Letterbox Nature Reserve and Boatswain Bird Island Sanctuary, Ascension Island

Year 1 Annual Review of Management

2023-2024

The Letterbox Nature Reserve and Boatswain Bird Island Sanctuary Management Plan set out how these two protected areas will be managed over the five years between 2023-2028. Five strategic objectives were produced with an action plan achieve these. Opportunities for scientific monitoring and research was identified to understand the ecosystems and conserve the species which utilise the protected areas.

This review summarises the progress that has been made so far with some suggestions for the coming year.

Ascension Letterbox/Boatswain Bird Island Reserve Action Plan

Ascension Letterbox Reserve/Boatswain Bird Island Monitoring and Evaluation

Letterbox NR/Boatswain Bird Island
Year 1 Action Plan

1. Clearance of invasive flora

Proposed: Removal of key invasive plants from designated boundaries within the NR.

Purpose: Protect the NR and relevant species from the threats of invasive species.

Outcome: No invasive plant species found in seabird nesting or Ascension spurge habitat.

	Description	Target	Year 1 progress	Year 2 target
1a	Monitor and remove new recruits of plants within the watershed above Razors Edge.	Watershed cleared of invasive plants Twice annually	Two visits were made to this site to remove invasive species in 2023/2024. Tree tobacco was noted to be growing here extensively with 1,305 uprooted and 170 larger tobacco trees cut and treated. An additional 7 guava trees were also treated. Smaller tomato plants were removed when encountered.	Increase the number of visits to this site to continue controlling the high density of tree tobacco growing here
1b	Monitor and remove new recruits encroaching onto Wig Hill from the western edge towards the Ascension spurge sites on Little White Hill and Little White Horse Hill.	Wig Hill remains free of invasive flora Area checked every quarter	No progress– access road damaged and therefore time on reserve limited	Implement target once access road is repaired and allows additional visits to the reserve.
1c	Remove Waltheria and swamp flat-sedge within 200m boundary of Ascension spurge areas.	Boundary of 200m around Spurge sites free of non-native plants Ongoing	No progress– access road damaged and therefore time on reserve limited	If access allows– remove Waltheria and swamp flat-sedge within 200m boundary of Ascension spurge areas.
1d	Clearance of guava from White Horse Hill	Plateau of White Horse Hill free of invasive guava Cleared by Year 5	No progress- staff resources focused on other areas of the NRs	20% of WHH plateau cleared by the end of Y2

Watershed above Razors Edge showing invasive vegetation growth prior to removal

2. Predator control

Proposed: Control the rodent (black rat and house mouse) populations in the Letterbox NR. Manage local populations of rabbits and sheep so they are unable to graze on Ascension spurge. Manage domestic cats on island to prevent individuals from turning feral. Maintain the rodent-free status of Boatswain Bird Island Sanctuary.

Purpose: Protect the Ascension spurge in the Letterbox NR from grazing pressure. Protect the nesting seabirds of the Letterbox NR from predation. Protect Boatswain Bird Island seabirds from non-native species.

Outcome: No grazing on the Ascension spurge or predation of seabird eggs/chicks.

	Description	Target	Year 1 progress	Year 2 target
1	Remove invasive plant species in NR, which harbour local rodent populations (see action point 1 for details).	No invasive plant species within 500m buffer zone around Ascension spurge sites. Ongoing	See action point 1 for details	See action point 1 for details
2a	Maintain a working register of domestic cats on island. Any domestic cats which become feral should be caught and rehabilitated. All cats on island neutered or spayed. AIGCFD work closely with cat owners to minimise the likelihood of cats straying, providing advice and support. Cat owners should be well informed about the Dog and Cat Ordinance, Cap A10 to ensure they are familiar with their legal responsibilities of being a cat owner.	No domestic cats go feral. No feline predation on native wildlife. Year 1	In Nov 2023, a domestic cat disappeared from residence in Two Boats village. Camera traps were used to identify the cats new territory and live trapping remains ongoing. Contact cat owners each quarter to manage the domestic cat population.	Continuation of trapping for the missing cat. Continuation of contact with cat owners.
2b	Rabbit and sheep proof fencing installed around mature spurge plants at Little White Horse Hill restoration site to protect from grazing. Regular maintenance of the fence is required.	No evidence of rabbit grazing on protected spurge plants Ongoing	In Sept-Oct 2023, a disease went viral through Ascension's feral rabbits, largely reducing the local population. A small population survived and can be seen around the Letterbox NR. Fencing around spurge restoration site at White Horse Hill in position and maintained throughout season. No evidence of grazing on spurge here.	Maintain rabbit and sheep proof fencing around the Little White Horse Hill restoration site.

