Illegal Wildlife Trade (IWT) Challenge Fund Main & Extra: 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 2025

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IWT Challenge Fund Project Information

Scheme (Main or Extra)	Main
Project reference	IWT114
Project title	Harnessing Technology to End the Illegal Trade in Succulent Plants
Country/ies	South Africa and Namibia
Lead Organisation	Royal Botanic Gardens, Kew
Project partner(s)	TRAFFIC
IWTCF grant value	£513,567
Start/end dates of project	June 2022 – June 2025
Reporting period (e.g. April 2024-Mar 2025) and number (e.g. Annual Report 1, 2, 3)	April 2024 – March 2025 - Annual Report 3
Project Leader name	David Whitehead
Project website/blog/social media	RBG Kew – https://www.kew.org/science/our-science/projects/technology-illegal-trade-succulents TRAFFIC - https://www.traffic.org/what-we-do/thematic-issues/promoting-sustainable-trade/succulent-plants/
Report author(s) and date	David Whitehead / Dominique Prinsloo – April 30 2025.

1. Project summary

The illegal trade in Southern African succulent plants poses a serious threat to the endemic floral biodiversity of sub-Saharan Africa. 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, have been used to identify points of intervention and inform strategies to improve regulation and law enforcement actions. Development of chemical fingerprinting and marking techniques aims to 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 provide tools and evidence to support 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 which perpetuates the poverty cycle. Longer-term, improved understanding of these illegal markets and the development of interventions to improve the transparency of online trade while deterring illegal sales, will help support the required changes in perceptions and attitudes towards illegal plant trade required globally, to address this problem in a holistic way.

At the time of writing (April 2025), the poaching of succulent plants continues at pace and scale, with more than 1.6 million plants now seized by authorities in South Africa, with even greater numbers thought to have been trafficked from the country. A number of species are now thought functionally extinct in the wild as a result of this illegal activity. 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.

Please note that while this remains a 3-year project, due to a lack of synchronicity with financial years, the final quarter of the project is referred to below as Y4 Q1, to reflect the project's spanning of 4 financial years in total. In terms of funding, while the period of the project funded by IWTCF ended in March 2025 (as per the December 2023 change request), some of Kew's activities are continuing until the formal end of the project in June 2025, with the Project Leader's time to complete these supported by in-kind contributions from RBG Kew.

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 non-governing Project Partners and consultants provides crucial input to enable the delivery of specific objectives and outputs. The following is a summary of our active engagements in Year 3 of the project – please note that supporting evidence for consultancies and some activities that concluded in Y2 and were reported on in the Yr2 Annual Report have not been included below, although are referenced in Annex 1:

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. While TRAFFIC's funded time on the project officially ended in October 2024, Kew and TRAFFIC continue to liaise regarding ongoing project activities, including the preparation of this report.

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. In Y3, teams from SANBI provided logistical support to guide Kew staff during fieldwork for the collection of georeferenced plant material for use in Output 4, with this sharing of in-country expertise essential for the successful delivery of this branch of the project (see Annex 11), and we look forward to collaborating with staff at SANBI on the write up of these results. Additionally,

TRAFFIC remains 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 train, assess, grade and 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. Even though TRAFFIC's illegal succulent trade training was delivered in Y2, TRAFFIC and DFFE still work closely together. TRAFFIC submits profiles and adverts to DFFE's Environmental Enforcement Fusion Centre's (EEFC) CMORE platform that TRAFFIC suspects contain illegally harvested succulent plants. DFFE then allocate these to various analysts to investigate further. DFFE records all succulent plant cases across the country and do share aggregated results with TRAFFIC when requested.

University of Southampton: Southampton's School of Electronics and Computer Science has provided consultancy for the development and use of the FloraGuard software. In Y3 Q4, this included working alongside in-house AI experts at Kew to deliver training and technical support for the deployment of the search tools, and refinements to the software repository (GitHub) that will enable the software to be made available to third parties in future. Throughout the life of the project, Kew and UoS's strong relationship has continued to develop, along with our mutual understanding of the ways in which AI can be used to support the investigation of biodiversity issues in the online domain (see Annex 4).

British Geological Survey: Following a procurement exercise, the British Geological Survey were appointed the role of delivering the laboratory results for Output 4 of the project. This was successfully achieved between January and March 2025, with stable isotope and trace element data generated for 436 plant samples. Working in this restricted timeframe, teams from RBG Kew and BGS collaborated closely to ensure that samples were processed efficiently, with any variables potentially affecting the samples noted and discussed (see Annex 13). BGS's guidance to the best approach for processing samples has been invaluable, and we look forward to converting this data into more detailed written analysis and results.

Botanic Gardens Conservation International (BGCI) – Dr Carly Cowell: Dr Carly Cowell has continued to provide expert advice to the project concerning Output 4, and while the timing of the delivery of data within this branch of the project has prevented us completing all of our objectives in full, we look forward to continuing to work together to convert data into written Outputs, despite the funded period of the project now coming to an end.

eBay Global Regulatory Team: During Y3, TRAFFIC and Kew have met regularly with eBay's Global Regulatory team to discuss and devise potential interventions to improve the transparency of the online trade in threatened succulent plants. In June 2024, the project team hosted eBay at RBG Kew enabling ideas to be discussed in person and examples of plants threatened by illegal trade to be viewed with the help of Kew's horticultural team. Kew and TRAFFIC look forward to continuing to work with the eBay team towards appropriate and practical interventions around plant trade, with all three organisations continuing to work together, despite TRAFFIC's funded period on the project having now come to an end (see Annex 10).

Other Key Stakeholders:

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 (PE). Refer to 3.1 Output 2 Activities 2.1.1 & 2.1.2 for more information.

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 (hereafter the National Response Strategy or NRSAP; Crouch et al. 2022). On 26/09/24 (Annex 15) and on 14/03/2025 (Annex 16), TRAFFIC and Kew attended online meetings of stakeholders contributing to the Strategy and Action Plan to address succulent poaching. TRAFFIC are also members of various Task Teams, which are themed around different objectives, such as the Law Enforcement Task Team, the Communities Task Team, and the Communications Task Team. Additionally, TRAFFIC and Kew are members of the Succulent Plant Illegal Trade Task Force (SCITTF) created in 2024 under IUCN's Species Survival Commission (SSC), with our project work aligning well with many of the aims and objectives of this new expert group.

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.

In-House Teams at RBG Kew: During Y3, we have been grateful for the support and expertise of the following teams at Kew: ***Horticulture/Plant Health*** – for maintenance of experimental plants and advice on aspects of plant ecology and horticulture that inform many areas of the project; ***Laboratory Staff*** – Staff from the Jodrell Laboratory provided in-kind support and advice in the preparation of laboratory samples; ***Biochemistry Experts*** – Kew's biochemistry experts have helped with setting out the scope and details of the laboratory testing required for Output 4, and initial reviews of the data obtained (see Annexes 12 and 13).

Interactions with Other Stakeholder Groups:

During the last 12 months there have been several opportunities to share insights from the project and receive feedback from key stakeholders, including:

RBG Kew: On 3rd February 2025, Kew's Project Leader attended a one-day workshop organised by BGCI which among other themes, discussed the role of Botanic Gardens in addressing the South Africa poaching crisis. The workshop was attended by representatives from the Botanical Society of South Africa and the South African National Biodiversity Institute (SANBI) and reflected the need for continued multi-agency co-operation to address the poaching crisis into the future.

TRAFFIC: TRAFFIC engaged closely this year with DFFE and TRAFFIC's team working on the UNDP-GEF 6 project titled: *Development of Value Chains for Products derived from Genetic Resources in Compliance with the Nagoya Protocol on Access and Benefit Sharing and the National Biodiversity Economy Strategy*. TRAFFIC submitted a proposal for GEF-6 funding to UNDP to fund a project with the aim of reducing pressure on wild populations of South African succulent flora within the Arid Zone by engaging local communities and facilitating diversification of livelihoods. These project outcomes would also feed into Objectives 5 and 7 of the National Response Strategy (Crouch et al. 2022), which are the main priorities for the Strategy's working group as they have received little funding and made little progress.

