Darwin Initiative Main & Extra: Final Report

To be completed with reference to the "Project Reporting Information Note": (https://www.darwininitiative.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.

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Darwin Initiative Project Information

Scheme (Main or Extra)	Main
Project reference	DPLUS161
Project title	Exploring the drivers of human-shark conflict at Ascension Island
Country(ies)	Ascension Island
Lead Organisation	University of Exeter
Project partner(s)	University of Exeter, University of Windsor, University of Plymouth, Zoological Society of London, Ascension Island Government
Darwin Initiative grant value	£285,415.00
Start/end dates of project	October 2022 – March 2025
Project Leader name	Dr.Sam Weber
Project website/blog/social media	N/A
Report author(s) and date	Sam Weber (Project Leader) & Dan Simpson (Project Officer), June 2025.

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1 Project Summary

Ascension Island is surrounded by one of the world's largest marine protected areas (MPAs), which aims to conserve biodiversity while simultaneously contributing to the social and economic wellbeing of the Island's human population. Recently, however, an increasing number of Galapagos sharks in shallow coastal waters has created significant conflicts with ocean users. While no full-time commercial fishery exists on Ascension Island, recreational fishing is a culturally important activity with 3-6 inshore vessels regularly operating from Georgetown Pier and a significant proportion of the island' population people engaged in shore-based rock fishing. Diving and bathing are also popular pastimes on an island with few other amenities. However, catch depredation and perceived or real threat to life from sharks using shallow coastal waters

has increasingly impacted these activities. The disruption to Island life has led some to call for lethal control, posing a significant test of Ascension's MPA and strict shark protection laws. Prior to the project, however, the causes of recent increases in shark activity were unknown, which has fuelled speculation and concern. This project aimed to provide reliable evidence to Government and stakeholders by undertaking a rigorous, scientific investigation into the socio-ecological drivers of human-shark conflict at Ascension Island. The project set out to characterise the nature and extent of human-shark interactions; explore underlying ecological drivers; and conduct experimental trials and feasibility studies of conflict reduction measures. Results were shared with the community to foster a deeper understanding of shark ecology and fed into ongoing public consultations led by AIG to find evidence-based, co-developed solutions for mitigating human-shark conflicts.

2 Project Partnerships

This project involves five formal partners (Ascension Island Government Conservation and Fisheries Directorate, University of Exeter, University of Windsor, University of Plymouth, Zoological Society of London) and a large and diverse stakeholder group of local marine users and policy makers. The need for the project was originally identified by AIGCFD who then worked alongside other partners to develop a proposal and set of outputs that are relevant to local needs. This collaborative approach has continued throughout the project through participation in joint field expeditions, project M&E, data sharing, and co-authoring of reports and peer-reviewed manuscripts (see **Annexes 5.1 – 5.4**).

The key stakeholders in the project are the Ascension Island community, who have been directly affected by human-shark conflicts and were continuously engaged with in multiple forms. Island residents were active participants in social and ecological research elements of the project, contributing local knowledge on spatiotemporal variation in human-shark interactions (**Annex 5.2 & 5.3**) and sharing perspectives on the impacts of these interactions (**Annex 5.1**) and preferences for future management interventions (**Annex 5.4**). These contributions were directly integrated into project planning and outputs, and the results of social and ecological research shared back with the community through varied and well-attended public events (**Annex 5.5**).

3 Project Achievements

3.1 Outputs

Output 1. *The social context of human-shark conflict on Ascension Island is characterised through a process of inclusive stakeholder engagement, ensuring that local knowledge and views are duly represented in project design and implementation.*

After some initial delays during Y1 while the aims, scope and methodology for this Output were agreed with local stakeholders, significant progress was made during the remainder of the project, and all indicators were subsequently achieved. In December 2023 (Y2Q3), eight key informant interviews were conducted with stakeholders from 4 employing organisations, including Government, military, and civil society (**Output 1.1**). Preliminary results were reported back to stakeholders (**Annex 5.1**) and used to refine a semi-structured interview (SSI) protocol that was subsequently conducted with a further 25 respondents from a representative sample of genders, ethnicities and employment status (n = 33 respondents in total; **Output 1.2**). The results of these interviews are reported in a peer-reviewed manuscript, Collins et al. (2025) *Social Dimensions of Shark-Human Interactions in a Large Remote Marine Protected Area*, that is currently undergoing minor revisions for publication in the journal *People & Nature* (**Annex 5.1**). As well as documenting the social impact of human-shark interactions at Ascension for the first time, the study also identified consistent themes that fed into wider project design and messaging. For example, the need for community participation in research and management was commonly articulated and was implemented through stakeholder group meetings (see Section), public research seminars (see Output 4), and consultation on different shark barrier options as part of a wider feasibility study (see Output 3).

One of the key deliverables from this output was to develop a system for quantifying the frequency and nature of human-shark interactions and monitoring changes over time (**Output 1.3**). Our original application had proposed to achieve this by collating reports of catch depredation events by fishers, but this methodology had to be changed (with approval of the Darwin Secretariat) following low uptake of Government issued logbooks. Instead, we developed an innovative set of digital tools for collating local experiences of human-shark interactions, including harvesting visual and textual data from social media platforms, searching archival records on the island for references to sharks, and conducting targeted online questionnaires with former residents recruited through social media groups (**Output 1.3**). By integrating these different data sources with SSI data (**Output 1.2**), we were able to show that the frequency of human-shark interactions at Ascension Island is dynamic over multiple temporal timescales, ranging from short-term intra-annual fluctuations to long-term decadal scale oscillations. We were also able to identify consistent themes in the nature of these interactions, including abrupt shifts in inshore shark presence and behaviour and high levels of fisheries catch depredation, which appear to have been recurrent events over longer timescales. The results are reported in a manuscript, Clarke et al. (2025) *A Multi-Method Approach to Characterising Dynamic Human-Shark Interactions at a Remote Oceanic Island* that is currently undergoing peer review for publication in the journal *People & Nature* (**Annex 5.2**)**.**

Output 2*: Knowledge of the behaviour and distribution of Galapagos sharks on Ascension Island is significantly enhanced and is used to evaluate a range of hypotheses proposed to explain recent increases in inshore activity.*

At the outset of this project, very little was known about the ecology of Galapagos sharks around Ascension Island and the causes of periodic increases in human-shark interactions were unknown. The project aimed to address these gaps by studying the distribution dynamics of sharks and relating movements and behaviour to physiological and oceanographic changes.

Two methods were used to monitor shark distributions and overlap with humans. First, remote time-lapse cameras were installed at two key coastal locations used by island residents (Georgetown Pierhead, used by boat and rock fishers, and Comfortless Cove, a popular bathing beach) to gather direct observational data on inshore shark presence (**Output 2.1**). Cameras gathered still images every 5-10 minutes over a > 12-month period, although firmware issues (now resolved with the manufacturer) led to occasional temporal gaps. In total > 40,000 images were collected and manually analysed to quantify the presence, species and number of sharks observed. The results of the first year of observations, which are presented in a manuscript that has been submitted to the journal *People & Nature* (**Annex 5.2**), show a clear peak in inshore shark activity in July-August 2024 and suggest that this method has promise as a long-term, autonomous monitoring tool.