2c	Extend fencing around Little White Horse Hill restoration site to encompass Ascension spurge growing outside of the current fenced area.	No evidence of rabbit grazing on protected Ascension spurge plants Year 1	Mature plants outside of restoration site individually fenced and shaded (photographed below)	Review if individual fencing is sufficient to protect plants.
2d	Following any observation of high grazing on spurge, increase the number of baited boxes around spurge restoration sites and fill weekly or more frequently if necessary. Additional bait may be hand strewn.	No signs of rodent predation on Ascension spurge Ongoing	No baiting occurred in year 1 due to reserve access issues.	Monitor spurge plants and bait as required.

3. Conservation of the Ascension spurge

Proposed: Protect and maintain population of Ascension spurge on Letterbox NR.

Purpose: Protect the native fauna of the NRs from the impacts cause by invasive non-native species and climate change.

Outcome: Healthy, self sustaining population of Ascension spurge at Letterbox NR.

	Description	Targets	Year 1 progress	Year 2 target
3a	Protect and maintain wild population of Ascension spurge providing fencing and shade to individuals where necessary	Self-sustaining wild population of Ascension spurge in the Letterbox NR Ongoing	Four separate wild populations of Ascension spurge monitored within NR. All populations thriving.	Continuation of population monitoring and intervene as described in other targets where deemed necessary
3b	Control pest invertebrates found on Ascension spurge. This involves examining individual plants and treating with a species-specific insecticide. Individual pests may be carefully removed and killed on site. During periods of high mealy bug infestation, station ant bait traps strategically around the Ascension spurge sites.	No plant death caused by invertebrates Ongoing	Mealy bug controlled by careful removal by hand and application of non-toxic pesticide (SB invigorator and neem oil) during two site visits to Little White Horse Restoration Site. No requirement for ant bait stations during this time.	Plants routinely monitored and pest levels kept to a minimum. Review requirements for pesticide or ant bait stations.
3c	Maintain a viable stock of cultivated plants at Kew and on Ascension Island. Each nursery should hold 200 plants, 50 specimens from each sub-population. These will provide a potential source for restoration work.	50 Letterbox spurge plants held in a nursery on Ascension Island. 50 Letterbox spurge plants at Kew Ongoing	>100 plants held in the nursery on island. Kew Garden has 10 mature plants in their nursery.	Maintain healthy stock mature plants in the nursery on island. Maintain healthy stock of mature plants at Kew.
3d	Maintain a viable, ex-situ seed bank at Kew's Millennium Seed Bank and on Ascension Island. Collect, clean, dry and bank seed from all wild Ascension spurge populations.	Viable seed bank of Letterbox spurge kept on island and at Kew Gardens Ongoing	Kew's Millennium Seed Bank and Ascension Islands dry lab storage contains >1,000 viable seed from the Letterbox spurge population.	Regular collection of fresh seed from the Letterbox spurge population. Appropriate drying and storage as per protocols.

	Description	Targets	Year 1 progress	Year 2 target
3e	In collaboration with Kew gardens, produce a propagation document to develop cultivation techniques for the Ascension spurge.	Propagation document produced by end of Y1 Year 1	Ascension spurge propagation document produced by Delphine Cabanis and Catherine Gautier, Natural Conservatory of Brest in collaboration with the AIG Conservation Directorate.	Use propagation document to assist with plant nursery work, maintaining a healthy nursery population.
3f	Establish a new wild population of plants from the Letterbox provenance at other sites on Ascension (NASA site) where the climate is likely more suitable for Ascension spurge.	New wild population established Year 3	New population of Letterbox spurge established at NASA site in a custom-built restoration site. These are protected with a sheep and rabbit-proof fence and an passive irrigation system installed to water the plants regularly (below right).	Maintain new population at NASA site. Fence and irrigation system maintenance when required.
3g	Ensure all island organisations are familiar with and adhere to strict biosecurity control measures. All importations should be suitably cleaned and treated to prevent entry of non-native flora and fauna. All non-native species should be destroyed on entry to the island to prevent colonisation.	No new established populations of non-native species Ongoing	Biosecurity measures being strictly adhered to by all island organisations. Importations are suitably cleaned and treated to reduce entry of non-native flora and fauna.	Maintain close relations with all persons importing goods to island to ensure everyone is familiar with and adheres to biosecurity measures.

