Darwin Plus:
Overseas Territories Environment and Climate Fund
Annual Report

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

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

Submission Deadline: 30th April 2024

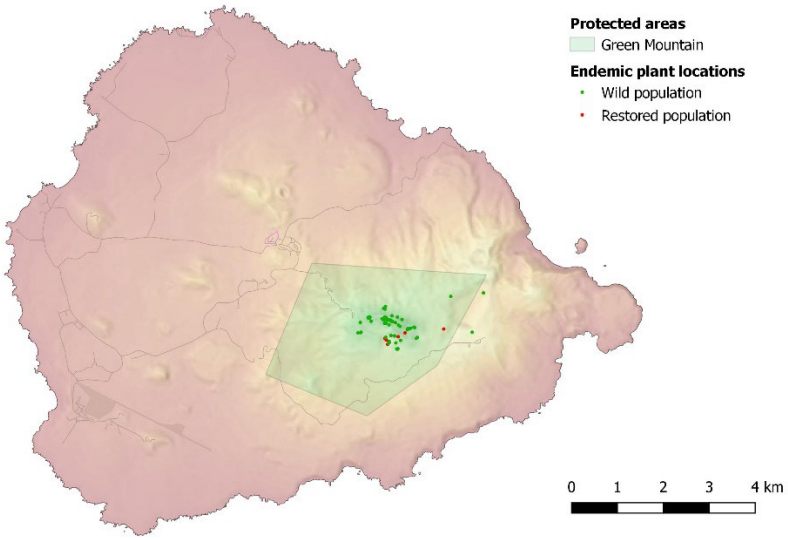
Submit to: BCF-Reports@niras.com including your project ref in the subject line

Darwin Plus Project Information

Project reference	DPLUS159
Project title	Growing hope – a blueprint for saving Ascension's endemic plants
Territory(ies)	Ascension Island
Lead Partner	Ascension Island Government Conservation and Fisheries Directorate (AIGCFD)
Project partner(s)	
Darwin Plus grant value	£77,850.00
Start/end dates of project	01/01/2023 – 31/12/2024
Reporting period (e.g. Apr 2022-Mar 2023) and number (e.g. Annual Report 1, 2)	Apr 2023 – Mar 2024: Annual Report 2
Project Leader name	Tiffany [redacted]
Project website/blog/social media	
Report author(s) and date	Phil [redacted] 18/03/2024

1. Project summary

Ascension's five critically endangered upland endemic plants face the dual threats of climate change and non-native species. Populations are in decline with some at serious risk of extinction. This project will undertake a review of the successes and failures of past work. It will address knowledge gaps about the preferred growing conditions of plants and trial the best means to create suitable conditions and control non-native competitors. This will provide the evidence base for a new Endemic Plant Restoration Plan.



NOTE: The project start date was postponed, which has caused some confusion in terminology. For the purposes of this report, Y1Q1 is the actual start date, commencing in January 2023.

2. Project stakeholders/partners

The project has no formal partners other than AIGCFD, although it was planned to establish a steering group via which external experts could be consulted. Our intention was to keep the group small and informal: thus, rather than scheduling a regular and fixed timetable of meetings, we would use it as a resource to draw on as and when technical issues arose. This structure partly reflects our needs, but also reflects the constraints of assembling a steering group: there is only a limited pool of habitat restoration specialists with direct interests and experience on Ascension Island external to AIGCFD; these people are often extremely busy and have limited time to offer.

The group thus far has comprised the following:-

Name	Role
Tiffany [redacted]	AIGCFD Director
Jolene [redacted]	AIGCFD Conservation Officer
Colin [redacted]	Former head of UK Overseas Territories Group, Royal Botanic Gardens, Kew
Marcella [redacted], Tom Heller	UK Overseas Territories Group, Royal Botanic Gardens, Kew
Rebecca [redacted]	Head of St Helena Research Institute

Nevertheless, due to other time demands on contributors, discussions have been infrequent. This was particularly true at Kew, who have faced their own challenges: Colin Clubbe retired soon after the project started and the UK Overseas Territories Group has been in the process of a protracted restructuring, with uncertainty over the ongoing roles of staff. We are still in contact with Kew, and the project officer was able to visit in March 2024 for a face-to-face meeting.

Despite the limitations, collaboration has proved useful: for example, we have been able to obtain direct assistance from the Micropropagation Team at Kew with multiplying the threatened fern *Anogramma ascensionis*, which is now being grown in both London and on Ascension Island.

There are clearly constraints on the efficacy of these interactions, and some adaptation has necessary. The needs of the project are specific. The project officer, Phil Lambdon, has been working in habitat restoration of remote island ecosystems for 24 years, approximately ten of which have been based in the South Atlantic. Whilst this does not preclude a need for advice, day-to-day mentoring from external experts is not necessary for the running of the project. Also, now that the basic methodologies have been established, most of the activities are routine and do not require much oversight. The main need for broader discussion lies in developing a final plan, which will become the main focus towards the end of the project. We therefore consider that a one-off, 'workshop-style' online meeting with a broader number of contributors than we currently have involved, to review the current situation and discuss future ideas, might be a more useful and practical approach. These contributors have been identified and will be approached as when the workshop planning begins.

Engagement activities are periodically conducted by AIGCFD plant team: educational talks and shade house tours for the school and youth groups, volunteer conservation days and occasional public tours of key plant areas. We feel that these cover most of the general needs, although some form of event more focused on the project is under discussion for later in the year (e.g., a public talk, social media and/or public notices, a guided walk and a specific meeting with the Council have been suggested).

3. Project progress

3.1 Progress in carrying out project Activities

Only those activities that are scheduled to have started are discussed in this section:

1.1 Analyse endemic plant census data collected by AIGCFD between 2012 and 2022.
By the previous half-year report, most of the analysis had been completed, but further progress has been hampered. Whilst interpreting the results, inconsistencies were uncovered that required us to further interrogate the original data. After a discussion with the AIGCFD Conservation Officer, Jolene Sim, it was determined that the issues could only be resolved by supplementary fieldwork, which is being incorporated into the latest Endemic Plant Census (March-April 2024). Finalisation of the study has thus been delayed, pending this input.

Some sample trends (on those species or populations without major methodological problems) are presented in Fig. 1, and example maps are shown in Fig. 2. However, within the scope of this report, it is impossible to offer a complete overview, as there are various confounding factors that require careful interpretation. For example, there are differences in the performance of restored and wild populations, and parts of the data set have been collected using different methodologies. As noted in previous Darwin reports, a rationalisation of the methodology and data management is underway, with recommendations for the future still being refined. The final report will be compiled by the end of the project.

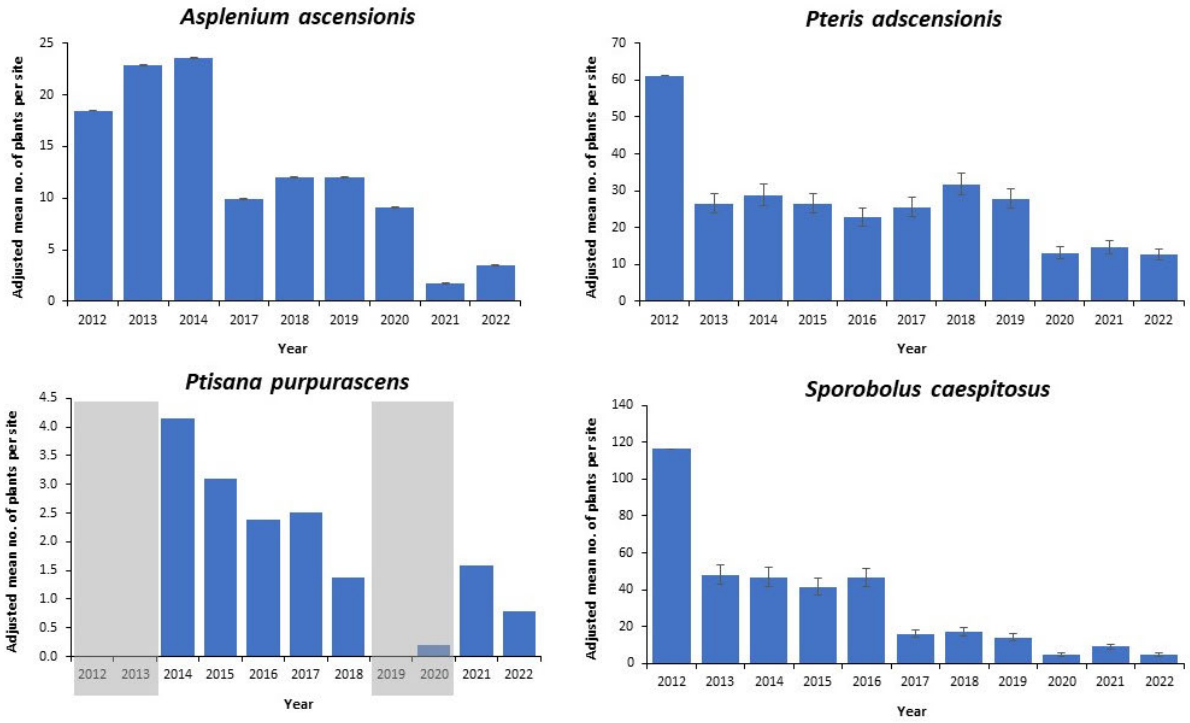


Figure 1 Population trends in numbers of mature plants recorded for four endemic plant species on Ascension Island between 2012 and 2022, based on an analysis of endemic plant census data. Values have been adjusted to compensate for missing information using generalised linear models. Error bars represent standard error values (thus giving an impression of confidence in the estimates). However, this was not an adequate correction in a few years when recording difficulties made the findings particularly unreliable: these cases are indicated in grey. For most species, the data set comprised close to the whole population, but for *Ptisana purpurascens*, the presented trends are restricted to only those sites that were accessible on foot (less than half of the total).

