Darwin Initiative: Final Report

*To be completed with reference to the "Writing a Darwin Report" guidance: (http://www.darwininitiative.org.uk/resources-for-projects/reporting-forms). It is expected that this report will be a **maximum** of 20 pages in length, excluding annexes)*

Darwin Project Information

Project reference	23-012
Project title	Improving marine biodiversity and livelihoods of coastal communities in Principe
Host country(ies)	Sao Tome and Principe
Lead organisation	University of Exeter, UK (UoE)
Partner institution(s)	Principe Foundation (PF), Regional Fisheries Department and Principe's Biosphere Reserve Management Unit
Darwin grant value	£295,187
Start/end dates of project	01-07-2016 to 31-03-19
Project leader's name	Prof Annette Broderick
Project website/blog/Twitter	http://omaliprincipe.weebly.com/ (Click English/Portuguese for specific website language)
Report author(s) and date	Ana Nuno (UoE), Annette Broderick (UoE) and Estrela Matilde (PF) 28th June 2019

1 Project Rationale

Sao Tome and Principe is a Portuguese-speaking island nation in the Gulf of Guinea, off the western equatorial coast of Central Africa. São Tomé lies 255 km, and Príncipe 220 km, off the coast of Gabon; the former is the larger covering 859 km^2, with the latter covering 142 km^2. An independent nation since 1975, São Tomé and Príncipe has a population of ca. 179,000 inhabitants with population density unevenly split between islands (Príncipe has around 7500 inhabitants) and annual population growth approximately 2.45% (INE 2012). Príncipe, where this project was based, became an autonomous region in 1995, with its own regional government reporting to the national government based in São Tomé.

With a high degree of endemism, the island of Principe is of global biodiversity significance and was designated a UNESCO Biosphere Reserve in 2012. The island hosts great marine biodiversity: coral reefs, important fish species (including threatened billfish, sharks and rays), five sea turtle species, seabirds and cetaceans.

An agrarian economy sees reliance on subsistence farming and fisheries, with 62% of the population below the poverty line. Around 17% of the national population are involved in fisheries; a major source of protein for households in Principe (>70% animal protein intake), with over 500 of the 7,500 population being licensed small-scale fishers (Fig.1A) versus 2500 of 171,000

inhabitants in Sao Tome. The key issues identified by fishers and fish traders (a traditionally female role; Fig.1B), during our pre-project scoping study in Principe, were: access to equipment; infrastructure; conflict; alternative livelihoods and government support. Households headed by women (29% of all households in Principe) are especially vulnerable as women suffer from unequal access to education and job opportunities (e.g. female illiteracy 186% higher than male).

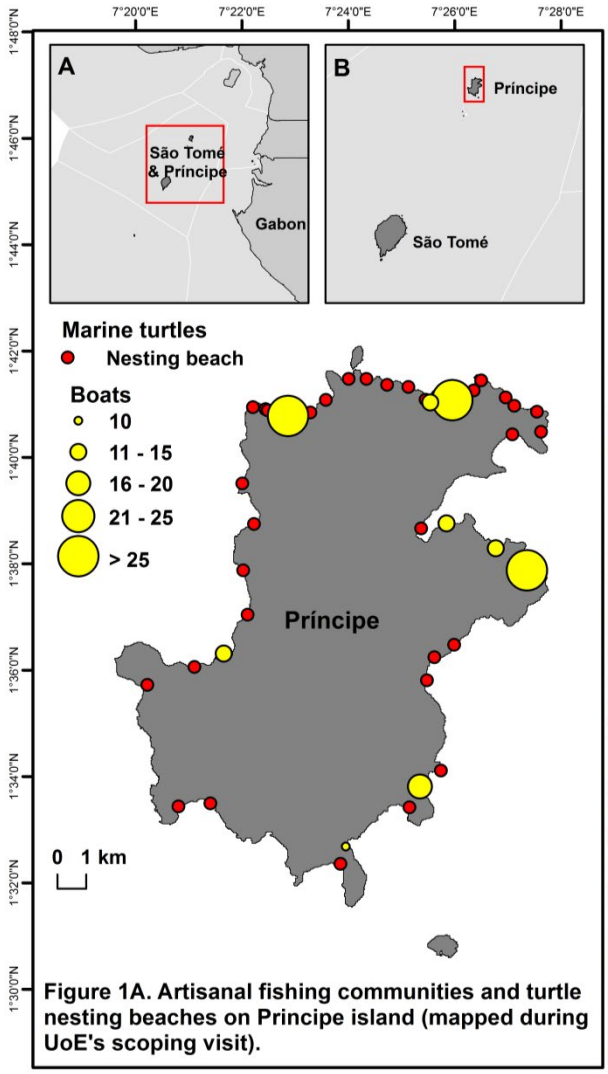

Figure 1A. Artisanal fishing communities and turtle nesting beaches on Principe island (mapped during UoE's scoping visit).

Figure 1B. Traditional gender roles in fishing communities, Principe: harvest by men and preparation/commercialisation by women.

Overfishing and habitat degradation are directly affecting the viability of fishing livelihoods. Principe has also recently attracted several investors, leading to rapid change in development, population growth and tourism. Ongoing changes in fishing practices suggest dynamic responses to socio-economic drivers. Low conservation capacity, limited monitoring/enforcement, poor governance and lack of impact evaluation are major barriers to effective resource management on the island; this has crucial implications for biodiversity, food security and human wellbeing, given fisheries dependence.

The project was designed to address these challenges through incentivizing a participatory approach to enhance marine biodiversity and resource management in order to improve food security, increase gender equality and poverty reduction in fisheries dependent coastal communities in the island of Principe.

2 Project Partnerships

During project implementation, all partnerships strengthened, particularly regarding involvement of the Regional Fisheries Department and Principe's Biosphere Reserve Management Unit; after the end of Y1, all project partners became much more involved in actively advising project activities and making decisions about them, as well as establishing links to other ongoing initiatives. For example, the selection panel for the "community ideas" initiative was composed by representatives from all project partner organizations (blog and photos), stimulating

involvement in budget allocation and choice of interventions to be implemented. Given that the lead partner (UoE) had only recently started working with these partners on the island (after being invited by PF to undertake a scoping visit that subsequently informed the preparation of a successful Darwin Initiative application), this improvement was to be expected and represented a significant advancement in partner trust and buy-in. We believe continuous engagement, regular communications and updates, balanced representation in decision-making processes as well as given appropriate credit to everyone's contributions were at the core of these advancements. This involvement and strong partnership were clear, for example, in our final project event facilitated by multiple partner organizations (programme in Annex 7) and attended by around 60 individuals (including fishers, fish traders, regional and national government representatives and development and environmental organizations; list of participants in Annex 8) that demonstrated support for our project as part of their speeches and comments.

High staff turnover (both at governmental level and main host partner organization PF) and complete restructuration of PF during the project have been the most challenging aspects in terms of partnerships. To address these issues, UoE invested on increased presence on the ground (e.g. thanks to additional funds, we hired a Research Assistant that spent 18 months in Príncipe). We also increased our focus on training and hiring of local project officers and strengthening links to regional and national institutions so that the project could continue as planned with no major implications for project delivery, timings or budget.

In addition to project partners, we strengthened or started relationships with other relevant stakeholders. In particular, throughout the project we kept regular contact with organizations working in the neighbour island São Tomé (Oikos - development NGO; Marapa - artisanal fisheries NGO; Programa Tatô - sea turtle conservation NGO), providing updates about our progress and exchanging experiences between islands. We also established collaborations with the University of São Tomé (e.g. local Biology BSc student did her research project with us) and started a collaboration with Africa's Eden, a conservation and tourism enterprise in Príncipe; thanks to this, we were able to conduct complementary ecological research and monitoring tasks.

The new collaboration with Oikos and Marapa was particularly fruitful in terms of ensuring sustainability of progress made as part of our project; thanks to funding from the Blue Action Fund, a new project led by Fauna & Flora International (FFI) in partnership with Oikos, Marapa and PF, and with the collaboration of UoE, has now begun. This will allow continuing multiple project activities pioneered within our project, as well as expanding to São Tomé, aiming to establish a national network of marine protected areas through a co-management approach.

3 Project Achievements

3.1 Outputs

Output 1. Fisheries and livelihoods: *Increased understanding of artisanal fisheries and resilience of sector to threats and best practices for reduction of fishing pressure on non-target species of conservation concern achieved through participatory research and community-engagement.*

Overall, we achieved our goal of stimulating participatory approaches for improved fisheries management and livelihood improvements in Principe. We were successful in managing to work in all the permanent coastal communities in Principe (N=6) and community participation levels were high (please note this is a small island with <8000 ppl, including only around 4000 adults). For example, 142 people (73 men and 69 women) participated in inception focus groups (October-November 2016); 880 adults (459 men and 421 women; only 12 people refused) answered questionnaires in Jan-Feb 2017; 41 fishers volunteered to use GPS data loggers for mapping their fishing areas (in one of the communities, there was so much interest that, following their suggestion, we organized a lottery in order to allocate devices fairly); and 69 fishers or fish traders (47 women and 22 men) received training. This was key for identifying and implementing locally-relevant project activities. For example, in focus groups we discussed, among other topics (see English version of focus group guidelines), threats and barriers to fishing livelihoods, as well as seeking their opinions about ways of addressing those challenges (see workshop summaries).

Thanks to these high levels of participation, we collected: 24 months of fisheries landing surveys; 13 months of GPS tracking; baseline socio-economic information obtained in Jan-Feb 17 from 194 fishers and 157 fish traders, as well as 529 non-fishing individuals; socio-economic questionnaires repeated in Jan-Feb 19 (516 residents of fishing communities, including 200 fishers and 158 fish traders). In addition to these initially planned activities, we collected complementary information on fish reproductive biology and marine biodiversity distribution: samples collected from 655 individual fish (gonads, length, weight, etc.), 154 hours of video recorded to assess underwater biodiversity collected during two sampling phases (July-Aug 18 and Dec 18-Jan 19). A summary reporting results from all these activities can be found here. Comparing to baseline levels of zero, by the end of project we produced: six comprehensive datasets (landing surveys; socioeconomics; small-scale fisheries mapping; coastal habitat mapping; marine biodiversity assessment; fish reproductive biology); one submitted peer-reviewed publication and two in preparation. None of this information was available pre-project.

In particular, fisheries practices and catch were better understood thanks to landing surveys (guidelines and forms) conducted twice a week in 6 fishing communities from Dec 2016 to Dec 2018. We estimate than >200 fishers participated in this activity (we cannot give precise number of participants due to inconsistency in names recorded over time). For example, thanks to this activity, we were able to describe and ascertain prevalence of different fishing techniques (Fig. 2). We produced a detailed report based on the landing surveys, summarizing key findings and recommendations (document in Portuguese with English executive summary). Spatiotemporal patterns of fishing trips were recorded using participatory mapping with GPS trackers (blog and preliminary map).

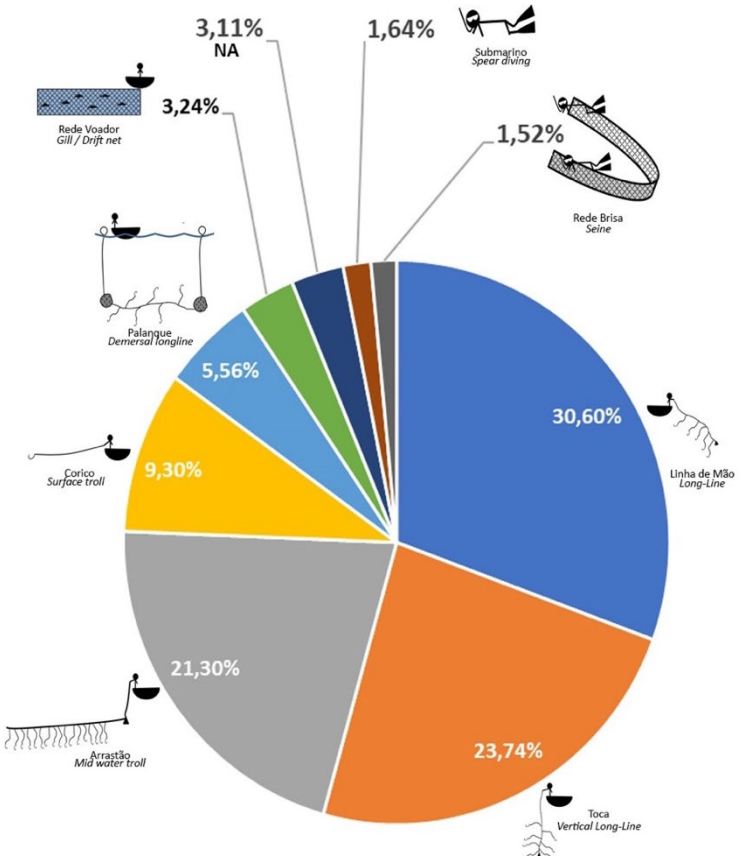

Figure 2. Frequency (in %) of different techniques recorded during 1879 fishing trips in six communities in Príncipe.

Based on this participatory research, we decided to adopt a community-driven approach to identify interventions for improving sustainability of small-scale fisheries. These ended up being broader than initially planned (see description as well as proposal and evaluation sheets) but, by focusing on a participatory approach, we promoted community engagement and ownership over these interventions. Six interventions were implemented in 5 fishing communities (a handicraft center at Burras Beach; handmade soap from Abade; construction of a community headquarters in Lapa and Campanha; community shop selling material for repairing gear and trading fish in Santo Antonio; materials for transformation of fish products for the association of fish traders from Abade; Annex 9). This allowed us assessing and evaluating feasibility of different strategies for improving fisheries sustainability. A report was produced for local partners (in Portuguese) with recommendations about evaluation and expansion of these interventions after this project.

Output 2. Laying foundations for establishing co-management: *to improve long-term sustainability of fisheries sector through improved and empowered governance.*

Acknowledging the complexities and time-scale for establishing strong and fair institutions, this took a multipronged approach with a focus on community participation and supporting the

production of operational plans in collaboration with regional stakeholders (with long-term support guaranteed by Fisheries Department, Biosphere Reserve and Principe Foundation). Indeed, our project focused on developing community capacity and laying foundations for co-management but establishment of co-management was not achieved within its timeframe; we spent considerable time assessing capacity and potential mechanisms but the process was too incipient.

Based on preliminary project work and workshops during Y1 assessing current status and feasibility of fisheries co-management (our report in Portuguese on "Associativism for the co-management of coastal and marine resources in the island of Principe?"), community cohesion, trust and teamwork were identified as key factors to be targeted to enhance success of potential fisheries co-management initiatives. For example, although there are some community-level fisheries associations on the island, several of them have a history of mistrust and money mismanagement and are mainly driven by economic incentives and are created to receive government funds. In practice, they are poorly functional and not involved in fishing decision-making. We thus decided to focus on those through a "community ideas" initiative to develop skills and promote collective action.

