Darwin Plus: Final 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: no later than 3 months after agreed end date.

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 Organisation	Ascension Island Government Conservation and Fisheries Directorate (AIGCFD)
Project partner(s)	
Darwin Plus Grant value	£77,850
Start/end date of project	1st January 2023 — 31st March 2025
Project Leader name	Tiffany Simpson
Project website/Twitter/blog etc.	
Report author(s) and date	Phil Lambdon, 5th June 2025

1 Project Summary

Green Mountain National Park (Fig. 1) is home to Ascension Island's ecologically-important upland zone. It receives most of the island's rainfall and supports a large proportion of the endemic flora, including five critically endangered vascular plants. However, these face acute threats from climate change and non-native species, and they have previously been considered at serious risk of extinction. The ultimate goal of this project was to synthesise available information in order to develop a Threatened Plant Strategy, capable of guiding plant conservation on Ascension Island through its next phase of development. The synthesis was based on a wide range on findings from the past 20 years, brought together for the first time, and was also supported by additional data collected through the following activities:

1. Evaluation of population trends over the past decade, obtained through the first comprehensive analysis of the island's Endemic Plant Census database.
2. A first exploratory study of climate on Green Mountain, facilitating a better understanding of the ecological constraints on current habitats, and shaping ideas about the prospects of future climate change.
3. A pilot attempt to restore the extremely threatened Ascension Island parsley fern (*Anogramma ascensionis*) to the wild.
4. A trial of improved control techniques for selected invasive species that remain difficult to supress and currently represent a significant threat to ecological stability.

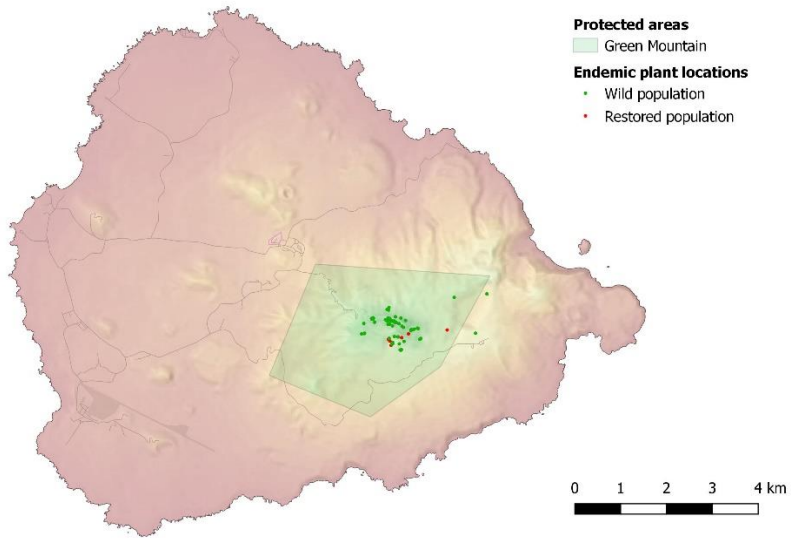


Figure 1 Map of Ascension Island, showing the location of Green Mountain National Park and the distribution of endemic plant populations across the uplands.

2 Project Partnerships

When the original proposal was written there were no formal partners included. For a number of years, Ascension Island has struggled to maintain links with plant conservationists from the international community. This has partly been because there is only a small pool of candidates with direct interests and experience on Ascension Island, but limited internal capacity, both in terms of time and also experience in communicating with scientists and other relevant parties, has also made it particularly difficult to develop collaborations.

Originally, we planned to establish a small, informal steering group with experts from the Royal Botanic Gardens, Kew (RGBK), the St Helena Research Institute (SHRI) and stakeholders within AIGCFD, which we were hoping to use as a sounding board for ideas, and a platform to develop future interaction. Although intermittent conversations were possible across the group, the format proved to be difficult to sustain on a regular basis. Staff changes at RGBK resulted in upheaval to their schedules, and all collaborators were extremely busy. Finding time to convene was challenging for our colleagues.

To overcome the barriers, we decided that an alternative approach was required. In parallel to this, additional considerations were developing. Part of the project remit was to review the future strategy of AIGCFD plant conservation, and one of the areas we identified as a key to long-term improvement was our ability to develop partnerships and support networks. We therefore decided on a more ambitious plan to stage an on-line conference, inviting a range of potential future collaborators and bringing expertise from various fields (see Table 1), The Ascension Island Endemic Plant Workshop was staged on 25th-26th February 2025.

The workshop was secured with funding support from the Ascension Island Marine Protected Area Community Trust (AIMPACT) Fund and coordinated by Treehouse partners ltd. We were able to run sessions covering eight species action plans and six major planning themes. Each involved mini-lectures and breakout groups. The main aims of the workshop were to:

- Propagate an awareness and understanding of the conservation issues faced on Ascension Island
- Establish links with new partners that can be developed in the future
- Obtain feedback on the draft strategy
- Assist with a prioritisation framework
- Invite new ideas of potential alternative steps

Ideas were captured using spreadsheet tools designed by Treehouse (Fig. 2), but also through posted messages and subsequent follow-up conversations. These have been incorporated into the updated version of the Threatened Plant Strategy.

Table 1 Participants of the Ascension Island Threatened Plant Workshop, February 2025

Name	Affiliation
Tiffany Simpson	AIGCFD Director
Phil Lambdon	AIGCFD Growing Hope project officer
Chrisna Visser Sophie Tuppen	AIGCFD Coastal Reserves Team
Laura Shearer	Coastal Reserves Team/Island councillor
Anna Weir Alice Fry	AIGCFD National Park Warden Team
Lee-Roy Estrale Jasmine Duffell Jolene Sim	AIGCFD Plant Team
Norbert Maczey Corin Pratt	CABI Biosciences
Alan Gray	Centre for Ecology and Hydrology
Kashmir Flint	Independent conservationist
Chris Cheffings Amanda Gregory	JNCC
Juan Viruel	RGBK - Population genetics
Thomas Heller Colin Clubbe Marcella Corcoran	RGBK - UK Overseas Territories group
Andrew Callender Andy Schofield	RSPB
Vanessa Williams	St Helena Government
Shayla Ellick	St Helena Peaks Project Officer
Rebecca Cairns-Wicks	St Helena Research Institute
Quentin Cronk	University of British Columbia

In addition to valuable support in honing ideas, the hope is that we can build on these relationships in the future by developing stronger conversations and synergies. In addition, the workshop was somewhat experimental as an approach that may be used more widely on Ascension Island in the future. Many local staff have little exposure to conference or workshop environments due to the expense and time needed for travel. Successful delivery of a virtual event opens the door to more practical opportunities for support, confidence-building and stimulating enthusiasm.

At the start of the project, RGBK and CABI were probably the only regular partners with whom we had regular interaction. The outcome of the workshop has been to extend our existing external links. We have at least tripled this network, and also forged internal collaborations on a range of issues between separate teams within AIGCFD.

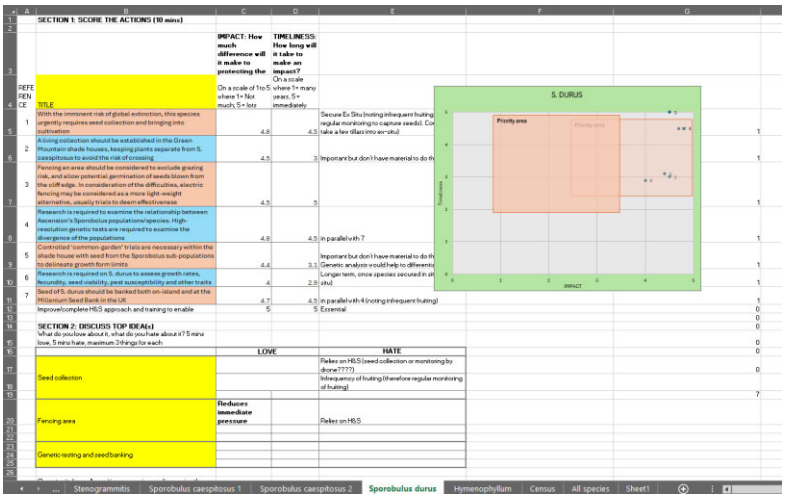


Figure 2 Feedback capture tools and message board designed by Treehouse for the Ascension Island Threatened Plant Workshop.

The project engaged with stakeholders in the local community in the following ways:

- A volunteer, Tony Roberts, assisted in fieldwork as a volunteer for several weeks (until he left at the end of his contract)
- We organised a team day with the RAF in March 2025 in order to clear a site of old infrastructure. Six volunteers participated along with Four AIGCFD staff.
- A field guide to the plants of Ascension Island was published by project staff in April 2024, and has sold close to 100 copies thus far (the population of Ascension Island is only 800)
- A public talk and discussion were held in April 2025 to disseminate to key findings of the Strategy, with opportunities for feedback.
- Findings were shared on social media platforms throughout the project
- Interpretation and signage have been developed in collaboration with Green Mountain National Park Wardens to display in recreational spaces and information booklets

3 Project Achievements

3.1 Outputs

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

Prior to this project, the Endemic Plant Census has been running since 2002 in some form, but AIGCFD has traditionally suffered from a lack of staff time and statistical capacity; the information has simply been compiled into a spreadsheet and there have been relatively few attempts to use it over the past 20 years. As a consequence, numerous errors and methodological issues have accumulated without being properly addressed.