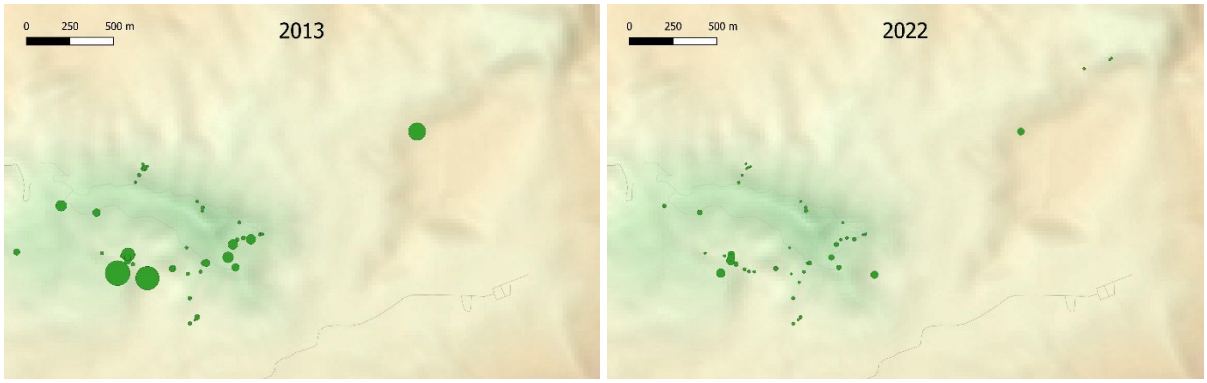


Figure 2 A comparison of the distribution of *Asplenium ascensionis* on Ascension Island, from plant census data collected in 2013 and 2022. Symbol size is logarithmically proportional to the size of the population (maximum size = 10,000 plants). A clear decline is evident.

1.2 Evaluate the success of endemic plant restoration efforts undertaken by AIGCFD since 2008.

An initial review of the performance of restoration efforts was undertaken by Jolene Sim in 2022. There are constraints in the lessons which can be learned from this exercise, because there have only been a few previous restoration attempts on Green Mountain and these have all been subject to limited success, or been poorly documented. Nevertheless, the current project will attempt to suggest new approaches to some of the problems. This is an on-going, evidence-based process that is dependent on results from other project activities which have not yet finished, and of broader discussions with partners (see Section 2). Further indicators of progress are thus difficult to provide at present. The findings are an integral part of the endemic

plant census review (Activity 1.1) and the results of the final management plan (Activity 4), neither of which is complete.

2.1 Establish temperature, humidity and light monitoring devices at 24 locations.

The first aim (though not specifically listed as an activity) was to establish a long-term monitoring program to investigate climate change on Green Mountain, by siting a permanent automated weather station. This was achieved in August 2023. Whilst the data set will be invaluable, it does not offer a complete picture as it covers only a single site. To obtain more detailed information about how climate varies with topography, additional data have been collected from 21 sites across the south and east sides of Green Mountain, starting in June 2023 and continuing to January 2024. The sites were each furnished with a temperature/humidity logger. We were particularly interested in determining how fog contributes to the total precipitation in different areas, so fog gauges were constructed and deployed at 14 of these locations. Precipitation, together with wind, light and soil moisture recordings, were measured manually on a weekly basis. Surveys of the plant communities at the target sites have also been made, so that the relationship between vegetation and climate can be investigated.

2.2 Download and collate 14 months of temperature, humidity and light data from the 24 locations

Recordings from the weather station have been downloaded on a monthly basis, and will continue indefinitely. It is too early for detailed analysis as trends will only become apparent in over a span of years, but a sample of the recordings from the first months is presented in Fig. 3.

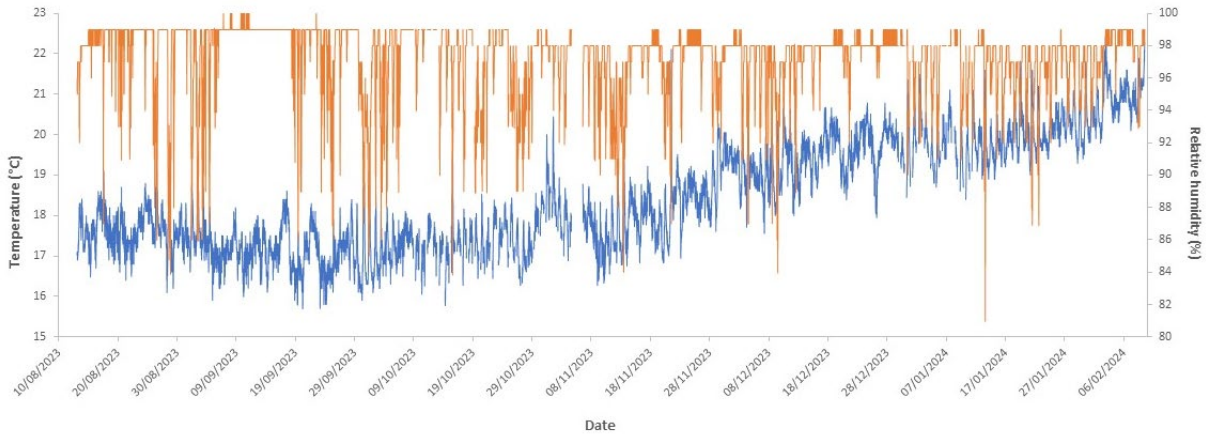


Figure 3 Temperature (blue) and relative humidity (red) recorded from Green Mountain weather station, August 2023 – February 2024.

As the data collection from the 21-site network has only just been completed, it has not yet been possible to analyse the results in any detail, although some illustrative trends are shown in Fig. 4. It is clear that variation in microclimate across the mountain is complex, and affected by a number of factors which will be difficult to unravel. For example, wind speed increased with altitude, but was also affected by the orientation and degree of site exposure. Light levels were much higher under guava canopy than that of other species, but were also affected by cloud cover, which increased with altitude. Fog precipitation increased with altitude, but was heavily affected by wind speed. Surprisingly, total precipitation decreased substantially under tree cover, but soil moisture remained much higher than in open sites, regardless of the tree species, because this was offset by high humidity and low evaporation.

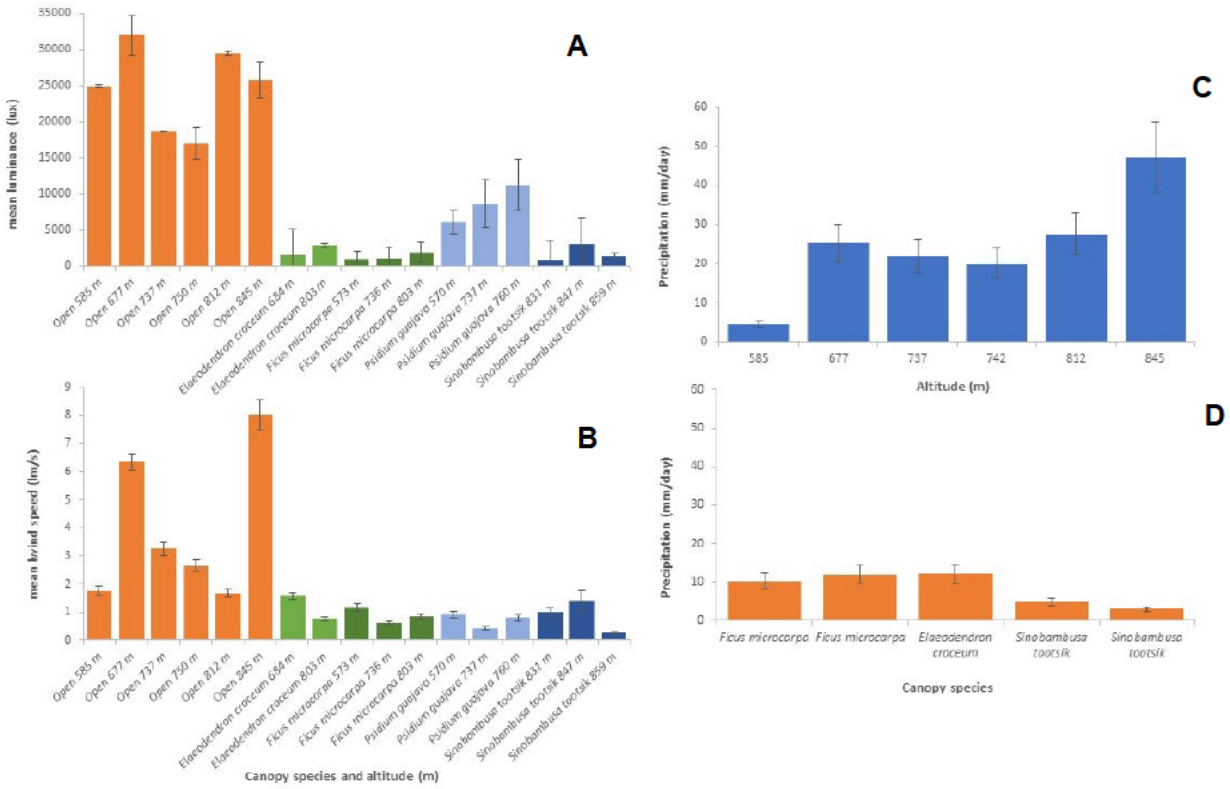


Figure 4 Summary data for climatic variables at different sites across Green Mountain, June 2023 to January 2024: (A) Light levels (luminance), both in open and under canopy of various tree species at different altitudes; (B) Wind speed, both in open and under canopy of various tree species at different altitudes; (C) Precipitation (fog + rain) at different altitudes; (D) Precipitation (fog + rain) under different canopy species.