Six community interventions, each with their respective management committee and operational plan (see Annex 10 for an example of committee agreement developed with one of the project communities), were implemented (baseline level was zero). During implementation, community ideas were affected by issues of mistrust, theft, poor accountability, limited active engagement and poor technical capacity; however, by working through these issues as a team and with our support, we strengthened their ability to work together and cope with challenges. Governance was thus improved through community engagement and enhanced local capacity, ultimately aiming to improve conservation through establishment of a network of marine protected areas through co-management of marine resources at the medium/long-term (thanks to next initiative capitalizing on our efforts). Evaluation discussions at each community at the end of project (blog and photos) were key for assessing perceived impacts and next steps (summary in Annex 11).

***Output 3. Ecosystem services trade-offs and social spill-over effects** assessed across the island to observe the role of improved fisheries practices and co-management in facilitating these wider-scale insular effects.*

Given the small size of Principe island and its population, at the start of project we were expecting our project interventions to impact on non-target communities as well (e.g. economic effects) and so we carefully considered potential wider-scale effects. We were expecting that improved fisheries practices and co-management could facilitate wider socio-economic and ecological effects across the island; thus, we collected baseline socioeconomic information in the six permanent coastal communities and five randomly selected non-coastal communities, and we incorporated questions about the use of key terrestrial resources to account for potential trade-offs between marine and terrestrial resources (English version of questionnaire; Fig. 3).

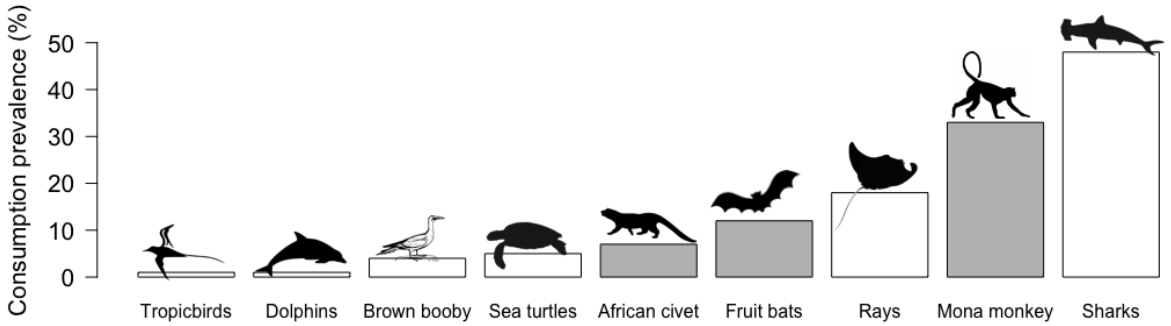

Figure 3. Prevalence of consumption of several marine and terrestrial taxa of conservation concern or interest by surveyed participants (N=869) in the island of Principe during the last 12 months prior to our study (Jan-Feb 2017). White bars illustrate coastal and marine species and grey bars refer to terrestrial species. Sea turtles are legally protected in São Tomé and Príncipe, making harvest, selling and consumption illegal. Mona monkey (*Cercopithecus mona*) and African civet (*Civettictis civetta*) are introduced species. Further details in Annex 12.

For example, based on this data collection we found that consumption of monkeys ($p<0.02$) and bats ($p<0.01$) was more likely in non-coastal communities and sharks ($p<0.001$), rays ($p<0.03$), brown boobies ($p<0.02$) and sea turtles ($p<0.05$) were more frequently consumed in coastal areas; no significant differences were found for consumption of civets, dolphins and tropicbirds. When comparing socio-demographic characteristics of respondents in coastal and non-coastal communities, we found that household size was larger in coastal communities (mean household size= 4.68 vs 4.3 in rural; $p<0.05$) and people in coastal communities were more likely to have emigrated from São Tomé than those in non-coastal communities ($p<0.01$). The remaining socio-demographic variables (i.e. age, gender, level of education and wealth) did not differ between areas. In addition, livelihood diversity (i.e. average number of different occupations divided per household size) was lower in coastal communities ($p<0.001$) and people were more likely to belong to an association if they lived in a coastal community ($p<0.05$). This information has been reported in a submitted peer-reviewed publication.

However, given that our project activities and interventions ended up having only localized impacts (see section 3.2), we weren't able to look into these potential ecosystem services trade-offs and social spill-over effects as a function of project interventions. Nevertheless, this baseline information will be useful for exploring impacts over time and space at longer-term; this type of data will be used to ascertain if, over time, potential changes in marine governance also reflect in use of other natural resources and social factors in both fishing communities and non-target communities (so this contributes to defining baseline for post-project assessments).

***Output 4. Capacity**: Increased local capacity and technical expertise to improve marine resource governance in Principe through tailored training programmes underpinning work for outputs 1-3.*

The number of training participants exceed those initially planned, both at community level and local staff. This training was essential for increasing local capacity and technical expertise, particularly in terms of livelihood interventions and biodiversity and social data collection. At the start of the project, none of this capacity was available locally and this was key for developing local capacity (trained staff and material available) for implementing activities that will carry on after this project (social and ecological monitoring; livelihood interventions).

Enhancing technical expertise of local staff (n=28, including 9 women) was a top priority, with multiple training sessions (e.g. biological and socio-economic data collection, GPS, project management, conflict mediation) delivered. Key staff training provided (more details in Annex 2):

- Training in fisheries landing surveys occurred on the 13th December 2016 (1 day x 7 participants, of which 2 were women). PF and the Fisheries Department were both involved in administrating this training session focused on explaining the rationale behind the surveys and the practical side of undertaking them (see photos). Fisheries landing follow-up visits to community focal points were conducted twice a week from 15th July 2017 to end of September 2017. This allowed us identifying key challenges in order to improve community engagement and data collection. A refresher session for the 6 focal points was then organized on the 5th October 2017 (blog and photos).
- Training in social data collection was provided on 1-2 February 2017 (2 days x 7 participants, of which 2 were women: see photos). Training was provided by UoE and focused on: good practices in social surveying (e.g. how to introduce themselves, remain neutral, no right/wrong answers); obtaining and recording consent; practice in conducting pilot survey. Similar training was provided to the new team repeating questionnaires in Jan-Feb 2019.
- On the 28th February 2017, GIS training was provided related to the deployment and collection of data from artisanal fisheries GPS trackers. Dr Kristian Metcalfe (UoE) ran this session, with participants including staff from PTF, UoE and the National Fisheries Department (4 participants, of which 3 were women; see manual and simplified instructions).
- As part of an ecotourism course taking place in Principe, we ran a 25h cartography module (24 July - 2 August 2017; 21 students, 9 of which women) aiming to develop capacity of local staff in both the conservation and tourism sectors (blog and photos).

- During 2 weeks (17 - 30 September 2017), training on Baited Remote Underwater Video Stations (BRUVS) deployment at sea was provided to 8 people (e.g. schematic illustrating devices) with support from Dr Phil Doherty (UoE), who helped us setting-up and implementing this methodology (blog and video).
- In 11-15 December 2017, PF's director, Estrela Matilde, attended the "Managing and Leading Conservation Projects" course in Cambridge (UK) hosted by the University of Kent, the Durrell Institute and FFI (blog and photos).
- From 22nd to 27th January 2018, project officer Litoney Matos attended a Conflict Mediation course ran by the Institute for Certification and Training of Lusophone Mediators (ICFML), at the Catholic University of Porto (Portugal; blog and photos).
- In June 2018, our research assistant Guillermo Porriños was trained on histological techniques (mounting and staining fish gonads samples and observation in the microscope); training was delivered for eight days (80 hours) by Dr Anke Lange in Prof Charles Tyler's laboratory at UoE.

We also provided training in 6 fishing communities to a total of 69 fishers or fish traders (including 47 women and 22 men). In addition to training for participating in specific monitoring activities (i.e. landing surveys), training was tailored according to community interventions:

- during five days (10-16 August 2017), fish traders and fishers (total: 25 people, including 17 women) participated in entrepreneurship classes where they learned how to evaluate and grow their business in a sustainable way (blog and photos). Based on participants' feedback, this was particularly useful for "learning how to assess if business is going well" (i.e. register sales and purchases), "learning how to manage business" and "how to treat customers", allowing them to "grow their own business initiatives" (e.g. fish trading).
- From 19 to 29 March 2018, a group of fish traders and fishers (total: 16 people, including 8 women) from Praia Burra received training in handicraft production (for example, with fish scales and sea shells; blog and media coverage). This training was related to the idea proposed by this community: creating a craft center to supplement their fishing activity and increase income by taking advantage of materials that otherwise would be wasted. Training was provided in collaboration with artisan from neighbour island Sao Tome.
- In collaboration with the Sao Tomean NGO Marapa, we held training on small business management on the 26th of April 2018 (blog and photo); fish traders of Praia Abade (all women; N=15 participants) participated to learn how to better manage their financial resources.
- On the 30th and 31st of May 2018, fish traders and fishers from Praia Abade (N=7 participants, among which 4 were women) learnt how to produce handmade soap using locally produced coconut oil (blog and photos).

All this training was then followed up by our project officers in order to ensure application into specific community interventions, with regular support provided by trainers. See Annexes 13-15.

3.2 Outcome

Outcome statement: *To enhance livelihoods and long-term sustainability of artisanal fisheries sector in Principe through the implementation of improved fisheries practices and laying foundations for co-management in fisheries-dependent communities.*

Considerable steps were made towards improving livelihoods of fishing communities through implementation of six community interventions targeting improved sustainability of small-scale fisheries. For example, based on follow-up social surveys conducted with 516 residents of fishing communities at the end of project (including 200 fishers and 158 fish traders; see protocol and English version of questionnaire), we found that residents of fishing communities targeted by our activities felt that the project had a positive impact mainly on improving the living conditions of fish traders and fishers. As described in our report presented to all stakeholders, the percentage of surveyed residents who thinks the project had a positive impact on each of our stated goals was (in descending order of percentage):

- improving the living conditions of fish traders (i.e. women): 63%
- improving the living conditions of fishers (i.e. men): 59%
- access to opportunities to improve living conditions of fishing communities: 54%
- use and management of marine resources: 50%
- involvement of fishing communities in fisheries decision-making: 42%.

Approximately 8% of respondents believe the project had some negative impacts. The remaining people felt the project did not produce positive or negative impacts.

In addition to directly asking about perceived impacts, we also explored potential effects on different wellbeing indicators (Table 1). Although all our six community-proposed interventions were supposed to generate economic benefits, in reality only three of them did so (another had good potential but the community group lacked motivation and unfortunately gave up after first sale event). Nevertheless, despite being active for 11 months, direct income benefits for people involved were virtually non-existent because they all decided to invest in more group materials to carry on and expand interventions (report produced for local partners in Portuguese with evaluation and recommendations about expansion of these interventions after this project). Given that our project ended up having only very minor impacts in terms of economic-generating activities, here we focus on governance and empowerment (i.e. influencing decision-making processes that affect their lives) as key poverty/wellbeing domains (Table 1).

When comparing these levels at the start of project (337 residents surveyed in six fishing communities: 151 fish traders and 186 fishers) with those at the end of project (358 residents surveyed in six fishing communities: 200 fishers and 158 fish traders), unfortunately we found negative trends for all the governance and empowerment metrics considered (men and women had similar answers, except for "perceived individual ability to influence marine protection" which seemed to be decreased less for men). While remaining at similar agreement scores (i.e. if, on average, people agreed with a specific statement, they were likely to still agree, although less strongly), on average there were decreases for all metrics; using this approach, we cannot conclude that wellbeing has approved. While it is possible that other factors outside of our control might have played a role (e.g. other governmental initiatives, delays in implementing community interventions, community frustration about lack of state support), this deserves careful consideration both from a methodological perspective (e.g. are these indicators adequate for capturing wellbeing differences at short term?) and in terms of planning for next initiatives (e.g. have we generated too many expectations in terms of community interventions and are we failing to reach wider beneficiaries in significant manner?).

Six committees for management of marine-related livelihood interventions ("community ideas") were established in five fishing communities (see Annex 10 for an example of committee establishment and agreement developed with one of the project communities); one of these committees was composed only of women, while the other five had mix gender representation (i.e. including both fishers and fish traders). Evaluation discussions at each community at the end of project (blog and photos) were key for assessing perceived impacts and next steps. For example, committee members were generally happy with opportunity and training provided, keen to carry on and expand activities although also clear about the need for further training and follow up visits for technical support. In contrast to the quantitative wellbeing assessment described in previous paragraph, qualitative insights from these discussions point to multiple wellbeing benefits for committee members involved in these interventions (Annex 11), including: generating some (but very little) income; promoting teamwork; knowledge exchange among community residents; enhanced access to materials; promoting cooperation between fishers and fish traders. To record feedback from local stakeholders involved in the project, we also produced a 22-min video showcasing current challenges and opportunities for improving fisheries practices in Príncipe and what people think about our project, including fishers, fish traders and governmental representatives (blog and video with English subtitles).

Table 1. Framework used to explore potential project impacts on wellbeing among fishers and fish traders in six fishing communities. This framework is based on Gurney et al. (2014)[1], with addition of complementary context-specific indicators identified as potentially important during focus group discussions (see English version of focus group guidelines). N.S.: non-significant.

Component measured	Indicator	Description	Estimated effects[2]	
			Survey year (Y1 vs Y3)	Gender * Survey year
Governance	Level of perceived compliance with fisheries regulations at community level	Agreement with statement "People in my community comply with fisheries regulations" based on a 5-point item	agreement decreased in Y3 ($p<0.02$)	N.S.
Governance	Community enforcement of fishing laws	Disagreement with statement "If anyone breaks fisheries rules, my community doesn't do anything" based on a 5-point item	disagreement decreased in Y3 ($p<0.001$)	N.S.
Governance	State enforcement of fishing laws	Disagreement with statement "If anyone breaks fisheries rules, authorities in Principe don't do anything" based on a 5-point item	disagreement decreased in Y3 ($p<0.001$)	N.S.
Freedom of choice and action	Level of freedom of choice and action	Composite scale on agreement with statements "I feel pleased about my occupation", "I can decide my own life's path" and "I have a lot of opportunities to decide my own life's path" based on sum of three 5-point items	agreement decreased in Y3 ($p<0.001$)	N.S.
Participation	Level of involvement in community decision-making	Agreement with statement "I am involved in decisions made in my community" based on a 5-point item	agreement decreased in Y3 ($p<0.001$)	N.S.
Participation	Level of involvement in fisheries management decisions	Agreement with statement "I am involved in decisions made about fisheries management in Principe" based on a 5-point item	agreement decreased in Y3 ($p<0.001$)	N.S.
Influence	Perceived individual ability to influence marine protection	Disagreement with statement "There's nothing I can do to protect the sea in Principe" based on a 5-point item	disagreement decreased in Y3 ($P<0.05$)	disagreement decreased less for men ($P<0.02$)
Influence	Perceived collective ability to influence marine protection	Agreement with statement "If people in my community work together, we can protect our sea" based on a 5-point Likert-type item	agreement decreased in Y3 ($p<0.001$)	N.S.

