Applicant: **Ingledew-Gale, Jack**
Organisation: **South Atlantic Environmental Research Institute**
Funding Sought: **£20,074.53**

DPLR4\1055

Piloting new solutions: UAV LiDAR and Photogrammetry in the Falklands

This overall project aims to increase the capacity on the Falkland Islands to undertake habitat-mapping and long-term monitoring for decision-making by purchasing both L2 and P2 payloads for a DJI Matrice 350RTK UAV. These sensors enable detailed habitat mapping with LiDAR's 3D models and improved vegetation/wildlife monitoring with high-resolution imagery. A small pilot/proof of concept project on Sea Lion Island will utilise the equipment to survey the impact of the 2024 wildfires, a baseline for future impact and restoration monitoring.

DPLR4\1055

Piloting new solutions: UAV LiDAR and Photogrammetry in the Falklands

Section 1 - Project Title & Contact Details

Q1. Project Title

Piloting new solutions: UAV LiDAR and Photogrammetry in the Falklands

Q2. Please select whether you are applying as an organisation or as an individual **(Guidance section 3 and Guidance Glossary)**

⦿ Organisation

PRIMARY APPLICANT DETAILS

Title	Mr
Name	Jack
Surname	Ingledew-Gale
Organisation	[redacted]
Tel (Work)	[redacted]
Email (Work)	[redacted]
Address	[redacted]

GMS ORGANISATION

Type	**Organisation**
Name	South Atlantic Environmental Research Institute
Phone (Work)	[redacted]
Email (Work)	[redacted]
Website (Work)	[redacted]
Address	[redacted]

Section 2 - Overseas Territory(ies)

Q3. Please state whether the same (or similar) project proposal has previously been submitted to the UK Government for funding, including through Darwin Plus Local, Defra's other Darwin Plus grant schemes or other UK Government funding mechanisms. Failure to do so may result in the application being ineligible.

⦿ No

Q4. Overseas Territory (Guidance section 1.3):

Which UK Overseas Territory(ies) will your project be working in? Please note that in case of a non-permanent resident population you need to demonstrate a clear, meaningful, long-term link to the territory.

☑ Falkland Islands (FI)

*** if you have indicated a territory group with an asterisk, please give detail on which territories you are working on here:**

No Response

In addition to the UKOT(s) you have indicated, will your project directly benefit any other UK OT(s) or country(ies)?

⦿ No

Section 3 - Project Partners

Q5. Project partners (Guidance section 3.2)

In this section, please give details of all the partners involved (including the Lead Organisation) and provide a summary of their roles.

Project Leader name (Guidance section 3.1):	Jack Ingledew-Gale
Lead Organisation name (if applying as an organisation; Guidance section 3.1):	South Atlantic Environmental Research Institute (SAERI)
Lead Organisation Website (if applicable):	http://www.south-atlantic-research.org/
Is the Lead Organisation based in a UKOT where the project is working (Guidance section 3.1)?	⦿ Yes

List other partners involved and where are they based:	Wild Falklands Ltd., Falkland Islands
	SAERI will lead the project, implement the pilot project in Sea Lion island, purchase the LiDAR and Photogrammetry payloads for the existing DJI Matrice 350RTK UAV and have responsibility for project management and implementation. Subsequent projects will be undertaken with the relevant Falkland Islands Government (FIG) departments/project partners. The Department of Environment has provided support (see letter of support attached) to conduct a pilot project using the new equipment on Sea Lion Island, which has been recently affected by wildfires (see Figure A in section 7b). This project will aim to create a high-resolution orthomosaic image and 3D terrain model of the affected area, providing a baseline for monitoring erosion and any efforts to replant Tussock Grass or other vegetation in the future.
Summary of roles and responsibilities of each partner in the project:	Wild Falklands Ltd. have confirmed support for the pilot project on Sea Lion Island and will cover the costs of flights and accommodation. Outputs (3D model, RGB imagery) from this survey will be provided to Wild Falklands Ltd. to allow for detailed assessment of the affected area. The following FIG departments have confirmed that they support the project and will be involved as project stakeholders and will use the data provided by two new UAV payloads in the future to contribute to creating a better understanding of their work areas post project: •Agriculture •Development & Commercial Services •Environment •Maritime Authority •Fire & Rescue Service A meeting with project stakeholders will be held to discuss project ideas for their areas of interest, using both LiDAR and Photogrammetry surveys.
I confirm that all listed partners are aware of this application and have indicated support:	Checked

Attach a Cover Letter for your application (Guidance section 4.2).

