and deter illegal trade in succulent flora and adopt and implement effective monitoring frameworks.

The Project's collaboration with the Coalition to End Wildlife Trafficking Online has been crucial to our activities under this Output. The Coalition brings together companies from across the world in partnership with wildlife experts at WWF, TRAFFIC, and IFAW for an industry-wide approach. The Coalition has good working relationships with many eCommerce companies and supports them regularly by flagging online adverts of prohibited wildlife products to be removed. TRAFFIC attended the Coalition to End Wildlife Trafficking Online Convener's Meeting in September 2023 in Cambridge, UK (See Annex 4 Figures 11 and 12). The purpose of this meeting was to review the progress of the Coalition since its inception in 2017, review existing relationships with member companies and discuss a strategy for and the sustainability of the Coalition going forward. TRAFFIC presented on the proposed engagement on monitoring plants and seeds of priority succulents with a major eCommerce platform. The Coalition attendees agreed that plants should be included in monitoring going forward and that the engagement with a major platform involving the priority list of succulent plants might pave the way for how ecommerce companies do this. The Project and the Coalition identified eBay as the suitable platform and they have accepted our invitation to participate in this pilot engagement in Year 3. The engagement is further explained below under Indicator 3.2.

Indicator 3.1. Identification of strengths, weaknesses, and gaps in >15 online marketplaces' (e.g., eBay) current trading policies with regards to succulent flora.
TRAFFIC brought on an eCommerce consultant that (1) identified strengths, weaknesses, and gaps in current trading policies with regards to plants and seeds from over 50 ecommerce platforms/companies/online marketplaces and produced a report summarising the findings (Annex 11). Of these, only three had policies specific to plants and seeds, i.e. eBay, Etsy and Amazon. Refer to Annex 11 for further details.

Indicator 3.2. By end Year 3, a pilot study with a major e-commerce platform demonstrates successful interventions to identify and take appropriate actions against trade in illegally harvested succulent plants. TRAFFIC's eCommerce consultant and the project team at TRAFFIC and Kew drafted a "best version" internal-facing policy titled "Internal Policy for Monitoring Online Advertisements of Prohibited South African Succulent Plants and Seeds." This policy also contains a list of priority succulent plant taxa found in South Africa that are being traded online as well as any legal protections afforded to these through provincial ordinances, national acts and international treaties (Annex 12). In December 2023, the project team met with eBay's Prohibited and Restricted Items team, specifically their Global Regulatory Specialist and Global Regulatory Counsel. In February 2024, the project team shared the internal policy with eBay (Annex 12). The engagement commenced in Y2 and is detailed further in Annex 15.

Indicator 3.3. By end Year 3, based on the results of the pilot study, at least three internet marketplaces identified as being used to actively trade in suspected illegally harvested succulent flora have received succulent plant awareness material and draft succulent plant policies. Following our engagement with eBay and based on their initial feedback, we aim to refine our proposed trading policy document and share this with at least two other online trading platforms to widen our scope of engagement, during Y3 Q2.

Output 4. Development and testing of innovative tools and technology to improve and facilitate identification and intervention of illegally traded succulent flora. Due to delays to the transfer of plant material from South Africa to Kew during Year 1, the Activities under this

Output were delayed to Y2/Y3, but these activities are now underway and at various stages of progress.

Indicator 4.1. By mid-Year 3 identification of the species-specific chemical signatures, and most accurate testing loci based on a minimum of 50 samples across six *Conophytum* spp. processed. Using plant material of South African origin, Kew has developed a methodology to take samples from succulent plants and prepare these for laboratory analysis, to profile their stable isotope and trace element content. >150 samples from 61 plants (representing 8 different species of the same genus) have been taken, weighed and dried in preparation for sending to an external laboratory partner for analysis. Representing leaf, stem and root material drawn from 8 different species, this analysis should provide an overview of the "chemical signature" of wild South African *Conophytum* plants, within three different structures of the plant. We intend to deliver these samples to the laboratory in May 2024, with a maximum 90-day window for laboratory results to be returned. As these samples represent 3 different plant loci, we are on track to meet the objectives of Logframe Indicator 4.1 in terms of the number of samples processed (target 50) and number of plant loci evaluated (target 3), with the methodology we have developed helping to refine our approach to the methodology and sampling strategies required to fulfil Indicators 4.2 and 4.3. As a baseline to measure against, our work is based on previous work conducted in South Africa (Retief et al, 2014) which was successful in its analysis of 6 stable isotopes within Cycads, another type of non-timber plants (although not a succulent species). Engagement with experts in this field, including those involved in the World Forest ID programme, has been encouraging, and we expect the samples that we have prepared for laboratory analysis to yield interesting results, based on the analysis of 5 stable isotopes and a suite of trace elements and trace metals, which when combined should give a more granular indication of the organisms original geographic location. To evaluate the effects of planting wild plants into cultivation, all plants received have had a "Time Zero" sample taken representing their wild state, to which subsequent samples can be compared at intervals following the transfer of these specimens into a horticultural setting.

Indicator 4.2. By mid-Year 3, geographic maps and statistical plots based on the isotope/elemental profiles of 50 – 100 *Conophytum* samples from wild locations created and used to authenticate provenance of marketplace specimens. As detailed in our September 2023 change request, we have postponed plans for fieldwork to collect georeferenced samples from the field to Project Y3. This has provided more time to plan the optimum combination of species and collection localities, using the methodologies developed under Indicator 4.1 to inform our approach (for instance, enabling more accurate wet weight to dry weight ratios of plant material to be calculated). Detailed planning of this fieldwork is currently underway in collaboration with colleagues in South Africa and our Project Consultant, with an aim of conducting fieldwork in June 2024. Work to authenticate marketplace specimens can also be developed using results obtained under Indicator 4.1 above, with the chemical profiling of our first batch of plants enabling a direct comparison between wild and cultivated plants to be made. While there is no baseline for this technique for *Conophytum* species, we have discussed our sampling strategy in terms of species and geographic range with external experts, who are satisfied that our fieldwork would yield sufficient results to create an isoscape map capable of proving the validity of the technique.

Indicator 4.3. By end of Year 3, use of geographic maps produced in 4.2 to aid the reintroduction of confiscated material back to point of origin in the wild. This Indicator will be completed following the processing of field collected samples in the laboratory, expected in Y3 Q3. The correct geographic range and appropriate species for use in the study have been identified through conversations with Project Partners, to provide a clear objective for the fieldwork to achieve. While physical re-introductions may not be possible within the lifetime of the project, we will aim to demonstrate how the data acquired under Indicator 4.2 can be used to achieve this, and will at minimum work with project partners in South Africa to develop a workflow

for the sampling and testing of seized succulents specimens, for comparison with the isoscape maps that will have been created, as an aid to restoration work what may be possible using these plants or their seeds in the future.

Indicator 4.4. By mid-Year 3, isotope watering is demonstrated to be a viable technique of marking cultivated plants for traceability purposes. Based on trials with a minimum of 2 *Conophytum* spp. Following some delays to initiating this activity (please see Sept 2023 change request), a methodology has been developed, and plant specimens representing 5 different succulent species selected and donated from Kew's Living Collection for use in this experiment. Experimental treatments to harmlessly mark plants for traceability purposes were applied in December 2023 and will conclude after 12 months, with results obtained incrementally from the laboratory during Y3. As with the turnover study described in Indicator 4.1, Time-Zero samples have been taken before the isotope labelled marker was applied, as a means of comparison with subsequent samples that are drawn from the "marked" plants. Please see Annex 18 for further details.

Indicator 4.5 Delivery of outreach program to the enforcement sector and other relevant stakeholders, to communicate the technologies and their application to protect at risk species. Activities towards this Indicator have not yet commenced and will be informed by the results obtained under Indicators 4.1 to 4.4.

3.3 Progress towards the project Outcome

Project Outcome: The volume of illegal trade in succulent flora in South Africa and Namibia is reduced through empowerment and capacitation of law enforcement agencies and self-regulation by internet companies. The succulent poaching crisis continues to see high levels of succulent plants intercepted by South African enforcement agencies, with the range of plant groups targeted by poachers also continuing to expand. The ongoing scale of this issue, both on the ground in South Africa and online in many territories around the world, suggest this issue is likely to continue to threaten Southern African plant populations for the foreseeable future and far beyond the life of this project. However, we believe our Outcome Indicators remain suitable, and that we have made some good progress towards these overarching aims, with our interventions intended to set in motion long term and fundamental change to address the persistent threat to wild plant populations posed by the combined threats of poaching followed by use of the internet to profit from illegally harvested plants. To ensure and maximise the project's impact, follow up on our key Outputs beyond the life of the project will be required. However, we feel assured that this can be achieved, through the Project Partners continued interest in this field, and with the support of a broad network of stakeholders who are engaged with this topic, for instance through the IUCN Succulent Trade Task Force, of which project staff are members.

The Y1 Annual Report feedback highlighted that the Project could benefit from having more baseline data to refer to and measure impact by. In some areas of the project, due to the novelty of our interventions, baseline data is not always available, although where possible, we have added some information or data below that may act as a form of baseline measure and/or reflect the current knowledge base, to give a better indication of our Project Outputs' potential impacts. Despite some delays to several of our Activities, we are confident that the current staffing and timeframe arrangements agreed in our December 2023 Change Request will enable us to still fully achieve our intended Project Outcome during the year ahead.

0.1. By end Year 2, improved understanding of the illegal trade in succulent flora used to raise the profile of illegal plant trade with law enforcement agencies and to inform appropriate interventions. The trainings conducted under this Project as detailed under Output 2 has contributed some early success, as described in Section 3.2 Output 2 Indicator 2.1.1 above. However, even greater impact will be achieved following the publication and dissemination of our

Project Reports during Project Y3, and completion of the FloraGuard training for enforcement officials, described under Section 3.2 Indicator 2.2 above.

0.2. By end Year 3, 30% increase in the number of investigations/arrests related to illegal trade in succulent flora in South Africa and Namibia compared with 12-month period prior to start of project. In Y2, TRAFFIC collated information on 267 seizures involving illegally obtained succulent plants that took place between 2019 and 2022 in South Africa, of which a map was developed (see Annex 4 Figure 5). In April 2024, now Y3, TRAFFIC received an updated list of seizures/arrest. In 2020 (around 12 months prior to start of project), a total of 98 arrests/seizures involving succulent plants were reported for South Africa. The number of arrests/seizures since then are as follows: 282 in 2021, 193 in 2022, and 227 in 2023. These numbers exceed a 30% increase that was initially expected. The project likely made an impact to arrests/seizures made in 2023 as this is when the training occurred along with support to active cases with species valuations based on online adverts. We will continue to seek feedback from enforcement teams during Y3, while the Project will obtain the number of investigations started, as well as any arrests made, after the roll out of the training on FloraGuard in mid-Y3.