The analysis has now been completed, with results presented and discussed in detail in Parts I and II of the Strategy document. Months of effort were necessary to review and address as many of the data errors as possible, and to find ways to use data where the methodology presented statistical complications. A review of these problems, and recommendations for future improvements, is provided in Part III of the Strategy document (Section 3).

Although we committed to conducting the analysis on the five critically endangered species resident on Green Mountain, it seemed inefficient to limit the scope when a similar treatment was needed for the entire data set, and there would be few future opportunities to achieve this. We therefore expanded the remit to cover all nine globally threatened vascular plant taxa on Ascension Island, regardless of habitat. The findings of the analyses point to extremely worrying declines across virtually all of the target species. This has led to a renewed awareness of the severity of the threats, and the need to accelerate efforts to address them.

The stated aim of evaluating past restoration efforts has been difficult because comparatively few restoration projects have been attempted on Ascension Island in the past, and little information recorded about them. Each of the species accounts in Parts I and II of the strategy has a sub-section on “Conservation actions to date” where we have endeavored to draw together as much historical information as possible. Future recommendations have been drawn-up by taking these and a range of other findings into account. In Part III of the strategy, Section 6 is devoted to ‘Restoration’, and this summarises some of the broader lessons that can be learned from past efforts.

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*

This study was adapted slightly from the methodology suggested in the original activities because we had neither the funds nor the personnel capacity to purchase equipment for, or maintain, 24 sites in synchrony. Instead, the approach was organised into several more targeted sub-studies, designed around specific questions that needed answering, and these were run in a more staged manner. It was possible to examine 18 sites in 2023 and 18 sites in 2024, with some overlap between different phases (Fig. 3A). Thus, rather than the promised 24 sites over 14 months, we collected data from 36 sites, each active for an average of nine months. Despite the shorter time period per site, this was comfortably sufficient to obtain the necessary results. To have extended the monitoring for longer would have consumed considerable time without providing much additional value, and the wider coverage has been much more useful.

We initially promised to study temperature, humidity and light. All of these variables were monitored, but alone they were deemed insufficient to develop a detailed understanding of ecological issues. In various sub-studies, we therefore extended the data collection to cover rainfall, fog capture, cloud base altitude, soil moisture, wind speed and wind direction. The complete data set proved much more powerful for purposes of interpretation, and has created a basis to understand future climate change risks.

A long-term automated weather station was purchased and installed to provide much needed continuous monitoring of climatic conditions on Green Mountain into the future (Fig. 3B). Previously, the only permanent weather stations were in the lowlands and these were not useful to understand the complex dynamics occurring within the island’s ecologically-important cloud zone. The new facility has been running since August 2023, but some problems were encountered over the siting: it was in the direct flow of a ‘funnel effect’ where wind was concentrated up a valley. As conditions were not typical, and the strong winds caused some wear and tear to equipment, a decision was made in April 2025 to relocate to a more suitable site on Bishop’s Path.

The results of the climatic studies have been analysed and are fully-integrated into the Threatened Plant Strategy. Treatment of climate-related topics is somewhat dispersed throughout the document. Where individual sub-studies were relevant to understanding issues faced by a particular species, they have been incorporated into the species accounts (e.g., Part I, pg. 39 and Part II, pg. 196). However, a dedicated section on climate change is presented in Part II (Section 13) which provides a broader overview and discusses the implications in detail.

Despite the changes to the delivery, the overall output is considerably more extensive than that originally proposed. We were able to cover more sites and more variables, develop a long-term monitoring capacity and use the results to explore the potential threats posed by climate change.

Output 3 *Results of trial endemic plant reintroductions and control non-native invasive plants*

There were two activities involved in this output, and it is easier to discuss them separately:

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

This has been the least successful part of the project. The two sites were identified and prepared in good time. Each comprised a section of vertical cinder bank somewhat exposed to incoming weather and extending for approximately 30 m. At each site, fog catchers were

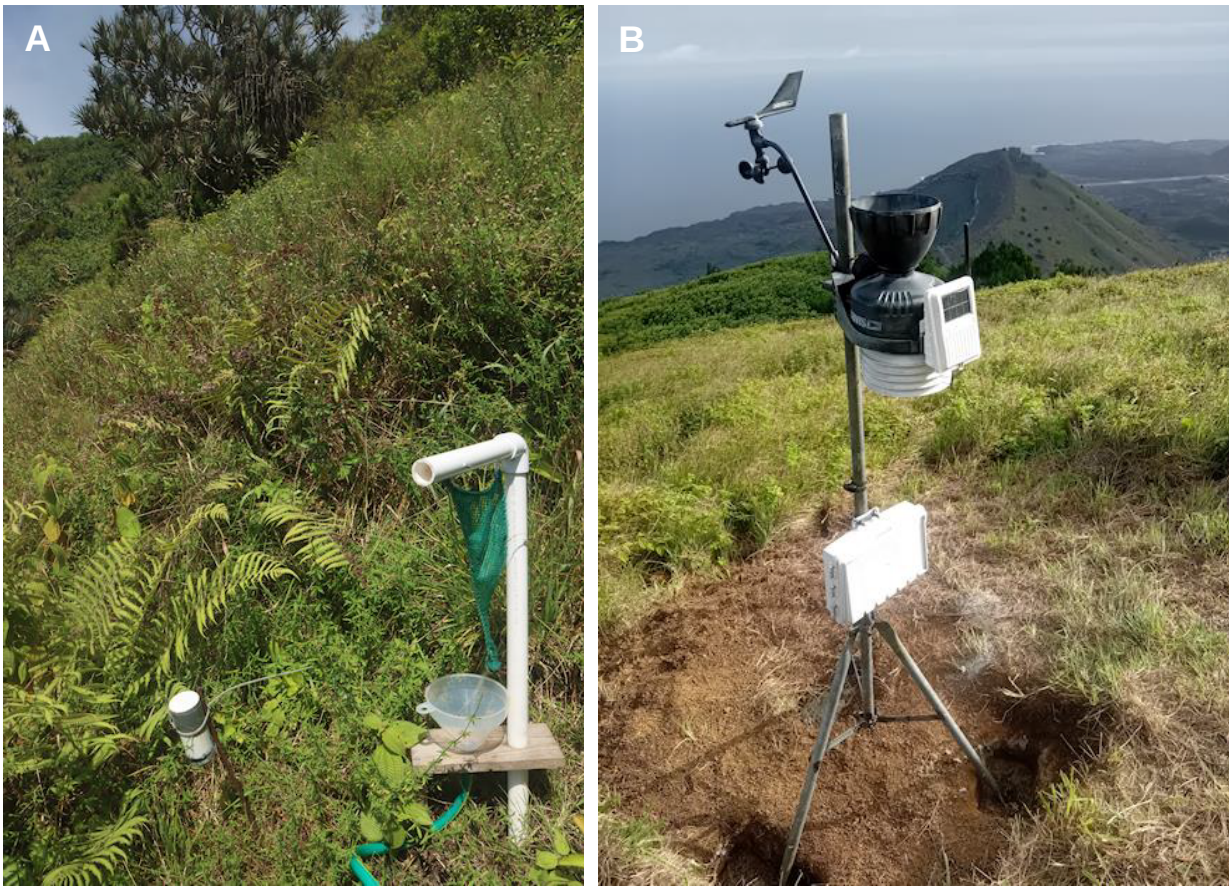


Figure 3 Climate monitoring on Green Mountain: **A** typical weather station, showing temperature/humidity logger and fog gauge; **B** Permanent automated weather station, now installed on Bishop's Path.

installed to harvest water, and irrigation systems were put in place, activated by timers at appropriate intervals (Fig. 4D). The aims of these were to (a) encourage rehabilitation of bryophyte communities by providing damp conditions; (b) create a capacity to supplement rainfall for the delicate endemic plants, thus mitigating against the risk of drought in the early stages of establishment. The sites were carefully weeded to remove the majority of invasive species. This is a prolonged and ongoing process, as there is a large invasive seedbank present which ensured rapid recolonisation. Many of the invasives have deep rhizomes, and removing them risks damage to the bank without sufficient care.

Sixty individuals of the critically endangered endemic grass *Sporobolus caespitosus* were introduced to the sites in June 2024 (Fig. 4A-C). The work was achieved two months after the stated deadline, largely because the project officer was on annual leave, but otherwise the target was fully delivered. A further site (Elliot's E5) that had been developed under a previous Darwin Project (DPLUS 138) was also planted with ten *S. caespitosus*.