3. Project progress

3.1 Progress in carrying out project Activities

Output 1: Activities 1.2, 1.3, 1.4 and 1.5 have been completed as planned. Data generation and analysis under Activity 1.1 was undertaken in Y3 Q4 and will continue in Y4 Q1. While delays to this Activity 1.1 have also delayed the completion of some of our report writing under Activity 1.6, we look forward to completing the remainder of both these activities in Y4 Q1. The scope of this study has been narrowed to focus on core species and will deliver important messages relating to the online trade in succulent plants that we are looking to convey. Please see Annex 1 and 4 for more information on our progress in this area.

Output 2: Activities 2.1.1 and 2.1.2 were completed by TRAFFIC in Y2, through the delivery of a plant IWT training programme for Environmental Management Inspectors (EMIs) in South Africa. Please see Annex 7 and 18 for more information. As Activity 2.2 logically follows the completion of our own online monitoring study work (Activity 1.1), preparations are underway to release the FloraGuard software into the public domain and provide training on this web scraping technique to interested third parties and law enforcement analysts from Namibia and South Africa in Y4 Q1 (both planned for June 2025). Please see Annex 1 and 4 for more information.

Output 3: Activities 3.1 and 3.3 have been completed. The draft internal-policy document that was created by the project team under Activity 3.1 (*shared with our Y2 Annual Report – Annex 11 – April 2024*) has been helpful in informing our continuing discussions with eBay's Global Regulatory Team under Activity 3.2, and in aiding our approach to two other eCommerce platforms, who did not ultimately engage with our project work. Our work with eBay under Activity 3.2 is still active and remains supported by staff from both TRAFFIC and Kew, despite TRAFFIC's funded period on the project having come to an end. Given the complexity of devising and implementing the correct trade interventions at platform level, we anticipate our collaborative work in this area will also continue beyond the lifetime of the project itself, as one of the project's lasting impacts. Please see Annex 1 and 10 for more information.

Output 4: While not listed as an activity, the completion of fieldwork in South Africa in June 2024 has been key to facilitating the core objectives of Output 4. Laboratory work towards activities that rely on the laboratory processing of wild origin plant samples (Activities 4.1.1 4.1.2 and 4.2.1) has been completed, with sets of Stable Isotope and Trace Element data successfully generated ready for analysis. Given the delays to this branch of the project detailed in previous ARs and Change Requests, we will be unable to complete Activity 4.3.1 (testing specimens acquired from marketplace settings), although our other results may provide a theoretical framework to help conduct such work in future. The extent to which our work will influence re-introduction strategies (Activity 4.3.2) within the lifetime of the project is also currently unclear, although here again, we anticipate our results and any resulting recommendations will be influential in any future succulent reintroduction programmes that are devised. Activity 4.4 is partially complete with the isotope watering experiment successfully conducted during Y3 and laboratory data generated, which we will complete the analysis of in Y4 Q1. Following our data analysis and write up, we will look to undertake Activities 4.5.1 and 4.5.2 to share our results with relevant stakeholders. Please see Annexes 1, 12 and 13 for more information.

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 Y2 Annual Report Reviewer's feedback:

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

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. As reported in our Y3 HY Report, deployment of the web

crawler was delayed in Y3 due to the need for Kew's project staff to focus on Output 4, where the development of novel workflows to process samples proved more time consuming than anticipated. However, following preparatory work including a systematic review of online marketplaces to identify relevant eCommerce outlets for succulent plants, we conducted an online monitoring study in Y3 Q4, including use of the FloraGuard web crawling technology. While this has so far focused on fewer eCommerce websites than originally planned (n = 14 compared to a target of 30), the study captured information from >4,000 online advertisements, and we feel our conclusions will provide new insights regarding the online trade in succulents, applicable to both forums and eCommerce sites, along with a methodology that will inform future work in this area. Annex 4 provides some examples of the methodological approach developed, with the full study to be published by the end of June 2025.

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. This Indicator was completed in Y2. However, as work on Indicator 1.1 involved deployment of the updated web crawler in a variety of online settings, we ensured technical support was provided for the duration of the study by the University of Southampton and in house AI expertise within Kew. This enabled some further fine tuning of the algorithm based on feedback from its use within the study, along with the development and testing of some advanced search lexicon techniques, detailed in Annex 4.

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. Completed. TRAFFIC collected and analysed the data in Year 2, the results of which were published in TRAFFIC's report under Indicator 1.6 (Annex 5).

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). Completed. TRAFFIC completed 24 interviews in South Africa in Y2 with the following participants: law enforcement officers (7), protected area managers (7), private landowners (5), and nurseries (5). The results of these interviews were published in TRAFFIC's report under Indicator 1.6 (Annex 5).

Indicator 1.5: By end Year 2, two field trips conducted in Namibia to determine hotspot poaching localities and genera/species targeted. Completed. 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 in Year 2. TRAFFIC shared NBRI's field trip report (Annex 6) with Namibia's Protected Plants Task Team.

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.

Two reports have been completed under the project so far with a third report in progress:

(1) Based on the data collected (excluding automated searches of online marketplaces from 1.1 and 1.2), TRAFFIC published a report titled "A Succulent Trade: The Legal and Illegal Trade in Succulent Flora Stemming from South Africa" (Annex 5). This report provided an update on the 1998 TRAFFIC Succulent Trade report which provided a baseline for all indicators above. The report provides an up-to-date source of knowledge on South Africa's succulent plant poaching crisis for law enforcement and other stakeholders.

(2) A short report was developed under Indicator 1.5 and was shared with the Namibia's Protected Plants Task Team (Annex 6). This report complemented research already completed in Namibia by the PPTT and addressed a crucial information gap, which was the lack of baseline data for many succulent plant species and their populations that may be vulnerable to poaching in Namibia. Two field surveys yielded quantitative data on more than 20 highly vulnerable succulent species ranging from dwarf succulents to dwarf shrubs and pachycauls. The data will be useful in monitoring the species in the areas surveyed as well as to contribute to Red List assessments.
(3) Kew are in the process of completing an online trade monitoring study under Indicator 1.1. While this will not provide the coverage of species originally planned, we believe the methodology developed and insights into the dynamics of the online trade in succulent plants will nonetheless prove to be an impactful source of evidence to help encourage changes to the online trading landscape for endangered plants that we are striving to achieve (Annex 4).

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

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. Completed. In Year 2, TRAFFIC along with the Plant Mentor and Law Enforcement Mentor ran four physical trainings for 13 EMI mentees in three provinces, which was well-received by mentees. The team also ran one virtual training for another 9 EMIs from various other provinces. A total of 22 EMI mentees were trained (Annex 18). The trainings were well-received especially the training materials developed, and guidebooks shared. As a baseline, EMIs receive various environmental crime training during their EMI Basic Training Certification Course. Their baseline knowledge on the illegal plant trade is basic especially when it comes to plant identification, evidence collection and criminal court case development. The EMIs gained knowledge on the importance of succulent plant diversity in South Africa, basic succulent plant identification, national and provincial legislation that protect succulent plants, criminal penalties for convictions of cases involving succulent plants, maintaining the chain of custody in the event of a succulent plant seizure, the process of rehabilitating confiscated plants, and the roles and responsibilities of EMIs in combating the illegal succulent plant trade. 100 copies of the South African CITES Appendix 3 guide were printed and distributed to various LE officials across South Africa. The training materials were used by TRAFFIC's LE Mentor to train other traffic officers and police officers. Shortly after this training, a seizure was made by some of these officers where 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 (Annex 7).

TRAFFIC obtained feedback from some EMIs that attended TRAFFIC's training sessions in September 2023. Most respondents indicated that they found the training valuable because they learnt so much and many felt confident in applying the skills/knowledge acquired when working on criminal cases involving plants. Most felt that the guidance on succulent plant identification was the most helpful to enhance their ability to manage criminal cases involving plants. Feedback from some respondents included that the CITES Appendix III guide for South African succulent plants is a great resource but that a similar resource like this is needed for all threatened plants and not only listed on CITES Appendix III.