0.3. By end Year 2, a pilot study with a major eCommerce platform demonstrates successful interventions to identify and take appropriate actions against trade in illegally harvested succulent plants. Through collaboration with the Coalition to End Wildlife Trafficking Online, the project has entered a pilot engagement with eBay. The project team is gaining insights from this extremely positive collaboration which are proving invaluable in understanding the challenges to overcome, to help industry move towards the effective regulation of online trade in threatened plant species of all types.

0.4. By end Year 3, based on the results of the pilot study, at least three internet marketplaces identified as being used to actively trade in suspected illegally harvested succulent flora have received succulent plant awareness material and draft succulent plant policies. We have identified at least two further companies which we believe will be receptive to receiving and reviewing the recommendations for plant trading policies. In terms of baseline, while many platforms have a Terms of Use policy, we believe the development of flora-specific trade policies and the effective monitoring of compliance are likely to be the most detailed solutions yet proposed to eCommerce companies, with the resulting discussions, we believe, breaking new ground in an area where the challenges of regulating the trade in plants have prevented effective action being taken before.

0.5. By end Year 3 the role of laboratory techniques in authenticating plant species and provenance are tested as traceability tools in marketplace settings, presented as forensic evidence to law enforcement agencies, and used to enhance existing species reintroduction programmes. Following a delayed start, in collaboration with colleagues in South Africa and laboratory partners, work towards this objective is progressing well. We look forward to soon converting the samples that we have taken to date into data for analysis. In terms of baseline, as SIRA and trace element analysis are well established techniques, we will be able to evaluate the quality of our results and methodology through comparison with other established work using these techniques. However, as these techniques have not previously been trialled with succulent plants in this way, our work in this area involves considerable learning and adaptation, that we believe will make a valuable contribution to this field. One impact of the project we hope to achieve, is to sufficiently prove the value of the technique that the collection of samples within South Africa to contribute to an isotope and trace element reference database is of interest to South African conservation organisations to incorporate within their routine plant monitoring work. We also believe that our Outputs can help to advance the use of these techniques for enforcement purposes, highlighting that threatened plant species of all types can

benefit from the use of these techniques to enhance their traceability and deter illegal harvesting practices.

3.4 Monitoring of assumptions

Outcome: The volume of illegal trade in succulent flora in South Africa and Namibia is reduced through empowerment and capacitation of law enforcement agencies and self-regulation by internet companies.

Assumption 1: Covid-19 and political changes do not prevent partners from accessing sites in the field, target communities, training, and outreach events.
Comments: The project team continue to be vigilant and take sensible precautions in the build-up to these events, to minimise the risk of Covid-19 impacting project activities as far as possible.

Assumption 2: Industry stakeholders receptive to potential changes to the trading environment for threatened plants.
Comments: This assumption is still holds true, with our engagement with a major eCommerce company to discuss proposed changes to their trading policies with respect to succulent plants having been very positively received. These discussions and feedback from wider fora suggest the implementation of policies that reflect the complexity of online plant trade face considerable practical challenges, but we have been encouraged by the enthusiasm of the industry stakeholders we have engaged with, to learn more about plant trade and enter into open discussion about how these challenges might be addressed going forward.

Assumption 3: The use of stable isotopes and multi-elemental analysis is effective in authenticating non-timber plant provenance.
Comments: While we don't yet have results to prove this assumption, our work is based on previous work conducted in South Africa using Cycads (Retief et al, 2014) which was successful in its analysis of the chemical profile of non-timber plants. Engagement with experts in this field, including those involved in the World Forest ID programme, has been encouraging, and we expect the samples that we have prepared for laboratory analysis to yield interesting results.

Output 1: Greater understanding of trade dynamics informs law enforcement strategy and action.

Assumption 4: Websites and marketplaces allow searching by automated AI software.
Comments: Our workflow enables the application of the web crawler to open-source websites, using automated techniques that are increasingly recognised by a wide range of stakeholders engaged in the monitoring of online IWT. Additionally, we adhere to strict workflow protocols to ensure compliance with GDPR requirements, focusing strictly on data pertaining to patterns in plant trade.

Assumption 5: Fieldwork, interviews (in-person) and face-to-face meetings are allowed and not restricted due to Covid-19 or other external factors.
Comments: All fieldwork, interviews (in-person) and face-to-face meetings have gone ahead without any delays/cancellations due to Covid-19. As per assumption 1, reasonable precautions continue to be taken by the project team to minimise the potential impact of Covid-19 on project activities.

Assumption 6: Criminal records and court proceedings are accessible for analysis.
Comments: Aggregated data on court cases and seizures involving illegally acquired succulent plants are accessible however permission is required from the managing law enforcement agency. As shown under 3.2 Output 1 Indicator 1.3, this data was accessed with permission by TRAFFIC.

Assumption 7: Export data from various sources are available and accessible for analysis (e.g., nursery export data, etc.).
Comments: Some data sources accessed by TRAFFIC are open-source (i.e., CITES Trade Data). Others such as online catalogues for nurseries either require contacting the nursery for access to price lists or downloading the online shop. As shown under 3.2 Output 1 Indicator 1.3, various data sources were accessed by TRAFFIC.

Assumption 8: Stakeholders are able and willing to be interviewed.
Comments: As shown under 3.2 Output 1 Indicator 1.4, 24 stakeholders were willing and consented to being interviewed by TRAFFIC.

Assumption 9: Enforcement agencies in Namibia and South Africa are concerned about the illegal trade threatening endemic succulents.
Comments: Both countries are very concerned about this issue and have developed dedicated groups to deal with the succulent plant poaching crisis, i.e. the Protected Plants Task Team in Namibia and the implementing organizations of the National Response Strategy and Action Plan to Address the Illegal Trade in South African Succulent Flora.

Assumption 10: Enforcement agencies in Namibia and South Africa are able and willing to work with the project.
Comments: At the outset of the project, the assumption was made that enforcement agencies in Namibia and South Africa are able and willing to work with the project. As mentioned above, Namibia's Protected Plant Task Team has now taken over addressing illegal trade in succulent plants in the country. Namibian law enforcement is also not willing to share any information gathered on their trade in succulent plants with the Project but will share relevant information with South Africa law enforcement officials as and when necessary. Members of the task team have already completed interviews, an activity that TRAFFIC planned to do to provide knowledge on this trade to Namibian law enforcement. Given that this has already been done, the task team would prefer TRAFFIC to direct its efforts in supporting Namibian law enforcement with knowledge obtained from the analysis of online monitoring results and training on FloraGuard.

Output 2: Technical skills of law enforcement officers in identifying and intercepting illegally traded succulent plants are improved, supported by innovative technology.

Assumption 11: Enforcement agencies in Namibia and South Africa are concerned about the illegal trade threatening endemic succulents.
Comments: As mentioned under Assumption 9, enforcement agencies in both countries are very concerned about the succulent plant poaching crisis.

Assumption 12: Enforcement agencies in Namibia and South Africa are able and willing to work with the project.
Comments: South Africa has been very willing to work on this project, however as mentioned under Assumption 10, Namibian law enforcement is also not willing to share any information gathered on their trade in succulent plants with the Project but will share relevant information with South Africa law enforcement officials as and when necessary. The task team would prefer TRAFFIC to direct its efforts in supporting Namibian law enforcement with knowledge obtained from the analysis of online monitoring results and training on FloraGuard.

Output 3: Internet companies are aware of their responsibility to police and deter illegal trade in succulent flora and adopt and implement effective monitoring frameworks.

Assumption 13: Internet companies are aware of their responsibility to police and deter illegal trade in succulent flora and adopt and implement effective monitoring frameworks.

Comments: We believe this assumption remains true, although believe the challenges involved in regulating the trade in plants and differentiating between wild and cultivated specimens may be deterring wider action by the eCommerce sector. We believe our efforts to highlight the threat to plants posed by online trade, for instance through engagement with the Coalition to End Wildlife Trafficking Online, have helped to raise the profile of plant trade and the urgent need to find solutions for the challenges involved, and welcome the Coalition's suggestion to initially work with one eCommerce platform to hone ideas a approaches that could then potentially be deployed more widely in future.

Assumption 14: A major eCommerce platform is willing to enter into a pilot study, and trial interventions to counter illegal plant trade with their platform users.
Comments: We are in active discussion with a major eCommerce platform regarding potential updates to trading policies and interventions they could potentially trial. Their feedback regarding the current potential barriers to implementation is invaluable, and we look forward to continued discussions with them, to see what practical trial steps may be implementable within the life of the project, or if needs be, beyond.

Assumption 15: Legislation relating to online trading conditions does not restrict the scope of the interventions that can be trialled by individual eCommerce platforms.

Comments: Our discussions to date indicate, to the contrary, that the implementation of trading policies is not necessarily dependant on prevailing legislation, and instead to a large extent, is at the volition of online trading platforms. In devising interventions that could potentially be trialled, this is encouraging, although the practical considerations relating to the volume of online content that requires monitoring and interpretation by human analysts of course still present considerable challenges to overcome.

Output 4: Development and testing of innovative tools and technology to improve and facilitate identification and intervention of illegally traded succulent flora.

Assumption 18: Plant material is available and agreements for material transfer from South Africa to UK are in place to enable analysis of the full range of specimens as planned.
Comments: In Year 2, we received an initial batch of *Conophytum* specimens, donated by our project partners in South Africa. With their continued support and utilising similar permitting pathways, we anticipate the collection and transfer of further plant material to the UK for laboratory analysis in the first quarter of Year 3.

Assumption 19: Work in 4.1 and 4.2 can inform further work and mapping, noting prior work has demonstrated isotope discrimination in succulent plants and in timber species.
Comments: As we have not yet processed our samples within the laboratory or conducted our fieldwork to collect samples from wild plant populations, we cannot be sure of the Outcome of our objectives under indicator 4.1 and 4.2. A key step before departing for fieldwork will be to deliver our currently prepared samples to the laboratory for their assessment, so that any feedback can be applied to the collection of samples from wild populations in the field.

Assumption 20: Other challenges to reintroduction, such as plant health considerations, do not prevent implementation of 4.5 (noting that seeds harvested from confiscated plants can also be used in reintroduction programmes in the same way).
Comments: Here, we have learned that successful re-introductions of succulent plant species within South Africa require a number of logistical, practical and financial conditions to be met. An additional barrier is the fact that re-introduced plants would be at high risk of being poached again. As such, it is unlikely that a physical reintroduction of plants will be made during the life of the project. However, the reference data that we aim to produce has the potential to inform re-introductions long into the future, including through the use of seeds banked from seized

succulent plants, which could then be re-introduced to their correct locality in the wild, when conditions for the plant's long-term survival are more promising.