To investigate shark distribution dynamics in more detail, passive acoustic telemetry was also used to track the three-dimensional movements of a subset of individuals on a comprehensive hydrophone array encircling the island (**Annex 5.3**). In total, 53 sharks (42 Galapagos sharks and 11 silky sharks) were tagged with acoustic transmitters during the project and tracked over a 2-year period, exceeding our indicator target of 50 (**Output 2.2**). Originally, we had proposed to track only Galapagos sharks. However early fieldwork revealed that silky sharks commonly occur in mixed coastal schools with Galapagos sharks around Ascension suggesting they could also be involved in interactions with human ocean users. To assess overlap of shark distributions with human ocean users, a participatory mapping approach was used to identify core areas visited for different vessel and shore-based recreational activities. This was not one of original project indicators but was a necessary addition to assess temporal variation in human-shark overlap (and hence potential for interactions). Participatory mapping was conducted as part of semi-structured interviews reported in **Output 1.2** and represent another example of how local knowledge was incorporated into project design (**Output 1**). Tag detection data indicate that two major peaks in human-shark overlap occurred during the project, which aligned well with concurrent observations from shore-based cameras (see **Annex 5.3**). In both cases, peaks in overlap were associated with a redistribution of sharks from previously unknown activity hotspots on Ascension's remote and uninhabited southern coastline into areas frequented by people

(**Annex 5.3**). This constitutes an important finding and counters speculation that peaks in human-shark interaction are driven by attraction of sharks from offshore areas.

Having characterised the spatial dynamics of the shark population, one of the key objectives of the project was to explain why these distributional shifts occur. Several related hypotheses were proposed for testing in our original application; however, the relative emphasis given to each of these changed over the course of the project on logistical and scientific grounds. For example, the hypothesis that inshore movements may be related to reproduction/pupping was discarded due to a lack of any consistent seasonality and the small number of adult females captured during the study which precluded ultrasound and hormonal analysis (**Output 2.3**). A second hypothesis evaluated was that hunger linked changes in prey availability may cause sharks to move inshore in search of prey. To test this, a small number of sharks were captured monthly for collection of morphological condition metrics and blood and tissue samples for biochemical analysis of diet and starvation markers. In total, 175 individuals were sampled over a 14-month period, exceeding our indicator target (**Output 2.3**). Unfortunately, however, it was not possible to obtain sufficient samples from sharks in inshore areas during the short peaks in human-shark overlap that occurred during the project to test for differences. As a workaround, we obtained a set of tissue samples collected from Galapagos sharks during the last major phase of inshore movement in 2021-2022 and compared these with more recent samples obtained during the project (**Annex 5.6**). This analysis detected a small difference in tissue stable isotope ratios of carbon and nitrogen which are consistent with a change in diet. However, replication across more inshore movements is needed to confirm whether this pattern is repeated.

As the project progressed, greater attention was given to the third and more promising hypothesis that changes in local and regional oceanography may drive shifts in shark distribution (**Output 2.4**). This was the explanation most commonly proposed in interviews with island residents (**Annex 5.1**) but had not been formally tested prior to the project. To evaluate this hypothesis, we gathered 2-years of *in situ* observational data of water temperature and current regimes at five locations around the island, concurrent with our acoustic tracking study, and combined this with Global Ocean Circulation Model outputs for the same period (**Output 2.4; Annex 5.3**). Current direction/strength and water column temperature profiles were then compared with distributions of tagged sharks. Interestingly, the results indicate that both periods of high human-shark overlap that occurred during the project coincided with abrupt shifts in the regional currents from the prevailing westerly flow to an easterly flow (**Annex 5.3**). These shifts appear to have triggered a redistribution of the shark population from south coast activity hotspots to a more diffuse distribution, that included greater occupancy of west and north coast areas used by humans. Further work is needed to confirm this pattern and establish the underlying mechanism; however preliminary results suggest that there is an oceanographic basis to short-term fluctuations in the frequency of human-shark interactions, which represents an important output.

Output 3*. Field trials and fully costed feasibility studies of non-lethal conflict reduction measures are undertaken to assess their viability on Ascension Island.*

In addition to exploring underlying drivers, the project also aimed to appraise non-lethal management options for mitigating human-shark conflicts. Two different conflict reduction measures were evaluated: (1) electronic 'shark deterrent' devices for reducing negative interactions with fishing vessels and (2) the feasibility of installing shark barriers at bathing beaches to reduce future risks to ocean users and restore public confidence in ocean recreation.

During the project, field trials of two "shark deterrent" devices were initiated to establish their effectiveness at deterring Galapagos sharks (**Output 3.1**). This included the "SharkGuard" (FishTek Marine), which is designed to be mounted to fishing gear and has achieved promising results in reducing bycatch in commercial longline fisheries, and the Shark Shield FISH Series (Ocean Guardian) which is designed to be suspended from the side of vessel. The devices were showcased at a meeting in Y1, but interest from fishers in participating in trials was low, primarily due to low levels of catch depredation at the time and concerns that the devices would affect catch of target species. As an alternative, an experimental trial of the Shark Shield was initiated using Ascension Government's inshore research vessel, with the aim of measuring approach distances and interaction times of sharks with a bait stimulus in the presence and absence of an

active deterrent (**Annex 5.7**). An experimental rig was designed using a stereo camera system to measure distances and some interactions were recorded; however, insufficient sharks were encountered to confidently measure responses and results were inconclusive. Recently, the manufacturer of the SharkGuard announced that they are developing a smaller variant of the device specifically designed for recreational fisheries and have launched their own field trials in Australia (including tests on Galapagos sharks) where a large recreational fleet makes such studies considerably more tractable. Therefore, a decision was taken not to pursue trials of the older model on Ascension.

In contrast, an evaluation of the installation of shark exclusion barrier systems at bathing beaches was completed as planned (**Output 3.2**). This was the favoured management option in a survey of island residents conducted during the project, supported by >70% of respondents (**Annex 5.1**). A fully costed feasibility study of three leading, commercially available exclusion barrier systems has now been completed and submitted to Ascension Island Government for review (**Annex 5.4**). For each system, four different barrier configurations were considered at Ascension's two most popular bathing beaches, English Bay and Comfortless Cove. Each system and configuration was evaluated using a semi-quantitative scoring system against five criteria (cost, technical suitability, effectiveness, social acceptability, and environmental impact) to identify the most locally appropriate solution. As part of SSIs conducted in Output 1, respondents were asked to rank the extent to which each option would make, ensuring that local views were captured in the final recommendations. Overall, the cheapest, most effective, least impactful and most socially acceptable option was the installation of a short eco-mesh barrier at Comfortless Cove (**Annex 5.4**). Given the relatively low upfront cost of this option [redacted] and high levels of public support (80% of respondents said this option would improve their confidence is using the ocean), we are hopeful funding can ultimately be found to implement the recommendations of the report, subject to further consultation, legal and MPA compliance checks by AIG.

Output 4 The results of social and ecological research are openly shared and discussed with the Ascension Island community.

Project activities and findings were shared and discussed in multiple forums and formats to ensure accessibility to a broad cross section of the Ascension Island community (**Annex 5.5**). As proposed in the original logframe, the results of social and ecological research (Outputs 1 & 2) were presented at two well-attended public talks held in Y2 and Y3 of the project (**Output 4.1**). Public talks took the form of a formal presentation by local project officers and visiting scientists followed by time for audience questions and comments (see **Annex 5.5**). The first of these talks was attended by > 100 people (~12% of the population) and had to be run twice due to demand, while the second was standing room only, illustrating the continued level of interest and engagement in this topic locally. Nevertheless, it became apparent that a significant section of the community was not being engaged through this format. We therefore organised a series of more informal, interactive events, including two catered evening functions at local social clubs for the project team to meet with residents, discussion forums with key stakeholder groups (e.g. Ascension Island Fishers Association), and two shark-focussed activity sessions at Two Boats School. Project activities and outputs were also disseminated online in >40 social media posts to reach a wider range of local and international audiences (**Annex 5.5**).

To provide a permanent resource for local policymakers and practitioners, management recommendations and key findings from socio-ecological research have been summarised in two reports submitted to Ascension Island Government, including non-technical summaries (**Output 4.2**; **Annexes 5.3 & 5.4**) and two manuscripts that have been submitted to scientific journals and will be published Online Open Access once the peer-review process is complete (**Annexes 5.1 & 5.2**). We anticipate that several additional papers will be published in due course summarising results from the project, helping to share key scientific and methodological advances with the wider international conservation and research community.