The main goal of the trials was to determine whether, given appropriate conditions, the species could become self-sustaining. We have thus been monitoring ongoing survival and recruitment. By the end of the project, there were encouraging signs, with all but one plant surviving at the main sites and seedlings appearing in all three locations. As the wet season only started in April (coinciding with the project end) there were only a few very small individuals emerging at the two main sites. Elliot's E5, however, had been planted much earlier (November 2023). The first seedling appeared in 18th October 2024, and by the project end there were sixty seedlings present, with the largest almost 4 cm across (Fig. 5).

Figure 4 Restoration activities: **A-B** Restored bank on Coronation Peak; C *Sporobolus caespitosus* planted at Old Marine Barracks;
D Information board at Coronation Peak; **E** Fog catcher installed above Coronation Peak site to supply irrigation system;
F Growth units established in plant lab, during period test period

Whilst restoration efforts were showing promising signs for *S. caespitosus*, the same cannot be said of *Anorgramma ascensionis*, the Ascension Island parsley fern. This extremely rare species has only one individual left in the wild, and therefore is a high priority for rescue efforts. As reflected by its extreme rarity, it is a small, very delicate species, difficult to grow in cultivation. In order to facilitate the restoration effort, it was necessary for AIGCFD's Plant Team to multiply it in sufficient numbers, thus developing a small production line. This was a significant challenge, and one that had not previously been addressed.

Initial progress was promising, with the total cultivated collection increased from approximately 50 to 150 plants. However, in late 2023, the numbers crashed again due to a disease outbreak in the shade houses. Genetic tests were able to identify the causal agent as a *Pythium* species, a common genus of oomycetes responsible for stem rots in a range of horticultural and agricultural plants. The shade house population (which comprises most of the world population) was reduced to only approximately 20 individuals by this point. A review was subsequently initiated and attempts were made to enforce much stricter biosecurity. Numbers had recovered to more than 90 by the end of 2024. However, subsequent disease issues have continued to plague progress. A further, smaller, wave of mortality was experienced at the start of 2025, along with heavy fungal growths over the surface of the soil in some pots. Samples sent to FERA revealed at least four virulent plant diseases, including two further aggressive stem-rotting fungal genera, *Fusarium* and *Rhizoctinia*. We cannot risk transferring these infections to the wild at present.

The causes of the problems are fundamental and not easy to solve. Nursery infrastructure on Green Mountain is old, basic and not well equipped to maintain a sterile environment. The department has a plant laboratory which would provide a much more suitable alternative, but with only three staff there is neither the capacity nor a suitable-trained skill base to make regular use of it. As part of the Threatened Plant Strategy, these issues have been discussed and steps recommended to resolve the issues. However, there are no easy fixes, and greater capacity will ultimately be required to deliver an effective cultivation program.

Some of the problems were anticipated at the start of the project, and two terrarium-based growth units were purchased to enable *A. ascensionis* cultivation in the lab under sterile conditions, using a much simpler protocol than that needed for micropropagation (Fig. 4E). The terraria have been set-up, but were contaminated with *Pythium* when the first batch of plants were introduced. The units had to be dismantled and re-sterilised. After the reset, further contamination started to develop. The source was eventually identified as spores spread via the room's air-con system, which was old, mouldy and had not been serviced regularly. The A/C unit eventually had to be replaced (which took several months) and the process restarted once again. The terraria have now been re-tested by successfully maintaining another endemic fern, *Pteris adscensionis*, for two months. They now seem to be safe for further attempts with *Anogramma*, but ongoing development will now fall to the existing Plant Team.

Figure 5 Recruitment of *Sporobolus caespitosus* seedlings at Elliot's E5 by April 2025.

3.2 *Trial and evaluate different methods to control four priority non-native species*

This action took some time to deliver. Initially, issues arose because 2023-24 was exceptionally wet, and therefore it was difficult to use herbicides safely and under controlled conditions. Subsequently, time constraints created a challenge to complete the treatments alongside other activities. Nevertheless, the target was eventually reached in August 2024. The trial involved testing five different approaches on four species, with at least ten trees in each treatment group, thus encompassing over 200 trees in total. It was necessary to leave at least six months to determine whether there was any regrowth, so the final round of checks was not completed until April 2025, after the official end of the project.

The conclusions of the trial are presented in the herbicide trial report, attached with this submission. The results demonstrate considerable promise for the novel approach of using stem injection techniques rather than cut stump poisoning, achieving mortality rates up to twice those of the traditional techniques, and reaching close to 100% efficacy in some cases. This is a useful step forward, although further work may be needed to perfect the methodology, and the most appropriate technique or herbicide is dependent on the ecology of the species in question.

Output 4 *A pathway document mapping out future approaches to achieve sustainable conservation of Green Mountain's five endemic vascular plant species, that has the support of stakeholders*

Before this project, the main reference to guide plant conservation on Ascension came from a series of species action plans produced in 2015. After ten years of change, these were inevitably somewhat out of date. Although the actions have only been partly implemented, the focus on delivering them had drifted. New goals were needed, and, with issues which the department has struggled to address, encouragement was necessary to explore alternative options.

The new "pathway document" is the 2025 Ascension Island Threatened Plant Strategy, which has been appended to this submission. In our indicators, it was promised that the document would:

(1) Review and update existing Action Plans

(2) Provide detailed documentation, conclusions and recommendations from the studies delivered during the course of DPLUS159

(3) Identify the issues and unknowns associated with the conservation of each endemic species and the ecosystem they occupy, 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

All of these requirements have been covered. The strategy sets-out in detail the evidential basis for determining the current status and future threats to each species. At the end of each section, a summary list of recommendations has been made. In addition to a species-led approach, Part III also explores a strategy to deal with broader themes such as 'ex situ cultivation', 'invasive species' and 'staffing, structure and resources'.

Whilst we promised to deliver a focus on the five critically endangered plants on Green Mountain, the remit has been extended to cover all nine globally threatened vascular plant taxa on Ascension, in both upland and lowland ecosystems. It has also drawn-together a much broader range of source material, encompassing the project officer's personal studies conducted over the past 15 years. This combines into the most comprehensive scientific review of Ascension's threatened flora and ecosystems produced to date.

The draft strategy was reviewed by contributors to the Threatened Plant Workshop and has been revised on the basis of feedback from the various stakeholders who attended.

3.2 Outcome

Conservation of Green Mountain's five critically-endangered plants is based on a strategic, evidence-based pathway document, that provides the blueprint for future action needed to maintain a sustainable ecosystem and save these species from extinction

The outcome of the project is closely associated with Output 4, and the evidence is more-or-less self-contained in the Ascension Island Threatened Plant Strategy document. The 'Measurable indicators' from the original proposal were as follows:

0.1 *Evaluation of existing data and restoration attempts to consolidate learning*
This was discussed under Output 1; it has been completed and incorporated into the strategy

0.2 *Completion of monitoring and trials to identify optimum restoration methods*.
As far as is possible, past restoration trials have been reviewed and incorporated into the strategy and the herbicide trial report. Clearly, recent attempts to restore *Anogramma ascensionis* have been unsuccessful, but we have attempted to learn lessons from the experiences and will explore ways to improve in the future.

0.3 *Publication of final Endemic Plant Restoration Plan following public consultation*
The strategy has been produced, and is undergoing final review by AIGCFD before publication, when it will be posted on the Ascension Island Government website. Consultation amongst experts was achieved through the Threatened Plant Workshop. Consultation amongst the general public was invited through the public talk and discussion.

3.3 Monitoring of assumptions

Were Outcome and Output level assumptions monitored throughout the course of the project?

This is a difficult question to answer. AIGCFD does not have a terrestrial ecologist, so the project proposal was written by non-specialists who may not have fully appreciated all of the key issues. The assumptions were thus not always particularly relevant.

Output 1 *There is sufficient census and monitoring data available to draw robust conclusions*

The Endemic Plant Census data set is quite extensive. Quantity was not an issue, although as a reasonable proportion of the records contained mistakes or presented methodological problems, it was necessary to find ways around the deficiencies. The latter was a more important consideration. Overall, the original motivation for this assumption was based on the idea that the analysis of the plant census data would be able to draw 'conclusions' about species' ecology by identifying why species were failing in certain areas and succeeding in others. This was not relevant. Firstly, the census does not record details of environmental conditions which could be used to explain differences. Secondly, population declines were more or less universal at all sites, so there were no 'succeeding' sites to compare against. Nevertheless, analysing the data trends was useful in its own right to understand what is happening to populations. The Threatened Plant Strategy has incorporated as many ecological insights as possible to help shape our understanding, but these insights have largely been derived from other sources.

Output 2 *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*

In fact, the climatic studies were conducted during an exceptionally wet period. Estimates suggested an annual rainfall of 2.3 m on Windy Ridge on 2024, whereas the few previous estimates for Green Mountain lie close to 600 mm. The heavy rainfall made fieldwork difficult, but did not create an intrinsic problem. A period of 1-2 years is never sufficient to provide a long-term average, so the results are merely a snap-shot of a particular moment. Again, the 'risk' outlined seems to have been based on a slight misunderstanding of the scientific process adopted. The proposal intended that we would examine the climate experienced by particular endemic plants and use this to draw conclusions about their ecology. In fact, we designed the

studies to look at how climate varied across environmental gradients, which is more practical, and also more useful to identify patterns and make future predictions. The assumption is not relevant because the questions asked ultimately did not require 'typical' conditions.