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

While this project does not directly contribute to poverty reduction, we believe it can be of help in indirect ways. Firstly, the project will empower and capacitate enforcement personnel to tackle the illegal trade in succulent flora, reducing illegal harvesting and helping to protect local communities from exploitation by syndicates. This will aid in the prevention of criminal activities by community members, and the economic impact that fines and criminal records can have on individuals and their households.

In general terms, reduced poaching activity and increased protection for wild populations of succulent plants would help create the conditions in which conservation initiatives based on the creation of a formal economy for succulent plants can succeed. These initiatives were discussed at a workshop titled "Towards developing a formal economy around South Africa's succulent flora" for relevant stakeholders in January 2024 (Annex 4 Figure 16 and Annex 14), attended by TRAFFIC's Project Manager and Project Supervisor, with improved understanding of the illegal trade in succulent plants that we are formulating under Output 1, improvements to the online trading landscape that we are working towards under Output 3, and the development of traceability systems that could be applied to nursery grown plants under Output 4, all able to contribute to this long term national objective, which is described in Section 7 of South Africa's National Strategy and Action plan.

Our combined project outputs therefore align with these objectives that could help to address plant conservation and reduce poverty within some communities in this way, two objectives that would both be well supported by well-regulated online markets for succulent plants, in which consumers can readily differentiate sustainable products originating from Southern Africa.

4. Thematic focus

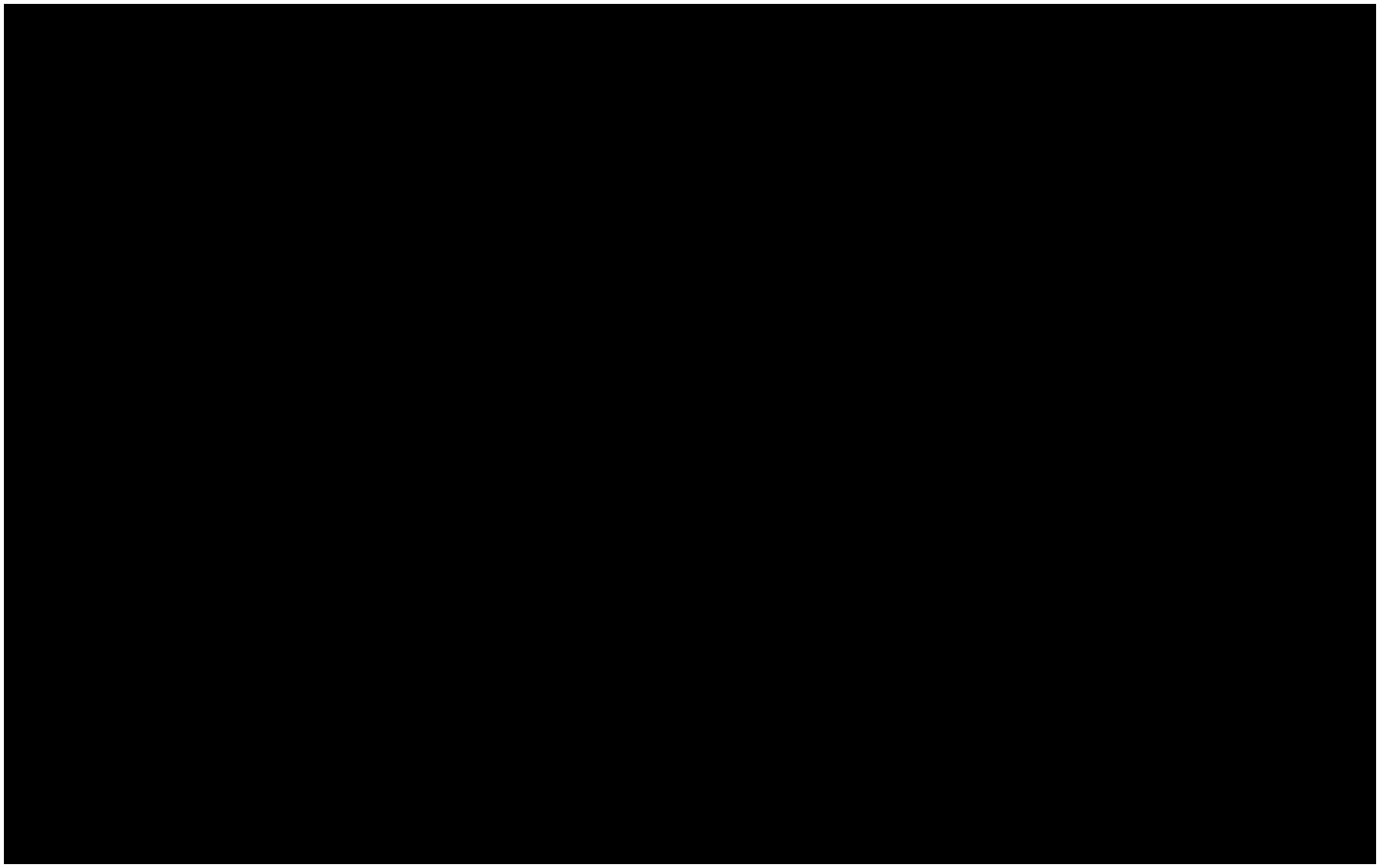
The project is directly working to support two of the project themes (E*nsuring effective legal frameworks and deterrents* and *Strengthening law enforcement*) with the potential offer indirect support to the other two (*Reducing demand for IWT products* and *Developing sustainable livelihoods to benefit people directly affected by IWT*).

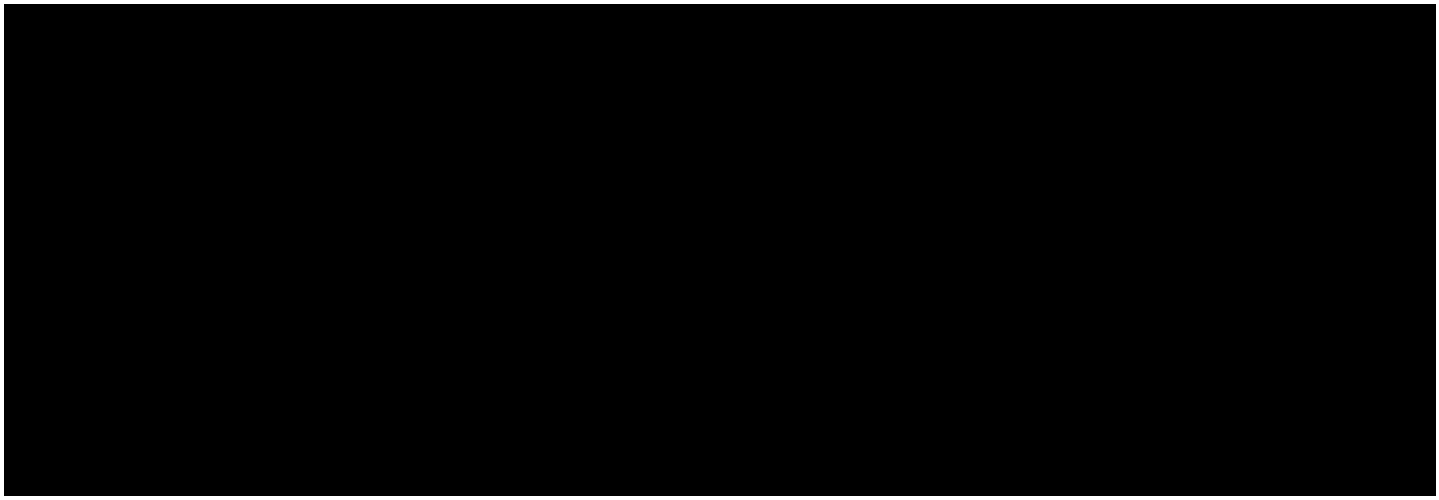
Strengthening law enforcement: Our research into the illegal trade dynamics of succulent plants in Southern Africa will inform law enforcement officials and may be used to support investigations. The enhancements in technical capabilities to junior EMIs and law enforcement analysts achieved under Output 2 will strengthen the ability of enforcement teams to detect, intercept and address indicators of illegal trade, and to conduct effective monitoring of online trade activity. These activities will directly support the theme of strengthening law enforcement. Additionally, the development of provenance testing tools under Output 4 are designed with future enforcement capabilities in mind. Reference databases of chemical signatures for timber species are being developed apace, and we believe our work can provide a foundation for similar databases to be developed for non-timber plants at risk of illegal collection in the wild, as an aid to enforcement and to act as a deterrent to the laundering of wild sourced plants into trade, by illegal vendors mis-declaring them as cultivated specimens.

Ensuring effective legal frameworks and deterrents: The provision of policies and frameworks to eCommerce companies under Output 3 will not only create awareness among eCommerce monitors that the trade in online flora can be illegal and that harvesting of wild populations to supply this trade is detrimental to these populations, but will also enable them to inform sellers posting adverts containing succulent plants for sale that certain plants are protected and are therefore prohibited from being sold on their platform. These activities will ensure that frameworks to monitor and remove the illegal sale of ornamental succulent plants online are effective and that sellers are deterred from exploiting online platforms for this purpose.

Reducing demand for IWT products: This theme could potentially be supported through our engagement with eCommerce companies under Output 3. One of our currently agreed areas of discussion is the creation of outreach materials to help inform customers using this online platform about responsible plant purchases, which may help to reduce the demand for wild sourced plants, albeit through raising awareness, rather than more specific behaviour change interventions.

Developing sustainable livelihoods to benefit people directly affected by IWT: While the project does not involve the development of sustainable livelihoods, a potential application of our work under Output 4 (Activity 4.4) is the creation of a cost-effective traceability marker that could potentially be applied to succulent plants to aid their traceability in marketplace settings. As a novel addition to a certification scheme, this could therefore help to support the creation of a formal economy for succulent plants, which is an ongoing consideration within South Africa at present.





6. Project support for multidimensional poverty reduction

As described under 3.5, this project does not intend to alleviate poverty directly, but our combined project outputs will help to create the conditions to support future livelihood interventions, helping to address poverty reduction in the long-term.

7. Gender Equality and Social Inclusion (GESI)

The Project Team commits to taking the GESI into account going forward as much of the project was designed prior to its inclusion. The Project Team endeavours to ensure meaningful participation of women and marginalised groups where possible. For example, out of the 23 EMIs that received the succulent training, there were 16 males and 7 females. Unfortunately, in South Africa, law enforcement is male dominant and therefore selecting LE participants is largely out of our hands. However, we will encourage agencies to nominate appropriate staff members for the Floraguard training coming up in Y3.