Darwin Local L2-P1 Cover Letter
20/06/2024
13:14:59
pdf 236.91 KB

Letter of Support Drone Kit Local
20/06/2024
13:06:05
pdf 117.43 KB

Section 4 - Project Summary & Description

Q6. Project Summary (Guidance section 3.8)

Please provide a brief summary of your project. This may be used in communication activities and/or published online, if your application is successful.

This overall project aims to increase the capacity on the Falkland Islands to undertake habitat-mapping and long-term monitoring for decision-making by purchasing both L2 and P2 payloads for a DJI Matrice 350RTK UAV. These sensors enable detailed habitat mapping with LiDAR's 3D models and improved vegetation/wildlife monitoring with high-resolution imagery. A small pilot/proof of concept project on Sea Lion Island will utilise the equipment to survey the impact of the 2024 wildfires, a baseline for future impact and restoration monitoring.

Q7a. Description (Guidance section 2.1 and 6)

Please provide a description of your project, including:

- **the overall objective**
- **the current situation and the problem the project is trying to address**
- **what success will look like and how you will measure it.**

Please be as specific as possible when describing the project, using quantified data and evidence where available. You may wish to consider: what are the specific threats to the environment that the project will attempt to address, and what should we know about these threats? What does your successful project look like? And how will you demonstrate whether and how your project has been successful?

This projects objective is to pilot innovative remote-sensing techniques for undertaking environmental surveys on the Falklands, to feed into policy and decision-making, by acquiring the Zenmuse P1 and L2 payloads for an existing Unmanned Aerial Vehicle (UAV) (purchased as part of DPLUS00047), and sourcing a lifetime license for DJI Terra software which will ensure efficient processing of the LiDAR data. This pilot will significantly increase the scope and depth of environmental surveys conducted by SAERI and FIG.

Currently, UAV surveys on the Falkland Islands face several challenges:

•Limited Data Precision: Existing methods lack the precision needed for detailed environmental monitoring, impacting the ability to make informed decisions.
•Resource Constraints: Manual surveys are time-consuming and labour-intensive, limiting the frequency and extent of data collection.
•Technological Gaps: There is a need for advanced technology to provide comprehensive and accurate environmental data, especially in remote and difficult-to-access areas.

This gap has come to the fore recently for example when there has been a series of wildfires on the Falkland Islands and UAV mapping would significantly enhance the ability for both rapid assessment of the extent of the damage, and long term monitoring of future change.

Thiss project builds on the DPLUS00047 success. Enhanced data and measurable outcomes will enable SAERI and FIG to make more informed decisions in conservation, resource management, and environmental monitoring.
As proof of concept,apilot project will undertake a using both the L2 and P1 payloads to assess the environmental impact of the wildfires that were experienced on Sea Lion Island in April 2024. A survey. This will include a map of the total affected area, facilitating future comparisons to monitor changes in vegetation cover and soil degradation levels (see Figure A attached).

A number of potential future uses for each payload include:

Zenmuse P1 (Photogrammetry):
•Change Detection: By capturing high-resolution RGB images over time, it is possible to monitor changes in landscapes and vegetation cover. This can be helpful in areas that affect the biodiversity of the Falkland Islands, such as: studying erosion, tracking the spread of invasive species, or urban development.
•Habitat Monitoring: Imagery can be used to map and characterise different habitat types, which can be crucial for wildlife studies, ecological monitoring, and conservation efforts.
•Phenological Studies: RGB image capture can track seasonal changes in plant phenology, such as bud burst, flowering, and leaf senescence. This data can help to understand the impacts of climate change on plant life cycles and provide baseline data for further study, such as fire risk forecasting.
•Ground Truthing: Imagery can be used to verify and refine data collected by other sensors, such as LiDAR or thermal imaging cameras.