3.1 Conduct restoration trials to establish thirty individuals of *Anogramma ascensionis* and *Sporobolus caespitosus* at each of two locations.

This activity was modified from the original one via a change request, approved by Darwin Plus in November 2023. The change stemmed from the review of previous restoration efforts undertaken as part of Activity 1.2, and was designed to push forward priority conservation needs. One critical deficiency in the past has been the lack of success with re-establishing threatened plants in wild situations, and we aimed to trial more advanced techniques to deliver this goal.

A considerable time investment has been made in preparing for this objective since November. The two target sites have been intensively and carefully weeded. With considerable help from Ascension Island Conservation interns, fog catchers have been built according to a design refined from one we trialled in a previous Darwin Plus project (DPLUS113). These have been installed at each site to harvest water to keep the plants irrigated when they are established, thus mitigating against drought in the early stages (Fig. 5). Tanks (650 litres) have been positioned to store the water; the first of these filled within 4-5 days using harvested fog alone, during a reasonably dry period on Green Mountain. The sites are thus almost ready to receive plants. Introduction will not be attempted until May 2024, as (a) the project officer is currently on annual leave, and (b) March and April on Ascension typically experience very heavy downpours, which could be damaging to poorly established ferns.

Figure 5 Irrigation infrastructure built on Coronation Peak to supply the demands of the *Anogramma*/*Sporobolus* restoration trial.

One further difficulty has been multiplying sufficient numbers of *Anogramma ascensionis* to supply the restoration effort. *A. ascensionis* is extremely difficult to grow, as it is sensitive to both excess heat and overwatering. It requires high humidity, but this also makes it prone to fungal contamination. We have developed two new terraria so that plants can be reared in controlled conditions in the lab, rather than in the shade houses where they are more vulnerable to climatic fluctuations, pests and diseases. Although the plants initially performed well in the terraria, we have recently experienced some die-back. The reasons for this are unclear, and work is ongoing to rectify the problem. If not resolved soon, this could delay the latter stages of the reintroduction, but as it was always expected to take several months to accelerate plant production in the terraria, we had planned to start the reintroduction work using shade house stock, which has not been affected.

3.2 By Y2Q4 optimum control methods identified for eight key invasive species, using a combination of literature searches and replicated field trials.

This activity has proved challenging. Initially, the start was delayed because the herbicides had not arrived on Ascension. The past year has been very wet on Green Mountain and it has subsequently been difficult to find dry days suitable for using herbicides (if toxic substances are washed off the plant, they will likely be ineffective and may also present a risk to the wider environment). In addition, other project activities have necessitated a considerable amount of fieldwork, making it difficult to fit all the demands into a restricted schedule (field time has increased from approximately three days to almost five days a week since the start of 2024, even in bad weather). There is some urgency to complete the treatments, as the key determinant of success depends on whether the plant recovers from control efforts, and it may take six months or more for signs of re-shooting to emerge. This means that results will not be available until very near the end of the project.

Due to issues of practicality, we have limited the trial to four treatments plus a control (where the tree is cut but no herbicide applied) conducted on four tree/shrub species. A minimum of ten trees are required to adequately evaluate success, necessitating a total of 200 trees of suitable size and accessibility to be located and visited. Thus far we have succeeded in completing the treatments on 120 individuals, leaving at least 80 more to be found.

Each tree must be measured and assessed for condition before the treatment is applied. Follow-up checks, to assess for signs of death and-or regrowth, have been conducted four times (this monitoring at least is less weather-dependent). Some further, small-scale trials have been conducted on ginger control, and limited tests of other methods have been applied to certain other species. The latter were merely pilot tests and not adequately replicated.

Unfortunately, it is not possible to present evidence of progress at this stage, as the data set is still in the early stages of compilation and there has been no time available to conduct any

analysis on it. However, most of the treated plants have shown the expected signs of die-back, except for some *Sageretia minutifolia*. This species may root in various places from trailing stems, and is particularly difficult to control because it can regenerate rapidly if the rooting points are missed. No regrowth has yet been observed from treated plants, but is almost certain to develop over the coming months. Some species are also under consideration for biocontrol through a separate Darwin project to address the limitations of traditional control methods.

3.2 Progress towards project Outputs

Output 1: Analysis of census data and evaluation of past restoration efforts

Activity 1.1: The 'baseline condition' is that AIGCFD had been conducting a bi-annual endemic plant census since 2002. For much of the early part of the department's existence it was run with very few staff, who had little opportunity to train in IT skills and in scientific methods. Unfortunately, all data from before 2012 was lost or is now unusable due to uncertainties over sites, species names or recording dates. The need for better processes was identified some years ago. Subsequent surveys have been much more rigorous, and simple trends have occasionally been plotted from the counts, but they have never been fully analysed using advanced statistical techniques and the resource has been somewhat underused to make conservation decisions. Lack of such analysis at regular intervals is inherently dangerous: errors inevitably accumulate, and the longer these errors lie undetected, the more difficult it becomes to determine the appropriate correction. Further tracts of data could thus become unusable.

According to the original log frame, the analysis of plant census data was scheduled to be completed by Q3 of the first year - a deadline that has long passed. The biggest problems have been in understanding the data set, correcting recording errors and determining how to standardise inconsistencies. Most of this task was completed in the first three months, but there still remained outstanding elements that needed to be resolved. The main reasons for the longer delays have been (a) the need to contact staff who took part in the surveys for assistance in interpreting ambiguities, (b) a need to obtain more data to calibrate results obtained using different methodologies and (c) fieldwork on other elements of the project has been a higher priority, leaving the project officer with little office time over recent months.

There is no reason why the analyses should not be completed well before the project end and incorporated into the final reporting as originally planned, especially as the fieldwork commitments are scheduled to diminish soon, allowing the project officer more office time. However, with so much other work to do it is impractical to produce an interim report before the final one, which would absorb vital time for little gain. It is thus difficult to provide much direct evidence of progress other than the sample trends shown in Figs.1 and 2.

Activity 1.2: In fact, there have only been a handful of previous "endemic plant restoration efforts" on Green Mountain, with only a few of these documented in any detail and none of which have led to the establishment of a stable and self-perpetuating population of a threatened species. Nevertheless, before DPLUS159 this had not been formally appraised. A report was produced by Jolene Sim, shortly before the project start date. This does not contain detailed data analysis, which will ultimately be produced through Activity 1.1, but the trends are readily interpretable without it. Of more practical relevance is the process of determining why restoration attempts have failed, and developing appropriate solutions. This process is not independent of the final endemic plant management plan, and thus cannot be fully addressed until the end of the project.

Output 2: Results of monitoring to establish the ecological requirements of the five endemic plant species and the suitability of potential habitats on Green Mountain.

Some clarification of terminology is necessary for this output. "Ecological requirements" could be interpreted very broadly to include various aspects of the life history and ecology the species. Obtaining such information would be a huge task requiring several dedicated projects, but from the activities listed in the project proposal, it is clear that the intention is to focus on the

relationship between species and climatic variables only. The baseline condition is that no data had previously been collected on these relationships.

Even with this more limited aim, it remains a very ambitious objective that is not fully achievable within the project scope. There are six endemic plant species on Green Mountain, each of which is associated with several present and/or historical locations. To compare the climate at these sites against the 'background conditions' would require a large number of baseline monitoring stations to be established at additional locations the Mountain. From the results we have obtained, it is clear that climate varies considerably at a scale of metres, due to the effect of topography, elevation and vegetation. The number of monitoring sites necessary to adequately describe this variation would thus be in the range of at least 100-200, which is considerably in excess of the logger capacity we have available, and would require much more manpower and modelling expertise than the project has at its disposal.

Consequently, our aims have been refined to three simpler objectives:

1) To perform a small pilot investigation on how climate varies according to geophysical conditions, which could form the basis for a future, more detailed modelling study.
2) To assess the role of tree canopy in modifying climatic conditions
3) To make an exploratory assessment the climatic niche of some endemic plant species within this matrix (*Asplenium ascensionis*, *Sporobolus caespitosus* and *Ptisana purpurascens*). Other species occupy sites that are considered too distant or inaccessible to be practically included at present.

Output 2.1 states: "temperature, humidity and light monitoring established at 24 sites". Monitoring began on the first set of sites by August 2023 (YR1, Q3), slightly behind schedule due to the time taken for shipping of equipment. We were only able to work on 21 sites (plus a new automated weather station), because the budget only extended to 21 data loggers, and also because some of our loggers available from previous projects stopped functioning in the early stages. However, all existing sites were on the exposed, south and east sides of Green Mountain, and now data from these sites have been secured, it is planned to move the apparatus to new monitoring sites for an additional eight month's recording, mostly on the sheltered north side. Monitoring of some of the original sites will be continued, so that comparisons of sites from different years can be calibrated. The loggers were relocated to the new stations in March 2024.