Please quantify the proportion of women on the Project Board[1].	50% (two of four), one female and one male from TRAFFIC; likewise, one female and one male from KEW.
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].	Kew's immediate project team is male led (one male) although the wider internal governance team that the project reports to is 80% female, while Kew's executive board is 50% female. 50% - TRAFFIC's immediate project team is female led (one female, one male).

GESI Scale	Description	Put X where you think your project is on the scale
Not yet sensitive	The GESI context may have been considered but the project isn't quite meeting the requirements of a 'sensitive' approach	
Sensitive	The GESI context has been considered and project activities take this into account in their design and implementation. The project addresses basic needs and vulnerabilities of women and marginalised groups and the project will not contribute to or create further inequalities.	X
Empowering	The project has all the characteristics of a 'sensitive' approach whilst also increasing equal access to assets, resources and capabilities for women and marginalised groups	
Transformative	The project has all the characteristics of an 'empowering' approach whilst also addressing unequal power relationships and seeking institutional and societal change	

[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.

8. Monitoring and evaluation

Kew and TRAFFIC are in regular communication and meet regularly to ensure that all parties are kept up to date with progress on all activities. We are also in regular communication with all key stakeholders who are supporting the project to share updates on progress, through a variety of communication channels.

During the course of Y2, it was also necessary to evaluate our progress and the impact of several challenging situations, including the change in role of the previous Project Leader to become a Project Consultant, and the departure of Kew's previous project officer from the role which left a temporary staffing shortage leading to delays with several of our deliverables under Outputs 1 and 4. Additionally, due to logistical constraints, we were also forced to change laboratories for the execution of plant analysis work under Output 4 and while this transition has been smooth, it has necessitated some duplication of work towards contracts and the formulation of work plans etc.

As we begin to generate more results in Y2, monitoring of progress against Logframe indicators will become more quantified and provide a greater range of measures to inform Kew and TRAFFIC's internal project review processes.

The December 2022 Change Request provided an opportunity to thoroughly review our progress and the suitability of our indicators, some of which were updated and adapted following engagement with and feedback from key stakeholders during Y1.

Aside from these specific areas of focus, a number of other monitoring and evaluation processes are in place. These include the monitoring of work in Namibia which was conducted using the Terms of Reference of the consultancy agreement in place. The EMI training programme is an established national programme in South Africa and has proven M&E processes. Our agreements with laboratory partners and project consultants include agreed work plans, with a degree of flexibility acknowledged within these contracts, reflecting the highly experimental nature of our research. The project is also informed by TRAFFIC and Kew's internal Process Risk and Controls (PRC) processes for the overall management of the project.

9. Lessons learnt

The second year of the project (months 9 to 21), have involved both exciting progress, and in some cases, delays, which have required the postponement of plans. While these delays have been frustrating, we have managed to keep options to achieve our Logframe objectives open, and with the support of our project partners, are confident of reaching these goals during the year ahead. Some key lessons to highlight range from logistical considerations, to insights and learning that we have encountered during the course of our work:

- Due to a member of staff leaving the project in November 2023, the impact of staff shortages on Kew's side of the project has had a significant impact on the timing of the execution of work under Output 1 Indicator 1.1, Output 4, and Output 2, Indicator 2,2. When submitting our December 2023 Change Request which highlighted the delays to Output 4, it may have been possible to better predict the delays to these other outputs, where the staff shortage has also been keenly felt. By delaying re-recruitment until Y3, however, has provided an opportunity to create a full time Project Officer post for the remainder of the Project, which means resources will be maximised in the year ahead, and we are very grateful for the granting of our December 2023 Change request in order to achieve this. The new Project Officer has been in post since 22 April 2024, and is having an immediate impact on our capacity to work towards our key Logframe objectives (Please see Annex 20).
- The timeframe for delivering change within industry sector may prove to be longer than anticipated. While we are still very much aiming for practical interventions to be enacted by eCommerce industry stakeholders within the life of the project, our fruitful and very positive engagement has highlighted the practical challenges involved in undertaking what we feel are some otherwise desirable steps, such as greater engagement with

vendors around the sale of ornamental plant products. Gaining such feedback through open and honest discussion though is proving to be an invaluable result of this work in itself, although we appreciate that to make interventions that are robust and permanent, means preparing the ground extremely thoroughly, which we will continue to strive to do.

- A practical consideration around Output 4 has been the selection of small species for use in this work. The diminutive size of *Conophytum* spp. and the high degree of water retention by succulents, means thafigut to achieve a minimum dry weight sample size, the plants do not sustain as many repeat samples as originally anticipated. We have therefore had to adjust our sampling strategy accordingly, although while we will have fewer data points, we will still be able to cover the key milestones of plant growth, to prove our Logframe objectives. It's fair to say though that this highly experimental work would have been made easier through the use of larger bodied plant species!
- TRAFFIC's longstanding engagement with South Africa's law enforcement has worked well for the data collection component of the Project. Law enforcement in the EC, WC and NC provinces have been willing to meet with and be interviewed by TRAFFIC as well as share data with TRAFFIC.

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

Thank you for the feedback in our Year 1 Report, which we have addressed within the following sections of the present Year 2 Report as follows, along with directly addressing the Reviewer's other comments and feedback below:

1. **Further reflection on the effectiveness of partnerships should be provided:** See section 2 on Project stakeholders/ partners.
2. **A full interrogation of project assumptions should be provided:** See section 3.4 on Monitoring of assumptions.
3. **Baseline data should be measured and formalised for at least the Outcome indicators:** See section 3.2 Indicators 2.2, 1.3, 4.1 to 4.4 and section 3.3. 0.0.2.
4. **Greater exploration of the indirect impact on reducing poverty would be beneficial:** See section 3.5 on Impact: achievement of positive impact on illegal wildlife trade and poverty reduction.
5. **The gender balance figures for partner organisations should be confirmed:** See section 7 on Gender Equality and Social Inclusion (GESI).
6. **Several suggestions to improve logframe indicators have been included within the Annual Report Review (ARR):**

Reviewer comment: It is unclear to the reviewer whether NBRI is potentially causing duplication in these field trips, or if their work is what TRAFFIC is being asked to avoid duplication with.
Feedback: NBRI is a member of Namibia's Protected Plants Task Team. The two field trips and report that they completed was not a duplication of any activities under the PPTT's action plan. This contributed to the PPTT's understanding of succulent plant species and sites in Namibia. Namibia asked TRAFFIC not to duplicate the interviews with Namibian stakeholders that had already been completed by the PPTT. The indicators for NBRI's component were for two field trips to three national parks. Two national parks were visited during Field Trip 1 and one national park was visited during Field Trip 2.

Reviewer comment: The final Output 1 indicator is to produce a report with findings of the investigatory work.
Feedback: This was changed to *reports* in the September 2022 Change Request. Given the delays experienced with Floraguard, it was decided that data collected under Indicators 1.1 and 1.2 would form one report, while data collected by TRAFFIC under Indicators 1.3, 1.4 and 1.5 would form a second report, this of which could be published sooner.

Reviewer comment: The activities under Output 3 are slightly unclear in terms of presentation – the reviewer assumes based on the logframe that Output 3 has two activities, with the second

covering three Output indicators, in which case the reviewer would advise changing the numbering.
Feedback: The two activities have now been split into 3 activities in line with the three output indicators as follows:
3.1 Evaluation of online trading policies to identify gaps or weaknesses relating to the trade in succulent flora.
3.2. Develop a “best version” internal-facing policy that can be shared with eCommerce platforms for review, discussion and customization.
3.3. Engage with Internet companies directly and in collaboration with the Coalition to End Wildlife Trafficking Online, by sharing the internal-facing policy with them. Commence an engagement with one of these eCommerce platforms to work towards restricting illegal trade of succulent plants on their platform.

Reviewer Comment: Missing baseline data for indicators.
Feedback: Ways to procure baseline data as well as actual baseline data has been added to Annex 1 and within Section 3.2.

Reviewer comment: The AR reports confidence that this will be achieved but there is limited description as to how, except noting the ongoing legal consultancy agreement. Given the eCommerce platforms referenced in the report are private companies, the AR would benefit from more exploration of how the project will secure the participation, particularly given the project is asking these companies to adopt new policies.
Feedback: Even though the internet marketplaces are private companies, they are all members of the Coalition. The Coalition’s Account Managers for these Companies will introduce the project team to the company representatives and encourage a meeting between the project and the companies, after which policies will be shared. It is through these relationships that the Coalition has built that the project will leverage which will ensure greater success in engaging with these companies going forward.

Reviewer comment: There is no clear baseline set for [Indicator 0.1] and the reviewer is unclear how this will be measured in the future – the contributing outputs (trainings conducted) can be measured but it would be useful to set out the approach to measuring the resulting change in knowledge.
Feedback: Please see some additional details to address this point under Section 3.2 Indicator 2.2 and Section 3.3 Outcome 0.1 above.

Reviewer comment: The final indicator relates to the laboratory techniques for authenticating plant species, which has been delayed. The indicator does not have a measurable target or baseline, which should be introduced for clarity in future reporting.
Feedback: Please see the additional details added to Section 3.1 Indicators 4.1 to 4.4, to help address this point. While there are no baseline measures for these experiments, our results will be based on the analysis of 5 stable isotopes and a suite of trace elements and trace metals within the plant tissues. Where necessary, a “time zero” sample to record the plants condition at the outset of the experiment has been taken, in order for the degree of change caused by planting into cultivation, or the application of an isotope marker, to be measured and quantified.

11. Risk Management

Please see the risk register for other risks and adaptations, which will be submitted along with this Annual report. While no new risks have been identified, a number of updates to the register have been made, with details of one resolved issue also added.

12. Sustainability and legacy

We believe that the project has achieved a good visibility within South Africa and Namibia, with plenty of potential for this work to provide the foundations for future initiatives based on each of our four main Outputs.

1. Greater understanding of trade dynamics informs law enforcement strategy and action: Law enforcement in South Africa and Namibia have expressed their need to obtain a better understanding of the current dynamics on the illegal trade in succulent plants as well as how to navigate online platforms trading in succulent plants originating from their countries. This includes analysing data and presenting metrics on species and prices from adverts that they suspect are not compliant with legislation. The sheer volume of adverts and platforms is simply too vast for them to analyse manually so they acknowledge that the training on Floraguard for their analysts is a vital skill that is currently absent. They have already nominated LE analysts for this training and are looking forward to the publication of research results. Any data collected that is open-source (online news articles, etc) is made available on TRAFFIC's Wildlife Trade Portal where any person or organization can access these. Unfortunately, any data that is obtained with permission from an LE agency cannot be made available to the public without express permission from that agency.