Zenmuse L2 (Light detection and ranging - LiDAR):
•Digital Elevation Model (DEM) Generation: High-resolution DEMs are invaluable for geological studies, flood risk mapping, and topographic analysis. LiDAR's ability to penetrate vegetation cover allows for detailed ground surface mapping..
•Elevation models are key for measuring and monitoring biodiversity loss to erosion, an increasing problem for the Falkland Islands.
•Urban Planning and Development: Data can be used to create detailed 3D models of infrastructure, enabling planners to assess structures, analyse potential development sites, and model solar energy potential on rooftops.
•LiDAR data can be combined with other datasets, such as RGB imagery or multispectral data, to create more detailed surveys. Having access to higher-quality elevation data will provide opportunities to update and improve upon existing composite datasets created for the Falklands.

While the proposed project focuses on acquiring the L2 and P1 payloads for the existing Matrice 350RTK platform, the long-term goal is to unlock a wider range of research applications for SAERI and FIG.

Q7b. Long-term sustainability (Guidance section 2.1 and 6)

Please describe the long-term benefits of the project and the change it will bring about. How will the outcomes of the project be sustained after the funding is finished?

This project goes beyond acquiring the L2 and P1 payloads. It allows SAERI and FIG to conduct advanced environmental studies, fostering long-term sustainability by:

•Expanded data collection Capabilities: The L2 and P1 payloads unlock a new era of environmental data collection. LiDAR data enables detailed habitat characterisation, topographic analysis, and infrastructure inspection. High-resolution photogrammetry imagery supports change detection, habitat monitoring and wildlife censuses, phenological studies, and ground truthing. This empowers SAERI and FIG to tackle a wider range of research questions.
•A lifetime licence for DJI Terra software to process LiDAR point cloud data mean there are no annual costs which may become unsustainable.
•Sustainable Collaboration with FIG: Partnering with FIG ensures the payloads' continued use for environmental research and commercial applications, fostering long-term project sustainability and knowledge sharing.
•Integration into SAERI's Infrastructure: SAERI will integrate the payloads into their existing drone platform, ensuring proper maintenance and training for continued data collection. This investment in research infrastructure guarantees the project's long-term impact.

By acquiring these advanced payloads and fostering collaboration, this project paves the way for a more comprehensive understanding and improved management of the Falkland Islands' unique ecosystems, with benefits extending far beyond the initial funding period.

(Optional) Please upload any additional and supporting materials or files (such as maps of project sites, etc) below. Maximum of 5 sides of A4, and is combined as a single PDF:

Sea Lion Area v.01
20/06/2024
13:44:35
pdf 2.98 MB

Section 5 - Project Outcome(s)

Q8. Project Outcome(s) (Guidance section 1.2)

Successful Darwin Plus Local projects must demonstrate measurable outcomes in at least one of the themes of Darwin Plus with a clear focus on biodiversity and the natural environment, either by the end of the project or soon after through a credible plan.

Please note: Any proposals including research or monitoring are required to demonstrate a clear link to tangible outcomes for conservation of biodiversity and the natural environment. Please explain how any new research will be applied to drive environmental outcomes on the ground.

Please confirm that your project has a clear focus on biodiversity and the natural environment.

Checked	**Biodiversity: improving and conserving biodiversity, and slowing or reversing biodiversity loss and degradation;**

Please tick which additional theme(s) of Darwin Plus your project contributes to (if relevant):

Unchecked	**Climate change: responding to, mitigating and adapting to climate change and its effects on the natural environment and local communities;**
Checked	**Environmental quality: improving the condition and protection of the natural environment**
Checked	**Capability and capacity building: enhancing the capacity within OTs, including through community engagement and awareness, to support the environment in the short- and long-term.**

Please justify your selection. Please use quantitative information where possible here.

•Biodiversity: Monitoring changes in vegetation cover over time helps track habitat degradation, along with coastal erosion monitoring; will address these particularly salient topics in the Falkland Islands. This will enable

targeted conservation efforts to protect biodiversity.

•Environmental Quality: High resolution DEMs allows for more accurate modelling of catchment interventions, ensuring they are not put in a harmful area to the wider environment

•Capability and Capacity Building: The project fosters collaboration between SAERI and FIG, leading to knowledge sharing and capacity building within both organisations. This can empower FIG and other local partners to contribute more effectively to long-term environmental monitoring.