3.2 Outcome

While some output level indicators were only partially achieved (see Section 3.1), overall, the project achieved its intended outcome of advancing understanding of the socio-ecological drivers of human-shark conflict at Ascension Island. An important finding that emerged from social

research (Output 1) was that the unpredictability of peaks in shark activity, a sense that the situation was abnormal, and a perception that it had been caused by the actions of others, were all key social drivers of underlying conflicts (**Annex 5.1**). This social context subsequently provided the justification for the ecological research (Output 2) and helped frame the communication of project findings (Output 4). For example, presenting evidence that recent peaks in human-shark interactions were not abnormal but appear to be part of a recurrent pattern of behaviour over longer timescales was an important outcome (**Annex 5.2**) and helped to discredit theories that they were attributable to the other marine users (**Outcome 0.1**). During the project we were also able to test several credible ecological hypotheses explaining these recurrent patterns of movement. Although some were quickly abandoned based on limited support or available data, we found strong evidence that regional mesoscale oceanography plays a role in triggering movements of Galapagos sharks into core human use areas (**Outcome 0.1**; **Annex 5.3**). This was the favoured explanation proposed by island residents (**Annex 5.1**) and providing evidence in support of it constitutes a notable achievement from the project, particularly given the short timeframe of the study relative to the timescales over which sharks move. Our hope is that by demystifying shark behaviour and building a shared understanding of the ecological causes of human-shark interactions we can address some of the underlying drivers of conflict identified through our social research (**Outcome 0.3**)**.**

Social research also identified a lack of management response as another underlying source of conflict (**Annex 5.1**), which we attempted to address through the project (Output 3). While the environmental drivers of human-shark interactions may be impossible to mitigate, the project made meaningful progress in evaluating practical management options for future conflict reduction. Although field trials of electronic shark deterrents were inconclusive and had limited engagement from local fishers, a feasibility study on the installation of shark barriers at key bathing beaches identified affordable, low impact, and technically suitable options that benefitted from a high level of public support (**Annex 5.4; Outcome 0.2**). A report with recommendations for taking this initiative forward have been submitted to Ascension Island Government for consideration (**Annex 5.4; Outcome 0.3**) and we hope will form the basis of future implementation plans and funding proposals.

3.3 Monitoring of assumptions

Key assumptions identified in the original logframe were monitored continuously throughout the project and, where these did not hold, plans were put in place to mitigate this, including through formal change requests submitted to Darwin. One of the most important assumptions underlying our proposed approach was that shark activity in core-human use areas would vary during the study and that sufficient data could be collected to test alternative hypotheses and identify underlying drivers (**Assumptions 0.1 & 0.3**). These assumptions largely held. Although levels of inshore shark activity were not as high as during recent peaks in 2016-17 and 2021-22, two significant movements of Galapagos sharks into human use areas occurred during the project and we were able to identify a potential oceanographic driver of these (**Annex 5.3**). The output level assumptions underpinning this outcome (that a suitable research vessel would be available, that equipment would remain functional, and that we would be able to catch sufficient sharks for sampling and tagging; **Assumptions 2.1 – 2.4**) also largely held. While a small number of acoustic tracking receivers were lost during the project, we were able to exceed our indicator targets for numbers of individuals tagged, duration of tracking, and samples collected (**Annex 5.3**). However, we were unable to sample enough sharks in inshore locations during short periods of high overlap to test for physiological drivers (**Assumption 2.3**). Instead, alternative plans were put in place to analyse a historical sample set from 2021-22 that could be compared to more recent material collected during the project (see Section 3.1 and **Annex 5.6).**

The other set of assumptions that were critical to our intended outcome was that local stakeholders and external organisations would be sufficiently engaged in the project to participate in social research, reporting of negative encounters, evaluations of mitigation options, and public meetings and events. Again, these assumptions largely held and, where they did not, project design could generally be adjusted accordingly. Public engagement in the issue of sharks remained high throughout the project and we were able to exceed our indicator targets for number of key informant interviews and semi-structured interviews completed (**Assumptions 1.1 – 1.2;**

see Annex 5.1). Public meetings were also exceptionally well attended, and we were able to organise additional events not in the original project log frame (**Assumption 4.1**; see Section 3.1 & **Annex 5.5**). The assumption that fishers would be willing to reliably record and report data relating to catch depredation events did not hold (**Assumption 1.3**). This appeared to have to have stemmed from a general apathy or scepticism towards formal logbooks and catch recording, as fishers were willing to share information on shark encounters in an informal context. As a substitute we developed a novel, multi-method approach for collating information on frequency of human-shark interactions from publicly accessible social media, archive sources, and online questionnaires (see Section 3.1 & **Annex 5.2**). This change was approved by Darwin, and the results exceeded our original goals by allowing us to reconstruct a timeline of human-shark interactions over decadal timescales and provide much-needed historical context to current conflict events (**Annex 5.2**). The assumption that fishers would engage in field trials of shark deterrent devices also did not hold (**Assumption 3.1**), partly due to low levels of catch depredation for much of the project (see Section 3.1). While we could not identify a suitable workaround for this output, it did not prevent us from achieving our intended outcome as manufacturers of shark barrier systems were highly responsive in providing technical information and quotes for a feasibility study of future conflict reduction measures (**Assumptions 0.2 & 3.2**; **Annex 5.4**).

4 Contribution to Darwin Plus Programme Objectives

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

Human-wildlife conflicts are complex socio-ecological problems that are not easily 'solved' in a single project. However, as reported and evidenced in Section 3, the interdisciplinary approach taken here has significantly contributed to our overall objective of understanding the socio-ecological drivers of human-shark conflict on Ascension Island and finding evidence-based solutions. This objective is well aligned with **Strategic Objectives 1 & 2** of the **Ascension MPA Management Plan** ("Conserving Ascension Island's marine biodiversity…" and "Supporting the sustainable development of social and economic activities") which are conflicted by negative interactions between sharks and human ocean users such as fishers, divers, and bathers.

Although it is not possible to quantify the impact of the project on local perceptions towards sharks, we can demonstrate meaningful progress in addressing the underlying drivers of conflict. Social research identified the unpredictability and unexplained nature of recent increases in interactions as key contributors to conflict (**Annex 5.1**), which we subsequently addressed through ecological research which showed that these events are both recurrent and potentially predictable based on environmental processes (**Annexes 5.2 & 5.3**). A lack of a clear management response was also identified as a source of conflict, which we subsequently addressed by providing evidence-based recommendations for future conflict reduction measures (**Annex 5.4**). All these outputs were shared with the community through well-attended public events (**Annex 5.5**) and informal feedback received from participants indicate that they were well received.

Internationally, project outputs also contribute to meeting AIG's commitments under the draft Post 2020 Global Biodiversity Framework, specifically Target 4 (managing human-wildlife conflict), Target 9 (ensuring livelihoods of local communities), and Target 14 (integrating biodiversity values). The outcome of the project also supports the recently adopted IUCN Resolution relating to human-wildlife conflict, which recognises the challenges of balancing public safety and wildlife's needs and calls for holistic responses "…*supported by the best-available information and systematically collected and credible evidence*;" which is fundamental to all of the work undertaken.

4.2 Gender Equality and Social Inclusion (GESI)

GESI Scale	Description	Put X where you think your project is on the scale
Not yet sensitive	The GESI context may have been considered but the project isn't quite meeting the requirements of a 'sensitive' approach	
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	

Human-shark conflicts are not a strongly gendered issue on Ascension Island and the project does not have any specific implications for gender equality. While there are known gender biases in the fishing community, with men possibly more engaged with and vocal about conflicts involving catch depredation, the issue regarding shark interactions effects everyone. However, it is a socially divisive issue that can be structured around socio-demographic characteristics such as employment, education and ethnicity. One of the key considerations of social research (Output 1) was to capture this diversity of perspectives, meaning inclusivity and representation was embedded in project design from the outset (see **Annex 5.1** for demographic breakdown or respondents). The project also aimed to take a GESI-sensitive approach in the way that the project engaged with the local community. In the original logframe, we proposed that project outputs would be shared through public talks and Q&A sessions. However, while these events were well-attended, it became clear that participation from some sectors of the community was low. To address this, we adapted our approach to include a series of more informal, interactive events that were accessible to a broader range of stakeholder groups (**Annex 5.5**).