In the original proposal, the indicators for achievement of this objective were:-

(1) A map and photos of the sites

A map has been included in Fig. 6. Unfortunately, photos are not currently available as the project officer's phone broke shortly before this report was due, and it has not been possible to extract the images. It is a relatively small task to obtain more, but as the project officer is currently off-island, presentation will have to wait until the next report.

(2) A spreadsheet of data

The data have been stored in an Access database rather than a spreadsheet, making it easier to integrate different data sets into a single analysis. A copy of the database, as it currently stands, has been included with this report. Not all of the logger and weather station data have been uploaded yet.

(3) A standalone analysis report for later incorporation into final restoration plan.

This is not scheduled until the project end. Since the scheduled delivery date for the standalone report is the same as the delivery date for the final restoration plan, it seems unnecessary to produce it separately, as this would merely result in duplication.

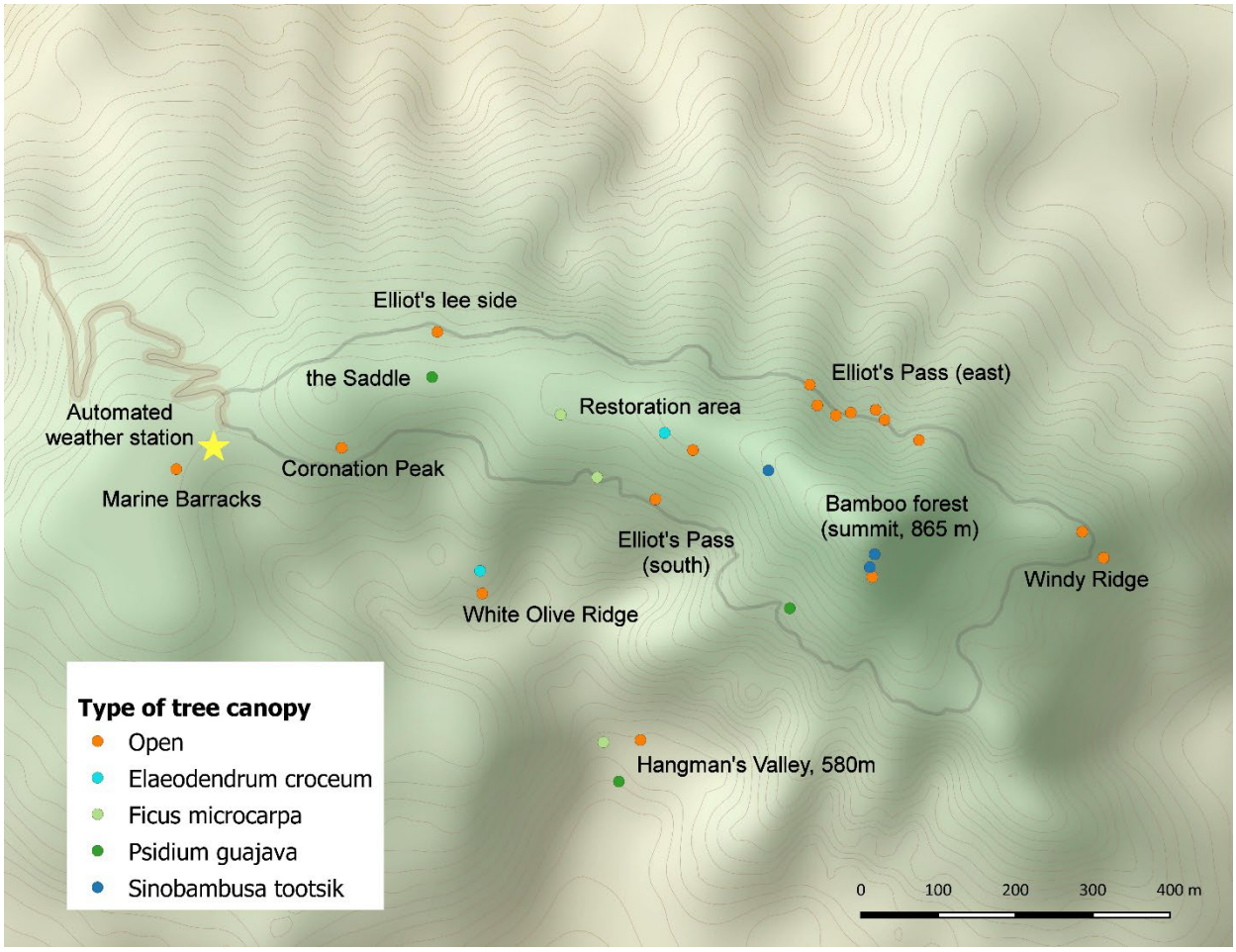


Figure 6 Map of Green Mountain, showing locations of climate data recording sites, August 2023-January 2024. Some sites were in open locations and others under canopy of trees (species indicated in legend). Open and canopy sites were usually paired.

Output 3: Results of trial endemic plant reintroductions and control methods for non-native invasive plants

Output 3.1: The baseline condition is that only a single individual of *Anogramma ascensionis* survives in the wild. One previous attempt has been made to restore a population from cultivation, by Jolene Sim in 2014, but no plants survived for more than one year. *Sporobolus caespitosus* occurs at several small and fragmented wild sites, with a total population (omitting at least one small inaccessible site) of 122 individuals in 2022. One previous attempt was made to restore plants to a wild situation, by Stedson Stroud between 2007-2012, but no written record is available and little is known about the effort. It is unlikely that any have survived.

We have been growing plants to supply the latest restoration effort since the start of the project, and have sufficient numbers to complete the first phase (20 plants of each species) by YR2Q2, with no reason to assume that the requirement for the next phase (60 plants of each species) will not be met by YR2Q4. Most of the infrastructure for the restoration is now in place (except for drip lines, which will only be installed when the plants have been positioned). The planting is scheduled for May 2024. This may be delayed slightly: as there has been some invasive species regrowth at the target sites since they were initially cleared, and the project officer has been off-island for several weeks (thus unable to conduct maintenance), some further weeding will be necessary before the plants are introduced. The weeding should only take 1-2 weeks, but is somewhat weather-dependent as accessing the sites involves ladders positioned on sloping ground. The work is thus not due to have been actioned yet, and it is not possible to provide further evidence of completion.

Output 3.2: The baseline for this activity is that some control work on invasive species has been conducted on Green Mountain in the past, although efforts are limited due to a lack of manpower. Staff have generally used a standard approach for invasive control, involving cut-stump treatments and application of Garlon (® Corveta Agriscience), at specified

concentrations and mixed with water or diesel depending on South African recommendations for the species concerned (Van Zyl, 2022: “Guide for the control of problem plants”). These treatments are not completely effective, as some rhizomatous species typically display regrowth after a few months. Regrowth is costly because it requires much repeated effort through return visits. We have aimed to investigate whether alternative approaches could be used to improve efficiency.

The original proposal committed to trials of different methods on eight invasive species. We consider this too many to be practically achievable, given the manpower and time available. Four species is a more attainable target (*Juniperus bermudiana*, *Psidium guajava*, *Sageretia minutiflora*, *Vitex trifolia*). The trials still involve 200 plants; with each tree taking approximately 15 minutes to survey and treat (excluding search and travel time), it is only possible to cope with 10-15 trees per rain-free day. Smaller-scale tests have been made on a further species, *Alpinia zerumbet*.

The indicator for this output is a report to be incorporated into the final management plan, and this is not due until the end of the project. Although “before and after” photos of target plants were planned, these have been lost due to a phone breakage and are not currently available. As the treatments can only be evaluated by assessing the level of regrowth, which may take several months to become visible, it has been imperative to complete the initial treatments well in advance. Unfortunately, we are slightly behind with achievement of the objective, with only 120 trees processed thus far. An intensive effort to complete the task will be made when the project officer returns from leave near the end of April, provided the weather allows it.

Output 4: Detailed evidence-based restoration plan for five endemic plant species that has the support of stakeholders

The baseline for this output is that the previous endemic plant management plan for Ascension was produced in 2013, in the form of a series of Species Action Plans for each endemic species, and a Habitat Action Plan for the overall management of the environment (the funding for this work arose from an OTEP initiative). Relatively few of the action points from this work have been delivered, as the Directorate still only had modest capacity in the years after it was published, and the focus shifted more heavily to marine conservation: a field which had previously been somewhat neglected.

As with previous actions, it is important to clarify the objectives of this output in realistic terms. Many of the recommendations of the 2013 reports remain relevant to today’s needs, and there is little point in simply rehashing ground that has already been covered. Also, the wording of Output 4 specifically states that any plan should be “evidence-based”, which is indeed important. Many of the problems facing Ascension’s endemic plants are due to ecological factors that we do not yet fully understand. Other issues arise from factors for which there is no easy solution: e.g., the overwhelming pressure from competition by invasive plants, which cannot be held at bay with a workforce of only a few people. It is impossible to develop concrete solutions without a reasonable comprehension of these problems and rigorous pilot tests of potential solutions (our change request to update Activity 3.1 was an attempt to ‘pilot’ one possible solution in exactly this way). Whilst the current project has a research component, it does not delve into the ecology of individual species in sufficient detail to provide many of the necessary answers. Indeed, to do so would require a dedicated project devoted to each species.

The final document will therefore be an outline proposing pathways for progress in the conservation of Ascension’s endemic flora, which would set-forth the next steps towards a restoration plan. At present, we can achieve the following:-

(1) Undertake a (minor) review of the previous Action Plans, updating them in the relatively few cases where new information has become available

(2) Provide detailed documentation, conclusions and recommendations from the studies delivered during the course of DPLUS159, to a scientific standard.