2. Technical skills of law enforcement officers in identifying and intercepting illegally traded succulent plants are improved, supported by innovative technology: The training provided to EMIs under Indicator 2.1 has already proved effective. The sharing of materials with other agencies for further training, such as CapeNature, supported the successful apprehension of plant poaching suspects. We believe the technical skills and increased awareness of plant crime by enforcement officials will have a lasting impact, buoyed by this early success. The technical tools for online monitoring that will be provided under Indicator 2.2 should have some short to medium term impact, by allowing the more efficient monitoring of online trade by enforcement officials within South Africa. A longer-term solution would require the provision of more consistent technical support, but the feedback that these teams are able to provide us with regarding their use of the tools will be invaluable and could provide the motivation for future funding bids aimed at making the deployment of these tools of more widespread and routine use.

3. Internet companies are aware of their responsibility to police and deter illegal trade in succulent flora and adopt and implement effective monitoring frameworks: Our outputs relating to work with the Coalition to End Wildlife Trafficking Online and eBay, are intended to initiate fundamental changes to the online trading policies of online marketplaces with respect to succulent and other endangered flora. As this aspect of the study breaks new ground, it remains difficult to predict how these changes will manifest and over what timeframe, but we will continue to aim for tangible changes to the trading conditions applied to South African succulent plants within the lifetime of the project, which could then act as a blueprint for others in the eCommerce sector to potentially follow suit.

4. Development and testing of innovative tools and technology to improve and facilitate identification and intervention of illegally traded succulent flora: Our work under Output 4 has recieved much attention and support from colleagues in South Africa. This builds on work previously conducted within South Africa focused on Cycads, with teams in South Africa following up on this work in contact with the Project team, and keen to find synergies between these initiatives, which we believe is possible and will actively try to establish. Should the results of the Output prove to be clear, replicable and scalable as we expect, a principle aim is for this study to drive interest in these techniques, leading to the creation of a reference database for stable isotopes and trace elements, for succulent plants within South Africa. Future iterations of this study could potentially be fully conducted within South Africa, with the learning and initial results we can provide helping to inform this potential future development. Introducing plant sampling for this aim to other routine plant monitoring work is one potential vision for the future, enabling a large reference database to be established over time, with potential applications to support law enforcement cases, and to aid the reintroduction of seized plants or their seeds to the correct locality in the wild, when such programmes are eventually established.

Other Sustainability and Legacy Avenues:

More generally, our results and outputs will also help to inform the South African National Response Strategy, which continues to be actively evaluated, and may lead to future

collaborations with other organisations focusing their attentions on plant poaching within Southern Africa, with multidisciplinary approaches likely to continue to be required.

Additionally, and while no plans have yet been made, the concept of a Global Succulent Trade side event for CITES CoP20 has been raised within IUCN Succulents Task force meetings, which may provide an opportunity for the project's results to be shared with CITES practitioners at CoP, which is expected to take place in the latter half of 2025.

13. IWT Challenge Fund identity

During Y2, the project has been recognized and publicised in a number of ways and at a number of specialist events and fora attended by members of the project team. In each case, the support of the UK Government through the Illegal Wildlife Trade Challenge fund is acknowledged both verbally, and through use of the IWTCF logo, as a distinct project with a clear identity. The project is referred to as the "Harnessing technology to end the illegal trade in succulent plants" and has dedicated webpages on both Kew and TRAFFIC's websites.

Most stakeholders working on South Africa's National Response Strategy are aware of the IWT Challenge Fund and the fact that Kew and TRAFFIC's project is funded by this. Some stakeholders have applied for funding by the IWT Challenge Fund before or intend to in the future. It is a well-known source of funding in this sector.

Examples include:

On 16 May 2023, TRAFFIC shared a post to all its social media platforms (X(Twitter)/Instagram) creating awareness on the illegal succulent trade. In each case, the IWT Challenge Fund/Biodiversity Challenge Funds was acknowledged and/or tagged. (See Annex 4 Figure 13).

In June 2023, TRAFFIC and Kew were invited to present on the project at a side event at the 26th meeting of the CITES Plants Committee. The side event highlighted the crisis that illegal harvesting is causing to South Africa's endemic succulent flora and how the country's national strategy and response plan is working to curb this. Photos of the event were posted on TRAFFIC's social media page with this tagline: "*This project is funded by the UK Government's Illegal Wildlife Trade Challenge Fund - Biodiversity Challenge Funds"* with an embedded link to the Biodiversity Challenge Funds Facebook page (See Annex 4 Figure 14a).

In September 2023, TRAFFIC posted photos of the EMI trainings on their social media profiles and tagged the Biodiversity Challenge Fund social media profile (See Annex 4 Figure 14b).

In October 2023, members of the project team attended the Arid Zone Ecology Forum (AZEF) in Graaf Reinet in South Africa and delivered a keynote speech based on project work (See Annex 4 Figure 3 for photographs and Annex 7 for AZEF presentations).

On 10 January 2024, TRAFFIC published a blog called "How can you ensure your online plant purchases are ethical, legal, and sustainable?" providing guidance to consumers on purchasing plants online (Annex 13). The IWT Challenge Fund was mentioned in the footnote below the article. The blog was published on TRAFFIC's social media platforms as well and was re-shared for Valentine's Day (Annex 4 Figure 15). Kew also re-shared the post on its social media channels, where it was seen 5129 times and 117 people engaged with it in some way (likes, retweets, clicking the link etc.). Specifically, it received 21 retweets and 56 likes.

Additionally, the IWT Challenge Fund logo has been used on the project's dedicated webpages on both Kew and TRAFFIC's websites, as well as within all presentations delivered to various stakeholders.

14. Safeguarding

Has your Safeguarding Policy been updated in the past 12 months?		Yes/**No**
Have any concerns been reported in the past 12 months		Yes/**No**
Does your project have a Safeguarding focal point?	**Yes**/No Kew Project Focal Point - David [redacted] – [redacted] Kew also has designated safeguarding Leads, with Elizabeth [redacted] the safeguarding lead for Science and International. [redacted] TRAFFIC: Saheed [redacted] (TRAFFIC's new Chief Operating Officer) has become the focal point for donors regarding safeguarding	
Has the focal point attended any formal training in the last 12 months?	**Yes**/No Kew: David [redacted] attended a one day fieldwork safety training course in July 2023, and completed Kew's mandatory safeguarding training in November 2023. TRAFFIC: TRAFFIC's Project Manager completed an online course called *Introduction to Social Safeguards* provided for free by the Capacity for Conservation Learning Hub	
What proportion (and number) of project staff have received formal training on Safeguarding? Kew = Safeguarding training is mandatory for all staff. TRAFFIC = All new staff attend a presentation called 'Protecting People and the Organisation' as part of their induction. More established staff have the option to attend. It covers TRAFFIC's risk management framework, including safeguarding and human rights.		Kew: Past: **100%** [5] Planned: **100%** [2] TRAFFIC: Past: **0%** [0] Planned: **50%** [2]
Has there been any lessons learnt or challenges on Safeguarding in the past 12 months? Please ensure no sensitive data is included within responses. Kew – none in relation to the Project. TRAFFIC has a safeguarding statement which is published on the website here: Our Policies - TRAFFIC - The Wildlife Trade monitoring network. It is currently being reviewed along with the introduction of a new SEAH (Sexual Exploitation and Harassment Policy). Following a discussion in April 2024 between TRAFFIC and the Safeguarding Manager at NIRAS (the DEFRA administrators), feedback from NIRAS was provided on the new SEAH policy.		
Does the project have any developments or activities planned around Safeguarding in the coming 12 months? If so please specify. Kew are planning to run first aid and fieldwork safety courses this year, which the project staff plan to attend, although the dates for these courses are currently TBC.		
Please describe any community sensitisation that has taken place over the past 12 months; include topics covered and number of participants. N/A		
Have there been any concerns around Health, Safety and Security of your project over the past year? If yes, please outline how this was resolved: Given the close collaboration with law enforcement in South Africa, it come to the attention of the team that a major concern is intimidation and corruption and this is a major challenge for law enforcement officials to combat the illegal succulent trade. Any instances of suspected intimidation and corruption were escalated to relevant parties and are being dealt with accordingly. Kew staff travelling to South Africa complete a detailed risk assessment to understand the risks of travel, including consulting the latest FCDO and CHUBB advice. In country travel is conducted with extreme care, with accommodation, mode and time of transportation carefully considered at all times. A similar risk assessment will be conducted prior to commencing fieldwork in Project Y3.		

15. Project expenditure

Please see below a summary of our Project Expenditure for Y2. Please note these are DRAFT indicative figures at this stage, with some additional costs still to be processed. The delays to certain project activities were highlighted in our December 2023 Change Request, although at that stage some uncertainty remained regarding the progress we would make towards some of our objectives associated with this output, such as fieldwork, which has resulted in some underspend in some areas. As there is a degree of flexibility with our laboratory processing costs which will depend on evolving sampling and sample processing strategies, we anticipate being able to rebalance these consultancy inputs within Y3, to overall achieve the originally intended balance of consultancy inputs to the project.

Table 1: Project expenditure during the reporting period (April 2023-March 2024)

Project spend (indicative) since last Annual Report	2023/24 Grant (£)	2023/24 Total actual IWT Costs (£)	Variance %	Comments (please explain significant variances)
Staff costs (see below)	[redacted]			
Consultancy costs				Underspend due to: i. delays to fieldwork and difficulties in arranging payment for fieldwork fixer in South Africa; ii. aspects of Output 4 being delayed leading to less consultancy work with the Project Consultant than anticipated at this stage iii. Delays to the delivery of Floraguard training under Indicator 2.2, which has resulted in underspend of funds for the criminology consultant (Anita [redacted]) which we plan to address when this training is delivered in Y3.
Overhead Costs				
Travel and subsistence				
Operating Costs				Underspend due to less requirement for courier fees due to delays to sample processing under Output 4.
Capital items (see below)				
Others (see below)				
TOTAL	198,677.42	194,433.27		

Table 2: Project mobilised or matched funding during the reporting period (1 April 2023 – 31 March 2024)

Kew: Due to delays to the processing of samples at the laboratory Under Output 4, match funding relating to expertise required to interpret laboratory results will move from FY1/2 to FY3 in line with the agreed Change Request. Match funding has also been provided by Kew during Y2 to cover staff cost overage (£921.61) and to add to the Travel and Subsistence budget (£2,413.52) to enable the Project Leader to attend the Arid Zone Ecology Forum Conference in South Africa, in October 2023.

TRAFFIC: During Y2, TRAFFIC has completed their allocated match funding spend for the project, through contributions to staff costs from ReTTA (GBP 5,864.07); the consultancy for the plant mentor/EMI trainer (GBP 4,000); and the workshop for Activity 1.1.4 (GBP 6,000).