[1] Gurney, G.G., Cinner, J., Ban, N.C., Pressey, R.L., Pollnac, R., Campbell, S.J., Tasidjawa, S. & Setiawan, F. (2014). Poverty and protected areas: An evaluation of a marine integrated conservation and development project in Indonesia. *Glob. Environ. Chang.*, 26, 98–107.

[2] To account for the quantitative nature of Likert-type scales, ordered logistic regressions were used to assess potential effects. For each variable, a full model was considered including interaction between gender and survey year (to explore if project potentially impacted women and men differently). Statistical analyses were conducted in R version 3.4.4 (R Core Team 2018).

Although none of our community interventions end up focusing specifically on reducing harvest of key marine species (subject to illegal take and bycatch), we gathered information that can be useful to plan such interventions. Fish catch was recorded using landing surveys and we collected information from approximately 200 fishers regarding 1879 fishing trips over two years. 79785 captured animals were recorded (53 575 Kg in total) and we found that 90% of the captured total weight were pelagic species. More than 73 different species were captured and Blue runner, Bluespotted seabream, Frigate tuna, Atlantic sailfish and Gorean snapper were the most important in terms of total captured weight. Harvest of key marine species, such as sharks and rays, were, however, rarely recorded, suggesting that they were only occasionally and opportunistically caught. For example, sharks and rays were captured in 2% (N=36) and 0.4% (N=7) of the fishing trips. Complementary information was collected using socioeconomic questionnaires in Y1 to assess consumption of taxa of conservation concern (Annex 12). We found that sharks and rays were consumed by 52% and 20% of residents in fishing communities, respectively. During follow-up surveys in Y3, we found that these values had increased slightly (59% consumed sharks and 29% ate rays). Although we aren't able to ascertain what might be driving these changes, this requires further investigation by local partners.

We were successful in collecting social and ecological information related to fishing practices, allowing for more robust and informed management decisions. For example, Fig.4 illustrates fishing areas for each community obtained with participatory GPS tracking; this information is essential for delineating potential community managed areas and identifying areas of conflict with other types of use (e.g. industrial fisheries). Comparing to baseline levels of zero, by the end of project we produced: six comprehensive datasets (landing surveys; socioeconomics; small-scale fisheries mapping; coastal habitat mapping; marine biodiversity assessment; fish reproductive biology); one submitted peer-reviewed publication and two in preparation. An English version of the summary reporting results from these activities can be found here. In addition to frequent presentations of preliminary findings at local level (e.g. regional stakeholder events, community discussions, project partner meetings, updates to government representatives), at the end of the project, this information was summarized and presented to all key stakeholders (presentation slides, blog, photo and media coverage about regional event), including community groups, and data made available locally. Given low literacy levels, summary information and key recommendations were provided orally in communities (with laminated sheets illustrating key points) to enhance understanding and generate discussion (blog and photos).

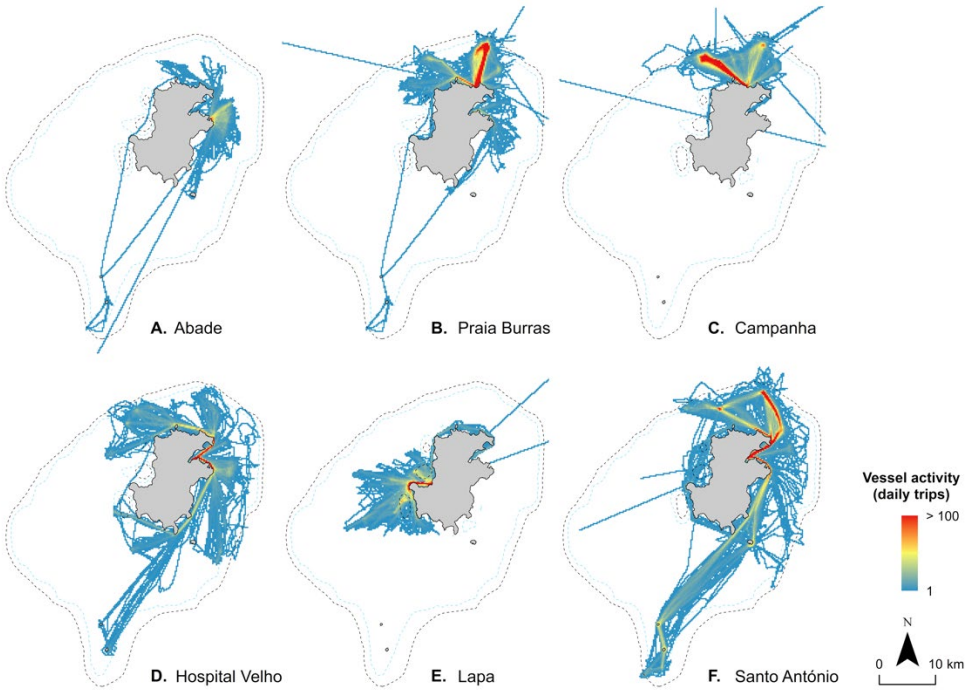

Figure 4. Maps of artisanal fishing representing activity level of vessels (i.e. number of fishing trips) for each community.

Throughout the project, our findings and progress were also presented at 14 different national and international events, namely: 2nd International Conference on Island Evolution, Ecology and Conservation: Island Biology 2016 - Angra do Heroísmo, Portugal (18-22 July 2016; conference programme); National Fisheries Week, Sao Tome (6-7 July 2017; presentation; blog and photos); IV Lusophone Congress of Environmental Education, Príncipe (17-20 July 2017; presentation; blog and photos); 3rd Marine Ecology and Conservation Network meeting, University of Exeter – UK (26 July 2017; presentation); ZSL and CIIMAR / CIMAR Associate Laboratory workshop to share best practice in working with communities for marine conservation, Matosinhos – Portugal (22 Jan 2018; presentation; blog and photos); First Congress of Marine Biology of Portuguese Language Countries, Faro – Portugal (24-26 January 2018; presentation); Conference of Financing Sustainable and Climate-Resilient Ocean Economies in Africa, Seychelles (at the invitation of World Bank Group; 22-23 February 2018; blog and photos); remote presentation at the seminar "Biodiversity - Contributing towards diversifying Angola's economy", Luanda - Angola (27-28 February 2018; video presentation); IV Biology Conference in São Tomé (21-24 May 2018; blog and photos); first meeting of the Abidjan Aquatic Wildlife Partnership, Ivory Coast (23-25 July 2018; presentation; blog and photos); lecture to fourth year of the course of Sciences of the Sea and Environment, in the University Lusófona in Bissau, Guinea Bissau (10 Nov 2018; blog and photos); invited presentation about marine conservation in Principe - Cambridge Conservation Initiative (26 April 2019; link); 2019 MARE People & Sea X Conference – Amsterdam, The Netherlands (25-28 June 2019; presentation); accepted upcoming presentation at the 15th European Ecological Federation (EEF) Congress "Embedding Ecology in Sustainable Development Goals" – Lisbon, Portugal (29 July – 2 August 2019).

3.3 Impact: achievement of positive impact on biodiversity and poverty alleviation

Impact statement: *Poverty alleviation, food security, and sustainable use of marine biodiversity through improved marine governance in Principe.*

This project aimed at improved food security, increased gender equality and poverty reduction in fisheries dependent coastal communities in the island of Principe, through a participatory social-ecological approach to enhance marine biodiversity and resource management. At the long-term, positive impacts on biodiversity are expected through its better management and improved fisheries practices, with an increase in the diversity and abundance of indicator species over time. Positive impacts on poverty alleviation are expected through an increase in income and wellbeing for both fishers and fish traders given the more empowered and better management of artisanal fisheries and implemented livelihood interventions.

We made progress in terms of implementing six community interventions that are directly linked to empowerment by adopting a fully participatory approach and, some of them, are linked to income-generating opportunities. By the end of the project, we were expecting to achieve improvements in wellbeing (e.g. freedom of choice and action) and, for some, additional sources of income. As described in the previous sections, we made some steps towards contributing towards the stated impacts at the longer-term but, at least at the short term, we cannot conclude that wellbeing has generally improved as a function of our interventions (see section 3.2).

In terms of biodiversity conservation, we gained a much better understanding of species abundance, distribution and resource use (section 3.2); based on this information and close work with all key stakeholders, our findings are linking into fisheries management recommendations (e.g. marine biodiversity distribution to inform processes of spatial protection). Our baseline social and ecological data will be used to monitor future impacts as initiatives by local partners progress.

4 Contribution to Darwin Initiative Programme Objectives

4.1 Contribution to Global Goals for Sustainable Development (SDGs)

Our project aimed to contribute to the following SDGs:

- Goal 1 (end poverty): the project aimed to contribute to decreased income and non-income poverty. We implemented six community interventions but, although all these community-proposed interventions were supposed to generate economic benefits, in reality only three of them did so. However, direct income benefits for people involved were virtually non-existent

because they all decided to invest in more group materials to carry on and expand interventions. Thus, our project ended up having only very minor impacts in terms of economic-generating activities at the short term. In addition, despite the several benefits described by committee members involved in these interventions (Annex 11), our data collected through socioeconomic monitoring does not support an increase in any of the wellbeing indicators (see section 3.2). It is likely that, given that these community interventions only started in late Y2/ start Y3 (timings due to logistical delays and participatory nature of decision-making process), these impacts will take longer to be achieved, particularly at wider scale (i.e. for those not directly involved in interventions at community level). Nevertheless, these interventions will be continued and expanded as part of new initiative and we will be able to monitor these effects thanks to baseline information and survey tools made available by this project.

- Goals 2 & 14 (food security & conserve marine resources): the project worked towards better managed local fisheries and reduced impact on other marine species, supporting regeneration of local biodiversity with expected increased catches by fishers in focal communities at the long-term. The project provided a better understanding of major issues at play (e.g. fishers catching undersized fish at bays) and worked towards providing specific recommendations to inform government decisions about fisheries management and protected areas. We collected baseline ecological and social data to assess these impacts later on. For example, based on this information, we produced technical reports and summaries with management recommendations related to fish reproduction, catch size and gear types, establishment of marine protected areas based on marine biodiversity assessment and addressing illegal, unreported and unregulated fishing. For example, Baited Remote Underwater Video Stations (BRUVS) are a non-invasive technique that allows recording diversity and abundance of marine species by attracting them into the field of view of an underwater camera with bait (blog and video); this information is now being used for determining spatial protection measures as well as measuring biodiversity impacts over time and space. Thanks to all these efforts, a new initiative is now underway to establish the first network of marine protected areas in São Tomé and Príncipe through co-management approach; during the next five years, our information, enhanced local capacity and management recommendations will be capitalized upon, contributing towards food security and marine conservation.
- Goals 4, 5 & 8 (gender equality & lifelong learning & inclusive sustainable economic growth): our project targeted women (fish traders and staff) for capacity building and training, as well as providing direct employment for local residents and stimulating sustainable business opportunities (e.g. handicraft centre). For example, all of our six community interventions benefited women directly, with one of them focusing only on women (i.e. fish traders). See section 4.4.
- Goal 12 (sustainable consumption): “community ideas” within our project (e.g. handicraft production with fish scales and sea shells) are a contribution towards enhancing efficiency of marine resource use, aiming to achieve sustainable management of natural resources. This also raised awareness about using fisheries by-products as sources of income.

4.2 Project support to the Conventions or Treaties (CBD, CITES, Nagoya Protocol, ITPGRFA)

The work undertaken in this project was intended to support Sao Tome and Principe meet obligations under two of the following major biodiversity conventions:

- contribution to all CBD’s Strategic Goals: (A) mainstreaming biodiversity, focusing on environmental awareness (Aichi 1), integration of biodiversity considerations in development and poverty alleviation (Aichi 2), sustainable fisheries management (Aichi 4); (B) reducing direct pressures on marine biodiversity and promoting sustainable use (Aichi 6); (C) improving the status of biodiversity focusing on enhanced management (Aichi 11), reduction of exploitation of threatened sea turtles and sharks (Aichi 12); (D) enhancing benefits from biodiversity through sustainable livelihood opportunities with a focus on women and the poor (Aichi 14); (E) enhancing implementation through participatory planning and capacity building (Aichi 18 & 19). Progress made by our project was particularly relevant in terms of defining and implementing livelihood opportunities, stimulating participatory and empowered decision-

making by fishers and fish traders (i.e. women), while obtaining a better understanding of biodiversity considerations for advising conservation and management.

- At its planning and inception, CITES was listed as a major convention to be informed by our work; our project aimed to inform governmental decisions by providing evidence about the international trade of endangered species and support legislative changes to enable CITES ratification. Whilst this remained an important consideration, based on findings obtained during Y1, we realized the scale of this issue on the island is probably very small and reducing. For example, based on informal conversations with two previous shark fin traders, the income generated was very small and they stopped doing it because the effort wasn't worth it as the price offered by middlemen reduced drastically (around 75% reduction). Although there seems to be some international trade through links in Nigeria, we found that sharks and rays are mainly caught opportunistically (see section 3.2). Nevertheless, baseline information about domestic consumption, harvest and trade of species listed in CITES Appendix I (e.g. marine turtles) and CITES Appendix II (e.g. manta rays, hammerhead sharks) was obtained as part of our socio-economic questionnaires (Annex 12). During Y2, we met the CITES focal point and he attended our presentation at the National Fisheries Week where we reported preliminary findings (6-7 July 2017; blog and photos). In addition, we have also presented this information to an international audience at the First Meeting of the Abidjan Aquatic Wildlife Partnership, Abidjan, Ivory Coast (23-25 July 2018; presentation; blog and photos); this event was attended by representatives from government agencies and environmental organizations from West and Central Africa.

4.3 Project support to poverty alleviation

As discussed in sections 3.2 and 4.1.

4.4 Gender equality

As demonstrated in activities and indicators reported in section 3.1, this project worked to address gender equality by: promoting capacity building and employment for women staff; targeting both fishers (generally men) and fish traders (generally women) as key actors of artisanal fisheries and involving them throughout all project stages (including design of project activities and proposal of community interventions); collecting social and economic information from 1 man and 1 woman per household, thus allowing gender differences to be identified and accounted for when developing and implementing interventions; organizing discussions for men and women separately in order to allow for differences in experiences, opinions and social dynamics to be respected and accounted for. Notably, during Y2 we made explicit that at least 50% of winning community proposals should directly benefit women (i.e. fish traders); in the end, all of our six community interventions implemented benefit women, with one of them focusing only on women (i.e. fish traders).