5 Monitoring and evaluation

Overall responsibility for monitoring assumptions and progress against project indicators lay with the Project Leader and local Project Officer based on Ascension Island. However, where it became apparent that assumptions that were unlikely to hold, these were shared and discussed across the wider project team to identify suitable mitigation options. This approach was generally effective and allowed the project to adapt and respond to several unforeseen challenges. The key changes are described in detail in Section 3.3 and are not repeated here. The only substantial amendment to the original log frame related to Output 1.3, which had originally intended to harvest on catch depredation events directly from local fishers but was subsequently modified to focus on collation of data from digital sources following low engagement in formal catch reporting systems. In retrospect, the revised output was a significant improvement and allowed a reconstruction of human-shark interactions over much longer timescales than we had originally envisaged, including much-needed historical context (**Annex 5.2**).

Internal evaluation of project outputs occurred continuously throughout the project and was shared across the multi-institutional project team. All key reports and manuscripts (**Annexes 5.1-**

5.4) were reviewed by other partners prior to submission, which improved the quality and scientific rigour of key outputs. Several have also undergone or are currently undergoing external evaluation through the journal peer-review process (**Annexes 5.1 & 5.2**). External evaluation of remaining outputs will be completed post-project as reports are reviewed by AIG managers and elected representatives, and additional findings are submitted for publication in the peer-reviewed literature.

6 Lessons learnt

This project represents one of the most interdisciplinary Darwin Plus projects that we have implemented on Ascension Island, which yielded several key learnings. One of the key strengths of the project lay in the synergies between the social research (Output 1) and other outputs, which only became fully apparent as the work progressed. By defining the social context of the problem, Output 1 allowed the remaining research and management outputs to be responsive to local needs and views, and to demonstrate that project activities were directly addressing underlying drivers of conflict. This proved to be valuable for framing project communications locally and for M&E purposes (see Section 3). Social research also accessed local knowledge that directly informed several key outputs (e.g. participatory mapping of human-shark interaction areas and timelining of conflict) and enabled public preferences to be incorporated into management recommendations (shark barrier designs). Indeed, it is notable that all the key project outputs (**Annexes 5.1–5.4**) contain an integration of social and ecological data, highlighting the value of an interdisciplinary approach for addressing conservation issues such as human-wildlife conflicts. This lesson is not surprising itself; however, reflecting on past projects there is often scope for incorporating a greater focus on human dimensions, led by specialised practitioners. Simple approaches taken during the project, such as asking stakeholders where they get their information and how they would prefer to be communicated with, were highly effective and are likely to be transferrable to a range of contexts.

Social research also presented several challenges and encountered delays in Y1 while the aims and scope of this element were agreed by partners. There were justifiable concerns that if not handled sensitively, this output could expose deeper social divisions, undermine the work of local conservation managers, and create unrealistic expectations, which may ultimately serve to enflame conflicts further. Thankfully, none of these concerns materialised, in part due to careful coordination between experienced social scientists and local conservatmanagers to ensure that data collection protocols were robust but appropriate to the local context.

Several other technical learnings from the project, including effective methodologies for studying human-wildlife interactions (locally and more broadly), are reported in other sections and are not repeated here (Sections 3 & 5). This project was one of the more technically challenging we have implemented due to the number of different hypotheses tested and methodological approaches trialled, some of which proved to be more tractable than others. While in retrospect it would have been possible to focus on smaller number of deliverables, the nature of research means it is often not apparent which approach or line of enquiry will be most effective at the outset. This should be captured and acknowledged in the M&E process, accepting that while some outputs may be only partially completed, others exceed expectation.

7 Actions taken in response to Annual Report reviews

Reviewer comment: "Exit strategy - please elaborate on your expectations re-equipment ownership and capacity to continue research post-project"

Response: This comment has been addressed in Section 9, where we outline our exit strategy and plans for continuation of research post-project.

8 Risk Management

No additional risks arose during the past 12-months that hadn't been previously accounted for and no further changes to project design were required, beyond those reported from previous years (see Section 5)

9 Scalability and Durability

This remains an active research and conservation initiative thanks to continuation funding that builds on, and was leveraged through, progress made during the project. In 2025, the Project Leader was awarded a Save Our Seas Foundation Keystone grant (Project Ref. SOSF700; award value £54,000) which will fund the continuation of social research (Output 1), acoustic shark tracking (Output 2.2), remote camera monitoring (Output 2.1), oceanographic research (Output 2.4) and community engagement (Output 4) for a further three years (2025 – 2027). Given that the frequency of human-shark interactions at Ascension Island was shown to vary over multi-year timescales (**Annex 5.2 & 5.3**), this is an important and necessary step to consolidate progress made during the project and gather more robust evidence for the mechanisms suggested by our preliminary findings (**Annex 5.3**). A 4-year NERC GW4+ PhD Studentship was also secured (2023-2027), hosted at the University of Exeter and co-supervised by the project team, which will provide continued capacity to analyse and publish data collected during the project, as well as extending the work in new directions. The candidate (Lucy Clarke) has already undertaken two expeditions to Ascension as part of the current project, training with the local team and international partners, and has led one of the manuscripts that has been submitted for publication (**Annex 5.2**). Future PhD chapters will finalise the analysis of oceanographic drivers of shark movements (**Annex 5.3**) and conduct a more detailed investigation of shark aggregation hotspots on the South coast that were identified during the project and appear to be key to driving the fission-fusion dynamics of the Galapagos shark population (see further work in **Annex 5.3**). The incumbent local Project Officer, Dan Simpson, has also been appointed to a new role in AIG Conservation Department working on a related Darwin Plus project, further ensuring that skills and expertise are retained on-island. This continuation of research and sustained stakeholder engagement will be key to securing the long-term legacy of the project by progressively addressing the underlying social drivers of human-shark conflict identified in **Annex 5.1**.