	Secured to date	Expected by end of project	Sources
Matched funding leveraged by the partners to deliver the project (£)	[redacted]		Kew: [redacted] (through access to expertise for laboratory results and other in-kind support, staff costs/overheads, IT equipment). TRAFFIC: [redacted] through the `Reducing Trade Threats to Africa's Wild Species and Ecosystems' project funded by Arcadia; [redacted] through the `Development of a Comprehensive Mentoring Programme for Junior Wildlife Investigators in South Africa' project funded by United States Department of State – Bureau of International Narcotics and Law Enforcement Affairs).
Total additional finance mobilised for new activities occurring outside of the project, building on evidence, best practices and the project (£)	[redacted]		Kew provided [redacted] in match funding to enable the Project Leader to attend the AZEF Conference in South Africa, in October 2023.

16. Other comments on progress not covered elsewhere

None.

17. OPTIONAL: Outstanding achievements or progress of your project so far (300-400 words maximum). This section may be used for publicity purposes.

File Type (Image / Video / Graphic)	File Name or File Location	Caption including description, country and credit	Social media accounts and websites to be tagged (leave blank if none)	Consent of subjects received (delete as necessary)
				Yes / No
				Yes / No
				Yes / No
				Yes / No
				Yes / No

Annex 1: Report of progress and achievements against logframe for Financial Year 2023-2024

Project summary	Progress and Achievements April 2023 - March 2024	Actions required/planned for next period
Impact: *Illegal harvesting of wild populations of protected succulent plant species is reduced, supporting restoration efforts and the long-term recovery of these species in the wild.*	As many of the Project's impacts will depend on the final Project Outputs, it is difficult to assess our impact at this stage, although we continue to experience great interest and support for the project from external stakeholders, with the development of these relationships paving the way towards a greater project impact when we are in a position to share our results and findings in full. One area where we have achieved a more immediate impact is through the training of enforcement personnel in South Africa under Indicator 2.1, where the training and wider dissemination of training materials has improved the capabilities of enforcement teams with respect to plant crime, which we believe has provided timely support at a time when the number of plant poachers successfully apprehended is increasing.	
Outcome The volume of illegal trade in succulent flora in South Africa and Namibia is reduced through empowerment and capacitation of law enforcement agencies and self-regulation by internet companies.		
Outcome indicator 0.1. By end Year 2, improved understanding of the illegal trade in succulent flora used to raise the profile of illegal plant trade with law enforcement agencies and to inform appropriate interventions.	The creation and sharing of the one-day training curriculum and printed material with various agencies across South Africa has led to improved understanding of the illegal trade in succulent flora with law enforcement agencies. Evidence provided in Section 3.2 Output 2 Indicator 2.1.1. In preparation for Indicator 2.2, the FloraGuiard software and method of installation has been enhanced (Indicator 1.2). To procure baseline data, LE analysts attending the Floraguard training will be asked to demonstrate competence in the configuration of FloraGuard to websites, complete a post-training questionnaire, and will also be asked to report back on the use of FloraGuard in their ongoing work.	Recruit Computer Science consultant, provisioned for in the Dec 2023 Change Request. Complete training for analysts from Namibia's MEFT IIU and South Africa's DFFE EEFC on FloraGuard (Indicator 2.2). Share finalized reports with LE and relevant stakeholders, i.e. the Protected Plants Task Team in Namibia and the implementing organizations of the National Response Strategy and Action Plan to Address the Illegal Trade in South African Succulent Flora.

Outcome indicator 0.2. By end Year 3, 30% increase in the number of investigations/ arrests related to illegal trade in succulent flora in South Africa and Namibia compared with 12-month period prior to start of project.	In 2020 (around 12 months prior to start of project), a total of 98 arrests/seizures involving succulent plants were reported for South Africa. The number of arrests/seizures since then are as follows: 282 in 2021, 193 in 2022, and 227 in 2023. These numbers exceed a 30% increase that was initially expected. Evidence provided in Section 3.3 Outcome Indicator 0.2.	In 2024 so far, 40 arrests/seizures involving succulent plants have been reported for South Africa. By end Y3, the final number will be known. Efforts will be made to obtain similar information for Namibia.
Outcome indicator 0.3. By end Year 3, a pilot study with a major eCommerce platform demonstrates successful interventions to identify and take appropriate actions against trade in illegally harvested succulent plants.	A pilot engagement with eBay is underway. Evidence is provided through email communication between eBay, TRAFFIC and Kew. Annex 15 reflects action items agreed to by the team.	During Y3, the project team aims to complete the action items described in Annex 15.
Outcome indicator 0.4. By end Year 3, based on the results of the pilot study, at least three internet marketplaces identified as being used to actively trade in suspected illegally harvested succulent flora have received succulent plant awareness material and draft succulent plant policies.	Internet marketplaces were identified in Y2.	During Y3, meetings with at least three internet marketplaces identified as being used to actively trade in suspected illegally harvested succulent flora will be convened.
Outcome indicator 0.5. By end Year 3 the role of laboratory techniques in authenticating plant species and provenance are tested as traceability tools in marketplace settings, presented as forensic evidence to law enforcement agencies, and used to enhance existing species reintroduction programmes.	Plant material for initial sampling has been transferred from South Africa to Kew. With the help of Kew's horticultural team, these plants have been successfully maintained within Kew's Quarantine House, with >150 samples drawn for initial laboratory processing, including "time zero" samples taken when the plants arrived, to compare subsequent change of state within the plant's tissues to. An experiment to mark succulent plants with a harmless, invisible tracer have also commenced. Fieldwork to collect georeferenced samples from wild populations of succulent plants within South Africa is in the final stages of planning. In total, we anticipate sending >400 samples to the laboratory for processing, with sub-samples drawn from these for isotope and trace element analysis.	Complete the processing (milling) of samples and deliver to the laboratory for processing. Conduct fieldwork to collect georeferenced samples from wild populations of succulent plants within South Africa and complete analysis of laboratory results for publication in scientific journals. Continue to maintain and draw samples from plants involved in experimental work under Indicator 4.1 and 4.4.

		Disseminate results under Indicator 4.5.
Output 1. Greater understanding of trade dynamics informs law enforcement strategy and action		
Output indicator 1.1. By end Year 1, use of an AI led methodology for web crawling (FloraGuard), aids the identification and trade profiling of priority species, traded on ≥ 30 eCommerce marketplace platforms and ≥ 20 online forums relating to relevant horticulture and trade.	A Computer Science intern from the University of Southampton has made further improvements to the functionality of the web crawler which is ready to be deployed for live data capture. While this was intended to commence in Y2, a staffing shortage has caused further delays to this data capture and analysis.	Following the recruitment of a Project Officer in late April 2024, the web crawler will be deployed for data capture and analysis to meet or surpass our Logframe objectives across the course of this year. Disseminate the results in a report under Indicator 1.6.
Output indicator 1.2. By end of Year 2 the ease and scope of applying the FloraGuard web crawler is enhanced due to functional enhancements made to AI algorithms.	Improvements to the crawler include to the operational interface for user-friendliness, and the creation of new installation guides and training materials, to allow for simpler installation and less support from IT specialists.	None.
Output indicator 1.3. By end Year 1, trade data secured from complementary sources (CITES data, nurseries, court cases - to the extent these are available for Namibia) to further determine source, routes, pricing, and destinations for South African and Namibian succulent flora.	TRAFFIC collected and analysed the following data in Year 2: CITES Trade Data, court cases and seizures, and nursery catalogues.	The results of these will form part of TRAFFIC's report under 1.6 due for completion by mid-Year 3.
Output indicator 1.4. By end Year 1, in person interviews conducted with South African enforcement officers (>5), nurseries (>5) and private landowners (>5).	TRAFFIC completed 24 interviews in South Africa with the following participants: law enforcement officers (7), protected area managers (7), private landowners (5), and nurseries (5).	The results of these will form part of TRAFFIC's report under 1.6 due for completion by mid-Year 3.
Output indicator 1.5. By end Year 2, two field trips conducted in Namibia to determine hotspot poaching localities and genera/species targeted.	TRAFFIC's Consultant, Namibia's National Botanical Research Institute (NBRI), conducted field trips to Namib Naukluft Park, the Tsau //Khaeb (Sperrgebiet) National Park and the Ais Ais / Richtersveld Transfrontier Park in southern Namibia to record colonies of succulent plant species that are deemed at risk of being illegally harvested for the illegal trade.	NBRI finalized their field trip report, which will be incorporated into a final research report shared with Namibia's Protected Plants Task Team upon completion.

Output indicator 1.6. By mid-end Year 3, report with findings of investigatory work under 1.1. - 1.5. provides quantitative and qualitative understanding of the drivers behind legal and illegal trade in key South African and Namibian succulent flora (to the extent data are available for Namibia), with recommendations on how to address IWT in succulent plants, including recommendations on changes to legislative frameworks.	Report comprising information generated from above activities will be completed in Y3.	Complete and publish all planned reports.
Output 2. Technical skills of law enforcement officers in identifying and intercepting illegally traded succulent plants are improved, supported by innovative technology.		
Output indicator 2.1. By end Year 2, fourteen junior Environmental Management Inspectors have improved knowledge and skills to detect and effectively investigate the illegal trade in succulent plants.	TRAFFIC brought on two consultants – a plant mentor and law enforcement mentor – to develop a one-day training curriculum for EMI mentees. A total of 24 EMI mentees across South Africa were trained (virtually and/or physically) on various topics relating to the illegal succulent trade.	Activity completed. No further actions required.
Output indicator 2.2. By end Year 3, as a pilot, five law enforcement analysts are trained on how to use FloraGuard technology as a tool to detect and investigate the illegal trade in succulent plants online.	TRAFFIC has received nominations from Namibia's MEFT IIU and South Africa's Environmental Enforcement Fusion Centre (EEFC) for analysts to receive training on FloraGuard in Y3. The FloraGuard software package has been improved to facilitate utilisation by third party organisations, among other benefits. Installation and training materials have been created. We anticipate training a minimum of 6 enforcement personnel in this technique.	Analysts will receive training in Y3. Kew will recruit a Computer Science consultant to assist with training under Indicator 2.2, and to provide additional technical support should this be required. Training to nominated organisations to be delivered.
Output 3. Internet companies are aware of their responsibility to police and deter illegal trade in succulent flora and adopt and implement effective monitoring frameworks.		
Output indicator 3.1. Identification of strengths, weaknesses, and gaps in >15 online marketplaces' (e.g., eBay) current trading policies with regards to succulent flora.	TRAFFIC brought on a legal consultant that identified strengths, weaknesses, and gaps in current trading policies with regards to plants and seeds from over 50 ecommerce platforms/companies/online marketplaces (Annex 11).	Activity completed. No further actions required.
Output indicator 3.2. By end Year 3, a pilot study with a major e-commerce platform demonstrates successful interventions to identify and take appropriate actions against trade in illegally harvested succulent plants.	The Project Team have commenced their long-term engagement (pilot study) with eBay's Prohibited and Restricted Items team, specifically their Global Regulatory Specialist and Global Regulatory Counsel. TRAFFIC's legal consultant and the project team drafted a "best version"	Complete action items as listed above.