Output 3.1 *Plants may be subject to accidental mortality regardless of site suitability*

The associated mitigation measure for this risk was suggested as "*replacements will be grown in readiness if needed*". This is good practice, and an entirely sensible step. Unfortunately, the risk assessment failed to anticipate the very high risk of working with a very difficult species, *Anogramma ascensionis*. In the event, we were not able to even grow enough plants for the initial restoration effort, let alone replacements. This is not a criticism of the original staff. It is generally only through tackling difficult challenges that problems are realised, and these are better uncovered so that they can be corrected in the future. A worse failure would have been not to conduct the attempt, in which case we would still be much less far along the route to a solution.

A second mitigation measure was "*AIGCFD staff will maintain the capacity for ongoing monitoring into the future to improve the accuracy of findings*". This is another point worth highlighting, and one which perhaps stemmed from over-optimism. In fact, it should be recognised that, as a department, freeing up sufficient staff to absorb project continuation it is a struggle. It was even difficult to find cover for maintaining the field site weeding during the project when the project officer was unavailable. This is entirely a matter of capacity, and one that is difficult to resolve when the existing Plant Team extends to just three individuals. The issue has been recognised, and is discussed in the Threatened Plant Strategy. Solutions will not be easy, but we must work on them.

Output 3.2 *Effective control methods for non-native plants can be found without posing unacceptable environmental risks (e.g. use of herbicides in sensitive habitats)*

It is unrealistic to hope that anything we were able to do within this project would find the definitive solutions to weed control; these are problems that have existed since the science was developed. The key problems are certain species that are very good at regenerating after initial control. We have agents that have some efficacy, but they are not 100% effective, so considerable time is spend on revisiting the same plant repeatedly in order to prevent regrowth. If we can improve on current methods by even a small amount, it will save time and expense in the longer term. There was a risk that none of the approaches would work, but this is how science works. We never know the answers until tests have been made. A null result should not be seen as a 'risk' to be mitigated against, it is just the answer.

Output 4.1 *Outputs 1-3 provide sufficient information to produce evidence-based recommendations*

Perhaps not a huge risk, as considerable data were available to draw from.

Output 4.1 *Stakeholders engage with the consultation*

As discussed in Section 2, this did prove to be an issue. In fact, our pool of contacts has been very limited in the recent past and it was difficult for technical collaborators to find time in their busy schedules. One of the probable reasons was that we were asking them to contribute time for free. Building some funding into the application for consultation may be necessary to circumvent this issue in future. Ultimately, we changed course, and developed a more ambitious plan for our Threatened Plant Workshop, that did incorporate consultation with numerous collaborators.

Objective *Past data evaluation, new monitoring results and trial outcomes indicate sustainable restoration options exist*

This statement may again have been framed with a slight misunderstanding of what the project was capable of delivering. As a result, the wording of Output 4 was modified via a change request, and the proposed original "restoration plan" has been rephrased as a "threatened plant strategy". It is unrealistic to expect that we are in a position to solve the problems Ascension has in conserving its endemic plants. These problems are severe and deep-rooted. We have conducted far too little research and made too few exploratory attempts to be yet anywhere close to definitive answers. The strategy merely suggests the next steps forward. It should not,

therefore, be viewed as a 'risk' that we may not achieve the ultimate plan, with "sustainable restoration options".

4 Contribution to Darwin Plus Programme Objectives

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

The project has achieved the following:

- By analysing data on the populations of nine threatened species over the past decade, it has enabled an accurate assessment of current threat status based on their rates of decline
- Information on the ecology of the nine threatened species from the past 20 years has been collated and interpreted to improve understanding of the ecological issues facing Ascension's flora, thus providing a baseline for improved conservation measures
- Additional data have been collected and analysed to enable an understanding of climate-related issues in Ascension's critical upland zone, and also providing a baseline for assessing future climate change
- Trials aimed at controlling non-native plants have determined more efficient approaches, thus increasing knowledge capacity for addressing invasive species issues
- One critically endangered plant species has been reintroduced to three new sites, and thus far appears to be establishing successfully, providing hope of expanding the initiative in the future
- One endemic plant species formerly considered to be extinct has been rediscovered (the grass *Sporobolus durus*)
- A strategy has been developed for future plant conservation on Ascension Island, thus providing the impetus and direction to propel the field into a new phase of ambition and delivery
- Through a threatened plant workshop attended by a range of international and internal participants, links have been established with the potential to strengthen collaborations in the future

What will change as a result of the project?

Over recent years, Ascension's threatened plant populations have been declining rapidly, with no internal capacity available to halt these declines in natural habitats. As the department has little expertise in data analysis, staff were thus largely unaware of the severity of the problems. The ecological issues responsible for deterioration were poorly-understood due to a lack of research and no one to draw existing information together.

Through an evidence-based process, we have attempted to focus attention on the current reality, thus priming stakeholders with an understanding of what is required in the future. We have also attempted to fill-in the knowledge gaps as far as possible, making the problems clearer and bringing us closer to solutions. The Threatened Plant Strategy not only suggests pathways for future improvement, but we also recognise that the challenges are more fundamental; rather than merely presenting a 'wish list' of actions, we have attempted to explore options for restructuring and fund-raising to meet these new demands. There is no point in suggesting change unless it is practical to deliver.

There is no guarantee that anything will change. The aims of the project were to place AIGCFD in a better position to execute positive steps in the future. Whether this goal is achieved depends on implementation of the plan and use of the information platforms developed. Delivering many of the actions will be challenging. The department has severe limitations on staff and, to a lesser extent, skills, which make it difficult to enforce the transformational shifts that are needed to halt species declines. We have, however, provided tools to facilitate the process.

What contribution did your project make to key UKOT Government priorities?

Under the Ascension Island Environmental charter, Ascension Island Government commits to:

- "Ensure the conservation and restoration of key habitats through … appropriate management structures and mechanisms"

- "Review the range, quality and availability of baseline data for natural resources and biodiversity"
- "Promote special features of the environment in Ascension Island"

Through analysing the key data sets, providing a plan for the future of plant conservation and disseminating the findings, DPLUS 159 contributes to each of these objectives.

The Ascension Island Biodiversity Strategy and Action Plan identifies the following relevant goals:

- "Changes in climate … are monitored and their impact on protected species and habitats quantified"
- "Propagate and plant out beneficial trees to expand the man-made cloud forest for the benefit of endemic species"
- "Cut and remove potentially invasive plants and control rodents"
- "Planting out of cultivated endemic plants to enhance existing populations and establish new ones"
- "Establish spurge at new sites on the island with higher rainfall and soil moisture"
- "Remove non-native plants from key sites for endemics and restoration areas"

We have undertaken the first detailed study of upland climate and provided a plan for the delivery of the other goals. It may also be noted that the AIBSAP is rather thin in some areas, for example, there is no specific action requiring staff to preserve wild populations of threatened species. The Threatened Plant Strategy thus strengthens the focus of approaches and provides a wider, more integrated set of recommendations.

How did the project support the host Territory's obligations under multi-lateral agreements?

Under the UKOTs Environmental charters, the UK Government commits to:

- "Help build capacity to support and implement integrated environmental management"
- "Help Ascension Island to ensure that is has the legislation, institutional capacity and mechanisms it needs to meet international obligations"
- "Promote better cooperation and the sharing of experience and expertise between Ascension [and] other Overseas Territories"
- "Help Ascension Island identify further funding partners for environmental projects, such as donors, the private sector or non-governmental organisations"

By assessing the extent of the problems and identifying what support is needed to meet them, the project lays a framework for future fulfilment of these objectives.

Ascension Island's obligations under the Convention for Biological Diversity are addressed through the Global Strategy for Plant Conservation. There are ten targets particularly relevant to Ascension Island, and an assessment of current delivery is provided in Part III of the Threated Plant Strategy (Section 1.2). DPLUS159 has directly contributed to fulfilling two targets:

- An assessment of the conservation status of all known plant species [made] … to guide conservation action
- Information, research and associated outputs, and methods necessary to implement the Strategy developed and shared

The research and analyses conducted have helped to inform conservation statuses, address ecological information gaps and make this knowledge more widely-accessible.

The Threatened Plant Strategy suggests a pathway for fulfilling the remaining eight targets, although there is a considerable way to go: according to our assessment, progress is currently only graded as 'adequate' in three of the ten topics covered by the GSPC targets.

Although not a legally-binding document, Ascension's Threatened Plant Strategy also develops a plan for delivering the six action points on climate change mitigation, as set-out in the UK Government's "*Guidance for Biodiversity Conservation and Management in a Changing Climate in the UK Overseas Territories*".