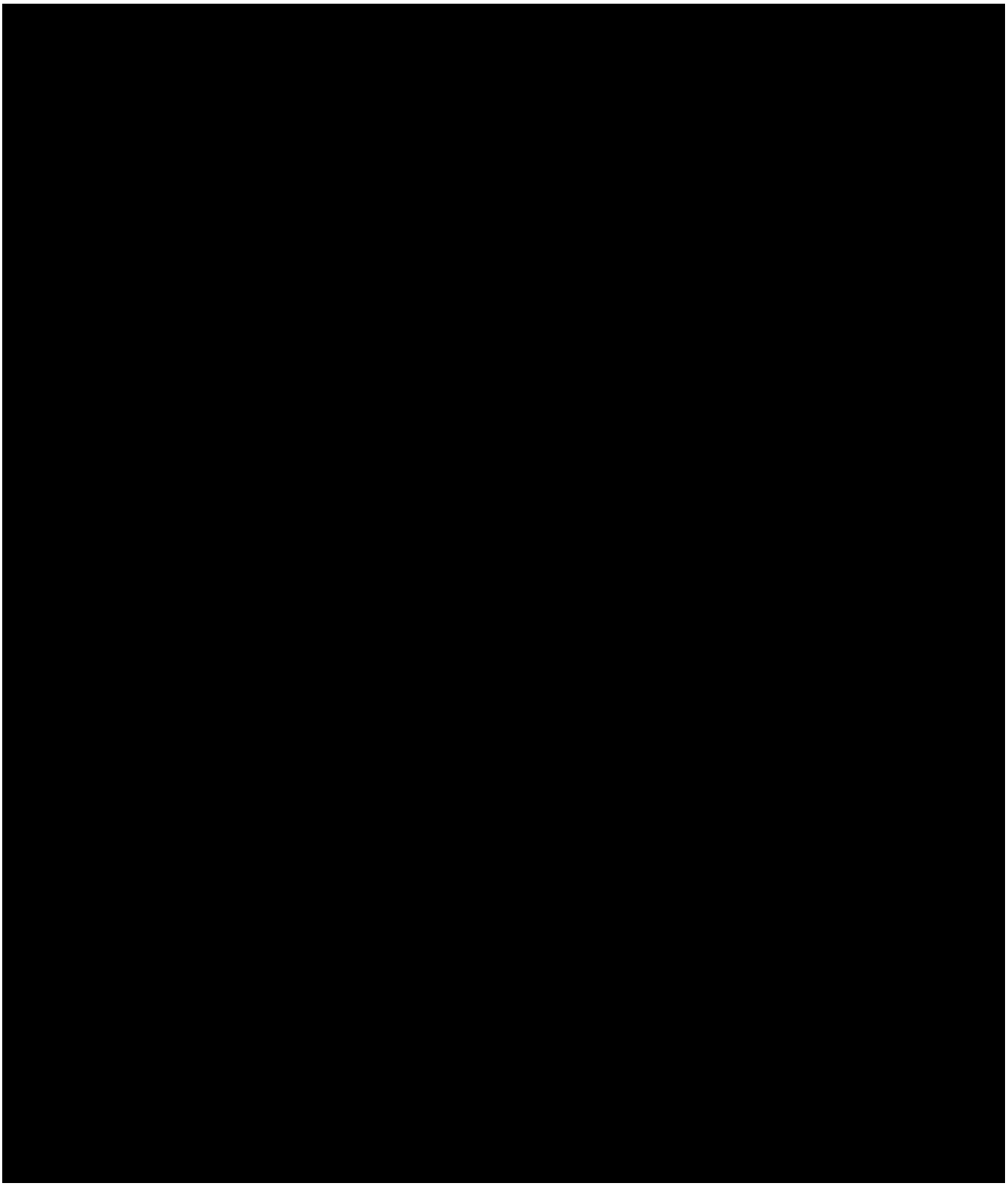
The project is also expected to have broader impacts and scalability beyond Ascension Island. Human-wildlife conflicts are a growing conservation globally, particularly where efforts to conserve or restore top predator populations are perceived to conflict with the safety and wellbeing of human populations. However, despite a growing literature on human-shark conflicts, few studies have simultaneously explored both the social and ecological dimensions of the problem, including the factors that cause sharks to interact with people and the impact this has on communities. Our interdisciplinary approach therefore has the potential to become a case study and template for similar projects elsewhere and will be shared with the wider conservation community through pending and future peer-reviewed publications. Indeed, commenting on our first submitted manuscript the Handling Editor for People & Nature noted that the work "*addresses a timely and important issue, particularly in the context of expanding marine conservation initiatives and the socio-ecological dynamics they entail"*. In addition to its interdisciplinarity, the project also made several significant methodological contributions to the field. To our knowledge, the work presented in **Annex 5.2** represents the first attempt to use social media data and archival records to study contemporary human-wildlife conflicts and establish historical baselines (respectively) in any system. These approaches are likely to be scalable across a wide range of species and geographic contexts, ensuring a wider legacy and impact from the project.

10 Darwin Plus identity

Darwin Plus has been the principal external funder of conservation projects on Ascension Island for over a decade, and its brand and objectives are widely recognised and understood within the Territory. A strong Darwin Plus identity was maintained throughout the project through prominent placement of the logo and acknowledgement of Darwin support on promotional materials for

community events (**Annex 5.5**), digital communications through social media (**Annex 5.5**), reports submitted to Ascension Island Government (**Annexes 5.3 & 5.4**), and funding acknowledgements in peer-reviewed papers (**Annexes 5.1 & 5.2**). Indeed, the project was widely known locally as the “Darwin Shark Project”.

11 Safeguarding



12 Finance and administration

12.1 Project expenditure

Project spend (indicative) since last Annual Report	2024/25 Grant (£)	2024/25 Total actual Darwin Initiative Costs (£)	Variance %	Comments (please explain significant variances)
Staff costs (see below)	[redacted]			
Consultancy costs				
Overhead Costs				
Travel and subsistence				
Operating Costs				
Capital items (see below)				
Others (see below)				
TOTAL	57,345	56,355.57		

Staff employed (Name and position)	Cost (£)
Sam Weber - Project Leader	[redacted]
Phil Hosegood - Associate Professor	
Daniel Simpson - Project Officer	
Claire Collins (Technical specialist)	

TOTAL	[redacted]

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

Other items – description	Other items – cost (£)
Consumables for repair and maintenance of acoustic telemetry and oceanographic equipment Fieldwork consumables Fishing equipment Audit costs	[redacted]
TOTAL	

12.2 Additional funds or in-kind contributions secured

Matched funding leveraged by the partners to deliver the project	Total (£)
Ascension Island Government (salaries, accomodation, capital equipment and vessel operating costs provided in kind)	[redacted]
University of Exeter (Sam Weber research start-up grant, shortfall in FEC overheads and NERC GW4+ studentship)	
University of Plymouth (Oceanographic monitoring equipment contributed in kind)	
ZSL (in-kind salary contributions and acoustic fish tags)	
University of Windsor (in-kind salary contributions and telemetry captial equipment)	
TOTAL	

Total additional finance mobilised for new activities occurring outside of the project, building on evidence, best practices and the project	Total (£)
Save Our Seas Foundation Keystone Grant (Project SOSF700: Human-shark conflict and coexistence at Ascension Island)	[redacted]
NERC GW4+ PhD Studentship (Lucy Clarke; Spatial Ecology of Galapagos and Silky Sharks at Ascension Island: Exploring the Drivers of an Emerging Human-Wildlife Conflict)	

TOTAL	[redacted]

12.3 Value for Money

The value for money of the project is evident in the considerable matched funding provided by partners (**£264,719**), representing 48% of the overall budget, and the additional finance mobilised to continue and build on progress made during the project [redacted] Marine research is inherently expensive, and the achievements of the project would not have been possible without in-kind contributions of biotelemetry and oceanographic monitoring equipment and additional match funding provided by project partners (e.g. a University of Exeter start-up grant to the Project Leader), which kept the costs of capital equipment to the project very low. In-kind salary and overhead contributions from all partners, and vessel time and accommodation provided by AIG at a fraction of true cost, also ensured excellent value for money (see Section 12.2). Value for money has been further strengthened through the acquisition of continuation funding that builds directly on approaches and findings from the project, and which will help to consolidate the legacy and impact of the work undertaken (see Section 9).

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

Project summary	Progress and achievements
Impact Evidence-based solutions are identified for an emerging human-wildlife conflict in one of the world's largest marine protected areas.	Human-wildlife conflicts are complex socio-ecological problems that are not easily 'solved' in a single project. However, the interdisciplinary approach taken here can be shown to have made a meaningful contribution to identifying and addressing the underlying drivers of human-shark conflict at Ascension Island. Social research identified the unpredictability and unexplained nature of recent increases in interactions as key contributors to conflict (**Annex 5.1**), which we subsequently addressed through ecological research which showed that these events are both recurrent and potentially predictable based on environmental processes (**Annexes 5.2 & 5.3**). A lack of a clear management response was also identified as a source of conflict, which we subsequently address by providing evidence-based recommendations for future conflict reduction measures (**Annex 5.4**). While we cannot quantify the impact of these outputs on local perceptions towards sharks, the findings were shared with the community through well-attended public events and appeared to be well received (**Annex 5.5**). Importantly, this remains an active research initiative thanks to continuation funding that builds on progress made during the project (see Section 9), which will help to consolidate longer-term impact.
Outcome The underlying socio-ecological drivers of, and potential solutions to, human-shark conflict on Ascension Island are better understood and form the basis of evidence-based management recommendations.	
Outcome indicator 0.1. By Q4 of Y2, at least four credible hypotheses proposed to explain recent increases in inshore shark activity have been evaluated using empirical data.	Four different hypotheses were considered during the project. The hypothesis that recent spikes in inshore shark activity are abnormal events driven by the actions of specific marine stakeholders (e.g. non-traditional fishing practices) received limited support based on evidence that such movements have recurrent feature of life on Ascension Island over longer timescales (**Annex 5.2**). Three different ecological hypotheses were also evaluated (**Annexes 5.3 & 5.6**), although one of these – that inshore movements are linked to reproductive cycles – was quickly dismissed based on limited support and available data (see Section 3.1). The strongest evidence was found for the hypothesis that regional oceanographic changes trigger movements into core-human use areas, specifically abrupt switches in regional current regimes from prevailing westerly flows to atypical easterly flows (**Annex 5.3**). A climatological cause was the most common explanation proposed by island residents in social research (**Annex 5.1**), so providing empirical support for this represents an important achievement for the project. Limited support was also found for the hypothesis that