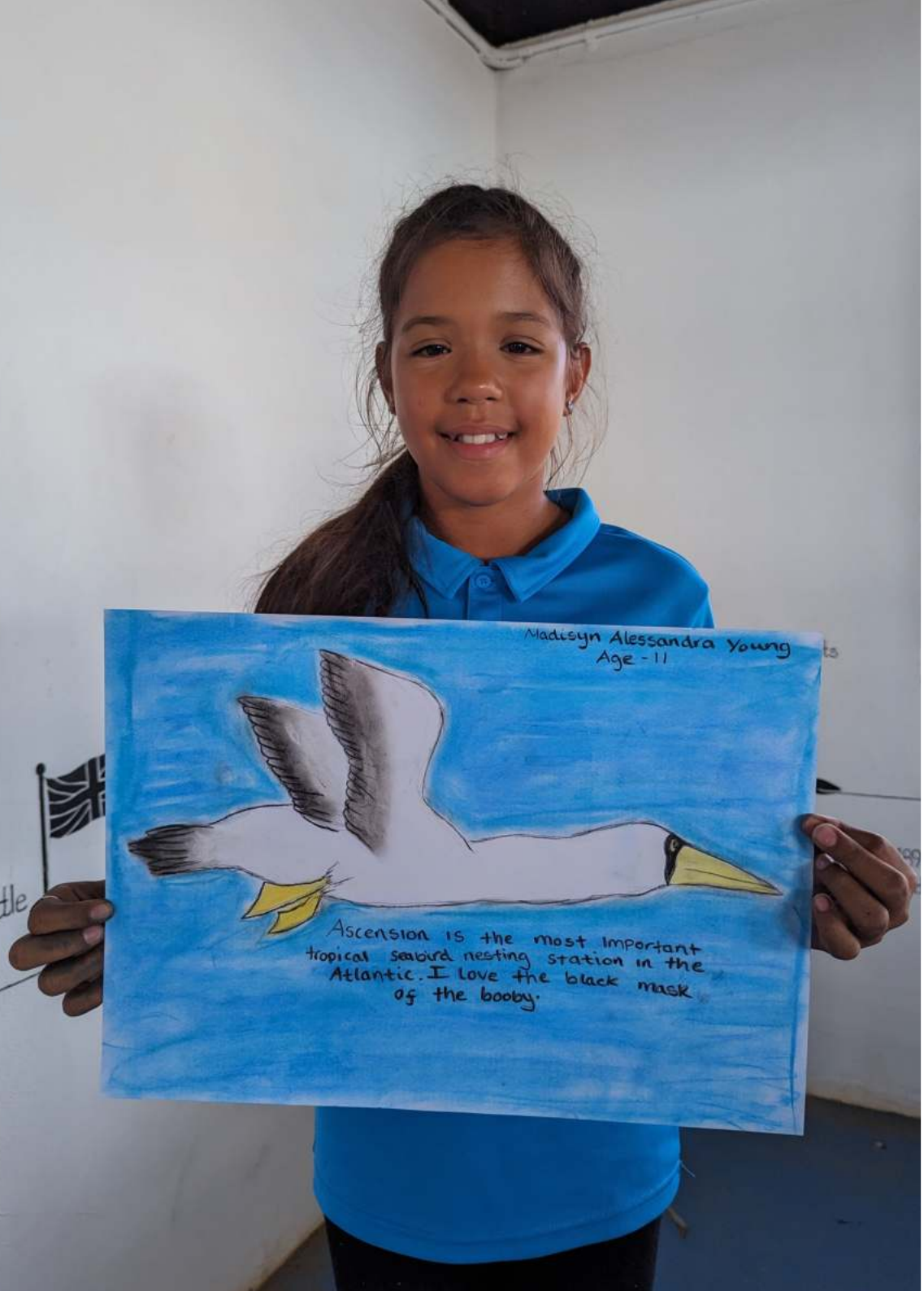
4. Public engagement

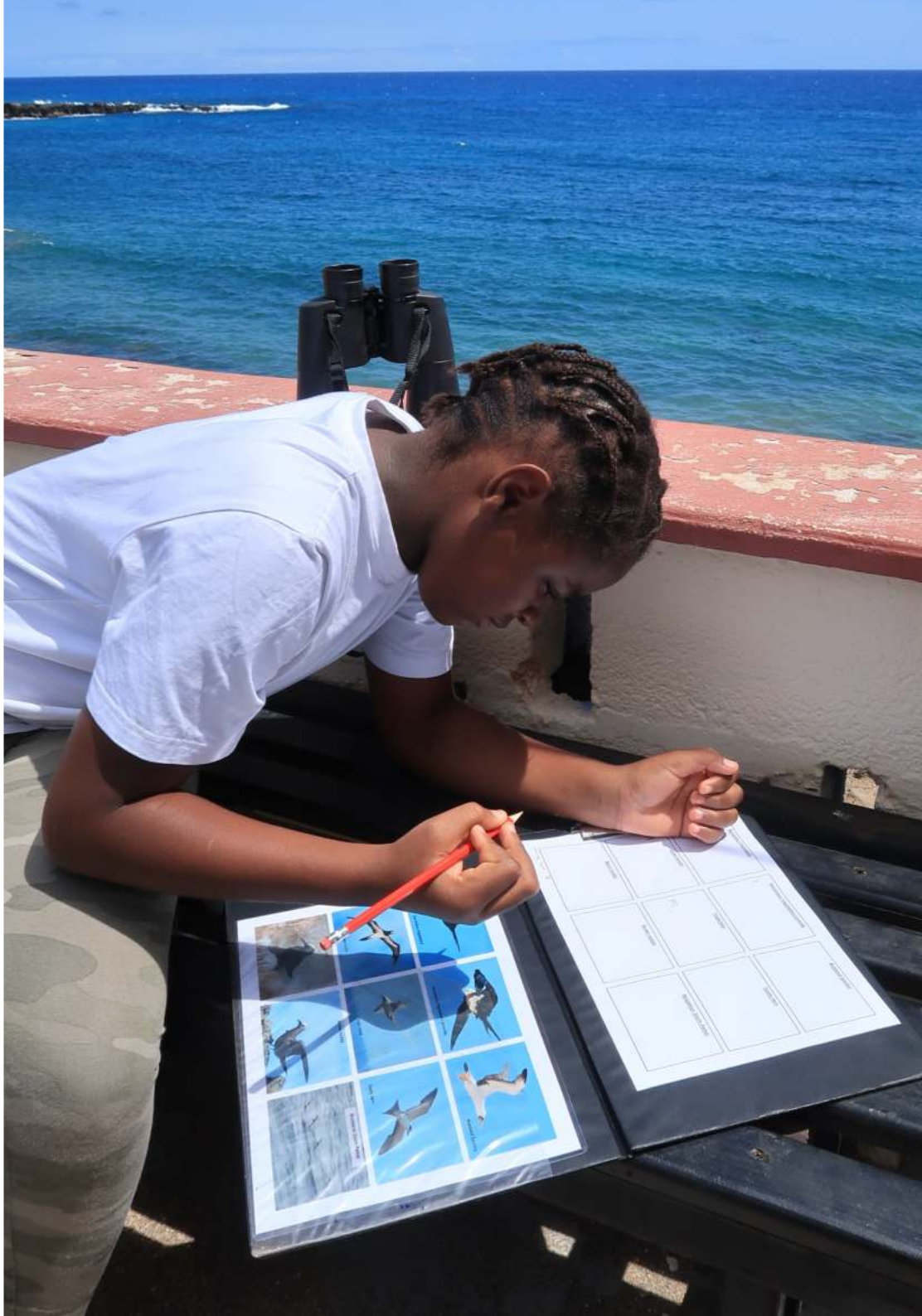
Proposed: Organise public engagement events for school children and islanders.