Section 6 - Workplan

Q9. Workplan (Guidance section 2.2)

Please provide anticipated dates for the start and end of your planned project here. Please use the Darwin Plus Local Project Workplan (available at: https://darwinplus.org.uk/apply/local-applications/**) to provide a list of the individual activities you have planned for this project, a brief description of what each activity entails, and the months in which the activities will be carried out. If the project involves only one activity (e.g. a purchase), please still provide project start and end dates (noting estimated times for procurement). Please note that your project must start after 1 October 2024 and be completed by 31 March 2025.**

Start date:	End date:	Duration (e.g. 3 months):
01 October 2024	31 March 2025	6 months

Please upload the completed Darwin Plus Local Project Workplan with your proposed project activities here

r4-dplus-local-implementation-timetable-template-13062024
20/06/2024
13:50:41
docx 30.23 KB

Section 7 - Costs

Q10. Costs (Guidance section 2.2 and please read the Finance Guidance)

Please provide a breakdown of costs to be funded through Darwin Plus Local (in GBP).

Are you seeking any matched funding for this project?

⦿ Yes

How much matched funding are you seeking and where from?

Match funding for one return flight to Sea Lion Island (£148) and one night accommodation at the Sea Lion Island Lodge (£150), to be provided by Wild Falklands Ltd. This funding is confirmed.

Budget line	Explanation	Cost in GBP
Staff costs:	Project oversight, updating and adjusting internal policy and insurance. Delivery, test flights, logging of the UAV and camera.	£[redacted]
Consultancy costs:	N/A	£0.00
Overhead costs:	SAERI Office overheads in the Falkland Islands	£[redacted]
Travel & subsistence costs:	N/A	£0.00
Operating costs:	N/A	£0.00
Capital equipment:	Purchase of the L2 and P2 Payloads, plus strap for DJI plus remote controller. Shipping to the Falkland Islands.	£[redacted]
Other Costs	LiDAR Point Cloud Data – lifetime access. Contribution to SAERI UAV insurance	£[redacted]
Total:		20,074.53

This section provides more information on the budget to help evaluators understand how you will use the funds you are requesting. You do not need to list all costs, but please list and detail costs of more than £1,000 per item below, under the appropriate budget line.

Details of staff costs over £1,000 (if relevant)

Jack Ingledew – GIS Officer and Database Manager, (£[redacted] time for 10 days to meet with project partners, undertake purchase, delivery and transfer to the Falkland Islands of the UAV payloads. Logging of equipment and undertaking test flights. This time also includes the pilotproject with FIG, reporting, and project delivery.
Tara Pelembe – International Director, (£[redacted] time for 1 day of project oversight and delivery.
Teresa Bowers - Director of Resources, (£[redacted] time for 1 day of financial management.

Details of overhead costs over £1,000 (if relevant):

No Response

Details of travel and subsistence costs over £1,000 (if relevant):

No Response

Details of operating costs over £1,000 (if relevant):

No Response

Details of capital equipment costs over £1,000 (if relevant):

DJI Zenmuse L2 Lidar Camera (£[redacted] and DJI Zenmuse P1 Photogrammetry Camera (£[redacted] main equipment for the project. DJI RC Plus Strap Bracket Kit (£[redacted] Cost of shipping to the Falklands also included.
Overall cost of equipment £[redacted]

Details of consultancy costs over £1,000 (if relevant):

No Response

Details of other costs over £1,000 (if relevant)

DJI Terra Software Perpetual Licence – required to process LiDAR Point Cloud Data – lifetime access (£[redacted]
A contribution to SAERI UAV insurance plan (£[redacted]

If your project budget was prepared in another currency and converted to GBP, please provide the exchange rate, its source, and the date it was accessed:

Other currency:	Exchange rate:	Source of this exchange rate:	Date exchange rate accessed:
No Response	*No Response*	*No Response*	*No Response*

Darwin Plus Local has been created to build capacity and contribute to local economies in-territory.

What % of the total will be spent in the OTs?	[redacted]

If less than 80% of the total project spend is to be spent within the OT(s), please explain why.

The project is run by a UKOT based organisation – the only reason that there is only [redacted] spend in country is because a high proportion of the costs are for the purchase of capital equipment sourced from the UK. This project is primarily related to buying scientific equipment to bring to the Falkland Islands to undertake future monitoring and applied research, this equipment is not available on the Falkland Islands. Staff based in the OT will be carrying out the work after the equipment has arrived.
Time spent undertaking the mini-project to create high resolution mapping and a 3D model of Sea Lion Island is included in this time.