	inshore movements are accompanied by dietary shifts (**Annex 5.6**), although further work is needed to verify this.
Outcome indicator 0.2 By Q4 of Y2, experimental trials and/or costed feasibility studies of at least four different non-lethal conflict reduction measures have been undertaken that are specific to Galapagos sharks on Ascension Island.	A fully-costed feasibility study comparing the suitability of three different commercially available shark barrier systems for installation at Ascension's key bathing beaches has been prepared and submitted to Ascension Island Government for evaluation (**Annex 5.4**). Systems were ranked based on five key evaluation criteria and recommendations have been made for taking this initiative forward. Field trials of electronic 'shark deterrent' devices were initiated but received limited engagement from fishers (see Section 3.1) and were discontinued based on advice that the leading manufacturer is currently developing and field testing a new deterrent device designed specifically for recreational anglers.
Outcome indicator 0.3 By Q1 of Y3, available mitigation options are reviewed and presented to stakeholders, drawing on the findings of 0.1-0.2 together with experiences of managing similar human-wildlife conflicts elsewhere.	While the overall outcome of the project was achieved as stated, this indicator was arguably not the most appropriate at capturing the links between addressing underlying social drivers of conflict and other project outputs, which only became apparent as the project progressed. Social research identified the unexplained nature of recent peaks in human-shark interactions and the perception they were abnormal and caused by the actions of others as key contributors to conflict (**Annex 5.1**). In this social context, furnishing evidence that shifts in shark distribution are not abnormal and may have a predictable environmental basis represents an important conflict reduction step, even if practical mitigation measures are not available. Preliminary findings from this work have been shared with stakeholders at public talks and in a report submitted to AIG (**Annex 5.3**) and will be developed into a peer-reviewed manuscript. Social research also identified a perceived lack of management intervention as a contributor to conflict, as well as a need for the community to participate in developing solutions (**Annex 5.1**). Recommendations presented in the shark barrier feasibility study go some way to addressing these drivers and will hopefully be implemented in future (**Annex 5.4**). Interestingly, however, informal feedback received from stakeholders was that the process of attempting to find solutions and soliciting views on different management options was itself an important step in acknowledging public concerns.
Output 1. The social context of human shark conflict on Ascension Island is characterised through a process of inclusive stakeholder engagement, ensuring that local knowledge and views are duly represented in project design and implementation.	
Output indicator 1.1. By **Q2 of Y2**, at least 7 key informants have completed a semi-structured interview to help inform and co-develop sampling protocols and approaches.	A total of 8 key informant interviews were conducted with in December 2023 (Y2Q3) and used to refine a semi-structured interview protocol for social research (**Annex 5.1**).
Output indicator 1.2 By **Q1 of Y3**, at least **30 persons** representing different marine user groups, genders, age classes and nationalities **have participated in**	Semi-structured interviews were conducted with a further 25 island residents in April 2024 (Y3Q1) using protocols refined through Output 1.1 (n = 33 respondents in total). Interviews explored underlying social drivers of conflict and perceptions of causes of periodic increases in human-shark interactions. Results and demographics of

semi-structured interviews to gather baseline data on attitudes towards sharks, spatiotemporal patterns in activity, and perceived causes of recent activity spikes.	respondents are summarised in a peer-reviewed manuscript that is currently in the final stages of revision for publication in the journal *People & Nature* (see **Annex 5.1**). Interviews also contributed additional data that fed into other outputs, exceeding our original objectives. An additional participatory mapping exercise was included to identify core use areas for different recreational activities, which fed into analyses of the environmental drivers of human-shark interactions (see **Annex 5.3**). Respondents were also asked to rank their preferences of different management options which was incorporated into the shark barrier feasibility analysis (see **Annex 5.4**)
Output indicator 1.3 By **Q2 of Y3**, a system for collecting data and media from marine users on shark sightings and depredation has been developed, both in-person and online.	After initial plans to gather data on catch depredation events directly from fishers proved intractable, we developed a novel multi-method approach for collating information on the frequency of human-shark interactions at Ascension Island from a range of sources, including publicly accessible social media data, archival material, and targeted online questionnaires. Using this approach, we were able to reconstruct a timeline of human-shark interactions on Ascension over the past 100 years and demonstrate that the frequency of interactions has fluctuated over multiple temporal scales, which significantly exceeded our original goals. The approach and results are summarised in a manuscript which is currently in review at the journal *People & Nature* (see **Annex 5.2**)
Output 2. Knowledge of the behaviour and distribution of Galapagos sharks on Ascension Island is significantly enhanced and is used to evaluate a range of hypotheses proposed to explain recent increases in inshore activity.	
Output indicator 2.1. By Q3 of Y2, time lapse camera systems have been installed and used to monitor Galapagos shark activity at three sensitive coastal locations (including the Pierhead and major bathing beaches) over a minimum 12-month period.	Timelapse camera systems were installed at two coastal locations (including the Pierhead and one key bathing beach) and gathered data on relative abundance of sharks over a 12-month period (see **Annex 5.3**). The higher than budgeted costs of suitably robust, solar powered camera systems precluded deployment at a third site.
Output indicator 2.2. By Q3 of Y2, an acoustic tracking array is established on the Ascension Island coastal shelf and is used to monitor the movements and depth use of at least 50 Galapagos sharks over a minimum 12-month period.	Three dimensional movements of a total of 53 sharks were tracked at Ascension Island over a period of up to 24-months using passive acoustic telemetry (see **Annex 5.3**). This included 42 Galapagos sharks and 11 silky sharks. The latter were discovered to form mixed schools with Galapagos sharks at key aggregation sites and were included in the study as a species potentially involved in interactions with human ocean users.
Output indicator 2.3. By Q3 of Y2, spatiotemporal variation in the body condition and reproductive status of Galapagos sharks is assessed over a 12-month period using blood biochemistry, morphology and/or ultrasound of at least 100 individuals sampled in inshore and offshore locations.	Morphological measurements of body condition and blood/tissue samples were collected from 175 Galapagos sharks and silky sharks over a 14-month period. Blood and tissue samples (n = 124) were analysed for stable isotope ratios of carbon, nitrogen and sulphur to investigate spatiotemporal changes diet. However, insufficient individuals were captured from inshore areas during the project to test for differences. Instead, we compared tissue isotope ratios from sharks sampled in offshore locations during the project with a set of existing samples collected during the last major inshore incursion in 2021/2022 (**Annex 5.6**). This analysis revealed small differences that may be consistent with a change in diet, however further work is needed to verify