In August 2024, TRAFFIC hosted a meeting in Cape Town for South African and Namibian law enforcement and other stakeholders involved in combating the illegal trade in succulent plants (Annex 8). The Namibian delegation comprised representatives from the Ministry of Environment, Forestry and Tourism's Intelligence and Investigation Unit (MEFT–IIU) who are also members of the Protected Plants Task Team. The delegation is concerned about the number of seizures of indigenous Namibian plants and that their investigations into the syndicates involved suggests that they are trading illegally in both South African and Namibian succulents. They requested to collaborate with South African law enforcement going forward and used this trip to build connections and meet relevant stakeholders. The Namibian delegation was very grateful for TRAFFIC's assistance with their trip and for all the information TRAFFIC has gathered on the

illegal succulent trade in Namibia and South Africa. The next steps agreed to by the Namibian and South African law enforcement agencies are to work together on investigating the cross-border succulent poaching syndicates through information sharing and joint operations.

In September 2024, TRAFFIC designed a poster for creating awareness for X-ray screeners and law enforcement about the illegal trade in indigenous plants that are exported by air and transported through international borders (Annex 9). TRAFFIC printed over 30 posters for distribution to two international airports in South Africa as well as the border post between South African and Mozambique. While not officially part of our Logframe objectives, this opportunity was presented through work on another project which embraced the expansion of their activities to include succulent plants.

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. Potential recipients of training in the Floraguard web scraping technology were identified in Y2. In Y3, other third parties have also expressed an interest in this training activity. Following the completion of Indicator 1.1, we are now preparing to undertake this training in the final quarter of the project, with the FloraGuard software and training materials to be made available via the GitHub software repository, and the training session supported by in house technical expertise at Kew. We will also incorporate a feedback questionnaire as part of the training session, to evaluate its impact and capture ideas for future needs and requirements in this area of IWT Research.

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.

Indicator 3.1. Identification of strengths, weaknesses, and gaps in >15 online marketplaces' (e.g., eBay) current trading policies with regards to succulent flora. Completed. In Y2, TRAFFIC brought on an eCommerce consultant that identified strengths, weaknesses, and gaps in current trading policies with regards to plants and seeds from over 50 ecommerce platforms (*evidence provided in Y2 Annual Report – Annex 11 – April 2024*).

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, Kew and members of eBay's Global Regulatory Specialist and Global Regulatory Counsel, commenced a long-term engagement in February 2024. This engagement was publicised in early September 2024 via a press release and on both TRAFFIC's and Kew's websites, and was picked up by a wide variety of news stations such as BBC World Radio, BBC World Service, and Classic FM (see Annex 10 and 17). In September 2024, the project team also hosted a training session for around 50 staff members from eBay's monitoring team to create awareness on the illegal trade in plants on eCommerce platforms, an initiative not previously conducted. This included talks by researchers studying IWT in a variety of plant groups, and an introduction to CITES and Plant Health regulations. Feedback obtained via a survey of attendees (n=8) was overall positive with 60% of respondents reporting an increase in their understanding of the illegal plant trade after the training. Please see Annex 10 for further details of this collaborative work between TRAFFIC, Kew and the eBay Team which remains ongoing and is set continue beyond the life of the project.

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. Completed. In Y3, TRAFFIC's China office translated a short concept note into Chinese on our offer to engage with platforms to help them combat plant IWT online, and shared this with three online platforms. All three platforms were responsive via email: Members from the Public Welfare Departments at Company 1 and 2 explained that they would like to discuss this

topic internally first. Company 1 requested specific materials, such as a succulent species list with CITES listings and examples of Company 1's social media accounts/advertisements of these plants. TRAFFIC shared several resources with them, however the fact that these documents are in English and not Chinese was a limitation for this engagement. Company 3 were very interested in this as they had plans in the future to raise sellers' awareness about wildlife and plant issues on their social media platform to promote reasonable and compliant sales of relevant products. The responses from these three platforms were positive and TRAFFIC hopes to continue engaging with these platforms further if their application for the IWTCF Round 11 Challenge Fund is successful. In the meantime, TRAFFIC and Kew have agreed to continue jointly working on our ongoing engagement with the eBay team, beyond TRAFFIC's official end date on the project.

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

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 material from 60 *Conophytum* specimens donated to RBG Kew in Y2 and using methodologies developed throughout the course of the study, >120 samples from 8 different species and comprising leaf, stem and root material, have been processed in the laboratory to generate data for 5 stable isotopes and 57 different trace elements contained within their tissues. To evaluate the effects of transferring wild plants into cultivation, all plants received have had a "Time Zero" sample taken representing their wild state, with a sub-set of plants having repeat samples taken to monitor the effects of transferring of these specimens into a horticultural setting. This means we have exceeded our Logframe objectives in terms of the number of samples processed, although with detailed data analysis still to be completed. As a baseline to measure against, our work is based on previous work conducted in South Africa (Retief et al, 2014 - *Can Stable Isotopes and Radiocarbon Dating Provide a Forensic Solution for Curbing Illegal Harvesting of Threatened Cycads?)* which was successful in its analysis of stable isotopes within Cycads, another type of non-timber endangered plants (although not a succulent species). We will also base the analysis of our results on extensive work conducted with timber species (e.g. the World Forest ID Project – see https://worldforestid.org/), guided by in-house expertise within Kew to determine the precise modes of analysis to apply to our succulent plant data set. Please see Annexes 12 and 13 for further details of this laboratory-based work.

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. RBG Kew staff undertook field work in South Africa in June 2024 supported by teams from the South African National Biodiversity Institute (SANBI). A sufficient number of geo-referenced plant samples were collected from sites across 12 broad geographic locations, with the data derived from these likely to be sufficient in generating a better understanding of the utility and potential of this approach to map South Africa's plant populations using biochemical analysis in this way. Please see Annex 11 which provides further details of RBG Kew staff's time in the field. Due to time constraints and difficulties in obtaining sufficient cultivated plant material of known provenance, we have been unable to make a direct comparison of wild and cultivated plant material from marketplace settings within the current project, although the data we have generated may provide a useful reference point for future comparative work of this nature. Additionally, a sub-section of the study examining the effects of transferring wild plants into horticultural settings may also yield results that will help to partially prove the potential of these techniques to make such authentications in future.

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, which is based on the results of laboratory data analysis under Indicators 4.1 and 4.2, has not yet been completed. In the project's remaining timeframe, we will aim to explore the use of geo-referenced data to map and differentiate plant populations, and will share these results with stakeholders in South Africa, to assess their use in informing future re-introduction and restoration programmes.

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. During Y3, we have completed the experimental phase of this 10-month study. In total, between December 2023 and October 2024, 60 samples were taken from 15 succulent plants split into three groups, two of which were watered with two different concentrations of an isotope marker, with the third acting as a control group. Each group contained a *Conophytum* species - meeting our Logframe objective - although four other succulent species were also included in the study, to broaden its scope and test the technique as widely as possible. All sampled material has been processed within the laboratory, with the data awaiting detailed analysis (see Annex 13 which provides a brief insight into this branch of the experiment within the laboratory report).

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. This activity has not yet been completed. We aim to share a summary of our approaches with relevant stakeholders in Y4 Q1 and would welcome their feedback which will help to inform the future develop of these tools.

[redacted]

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.

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 companie [redacted]

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. Several of our Outputs will enable us to achieve this Outcome, including the EMI trainings conducted in Y2 (Output 2.1), and publication and dissemination of

TRAFFIC's Project Reports during Project Y3, with the results of Kew's online monitoring work (Output 1.1) and training of enforcement officials in FloraGuard technique (Output 2.2) to follow in Y4 Q1.

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.

[redacted]

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. The project entered a pilot engagement with eBay in early 2024 which has continued throughout Y3. Through our discussions with the eBay Team, we have developed an understanding of the interventions used by the platform to ensure compliance in eCommerce trade, and which of these may be suitable for development and adaptation to plant trade. While enacting changes at platform level may require longer timescales than the project's lifespan, Kew, TRAFFIC and eBay have agreed to continue this collaboration into the future in order to bring these ideas to fruition, with the complexity of eCommerce trade in wildlife products necessitating a long-term and measured approach in order to provide effective levels of change to vendor and consumer behaviour (see Annex 10).