4.5 Programme indicators

- **Did the project lead to greater representation of local poor people in management structures of biodiversity?**

No formal management structures of biodiversity have been established or improved (e.g. see section 3.1 for issues about fisheries associations). However, based on participatory research during Y1, we decided to adopt a community-driven approach to identify interventions for improving sustainability of small-scale fisheries in Principe. Six community interventions were implemented, each one with their respective management committee, operational plan and business model; one of these committees was composed only of women, while the other five had mix gender representation (i.e. including both fishers and fish traders). By focusing on participatory approach, we promoted community engagement and local ownership.

- **Were any management plans for biodiversity developed and were these formally accepted?**

All the baseline biodiversity and social information collected throughout our project (i.e. marine biodiversity assessment, coastal mapping, fish reproduction, landing surveys, mapping of fishing areas and socioeconomic assessments) is currently being used to identify areas and processes

for establishment of first network of marine protected areas in São Tomé and Príncipe; this is a joint endeavour by Fauna & Flora International (FFI) in partnership with Oikos, Marapa and PF, with the collaboration of UoE with governmental support.

- **Were they participatory in nature or were they 'top-down'? How well represented are the local poor including women, in any proposed management structures?**

See above.

- **How did the project positively influence household (HH) income and how many HHs saw an increase?**

We are unable to report any household income change at this point because our project ended up having only very minor impacts in terms of economic-generating activities at the short term. Nevertheless, economic information has been collected and will be used to infer changes at longer-term.

- **How much did their HH income increase (e.g. x% above baseline, x% above national average)? How was this measured?**

See above.

4.6 Transfer of knowledge

This project focused on: knowledge transfer within, and from, fishing communities; management decision-making; and scientific reports and peer-reviewed publications. Portuguese versions (or executive summaries in Portuguese) of all relevant documents are available for increased local use of, and access to, produced information. For example, fisheries data collection and analysis were followed by results' sharing with fishers and traders to enhance their understanding and emphasize the importance of their role in data collection. This was essential for demonstrating project outcomes, seek their feedback and maintain engagement. This took place through village meetings. For example, preliminary individual, community and island fishing maps have been produced (blog and map). To protect fisher anonymity and privacy, only community and island maps are shared with other stakeholders. Preliminary information from landing surveys has also been summarized (see example summary) and discussed with fishers. The GPS tracking and resulting fishing maps have been perceived as particularly useful by many stakeholders, including the National Fisheries Department and other NGOs; similar information is now also being collected in Sao Tome by Oikos.

We also targeted a range of other key stakeholders (government decision makers, biodiversity/planning professionals) and the general public. Using a variety of media proved successful: project website (available in Portuguese and English); documentary; public meetings; regional radio; national TV and international TV. We believe this was crucial in terms of achieving expansion of our project activities to the neighbour island of Sao Tome in the next five years. Our project activities were also disseminated to national and international audiences by being covered as a 3-page section in PTF's 2017 annual report.

Finally, we shared knowledge with the international conservation science and practice community by presenting our findings and progress at 14 different national and international events (see section 3.2) and submitting 1 peer-reviewed article (another 2 in preparation) in collaboration with project partners, contributing to conservation science and learning within developing countries. For example, capitalizing on an International Conference on Environmental Education that happened in Principe during Y2, we magnified the impact and dissemination potential of our preliminary findings in other Portuguese-speaking countries.

Thanks to collaboration within our project, one male student (University of Cambridge, UK) completed his MSc degree (Conservation Leadership), one female student (Universidad Autónoma de Madrid, Spain) completed her research dissertation for her BSc degree (Biology) and one female student (University of São Tomé) has nearly completed her dissertation for her BSc degree (Biology). In addition, a recent female BSc graduate from University of Aveiro (Portugal) undertook a 6-months internship with us, thanks to Erasmus+ funding.

4.7 Capacity building

As discussed in section 3.1, our project had an important capacity building component, both at community and local staff levels. For example, our main Darwin officer (Litoney Matos) was hired for this project and, since then, has taken a number of new responsibilities within Principe Foundation and as liaison with government and communities. This was facilitated by a number of training opportunities he gained through this project, including attending a Conflict Mediation course ran by the Institute for Certification and Training of Lusophone Mediators (ICFML), at the Catholic University of Porto (Portugal; blog and photos) and giving a number of public presentations at regional and national level: National Fisheries Week, Sao Tome (6-7 July 2017; presentation; blog and photos); IV Lusophone Congress of Environmental Education, Príncipe (17-20 July 2017; presentation; blog and photos); IV Biology Conference in São Tomé (21-24 May 2018; blog and photos). This greatly developed capacity and internationalization of partner institution.

After completion of our project, four (including 2 women) of our six focal points gained job contracts with Principe Foundation to carry on fisheries monitoring activities, and one of our project assistants (Cileine Fernandes) had her contract renewed with PF to carry on activities within new BAF project. Also, Lindo (Manuel Graça), who benefited from training delivered within our project (e.g. deploying underwater cameras), has now been promoted within PF and will undertake a number of tasks related to supervision of focal points and marine fieldwork; Lindo had never touched a computer in his life and hasn't completed formal primary education but, thanks to access to new training opportunities, is thriving in his new responsibilities.

Based on our project progress self-reflection and feedback form completed by key staff every 6 months (see Annex 16), "the participatory nature of all activities", "the diversification of the activities and partners" and "being able to do so much with so little money" have been described as project highlights, while, in personal terms, also being a "challenging but enriching experience" and opening "windows for knowledge exchange" among staff. Capacity building of the local partners was indeed one of our biggest achievements, as stated by Principe Foundation's director:

> "*Because of Omali* [this project] *we have now a trained team, we have a fantastic relationship with the communities and the local entities, and we have important basis for the new Blue Action Fund project. We truly appreciate our partnership with Exeter and everything we learned."*

Enforcement capacity has also been enhanced at national level. In collaboration with Flora & Fauna International (FFI) and University of Cambridge, a MSc student (Conservation Leadership) undertook a placement looking at "Assessing options to mitigate the impacts of illegal, unregulated and unreported fishing on Príncipe". This entailed a student visit to Sao Tome and Principe from 13th to 24th June 2017 and conducting interviews with governmental departments and fishing communities to discuss impacts from IUU fisheries and consider ongoing and potential monitoring, control and surveillance (MCS) programs (e.g. VMS, AIS, and community-based approaches). This report has been submitted in August 2017 and a summary produced (see here; thesis available upon request) and then translated for local dissemination. Based on project discussions and priorities identified, equipment allowing the National Fisheries Department to use Automatic Identification Systems (AIS) to identify potential IUU fishing was provided by MarineTraffic.com. This is now been fully installed and has been working since 15th August 2018 (blog and photo; link to Sao Tomean AIS station). This substantially increases national capacity to detect and potentially control industrial fleets passing through Sao Tomean waters.

5 Sustainability and Legacy

We aimed to improve local capacity for self-sufficient marine management over the long-term, while acknowledging that building long lasting capacity and institutions is a slow process. We thus focused on fostering local stewardship and communicating benefits clearly. Enhanced partnerships between communities and other stakeholder groups ensured the visibility and

durability of project results, providing incentives for continued involvement. After project completion, all stakeholders (communities, NGOs, government) continue to have an interest in the long-term success of our approach since its aims correspond closely to current priorities of all these groups and existing needs.

This project was the first of its kind in Principe. This greatly enhanced both national interest in our project and the potential to draw wider recommendations for the region by piloting novel approaches as well as drawing comparisons across islands. We made all our project material, including presentations, survey protocols and forms, available to collaborators and the wider public (see resource section in project website).

By investing in capacity and engagement of local staff and communities, we aimed to enhance the sustainability and legacy of the project. Our activities were designed and implemented in order to promote active local participation and increase resilience in case of reduced external support. Particularly during Y2 and Y3, we strengthened national and international links to prepare next steps and post-project sustainability. Thanks to these efforts, we have been able to obtain funding from the Blue Action Fund to carry on and expand our activities during the next five years. This will benefit from all the trained staff and material made available thanks to our project. In addition to establishing best practice and baseline information to be used and reassessed over time, after project completion, social-ecological monitoring protocols will be used by locally trained staff, with implementation underpinned by project partners Principe Trust, Biosphere Reserve and Fisheries Department. Collaboration with Sao Tomean university also enhanced legacy of the project.

6 Lessons learned

- Be flexible (and thankful for DI's flexibility): compared with our initial proposal, we had to delay the start of our project, employed more field staff than planned, postponed the start of livelihood interventions to Y2 (with subsequent financial changes) and amended our key indicators to focus on broader non-income impacts. These changes (all approved by DI) were key for allowing for local challenges and complexities to be properly accounted for. For example, given the small population size and limited conservation capacity on the island, initially we struggled with hiring the main project officer. However, by allowing for late project start, we were able to identify and hire a local project officer who demonstrated great potential for progression in the field and became a key liaison with local communities; this was crucial for the success of the project.

- Choose partners wisely: Although our application only included the Regional Fisheries Department as a project partner (i.e., not the National Department), when the project started and as it progressed, it became very clear that the Regional branch did not have the capacity, information access or power to operate as a functional partner on its own. Given the autonomous status of the island, this is a sensitive consideration but it was obvious that a better link to the National government was needed for the project to be successful and enhance potential uptake of recommendations. Thus, we frequently provided project updates by email and face-to-face meetings in São Tomé. A focal point from the National Fisheries Department was identified in February 2017 and we were regularly in touch to discuss survey protocols and project activities, as well as doing project visits and attending general project meetings. This was particularly useful in terms of achieving expansion of our activities to neighbour island post-project.

- Things take time (a lot of time!): although being clearly defined in October 2017, the implementation of community interventions took much longer than planned due to bureaucracy, logistic delays in material transportation to the island, governmental approvals for construction, etc. These six interventions only started in May-June 2018, leaving us less than 11 months for trialling, improving and assessing viability of expansion. Throughout this implementation period, providing regular updates to everyone involved was crucial, particularly communities so it was clear why arrival of materials, etc, was delayed. In addition, national and regional elections occurred on the 7th October 2018, with busy campaigning during most of September (meaning community activities and government meetings were reduced during that time).

- Participatory approaches mean communities may not agree with the project partners about what is needed: the six target communities presented proposals for interventions to be implemented. The selection panel, including representations from all partner organizations, decided that, although with different levels of funding (ranging from £1065 to £3550), 6 out of 7 proposals deserved to be supported. This means that one community (Hospital Velho) was not allocated funding for implementing a community intervention. We found this to be a particularly difficult situation as it could lead to potential conflict and/or disengagement. Even more importantly, this non-funded proposal (getting a motorbike to improve transportation of people and fish) came from the biggest fishing community on the island, which means we would decrease our ability to directly benefit a considerable portion of the fishing population. There were multiple reasons for this decision, as well as important considerations for next steps and applications elsewhere: based on previous regional projects in which partners were involved, motorbikes had been already provided in several communities and were found to be difficult to manage (e.g. fuel expenses, people using them for personal use); this was the most expensive proposal and would exceed stipulated budget; people proposing this intervention had some support from wider community but, overall, this would only benefit a small group of people; several people from this community had attended our meetings to discuss potential ideas but struggled with identifying ideas to be proposed and/or agreeing on ideas to put forward. While we did our best to generate ideas for discussion, disseminate information, facilitate group discussions and provide support as required, everyone in the panel also felt giving them a motorbike would be unfair to the other communities, who were much more committed. We should keep in mind that, even adapting a fully participatory approach, not everyone is willing to participate and our incentives might not be enough for generating participation (for example, because the other communities are smaller, our funding represents a more considerable investment for them).
- Build a strong local network: as mentioned in section 2, high staff turnover and complete restructuration of the main host partner organization were considerable challenges (e.g. from planning to end of this project, PF had four different directors with different perspectives about project implementation). This required an increased field presence to provide technical and management support as well as maintaining good and regular communication with a wide range of people in order to promote institutional legacy and buy-in.
- Use mixed-methods for impact assessment (and be realistic about time and spatial scales at which they might occur): because we used socioeconomic questionnaires and focus group discussions to gather evidence about impacts, we could verify that there was a potential mismatch between what committee members vs general community perceived in terms of project benefits. Extent of our community interventions (in terms of number of beneficiaries and generation of economic benefits) was also much more modest than initially planned. Nevertheless, we believed, using a participatory approach for defining and implementing these interventions was more suitable than focusing on wider but more top-down approaches.

6.1 Monitoring and evaluation

Compared with our initial proposal, the logframe was amended (all changes approved by DI) because we had to delay the start and end of our project, postponed the start of livelihood interventions to Y2 (with subsequent financial changes) and amended our key indicators to focus on broader non-income impacts. Considering the type of community-chosen livelihood interventions implemented throughout our project (e.g. creating community headquarters, handicraft centre), we revised our project outputs and indicators so that we would: focus on a wider range of wellbeing benefits; account for more accurate magnitude of implemented interventions and amount of people directly (and indirectly) affected; be more realistic about steps taken (and still required) for effectively establishing fisheries co-management.

As reported in several other sections, monitoring and evaluation was an intrinsic component of this project. Based on definition of community interventions now implemented, we had to adapt our approach so that it focused on more qualitative assessments as well (rather than a single quantitative approach through the use of household questionnaires). Acknowledging that an economic metric for wellbeing improvements would be too narrow, we included a wide range of metrics capturing potential changes in, for example, empowerment and freedom of action.

Visits of people external to the project (e.g. focal point from National Fisheries Department, University of São Tomé, FAO, Blue Action Fund and KfW Development Bank) were used to received feedback about progress and suggestions about areas for improvement. This has been particularly useful in terms of planning expansion of livelihood interventions (particularly, suggestions about increasing production and improving business models).

6.2 Actions taken in response to annual report reviews

All comments from reviewers have been addressed in previous annual and 6-months reports and, if needed, subsequent changes have been approved by DI (after discussing with project partners). As suggested by reviewer in previous annual review, in this report we provide plenty of evidence about outputs (not simply inputs).

7 Darwin identity

This project is recognized as a distinct initiative with a clear identity. It has been locally named as "Omali vida nón" (Sea, our life) thanks to suggestions from fishers and fish traders. We produced a project logo (Fig. 5) and project website which we used to advertise and inform about project activities and outputs to an international audience. We produced abundant reports and summaries in Portuguese that were shared locally. All project documents include the Darwin Initiative logo, which has also been used in international and national presentations, project template forms and summaries for dissemination (e.g. Presentation at Congress of Marine Biology of Portuguese Language Countries).