Section 8 - Local and National Priorities

Q11. Local and national priorities

Please explain how this project aligns with local and national priorities? You may wish to consider the project in the context of national environmental laws, objectives, strategies, territory specific agreements, action plans or policies.

The project purchases and tests (through a small pilot project) the L2 and P1 payloads to increase the capacity for evidence and knowledge in the Falkland Islands, therefore much of the alignment to local and national priorities relates to the application and use of the UAV post project.

The Sea Lion Island mapping pilot project contributes to the delivery of Section 8.1. of the Falkland Islands Environment Strategy (2021-2040)– which aims:

o to protect and enhance our biodiversity (ecosystem integrity), reducing its loss through tackling threats
o to mitigate for degradation and promote restoration of native ecosystems, where possible
o to work towards understanding and managing creeping change (slow, incremental environmental degradation) before environmental thresholds are passed that have costlier and fewer solutions
o to increase knowledge of the marine, terrestrial and aquatic environments and biodiversity, through

identifying and filling key knowledge gaps, to support effective governance and decision-making

Addressing the equipment and knowledge gap, current environmental monitoring capabilities lack LiDAR and high-resolution photogrammetry data, crucial for detailed habitat assessments. Tangible future benefits with improved biodiversity monitoring come from tackling threats like habitat degradation, erosion management, and wildfire impact assessment, which directly support the government Environment Strategy 2021-2040.

Will the project take place on Government owned land or water or involve biocontrol, invasive alien species control or eradication?

⦿ No

Section 9 - Project Risks

Q12. Project Risks

Please demonstrate your consideration of any risks involved in this project and how you intend to manage them. Please note the importance of health and safety and environmental risk assessment in the design of your project. If there is any possibility that your project may have negative impacts on the environment or human health, it is important that you provide a comprehensive analysis of potential environmental and human health risks, and the prevention measures you will take to ensure the work does not cause harm.

Depending on your project, you may wish to consider:

- **Biosecurity risks – particularly for projects involving external equipment.**
- **Safeguarding risks – particularly for projects involving vulnerable groups such as children, older people or people with disabilities.**

Risk	Mitigation
Loss of the UAV/payloads during testing flights and logging of equipment.	Specific flight paths planned for test flights, including designated return to home sites and secondary landing locations. Test locations will be planned over land only. Weather and risk assessments to be undertaken.
Biosecurity risks introducing non-native species into the Falkland Islands from equipment.	The L2 and P1 payloads will be brand new at the time of purchase. No test flights will be carried out at the location of purchase, and only undertaken once in the Falkland Islands.
Delay in sourcing and shipping equipment	A 6 month window has been given for the project to provide a long enough time to mitigate against potential delays in equipment arrival. Equipment can travel as air cargo, of which flights occur twice per week.

Do you require more fields?

⦿ Yes

Risk	Mitigation
Avian Influenza risk	Sea Lion Island may become closed during the summer tourist season due to Avian Influenza. Monitoring is regularly undertaken by the Falkland Islands Government and the pilot project will only be undertaken when the island is cleared for travel.
No Response	*No Response*
No Response	*No Response*
No Response	*No Response*
No Response	*No Response*

Section 10 - Terms & Conditions

Q12. Terms and conditions (Guidance section 3.10)

By applying for Darwin Plus Local you are adhering in full to the grant Terms and Conditions in full (available at: Darwin Plus website **and as referenced in the Guidance at section 3.10). For information, the Terms and Conditions include requirements for all applicants to (amongst other requirements as per the full Terms and Conditions):**

- **Uphold a zero tolerance for inaction approach to tackling sexual exploitation, abuse, and harassment.**
- **Where appropriate, make all reasonable and adequate efforts to address gender inequality and other power imbalances.**
- **Notify all cases of fraud and theft (whether proven or suspected) relating to the project to the Grant Administrator as soon as they identified.**

Please indicate you have read, and understood, and will adhere to the Terms and Conditions.