(3) Identify the issues and unknowns associated with the conservation of each endemic species, and lay out a template for future research projects or pilot restoration trials.

(4) Provide some overview of directions for the future environmental management of Green Mountain on a wider level, particularly with reference to invasive species. However, as this is somewhat outside the remit of the current project and there is no dedicated time or resources to study it in detail, the conclusions will be general and limited.

The final report is not due until the project end, and although Jolene Sim's management plan, produced in 2022, will act as a basis, further writing has not yet commenced. Most of the objectives are dependent on results from the current work, and it is thus difficult to draw conclusions until they are more advanced. Also, the opportunity for desk time has been limited thus far due to the heavy fieldwork commitments. It is clear that further ideas from external partners, likely collated during a workshop, will help to shape the outcome. Some opportunity for public consultation should also be facilitated. Neither of these can appropriately be scheduled until there are sufficient results to share, and thus may be better delivered around September/October 2024.

3.3 Progress towards the project Outcome

Outcome: Conservation of Ascension's five critically-endangered plants is based on a strategic, evidence-based plan that provides the blueprint and impetus for future action needed to save these species from extinction

The Outcome is heavily dependent on the ultimate 'management plan' of the project, with the other activities providing the research that will feed into it. Since this output is not scheduled until the project end, the indicators of progress are measurable through the advancement of the various activities that have been discussed above. These are largely progressing according to an achievable timetable. The baseline, progress and issues associated with the Outcome are discussed under Section 3.2, Objective 4. It is particularly important to note the refinement of realistic goals of the 'restoration plan', as this has direct implications for the wording of the Outcome. We are wary of over-promising. In reality, a more accurate wording might be:

"Conservation of Green Mountain's endemic plants is guided by a strategic pathway document, that provides the impetus for future action to save these species from extinction"

Here, we more cautiously reinterpret references implying a literal restoration plan, as the final result will leave room for future development of this as the evidence base continues to grow. The number of species under threat has also been corrected: Ascension has six critically endangered plant species (although only five occur on Green Mountain), and another Green Mountain endemic is likely to qualify for this IUCN threat category at the next revision, based on analysis of the Endemic Plant Census data.

As specified in the proposal, the Outcome indicators are as follows:

0.1 By Y1Q3 Evaluation of existing data and restoration attempts to consolidate learning.

As discussed under Section 3.2, Output 1, the underlying activities associated with this indicator have over-run, and there is insufficient time left to produce an interim "Evaluation report". However, the findings are scheduled to be incorporated into the final project report, and there is no reason to suspect that this target will not be achievable.

0.2 By Y2Q4 Completion of monitoring and trials to identify optimum restoration methods.

This indicator is not due until the end of the project. However, most of the activities leading to it (Outputs 2 and 3) are on schedule.

0.3 Publication of final Endemic Plant Restoration Plan following public consultation

This indicator is not due until the end of the project, and the compilation of the report will, by necessity, be amongst the last focal activities as it is dependent on completion of the others. There is currently no reason to suspect that it will not be completed. A consultation process will appropriately be scheduled for YR2Q3.

3.4 Monitoring of assumptions

Assumption 1: Past data evaluation, new monitoring results and trial outcomes indicate sustainable restoration options exist

As discussed under Section 3.2, Objective 4, the current state of ecological knowledge, even including the research conducted in this project, will certainly be insufficient to determine "sustainable restoration options" in a comprehensive sense. The assumption thus risks overreaching slightly, and may be based on easily-adopted misconceptions in habitat restoration. Beyond planting threatened species in wild sites, restoration must also provide appropriate ecological conditions to permit the species to be re-integrated into the broader ecosystem. A plant species will not succeed unless it has various requirements, such as pollinators, seed dispersers, appropriate conditions and room for the seedlings to germinate, space to grow free from competition and sufficient reliance against pests. These latter elements are much more difficult to create and involve some manipulation of the overall ecosystem. The level of understanding required for this is considerably more exacting. It is particularly challenging on Ascension, where the communities are extremely chaotic and new, being dominated by recently imported invasive species. Climate change adds a further element of complexity. We therefore remain some way from being positioned to achieve the original goal. We propose to re-orientate slightly, focusing on a need to determine the next steps in the processes rather than the end point. There is little risk of not achieving this, as there are certainly further avenues that can be explored.

Assumption 2: There are sufficient census and monitoring data available to draw robust conclusions

The Endemic Plant Census certainly provides sufficient data to determine long-term population trends on Ascension, but there is again a need to be realistic about what these are capable of revealing. The census was designed merely to detect whole-population changes in the target species. There is very little explanatory data collected (such as geology, topography, climate, the surrounding community composition) that may reveal why certain sites do better than others. In fact, sites are generally separated by no more than 1 km and trends tend to be remarkably consistent between them. Therefore, we cannot expect to obtain too many insights into ecological requirements from the results.

The research conducted during the course of the project has yielded some informative data, but since the themes are limited to certain aspects of the island's ecology, they can only be expected to illuminate part of the puzzle. Furthermore, the climate monitoring is on a scale sufficient to provide an initial snapshot, but more detailed field investigations and modelling by professional climatologists would be needed to fully understand the role of climate in shaping the ecology of Green Mountain.

Thus, we can indeed expect robust and useful conclusions, provided the expectations are proportionate. We can advance knowledge and move towards workable solutions, but these cannot be achieved in a single step.

Assumption 3: Success [of climate monitoring] depends on conditions being typical: if the project runs during an extreme drought, the results will not indicate conditions that are suitable for survival

Fortunately, the project has not encountered severe droughts. If anything, the past two years appear to have been much wetter than average on Green Mountain, although this is difficult to confirm as there has been very little previous climate monitoring. As an example of the difficulties this has created, one of the key ecological parameters we were hoping to determine was the rate of soil drying of different sites on moving from the wet season to the dry season. However, little information was possible in 2023 because the 'dry season' lasted for only approximately 3 weeks, which was insufficient to obtain much change.

There is little that can be done to mitigate against such problems, but a comparison of other climate parameters between sites should prove valuable. The mitigation suggested in the project proposal stated that: "using plant census data, we will compare 'succeeding' and 'failing' sites to give a better idea of the limits". It is not entirely clear what was intended, but this

approach is unlikely to be particularly helpful, as almost all endemic plant sites have exhibited declines and would thus likely be universally classed as “failing”. This emphasises the need for more detailed understanding and a broader ecosystem approach to restoration, taking into account climate change.

Assumption 4: Plants [*Anogramma ascensionis* and *Sporobolus caespitosus* grown for restoration trials] may be subject to accidental mortality regardless of site suitability

We have yet to introduce plants to the restoration sites, but have experienced die-back (as yet, this has resulted in only a small amount of mortality) in cultivation. The assumption still applies, and we are endeavouring to grow as many plants as possible in mitigation for potential losses. Numbers of *S. caespitosus* should be adequate, but *A. ascensionis* has always been challenging, and this remains an on-going battle: it is a short-lived species that multiplies slowly, and plants have died in sudden and unexpected waves in the past.

Assumption 5: The full effectiveness of restoration and control measures may not be apparent by the project end

This remains a risk, and there is little that can be done to prevent it. The timing of fieldwork is largely dictated by seasonality on Ascension, and also by the practicality of the fieldwork schedule (some of the major tasks have been required to be undertaken almost simultaneously, presenting logistical problems). The constraints have precluded bringing start dates forward. As already proposed as a mitigation option, we can only commit to maintaining the monitoring beyond the project end date, and updating the final reports as and when necessary – if the results cannot be obtained on time. However, at present there is no particular expectation that this will happen.

Assumption 6: Effective control methods for non-native plants can be found without posing unacceptable environmental risks (e.g. use of herbicides in sensitive habitats)

Lack of effective control methods for certain rhizomatous species such as guava (*Psidium guajava*), which retain some ability to regenerate from cut stumps even after poisoning, has long been a problem throughout the tropics. There is certainly no guarantee that we can solve the issue, as there seems to have been little success at doing so anywhere. The best we can hope for is to obtain the most effective herbicide and means of application possible. This is difficult to ensure given that we are practically limited to four treatment options by time constraints and herbicide availability, but we have fortunately been able to obtain some head start from DPLUS134, who have also trialled methods for control of Mexican thorn (*Prosopis juliflora*) on Ascension, and already identified promising options. Biocontrol options are also starting to be assessed through the Darwin Local project DPL0038.

Assumption 7: Outputs 1-3 provide sufficient information to produce evidence-based recommendations for restoration action

This has already been discussed at length in Section 3.2 (Output 4), Section 3.3 and under Assumption 1 of this section.

Assumption 8: Stakeholders engage with the consultation

The difficulties associated with maintaining a stakeholder group have been discussed in Section 2. We are attempting to adapt by considering a change in strategy (moving towards a workshop format rather than regular meetings). Further discussion will be needed over the best way for local public engagement, which has always been challenging for projects not seen as ‘high-profile’ according to the daily concerns of islanders. Public talks have been the most common means of engagement, but these can be plagued by variable and sometimes disappointing levels of attendance. Integrating other methods including social media, drop-in sessions and questionnaires have been explored by other local projects and could widen the level of engagement. Such innovative solutions are much needed and will be considered in our discussions.

4. Project support to environmental and/or climate outcomes in the UKOTs

The project will principally contribute to the Darwin plus objective by building knowledge necessary to make better-informed conservation decisions, and thereby permit the more effective protection of threatened plant species. This is central to the Global Strategy on Plant Conservation (part of the Convention on Biological Diversity), particularly by contributing to the following targets:

Objective II: Plant diversity is urgently and effectively conserved

- Target 7: At least 75 per cent of known threatened plant species conserved in situ.
- Target 10: Effective management plans in place to prevent new biological invasions and to manage important areas for plant diversity that are invaded.