Given the reached visibility of this distinct initiative and its unique approach, the project partners decided that, to sustain and harmonize efforts, the new initiative funded by the Blue action Fund will carry on using this name and logo.

Figure 5. Project logo

8 Finance and administration

8.1 Project expenditure

Project spend (indicative) since last annual report	2018/19 Grant (£)	2018/19 Total actual Darwin Costs (£)	Variance %	Comments (please explain significant variances)
Staff costs (see below)			+4.00%	
Monitoring & Evaluation			+1.05%	
Consultancy costs				
Overhead Costs			+0.02%	
Travel and subsistence			-11.38%	reduced flight costs
Operating Costs			-8,41%	
Capital items (see below)				
Others (see below)			-9.95%	
TOTAL				

Staff employed (Name and position)	Cost (£)
Ana Nuno, Research Fellow	
Litoney Matos (Project coordination assistant)	
Cileine Fernandes (Project assistant)	
Yodiney Santos (Project assistant)	
Carlos da Silva Lopes Ribeiro (Focal point)	
Rolan Varela Pires dos Santos (Focal point)	
Marilene dos Anjos Rodrigues Sousa (focal point)	
Leonel Adelino Gomes (focal point)	
Victorino Santana José da Costa (focal point)	
Herlanda Semedo da Silva (focal point)	
TOTAL	

Capital items – description	Capital items – cost (£)
TOTAL	

Other items – description	Other items – cost (£)
Fieldwork and conference/workshop consumables – PF Fieldwork and conference/workshop consumables – UoE	
TOTAL	

8.2 Additional funds or in-kind contributions secured

Source of funding for project lifetime	Total (£)
University of Exeter Salaries	
University of Exeter Overheads	
Partner Salaries	
Partner Travel & Subsistence	
Partner Operating Costs	
Additional funds for fish maturity study and BRUVS from Africa's Eden	
Additional funds for BRUVS from the Halpin Trust	
TOTAL	

Source of funding for additional work after project lifetime	Total (£)
Blue Action Fund grant to carry on and expand project activities (5-yrs follow-up project: “Establishing a network of marine protected areas across São Tomé and Príncipe through a co-management approach”)	
TOTAL	

8.3 Value for Money

Following an effective value for money approach, we used open access and freely available tools, making the best use of resources (e.g. R for statistical analysis, Dropbox for sharing files). As part of UoE’s open access policy, all scientific publications will be uploaded to Exeter’s repository, Open Research Exeter (ORE), thereby reducing spend on open-access publication costs. The project has drawn upon international expertise and benefited from training and hiring local staff to conduct project activities. This represented great gains in terms of knowledge transfer and job creation. São Tomé and Príncipe is a relatively low cost country to work in and we spent as little as possible to achieve our results (e.g. we don’t pay per diems but allocate funds for food and transportation, if required).

This project was the first of its kind in Principe and thus all project investments were essential for producing novel and much needed findings with management implications. Receiving Darwin funding helped us leverage additional funding (section 8.2). Finally, by expanding our project activities to São Tomé (population around 190,000 ppl) over the next five years, we will greatly increase the reach of our findings; this resulted in post-project funding totalling >£1.7 million.

Annex 1 Project's original (or most recently approved) logframe, including indicators, means of verification and assumptions.

The logframe pasted below is the most recently approved version, containing small amendments requested on the 30th September 2018 and approved on the 19th November 2018.

Project summary	Measurable Indicators	Means of verification	Important Assumptions
Impact: Poverty alleviation, food security, and sustainable use of marine biodiversity through improved marine governance in Principe. (Max 30 words)			
Outcome: To enhance livelihoods and long-term sustainability of artisanal fisheries sector in Principe through the implementation of improved fisheries practices and laying foundations for co-management in fisheries-dependent communities.	**0.1** **Wellbeing improved for at least 50% of >500 fishing households in >5 communities** with both fishermen and female fish traders reporting the increase (domains to be measured using locally defined indicators: income, engagement, and freedom of choice and action) by **year 3** (baseline established in **year 1** and re-examined as part of the project in **years 2 and 3**).	**0.1** Data collection (household surveys, focus groups and workshops to generate baseline and monitor effects of interventions) and analysis, peer-reviewed publication and reports.	Government Departments remain amenable to implementation of fisheries co-management approach. **Note 1:** Fisheries Department Biosphere Reserve Management Unit are project partners and members of the steering group, and have been involved in identifying priorities, will benefit from capacity building and expansion of staff team and will remain fully involved throughout the project.
	0.2 Committees for management of marine-related livelihood interventions established with inclusive and equitable representation of fishers and fish traders and management initiatives implemented in at least **5** (60%) of Principe's fisheries-dependent communities by **Q3 year 3**. Current baseline is **zero**.	**0.2** Production of information synthesis document; biodiversity monitoring data; technical reports; records of feedback and stories of change from local stakeholders involved in the project; records of feedback and stories of change from community members. Press releases.	Fishing communities and government retain commitment to sustainable use of marine resources. **Note 2**: We will keep engaging communities throughout project implementation and evaluation given its participatory approach. See also **Support Letter E** by the President of Principe, and **Support Letter D** by the Department of Fisheries.
	0.3 Harvest of key marine species (subject to illegal take and bycatch) by **≥5** focal fishing communities (**>15 fishers** per community surveyed) will be quantified and significantly reduced by **year 3 as a result of community interventions** (baseline SMART reduction targets established in **year 1** and re-examined as part of the project **in years 2 and 3**).	**0.3** Data collection (household and fisher surveys and stranding records), peer-reviewed publication and reports.	Country remains politically stable. **Note 3**: Sao Tome and Principe has been relatively stable for several decades and is generally peaceful, with most visits trouble-free, as stated by FCO. Retention of key staff and/or ability to appoint replacements. **Note 4:** Key staff have been involved since the scoping visit and through continuous training and reassessment we will ensure skills are

	0.4 By year 3, information on **artisanal and emerging industrial fisheries sectors** (magnitude, seasonality, distribution, methodology target/non-target species, effort, dependency, threats and challenges, trade and value) and **best practices** is available to policy-makers, stakeholders and community groups**.** The number of datasets, action plans for priority species and number of peer-review publications from the current **zero** baseline will increase incrementally in **years 1, 2 and 3.** **0.5** By **Q3 year 3**, local staff including **at least 5 Darwin Field Officers** (women will be encouraged to apply for positions) have the capacity to support and advise biodiversity and social monitoring, environmental awareness raising and management of marine resources in Principe (baseline capacity level established in **year 1** and re-examined as part of the project in **years 2 and 3**).	**0.4** Production of information synthesis document; reports from meetings with the government; government documents; press releases; number of public presentations, and peer-reviewed publication. **0.5** Training materials and sessions; capacity assessment records to evaluate understanding, impact and application of training content and key principles; records of feedback from local staff and local communities. **NB To support the monitoring of sustainable development goals, data will be disaggregated by income, gender, age, race, ethnicity, migratory status, disability, and geographic location, when appropriate and relevant.** **NB All data and reports will be disseminated to project partners for future management.**	transferable between and within organizations and that staff are able to disseminate skills in future training. There are no major economic shocks, or anthropogenic or natural disasters affecting fish yield and community capacity to prioritize fisheries management.
Outputs: **1. Fisheries and livelihoods:** Increased understanding of artisanal fisheries and resilience of sector to threats and best practices for reduction of fishing pressure on non-target species of conservation concern achieved through participatory research and community-engagement.	**1.1** Household specific livelihoods opportunities, capacity and training needs are identified through participatory methods with individual beneficiary households by **Q3 year 1** and training delivered by **Q2 year 2**, specifically targeting female-headed households (**> 15 fishers and 15 females in at least 5 focal fishing communities**).	**1.1** Household socio-economic surveys. List of needs and gaps produced. Workshops delivered, training course attendance (number of attendees and certificates), number of practical training days. Training material produced.	Project partners, especially fishing communities and Government, retain commitment to sustainable use of marine resources. **Note 2 above** Target local community groups remain willing to explore and engage in research and co-management of fisheries. **Note 5:** We will place a great emphasis on project communication so that everyone involved

	1.2 Knowledge of current barriers to sustainability, needs and threats for fishers identified through participatory research in **year 1** (>**5 (60% of) fishing communities; >30** participants per community + key regional and national stakeholders) through household surveys and individual participant surveys, targeting fishers (male) and traders (female).	**1.2** Household socio-economic surveys. Reports including findings from scenario analysis and threat ranking exercises produced by **year 2 Q1**.	understands importance of their participation and is aware of project steps, outcomes and fisheries management benefits. Target local community groups remain willing to explore and engage in livelihood diversification and enhancement activities. **Note 2 above**
	1.3 Spatiotemporal patterns of resource use, seasonality (effort), target species, and distribution data for baselines and future comparison are assembled by **Q1 year 2** (**> 15 fishers in >5 fishing communities**) and re-examined as part of the project in **years 2 and 3**.	**1.3** Workshop reports, interim field reports, Darwin project website. Synthesis document/report and recommended actions on artisanal fisheries produced by end **year 3 Q1**.	The success of the pilot interventions will be sufficient enough to encourage more families, especially women-headed households, to trial interventions. **Note 5 above**
	1.4 Increased understanding of fisheries practices and drivers behind illegal/unsustainable fishing activities understood and **multiple interventions explored** (e.g. better access to storage facilities, markets, and reduction of catch losses) and **bycatch-reduction strategies identified** through participatory research by **start of year 2**.	**1.4** Surveys / focus groups. Report on take and trade of **CITES** listed species by **year 2 Q3**.	
	1.5 Interventions are identified, costed, and assessed by stakeholders and local partners and a **minimum of 2 piloted** to reduce bycatch and harvest of protected resources during **year 2**. Best strategies are disseminated and implemented in **>5 fishing communities** by the **end of year 2.**	**1.5** Synthesis and recommendations report for government regarding fisheries practices by **year 3, Q1**.	
	1.6 Increased understanding of linkages between livelihoods (e.g. dependency,	**1.6** Peer reviewed publication on livelihoods and fisheries by **year 3 Q3.**	

	vulnerability, loss evaluation) and fisheries practices by **year 3 Q3**.		
2. Laying foundations for establishing co-management: to improve long-term sustainability of fisheries sector through improved and empowered governance.	**2.1** Community management establishment process initiated by **Q2 year 2** and participatory research **>5 fishing communities** by **Q3 year 2** to identify key values and requirements lays foundations for development of fisheries co-management strategies (e.g. fisheries co-operatives). **2.2** Baseline fisheries and social data following establishment of community management process are assembled by **Q3 year 2** (**>5 fishing communities**) and re-examined as part of the project in **year 3**. **2.3** Committees for management of marine-related livelihood interventions identified for > 5 fishing communities by **year 3 Q1** and terms agreed by end of **year 3, Q2**. Current baseline is **zero**. **2.4** Annual operational plans for marine-related livelihood interventions are developed, and reviewed by stakeholders and local/national partners by **year 3.** Current baseline is **zero**. **2.5** By the end of **year 3**, preliminary lessons and potential implications for co-management are considered by the government as a marine resource management example for potential replication in other areas.	**2.1** Workshop reports, interim field reports, Darwin project website. **2.2** Fisheries, data collection (household surveys, focus groups and workshops to generate baseline and monitor changes). **2.3** Workshop reports, interim field reports, Darwin project website. **2.4** Annual operational plans. Workshop reports, interim field reports, Darwin project website. Evaluation reports from local partners. **2.5** Synthesis and recommendations report for government regarding fisheries co-management. Reports from meetings with the government; government documents and press releases.	Project partners, especially fishing communities and Government, retain commitment to sustainable use of marine resources. **Note 2 above** Target local community groups remain willing to explore and engage in research and co-management of fisheries. **Note 5 above**
3. Ecosystem services trade-offs and social spill-over effects assessed across the island to observe the role of improved	**3.1** Ecological and resource use assessments on terrestrial and marine biodiversity (dietary recalls, landings and bycatch surveys) undertaken in **>**5	**3.1** Fisheries, data collection (household surveys, focus groups and workshops to generate baseline and monitor changes).	Target local community groups remain willing to explore and engage in research. **Note 5 above.**

fisheries practices and co-management in facilitating these wider-scale insular effects.	fishing communities and at least **5 non-fishing** communities (**> 30 participants** per community; 50% female). Baseline established in **year 1** and re-examined as part of the project in **years 2 and 3.** **3.2** Social assessments undertaken in **>**5 fishing communities and at least **5 non-fishing** communities (**> 30 participants** per community; 50% female) to assess impact on individuals' wellbeing (domains to be measured: material, security, and freedom of choice and action). Baseline established in **year 1** and re-examined as part of the project in **years 2 and 3**. **3.3** Increased understanding of wider scale (negative and positive) effects of improved fisheries practices (interventions) and co-management synthesised by **year 3 Q2.**	 **3.2** Data collection (household surveys, focus groups and workshops to generate baseline and monitor changes). **3.3** Peer reviewed publication on wider scale effects of improved fisheries practices and co-management by **year 3 Q3**.	
4. Capacity: Increased local capacity and technical expertise to improve marine resource governance in Principe through tailored training programmes underpinning work for **outputs 1-3.**	**4.1** Technical capacity, specific training needs of local **staff** (**at least 10 ppl**) and critical gaps in community conservation capacity assessed and training programmes finalised by **Q1 year 2**. **4.2** Training programmes for **staff** (biological and socio-economic sampling methodologies, geographic information systems, data management and analysis) **delivered by Q1 year 2** and trainee skills for marine management assessed and evaluated semi-annually with follow up training in **year 2** as required. **4.3** Potential monitoring, control and surveillance (MCS) programs (e.g.	**4.1** Workshops delivered (at least 5), training course attendance (number of attendees and certificates), number of practical training days, list of needs and gaps produced, training material produced. **4.2** Workshops delivered, number of participants trained, capacity assessment scores, trainees' feedback and perceptions forms. Training material provided for future use. **4.3** Report on available options, cost-benefit analysis, capacity needs.	Retention of key staff and/or ability to appoint replacements. **Note 4 above** In country partners remain willing to learn and be actively involved in the implementation of the project. **Note 6:** <u>The issues and interventions described in this proposal have been identified through a **collaborative exercise** and the bid developed in partnership.</u>

	VMS, AIS, and community-based approaches) identified and cost-benefits assessed by end of **year 2, Q3** to address potential threats associated with an emerging industrial fisheries sector and illegal, unreported and unregulated (IUU) fishing effort.		