Checked

Supporting documents list (please have these ready to attach with application)

- **Cover Letter of no more than two A4 pages. (Guidance section: 4.2 has information on what this cover letter should include).**
- **If the project takes place on public land or water or is addressing invasive alien species, a Letter of support from OT Government.**
- **Project Workplan in the template provided for Darwin Plus Local (available at:** https://darwinplus.org.uk/apply/local-applications/**).**
- **Map and additional information (optional) maximum five additional pages.**

If your application is successful

If your project application is successful, the Fund Administrator (NIRAS) will ask you to provide some financial evidence for due diligence checks before you receive your project grant. (Please see section 3.3 of the Darwin Plus Local Finance Guidance). Please be ready to provide this evidence promptly.

- **Financial evidence for organisations: Year-end financial statements, the latest management accounts or audited accounts (if you have these).**
- **Financial evidence for individuals: Proof of identity such as a passport, ID card or driving licence and solvency (such as bank statements) and a police check.**

Section 11 - Certification

Certification

I certify that, to the best of my knowledge and belief, the statements made in this application are true and the information provided is correct.

Checked

I have the authority to submit an application on behalf of my organisation.

Checked

Name:	Jack Ingledew-Gale
Position in the organisation: (if applicable)	GIS Officer and Database Manager
Signature (please upload e-signature)	Signature 20/06/2024 14:02:04 jpg 65.19 KB
Date:	20 June 2024

Section 12 - Submission Checklist

Checklist for submission

	Check
I have read the Guidance **documents, including the "Darwin Plus Local Guidance" and the "Darwin Plus Local Finance Guidance".**	Checked
If my proposed project takes place on public lands or water or is addressing alien invasive species, I have uploaded a Letter of Support from Government.	Checked
I have uploaded a cover letter that details the information requested in the guidance (Guidance section 4.2 has information on what this cover letter should include).	Checked
I have read, and can meet, the current Terms and Conditions **for this fund (found at:** https://darwinplus.org.uk/apply/local-applications/**) for this fund.**	Checked
I have provided actual start and end dates **for my project that fit this Round.**	Checked
I have provided my summary budget based on UK government financial years **i.e. 1 April – 31 March and in GBP in the application form.**	Checked
I have uploaded my project workplan using the specific template provided (available at: https://darwinplus.org.uk/apply/local-applications/).	Checked

I have uploaded all supplementary documents if I have any.	Checked
(If copying and pasting into Flexi-Grant) I have checked that all my responses have been successfully copied into the online application form.	Checked
The application has been signed by a suitably authorised individual **(clear electronic or scanned signatures are acceptable).**	Checked
I have checked the Darwin Plus website **immediately prior to submission to ensure there are no late updates.**	Checked
I have read and understood the Privacy Notice on the Darwin Plus website**.**	Checked

We would like to keep in touch!

Please check this box if you would be happy for the lead applicant (Flexi-Grant Account Holder) and project leader (if different) to be added to our mailing list. Through our mailing list we share updates on upcoming and current application rounds under Darwin Plus. We also provide occasional updates on other UK Government activities related to biodiversity conservation and share project news. You are free to unsubscribe at any time.

Checked

Data protection and use of personal data

Information supplied in the application form, including personal data, will be used by Defra as set out in the **Privacy Notice**, available from the Forms and Guidance Portal.

This **Privacy Notice must be provided to all individuals** whose personal data is supplied in the application form. Some information may be used when publicising Darwin Plus including project details (usually title, lead partner, project leader, location, and total grant value).

Project Title:

Darwin Plus Local

Provide a **Project Implementation Timetable** that shows the key milestones in project activities. Complete the following table as appropriate to describe the intended workplan for your project. Round 4 is for a **maximum of 6 months** with activities starting from 1 October 2024. All activities must be completed by 31 March 2025.

Please add/remove columns to reflect the length of your project. For each activity (add/remove rows as appropriate) indicate the number of months it will last, and shade only the months in which an activity will be carried out. The workplan can span multiple pages if necessary.

Activity #	Description (max 25 words)	No. of months	UK Financial Year 2024/25					
			Calendar Year 2024			Calendar Year 2025		
			Oct	Nov	Dec	Jan	Feb	Mar
1	Purchasing the L2 and P1 Payloads	1						
2	Updates to current SAERI UAV Operations Manual / insurance / permits	1						
3	Test Flights, maintenance, logging, updates	1						
4	Pilot Project	2						
5	Final Reporting	1						