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. In Y3, in addition to the engagement with eBay, TRAFFIC contacted three other online platforms based in China, and offered to support them in addressing the sale of suspected illegally harvested succulent flora on their websites. All three platforms were interested in this offer. TRAFFIC made various succulent plant awareness materials available, however given that these were in English and not Chinese, this proved to be a limitation in making progress in the short term.

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. In collaboration with colleagues in South Africa and laboratory partners, we have now generated data to assess the effectiveness of stable isotope and trace element analysis applied to dwarf succulent plants, and address the key objectives of Output 4 While earlier delays to this branch of the project mean that we are unable to compare these results with marketplace specimens, the baseline data the study will generate will provide a basis for such work to be conducted in future, and enable the potential of the use of these techniques to support both law enforcement and re-introduction initiatives to be evaluated by relevant stakeholders. Our experimental work under Output 4.4 (isotope watering) will also help to

understand the viability of this technique to differentiate nursery grown plants in marketplace settings. Raising the profile of endangered non-timber species as potential beneficiaries of these techniques and informing debate among relevant stakeholders will depend on the analysis of our existing data, with the full impact of our results likely to be realised beyond the end of the project, providing a valuable foundation for future work in this area of endangered plant conservation.

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 have been vigilant to minimise the risk of Covid-19, and avoided this impacting any project activities including fieldwork conducted during Y3.

Assumption 2: Industry stakeholders receptive to potential changes to the trading environment for threatened plants.

Comments: This assumption has proved true in that our engagement with eBay has been extremely positive, with the challenges surrounding online plant trade thoroughly explored with the eBay team. While expanding our engagement to other online platforms has not yet come to fruition, we are confident that our work with eBay supported by our other outputs to help raise the profile of the online trade in succulent plants will encourage other online platforms to engage with this topic in future.

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, the data generated in the laboratory appears encouraging and we look forward to analysing it more fully in the final stage of our project work.

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: The scope of our online search technique has not changed, with the application of the web crawler restricted to open-source content, using strict workflow protocols to ensure compliance with GDPR requirements, focusing strictly on data pertaining to patterns in plant trade. While our approach means that some types of online content cannot be included within our study, the open-source material we are able to analyse provides insights into key markets for succulent plants, that are suitable for the original aims of our study.

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 were completed in Y2 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 was successfully accessed with permission from various government agencies in Y2 of the project, contributing to the results published within TRAFFIC Project Report (Annex X).

Assumption 7: Export data from various sources are available and accessible for analysis (e.g., nursery export data, etc.).

Comments: As reported in our Y2 Annual Report, various data sources were successfully accessed by TRAFFIC and contribute to the results published within TRAFFIC Project Report (Annex 5).

Assumption 8: Stakeholders are able and willing to be interviewed.

Comments: As reported in our Y2 Annual Report, stakeholders were willing and consented to being interviewed by TRAFFIC with these interviews contributing to the results published within TRAFFIC Project Report (Annex 5).

Assumption 9: Enforcement agencies in Namibia and South Africa are concerned about the illegal trade threatening endemic succulents.

Comments: During Y3, both countries have continued to be very concerned about this issue and continue to support 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 in South Africa.

Assumption 10: Enforcement agencies in Namibia and South Africa are able and willing to work with the project.

Comments: As reported in previous Annual Report, due to some overlap with the work of Namibia's Protected Plant Task Team, some of the project team's work in Namibia has been restricted in scope, although fieldwork within Namibia conducted by the Namibian Botanical Research Institute was successfully commissioned in Y2.

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 per Assumption 9 above.

Assumption 12: Enforcement agencies in Namibia and South Africa are able and willing to work with the project.

Comments: As per Assumption 10 above.

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: Further to comments under Assumption 2, based on our work with the eBay Team and feedback we have received from three other platforms approached, this assumption remains true.

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: As described above, our collaboration with eBay has been extremely positive, with a thorough and open discussion of the technical and logistical complexities involved helping to shape our approach. The eBay monitoring team were also very engaged in our training session to increase awareness and ability to identify the illegal online trade in plants.

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: This assumption remains true, with a requirement for vendors to meet the trading policies of the platform not necessarily needing to reflect the minimum legal requirements for online trade that may be officially set by legislation.

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: All plant material for the project has now been successfully transferred to the UK, including specimens obtained from fieldwork in June 2024.

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 analysed our data obtained from samples processed within the laboratory, we cannot be sure of the Outcome of our objectives under indicator 4.1 and 4.2, although an initial evaluation of the data appears promising.

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: Given the delays to Output 4 reported in previous reports and Change Requests, it will not be possible to support reintroduction work based on the results of our study during the lifetime of the project. However, the results of the study still have potential to inform future re-introductions work, with the use of seeds banked from seized succulent plants offering a means of avoiding potential barriers to re-introduction such plant pathogens or hybridisation that may occur when succulents are housed together in large numbers.

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

While this project does not directly contribute to poverty reduction, as stated in previous Annual Reports, 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.

Improvements to the transparency of the online trade in succulent plants that we are working towards under Output 3 would also support the development of a formal economy for succulent plants within Southern Africa. For example, the adoption of best practice in advertising by plant vendors would enable consumers to select sustainably grown plants that support South African's economy with confidence, while making it more difficult for illegal vendors to compete and disrupt this trade. The development of traceability systems that could be applied to nursery grown plants under Output 4 could also contribute to this long-term national objective, as described in Section 7 of South Africa's National Strategy and Action plan (please see Annex 14 for further information).

Building off of the relationships developed and progress made by the project team under this project, TRAFFIC has submitted two proposals for funding that comprise several activities that will address Objective 5 (Reduce pressure on wild populations of South African succulent flora within the arid zone by engaging local communities and facilitating diversification of livelihoods (where applicable) and Objective 7 (Explore options for the development of a formal economy around South African succulent flora that benefits the country, and contributes to socio-economic development and conservation within the Arid Zone) of South Africa's National Response Strategy.

4. Thematic focus

The project is directly working to support two of the project themes (*Ensuring effective legal frameworks and deterrents* and *Strengthening law enforcement*) with the potential to 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 South Africa published under Indicator 1.6 will inform law enforcement officials, while the enhancement in technical capabilities to 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. 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 and other commodities connected to deforestation risk are being developed apace, and we believe

our work can provide a foundation for similar databases to be developed for non-timber endangered plants, to aid to enforcement and deter the laundering of wild sourced plants into trade by illegal vendors mis-declaring them as cultivated specimens.

Ensuring effective legal frameworks and deterrents: Our work with eBay under Output 3 has been highly instructive and has allowed the online plant trade framework that we developed in Y2 to be combined with complexities and practicalities of global eCommerce trade. As the timeframe for making updates to platform policies is understandably long, we are continuing to develop steps that we can take to influence both online vendors and consumers in an incremental way, with measures designed to complement further steps that may be able to be introduced at a later stage, and over longer timeframes. Our positive engagement with eBay is therefore likely to continue beyond the life of the current project, reflecting the new ground that with eBay's help and support we are continuing to explore.

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 vendors and customers using this online platform about responsible plant sales and purchases, which may help to reduce the demand for wild sourced plants, albeit through improving the transparency of legal trade, 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 (see Annex 14).

[redacted]

The succulent poaching crisis in Southern Africa affects a wide and growing number of species. South African authorities have reported the illegal harvest and trafficking of 650 different species with the number of species being targeted by poachers continuing to increase. Of these, species in the genus *Conophytum*, (comprising around 106 scientifically accepted species) remains the most heavily targeted, with *Conophytum* spp. therefore something of a standard bearer for the South African poaching crisis and a continuing focus for the project. Indeed, in researching our Succulent Trade report produced under Indicator 1.6, when interviewees were asked which succulent plant taxa are traded illegally, they specified 15 genera overall, seven specific species, and three groups of plants. The genus *Conophytum* was mentioned most often (13) compared to the next most mentioned genus, *Lithops* (5).

[redacted]

[redacted]

6. Project support for multidimensional poverty reduction

As described in section 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 such as formal economy in succulent plants, helping to address poverty reduction in the long-term. Measures to conserve Southern Africa's unique floral heritage also help to preserve a crucial natural resource for the future well-being of people and communities, while deterring illegal trade helps to avoid the criminalisation of people who may become involved in this increasingly organised branch of the illegal wildlife trade.