Has the project helped embed environmental issues into decision making?

This is the raison d'être of the Threatened Plant Strategy. Whether it achieves this objective can only be evaluated by proof of action over coming years.

Please quantify the proportion of women on the Project Board[1].	50% (i.e., 1 out of 2 people)
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].	Not applicable, as there are no official partners

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 was very constrained in what could be achieved with respect to GESI. Ascension Island has no indigenous population to be taken into consideration. Only one person was employed to deliver the program (white European male) who has been responsible for 95% of the work. The remainder came via support from the AIGCFD plant team (2 of 3 are female: 3 distinct ethnic groups), conservation interns and occasional volunteers, who represent a moderately diverse demographic. During the two years of fieldwork, all nine participants to the Conservation intern scheme were female. We have no choice in social composition of the volunteer pool, and are simply grateful for any support that is offered.

No funding was available for engagement activities, although two major events were staged near the project end. The Threatened Plant Workshop was attended by 15 women and three St natives of Helena, out of a total 25 people. Invitations were largely dictated by existing links and expertise, but it was not considered that there were intrinsic biases during the planning phase. All local staff involved directly in terrestrial conservation (whether junior or senior) were included. Similarly, the public talk and discussion had open attendance to any interested party, but the audience eventually comprised more than 50% women.

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

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

Ascension Island Government has reasonably well-developed inclusion policies, to which all staff must adhere. The project officer undertook two rounds of safeguarding training during the course of the project, although no requirement to work with minors arose. All staff, regardless of gender or ethic group, are consulted about needs and limitations before engaging in fieldwork, given 1:1 mentoring during their participation and the project officer was open to possibilities for help with career development of younger staff where practical.

It is difficult to see that there were any issues of under-representation within the project environment. More proactive engagement with different sectors of society could have been built in to the application, but this would have required greater capacity and funding, and AIGCFD has other dedicated programs that are more directly focused on such activities.

5 Monitoring and evaluation

Changes to the project delivery were as follows:

May 2022 – change request (financial)

The project schedule was delayed from a period spanning July 2022 – June 2024 to a revised period of January 2023 – December 2024. This was due to a lack of available staff to take on the role of project officer. No additional funding was requested, but some of the award was shifted across a broader spread of financial years.

October 2023 – change request (non-financial)

Activity 3.1 was originally "*Conduct restoration trials by planting a minimum of ten individuals of each target species at five sites varying in environmental conditions*".

This was changed to "*Conduct restoration trials to establish thirty individuals of Anogramma ascensionis and Sporobolus caespitosus at each of two locations*".

The amendment resulted in a reduction in the number of focal species and locations, but allowed a stronger focus on a problem of high conservation importance. The original action was seen to be impractical and the approach would have yielded comparatively little benefit.

Activity 3.3 was "*Trial and evaluate different methods to alter temperature, light and humidity experienced by plants".*

This was dropped. We felt it has comparatively little value, was technically difficult to implement and stretched the available staff time too thinly.

July 2024 – change request (non-financial)

Activity 3.2 was originally "*Trial and evaluate different methods to control eight priority non-native species including mechanical removal and herbicide application*".

This was changed to "*Trial and evaluate different herbicide application methods to control four priority non-native species*".

The above amendment reduced the number of focal species, dropped the requirement to trial mechanical removal techniques and re-orientated the methodology to place more emphasis on methods to deliver the herbicides rather than the type of herbicide *per se*. These changes were necessary to answer a question more relevant to local needs, and to reduce the delivery burden. The original action was impractical for the available workforce, and unnecessary as some of the targeted species already responded well to established control methods.

August 2024 – change request (non-financial)

Objective 4 was originally "*A detailed evidence-based restoration plan for five endemic plant species that has the support of stakeholders*".

This was changed to "*A pathway document mapping out future approaches to achieve sustainable conservation of Green Mountain's five endemic vascular plant species, that has the support of stakeholders*".

The need for change arose because in the Year 1 annual report it was mentioned that the final document delivered for Output 4 would be designed to address current needs: these were more

wide ranging than just a restoration plan, and, indeed, insufficient research and capacity-building had been conducted to inform viable restoration approaches for some species at the present time. The reviewer of the report instructed us that a change request should be submitted in order for such a conceptual shift in emphasis to be approved.

September 2024 – change request (non-financial)

The final change request extended the project time frame over an additional three months, with the end date postponed to 31st March 2025. This gave sufficient opportunity to deliver the full set of objectives. It did not involve any change to finances, and remained within the existing financial year framework.

Looking back over the life of the project, was the M&E system practical and helpful to provide useful feedback to partners and stakeholders?

One peculiarity of this project is that most of the outputs were scientific surveys and analyses that took the majority of the project duration to deliver. Objective 4 and the Outcome were dependent on these outputs, and thus the majority of tangible progress was not manifested until very close to the project end. This was reflected in the original log frame, where deadlines for completion were mostly set at YR2Q4 (i.e., the end of the project).

Nevertheless, the long-term nature made it difficult to provide evidence of progress at earlier reporting periods. How should it be demonstrated that a dataset has been half-analysed? What is the indication that an incomplete experiment is on schedule when the time block allocated for analysing the data is still a year away? The review of our last annual report expressed discomfort with the evidence deficit. Although we had provided copies of data sets, and interim graphs of results, these were deemed inadequate as proof of progress. However, no suggestions were made for how the reporting or structure could have been improved, and we also found this a challenging problem.

During the lifetime of the project, has there been an internal or external evaluation of the work or are there any plans for this?

The draft version of the Threatened Plant Strategy was presented to the Threatened Plant Workshop and feedback obtained on the content. The document has now been revised, with new ideas incorporated and existing ones modified as appropriate. The workshop also included an exercise in which the expert group was asked to prioritise the various recommended actions. The gradings have largely been carried into later drafts of the document.

The public talk was staged as an opportunity for a wider audience to contribute. The strategy is very long and much of the material is very technical, so only an overview was presented. However, key suggestions were invited during the discussion, or subsequently via verbal or written feedback to the conservation offices. Eventually, a summary document will be posted on the AIG website, giving further opportunities for comments to be taken on board. The plan must be robust to changing circumstances, and is intended to evolve with needs and ideas.

Internal discussions within AIGCFD have been ongoing throughout the project, but have accelerated since the Threatened Plant Workshop, which was the first opportunity to present an overview of the entire plan. As a result, a quarterly meeting between the Plant Team, Coastal Reserves manager and Green Mountain National Park Warden team has been initiated to improve cross-team collaboration within the department. The latest version of the Threatened Plant Strategy should be seen as an advanced draft. It is currently being reviewed by staff within AIGCFD, and a ‘final’ revision will be updated in response.

6 Lessons learnt

One of the main difficulties arising during this project was the work load. Running three reasonably large and extended field projects simultaneously, whilst also attempting to set-up/troubleshoot a new lab facility, undertake a major statistical review of a 12-year data set and a compile a 300-page evidence-based report, was quite a lot for one person. However, the underlying reasons should be viewed in context. Ascension Island has no terrestrial ecologist, and therefore most project proposals are inevitably written by non-specialists, who may not have a clear appreciation of what is possible, or where the pitfalls are likely to lie. Many of the challenges faced are big, and appreciable change requires considerable effort.

A unique feature of the project was that the outcome was a review of progress, problems and potential solutions. The Threatened Plant Strategy deals in detail with the various issues surrounding capacity, organisation and project delivery, and is therefore a commentary on lessons learnt.

Within this, there are particular issues surrounding Darwin Plus, discussed in Part III (Section 6.2). Current staffing levels within AIGCFD do not permit a capacity for habitat restoration or for management of wild threatened species. External funding can be obtained, but, if accessing standard grant schemes, there are few options of sufficient size to bring in additional staff for the extended periods needed (Part III, Section 7.4). As Ascension does not meet the criteria for most conservation funding options, Darwin Plus is one of our only outlets for larger grants, and we have been heavily reliant on it for a number of years. However, this cannot really fill the void on its own. Restoration and habitat maintenance are often long-term undertakings that may take several years or even decades of gradual but sustained progress to make a difference. Intensive effort for two years which then stops entirely is not the answer: past experiences show that the progress gained is soon lost as the sites revert back to their original state. We have previously claimed that there are legacy plans in place for continuation, and these claims were no doubt made in good faith, but this is not the reality; a small workforce cannot be stretched ad infinitum to cover an ever-expanding portfolio. Alternative models must be sought.

7 Actions taken in response to Annual Report reviews

There were three queries from the last annual review that were marked to be dealt with in the final report. For the sake of clarity, these will be addressed here:

1. *The project had planned to have established twenty-four climate monitoring sites by Y1 Q2 (Indicator 2.1.). The report claims that twenty-one climate monitoring sites have been established. Please clarify if the project will set-up the remaining three sites.*

The climate monitoring has been completed. The reasons for changing the delivery approach have been outlined under Section 3, Output 2. They had also been explained in the previous annual report:

"*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 recording period, mostly on the sheltered north side*".