Purpose: Encourage recreational use of the Letterbox NR. Educate islanders about the importance of the protected areas and the species found there.

Outcome: Higher engagement between islanders and the Letterbox NR and Boatswain Bird Island Sanctuary.

	Description	Target	Year 1 progress	Year 2 target
4a	Classroom lesson about Ascension's seabirds.	Minimum of 2 year groups engaged. Annually	Two seabird lessons were provided to the Ascension Marine Protected Area Youth Club. This incorporated different egg shapes at Easter and the group took part in the Global Big Bird Weekend– an international study of bird migration. (photographed overleaf)	Early engagement with the local school to organise classroom lesson.
4b	Improved signage on the reserves describing the importance of the area for biodiversity and the regulations in place to protect the NR.	New signage erected in reserve Year 1	New signage ordered in Y1- awaiting delivery	Erect new signage once received
4c	Create videos, posters, islander articles and social media posts regarding the protected areas and the wildlife found there.	Minimum of 10 items on social media regarding Letterbox NR and Boatswain Bird Island Sanctuary Annually	A range of videos, articles and posts were generated for social media each few weeks about the Letterbox NR and Boatswain Bird Island. This included publishing about scientific research, peer reviewed manuscripts and general interest stories about the wildlife of the NRs .	Generate regular items of interest on social media regarding the wildlife of Letterbox NR and Boatswain Bird Island Sanctuary
4d	Develop wildlife watching guidelines for visitors to the protected areas to minimise disturbance.	Wildlife watching guidelines created and distributed. Guidelines made available on government website Year 1	Wildlife Watching guidelines in production	Finalise Wildlife Watching guidelines.


Madisyn Alessandra Young
Age - 11
Ascension is the most important tropical seabird nesting station in the Atlantic. I love the black mask of the booby.



Letterbox NR/Boatswain Bird Island
Year 1 Monitoring and Evaluation

Monitoring and Evaluation

Monitoring the natural features of the Protected Areas

Six areas were identified for monitoring the health of the natural features of the Letterbox NR and Boatswain Bird Island Sanctuary. These intend to monitor if the reserve biodiversity is declining because the action plan was not completed or if the action plan was sufficient to achieve the Protected Area objectives.

	Monitoring	Details	Related objective	
A	Population census of seabirds nesting on the Letterbox NR	Annual census performed during the peak incubation period for frigatebirds and masked boobies. While performing counts, record all seabird species encountered. Census performed manually and using a UAV.		• Record trends in the Letterbox NR nesting seabirds • Identify areas of population expansion.
B	Population census of frigatebirds and masked boobies nesting on Boatswain Bird Island	Annual census performed during the peak incubation period for these species. Census performed using a UAV and AI technology to process the images.		• Record trends in the Boatswain Bird Island nesting seabirds • Identify if Ascension's seabird population is increasing or if population increases on the mainland are a result of relocation.

A manual population census was performed in October 2023 during the peak incubation period for Ascension frigatebirds. A total of 1, 207 nesting attempts were recorded, down by 374 nesting attempts from the previous breeding season. It is suspected that the main cause for this drop is related to the inclement weather during the nesting season (frigatebirds do not possess the waterproofing oil in their feathers). A census each breeding season will continue to add to our knowledge about this species and understand how the population naturally fluctuates.

The AIG Conservation Directorate are working with partners from Oxford Brookes University to include Ascension as part of the Seabird Watch Programme. Seabird watch uses camera technology and citizen science to monitor seabirds nesting in remote locations. A partnership was created as part of the DPLUS174: A cross-UKOT camera network to enhance marine predator conservation. Unmanned Aerial Vehicles (UAV) were deployed across the Letterbox NR and Boatswain Bird Island Sanctuary during the peak nesting season to collect high definition images for analysis (photographed overleaf).

Seabird Watch are now working to process the images to produce population counts to be compared to the manual counts recorded by AIG Conservation. A comparison of several years of data will be performed before a decision is made on the best technique to monitor Ascension's seabird population.