7. Gender Equality and Social Inclusion (GESI)

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	X
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.	
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	

TRAFFIC and Kew consider this project as gender sensitive and have addressed the basic needs and vulnerabilities of women and marginalised groups for the training of law enforcement. The Project Team acknowledges that law enforcement tends to be male-dominated, and men are traditionally the powerholders, an entrenched gender and social norm across Africa. By working closely with government agencies, efforts were made to ensure that women were selected as active participants and beneficiaries in the EMI trainings completed in Y2 of the project, where of 22 participants, 16 were male and 6 were female. These same efforts will be made for the training on the Floraguard tool under Indicator 2.2. The Project Team follow a 'do no harm' approach to ensure that negative impacts do not arise from our gender equality actions.

We would also like to highlight that the University of Southampton's School of Electronics and Computer Science has now achieved the 'Athena Swan Silver Award', which is evidence of UoS commitment to GESI also.

However, in line with the feedback received in our Y2 AR review, and as these considerations in relation to our project work apply similarly in Y3, we have adjusted our scoring in the table above into the `Not Yet Sensitive' category.

8. Monitoring and evaluation

During the final year of the project, the monitoring of our achievements against our initial Logframe objectives has been achieved through both internal and external consultation with project partners and contributors. Internally, 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. Since September 2025, Kew's recently appointed Head of Science Policy has also contributed to discussions around project objectives and the planning of specific activities and resource requirements required to meet our objectives this year. While overall we are on track to meet the majority of our Indicator metrics, the use of a number of novel workflows in tandem (particularly under Output 4) is a factor that can make the time and resources required for certain activities difficult to predict, with unexpected developments in one area sometimes impacting the schedule of other ambitious outputs in another branch of the project. This is perhaps exacerbated by the small size of our project team and some staff turnover during the lifetime of the project. However, wherever schedule clashes have occurred, we have been careful to prioritise the key deliverables that are required to deliver each output, and that will have the greatest overall contribution to the project's impact.

Externally, contributors to specific outputs are regularly consulted on our activities, so that specific ideas and objectives can be co-designed with their help and refined where necessary to ensure realistic aims and timeframes can be set. This has helped with a continual process of learning and adaption in some areas of the project, so that even in areas of the Logframe where our initial aims have proved difficult to achieve (such as the nature and scope of our engagement with eCommerce companies), we believe the progress that we have made will still deliver considerable impact and accurately reflects the reality of situations that were difficult to fully predict at the outset of the project.

Aside from these specific areas of focus, a number of other monitoring and evaluation processes are in place. 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 third year of the project (months 22 to 33) has seen many of our project aims realised, while others have been a learning experience reflecting the novelty inherent to many of our project Outputs. Some lessons drawn from this, are as follows:

- Under Output 3, our engagement with eBay has been extremely positive. However, the timeframe for realising tangible changes at platform level may take longer than the lifetime of the project to realise, which reflects that we are not only performing research to create recommendations, but are also working with industry to refine and enact these recommendations which takes a great amount of consideration given the technical and practical considerations involved, affecting a great many other actors involved across the entire eCommerce supply chain. What we have learned is that bringing change to the way in which products which have both legal and illegal dimensions are traded, requires a detailed knowledge of the eCommerce landscape to first be developed, along with the knowledge and foresight to predict the likely impact and effectiveness of potential interventions. We believe the time invested by eBay, TRAFFIC and Kew in this branch of the project will prove invaluable and will help others to learn and follow suit more easily in future.
- While we are on track to deliver the majority of our project deliverables, having a small project team has at times contributed to delays to some outputs, particularly when the work and effort required to reach certain milestones in different areas of the project proves unpredictable.
- Laboratory analysis of plant sample material under Output 4 has revealed lessons about the optimal approach to sample preparation, including drying, grinding and storage techniques. Recording and sharing our methodologies across all branches of the project, including unit time to perform different aspects of our various methodologies, forms an important part of our project write ups, which we believe will be of great value to future researchers working with similar techniques in the future.

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

We have addressed the key feedback from the review of our Y2 Annual Report, as follows:

1. ***Much more specific – and better signposted – evidence is required to demonstrate achievement of project indicators. [Of the 18 optional / supplementary Annexes, several are of administrative relevance only, and three are not cross-referenced to the Report narrative (8, 17, 19) – and therefore serve no purpose]. Refer to project OVIs when selecting the evidence to provide to demonstrate achievement of Outputs and Outcome. For capacity building, pre- and post-training evaluations and training reports should be provided.***

   Here we have tried to incorporate more clearly relevant metrics that evidence progress against our Logframe indicators, and to relate the content of our Annexes more directly to the Logframe, so that the contribution of these activities to the project's progress and objectives is better signposted.

2. ***Ensure reporting against Year totals at Annex 3 (Standard Indicators).***

   We have updated the Standard indicators table, including some projected additions to follow in Y4 Q1, which will be reflected in further updates made within our Final Project Report.

3. ***Comment on variances in confirmed and received matched funding.***

   The finance section contains some additional details relating to match funding. A key point to highlight is that match funding that was projected to provide support for the analysis of laboratory results in Years 1, 2 and 3 has not yet been utilised, due to the delay in obtaining data for analysis within Output 4 of the project. However, Kew's support for the Project Leader to continue work beyond the funded period of the project, along with additional support in the form of in-house biochemistry expertise to guide our approach to data analysis, will provide in-kind support particularly focused on the delivery of Output 4 in Y4 Q1 of the project instead.

4. ***It would be useful to have sight of a report from the workshop '"Towards developing a formal economy around South Africa's succulent flora" held in January 2024 – mentioned at Section 3.5 of AR2. Could this be annexed to the FR? [The Reviewer realises this was not a project activity – but it is still of interest, and relevant].***

   Thank you for the interest in this aspect of the topic, and we have provided a copy of the materials that have been made available to us in Annex 14, submitted with this Y3 Annual Report. We will also continue to check for updates with colleagues in South Africa and will add further updates in our Final Report if there are any further developments over the coming months.

11. Risk Management

Please see the risk register for other risks and adaptations, which has been submitted along with this Annual report. While no new risks have been identified in Y3, a number of updates to the Project Risk Register, Delivery Risk Chain Map and Issue Register have been made.

12. Scalability and durability

We believe that our final project deliverables for each Output of the project will provide valuable foundations for future initiatives and work in this area to be based upon. The South African National Response Strategy, which continues to be actively evaluated, provides a framework for our results to feed into, with the results of our project representing progress against specific objectives of the strategy that can be recorded and built on by the wide range of stakeholders involved in delivering the strategy within South Africa.

Some specific examples of scalability within each Project Output include:

1. Greater understanding of trade dynamics informs law enforcement strategy and action: The information captured in TRAFFIC's Project Report (Annex 5) provides a knowledge base to help inform the law enforcement sector personnel in future. The online trade monitoring study produced under Indicator 1.1 will add to these resources and highlight the technical and horticultural knowledge required for the effective assessment of plant trade by both researchers and law enforcement agencies (Annex 4).

2. Technical skills of law enforcement officers in identifying and intercepting illegally traded succulent plants are improved, supported by innovative technology: While the training of EMIs under Indicator 2.1 was completed in Y2 of the project, the inclusion of an expanded training program for Law Enforcement agencies in Madagascar, Namibia, and Tanzania which builds on the materials created under this Output, forms an objective of TRAFFIC's current IWTCF Round 11 Extra submission. The availability of the FloraGuard software and training materials that will be provided under Indicator 2.2 will also provide a useful monitoring tool to enforcement agencies, which we believe could assist with their online monitoring work in the short term, while also providing a foundation for future technological advancements in this area, should sufficient interest in the potential of these tools be sparked.

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 continuing work with eBay will help to inform and provide a guide for the further work that will be required globally in this area. The IUCN Succulent Trade Taskforce of which the authors of this report are a member, have submitted a motion to the IUCN World Conservation Congress which if adopted, will encourage the eCommerce companies to engage with the issue of illegal plant trade within online platforms, with our current work with eBay therefore providing a forerunner of this expanded effort which is expected to follow.