	internal-facing policy which was shared with eBay (Annex 12).	
Output indicator 3.3. By end Year 3, based on the results of the pilot study, at least three internet marketplaces identified as being used to actively trade in suspected illegally harvested succulent flora have received succulent plant awareness material and draft succulent plant policies.	The project team has identified a number of possible internet marketplaces to engage with once the pilot engagement is completed.	Engage with at least three internet marketplaces with which to share succulent plant awareness material and draft succulent plant policies
Output 4. Development and testing of innovative tools and technology to improve and facilitate identification and intervention of illegally traded succulent flora.		
Output indicator 4.1. By mid-Year 23 identification of the species-specific chemical signatures, and most accurate testing loci based on a minimum of 50 samples across six Conophytum spp. processed.	Further to Indicator 0.5, >150 samples from 61 plants (representing leaf, stem and root material from 8 different species of the same genus) have been taken, dried and weighed in preparation for sending to an external laboratory partner for analysis.	Complete the milling and preparation of samples and deliver to laboratory for analysis.
Output indicator 4.2. By mid-Year 3, geographic maps and statistical plots based on the isotope/elemental profiles of 50 – 100 Conophytum samples from wild locations created and used to authenticate provenance of marketplace specimens.	Planning for fieldwork is underway, with a trip in June 2024 anticipated. We intend to collect samples of 2-3 widely distributed species (to look for within species effects), along with a smaller number of samples of less common species (to look at within genus effects). The minimum ideal sample size is ~40 samples from as wide geographic range as possible, with access to private land being negotiated by colleagues in South Africa.	Complete planning and conduct fieldwork. Transfer collected samples to the UK using correct permitting procedures and prepare for laboratory analysis.
Output indicator 4.3. By end of Year 3, use of geographic maps produced in 4.2 to aid the reintroduction of confiscated material back to point of origin in the wild.	This Indicator will be completed following the processing of field collected samples (4.2) in the laboratory, expected in Y3 Q3.	Complete analysis of results drawing on expertise provided by Kew, and prepare a scientific paper for publication.
Output indicator 4.4. By mid-Year 3, isotope watering is demonstrated to be a viable technique of marking cultivated plants for traceability purposes. Based on trials with a minimum of 2 Conophytum spp.	Plant specimens representing 5 different succulent species donated from Kew's Living Collection have recieved an experimental isotope marker, applied in two different concentrations, with a control group also used within this experiment. for use in this experiment. Time-Zero samples have been taken before the isotope labelled marker was applied, as a means of comparison with subsequent samples that are drawn from the "marked" plants.	Further samples will be drawn from these plants, to test the strength of the marker within their tissues, over the course of a year.
Output indicator 4.5 Delivery of outreach program to the enforcement sector and other relevant stakeholders, to communicate the technologies and their application to protect at risk species.	Activities towards this Indicator have not yet commenced and will be informed by the results obtained under Indicators 4.1 to 4.4.	Arrange suitable outreach activities to disseminate results to enforcement teams, and receive their feedback which will

		form part of our experimental write up.

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

(Change Request December 2023 Version – with updates to Activities under Output 3 reflecting Section 10 above)

Project Summary	SMART Indicators	Means of Verification	Important Assumptions
Impact: Illegal harvesting of wild populations of protected succulent plant species is reduced, supporting restoration efforts and the long-term recovery of these species in the wild. (Max 30 words)			
Outcome: (Max 30 words) The volume of illegal trade in succulent flora in South Africa and Namibia is reduced through empowerment and capacitation of law enforcement agencies and self-regulation by internet companies.	0.1. By end Year 2, improved understanding of the illegal trade in succulent flora used to raise the profile of illegal plant trade with law enforcement agencies and to inform appropriate interventions. 0.2. By end Year 3, 30% increase in the number of investigations/arrests related to illegal trade in succulent flora in South Africa and Namibia compared with 12-month period prior to start of project. 0.3. By end Year 3, a pilot study with a major e-commerce platform demonstrates successful interventions to identify and take appropriate actions against trade in illegally harvested succulent plants. 0.4. By end Year 3, based on the results of the pilot study, at least three internet marketplaces identified as being used to actively trade in suspected illegally harvested succulent flora have received succulent plant awareness material and draft succulent plant policies. 0.5. By end Year 3 the role of laboratory techniques in authenticating plant species and provenance are tested as	0.1. An up-to-date succulent trade report published and disseminated to enforcement personnel; other trade/horizon scanning reports published. 0.2. Court case tracker, seizures and arrests data obtained from LE agencies. 0.3. The eCommerce company involved in the pilot study provides data on the effectiveness of deployed interventions, such as the number of suspected illegal succulent adverts flagged and removed from their platforms; a report summarising the interventions explored and trialled in the pilot study. 0.4. Minutes of meetings, examples of briefing documents shared with internet companies; feedback from the eCommerce sector, including detailed feedback from at least three internet companies approached within Indicator 0.4, on the succulent awareness materials and draft succulent plant policies they have received. 0.5. The use of stable isotope and elemental analysis in determining non-timber plant provenance understood,	Covid-19 and political changes do not prevent partners from accessing sites in the field, target communities, training, and outreach events. Industry stakeholders receptive to potential changes to the trading environment for threatened plants. The use of stable isotopes and multi-elemental analysis is effective in authenticating non-timber plant provenance.

	traceability tools in marketplace settings, presented as forensic evidence to law enforcement agencies, and used to enhance existing species reintroduction programmes.	with results disseminated via scientific journal papers. Strategy to apply this technology as a traceability tool to marketplace settings devised and presented to law enforcement agencies.	
Outputs: **1**. Greater understanding of trade dynamics informs law enforcement strategy and action	1.1. By end Year 1, use of an AI led methodology for web crawling (FloraGuard), aids the identification and trade profiling of South African and Namibian priority species, traded on ≥ 30 e-commerce marketplace platforms and ≥ 20 online forums relating to relevant horticulture and trade. 1.2. By end of Year 2 the ease and scope of applying the FloraGuard web crawler is enhanced due to functional enhancements made to AI algorithms. 1.3. By end Year 1, trade data secured from complementary sources (CITES data, nurseries, court cases - to the extent these are available for Namibia) to further determine source, routes, pricing, and destinations for South African and Namibian succulent flora. 1.4. By end Year 1, in person interviews conducted with South African enforcement officers (>5), nurseries (>5) and private landowners (>5). 1.5. By end Year 2, two field trips conducted in Namibia to determine hotspot poaching localities and genera/species targeted. 1.6. By end Year 3, reports with findings of investigatory work under 1.1. - 1.5. provides quantitative and qualitative understanding of the drivers behind	1.1. Quantification of online trade of genera/species in demand disseminated as reports to stakeholders; updated succulent trade database; horizon scanning reports created and disseminated to industry stakeholders. 1.2.1. Weblink to simulated IWT marketplace to facilitate training. 1.2.2. Download of updated algorithm and work spec sheet of technician. 1.3.-1.4., 1.6. Joint RBG Kew and TRAFFIC reports and awareness material, such as a video, on legal and illegal trade in South African and Namibian succulent flora published and disseminated to conservation and enforcement agencies in South Africa and Namibia, relevant Internet companies and other national and international stakeholder groups. 1.5 Field trip reports from Tsau//Khaeb, and Sperrgebiet National Parks and the /Ai /Ais-Richtersveld Transfrontier Park in Namibia.	Websites and marketplaces allow searching by automated AI software. Fieldwork, interviews (in-person) and face-to-face meetings are allowed and not restricted due to Covid-19 or other external factors. Criminal records and court proceedings are accessible for analysis. Export data from various sources are available and accessible for analysis (e.g., nursery export data, NPPOSA export data, etc.). Stakeholders are able and willing to be interviewed. Enforcement agencies in Namibia and South Africa are concerned about the illegal trade threatening endemic succulents. Enforcement agencies in Namibia and South Africa are able and willing to work with the project.

	legal and illegal trade in key South African and Namibian succulent flora (to the extent data are available for Namibia), with recommendations on how to address IWT in succulent plants, including recommendations on changes to legislative frameworks.		
2. Technical skills of law enforcement officers in identifying and intercepting illegally traded succulent plants are improved, supported by innovative technology.	2.1. By end Year 2, fourteen junior Environmental Management Inspectors have improved knowledge and skills to detect and effectively investigate the illegal trade in succulent plants. 2.2 By end Year 2, as a pilot, five law enforcement analysts are trained on how to use FloraGuard technology as a tool to detect and investigate the illegal trade in succulent plants online.	2.1.-2.2. Invoices, training materials produced, training records, workshop report, pre and post workshop assessment results which will measure changes in knowledge and specific skill sets including identification of taxa, web crawling and evaluation of potential illegal trade.	Enforcement agencies in Namibia and South Africa are concerned about the illegal trade threatening endemic succulents. Enforcement agencies in Namibia and South Africa are able and willing to work with the project.
3. Internet companies are aware of their responsibility to police and deter illegal trade in succulent flora and adopt and implement effective monitoring frameworks.	3.1. Identification of strengths, weaknesses, and gaps in >15 online marketplaces' (e.g., eBay) current trading policies with regards to succulent flora. 3.2. By end Year 3, a pilot study with a major e-commerce platform demonstrates successful interventions to identify and take appropriate actions against trade in illegally harvested succulent plants. 3.3. By end Year 3, based on the results of the pilot study, at least three internet marketplaces identified as being used to actively trade in suspected illegally harvested succulent flora have received	3.1. Reports on online marketplaces' current trading policies published and presented to relevant Internet companies (in collaboration with Coalition to End Wildlife Trafficking Online). 3.2. Download of the Internet company policy, terms and conditions and/or prohibited items list from their websites for changes or inclusions of succulent flora; the eCommerce company involved in the pilot study provides data on the effectiveness of deployed interventions, such as the number of suspected illegal succulent adverts flagged and removed from their platforms; a report summarising the interventions explored and trialled in the pilot study.	Internet companies are willing to engage with the project and have adequate resources to do so. A major eCommerce platform is willing to enter into a pilot study, and trial interventions to counter illegal plant trade with their platform users. Legislation relating to online trading conditions does not restrict the scope of the interventions that can be trialled by individual eCommerce platforms.