Drone images of Letterbox showing examples of nesting frigatebirds and masked boobies

C	Productivity monitoring of frigatebird and masked boobies	Productivity monitoring of 6 frigatebird colonies. Productivity monitoring of 100 masked booby nests selected at random across the Letterbox plateau.		• Analyse trends in the breeding success of these two species and where possible make links of productivity to other environmental factors.
D	Monitor changes in prey composition and trophic position of frigatebirds and masked boobies	Collect regurgitate samples and a minimum of 20 breast feather samples from frigatebirds and masked boobies.		• Determine if seabird diet changes over time and investigate potential causes of this.

C. Productivity monitoring of Ascension Frigatebirds

Six frigatebird colonies were monitored throughout the 2023-2024 breeding season to calculate the breeding success. These colonies have been monitored for 12 years, creating a solid base for long-term monitoring. A total of 165 frigatebird nests were monitored throughout the season and a productivity figure of 45% was recorded.

Productivity monitoring of Masked Boobies

101 masked booby nests were selected at random across the Letterbox plateau. Monitored nests were divided across four sections of the plateau where the boobies nest in dense colonies. Nine nests were lost during the research with nest tags coming loose or being removed by the birds. Consequently 92 nests were monitored throughout the whole season, producing a productivity figure of 64%. It was a bumper year for masked boobies as they nested later in the season, avoiding the inclement weather that the frigatebirds faced. It may also be possible that there is less competition for food when the frigatebirds have a poor season and thus the boobies are travelling shorter distances for food which makes it easier to fledge a chick.

D. Seabird diet monitoring

Seabirds are apex marine predators and therefore the health of their populations are intrinsically entwined with healthy marine ecosystems. It is important to understand the main diet of seabirds and to monitor if this changes. This data provides AIG Conservation scientists with important information about the health of the surrounding Marine Protected Area where the birds are feeding.

A minimum of five breast feathers were removed from 20 Ascension Frigatebirds and 20 Masked Boobies. These were sent to the University of Exeter for stable isotope analysis. These samples feed into a long-term study with 10 years of data now obtained. Data will be analysed and published as a peer-reviewed scientific manuscript in the upcoming months.

E	Monitor the wild Ascension spurge population.	Carry out bi-annual census– once in the warm and once in the wet season to determine annual trends.		• Understand trends in the wild Ascension spurge population. • If necessary, take conservation action as described in Action Plan 3.
F	Monitor soil moisture levels.	Record the soil moisture levels at a range of depths from surface roots down to tap root (2m). Loggers deployed in areas which are irrigated regularly and in areas which are not watered. Loggers also deployed at other island locations as potential Ascension spurge restoration sites.		• Determine the appropriateness of the NR for a long-term sustainable Ascension spurge population. • Look for alternative locations on island which may be more suitable for the Ascension spurge to thrive.

E. Monitor the wild Ascension spurge population

A bi-annual census is performed on the Letterbox NR to monitor the wild Ascension spurge population.

	September 2023	March 2024
Razors Edge	842	556
Letterbox Plateau	1750	1015
Little White Horse Hill	469	298
White Horse Hill	0	0

An increase in rainfall in 2023 caused the suitable conditions for the seed bank to regenerate. This continues the trend that the Letterbox NR spurge population remains stable with an increase in population in comparison to the previous year.

Right: AIG Conservation performing plant census on Letterbox NR with Boatswain Bird Island Sanctuary offshore

F. Monitor soil moisture levels

The soil moisture levels are collected around a number of sites on island to assess the potential of translocating Letterbox spurge to sites which are more climatically suitable. This is an ongoing legacy from the DPLUS113 project. A new restoration site was built in 2020-21 at the NASA site (DPLUS113) with a rabbit and sheep proof fence and custom-built irrigation system. The new site is in an area of higher elevation with a natural higher soil moisture content, on the outskirts of the Letterbox NR.

The success of this assisted migration has been shown with annual increases in the population of Letterbox spurge in the site. A census in September 2023 recorded 72 mature plants and 37 seedlings within the fenced site.

Letterbox NR/Boatswain Bird Island

Year 1 Research

Research

Knowledge gaps prevent the effective management of the Letterbox NR and Boatswain Bird Island Sanctuary. The Management Plan specifically highlighted 12 research opportunities to allow AIG Conservation scientists to understand more about the species of these protected areas and inform conservation management. Some of the research suggested was undertaken in 2023/2024 and the results are described.