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 remains a work in progress, but the data we have received from the laboratory will provide a better understanding of the value in applying this technique to endangered non-timber plants threatened by illegal extraction from the wild. This includes the use of stable isotope and trace element analysis to potentially differentiate wild and cultivated specimens, and to aid the re-introduction of seized specimens to their correct locality in the wild. While future work of this nature would require considerable funding, we aim to demonstrate the potential of these techniques to make a tangible difference to the conservation of species that are vulnerable to poaching, with a wider adoption likely to improve the efficiency in terms of finances and logistics involved. If our work is able to identify the most useful combinations of isotopes and trace elements that aid the identification of succulent plant material, this could also further reduce the scope and costs of any laboratory work that may build on these results in future. Feedback on our results from relevant stakeholders will prove an important part of the evaluation of our final results.

13. IWT Challenge Fund identity

During Y3, 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 more recent rounds of IWTCF funding, with the fund's support for work in this area of plant conservation well established. Project staff regularly attend progress and update meetings concerning the National Response Strategy and Action Plan and give updates on our project work where appropriate (see Annexes 15 and 16).

Examples include:

In May 2024, TRAFFIC shared a post to all its social media platforms (X(Twitter)/Instagram) on an interview with TRAFFIC's Project Manager, Dominique Prinsloo, as part of a podcast series called Climate Connections, for a Singaporean Radio Station. She explained what's driving the trade and how consumers can differentiate between a wild harvested succulent versus a nursery-grown one. The link to the podcast was posted on TRAFFIC's social media pages with this tagline: "*This work is funded by the UK Government through the Biodiversity Challenge Funds Illegal Wildlife Trade Challenge Fund"* with an embedded link to the Biodiversity Challenge Funds Facebook page (Annex 17, Figure g).

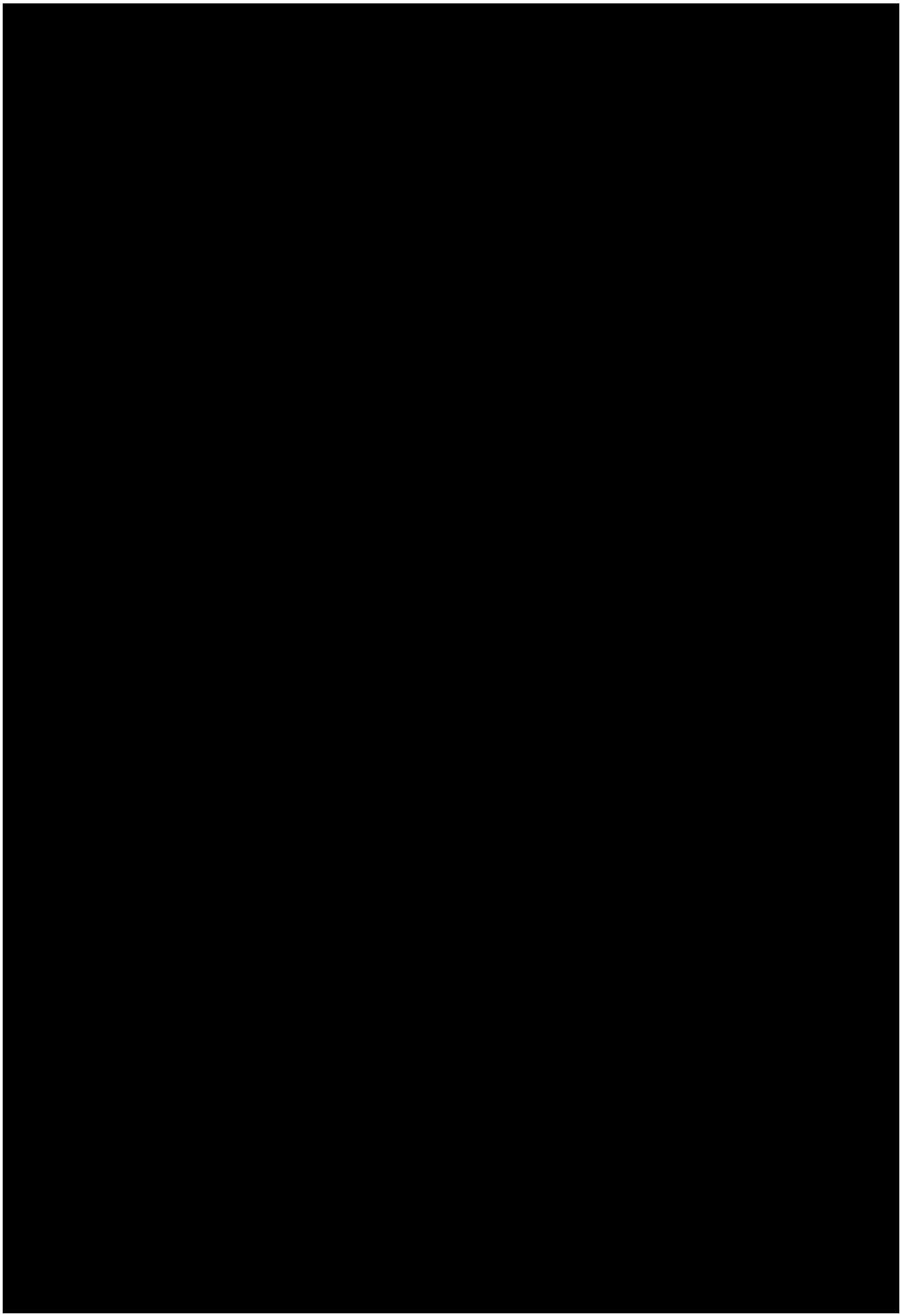
In September 2024, TRAFFIC posted the link to a press release on the engagement with Kew and eBay in addressing the illegal plant trade on eBay's platform (see Annex 10, Appendix 2).

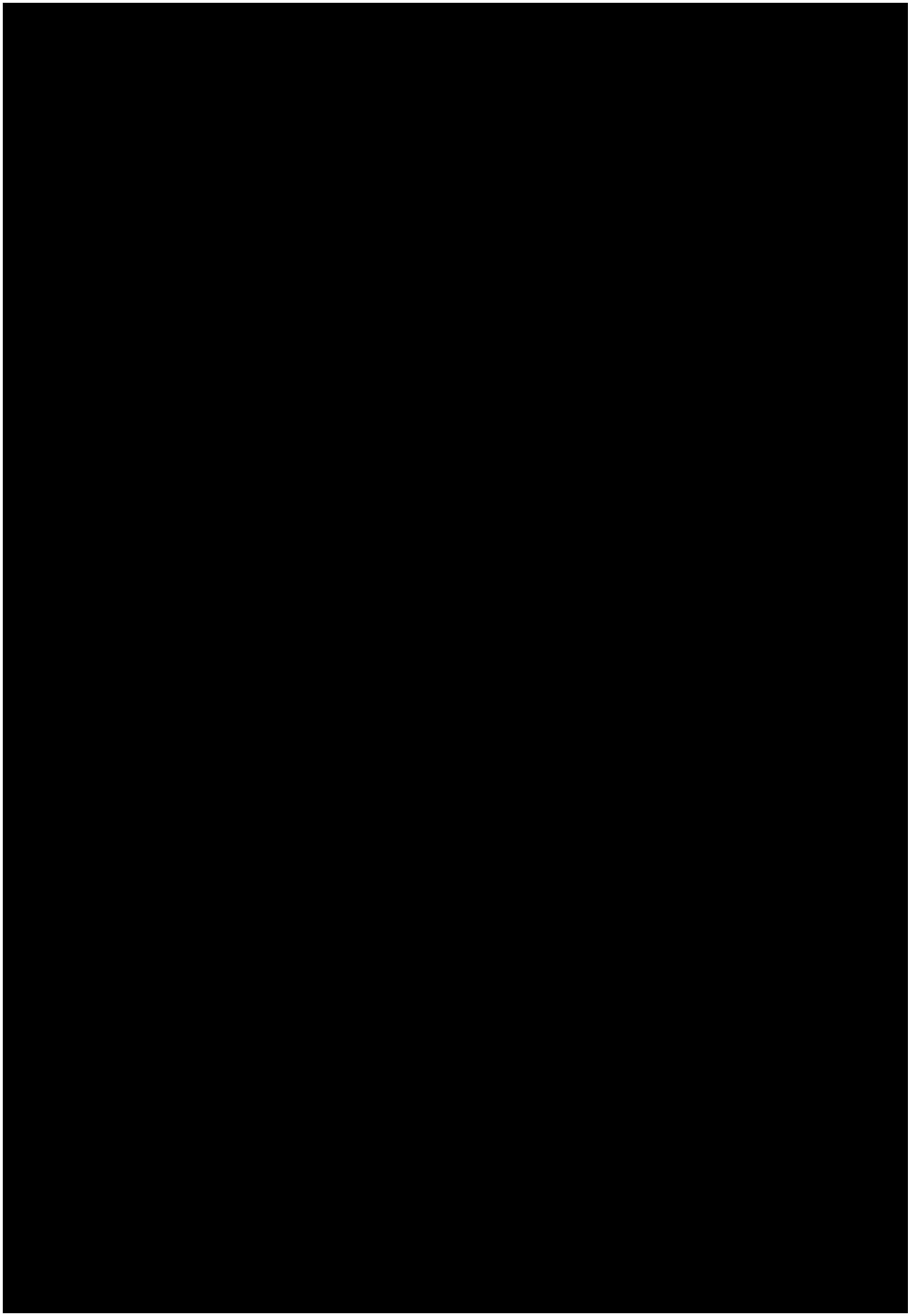
In October 2024, Kew released a blog on "How you can avoid buying trafficked plants" which was uploaded to their website and was shared by TRAFFIC across its social media platforms (see Annex 17, Figure i).