2. *Indicator 2.2 planned to download and collate 14 months of temperature, humidity, and light data from the 24 locations. Apparently, the project only collected data from six sites. It is unclear to the reviewer when and how the project plans to collect data from the other 18 locations*.

As explained under Section 3, Output 2, we have now assembled a data set covering 36 climate monitoring sites. It is unclear why the reviewer thought that we had only downloaded information from six sites. The previous annual report had stated that:

"*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*."

We also provided a copy of the database which contained data from all 21 sites.

3. *Instead of a formal Steering Group, the project plans to organise an online meeting "with a broader number of contributors" to review the current situation / discuss ideas. It is unclear when this meeting will take place and who will attend. There is no evidence in the report. It seems that the project does not include other stakeholders in project planning and decision-making*.

The Threatened Plant Workshop has been delivered and is described in Section 2. The reason that there was no evidence in the previous report is simply that it takes time to organise such an event, and it could not practically be scheduled until the latter part of the project. It is also

not entirely true to say that the project did not include other stakeholders in planning. The previous annual report had discussed the problems with the steering group and explained the following:

"*Due to other time demands on contributors, discussions have been infrequent. 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*."

The remaining two queries were labelled "Discuss with BCF's admin". These were dealt with in Change requests from July 2024 and August 2024, as described in Section 5. Both change requests were granted.

In overview, the previous annual review voiced considerable concerns that the project was not achieving the goals. It was stated that: "*it seems to the reviewer that the Outcome is unlikely to be achieved*". These concerns seemed to be particularly linked to what the reviewer felt was a lack of evidence of progress.

From our perspective, failure to deliver the Outcome was never a particular issue. The nature of the project (predominantly research and reporting) required that each activity would take some time (most of the project duration) to deliver tangible results. Although there were some internal shifts to the delivery schedule, it is not unusual that minor adjustments are needed in order to find a practical balance, particularly as the entire work load had to be juggled by a single person.

The limitations of providing evidence were discussed in Section 5, and this is undoubtedly a difficult question in such a project. If Darwin Plus reviewers have any recommendations, these would be welcome. However, we largely delivered the "Means of verification" that had been set-out in the original log frame (a few were not practical), which were accepted during the project award stage.

8 Sustainability and Legacy

Please comment on which project achievements are most likely to endure, and why

The project was focused on developing a strategy to carry plant conservation on Ascension Island forward into the next decade. By definition, it was designed to provide a legacy. However, this legacy remains dependent on successful implementation over future years, and there remain considerable challenges to be overcome. In the original proposal, one claim made for the post-project landscape was that " *We will not have to report the extinction of species on our watch*". In fact, findings from the plant census analyses suggest that several threatened species are declining rapidly, and two species have just a single individual left. Extinction is almost inevitable in these cases without urgent and intensive action, and there is reasonable evidence to predict further extinctions in just a few decades without substantial and rapid progress in addressing the issues. A plan cannot, overnight, reverse decades struggling with overstretched capacity. Delivery of transformational approaches will be needed to achieve this.

In addition to the Threatened Plant Strategy, the key legacy outputs are the following:

- A clean data set for the Endemic Plant Census that can now be verified as reasonably reliable as a baseline against which to compare future changes
- An extensive repository of collated information on the ecology of Ascension's threatened flora, to serve as a platform for future progress
- The first detailed study of Green Mountain's climate, to feed into future ecological and climate change work
- The establishment of a longer-term program of climatic monitoring on Green Mountain
- Progress in the methodology for invasive species control and restoration of *Sporobolus caespitosus*
- The rediscovery of an endemic grass species presumed extinct since 1889
- Reforms to areas such as nursery hygiene and intra-departmental collaboration (already initiated)

- Creation of opportunities for collaboration, through the Threatened Plant Workshop
- Greater awareness of the issues faced by Ascension's threatened flora

What will happen to project staff and resources now the Darwin Plus funding has ceased?

As the project was mostly designed to deliver academic and written outputs, there are relatively few 'resources' to be considered.

- The project officer has now left the island, as there is no possibility of remaining once funding has expired.
- The infrastructure for the restoration sites remains in place. AIGCFD have been attempting to find ways to keep this work going into the future, and eventually add *Anogramma ascensionis* to the sites in addition to the *Sporobolus caespitosus* already established. However, this is difficult due to limitations of staff, who are already stretched to deliver their existing roles. We applied for a Darwin Local grant in 2024 to support this work for one year, but the outcome of the application is not yet known.
- Small equipment items purchased (e.g., invasive control equipment) have been passed on to other staff. Most of the climate monitoring infrastructure will be stored in the event that future climate monitoring work is resumed, although there are no immediate plans in place.
- The weather station takes relatively little time to maintain, and this will be absorbed into existing schedules of the National Park Warden Team and/or the Plant Team.
- The plant growth units (terraria) constructed in the plant lab will be used by the Plant Team to develop improved cultivation facilities for *Anogramma ascensionis* into the future.
- Bespoke doors purchased to replace rotting and rusty ones on Green Mountain shade houses will keep the facility running for the next 10-20 years.
- All literature produced through the project will be retained on the AIGCFD server and is freely available for staff to use.

Please describe any action you have taken as part of the project's open access plan

Due to the time taken to process the huge amount of work in the project, final reviews of the Threatened Plant Strategy have yet to be completed. This will hopefully be achieved within the next few weeks, after which a summary version at least will be uploaded onto the AIG website and made available to the public. The full version will also be publicly-available in some form, although, as this is very long, the best means of facilitating it has not yet been decided.

The South Atlantic Environmental Research Institute hosts an online portal through which the Endemic Plant Census data are available (http://www.south-atlantic-research.org/ims-gis).

Discuss the profile of the project within the Territory and what efforts have been made during the lifetime of the project to promote the work

One of the problems with the project is that the conclusions only emerged very close to the end date. It was very difficult to talk about something that had not been delivered, and where the findings were often not yet entirely clear. In addition, the project officer was struggling to finalise all other activities, and there was little capacity to add more to the work load.

Thus far, the key local profile-raising activity has been the public talk, held in March 2025. We are aware that the findings do need to be disseminated more, and are in the process of developing further outputs. However, these need to be handled sensitively. A key finding has been the rapid declines in populations of endemic species. This could generate a range of feelings. Some stakeholders will see it as a motivation for change, and others may view it negatively, as a failure (we argue that this is unfair, but there are complex factors to understand). The issues must be well-managed, and we prefer not to rush into them merely to meet an artificial project deadline. Public engagement activities are further discussed in the following section.

9 Darwin Plus Identity

What effort has the project made to publicise Darwin Plus

As explained in the previous section, our publicity and engagement campaign is still in the early stages. Thus far, the following opportunities have been taken (Fig. 6):

- Two social media posts featuring DPLUS159 were produced by AIGCFD in March and June 2023, reaching 1.4 and 1.1K readers. The Darwin Plus Logo was included in both.
- An article on restoration work was published in August 2024 in Ascension's local newspaper, 'the Islander'. This acknowledged Darwin Plus funding and included the logo.
- A summary of the above newspaper article was replicated as a further social media post in August 2024. This acknowledged Darwin Plus funding and included the logo.
- A public talk was delivered at the island's cinema in March 2025. This acknowledged Darwin Plus funding and included the logo in the title slide. Efforts are currently under way to post a recorded version of the talk on the AIG web site or social media output.
- Two information display boards have been erected at the project's restoration sites, which include details of the work undertaken and display the Darwin Plus logo.
- The Threatened Plant Workshop carried the Darwin Plus logo on each of 15 mini-presentations delivered over the two-day program.
- The Threatened Plant Strategy document, which has been split into four parts, carries the Darwin Plus logo on the title page of each part. Part IV is the summary of the more detailed main document, and this contains an acknowledgement section in which Darwin funding is recognised. This will be posted on the AIG website.

We are currently developing additional social media outputs, although it has not yet been possible to finalise them due to demands of the project delivery schedule. These comprise 11 separate posts, one on each threatened species, one on the overall threat risk to the flora and one on how the Threatened Plant Strategy intends to address the problems. These will be released gradually over a period of months. Each post will carry the Darwin Plus logo.

We will also produce a further article for 'the Islander' when the strategy is released.

Was the Darwin Plus funding recognised as a distinct project with a clear identity or did it form part of a larger programme?

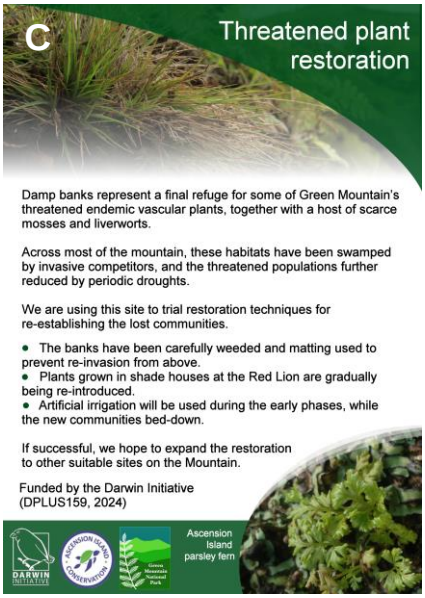
We do not really have any larger programs at present, so Darwin Plus was recognised as the distinct and primary funder in all cases.