The project also contributes to the Ascension Island National Biodiversity Strategy and Action Plan, particularly the following objectives:

1. No native species or known genetically distinct populations are lost from Ascension and the size and distribution of native populations is maintained or increased.
2. Management plans are in place and being implemented for all protected areas.
3. Habitats are improved to support self-sustaining populations of endemic species that require little or no ongoing management.

Thus far, we have increased knowledge by:

1. Working towards a more effective and sustainably-managed endemic plant census database, which will allow precise monitoring of changes in the threat status of Ascension Island's seven endemic vascular plants.
2. Establishing the first long-term monitoring of climate on Green Mountain, which will be critical to assess the problems posed by climate change.
3. Compiling data for the first study on Green Mountain's climate, in an attempt to understand how it changes with topography and habitat, and the effect this may have on natural communities.
4. Conducting trials to test the efficacy of different control methods, to improve management of invasive plant species on Green Mountain.
5. Setting-up infrastructure for a new attempt to restore the extremely threatened *Anogramma ascensionis* and *Sporobolus caespitosus* to the wild, using a new and refined methodology.

We have also increased capacity to grow *Anogramma ascensionis* in cultivation, by purchasing and setting-up two new climate-controlled terraria for fern cultivation.

1. Gender Equality and Social Inclusion (GESI)

Please quantify the proportion of women on the Project Board[1].	The steering group, as outlined in Section 2, has comprised four women and three men (including the project officer): i.e., 57%. Members of AIGCFD in the steering group comprise one man (the project officer) and two women: i.e., 67%.
Please quantify the proportion of project partners that are led by women, or which have a senior leadership team consisting of at least 50% women[2].	The three "organisations" that have contributed to the steering group, the "leaders" are as follows: AIGCFD: Director Tiffany [redacted] Royal Botanic Garden, Kew, UK Overseas Territories group: Leader Colin [redacted] St Helena Research Institute: Director Rebecca [redacted] Thus, two of the three groups are led by women.

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

The project only employs one person (white European male) and there has been no opportunity for other direct recruitment. The project includes support from the AIGCFD plant team, conservation interns and occasional volunteers, who represent a diverse demographic. We are simply grateful for any support that is offered. Activities over the past year have been driven by

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

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

data collection and thus have not required interaction with public on a level that could have any deep implications for gender or social equality.

2. Monitoring and evaluation

Responsibility for keeping the project on schedule and ensuring the outputs are delivered rests with the project officer, as the only person employed on the project. Progress is regularly discussed within AIGCFD with Tiffany Simpson (Director) and Jolene Sim (Conservation Officer). It has been discussed occasionally with the broader steering group, but the limitations of this process are discussed in Section 2.

As the project officer is dedicated full-time to the project, it is possible to continually review whether the activities are working in the best way and whether they are on-schedule. The metrics used to evaluate whether the project is working effectively are largely based on those set-out in the project log frame. Data collected is digitised within a week and basic analysis conducted to determine whether the methodology is appropriate and whether methodological changes could add value to the results.

The workload is quite high, but in the event of falling too far behind, it is often possible to request help from AIGCFD's interns. Thus far, we have received considerable and excellent assistance with:-

1) setting-up *Anogramma* restoration infrastructure
2) analysis of fog camera climate data and endemic plant census quadrat photos
3) weeding of field sites

Due to the relatively small-scale of the project, we consider these systems are sufficient to maintain effective operation.

3. Lessons learnt

The main difficulties encountered by the project officer have been in reconciling the project goals and deliverables with actions that can realistically be achieved, and in fitting these actions into a practical timetable. Overall, he has felt that the objective is somewhat over-ambitious for the stage Ascension has currently reached, both in terms of ecological understanding and in the facilities and manpower necessary to implement further progress. The project activities (in terms of the data collected) cannot fill all of the important knowledge gaps, as this would be impossible at our current stage of progress, but it is fair to say that all of the information we are collecting will be valuable.

Keeping on top of the workload has also been a challenge, as the total program is a considerable amount for one person, especially as some of the activities have been required almost simultaneously due to scheduling needs and weather. However, if we had employed a second dedicated person it is not clear that they would have been sufficiently occupied full-time.

A key recommendation would be to adopt a more process-driven approach to project development. In this case, the project objective is to develop an "evidence-based restoration plan". In order to achieve this, it is necessary to determine what evidence we have, and what we are lacking in order to build such a plan. What aspects of these requirements are already covered by the existing management planning documents? Can we realistically expect to fill the necessary gaps within a single project? If so, what specific actions, staffing and equipment are needed? If not, is it possible to decompose the objective into an achievable component which can be delivered?

In fairness, much tropical habitat restoration is based on templates developed in productive, temperate regions where a heavy emphasis on planting trees as the main activity may work reasonably effectively. The challenges often do not translate well to harsher, more fragile environments, and there is often a lag in developing an appreciation that more complex ecosystem-level approaches may be needed to achieve progress.

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

At the time of the last annual report, the project had only been running for three months and most of the activities had yet to start or were still in development. Consequently, the review had relatively little to comment on. The main queries of the reviewer were as follows:-

1. Please ensure to add enough evidence to the next report

We have tried to provide evidence of progress where practical. However, as most of the work is centred around data collection, and this is still ongoing with relatively little time available yet for analysis, it remains somewhat difficult to provide much evidence on some activities. It has been a struggle to keep on top of the workload, and the production of interim reports as evidence, largely duplicating the final refined version, has unfortunately proved beyond the capacity of the Project Officer.

2. Please add to the next report a list of experts contacted or incorporated in the planned steering committee of the project.

We have added this in Section 2. As stated, the steering group has provided some difficulties, although we are trying to improve the situation. Additional experts to participate in the upcoming workshop have been identified and will be contacted closer to the event.

3. Please clarify the collaboration with the “key external partner” the Royal Botanic Gardens, Kew.

We have commented on this in Section 2. The reviewer also noted that “no formal agreement had been signed” with Kew. It was the preference of RGBK to avoid any formal agreements, as this would have entailed a lengthy bureaucratic process involving their HR department, with some expectation of financial recompense for work undertaken. Under normal circumstances, Kew require projects to be approved at management level before submission of the grant application. The idea of including them as a stakeholder arose too late for this to be achieved, but the UK Overseas Territories team agreed to help as a gesture of goodwill.

4. It is unclear for the reviewer why the report is reporting expenditures for the period 01.04.2022 – 31.03.2023 when the project started in January 2023.Please clarify.

This was merely due to the way I had described the relevant time period: I noted the financial year in which the expenditures occurred, rather than the precise time period of the project. In fact, all the expenditure was indeed restricted to 01.01.2023 – 31.03.2023. Apologies that this was unclear.

5. It is unclear why there is a comment about utility bills associated with staff costs – perhaps this relates to a different budget line?

Ascension Island Government include a package of subsidies as part of their staff employment agreements (wages alone would not be sustainable without it). One of these subsidies is to cover the employee’s domestic utility bills. As this package is managed by the Finance Department, we do not have any flexibility in how it is accounted.

5. Risk Management

No new risks have arisen. An updated risk register has been submitted, although only a few minor issues have been encountered.

6. Other comments on progress not covered elsewhere

No additional comments are needed. The key points have been covered in other sections.

7. Sustainability and legacy

The project is designed to provide legacy in the form of knowledge-building and planning recommendations. This makes it somewhat easy to identify the legacy, which is derived directly from the outputs:-

1. Increased understanding of Green Mountain's ecology and the problems faced by Ascension's endemic species.
2. A pathway document for further progress in endemic species conservation.

It is, of course, necessary that AIGCFD, local and international partners buy-in to the plans in order to ensure that progression is structured, and taken forward beyond the project end. We will attempt to address this through consultation over the coming year.

A more difficult element to address with this type of project is how to demonstrate signs of legacy-building during the intermediate phases. Most of the activities are related to data collection and analysis, and these do not generate interest or capacity until completed. This will not happen until near the end of the project. However, increased information will be disseminated to the public through the remainder of the project to increase awareness and ensure that the local and global community are invested in ongoing commitment to this project.

8. Darwin Plus identity

As noted in the previous section, the nature of the project does not particularly lend itself to accruing publicity during the intermediate stages, as the outputs are not expected to yield concrete results until near the end of the work. The direct restoration trial (on *Anogramma ascensionis* and *Sporobolous caespitosus*) is the only element that could potentially attract some public attention, and this has not yet been scheduled to start.

Although it would potentially be possible to disseminate some general conservation publicity focused around endemic plants at this stage, another logistical problem with doing so is a lack of office time for the project officer, owing to the high field work commitments. AIGCFD in general do post regular social media to publicise their activities, and some of this does focus on endemic plants, but other members of the department are in a better position to contribute such material at present. Two social media post featuring DPLUS159 were produced by AIGCFD in March and June 2023, reaching 1.4 and 1.1K readers (likes 45/68, shares 3/9).

We will attempt to rectify the lack of activity during the latter stages of the project when suitable outputs have been produced and there is more time to focus on publicity.