Activities (each activity is numbered according to the output that it will contribute towards, for example 1.1, 1.2 and 1.3 are contributing to Output 1)

1.1 Engagement with fishing communities to gain permission and build on existing relationships with local partners in order to quantify and describe artisanal fisheries and their spatio-temporal extent as well as drivers and characteristics of potentially illegal harvest, domestic and international trade and bycatch.

1.2 Assess the current technical capacity, needs and critical gaps of fishers and fish traders in local communities using focus groups, participatory workshops and gap analysis.

1.3 Develop and deliver training programme tailored to meet critical local needs.

1.4 Field data collection and analysis. A mixed methods approach will be used combining specialized questioning techniques, socio-psychological scales, participatory market chain analysis and SWOT (strengths, weaknesses, opportunities and threats) analysis on livelihood alternatives. Data collected will also include mapping current use of fishing locations, gear types in both artisanal and emerging industrial fisheries as well as socio-economic data about the processing and trade sector.

1.5 Pilot and implement multiple interventions for increasing fisheries profitability, income diversification and/or improving fisheries management based on project findings.

1.6 Monitor adoption of activities, feedback and social-ecological (perceived and actual) outcomes.

1.7 Review existing national and regional legislation regarding protection of endangered and/or protected species of wild flora and fauna.

1.8 Fisheries synthesis document prepared. Detailed knowledge of artisanal fisheries sector with associated action plans to assess baseline capture, profitability and bycatch and promote sustainability (effective marketing, reduced bycatch). To include an analysis of future opportunities within the fisheries sector or outside (ecology, economics, social) based on existing research outputs and adapted to the local context of focal communities.

1.9 Produce recommendations report for government underpinning potential legislative changes and CITES ratification, and fisheries practices.

1.10 Peer reviewed paper prepared on the artisanal fisheries of the region.

2.1 Building capacity for establishing co-management mechanisms for fisheries in focal communities to increase fisher earnings, through a participatory approach.

2.2 Organize awareness campaigns and disseminate environmental education information across island. Organize final project event for local stakeholders.

2.3 Produce findings synthesis and recommendations report about fisheries co-management.

3.1 Development of data collection protocols and survey tools.

3.2 Field data collection and analysis. Mixed-methods approach investigating wellbeing and marine and terrestrial resource use in fishing and non-fishing communities.

3.3 Synthesis report produced on social and ecological benefits of improved fisheries management for Principe island.

3.4 Peer-reviewed paper prepared on ecosystem services trade-offs and social spill-over effects of improved marine management across island.

4.1 Assess the current technical capacity, specific needs and critical gaps of local staff and additional national conservation and fisheries staff. Recruit new local staff members.
4.2 Develop training programme and materials to build capacity in social-ecological monitoring, community engagement, biodiversity conservation and fisheries management.
4.3 Deliver training to current and new local staff.
4.4 Monitor the progress of staff to deliver activities; organise training refresher sessions if needed.
4.5 Identify and assess costs of potential monitoring, control and surveillance (MCS) programs (e.g. VMS, AIS, and community-based approaches).
4.6 Produce report on available options, cost-benefit analysis and capacity needs regarding potential monitoring, control and surveillance programs.

Annex 2 Report of progress and achievements against final project logframe for the life of the project

Project summary	Measurable Indicators	Progress and Achievements
Impact: Poverty alleviation, food security, and sustainable use of marine biodiversity through improved marine governance in Principe.		Steps made towards improving livelihoods of fishing communities through implementation of six community interventions targeting improved sustainability of small-scale fisheries. Governance improved through community engagement and enhanced local capacity, ultimately aiming to improve marine management and conservation. Biodiversity assessments and monitoring protocols put in place and to be carried on after project completion.
Outcome To enhance livelihoods and long-term sustainability of artisanal fisheries sector in Principe through the implementation of improved fisheries practices and laying foundations for co-management in fisheries-dependent communities.	0.1 Wellbeing improved for at least 50% of >500 fishing households in >5 communities with both fishermen and female fish traders reporting the increase (domains to be measured using locally defined indicators: income, engagement, and freedom of choice and action) by year 3 (baseline established in year 1 and re-examined as part of the project in years 2 and 3).	0.1 See description and evidence in section 3.2
	0.2 Committees for management of marine-related livelihood interventions established with inclusive and equitable representation of fishers and fish traders and management initiatives implemented in at least 5 (60%) of Principe's fisheries-dependent communities by Q3 year 3. Current baseline is zero.	0.2 See description and evidence in section 3.2
	0.3 Harvest of key marine species (subject to illegal take and bycatch) by ≥5 focal fishing communities (>15 fishers per community surveyed) will be quantified and significantly reduced by year 3 as a result of community interventions (baseline SMART reduction targets established in year 1 and re-examined as part of the project in years 2 and 3).	0.3. See description and evidence in section 3.2
	0.4 By year 3, information on artisanal and emerging industrial fisheries sectors (magnitude, seasonality, distribution, methodology target/non-target species, effort, dependency, threats and challenges,	0.4 See description and evidence in section 3.2

Project summary	Measurable Indicators	Progress and Achievements
	trade and value) and best practices is available to policy-makers, stakeholders and community groups. The number of datasets, action plans for priority species and number of peer-review publications from the current zero baseline will increase incrementally in years 1, 2 and 3.	
	0.5 By Q3 year 3, local staff including at least 5 Darwin Field Officers (women will be encouraged to apply for positions) have the capacity to support and advise biodiversity and social monitoring, environmental awareness raising and management of marine resources in Principe (baseline capacity level established in year 1 and re-examined as part of the project in years 2 and 3).	0.5 See description and evidence in section 3.2
Output 1. **Fisheries and livelihoods:** Increased understanding of artisanal fisheries and resilience of sector to threats and best practices for reduction of fishing pressure on non-target species of conservation concern achieved through participatory research and community-engagement.	1.1 Household specific livelihoods opportunities, capacity and training needs are identified through participatory methods with individual beneficiary households by Q3 year 1 and training delivered by Q2 year 2, specifically targeting female-headed households (> 15 fishers and 15 females in at least 5 focal fishing communities).	1.1 Training beneficiaries exceed those initially planned. We provided training in 6 fishing communities to a total of 69 fishers or fish traders (including 47 women and 22 men). Delivered training focused on: entrepreneurship; small business management; production of handmade soap; handcraft and landing surveys. See section 3.1 and annexes 13-15.
	1.2 Knowledge of current barriers to sustainability, needs and threats for fishers identified through participatory research in year 1 (>5 (60% of) fishing communities; >30 participants per community + key regional and national stakeholders) through household surveys and individual participant surveys, targeting fishers (male) and traders (female).	1.2 As planned, participation levels in project activities during Y1 were high. 142 people (73 men and 69 women) participated in inception focus groups discussions (October-November 16); 880 adults (459 men and 421 women; only 12 people refused) answered questionnaires in Jan-Feb 2017; and 41 GPS data loggers were distributed among fishers for mapping their fishing areas (in one of the communities, there was so much interest that, following their suggestion, we organized a lottery in order to allocate devices fairly). For example, in focus groups we discussed, among other topics (see English version of focus group guidelines), threats and barriers to fishing livelihoods, as well as seeking their opinions about ways of addressing those challenges (see workshop summaries). A summary reporting results from all these activities can be found here.
	1.3 Spatiotemporal patterns of resource use, seasonality (effort), target species, and distribution data for baselines and future comparison are assembled by Q1	1.3 Fisheries practices and catch were better understood thanks to landing surveys (guidelines and forms) conducted twice a week in 6 fishing communities from Dec 2016 to Dec 2018. Overall, we estimate than more than 200 fishers participated in this activity (please note we cannot give precise number of participants due to inconsistency in names recorded over time). We produced a detailed report based on the landing surveys,

Project summary	Measurable Indicators	Progress and Achievements
	year 2 (> 15 fishers in >5 fishing communities) and re-examined as part of the project in years 2 and 3.	summarizing key findings and recommendations (document in Portuguese with English executive summary). Spatiotemporal patterns of fishing trips were recorded using participatory mapping with GPS trackers (41 fishers participated). In addition, we also employed baited remote underwater video stations (BRUVS) to collect marine biodiversity distribution data; 154 hours of video were recorded during two sampling phases (July-Aug 18 and Dec 18-Jan 19). Preliminary research report available here. A summary reporting results from all these activities can be found here.
	1.4 Increased understanding of fisheries practices and drivers behind illegal/unsustainable fishing activities understood and multiple interventions explored (e.g. better access to storage facilities, markets, and reduction of catch losses) and bycatch-reduction strategies identified through participatory research by start of year 2.	1.4 and 1.5. Based on participatory research during Y1 (see description above), we decided to adopt a community-driven approach to identify interventions for improving sustainability of small-scale fisheries in Principe. These ended up being broader than initially planned (see description as well as proposal and evaluation sheets) but, by focusing on participatory approach, we promoted community engagement and ownership over these interventions. Six interventions were implemented in 5 fishing communities (annex 9). A report was produced for local partners (in Portuguese) with recommendations about evaluation and expansion of these interventions after this project.
	1.5 Interventions are identified, costed, and assessed by stakeholders and local partners and a minimum of 2 piloted to reduce bycatch and harvest of protected resources during year 2. Best strategies are disseminated and implemented in >5 fishing communities by the end of year 2.	
	1.6 Increased understanding of linkages between livelihoods (e.g. dependency, vulnerability, loss evaluation) and fisheries practices by year 3 Q3.	1.6 Manuscript on "Perceived influence over marine conservation: determinants and implications of empowerment" submitted to *Conservation Letters*. Additional peer-reviewed publications being prepared on: small-scale fisheries mapping and economic revenues; and marine biodiversity assessment using underwater cameras.
Activity 1.1 Engagement with fishing communities to gain permission and build on existing relationships with local partners in order to quantify and describe artisanal fisheries and their spatio-temporal extent as well as drivers and characteristics of potentially illegal harvest, domestic and international trade and bycatch.		Regular meetings, incentivizing community participation and ensuring community representatives were involved in project decisions were key to engaging fishing communities throughout the project. Focal points (3 women and 3 men) from six target coastal fishing communities worked in our project undertaking fisheries landing surveys and acting as liaison between the project and communities. In addition to these focal points, 2-3 community representatives were involved in project events. Regular meetings, both formal (e.g. focus groups, disseminating project information) and informal (e.g. follow up visits, spontaneous discussions) were key for promoting and strengthening engagement; project officers visited each community at least every 2 weeks. Particularly due to the "community ideas" initiative, this engagement was maintained throughout all project stages and allowed us successfully undertaking all activities listed below.

Project summary	Measurable Indicators	Progress and Achievements
Activity 1.2. Assess the current technical capacity, needs and critical gaps of fishers and fish traders in local communities using focus groups, participatory workshops and gap analysis.		In July-August 2016, we compiled information about previous initiatives related to artisanal fisheries in Principe; this was useful for better assessing what had been done before and potential outcomes (for example, previous projects have installed fish aggregating devices, community shops and provided solar fish dryers, with limited success). In September 2016, we undertook a SWOT (strengths, weaknesses, opportunities and threats) analysis of artisanal fisheries and livelihoods in Principe based on discussions with project partners (see summary output). In October-November 2016, we organized 14 focus groups discussions in local communities, where we discussed, among other topics (see English version of focus group guidelines), threats and barriers to their fishing livelihoods, as well as seeking their opinions about ways of addressing those challenges (see workshop summaries). For example, lack of (and limited access to) gear and infrastructure was a common theme and fish traders were generally interested in improving preservation and quality of fish, as well as adopting new ways of processing fish by-products. In February-March 2017, we rolled out a socio-economic survey in all communities by using questionnaires to survey adult residents, of which 194 were fishers and 157 were fish traders; one of the questionnaire sections focused on assessing needs and priorities for improving fishing livelihoods (see English version of questionnaire template). Finally, as part of the implementation of "community ideas" in Y2 and Y3, specific needs were identified to provide required training.
Activity 1.3 Develop and deliver training programme tailored to meet critical local needs.		In addition to training for participating in specific monitoring activities (i.e. landing surveys), training for communities was tailored according to community interventions: • In collaboration with Sonha, Faz e Acontece (Dream, Do and it Happens), a Portuguese social entrepreneurship association, for five days (10-16 August 2017), fish traders and fishers (total: 25 people, including 17 women) from one of the target communities participated in entrepreneurship classes where they learned how to evaluate and grow their business in a sustainable way (blog and photos). Based on participants' feedback, this was particularly useful for "learning how to assess if business is going well" (i.e. register sales and purchases), "learning how to manage business" and "how to treat customers", allowing them to "grow their own business initiatives" (e.g. fish trading). • From 19 to 29 March 2018, a group of fish traders and fishers (total: 16 people, including 8 women) from Praia Burra received training in handicraft production (for example, with fish scales and sea shells; blog and media coverage). This training was related to the idea proposed by this community: creating a craft center to supplement their fishing activity and increase their income by taking advantage of materials that otherwise would be wasted (e.g. fish scales). Training was provided in collaboration with artisan from neighbour island Sao Tome. • In collaboration with the Sao Tomean NGO Marapa, we held training on small business management on the 26th of April 2018 (blog and photo); the fish traders association of Praia Abade (all women; N=15 participants) participated in this training to learn how to better manage their financial resources. • On the 30th and 31st of May 2018, fish traders and fishers from Praia Abade (N=7 participants, among which 4 were women) learnt how to produce handmade soap using locally produced coconut oil (blog and photos).