A. Determine population size of frigatebirds and masked boobies nesting on Boatswain Bird Island.

Images of the Boatswain Bird Island Sanctuary were taken during the peak nesting period for frigatebirds and masked boobies using an Unmanned Aerial Vehicle (UAV) to produce population counts for the islet. These images are being processed by project partners at Oxford Brookes University as part of the DPLUS174: A cross-UKOT camera network to enhance marine predator conservation project. This 3 year project aims to develop an Artificially Intelligent programme to produce counts and to utilise citizen science to help with the modelling. This is on-going.

B. Methods for the control of the invasive flora of the NRs.

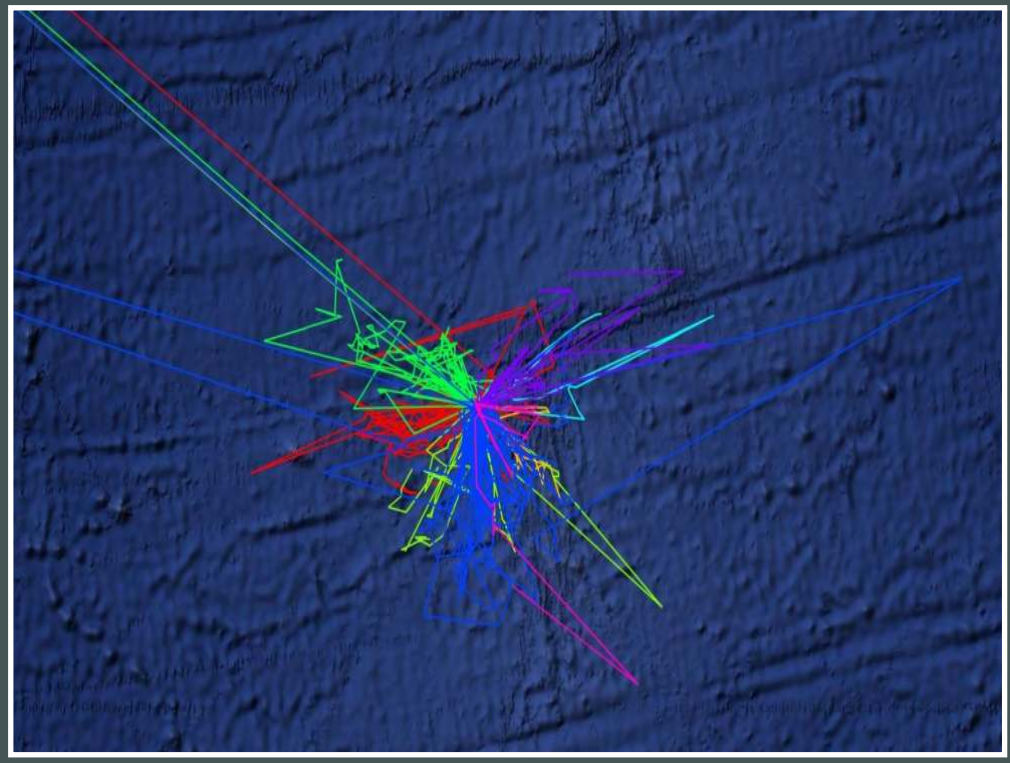
The DPLUS134 Project tested and discovered the best methods for controlling invasive species such as Mexican thorn and tree tobacco. The recommendation from this project was cut stump treated with Turbodor 29 mpa– a Mesquite specific herbicide which also works well on tobacco and guava. The results from this project have been published and the methods adopted for all invasive species control.

C. Determine the impacts of pollution on Ascension's seabirds

The DPLUS176 project quantified the prevalence of litter items found in Brown Booby (*Sula leucogaster)* nests on the Letterbox NR. A total of 43 items were found in 23 nests with 19% of all nests surveyed containing anthropogenic debris (Capel *et al.* in production).

D. Determine the dispersal of Ascension's seabirds outside of the breeding season

Satellite tags were procured and deployed on frigatebirds and masked boobies (data shown below) nesting on the Letterbox peninsula. This is part of the DPLUS195 project: Protecting Seabirds Across Borders. Data is continuing to be collected daily and will be analysed by project partners at BirdLife International in collaboration with data from Global Fishing Watch. This will help us understand the spatial use of the Atlantic Ocean by these birds and how they may interact with large-scale fishing vessels outside of the Ascension Marine Protected Area.