	succulent plant awareness material and draft succulent plant policies.	3.3. Minutes of meetings; examples of briefing documents shared with internet companies; feedback from the eCommerce sector, including detailed feedback from at least three internet companies approached within Indicator 3.3, on the succulent awareness materials and draft succulent plant policies they have received.	
4. Development and testing of innovative tools and technology to improve and facilitate identification and intervention of illegally traded succulent flora.	4.1. By mid-Year 3, identification of the species-specific chemical signatures, and most accurate testing loci based on a minimum of 50 samples across six *Conophytum* spp. processed. 4.2. By mid-Year 3, geographic maps and statistical plots based on the isotope/elemental profiles of 50 – 100 *Conophytum* samples from wild locations created and used to authenticate provenance of marketplace specimens. 4.3. By end of Year 3, use of geographic maps produced in 4.2 to aid the reintroduction of confiscated material back to point of origin in the wild. 4.4. By mid-Year 3, isotope watering is demonstrated to be a viable technique of marking cultivated plants for traceability purposes. Based on trials with a minimum of 2 *Conophytum* spp.	4.1i. Submission of journal paper for publication in scientific community including list of identified isotope/elemental profiles; laboratory reports. 4.1.ii Laboratory reports of isotope/trace element profiling, indicating most prominent differences and a plan of improvement towards future analysis. 4.2i. Maps of geographic region/locality for *Conophytum* spp. based on their isotope/elemental profiles produced by laboratory partners. 4.2ii. Submission of scientific paper for publication regarding marketplace authentication work. 4.3 Working with existing projects in country, development of a reintroduction plan for a minimum of 3 species. 4.4 Laboratory reports and analysis of the signal strength of isotopes applied as a traceable marker though watering, over time. 4.5 Industry conferences and workshop attendance records, minutes and online recording.	Plant material is available and agreements for material transfer from South Africa to UK are in place to enable analysis of the full range of specimens as planned. Work in 4.1 and 4.2 can inform further work and mapping, noting prior work has demonstrated isotope discrimination in succulent plants and in timber species. Other challenges to reintroduction, such as plant health considerations, do not prevent implementation of 4.5 (noting that seeds harvested from confiscated plants can also be used in reintroduction programmes in the same way).

	4.5 Delivery of outreach program to the enforcement sector and other relevant stakeholders, to communicate the technologies and their application to protect at risk species.		

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)

Output 1

1.1. Analysis of online marketplaces based on data captured by web crawler (FloraGuard). (Kew & TRAFFIC)

1.2. Enhancements to web crawling algorithm technology, and the creation of a simulated IWT marketplace. (Kew)

1.3. Collection of supplementary trade information collected from other relevant data sources. (TRAFFIC)

1.4. Fieldwork and interviews with relevant stakeholders in South Africa. (TRAFFIC)

1.5. Two field trips are undertaken to survey areas in Namibia. (TRAFFIC)

1.6 Reports with findings of investigatory work under 1.1. - 1.5. produced and published. (Kew & TRAFFIC)

Output 2

2.1.1. Design and production of information and training materials to share with enforcement personnel. (TRAFFIC)

2.1.2. Training and mentorship of South Africa's junior Environmental Management Inspectors (EMIs). (TRAFFIC)

2.2. Awareness and training of an AI web-crawler tool (FloraGuard) given to law enforcement analysts within South Africa. (Kew)

Output 3

3.1 Evaluation of online trading policies to identify gaps or weaknesses relating to the trade in succulent flora. (Kew & TRAFFIC)

3.2 - 3.4. Engage with Internet companies directly and in collaboration with the Coalition to End Wildlife Trafficking Online. (Kew & TRAFFIC)

Updated according to section 10.
3.1 Evaluation of online trading policies to identify gaps or weaknesses relating to the trade in succulent flora.

3.2. Develop a "best version" internal-facing policy that can be shared with eCommerce platforms for review, discussion and customization.

3.3. Engage with Internet companies directly and in collaboration with the Coalition to End Wildlife Trafficking Online, by sharing the internal-facing policy with them. Commence an engagement with one of these eCommerce platforms to work towards restricting illegal trade of succulent plants on their platform.

Output 4

4.1.1 Determine naturally occurring stable isotopes/elements within wild Conophytum spp. and identify which plant parts provide the best chemical signatures. (Kew)

4.1.2 Determine turnover rate of stable isotopes/elements within wild plants, once transferred to cultivated settings. (Kew)

4.2.1 Create geographical origin maps based on the stable isotope/elemental profiles at genus level and develop a stable isotope/elemental profile from 50-100 specimens. (Kew)

4.2.2 Test isotope/elemental profile against plants from marketplaces to determine origin of material. (Kew)

4.3.1 Using isoscape maps to reintroduce confiscated material back to the wild. (Kew)

4.3.2 Contribute to development of in-country reintroduction strategy for succulent species. (Kew)

4.4. Nursery trials to test isotope watering to mark plants under cultivation with a traceable isotope marker. (Kew)

4.5.1 Enforcement workshop for strategy development and implementation. (Kew)

4.5.2 Presentation at industry conferences. (Kew)

Table 1. Project Standard Indicators

Please note that the rows below highlighted in grey refer to indicators that the Project does not currently have but could potentially employ and report against. The rows that are not highlighted refer to indicators that have been replaced from the Project's existing indicators with adaptations to the IWT Challenge Fund 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
IWTCFB01	2.1. By end Year 2, fourteen junior Environmental Management Inspectors have improved knowledge and skills to detect and effectively investigate the illegal trade in succulent plants.	Number of junior Environmental Management Inspectors (EMIs) that received training on succulent plant awareness	Number	Gender Age Group	0	23		23	14
IWTCFB01	2.2 By end Year 2, as a pilot, five senior law enforcement personnel are trained on how to use FloraGuard technology as a tool to detect and investigate the illegal trade in succulent plants online.	Number of law enforcement analysts that received training on FloraGuard web crawling software and workflow.	Number	Gender Age Group	0	0		0	6
IWTCFB10 (Core)	0.2. By end Year 3, 30% increase in the number of investigations/arrests related to illegal trade in succulent flora in South Africa and Namibia compared with 12-month period prior to start of project.	Number of arrests of suspects involved in trading succulent plants illegally	Number	None	0			0	TBC
IWTCF- B12 (Core)	0.2. By end Year 3, 30% increase in the number of investigations/arrests related to illegal trade in succulent flora in South Africa and Namibia compared with 12-month period prior to start of project.	Number of court cases involving illegally traded succulent plants submitted for prosecution	Number	None	0			0	TBC
IWTCFB13 (Core)	0.2. By end Year 3, 30% increase in the number of investigations/arrests related to illegal trade in succulent flora in South Africa and Namibia	Number of suspects charged for crimes involving trading succulent plants illegally	Number	None	0			0	TBC

	compared with 12-month period prior to start of project.								
WTCFB14 (Core)	0.2. By end Year 3, 30% increase in the number of investigations/arrests related to illegal trade in succulent flora in South Africa and Namibia compared with 12-month period prior to start of project.	Number of suspects successfully prosecuted for crimes involving trading succulent plants illegally	Number	None	0			0	TBC
IWTCF-C08	3.2. By end Year 3, a pilot study with a major eCommerce platform demonstrates successful interventions to identify and take appropriate actions against trade in illegally harvested succulent plants.	Number of stakeholders that have actively discouraged the purchase /use of IWT products through new types of interventions.	Number	None	0	0		0	1
IWTCF-D03 (Core)	Number of local/national organisations with improved capability and capacity as a result of the project.	Number of local/national organisations (such as DFFE, NA MEFT and eBay) with improved capability and capacity in monitoring online trade in succulent plants	Number of organisations	None	0	7		7	3
IWTCF-D11	[Means of Verification] 4.1i. Submission of journal paper for publication in scientific community including list of identified isotope/elemental profiles; laboratory reports. 4.2ii. Submission of scientific paper for publication regarding marketplace authentication work.	Number of scientific papers detailing the development of plant provenance testing tools based on SIRA and trace element analysis, submitted to peer reviewed journal for publication.	Number	None	0	0		0	2
IWTCF-D13	1.6. By mid-end Year 3, reports with findings of investigatory work under 1.1. - 1.5. provides quantitative and qualitative understanding of the	Number of other publications and reports produced providing quantitative and qualitative understanding of the drivers behind	Number	None	1	0		0	2

	drivers behind legal and illegal trade in key South African and Namibian succulent flora, with recommendations on how to address IWT in succulent plants, including recommendations on changes to legislative frameworks.	legal and illegal trade in succulent flora.							
IWTCF-D23	1.3. By end Year 2, trade data secured from complementary sources (CITES data, nurseries, court cases) to further determine source, routes, pricing, and destinations for South African and Namibian succulent flora.	Number of records (court cases, open-source articles, seizures, etc) existing in, refined or added to TRAFFIC's WiTIS database.	Number	None	27	185		212	50
IWTCF-D26 (Core)	1.2. By end of Year 2 the ease and scope of applying the FloraGuard web crawler is enhanced due to functional enhancements made to AI algorithms. 2.2 By end Year 2, as a pilot, five senior law enforcement personnel are trained on how to use FloraGuard technology as a tool to detect and investigate the illegal trade in succulent plants online.	Number of tools for monitoring online trade in wildlife products developed, refined and optimised for use by conservation and enforcement agencies.	Number Number	None None	0 0	1 0		0	1 6
IWTCF-D26 (Core)	4.2. By end of Year 2 geographic maps and statistical plots based on the isotope/elemental profiles of 50 – 100 Conophytum samples from wild locations created and used to authenticate provenance of marketplace specimens. 4.4. By end of Year 3 2, isotope watering is demonstrated to be a viable technique of marking cultivated plants for traceability purposes. Based on trials with a minimum of 2 Conophytum spp.	Number of tools and techniques to authenticate succulent plant specimens in different settings through laboratory analysis (e.g. differentiate wild from cultivated plants, identify geographic provenance of seized plants, use of isotope marker for traceability purposes).	Number	None	0	0		0	3

Table 2 Publications

Title	Type (e.g. journals, best practice manual, blog post, online videos, podcasts, 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)
FloraGuard web crawling algorithm.	Downloadable online software.	Middleton, S.E. and Kazaryan, A, 2022. Updated by Middleton, S.E and Karunakularatnam, I, 2023.	Male	British	University of Southampton, Southampton, UK	Available with access granted through a Github account. To be released as Open Source software in 2024.

Checklist for submission

	Check
Different reporting templates have different questions, and it is important you use the correct one. Have you checked you have used the **correct template** (checking fund, type of report (i.e. Annual or Final), and year) and **deleted the blue guidance text** before submission?	X
Is the report less than 10MB? If so, please email to BCF-Reports@niras.com putting the project number in the subject line.	X
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.	Some annex content >10mb
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.	X
If you are submitting photos for publicity purposes, do these meet the outlined requirements (see section 17)?	N/A
Have you involved your partners in preparation of the report and named the main contributors	X
Have you completed the Project Expenditure table fully?	X
Do not include claim forms or other communications with this report.	