	this pattern across repeated inshore movements. Ultrasound was not ultimately used due to the small number of adult females captured during the project.
Output indicator 2.4. By Q3 of Y2, spatiotemporal variation in the physical oceanography of Ascension Island's coastal environment is monitored over a 12-month period and is related to Galapagos shark distribution, behaviour and life-stages present (3.4).	Oceanographic data was collected from two sources over a 24-month period spanning our acoustic shark tracking study. Regional context of the prevailing oceanographic conditions (geostrophic currents and water temperature) at Ascension Island was obtained from the Copernicus Marine Services global ocean circulation model. This was supplemented with *in situ* current and vertical temperature profile data collected by oceanographic moorings deployed at five locations around the island (although only two of these collected data for the full 24-month period). Current and temperature data were then related to the degree of overlap of acoustically-tagged sharks (Output 2.2) with core human use areas identified through participatory mapping (Output 1.2). Preliminary results are summarised in a report submitted to Ascension Island Government and suggest an oceanographic basis to recent shifts in shark distribution (see **Annex 5.3**)
Output 3. Field trials and fully costed feasibility studies of non-lethal conflict reduction measures are undertaken to assess their viability on Ascension Island.	
3.1 By Q1 of Y2, experimental trials of at least two electronic 'shark deterrent' devices are carried out to establish their effectiveness in reducing negative interactions with fishing vessel.	Field trials of two different electronic 'shark deterrent' devices were initiated during the project. Included the *FishTek Marine SharkGuard*, which is designed to be mounted to fishing gear, and *Ocean Guardian FISH Series*, which is designed to be deployed beneath a vessel. Technology was demonstrated to fishers early in the project; however, there was limited interest in participating in field trials, partly due to low level of catch depredation at the time. Experimental trials of the *Ocean Guardian* system were subsequently attempted using AIG's inshore research vessel to measure responses of Galapagos sharks to a bait stimulus in the presence of absence of an active deterrent (**Annex 5.7**); however insufficient sharks were encountered to a measurable response and results were inconclusive.
3.2 By Q3 of Y2, feasibility studies of at least two 'shark barrier' systems are undertaken for Ascension Island's main bathing beaches, including fully costed installation and maintenance budgets, and an assessment of wider impacts on biodiversity and other marine users (e.g. navigation hazards).	A fully costed feasibility study comparing the suitability of three different commercially available shark barrier systems for installation at Ascension's key bathing beaches has been prepared and submitted to Ascension Island Government (**Annex 5.4**). Systems were ranked based on five key evaluation criteria (cost, effectiveness, technical suitability, environmental impact, social acceptability) and recommendations were made for taking this initiative forward.
Output 4. The results of social and ecological research are openly shared and discussed with the Ascension Island community and are used to assess the suitability of a range of mitigation options for ameliorating human-shark conflicts.	
4.1. By the end of the project, at least two public meetings have been held to discuss and adapt research plans, and to disseminate findings.	Project findings were presented at two public meetings held in Y2 and Y3 of the project, which were attended by > 100 people (~12% of population) (**Annex 5.5).** In addition, six more informal and interactive events were organised to broaden participation and reach other sectors of the community. This included two catered

	evening functions, two activity sessions at Two Boats School, and two discussion forums with the committee of the Ascension Island Fishers Association (**Annex 5.5**).
4.2. By **Q2 of Y3** a report outlining potential mitigation options for emerging human-shark conflicts on Ascension Island is presented to stakeholders, including non-technical summaries of the key findings of social and ecological research.	Two reports have been submitted to Ascension Island Government for review before wider dissemination on-island. This includes a feasibility study on the installation of shark barriers at key bathing beaches (**Annex 5.4**) and a summary of the preliminary findings of participatory mapping and ecological research (**Annex 5.3**). Results of the social science work are currently in review at the journal *People & Nature* and will be published Open Access once accepted, ensuring they are available to local stakeholders (**Annexes 5.1 & 5.2**).

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

Project Summary	SMART Indicators	Means of Verification	Important Assumptions
Impact: Evidence-based solutions are identified for an emerging human-wildlife conflict in one of the world's largest marine protected areas.			
Outcome: The underlying socio-ecological drivers of, and potential solutions to, human-shark conflict on Ascension Island are better understood and form the basis of evidence-based management recommendations.	**0.1** By **Q1 of Y3**, at least four credible hypotheses proposed to explain recent increases in inshore shark activity have been evaluated using empirical data. **0.2** By **Q1 of Y3**, experimental trials and/or costed feasibility studies of at least four different non-lethal conflict reduction measures have been undertaken that are specific to Galapagos sharks on Ascension Island. **0.3** By **Q2 of Y3**, available mitigation options are reviewed and presented to stakeholders, drawing on the findings of 0.1-0.2 together with experiences of managing similar human-wildlife conflicts elsewhere.	**0.1** Papers published in the peer-reviewed literature or in-press manuscripts; MSc theses. **0.2** Reports available on the AIG website; manuscripts for submission to peer-reviewed journals. **0.3** Reports available on the AIG website	**0.1** Assumes that inshore shark activity varies during the study and that sufficient data can be collected from Outputs 1-3 to test each hypothesis (see Output specific assumptions). **0.2** Assumes that local fishers and manufacturers of shark barriers and deterrents engage in the project (see Output specific assumptions). **0.3** Action to address underlying causes assumes that drivers of recent increases in shark activity can be confidently identified within the timeframe of the project. Even if this assumption is not met, a range of management options can still be assessed based on international best practice and tests of common

			conflict reduction measures carried out during the project.
Outputs: **1**. The social context of human-shark conflict on Ascension Island is characterised through a process of inclusive stakeholder engagement, ensuring that local knowledge and views are duly represented in project design and implementation.	**1.1** By **Q2 of Y2**, at least 7 key informants have completed a semi-structured interview to help inform and co-develop sampling protocols and approaches. **1.2** By **Q1 of Y3**, at least **30 persons** representing different marine user groups, genders, age classes and nationalities **have participated in semi-structured interviews** to gather baseline data on attitudes towards sharks, perceived causes of recent activity spikes spatiotemporal patterns in activity and perceived causes of recent activity spikes **1.3** By **Q2 of Y3**, a system for collecting data and media from marine users on shark sightings and depradation has been developed, both in-person and online.	**1.1-1.2** Summaries of fully anonymised datasets and disaggregated summary statistics for spatiotemporal activity patterns available in project reports and databases held by AIGCFD. **1.3** Data reporting form available online and in-person (e.g. a board at the pier) and data collected and summarised in reports **1.3** Catch depredation data in databases held by AIG and summarised in project reports.	**1.1-1.2** Assumes that people engage with the project and are willing to participate in interviews. **1.3** Assumes that fishers are willing to participate and reliably record and report data relating to fishing sites and catch depredation.
2. Knowledge of the behaviour and distribution of Galapagos sharks on Ascension Island is significantly enhanced and is used to evaluate a	**2.1** By **Q4 of Y2**, time lapse camera systems have been installed and used to **monitor Galapagos shark activity at three sensitive coastal**	**2.1** Time-lapse footage uploaded to online citizen science platforms platforms (e.g. zoonopia.org); monitoring databases held by AIG;	**2.1** Assumes that necessary permissions can be obtained and suitable locations can be found for securely mounting cameras. Also

range of hypotheses proposed to explain recent increases in inshore activity.	**locations** (including the Pierhead and major bathing beaches) over a **minimum 12-month period**. **2.2** By **Q4 of Y2**, an acoustic tracking array is established on the Ascension Island coastal shelf and is used to monitor the movements and depth use of **at least 50 Galapagos sharks over a minimum 12-month period**. **2.3** By **Q4 of Y2**, spatiotemporal variation in the body condition and reproductive status of Galapagos sharks is assessed **over a 12-month period** using blood biochemistry, morphology and/or ultrasound of **at least 100 individuals** sampled in inshore and offshore locations**.** **2.4** By **Q4 of Y2**, spatiotemporal variation in the physical oceanography of Ascension Island's coastal environment is monitored **over a 12-month period** and is related to Galapagos shark distribution, behaviour and life-stages present (3.4).	summarised findings in project reports and MSc theses. **2.2** Tag/receiver metadata and filtered detections entered in existing AIGCFD databases; papers published in the peer-reviewed literature or in-press manuscripts; MSc theses; project reports. **2.3-2.4** Papers published in the peer-reviewed literature or in-press manuscripts; MSc theses; project reports made available on the Ascension Government website.	assumes that cameras do not malfunction and that sharks can be accurately enumerated in time-lapse images. **2.2-2.4** Assumes that a suitable research vessel is available for the duration of the project. AIG have confirmed current vessel availability, which includes a level of redundancy in case individual assets require repair or maintenance; however, this remains a risk. **2.2 - 2.3** Assumes that sufficient sharks can be captured for tagging and sampling. Minimum sample sizes are based on experiences during previous shark tagging projects at Ascension Island and are likely to be achievable given current high levels of activity. **2.4.** Assumes that instruments do not malfunction or are lost.