E. Estimate rodent population on the NRs

A feasibility study 'Can Ascension be predator free?' (DPL0037) was conducted in January 2024 and a report drafted (Bell *et al.* 2024). The project could not estimate rodent populations however provided the AIG Environmental Health department with on-site training and advice as well as formal recommendations on how to control the rodent population and price estimations for a complete eradication of invasive vertebrates.

F. Predict the impact of climate change on the Ascension spurge

The DPLUS113 project assessed climatic requirements of the Ascension spurge with a two year study of soil moisture monitoring to understand the hydrological constraints on the survival of this species. The detailed relationship between soil moisture and precipitation was identified as an essential part of predicting responses of Ascension spurge to future climate change.

The project trialed assisted migration of Ascension spurge plants to new sites on island which have a better climate for the species. These sites were installed with irrigation systems to assist with plant establishment and have had varying success. Maintaining these trial sites remains ongoing.

G. Assess the potential of biocontrol agents

The DPL0038 project: Can biocontrol halt the tsunami of non-native species on Ascension? sought to produce a list of the most damaging pest species on Ascension and to investigate any potential biocontrol agents which may be applicable. A shortlist of 10 targets for biocontrol was identified in November 2023 which included species with promising agents and some which required some further research.

CABI compiled species assessments detailing potential biocontrol options. It was determined that suitable biocontrol agents were not readily available for many of the target species on Ascension. The species assessments however are a useful resource for AIG Conservation as we develop an Invasive Species Action Plan.

H. Assess the potential of biocontrol agents

The DPLUS134 Project produced a risk assessment on the release of a biocontrol agent– *Evippe* moth– to assist with managing Mexican thorn. Following a public consultation, *Evippe sp. #1* was released on Ascension in April 2024 (photographed below) while some are reared in captivity for future release. Although not currently released on the Letterbox NR, the long-term effects of this biocontrol will be advantageous to the reserve, preventing the spread of Mexican thorn into the Western Edge.

I. Baseline survey of invertebrates in the Letterbox NR

An extensive baseline survey was conducted to identify the invertebrates found on the Letterbox NR. A database with all the species collected was generated as an output from DPLUS135: From Pseudoscorpions to crickets: securing Ascension Island's unique invertebrates. The database covers a wide variety of invertebrates including mites, crickets and beetles with data available from across the island including the Letterbox NR and an analysis of historical samples collected from Boatswain Bird Island Sanctuary.

A study by Sherwood *et al* in 2023 described the first record of *Clubiona hitchinsi* spider on Ascension Island which was collected from Boatswain Bird Island Sanctuary in 1964. Sherwood also studied the *Gnaphosidea* arachnids from mainland Ascension and Boatswain Bird Island, recording two new species from historical and new specimens collected through DPLUS135.

J. Potential impacts of climate change on Ascension's seabirds

Some modelling of climate change impacts on Ascension's seabirds was performed as part of the DPLUS113 project: Climate Resilience And Conservation of Ascension's Biodiversity. This was published on a designated website which has since crashed. More work on this subject should be undertaken to understand the true impacts and develop mitigation measures.

K. *Discophallus* taxonomy

The DPL0040 project– Ascension Scaly Crickets: Urgent Conservation of a Unique Endemic Genus performed lab trials to understand the temperature and diet preferences of the Ascension scaly crickets. The study by Weng *et al.* 2024 (right) found that invasive vegetation increases the microclimate temperature to above the preferred temperature of the scaly cricket. The study found a higher concentration of scaly crickets in native habitat compared to degraded habitat and a high predation risk by rats in native habitat. The evidence suggests that the *Discophallus* crickets are threatened (right above).

L. Pseudoscorpion taxonomy

A taxonomy assessment conducted on the pseudoscorpions of Ascension by Sherwood *et al.* 2024 revealed six endemic species. Three of these species are found only on Boatswain Bird Island Sanctuary including the world largest pseudoscorpion– *Garypus titanius.* This is recognized as critically endangered given its endemism to a single islet. The study also identified a new species of pseudoscorpion– *Garypus ellickae* (below right).

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