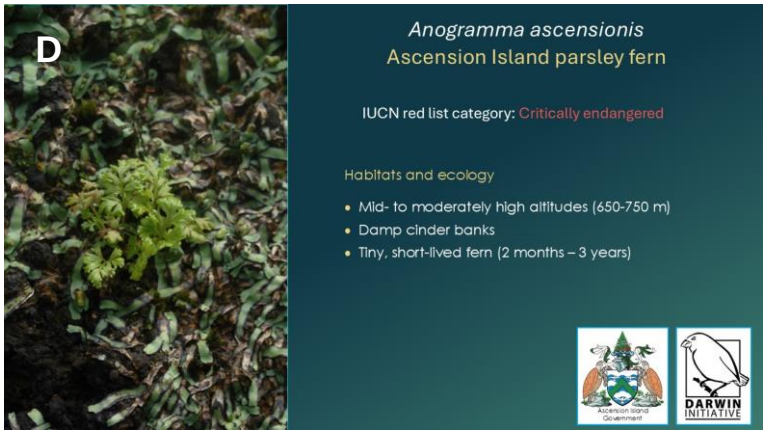
To what extent is there an understanding of Darwin Plus within the host country and who is likely to be familiar with it?

Ascension Island is somewhat unusual in that there is no resident population, and the staff who live here on working contracts are often short-term. As much of our conservation funding comes from Darwin Plus, the name is regularly propagated in AIGCFD's publicity. In my experience, quite a few of the longer-term staff (most of whom already work for government) are aware of Darwin Plus, although this is a fairly small pool by most standards. Much of the recognition amongst the temporary population is eroded quickly through emigration. Despite regular efforts at engagement, the degree of "nature connectedness" on the island is probably quite low, for reasons of culture, the role profile of the working society, and the limited sense of belonging. Although people may recognise the Darwin Plus name, it is therefore more difficult to assess the level of "understanding" behind this.

Two Facebook social media posts featuring DPLUS159 were produced by AIGCFD in March and June 2023 reaching 1.4 and 1.1K readers, and another in August 2024 (no statistics available). The Darwin Plus Logo was included in each post. Related to this project, there were 17 posts sharing information about endemic plant posts since April 2024 which had a total of 932 likes, 32 comments and 87 shares.

Figure 6 Public engagement outputs:
A Poster for public talk; B Islander article





C Display board at restoration site; **D** Presentation slide from Threatened Plant Workshop

10 Risk Management

Have any new risks arisen in the last 12 months that were not previously accounted for?

The main risk was a danger of project slippage due to the high work load. Some elements of the fieldwork were also not particularly well-aligned with our needs, so there was an associated risk of spending considerable time delivering results that would not prove to be particularly useful. These issues were identified and adjustments made to the outputs and delivery schedule through the October 2023 and July 2024 change requests.

Even after the above adjustments, it proved impossible to complete the project within the two-year time frame. A three-month no-cost extension was then sought through the September 2024 change request. This was also granted.

A more disappointing 'risk', which could not be resolved, arose through the failure to deliver a restoration attempt of *Anogramma ascensionis*. The 'risk' was pest and disease outbreaks in the AIGCFD shade houses. This was not new in 2024, as a similar issue had been encountered in 2023. However, we had hoped to overcome the problems by the project end. In fact, further contamination was experienced in spite of considerable efforts to improve nursery hygiene. Ultimately, the underlying problem can be attributed to an infrastructure which is insufficient to support a demanding propagation production line. Much more sterile conditions, and staff training in micropropagation techniques, will be needed to reliably grow this difficult

species in large numbers. Clearly, we had been over-optimistic in our ambitions. However, sometimes it is necessary to test a system before its failings can be identified. It is often the case with difficult threatened plant conservation that approaches do not work at the first attempt; they must be refined and adapted through trial-and-error. This may take many months, which is challenging in a two-year project. We have attempted to learn and develop a future pathway to progress.

Has the project made any significant adaptations to the project design to address changes to risk?

Over the course of the project, various adaptions have been made to mitigate risk:

1. The project aims and delivery schedule needed to be streamlined to enable completion within a reasonable time frame, and to focus the research outputs on relevant questions. This was achieved through the October 2023 and July 2024 change requests.
2. Two changes to the project time frame were needed, firstly with the aim of procuring time to find suitable staff and secondly enabling completion of the high workload. These were administered through the May 2022 and September 2024 change requests.
3. The difficulties in maintaining a regular steering group were evident reasonably early in the project. Almost everyone working in plant conservation in the UKOTs is stretched, and finding time to meet was demanding, especially with no funding financial attached to the role. We changed the approach by augmenting the original group with a Threatened Plant Workshop towards the end of the project. This ultimately proved more useful. It reduced pressures on our core existing colleagues, brought in a wider range of voices, helped us forge new links and communicated messages more widely.
4. In 2023, heavy mortality of the ex situ *Anogramma ascensionis* population resulted in a high risk of failing to deliver Activity 3.1. Management of the nursery resides with AIGCFD's Plant Team and action was not directly controlled by DPLUS159 staff. Nevertheless, in collaboration, extensive efforts were made to control the problems, through improving nursery hygiene, disseminating a plant disease manual amongst staff to highlight best practice, and attempting to improve sterile lab infrastructure via the construction of two new terraria. However, these measures were either not sufficient or required a longer time frame to implement in full.

11 Safeguarding

[redacted]

12 Finance and administration

12.1 Project expenditure

Project spend (indicative) since last Annual Report	2024/25 Grant (£)	2024/25 Total actual Darwin Plus Costs (£)	Variance %	Comments (please explain significant variances)
Staff costs	[redacted]			
Consultancy costs				
Overhead Costs				
Travel and subsistence				
Operating Costs				
Capital items				

Project spend (indicative) since last Annual Report	2024/25 Grant (£)	2024/25 Total actual Darwin Plus Costs (£)	Variance %	Comments (please explain significant variances)
Others	[redacted]			
TOTAL	28,312	28,522.67		

*This sum represents the underspend from 2023-24, which was moved to support the project extension in 2024-25 via a change request (September 2024)

Staff employed (Name and position)	Cost (£)
Phil Lambdon, project officer	[redacted]
TOTAL	

Consultancy – description and breakdown of costs	Other items – cost (£)
N/A	
TOTAL	[redacted]

Capital items – description	Capital items – cost (£)
N/A	
TOTAL	[redacted]

Other items – description	Other items – cost (£)
Batteries Drill bits Funnels Lab supplies Plant growth lamps Rope Weather writer Weed membrane Weed membrane fixings CON1444 - Mist units PO17770 - Garden products CON1133 – Fog catchers CON1213 – Galvanised poles CON1314 CON1275 – lamp bulbs Shipping	[redacted]
TOTAL	

12.2 Additional funds or in-kind contributions secured

Matched funding leveraged by the partners to deliver the project	Total (£)
Ascension Island Impact Fund – workshop delivery and facilitation	[redacted]
AIGCFD staff time	
AIG accommodation for project officer	
TOTAL	

Total additional finance mobilised for new activities occurring outside of the project, building on evidence, best practices and the project	Total (£)
TOTAL	

12.3 Value for Money

The deliverables listed at the start of Section 4.1 would seem a reasonable return for the money expended. The project was predominantly research-based, and the demands equivalent to a funded PhD or post-doctoral study. A comparable NERC grant would typically be in the region of [redacted]DPLUS159 was achieved for under [redacted] despite the high costs of logistics on Ascension.

Although the project was largely managed by a single person, the time and effort invested were considerably more than standard working hours. The project officer has a PhD, 20 years' experience working in habitat restoration of remote tropical island ecosystems, and has been involved with research on Ascension Island since 2008. This enabled a back-library of personal data and specific knowledge to be brought into the project that would not otherwise have been accessible. Under normal circumstances, this profile would rarely be available, and it has been historically difficult to attract candidates to the territory, especially as suitable personnel can earn much more elsewhere than the annual wage of just [redacted]

Beyond this, it is important to add a cautionary note. The true 'value for money' of the project really depends on whether the Threatened Plant Strategy delivers future changes. For example, we invested money into testing ways to improve invasive plant control. Whilst this did provide some promising options, the 'value' can only be recognised if these options are subsequently used to reduce time and costs. At present, Ascension Island does not have staff to enact an invasive weed control program, and there is a risk that it will never be possible to take advantage of the recommendations. Similarly, investing time in restoring threatened plant populations is only worthwhile if the efforts can be sustained and integrated into a longer-term rehabilitation program. This currently does not exist, and core staff are very stretched to maintain a skeleton support effort. Thus, whilst the project has provided a potential to unlock considerable benefits, much work will be required to improve capacity and (to a certain extent) efficiency in order to realise them.