9. Safeguarding

Has your Safeguarding Policy been updated in the past 12 months?		No
Have any concerns been reported in the past 12 months		No
Does your project have a Safeguarding focal point?	Yes Jolene [redacted]	
Has the focal point attended any formal training in the last 12 months?	Yes Jolene attended mental health first aid training in May 2023. The project officer and AIGCFD director also attended a safeguarding talk by the Ascension Island Government social worker.	
What proportion (and number) of project staff have received formal training on Safeguarding?		Past: 100% 1 to 3 people (see above) Planned: None

Has there been any lessons learnt or challenges on Safeguarding in the past 12 months? Please ensure no sensitive data is included within responses. No challenges have occurred since the start of the project.
Does the project have any developments or activities planned around Safeguarding in the coming 12 months? If so please specify. No safeguarding activities are planned.
Please describe any community sensitisation that has taken place over the past 12 months; include topics covered and number of participants. The Ascension Island Government Social worker gave a safeguarding talk to AIGCFD in 2023.
Have there been any concerns around Health, Safety and Security of your project over the past year? If yes, please outline how this was resolved. No concerns have been registered.

10. Project expenditure

Table 1: Project expenditure <u>during the reporting period</u> (1 April 2022 – 31 March 2023)

Project spend (indicative) in this financial year	**2022/23 D+ Grant (£)**	**2022/23 Total actual D+ Costs (£)**	**Variance %**	**Comments (please explain significant variances)**
Staff costs	[redacted]			Includes estimate of [redacted] for Q ultility bill (part of AIG allowances package)
Consultancy costs				
Overhead Costs				
Travel and subsistence				When the original budget was planned, flights to and from Ascension were routed via South Africa due to repairs to the island's runway. Therefore, the cost was more than twice that which is now available.
Operating Costs				
Capital items				
Others (Please specify)				There are still some items on order that did not arrive in time to be added to the account (approx. [redacted]). Last year's budget was [redacted] above-target, so we aimed to balance the deficit in 2023-24.
TOTAL	**333,700**	**28,172**		

Table 2: Project mobilising of matched funding during the reporting period (1 April 2022 – 31 March 2023)

	Matched funding secured to date	Total matched funding expected by end of project
Matched funding leveraged by the partners to deliver the project.	[redacted]	
Total additional finance mobilised by new activities building on evidence, best practices and project (£)		

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

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

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

Annex 1: Report of progress and achievements against logframe for Financial Year 2022-2023 – <u>if applicable</u>

Project summary	SMART Indicators	Progress and Achievements April 2022 - March 2023	Actions required/planned for next period
Impact Ascension can assure itself and others that every possible measure has been taken to avoid the extinction of its endemic plant species.		Too early in the project to see impacts on biodiversity	
Outcome Conservation of Ascension's five critically-endangered plants is based on a strategic, evidence-based plan that provides the blueprint and impetus for future action needed to save these species from extinction	0.1 By Y1Q3 Evaluation of existing data and restoration attempts to consolidate learning. 0.2 By Y2Q4 Completion of monitoring and trials to identify optimum restoration methods. 0.3 Publication of final Endemic Plant Restoration Plan following public consultation.	0.1 Analysis of Plant Census data well-advanced, but held-up due to a need for more data to calibrate problems. Review of previous restoration attempts commenced, but there have been insufficient attempts and/or record keeping of the attempts to draw extensive conclusions. 0.2 Climate monitoring sites established and data collected over more than six months. Invasive species control trials over half-way to completion. Infrastructure for conducting *Anogramma* and *Sporobolous* restoration trials established ready for plants to be introduced on schedule. 0.3 Data collected to inform final plan, as indicated for 0.1 and 0.2. Rationalisation of achievable goals for plan.	0.1 Continuation of plant census data set analysis and write-up findings for final report. 0.2 Continue climate data collection for final eight months. Complete invasive species control trails and assess results. Introduce first *Anogramma* and *Sporobolous* plants to restoration sites; maintain and monitor their progress. Continue to produce cultivated plants to be introduced to wild situations before project end. 0.3 Collate and analyse field data when available. Compile into a final report.
Output 1 Analysis of census data and evaluation of past restoration efforts.	1.1 By Y1Q3 analysis of biannual plant census data completed. Temporal and spatial patterns in population status for five critically endangered species reported.	1.1 Analysis of Plant Census data well-advanced, but held-up due to a need for more data to calibrate problems. Evidence provided in Section 3.1. 1.2 Review of previous restoration attempts commenced, and provisional report produced, but there have been insufficient attempts and/or record keeping	

Project summary	SMART Indicators	Progress and Achievements April 2022 - March 2023	Actions required/planned for next period
	1.2 By Y1Q3 evaluation of past endemic plant restoration activities completed. This will identify stages at which problems were most likely to occur and the factors with the greatest predictive power of success	of the attempts to draw extensive conclusions. Evidence provided as submitted report.	
Activity 1.1 Analyse endemic plant census data collected by AIGCFD between 2012 and 2022		Analysis of Plant Census data well-advanced, but held-up due to a need for more data to calibrate problems. Evidence provided in Section 3.1.	Continuation of plant census data set analysis and write-up findings for final report.
Activity 1.2 Evaluate the success of endemic plant restoration efforts undertaken by AIGCFD since 2008.		Review of previous restoration attempts commenced, and provisional report produced, but there have been insufficient attempts and/or record keeping of the attempts to draw extensive conclusions. Evidence provided as submitted report.	Some synthesis still required to integrate information into final report.
Output 2 Results of monitoring to establish the ecological requirements of the five endemic plant species and the suitability of potential habitats on Green Mountain.	2.1 By Y1Q2 temperature, humidity and light monitoring established at 24 sites, including selected wild target populations and potential reintroduction areas. 2.2 Download and collate 14 months of temperature, humidity and light data from the 24 locations.	2.1 Twenty-one climate monitoring sites established, and a long-term automated weather station erected on Green Mountain. Many of the loggers deployed to new sites in March 2024. Selected evidence provided in Section 3.1. 2.2 Data collected over at least six months at each site. These have been downloaded and most have been databased. Evidence provided as database submitted with this report.	
Activity 2.1 Establish temperature, humidity and light monitoring devices at 24 locations.		Twenty-one climate monitoring sites established, and a long-term automated weather station erected on Green Mountain. Many of the loggers deployed to new sites in March 2024. Selected evidence provided in Section 3.1.	Continue collecting data over eight months at new sites.

Project summary	SMART Indicators	Progress and Achievements April 2022 - March 2023	Actions required/planned for next period
Activity 2.1 Download and collate 14 months of temperature, humidity and light data from the 24 locations.		Data collected over at least six months at each site. These have been downloaded and most have been databased. Evidence provided as database submitted with this report.	Download data from loggers as necessary. Collate and analyse entire data set to be written-up as part of final report.
Output 3 Results of trial endemic plant reintroductions and control methods for non-native invasive plants.	3.1 By Y2Q4, 30 individuals of *Sporobolus caespitosus* and 10 individuals of *Anogramma ascensionis* planted at two selected and prepared transplant sites, with numbers increased to 30 individuals of *Anogramma ascensionis* by Y3Q2. Sites maintained, with survival and seed/spore production monitored until Y3Q2. 3.2 By Y2Q4 optimum control methods identified for eight key invasive species, using a combination of literature searches and replicated field trials.	3.1 Infrastructure for restoration trials almost complete. Evidence provided in Section 3.1. Plants in development in cultivation, ready for introduction on schedule in May 2024. 3.2 Invasive species control trials over half-way to completion. Scope of study reduced to four main species due to practicality.	
Activity 3.1 Conduct restoration trials to establish thirty individuals of *Anogramma ascensionis* and *Sporobolus caespitosus* at each of two locations.		Infrastructure for restoration trials almost complete. Evidence provided in Section 3.1. Plants in development in cultivation, ready for introduction on schedule in May 2024.	Commence introduction of first 10 plants to each site in May 2024.
Activity 3.2 Monitor survival, growth and seed/spore production of plants in the restoration trials		Not yet started.	Maintain and monitor trials once plants have been introduced.
Activity 3.3 Trial and evaluate different methods to control eight priority non-native species including mechanical removal and herbicide application.		Invasive species control trials over half-way to completion. Scope of study reduced to four main species due to practicality. Evidence not yet available as photos have been lost and data set is still being compiled.	Complete trials as a priority. Monitor performance of treatments over at least six-months.

Project summary	SMART Indicators	Progress and Achievements April 2022 - March 2023	Actions required/planned for next period
Activity 3.4 Recommend best methods to control each of the eight priority non-native species.		Not yet started as data are not yet available.	Write-up trial findings as part of final report.
Output 4 Detailed evidence-based restoration plan for five endemic plant species that has the support of stakeholders	4.1 By Y2Q4, a draft restoration plan published. This will contain with detailed species requirements and methodologies for engineering and maintaining the appropriate conditions, based on minimal intervention. Outputs 1,2 and 3 will underpin recommendations in the plan and form appendices within it.	Not yet started as data to inform report are not yet available.	Write-up all project findings into final report.
Activity 4.1 Produce draft Endemic Plant Restoration Plan incorporating results of the project analyses.		Not yet started as data to inform report are not yet available. Rationalisation of achievable objectives has been necessary.	Write-up all project findings into final report.
Activity 4.2 Share and discuss draft Restoration Plan with Steering Group and incorporate their suggested changes		Some discussions with steering group have been conducted, but this has been logistically difficult.	Develop and run on-line workshop with stakeholders to consider options for future restoration pathway when data analysis has reached a suitable stage for interpretation. Develop some form of public consultation to be undertaken within an approximately similar time frame to the workshop.