3. Field trials and fully costed feasibility studies of non-lethal conflict reduction measures are undertaken to assess their viability on Ascension Island.	**3.1** By **Q3 of Y2**, **experimental trials of at least two electronic 'shark deterrent' devices** are carried out to establish their effectiveness in reducing negative interactions with fishing vessel. **3.2** By **Q1 of Y3**, **feasibility studies of at least two 'shark barrier' systems** are undertaken for Ascension Island's main bathing beaches, including fully costed installation and maintenance budgets, and an assessment of wider impacts on biodiversity and other marine users (e.g. navigation hazards).	**3.1** Results of experimental trials presented in project reports and manuscripts for submission to peer-reviewed journals. **3.2** Results of feasibility studies presented in project reports available on the AIG website.	**3.1** Assumes that local fishers agree to participate in trials of shark deterrents. Given the impact of catch depredation on the fishing community and the desire to find solutions, we expect that this assumption will hold. **3.2** Assumes that manufacturers of barrier systems respond with quotes and technical specifications.
4. The results of social and ecological research are openly shared and discussed with the Ascension Island community, and are used to assess the suitability of a range of mitigation options for ameliorating human-shark conflicts.	**4.1. By the end of the project, at least two public meetings** have been held (one in **Y1** and one in **Y3)** to discuss and adapt research plans, and to disseminate findings. **4.3.** By **Q2 of Y3** a report outlining potential mitigation options for emerging human-shark conflicts on Ascension Island is presented to stakeholders, including non-technical summaries of the key findings of social and ecological research.	**4.1** Promotional posters for public meetings; Powerpoint presentations; photographs and attendance figures. **4.3** Report presented to AIG and the Island Council and made publicly available online.	**4.1** Assumes that the Ascension Island community are sufficiently engaged in the project to attend meetings. Given the high profile of this issue we are confident that this assumption will hold.
Activities			

Output 1: *The social context of human-shark conflict on Ascension Island is characterised through a process of inclusive stakeholder engagement, ensuring that local knowledge and views are duly represented in project design and implementation.*

1.1 Design and deliver semi-structured interviews with representative stakeholder groups to better understand the human dimensions of conflicts.

1.2 Develop and promote online and in-person tool to collect information on shark sightings and other key behaviours (such as depradation)

1.3 Analyse interview data to inform project design is appropriate for setting

1.4 Gather data on catch depredation rates working in collaboration with local recreational and sports fishers.

Output 2: *Knowledge of the behaviour and distribution of Galapagos sharks on Ascension Island is significantly enhanced and is used to evaluate a range of hypotheses proposed to explain recent increases in inshore activity.*

2.1 Install fixed-point, time-lapse camera assemblies for monitoring shark activity at key coastal locations.

2.2 Analyse time-lapse imagery to quantify relative shark abundance and validate results generated from online citizen science platforms.

2.3 Deploy passive acoustic telemetry array and oceanographic moorings.

2.4 Deploy acoustic telemetry tags on Galapagos sharks.

2.5 Carry out monthly physiological, morphological and reproductive assessments of Galapagos sharks to assess spatiotemporal variation in body condition and breeding status.

2.6 Analyse ecological and oceanographic data to explain any observed variation in inshore shark activity (2.2) and rates of catch depredation (1.4).

2.7 Report and publish the findings of applied shark research.

Output 3: *Field trials and fully costed feasibility studies of non-lethal conflict reduction measures are undertaken to assess their viability on Ascension Island.*

3.1 Conduct baited camera trials of electronic deterrent devices to assess their effectiveness in repelling Galapagos sharks.

3.2 Deploy electronic deterrent devices on fishing vessels to establish their effectiveness at reducing catch depredation relative to experimental controls.

3.3 Produce fully-costed designs and associated environmental impact assessments for shark barriers at bathing beaches, engaging with manufacturers and local marine users.

3.4. Analyse and report the results of field trials of shark deterrents.

Output 4: *The results of social and ecological research are openly shared and discussed with the Ascension Island community, and are used to assess the suitability of a range of mitigation options for ameliorating human-shark conflicts.*

4.1 Hold public meetings on Ascension Island to present and discuss project plans and findings.

4.2 Disseminate and promote project activities and outputs through a range of online and print media.

4.3 Produce a non-technical report summarising project findings and setting out recommendations for mitigating human-shark conflicts.

Table 1 Project Standard Indicators

Please see the Standard Indicator Guidance for more information on how to report in this section, including appropriate disaggregation. N.B. The annual total is not cumulative. For each year, only include the results achieved in that year. The total achieved should be the sum of the annual totals.

DI Indicator number	Name of indicator	If this links directly to a project indicator(s), please note the indicator number here	Units	Disaggregation	Year 1 Total	Year 2 Total	Year 3 Total	Total achieved	Total planned
DPLUS-A01	Number of people from key national and local stakeholders completing structured and relevant training	NA	People	Men	1	3	0	4	No planned target
DPLUS-A01	Number of people from key national and local stakeholders completing structured and relevant training	NA	People	Women	1	2	0	3	No planned target
DPLUS-A03	Number of local/national organisations with improved capability and capacity as a result of project	NA	Number		0	0	1	1	1
DPLUS-A05	Number of trainers trained under the project reporting to have delivered further training	NA	People	Men	0	0	1	1	No target
DPLUS-C01	Number of best practice guides and knowledge products published and endorsed.	0.1-0.3	Number	English	0	0	0	4	>3
DPLUS-C15	Number of Media related activities.	4.1	Number	Socia media (40) Print media (6)	23	14	9	46	>2

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)
Social Dimensions of Shark-Human Interactions in a Large Remote Marine Protected Area.	Journal Article	Collins et al. (2025)	Female	British	In revision at People & Nature	Link will be made available once published. (Annex 5.1)
A Multi-Method Approach to Characterising Dynamic Human-Shark Interactions at a Remote Oceanic Island	Journal Article	Clarke et al. (2025)	Female	British	In review at People & Nature	Link will be made available once published. (Annex 5.2)
Exploring the Oceanographic Drivers of Human-Shark Interactions at Ascension Island	Technical Report	Weber et al. (2025)	Male	British	University of Exeter.	Available from Ascension Island Government Conservation Department on request.
Installation of Shark Barrier Systems at Bathing Beaches on Ascension Island: A Feasibility Study.	Technical Report	Simpson et al. (2025)	Male	Australian	Ascension Island Government.	Available from Ascension Island Government Conservation Department on request.

Checklist for submission

	Check
Different reporting templates have different questions, and it is important you use the correct one. Have you checked you have used the **correct template** (checking fund, scheme, type of report (i.e. Annual or Final), and year) and **deleted the blue guidance text** before submission?	X
Is the report less than 10MB? If so, please email to BCF-Reports@niras.com putting the project number in the Subject line.	X
Is your report more than 10MB? If so, please consider the best way to submit. One zipped file, or a download option, is recommended. We can work with most online options and will be in touch if we have a problem accessing material. If unsure, please discuss with BCF-Reports@niras.com about the best way to deliver the report, putting the project number in the Subject line.	
If you are submitting photos for publicity purposes, **do these meet the outlined requirements** (see section 14)?	
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 provided an updated risk register? If you have an existing risk register you should provide an updated version alongside your report. If your project was funded prior to this being a requirement, you are encouraged to develop a risk register.	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.	