13 Other comments on progress not covered elsewhere

All necessary information has already been covered.

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

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

Ascension Island is one of the most remote places on Earth—and one of the most ecologically unique. Its flora, shaped by isolation and extreme conditions, includes species found nowhere else. But centuries of human impact, introduced animal species, invasive plants and habitat degradation have pushed much of this biodiversity to the brink. Three of the known endemic vascular plants have already become extinct and another two species have only one surviving plant left in the wild.

DPLUS159 enabled a review of evidence to understand the ecological pressures facing the modern flora and habitats. A comprehensive evaluation was conducted on the annual Endemic Plant Census database which has collated valuable data on the abundance and spatial distribution of endemic plants for over a decade. This review provided a prediction of declining populations for many of these species and identified the need for a long-term conservation strategy to ensure their survival. An exploratory study on the climate of Green Mountain was also undertaken to facilitate a better understanding of the ecological constraints of the current habitats and shape ideas about the prospects of future climate change. Trials were also conducted for improved methods for restoration of vulnerable species and control techniques for invasive species.

By identifying the challenges of the past and the constraints of the current situation, DPLUS159 enabled the development of a realistic long-term conservation strategy. To be effective, a long list of actions will be required over the next 2-3 decades. Nevertheless, this strategy attempts to prioritise those actions in terms of what is (a most important, or (b) most urgent (the two criteria may overlap somewhat, but not always). The prioritisation process was shaped by a panel of international conservation experts, brought together for an on-line workshop in February 2025. It marks the first comprehensive plan to guide the recovery of the island’s threatened flora, moving from crisis response toward long-term resilience.

NOTE: Although we have plenty of images potentially available, I cannot provide any at the time of submission. The submission is being made by the ex project officer from a remote situation without access to a laptop, I have only just received feedback on this section, and I can only respond to basic comments.

Annex 1 Report of progress and achievements against logframe for the life of the project

Project summary	Progress and achievements
Impact Ascension can assure itself and others that every possible measure has been taken to avoid the extinction of its endemic plant species	We have attempted to make the Threatened Plant Strategy as comprehensive as possible to maximise the chances of future successes. However, the aim of the project was to produce a plan. This is not the same as practical action. Recent data have demonstrated alarming and rapid declines in most of Ascension's threatened species, and there is much to be done in order to avoid extinctions. Progress can only be achieved through positive steps to implement the Strategy; these are highly challenging, and at least partly dependent on increasing skills and capacity.
Outcome Conservation of Green Mountain's five critically-endangered plants is based on a strategic, evidence-based pathway document, that provides the blueprint for future action needed to maintain a sustainable ecosystem and save these species from extinction	This has been completed with the production of the Threatened Plant Strategy (Annex 5A). The document compiles all available information on the ecology of Ascension's nine threatened species, and uses wide-ranging evidence to develop a pathway for progress.
Outcome indicator 0.1: By Y1Q3 Evaluation of existing data and restoration attempts to consolidate learning	Analysis of Endemic Plant Census data was extended across almost the entire project due to the complexity of the task. Reviews have now been completed and are incorporated into the Threatened Plant Strategy (Annex 5A), including discussion of implications for future practice.
Outcome indicator 0.2: By Y2Q4 Completion of monitoring and trials to identify optimum restoration methods	The invasive plant control trial was completed (see Output 3.2 below). The restoration trial was only partially completed (see Output 3.1 below).
Outcome indicator 0.3: Publication of final Endemic Plant Restoration Plan following public consultation	This duplicates Output 4 (see below)
Output 1 Analysis of census data and evaluation of past restoration efforts	
Output indicator 1.1 By Y1Q3, analysis of biannual plant census data completed. Temporal and spatial patterns in population status for five critically endangered species reported.	Analysis of Endemic Plant Census data took almost the entire project due to the complexity of the task. Analysis has now been completed and findings incorporated into the Threatened Plant Strategy (Annex 5A). The coverage was extended to all nine threatened plant taxa on Ascension Island.
Output indicator 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.	The number of past restoration attempts has been rather few; these have been poorly-documented and none can really have been said to have succeeded. However, evidence has been reviewed and incorporated into the Threatened Plant

	Strategy (Annex 5A), together with recommendations for the future of restoration on Ascension
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	
Output indicator 2.1: By Y1Q2, temperature, humidity and light monitoring established at 24 sites, including selected wild target populations and potential reintroduction areas	It was decided to extend the climatic monitoring to a wider range of variables and study more sites (36 in total). For evidence, see Output indicator 2.3.
Output indicator 2.2: By Y2Q3, Minimum of 14 months temperature, humidity and light data collected from 24 sites	Each of the 36 sites was surveyed for a shorter period (nine months), but this was sufficient to provide the necessary data. For evidence, see Output indicator 2.3.
Output indicator 2.3: By Y2Q4, Data analysed to describe suitable growing conditions for endemic plant species and select potential restoration sites	It was not really possible to assess "suitable growing conditions" because we do not know if the surviving habitats are 'suitable' – all the endemic species in them are currently declining. However, key factors governing the climate of Green Mountain have been identified, and the study is included in the Threatened Plant Strategy (Annex 5A). The limitations imposed by climate on ecology, and the potential impacts of future climate change, are discussed.
Output 3 Results of trial endemic plant reintroductions and control trials for non-native invasive plants	
Output indicator 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.	Two restoration sites were developed and maintained until the project end. Sixty individuals of *S. caespitosus* were planted; these have survived well and were starting to produce seedlings by the end of the project. For evidence, see Section 3 (Output 3). It was not possible to plant any individuals of *Anogramma ascensionis*, because serious contamination issues caused heavy mortality in the plant nursery. Improved biosanitary measures have only been partly successful in rectifying these problems, and it is unlikely that a resolution will be obtained without improved infrastructure and capacity. The subject is addressed in the Threatened Plant Strategy (Annex 5A).
Output indicator 3.2: By Y2Q4 optimum control methods identified for four key invasive species, using replicated field trials	A replicated trial was conducted involving four species and five control approaches. The results have been compiled into a report (Annex 5B).
Output 4 A pathway document mapping out future approaches to achieve sustainable conservation of Green Mountain's five endemic vascular plant species, that has the support of stakeholders	
Output indicator 4.1: By Y2Q4, a draft restoration plan published	Threatened Plant Strategy produced (Annex 5A). This covers all nine Threatened Plant Species on Ascension Island, and also addresses structural and capacity issues.

Output indicator 4.1: By Y3Q1 Steering Group and public consultation exercise completed and final Restoration Plan produced incorporating stakeholder comments	A consultation with science and conservation stakeholders was held in February 2025, through the virtual Threatened Plant Workshop. A public talk and discussion were staged in March 2025 in order to raise awareness and gain further feedback from a broader audience. Evidence is provided in Section 2 and Fig. 6. The updated version of the Threatened Plant Strategy is currently undergoing final reviews within AIGCFD before publication on the website.

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 four key invasive species, using 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: The focus will be on testing cut-stump and stem injection treatments that carry only limited environmental risks if applied correctly.
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	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.

	appropriate conditions, based on minimal intervention. 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 Trial and evaluate different herbicide application methods to control four priority non-native species.
3.5 Recommend best methods to control each of the four 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

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	9	9	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	9	9	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	1	1	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	1	1	2
DPLUS-C03		New assessments of habitat conservation action needs published.	Number	Ecosystem	0	0	1	1	0
DPLUS-A07		Number of government institutions/departments with enhanced awareness and understanding of biodiversity and associated local community issues	Government institutions	Environmental	0	0	1	1	1

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-C19		Number of other publications produced	Number	publication typology	0	0	1	1	1

Table 2 Publications

Title	Type (e.g. journals, manual, CDs)	Detail (authors, year)	Gender of Lead Author	Nationality of Lead Author	Publishers (name, city)	Available from (e.g. weblink or publisher if not available online)
Flowering plants & Ferns of Ascension Island	Book	Lambdon P, Sim J & Stroud S (2023)	M	UK	Pisces Publications, Newbury	https://www.naturebureau.co.uk/flowering-plants-and-ferns-of-ascension-island
Ascension Island Threatened Plant Strategy. Part IV. Summary**	Electronic report	Lambdon P, Sim J, Duffell J, Estrale L, Flint K, Horseman L, McGurk J, Wagdin E & Williams D (2025)	M	UK	Ascension Island Government, Georgetown, Ascension Island	https://www.ascension.gov.ac/
Evaluation of cut stump and stem injection herbicide delivery approaches for control of four invasive plant species on Green Mountain, Ascension Island**	Electronic report	Lambdon P (2025)	M	UK	Ascension Island Government, Georgetown, Ascension Island	https://www.ascension.gov.ac/

**Not yet online, although should be available within a matter of weeks

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.	
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. All supporting material should be submitted in a way that can be accessed and downloaded as one complete package.	X
If you are submitting photos for publicity purposes, **do these meet the outlined requirements (see section 14)?**	N/A
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
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.	