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

Project summary	Measurable Indicators	Means of verification	Important Assumptions
Impact: Ascension can assure itself and others that every possible measure has been taken to avoid the extinction of its endemic plant species			
Outcome: Conservation of Ascension's five critically-endangered plants is based on a strategic, evidence-based plan that provides the blueprint and impetus for future action needed to save these species from extinction	0.1By Y1Q3 Evaluation of existing data and restoration attempts to consolidate learning. 0.2 By Y2Q4 Completion of monitoring and trials to identify optimum restoration methods. 0.3 Publication of final Endemic Plant Restoration Plan following public consultation.	0.1 Evaluation report 0.2 Reports of monitoring results and trials 0.3 Published Restoration Plan	Past data evaluation, new monitoring results and trial outcomes indicate sustainable restoration options exist. Mitigation: All possible restoration options will be considered. Early indications from DPLUS113 and AIGCFD non-native control efforts indicate habitat improvements are feasible.
Output 1 Analysis of census data and evaluation of past restoration efforts	1.1 By Y1Q3 analysis of biannual plant census data completed. Temporal and spatial patterns in population status for five critically endangered species reported. 1.2 By Y1Q3 evaluation of past endemic plant restoration activities completed. This will identify stages at which problems were most likely to occur and the factors with the greatest predictive power of success.	1.1 Standalone analysis report for later incorporation into final restoration plan (Output 4.1) 1.2 Standalone evaluation report for later incorporation into final restoration plan (Output 4.1)	There is sufficient census and monitoring data available to draw robust conclusions. Mitigation: Plant census data is available since 2012 and restoration work has been ongoing since 2008. These span a range of climatic conditions and exceed the generation time of the plant species. Even if robust conclusions cannot be drawn, potential factors affecting success can be identified from these analyses and explored further in outputs 2 and 3.
Output 2 Results of monitoring to establish the ecological requirements of the five endemic plant species and the suitability of potential habitats on Green Mountain	2.1 By Y1Q2 temperature, humidity and light monitoring established at 24 sites, including selected wild target populations and potential reintroduction areas.	2.1 Maps and photographs of monitoring stations. 2.2 Spread sheets of monitoring data. 2.3 Standalone analysis report for later incorporation into final restoration plan (Output 4.1)	Success depends on conditions being typical: if the project runs during an extreme drought, the results will not indicate conditions that are suitable for survival.

	2.2 By Y2Q3 Minimum of 14 months temperature, humidity and light data collected from 24 sites. 2.3 By Y2Q4. Data analysed to describe suitable growing conditions for endemic plant species and select potential restoration sites.		Mitigation: using plant census data, we will compare 'succeeding' and 'failing' sites to give a better idea of the limits.
Output 3 Results of trial endemic plant reintroductions and control non-native invasive plants	3.1 By Y2Q4, 30 individuals of *Sporobolus caespitosus* and 10 individuals of *Anogramma ascensionis* planted at two selected and prepared transplant sites, with numbers increased to 30 individuals of *Anogramma ascensionis* by Y3Q2. Sites maintained, with survival and seed/spore production monitored until Y3Q2. 3.2 By Y2Q4 optimum control methods identified for eight key invasive species, using a combination of literature searches and replicated field trials.	3.1 Photographs of re-established target species in wild situations published on social media and/or similar outlets. 3.2 Preliminary evaluation of restoration method compiled into the final restoration plan (Output 4.1). 3.3 Non-native species control report compiled as an appendix to the final restoration plan (Output 4.1).	Plants may be subject to accidental mortality regardless of site suitability. Mitigation: replacements will be grown in readiness if needed. The full effectiveness of restoration and control measures may not be apparent by the project end. Mitigation: the urgency of the situation means lessons from the trials will needed to be acted on rapidly. However, AIGCFD staff will maintain the capacity for ongoing monitoring into the future to improve the accuracy of findings. Effective control methods for non-native plants can be found without posing unacceptable environmental risks (e.g.use of herbicides in sensitive habitats). Mitigation: Multiple control methods and means of applying them will be tested.
Output 4 Detailed evidence-based restoration plan for five endemic plant species that has the support of stakeholders	4.1 By Y2Q4, a draft restoration plan published. This will contain with detailed species requirements and methodologies for engineering and maintaining the appropriate conditions, based on minimal intervention.	4.1 Published Restoration Plan. 4.2 Photographs, attendance records and response submissions form consultation exercise.	Outputs 1-3 provide sufficient information to produce evidence-based recommendations for restoration action. Mitigation: There are reasonable time series data available to support Output 1.

	Outputs 1,2 and 3 will underpin recommendations in the plan and form appendices within it.		The monitoring and trials conducted to produce Outputs 2 and 3 will be designed specifically to address the most pressing data gaps. Stakeholders engage with the consultation. Mitigation: AIGCFD has good relations with major stakeholders on Ascension and the UK. Past consultation exercises conducted on the island have provided insight into the best engagement methods.
Activities (each activity is numbered according to the output that it will contribute towards, for example 1.1, 1.2 and 1.3 are contributing to Output 1) 1.1 Analyse endemic plant census data collected by AIGCFD between 2012 and 2022. 1.2 Evaluate the success of endemic plant restoration efforts undertaken by AIGCFD since 2008. 2.1 Establish temperature, humidity and light monitoring devices at 24 locations. 2.2 Download and collate 14 months of temperature, humidity and light data from the 24 locations. 2.3 Analyse temperature, humidity and light data to infer preferred growing conditions of endemic plants. 2.4 Identify suitable restoration sites based on the data analysis in activity 2.3 3.1 Conduct restoration trials to establish thirty individuals of *Anogramma ascensionis* and *Sporobolus caespitosus* at each of two locations. 3.2 Monitor survival, growth and seed/spore production of plants in the restoration trials 3.3 Trial and evaluate different methods to control eight priority non-native species including mechanical removal and herbicide application. 3.4 Recommend best methods to control each of the eight priority non-native species. 4.1 Produce draft Endemic Plant Restoration Plan incorporating results of the project analyses. 4.2 Share and discuss draft Restoration Plan with Steering Group and incorporate their suggested changes			

Annex 3: Standard Indicators

Table 1 Project Standard Indicators

DPLUS Indicator number	Name of indicator using original wording	Name of Indicator after adjusting wording to align with DPLUS Standard Indicators	Units	Disaggregation	Year 1 Total	Year 2 Total	Year 3 Total	Total to date	Total planned during the project
DPLUS-B02	Publication of final Endemic Plant Restoration Plan following public consultation.	Number of new/improved species management plans available and endorsed*.	Number	Recovery	0	0		0	5
DPLUS-C02	Analysis of biannual plant census data completed. Temporal and spatial patterns in population status for five critically endangered species reported.	Number of new conservation or species stock assessments published	Number	Flora	0	0		0	5
DPLUS -B01	Optimum control methods identified for eight key invasive species, using a combination of literature searches and replicated field trials.	Number of new/improved habitat management plans available and endorsed.	Number	Invasive species	0	0		0	1
*DPLUS-D04	By Y2Q4, 30 individuals of *Sporobolus caespitosus* and 10 individuals of Anogramma ascensionis planted at two selected and prepared transplant sites, with numbers increased to 30 individuals of *Anogramma ascensionis* by Y3Q2. Sites maintained, with survival and seed/spore production monitored until Y3Q2.	Stabilised/ improved species population (relative abundance/ distribution) within the project area.	% increase	Flora	0	0		0	2
Without double counting individual indicators, it is not possible to match any more standard indicators to the indicators submitted in the original project proposal.									

*Note: Following a change request, it has been possible to add an additional indicator to the list, although this is not a core indicator.

Table 2 Publications

Title	Type (e.g. journals, manual, CDs)	Detail (authors, year)	Gender of Lead Author	Nationality of Lead Author	Publishers (name, city)	Available from (e.g. weblink or publisher if not available online)
*Flowering plants & ferns of Ascension Island	Book	Lambdon P, Sim J & Stroud S	Male	UK	Pisces Publications, Newbury, UK	https://www.naturebureau.co.uk/flowering-plants-and-ferns-of-ascension-island

*Note: This publication was produced through a parallel project and not directly as a DPLUS159 output, but it is a resource that collates knowledge and makes it accessible to build capacity for conservation of Ascension's endemic plants. It thus contributes strongly to the project goals.

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

Annex 1: Evidence associated with Output 1.2

"Endemic plant restoration plan, 2020-2025" by Jolene Sim

Annex 2: Evidence associated with Activity 2.1

Access database of climatic records collated on Green Mountain, 2023-24

Annex 3: Updated risk register

Checklist for submission

	Check
Different reporting templates have different questions, and it is important you use the correct one. Have you checked you have used the **correct template** (checking fund, type of report (i.e. Annual or Final), and year) and **deleted the blue guidance text** before submission?	x
Is the report less than 10MB? If so, please email to BCF-Reports@niras.com putting the project number in the Subject line.	x
Is your report more than 10MB? If so, please discuss with BCF-Reports@niras.com about the best way to deliver the report, putting the project number in the Subject line.	-
Have you included means of verification? You should not submit every project document, but the main outputs and a selection of the others would strengthen the report.	x
Do you have hard copies of material you need to submit with the report? If so, please make this clear in the covering email and ensure all material is marked with the project number. However, we would expect that most material will now be electronic.	-
If you are submitting photos for publicity purposes, do these meet the outlined requirements (see section 15)?	-
Have you involved your partners in preparation of the report and named the main contributors	x
Have you completed the Project Expenditure table fully?	x
Do not include claim forms or other communications with this report.	