Project summary	Measurable Indicators	Progress and Achievements
		All this training was then followed up by our project officers in order to ensure application into specific community interventions, with regular support provided by trainers.
Activity 1.4 Field data collection and analysis. A mixed methods approach will be used combining specialized questioning techniques, socio-psychological scales, participatory market chain analysis and SWOT (strengths, weaknesses, opportunities and threats) analysis on livelihood alternatives. Data collected will also include mapping current use of fishing locations, gear types in both artisanal and emerging industrial fisheries as well as socio-economic data about the processing and trade sector.		Overall, we collected: 24 months of fisheries landing surveys; 13 months of GPS tracking; baseline socio-economic information obtained in Jan-Feb 17 from 194 fishers and 157 fish traders, as well as 529 non-fishing individuals; socio-economic questionnaires repeated in Jan-Feb 19 (516 residents of fishing communities, including 200 fishers and 158 fish traders). In addition to these initially planned activities, we collected complementary information on fish reproductive biology and marine biodiversity distribution, namely: samples collected from 655 individual fish (gonads, length, weight, etc.), 154 hours of video recorded to assess underwater biodiversity collected during two sampling phases (July-Aug 18 and Dec 18-Jan 19). A summary reporting results from all these activities can be found here.
Activity 1.5 Pilot and implement multiple interventions for increasing fisheries profitability, income diversification and/or improving fisheries management based on project findings.		We adopted a community-driven approach to identify interventions; in Y2, we launched a call for "community ideas" which were meant to be a participatory approach for improving sustainability of small-scale fisheries in Principe (see description as well as proposal and evaluation sheets). After selection in Oct 17 (blog and media coverage of event), six community interventions were implemented in Y2 and Y3; these included a handicraft center at Burras Beach, handmade soap from Abade, the construction of a community headquarters in Lapa and Campanha, a community shop selling material for repairing gear and trading fish in Santo Antonio and materials for transformation of fish products for the association of fish traders from Abade. A report was produced for local partners (in Portuguese) with recommendations about evaluation and expansion of these interventions after this project.
Activity 1.6 Monitor adoption of activities, feedback and social-ecological (perceived and actual) outcomes.		Our monitoring of project activities focused on: training feedback, socio-economic surveying (Y1 and Y3) and focus group discussions, incorporating a mix of quantitative and qualitative information. This information was presented in our report with recommendations about evaluation and expansion of "community ideas" after this project (in Portuguese) as well as in report presenting findings from our main activities (Portuguese and English versions). Evaluation discussions at each community at the end of project (blog and photos) were key for assessing perceived impacts and discussing challenges and opportunities for next steps.
Activity 1.7 Review existing national and regional legislation regarding protection of endangered and/or protected species of wild flora and fauna.		All national and regional legislation regarding fisheries and environment was compiled during Y1. Key information from each document (for example, general content, specific relevance and department responsible) was summarized (see summary).
Activity 1.8 Fisheries synthesis document prepared. Detailed knowledge of artisanal fisheries sector with associated action plans to assess baseline capture, profitability and bycatch and promote sustainability (effective marketing, reduced bycatch). To include an analysis of future opportunities within the fisheries sector or outside (ecology, economics, social) based on existing research outputs and adapted to the local context of focal communities.		In order to account for multiple project activities, their findings and recommendations about next steps, we prepared a main document for dissemination among stakeholders (Portuguese and English versions). This includes brief summaries of project findings in terms of, for example, fisheries practices, marine biodiversity and economic activities, as well as suggestions about next steps. This information was disseminated among local communities, regional and national governmental departments and non-governmental environmental and development organizations. Public events for sharing and discussing information at the end of project were also held in all project communities and in town (presentation slides, blog, photo and media coverage about regional event).

Project summary	Measurable Indicators	Progress and Achievements
		We also produced a detailed report based on the landing surveys, summarizing key findings and recommendations (document in Portuguese with English executive summary). In addition, we produced a report about the reproductive biology of the Golden African Snapper (*Lutjanus fulgens*) and management implications in terms of fish gear and minimum catch size.
Activity 1.9 Produce recommendations report for government underpinning potential legislative changes and CITES ratification, and fisheries practices.		These recommendations were produced as part of main report mentioned above (Activity 1.8). At its planning and inception, CITES was listed as a major convention to be informed by our work; our project aimed to inform governmental decisions by providing evidence about the international trade of endangered species and support legislative changes to enable CITES ratification. Whilst this remained an important consideration, based on findings obtained during Y1, we realized the scale of this issue on the island is probably very small and reducing. For example, based on informal conversations with two previous shark fin traders, the income generated was very small and they stopped doing it because the effort wasn't worth it as the price offered by middlemen reduced drastically (around 75% reduction). Although there seems to be some international trade through links in Nigeria, we found that sharks and rays are mainly caught opportunistically. Nevertheless, baseline information about domestic consumption, harvest and trade of species listed in CITES Appendix I (e.g. marine turtles) and CITES Appendix II (e.g. manta rays, hammerhead sharks) was obtained as part of our socio-economic questionnaires. During Y2, we met the CITES focal point and he attended our presentation at the National Fisheries Week where we reported preliminary findings (6-7 July 2017; blog and photos). In addition, we have also presented this information to an international audience at the First Meeting of the Abidjan Aquatic Wildlife Partnership, Abidjan, Ivory Coast (23-25 July 2018; presentation; blog and photos); this event was attended by representatives from government agencies and environmental organizations from West and Central Africa.
Activity 1.10 Peer reviewed paper prepared on the artisanal fisheries of the region.		Manuscript on "Perceived influence over marine conservation: determinants and implications of empowerment" submitted to *Conservation Letters*. Additional peer-reviewed publications being prepared on: small-scale fisheries mapping and economic revenues; and marine biodiversity assessment using underwater cameras.
Output 2. **Laying foundations for establishing co-management:** to improve long-term sustainability of fisheries sector through improved and empowered governance.	2.1 Community management establishment process initiated by **Q2 year 2** and participatory research **>5 fishing communities** by **Q3 year 2** to identify key values and requirements lays foundations for development of fisheries co-management strategies (e.g. fisheries co-operatives). 2.2 Baseline fisheries and social data following establishment of community management process are assembled by **Q3 year 2** (**>5 fishing communities**) and re-examined as part of the project in **year 3**.	2.1 Based on preliminary project work and initial workshops during Y1 assessing current status and feasibility of fisheries co-management (our report in Portuguese on "Associativism for the co-management of coastal and marine resources in the island of Principe?"), community cohesion, trust and teamwork were identified as key factors to be targeted to enhance success of potential fisheries co-management initiatives. We thus decided to focus on those through a "community ideas" initiative to develop skills and promote collective action. 2.2 and 2.3 Monitoring and evaluation scheme implemented in six community interventions (five fishing communities) during Y2, as well as composition of community committees responsible for managing these interventions.

Project summary	Measurable Indicators	Progress and Achievements
	2.3 Committees for management of marine-related livelihood interventions identified for > 5 fishing communities by **year 3 Q1** and terms agreed by end of **year 3, Q2**. Current baseline is **zero**. 2.4 Annual operational plans for marine-related livelihood interventions are developed, and reviewed by stakeholders and local/national partners by **year 3.** Current baseline is **zero**. 2.5 By the end of **year 3**, preliminary lessons and potential implications for co-management are considered by the government as a marine resource management example for potential replication in other areas.	2.4 and 2.5 Based on lessons from these community interventions (both in terms of community engagement and drivers as well as expected benefits), operational plans and recommendations were produced during Y3.
Activity 2.1. Building capacity for establishing co-management mechanisms for fisheries in focal communities to increase fisher earnings, through a participatory approach.		While our project focused on developing community capacity and laying foundations for co-management, establishment of co-management was not achieved within timeframe of project; we have spent considerable time assessing capacity and potential mechanisms but the process is too incipient. Based on project progress throughout Y1, during Y2 and Y3 we thus adopted a participatory approach for identifying and implementing community-specific interventions aiming to lead to improved community cohesion and improved management of resources. During implementation, community ideas were affected by issues of mistrust, theft, poor accountability, limited active engagement and poor technical capacity; by working through these issues as a team and with our support, we have strengthened their ability to work together and cope with challenges. Being empowerment a requirement of natural resource co-management, these efforts will be capitalized on thanks to a new project funded by the Blue action Fund that will have establishment of co-management for marine conservation as one of its key goals.
Activity 2.2. Organize awareness campaigns and disseminate environmental education information across island. Organize final project event for local stakeholders.		We prepared a report for dissemination among stakeholders (Portuguese and English versions). This includes brief summaries of project findings in terms of, for example, fisheries practices, marine biodiversity and economic activities, as well as suggestions about next steps. This information was disseminated among local communities, regional and national governmental departments and non-governmental environmental and development organizations. Public events for sharing and discussing information at the end of project were held in all project communities and in town (presentation slides, blog, photo and media coverage about regional event). Given low literacy levels in communities, summary information and key recommendations were provided orally (with laminated sheets illustrating key points) to enhance understanding

Project summary	Measurable Indicators	Progress and Achievements
		and generate discussion (blog and photos). Furthermore, we produced a 22-min video showcasing current challenges and opportunities for improving fisheries practices in Príncipe and what people think about our project, including fishers, fish traders and governmental representatives (blog and video with English subtitles). We found this approach more engaging and better suited to this specific audience than organizing awareness campaigns or focusing on environmental education.
Activity 2.3 Produce findings synthesis and recommendations report about fisheries co-management.		As part of our project activities, particularly the "community ideas" initiative, we identified key opportunities and challenges for implementing fisheries co-management. We found that fisheries associations in Principe remain incipient, conflicted and mainly a funds-driven endeavour (our report in Portuguese about fisheries associations), suggesting that informal collective action might be more locally appropriate. Recommendations were produced as part of reports mentioned above (activity 1.8 and activity 1.5).
Output 3. Ecosystem services trade-offs and social spill-over effects assessed across the island to observe the role of improved fisheries practices and co-management in facilitating these wider-scale insular effects.	3.1 Ecological and resource use assessments on terrestrial and marine biodiversity (dietary recalls, landings and bycatch surveys) undertaken in >5 fishing communities and at least 5 non-fishing communities (> 30 participants per community; 50% female). Baseline established in year 1 and re-examined as part of the project in years 2 and 3. 3.2 Social assessments undertaken in >5 fishing communities and at least 5 non-fishing communities (> 30 participants per community; 50% female) to assess impact on individuals' wellbeing (domains to be measured: material, security, and freedom of choice and action). Baseline established in year 1 and re-examined as part of the project in years 2 and 3. 3.3 Increased understanding of wider scale (negative and positive) effects of improved fisheries practices (interventions) and co-management synthesised by year 3 Q2.	3.1 and 3.2 Information collected during Y1 and Y3. Initially, we were planning to re-examine levels during Y2 too but we have decided against it to avoid survey fatigue given small population size and census-based interviewing. See section 3.1 3.3. Manuscript on "Perceived influence over marine conservation: determinants and implications of empowerment" submitted to *Conservation Letters*. Additional peer-reviewed publications being prepared on: small-scale fisheries mapping and economic revenues; and marine biodiversity assessment using underwater cameras.
Activity 3.1 Development of data collection protocols and survey tools.		Based on preliminary findings and discussions from July-December 2016 (see English version of focus group guidelines), in January 2017 we developed a questionnaire to be filled in by the head of household and respective partner, if any (aiming to target one man and one woman per household). After its development, we piloted the survey in 1-2 February 2017 before producing a final version (see protocol and English version of questionnaire). Sections focused on: individual and household characteristics (e.g. age, education, type and number of

Project summary	Measurable Indicators	Progress and Achievements
		household occupations, assets); gear, practices, income and costs related to fishing and fish trading; use of other natural resources (both marine and terrestrial, such as rays, sea turtles and bats); perceptions about threats, changes and opportunities for fishing livelihoods; opinions about marine resource management and decision-making as well as rule-breaking and individual freedom of choice and action. This tool was used to collect social information in Y1 and Y3. Fisheries landing surveys (guidelines and forms) were developed in November 2016, piloted and implemented in December 2016 and took place until December 2018 (with some amendments to forms made in October 2017 based on preliminary findings and focal points' training refresher).
Activity 3.2 Field data collection and analysis. Mixed-methods approach investigating wellbeing and marine and terrestrial resource use in fishing and non-fishing communities.		We collected 24 months of fisheries landing surveys (December 2016 to December 2018) and conducted two phases of socio-economic data collection: information obtained in Jan-Feb 17 from 194 fishers and 157 fish traders, as well as 529 non-fishing individuals; socio-economic questionnaires repeated in Jan-Feb 19 (516 residents of fishing communities, including 200 fishers and 158 fish traders).
Activity 3.3 Synthesis report produced on social and ecological benefits of improved fisheries management for Principe island.		These recommendations were produced as part of main report mentioned above (Activity 1.8).
Activity 3.4 Peer-reviewed paper prepared on ecosystem services trade-offs and social spill-over effects of improved marine management across island.		Manuscript on "Perceived influence over marine conservation: determinants and implications of empowerment" submitted to *Conservation Letters*. Additional peer-reviewed publications being prepared on: small-scale fisheries mapping and economic revenues; and marine biodiversity assessment using underwater cameras.
Output 4. Capacity: Increased local capacity and technical expertise to improve marine resource governance in Principe through tailored training programmes underpinning work for **outputs 1-3.**	4.1 Technical capacity, specific training needs of local staff (at least 10 ppl) and critical gaps in community conservation capacity assessed and training programmes finalised by Q1 year 2. 4.2 Training programmes for staff (biological and socio-economic sampling methodologies, geographic information systems, data management and analysis) delivered by Q1 year 2 and trainee skills for marine management assessed and evaluated semi-annually with follow up training in year 2 as required. 4.3 Potential monitoring, control and surveillance (MCS) programs (e.g. VMS, AIS, and community-based approaches) identified and cost-benefits assessed by end of year 2, Q3 to address potential threats associated with an emerging industrial	4.1 and 4.2 Enhancing capacity and technical expertise of local staff (n=28) was a priority of this project, with multiple training sessions (e.g. biological and socio-economic sampling methodologies, GPS, data management, conflict mediation) delivered. This was delivered to fit staff needs and specific activities so, instead of finalizing by Q1 year 2, it was done throughout all project duration. **4.3** Challenges and opportunities in implementing MCS programmes as well as potential threats associated with IUU fisheries were identified and discussed with multiple stakeholders. Based on project discussions and priorities identified, equipment allowing the National Fisheries Department to use Automatic Identification Systems (AIS) to identify potential IUU fishing was provided by MarineTraffic.com. This is now been fully installed and has been working since 15th August 2018. This substantially increases national capacity to detect and potentially control industrial fleets passing through Sao Tomean waters.