In December 2024, TRAFFIC published a news release on the publication of the TRAFFIC report. This was shared to TRAFFIC's social media platforms (see Annex 17, Figures j and k).

Additionally, the IWT Challenge Fund logo has been used within the credits for TRAFFIC's Project Report (Annex 5), and features 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





[redacted]

15. Project expenditure

Please see below a summary of our Project Expenditure for Y3. Please note these are DRAFT indicative figures at this stage, with some final project costs still to be processed:

Table 1: Project expenditure during the reporting period (April 2024-March 2025)

Project spend (indicative) since last Annual Report	2024/25 Grant (£)	2024/25 Total actual IWT Costs (£)	Variance %	Comments (please explain significant variances)
Staff costs (see below)	[redacted]			
Consultancy costs				
Overhead Costs				
Travel and subsistence				
Operating Costs				
Capital items (see below)				
Others (see below)				
TOTAL	233,059	207,625		

Table 2: Project mobilised or matched funding during the reporting period (1 April 2024 – 31 March 2025).

	Secured to date	Expected by end of project	Sources
Matched funding leveraged by the partners to deliver the project (£)	[redacted]		[redacted]
Total additional finance mobilised for new activities occurring outside of the project, building on evidence, best practices and the project (£)	[redacted]		Financial support for the Project Leader to continue working on the project until the end of June 2025. While the period of IWTCF funding has now ended (end March 2025), this provision will enable the completion of key deliverables, which could not be completed earlier due to unforeseen delays to some areas of project work. This equates to match funding of [redacted] We are still assessing the potential requirements for other Kew staff to provide support for the delivery of Indicator 2.2 (FloraGuard Training), and potential assistance with data analysis under Output 4, and will report on this further within the final Project Report.

16. Other comments on progress not covered elsewhere

During Y3 we have had one change of project personnel, with Kew's Project Officer leaving their post at the end of November 2024, with a replacement successfully recruited in February 2025. Reflecting the short term nature of this appointment, we tailored their involvement to focus on the online monitoring study under Indicator 1.1 to which they made a valuable contribution, and they will be named as a co-author on the online monitoring study report that we will publish in due course.

One other staffing development to note is that a previous member of the project team (recruited originally from the University of Southampton), who assisted with the development of the Floraguard software under Output 2, has now joined Kew in the capacity of an AI Research Associate, which has enabled them to make contributions in the form of technical support for use of the software under Output 1, during Y3 of the project.

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

Among the project's achievements, we would like to highlight the featuring of our work in a 4 page Sunday Times Article (Annex 17, Figures d - f), and within eBay's Annual Impact Report, both of which reflect ways in which our project has helped to raise the profile of succulent plant trade. However, as the Sunday Times article is only available via a paywall and eBay's Impact Report is not yet published, we are unable to share materials relating to these particular achievements.

~~I agree for the Biodiversity Challenge Funds to edit and use the following for various promotional purposes (please leave this line in to indicate your agreement to use any material you provide here).~~

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				Yes / No
				Yes / No

Annex 1: Report of progress and achievements against logframe for Financial Year 2024-2025

Project summary	Progress and Achievements April 2024 - March 2025	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.	In 2025, the succulent poaching crisis in Southern Africa continues to pose a serious threat to Southern Africa's native succulent flora, with many agencies engaged in tackling different aspects of the poaching crisis. While difficult to quantify exact contributions, we are confident that the information generated and shared by the project to date has aided these collective efforts, and helped raise the profile of succulent poaching within the international conservation sector more widely. As we complete our final project deliverables, we will seek further feedback on the latest trends in poaching activity, to consider in more detail how our work has and will continue to make a positive contribution to these overarching aims.	
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, as reported in our Yr 2 AR. In Y3, preparations have been made to share the FloraGuard software with third parties under Indicator 2.2, with this activity now due to take place in Y4 Q1 of the project. Participants will be asked to complete a post-training questionnaire, and will also be asked to report back on any use of the FloraGuard software they are subsequently able to make.	Complete training for analysts from Namibia's MEFT IIU, South Africa's DFFE EEFC and other interested third parties on FloraGuard (Indicator 2.2). TRAFFIC's report was shared 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	In 2020, a total of 98 arrests/seizures involving succulent plants were reported for South Africa. The number of arrests/seizures since then are as follows: 287 in 2021/22,	No specific actions planned, although we will continue to seek feedback from the enforcement sector if possible to help in this

and Namibia compared with 12-month period prior to start of project.	193 in 2022/23, 189 in 2023/24 and 56 in 2024/25. Overall, these updated figures indicate that the number of arrests made has therefore shown a declining trend, rather than the increase that was initially expected. These statistics reflect a complex picture of both plant IWT activity and enforcement effort, with the project likely making an impact to arrests/seizures made from 2023 onwards, as this is when the training of EMIs was delivered, along with support to active cases with species valuations based on online adverts. Please see Section 3.3 Output 0.2 for further consideration of these statistics.	evaluation of our project work, for further reflection in the final Project Report.
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.	Our pilot engagement with eBay has continued throughout Y3. Evidence is provided in Annex 10 reflecting our ongoing discussions re. the development of interventions to improve the transparency in plant trade in eCommerce settings.	During Y4 Q1 and continuing as a project legacy, the project team aims to convert certain concepts and ideas into tangible actions at platform level, as described in Annex 10.
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.	In addition to eBay, TRAFFIC have engaged with three other online platforms and offered to support them in addressing the sale of suspected illegally harvested succulent flora on their platforms. All three platforms were interested in this offer. TRAFFIC made various succulent plant awareness materials available, however given that these were in English and not Chinese, this proved to be a limitation.	During Y4 Q1, we will ensure our learning from our successful engagement with eBay and the other invitations made is shared with relevant stakeholders working in this area, although publicising these results may not be appropriate due to a risk of providing information to illegal vendors that could be used to circumnavigate platform policies and interventions.

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.	In Y3, fieldwork within South Africa to generate georeferenced plant sample material was successfully conducted by the project team. Following the commissioning of a UK base d laboratory, >400 plant samples have now been successfully processed for stable isotope and trace element analysis, at a UK based laboratory.	Complete analysis of Stable Isotope (SIRA) and Trace Element (TEA) data, to produce journal papers. 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.	Ongoing. In Y3, an online monitoring study focusing on the *Conophytum* genus was successfully conducted over a period of 5 weeks. While due to time constraints only 14 eCommerce websites were included in the study, information from >4,000 individual adverts was collected using web crawling techniques with 262 examined in depth to inform our results and conclusions.	Complete the write up of the results of the online monitoring study. 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.	Completed. Improvements to the crawler's installation and operational interface were completed in Y2, with the deployment of the web crawler to generate data for Output 1.1 receiving additional support from AI technical specialists in house at Kew and based at our project partner organisation the University of Southampton. This enabled operational know-how to be honed and technical issues specific to certain types of websites to be identified and addressed.	Ensure all learning through the delivery of Output 1.1 is reflected in the training materials available to third party users of the software.
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.	Completed in Y2 - TRAFFIC collected and analysed the following data CITES Trade Data, court cases and seizures, and nursery catalogues.	None.
Output indicator 1.4. By end Year 1, in person interviews conducted with South African enforcement officers (>5), nurseries (>5) and private landowners (>5).	Completed in Y2 - (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)).	None.