Project summary	Measurable Indicators	Progress and Achievements
	fisheries sector and illegal, unreported and unregulated (IUU) fishing effort.	
Activity 4.1 Assess the current technical capacity, specific needs and critical gaps of local staff and additional national conservation and fisheries staff. Recruit new local staff members.		We started by identifying key gaps and additional people. Key specific relevant gaps included: marine biodiversity monitoring; collection of social data; IT/computer skills; and fisheries management. In August 2016, one local Darwin project officer joined the team. In December 2016, we hired a further 6 Darwin field assistants ("focal points", one per fishing community; 3 women and 3 men) to be involved in data collection and general project assistance throughout its duration (see text on landing surveys under Activity 1.4.). In February-March 2017, an additional team of six local people (2 women and 4 men) joined the project to conduct social surveys. Five marine guards, who were already working for PTF, are also greatly involved in project activities and training. In addition, we recruited a graduate research assistant (with experience in landing fisheries surveys and fisheries co-management) that joined the team in Principe from May 2017 to March 2019. Albertino Lopes joined for two months (June-July 2017) to assist with data entry in Excel and Cileine Fernandes joined the team (July 2017-March 2019) to support database management and following up community interventions. In Jan-Fev 2019, an additional team of six local people (2 women and 4 men) joined the project to conduct social surveys. Our team also contributed from collaboration with one BSc student (Univ. of São Tomé), one MSc student (Univ. of Cambridge, UK), one intern (Univ. of Aveiro, Portugal) and one volunteer.
Activity 4.2 Develop training programme and materials to build capacity in social-ecological monitoring, community engagement, biodiversity conservation and fisheries management.		Training has been developed and provided to fit staff needs and specific activity requirements. Key staff training provided (additional training described in previous reports): • During Y1, the project officer obtained his car driving license, and spent 11 weeks working alongside the Darwin Research Fellow on-site in order to learn, practice and receive continuous feedback on a number of project related tasks, such as: budget management; social and ecological data collection and entry in database; public speaking and information dissemination; and community engagement. • After development of protocol and landing surveying forms, training in fisheries landing surveys occurred on the 13th December 2016 (1 day x 7 participants, of which 2 were women). PF and the Fisheries Department were both involved in administrating this training session focused on both explaining the rationale behind the surveys and the practical side of undertaking them (see photos). The training included a practical 'try-out session' that allowed to assess their understanding of the information provided and to tackle some errors early on. Fisheries landing follow-up visits to community focal points were conducted twice a week from 15th July 2017 to end of September 2017. This allowed us identifying key challenges in order to improve community engagement and data collection. A refresher session for the 6 focal points was then organized on the 5th October 2017 (blog and photos). • Training in social data collection was provided on 1-2 February 2017 (2 days x 7 participants, of which 2 were women: see photos). Training was provided by UoE and focused on: a) introducing them to project team and project goals (e.g. project approach and describe social survey goals); b) good practices in social surveying (e.g. how to introduce themselves, remain neutral, no right/wrong answers) and explain survey protocol; c) obtaining and recording consent; d) structure and explanation about questionnaire; e) conducting mock surveys with office staff; and f) practice and conduct

Project summary	Measurable Indicators	Progress and Achievements
		pilot survey (21 people were interviewed on the street). Similar training was provided to the new team repeating questionnaires in Jan-Feb 2019. • On the 28th February 2017, GIS training was provided related to the deployment and collection of data from artisanal fisheries GPS trackers. Capitalizing on experiences and lessons from a similar initiative in the Republic of Congo (Darwin Initiative project 20009), Dr Kristian Metcalfe (UoE) ran this session, with participants including staff from PTF, UoE and the National Fisheries Department (4 participants, of which 3 were women; see manual and simplified instructions). • As part of an ecotourism course taking place in Principe, we ran a 25h cartography module (24 July - 2 August 2017; 21 students, 9 of which women) aiming to develop capacity of local staff in both the conservation and tourism sectors (blog and photos). • During 2 weeks in September 2017, training on BRUVS deployment at sea was provided to 8 people (e.g. schematic illustrating devices). • In 11-15 December 2017, PF's director, Estrela Matilde, attended the "Managing and Leading Conservation Projects" course in Cambridge (UK) hosted by the University of Kent, the Durrell Institute and FFI (blog and photos). • From 22nd to 27th January 2018, project officer Litoney Matos attended a Conflict Mediation course ran by the Institute for Certification and Training of Lusophone Mediators (ICFML), at the Catholic University of Porto (Portugal; blog and photos).
Activity 4.3 Deliver training to current and new local staff.		See description provided above.
Activity 4.4 Monitor the progress of staff to deliver activities; organise training refresher sessions if needed.		Refreshers sessions were organized as required throughout project, particularly regarding landing surveys by focal communities from local communities. See description provided above. Monitoring of progress was tailored to specific activities. For example: • Throughout each day of the training on social surveying, the Darwin Research Fellow recorded any errors (e.g. explaining something poorly, missing data) and provided detailed individual feedback (in addition, this was also useful for improving the questionnaire). At the end of day 2, the number of errors had decreased considerably and by day 3-4 there were almost no mistakes. During week 1, we maintained a similar approach, providing constant feedback and the need for this decreased throughout survey season as the enumerator team became more independent. By the end of week 7, when surveys finished, the team was fully capable of undertaking social surveys with minimum supervision. • The Darwin Project Officer was in charge of deploying and collecting GPS loggers; we organized refresher sessions on the 2 and 23 March 2017 before he went back to the field for first data collection. Out of 25 GPS collected by end of 1st month, he lost data for one of them, suggesting some improvements needed but good effectiveness. He managed to download and store all data correctly. • We developed and administrated a "self-reflection and evaluation form" (see Annex 9) to be completed by the Darwin Project Officer every 6 months. For example, this included questions about both negative and positive aspects of the project (overall and in terms of

Project summary	Measurable Indicators	Progress and Achievements
		personal career development) as well as further skills to be developed. We used this tool for key personnel throughout project.
Activity 4.5 Identify and assess costs of potential monitoring, control and surveillance (MCS) programs (e.g. VMS, AIS, and community-based approaches).		In collaboration with FFI and University of Cambridge, a MSc student (Conservation Leadership) undertook a placement looking at "Assessing options to mitigate the impacts of illegal, unregulated and unreported fishing on Príncipe". This entailed a student visit to Sao Tome and Principe from 13th to 24th June 2017 (blog and photos) and conducting interviews with governmental departments and fishing communities to discuss impacts from IUU fisheries and consider ongoing and potential monitoring, control and surveillance (MCS) programs (e.g. VMS, AIS, and community-based approaches). This report has been submitted in August 2017 and a summary produced (see here; thesis available upon request) and then translated for local dissemination. Based on project discussions and priorities identified, equipment allowing the National Fisheries Department to use Automatic Identification Systems (AIS) to identify potential IUU fishing was provided by MarineTraffic and was installed in Y3, enhancing national monitoring capacity.
Activity 4.6 Produce report on available options, cost-benefit analysis and capacity needs regarding potential monitoring, control and surveillance programs.		See description above. This report has been produced during Y2 and a summary translated for local dissemination.

Annex 3 Standard Measures

Code	Description	Total	Nationality	Gender	Title or Focus	Language	Comments
Training Measures							
1a	Number of people to submit PhD thesis						
1b	Number of PhD qualifications obtained						
2	Number of Masters qualifications obtained	1	New Zealand	M	Professional placement as part of Masters in Conservation Leadership, University of Cambridge, UK	English	Report titled: “Making decisions about conservation interventions: assessing options to mitigate the impacts of illegal, unregulated and unreported fishing on Principe”
3	Number of other qualifications obtained	1	Spanish	F	Research dissertation as part of Biology BSc, Universidad Autónoma de Madrid, Spain	Spanish	Research dissertation on “Use of Geometric Morphometry in the distinction of populations of individuals of *Lutjanus fulgens* from different locations”
4a	Number of undergraduate students receiving training	2	1 São Tomé and Príncipe + 1 Portugal	2 F	Marine biology research techniques (BRUVS, landing surveys, fish maturity, etc)	Portuguese	1 Biology student from the University of São Tomé + 1 Biology student from the University of Aveiro (Portugal) with Erasmus+ funding for 6-months internship
4b	Number of training weeks provided to undergraduate students	30 (4 weeks + 24 weeks)	1 São Tomé and Príncipe + 1 Portugal	2 F	Marine biology research techniques (BRUVS, landing surveys, fish maturity, etc)	Portuguese	1 Biology student from the University of São Tomé + 1 Biology student from the University of Aveiro (Portugal)

							with Erasmus+ funding for 6-months internship
4c	Number of postgraduate students receiving training (not 1-3 above)						
4d	Number of training weeks for postgraduate students						
5	Number of people receiving other forms of long-term (>1yr) training not leading to formal qualification (e.g., not categories 1-4 above)	9	São Tomé and Príncipe	4 F + 5 M	1 Project coordination assistance + 1 database management + 7 landing surveys	Portuguese	Local project assistants involved in multiple tasks
6a	Number of people receiving other forms of short-term education/training (e.g., not categories 1-5 above)	12	São Tomé and Príncipe	4 F + 8 M	Social surveying	Portuguese	Local enumerators conducting social surveys
6b	Number of training weeks not leading to formal qualification	8	São Tomé and Príncipe	4 F + 8 M	Social surveying	Portuguese	Local enumerators conducting social surveys
7	Number of types of training materials produced for use by host country(s) (describe training materials)						

Research Measures		**Total**	**Nationality**	**Gender**	**Title**	**Language**	**Comments/ Weblink if available**
9	Number of species/habitat management plans (or action plans) produced for Governments, public authorities						Participatory process?

	or other implementing agencies in the host country (ies)						
10	Number of formal documents produced to assist work related to species identification, classification and recording.						
11a	Number of papers published or accepted for publication in peer reviewed journals						
11b	Number of papers published or accepted for publication elsewhere						Location?
12a	Number of computer-based databases established (containing species/generic information) and handed over to host country	6 (landing surveys; socioeconomics; small-scale fisheries mapping; coastal habitat mapping; marine biodiversity assessment; fish reproductive biology)					
12b	Number of computer-based databases enhanced (containing species/genetic information) and handed over to host country						
13a	Number of species reference collections established and handed over to host country(s)						
13b	Number of species reference collections enhanced and handed over to host country(s)						

Dissemination Measures		Total	Nationality	Gender	Theme	Language	Comments
14a	Number of conferences/seminars/workshops organised to present/disseminate findings from Darwin project work	3 regional events					
14b	Number of conferences/seminars/ workshops attended at which findings from Darwin project work will be presented/ disseminated.	14					See section 3.2

Physical Measures		Total	Comments
20	Estimated value (£s) of physical assets handed over to host country(s)	19120	Includes infrastructure and equipment (e.g. GPS trackers, underwater cameras, engine boat)
21	Number of permanent educational, training, research facilities or organisation established		
22	Number of permanent field plots established		Please describe

Financial Measures		Total	Nationality	Gender	Theme	Language	Comments
23	Value of additional resources raised from other sources (e.g., in addition to Darwin funding) for project work	1,955,443.07£					

Annex 4 Aichi Targets

	Aichi Target	Tick if applicable to your project
1	People are aware of the values of biodiversity and the steps they can take to conserve and use it sustainably.	✓
2	Biodiversity values have been integrated into national and local development and poverty reduction strategies and planning processes and are being incorporated into national accounting, as appropriate, and reporting systems.	
3	Incentives, including subsidies, harmful to biodiversity are eliminated, phased out or reformed in order to minimize or avoid negative impacts, and positive incentives for the conservation and sustainable use of biodiversity are developed and applied, consistent and in harmony with the Convention and other relevant international obligations, taking into account national socio economic conditions.	
4	Governments, business and stakeholders at all levels have taken steps to achieve or have implemented plans for sustainable production and consumption and have kept the impacts of use of natural resources well within safe ecological limits.	
5	The rate of loss of all natural habitats, including forests, is at least halved and where feasible brought close to zero, and degradation and fragmentation is significantly reduced.	
6	All fish and invertebrate stocks and aquatic plants are managed and harvested sustainably, legally and applying ecosystem based approaches, so that overfishing is avoided, recovery plans and measures are in place for all depleted species, fisheries have no significant adverse impacts on threatened species and vulnerable ecosystems and the impacts of fisheries on stocks, species and ecosystems are within safe ecological limits.	✓
7	Areas under agriculture, aquaculture and forestry are managed sustainably, ensuring conservation of biodiversity.	
8	Pollution, including from excess nutrients, has been brought to levels that are not detrimental to ecosystem function and biodiversity.	
9	Invasive alien species and pathways are identified and prioritized, priority species are controlled or eradicated, and measures are in place to manage pathways to prevent their introduction and establishment.	
10	The multiple anthropogenic pressures on coral reefs, and other vulnerable ecosystems impacted by climate change or ocean acidification are minimized, so as to maintain their integrity and functioning.	
11	At least 17 per cent of terrestrial and inland water, and 10 per cent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscapes and seascapes.	✓
12	The extinction of known threatened species has been prevented and their conservation status, particularly of those most in decline, has been improved and sustained.	
13	The genetic diversity of cultivated plants and farmed and domesticated animals and of wild relatives, including other socio-economically as well as culturally valuable species, is maintained, and strategies have been developed and implemented for minimizing genetic erosion and safeguarding their genetic diversity.	

14	Ecosystems that provide essential services, including services related to water, and contribute to health, livelihoods and well-being, are restored and safeguarded, taking into account the needs of women, indigenous and local communities, and the poor and vulnerable.	
15	Ecosystem resilience and the contribution of biodiversity to carbon stocks has been enhanced, through conservation and restoration, including restoration of at least 15 per cent of degraded ecosystems, thereby contributing to climate change mitigation and adaptation and to combating desertification.	
16	The Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization is in force and operational, consistent with national legislation.	
17	Each Party has developed, adopted as a policy instrument, and has commenced implementing an effective, participatory and updated national biodiversity strategy and action plan.	
18	The traditional knowledge, innovations and practices of indigenous and local communities relevant for the conservation and sustainable use of biodiversity, and their customary use of biological resources, are respected, subject to national legislation and relevant international obligations, and fully integrated and reflected in the implementation of the Convention with the full and effective participation of indigenous and local communities, at all relevant levels.	
19	Knowledge, the science base and technologies relating to biodiversity, its values, functioning, status and trends, and the consequences of its loss, are improved, widely shared and transferred, and applied.	✓
20	The mobilization of financial resources for effectively implementing the Strategic Plan for Biodiversity 2011-2020 from all sources, and in accordance with the consolidated and agreed process in the Strategy for Resource Mobilization should increase substantially from the current levels. This target will be subject to changes contingent to resource needs assessments to be developed and reported by Parties.	

Annex 5 Publications

Type * (e.g. journals, manual, CDs)	Detail (title, author, year)	Nationality of lead author	Nationality of institution of lead author	Gender of lead author	Publishers (name, city)	Available from (e.g. web link, contact address etc)
Oral presentation - Conference program and abstracts	Participatory approaches for marine conservation - Ana Nuno, Guillermo Porrinos, Litoney Matos, Kristian Metcalfe, Brendan Godley, Annette Broderick (2018)	Portugal	U.K.	F	First Congress of Marine Biology of Portuguese Language Countries, Faro - Portugal	link
Oral presentation - Conference program and abstracts	“Omali Vida Nón”: bringing marine conservation and livelihoods together – Litoney Matos & Ana Nuno (2018)	Sao Tome and Principe	Sao Tome and Principe	M	IV Lusophone Congress of Environmental Education, Príncipe	link
Oral presentation - Conference program and abstracts	““Perceived influence over marine conservation: determinants and implications of empowerment” ” - Ana Nuno, Litoney Matos, Kristian Metcalfe, Brendan Godley, Annette Broderick (2019)	Portugal	U.K.	F	2019 MARE People & Sea X Conference – Amsterdam, The Netherlands (25-28 June 2019)	link

Annex 6 Darwin Contacts

Ref No	23-012
Project Title	Improving marine biodiversity and livelihoods of coastal communities in Principe
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