Output indicator 1.5. By end Year 2, two field trips conducted in Namibia to determine hotspot poaching localities and genera/species targeted.	Completed in Y2 - (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).	None.
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.	In Y3, TRAFFIC published a report titled *A Succulent Trade*, comprising information generated from the above activities under Output 1 (see publications section).	Kew to complete and publish a report into the online trade in succulent plant species, reflecting the research conducted under Indicator 1.1.
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.	Completed in Y2 – TRAFFIC delivered 4 x one-day trainings for 13 EMI mentees in the Northern Cape, Eastern Cape and Western Cape Provinces in South Africa and 1 x virtual training for 9 EMI mentees from all South African provinces on various topics relating to the illegal succulent trade. A total of 22 EMIs were trained oh which 6 were female and 16 were male. Annex 18 provides evidence for the trainings including the agenda for the first training, a list of attendees with names redacted and the presentations.	None.
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.	To be completed in Y4 Q1. In Y2, TRAFFIC has received nominations from Namibia's MEFT IIU and South Africa's Environmental Enforcement Fusion Centre (EEFC) for analysts to receive training in FloraGuard, and we have since received further enquiries from other third parties to further expand this pool of interested third parties. We still anticipate training a minimum of 6 enforcement personnel in this technique.	Deliver training in FloraGuard to nominated third party organisations and make software publicly available for download. Training to be supported by in-house AI expertise provided in kind by RBG Kew.

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.	Completed Y2 – (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).	None.
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.	Our pilot engagement with eBay's Global Regulatory Team has continued throughout Y3. Evidence is provided in Annex 10 reflecting the detailed discussions and commitment towards this topic that is shared by all parties.	During Y4 Q1 and continuing as a project legacy, the project team aims to convert certain agreed concepts and ideas into tangible actions at platform level.
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.	Completed. In Y3, TRAFFIC's China office translated a short concept note into Chinese on our offer to engage with platforms to help them combat plant IWT online, and shared this with three Chinese online platforms, all of which were responsive via email. TRAFFIC shared several resources with them, however the fact that these documents are in English and not Chinese was a limitation for this engagement. However, as the responses from these three platforms were positive, TRAFFIC hopes to continue engaging with these platforms further if their application for the IWTCF Round 11 Challenge Fund is successful. In the meantime, TRAFFIC and Kew have agreed to continue jointly working on our ongoing engagement with the eBay team, beyond TRAFFIC's official end date on the project.	During Y4 Q1, we will ensure our learning from our successful engagement with eBay and the other invitations made is shared with relevant stakeholders working in this area.
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 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.	Ongoing. >370 plant samples have now been tested in a laboratory to generate stable isotope and trace element data for analysis, to address the questions posed by Indicators 4.1 and 4.2.	Complete analysis of laboratory data and journal publications.
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.	Ongoing. Fieldwork was completed in June 2024 to obtain georeferenced plant samples which have been tested in a laboratory to generate stable isotope and trace element data for the creation of isoscape maps. Due to time constraints we have been unable to incorporate plants obtained from marketplace settings within the current study, although the data created will provide a reference point for future	Complete analysis of laboratory data to create isoscape maps and journal publications.

	comparative work of this nature. Additionally, a sub-section of the study examining the effects of transferring wild plants into horticultural settings may also yield results that will help realise the potential of these techniques to make such authentications in future.	
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.	Ongoing. This Indicator will be completed following analysis of laboratory data generated under Indicators 4.1 and 4.2.	Complete analysis of laboratory data 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.	Ongoing. This experiment was successfully conducted over a period of 10 months during Y3, with 60 samples obtained from 15 plants processed in the laboratory to provide stable isotope data for analysis.	Complete analysis of laboratory data and journal publication.
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 outreach activities to disseminate results to relevant stakeholders.

Annex 2: Project's full current logframe - Change Request December 2023 Version – with updates to Output 3 Activities made in April 2024 (as part of Y2 Annual Report).

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.			
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.	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	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	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.

	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 traceability tools in marketplace settings, presented as forensic evidence to law enforcement agencies, and used to enhance existing species reintroduction programmes.	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, 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	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	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.

	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 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.	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.	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.
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	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	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.

	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 succulent plant awareness material and draft succulent plant policies.	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. 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.	Legislation relating to online trading conditions does not restrict the scope of the interventions that can be trialled by individual eCommerce platforms.
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	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.	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).

	purposes. Based on trials with a minimum of 2 *Conophytum* spp. 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.	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.	

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. Develop a "best version" internal-facing policy that can be shared with eCommerce platforms for review, discussion and customization - (Kew & TRAFFIC).
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 (Kew & TRAFFIC).

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 cannot directly quantify, but could potentially report against which we will give further thought to within our final project report. 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, which were introduced after the commencement of this Round 8 Project.

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	22	0	22	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	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	193 (+189% compared to 2020; -33% compared to 2021)	189 (+185% compared to 2020; -35% compared to 2021; -2% compared to average of 3 previous years from 2020 to 2022).	56 (-45% compared to 2020; -80% compared to 2021).	Average of 146/yr. (+33% compared to 2020; -49% compared to 2020).	Under evaluation – specific contribution of project work to these figures difficult to quantify.

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	82 (-30% compared to 2021, but with increase in conversion rate from 41% to 42% of cases).	87 (-24% compared with 2021, but with increase in conversion rate from 41% to 46% of cases).	18 (-85% compared with 2021 with a decrease in conversion rate from 41% to 32%).	Average of 62/yr (-48% compared to 2021, with an average conversion rate of 40% compared to 41% in 2021).	Under evaluation – specific contribution of project work to these figures difficult to quantify.
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 compared with 12-month period prior to start of project.	Number of suspects charged for crimes involving trading succulent plants illegally	Number	None	TBC	TBC	TBC	0	TBC – exact contribution of project work to these figures difficult to quantify.
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	TBC	TBC	TBC	0	TBC – exact contribution of project work to these figures difficult to quantify.
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	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	0	7	12

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	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 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.	Number of other publications and reports produced providing quantitative and qualitative understanding of the drivers behind legal and illegal trade in succulent flora.	Number	None	1	0	1	0	3
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	7	212	212
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.	Number of tools for monitoring online trade in wildlife products developed, refined and optimised for use by conservation and enforcement agencies.	Number	None	0	1	0	0	1

IWTCF-D26 (Core)	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 third party personnel trained in FloraGuard technology and techniques.	Number	None	0	0	0	0	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	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)
A Succulent Trade	Report	Prinsloo, D., Burger, M., and Newton, D. (2024). A succulent trade: the legal and illegal trade in succulent flora stemming from South Africa. © TRAFFIC 2024.	Female	South African	TRAFFIC International, Cambridge, United Kingdom	https://www.traffic.org/site/assets/files/26240/succulents_report.pdf

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, scheme, type of report (i.e. Annual or Final), and year) and **deleted the blue guidance text** before submission?	Y
Is the report less than 10MB? If so, please email to BCF-Reports@niras.com putting the project number in the subject line.	Y
Is your report more than 10MB? If so, please consider the best way to submit. One zipped file, or a download option is recommended. We can work with most online options and will be in touch if we have a problem accessing material. If unsure, please discuss with BCF-Reports@niras.com about the best way to deliver the report, putting the project number in the subject line.	Some annexes may deliver in downloadable format.
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.	Y
Have you provided an updated risk register? If you have an existing risk register you should provide an updated version alongside your report. If your project was funded prior to this being a requirement, you are encouraged to develop a risk register.	Y
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	Y
Have you completed the Project Expenditure table fully?	Y
Do not include claim forms or other communications with this report.	