



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	23-011
Project title	Transforming marine resource management in the Republic of Congo
Host country(ies)	Republic of Congo (Congo-Brazzaville)
Contract holder institution	University of Exeter (UoE)
Partner institution(s)	Wildlife Conservation Society (WCS) Association de Conservation de la Biodiversité (Rénatura) Ministère de l'Economie Forestière et du Développement Durable et de l'Environnement (MEFDDE) Parc National Conkouati-Douli (PNCD)
Darwin grant value	£299,435
Start/end dates of project	1 ST April 2016 – 30 TH September 2018
Project leader's name	Professor Brendan Godley
Project website/blog/Twitter	@wcs_congo @BrendanGodley @_KMETCALFE
Report author(s) and date	K.Metcalf B.J.Godley & M.J.Witt (UoE) / M.Gately (WCS) / N.Bréheret (Rénatura) – 28 TH March 2019

1 Project Rationale

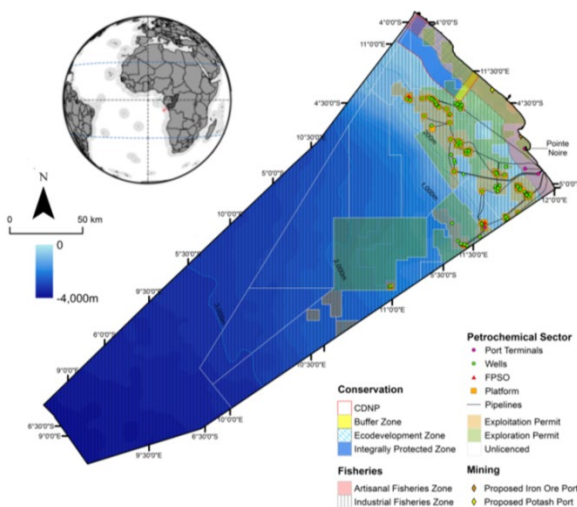


Fig. 1 Location of Congo-Brazzaville, and overlapping ocean uses within its exclusive economic zone.

The Problem: The Republic of Congo (**Fig. 1**) has significant resources with potential to contribute to food security and poverty alleviation in fisheries-dependent coastal communities where few alternative livelihood opportunities exist. This project sought to improve marine resource governance by promoting the sustainable and legal extraction of marine resources, and the conservation of marine biodiversity through the development of an evidence based marine spatial plan that minimises impacts on, and conflicts between, competing sectors. **Objectives:** To address these aims there were clear needs to: (i) improve technical capacity and develop the existing knowledge and skills base in-country; (ii) characterise the socioeconomics of the small-scale artisanal fisheries sector due to its essential role in food security, employment, and its potential role in poverty alleviation; (iii) fill key knowledge gaps related to marine biodiversity of regional importance; (iv) integrate available information on the spatial

distribution of biodiversity and threats associated with different ocean user groups; and finally (v) identify priority areas for conservation zoning. The overall aim of the project was thus to increase awareness among stakeholders to the importance of marine biodiversity and sustainable fisheries in the region; and support the development of a representative MPA network that meets national and international conservation targets, whilst minimising impacts on competing sectors (**Fig. 1**).

2 Project Partnerships

Lead Partner and Partner Organisations: Throughout the project the lead partner (**UoE**) has engaged frequently with all partner organisations (**WCS** and **Rénatura**) with Prof. Brendan Godley (**PI**) and Darwin Research Fellow (**DRF**) Dr Kristian Metcalfe spending a total of 4 and 20 weeks in country between 1ST April 2016 and 31ST December 2018, respectively. During periods where the **PI** or **DRF** was not present in-country the relationship with project partners was maintained through regular skype meetings and email exchanges, with **WCS** and **Rénatura** leading on the delivery of in-country activities. No specific challenges were encountered during the project. The relationship between project partners is demonstrably strong – as evidenced by the fact **UoE**, **WCS** and **Rénatura** will continue to work together as 2 years further funding has been secured for a follow up project by the Waterloo Foundation. This follow-up project will employ several project staff in the UK and Republic of Congo and involve working with the Ministère de l'Agriculture, de l'Elevage et de la Pêche (**MAEP**) to try and understand and reduce the prevalence of illegal fishing in Congo (**see section 8.2**). The Waterloo Foundation builds on the Darwin legacy and utilises the skills training provided to local staff during the current and one previous Darwin project implemented in the Republic of Congo (Refs 20-009 and 23-011). **External Partners:** Throughout the project all partners have engaged regularly with representatives from the two main ministries that manage protected areas and marine (fisheries) resources – the Ministère de l'economie forestiere et du developpement durable et de l'Environnement (**MEFDDE**) and the Ministère de l'Agriculture, de l'Elevage et de la Pêche (**MAEP**). These meetings provided a platform to increase awareness, disseminate key findings and outputs. As a result of this high level engagement the relationship between project partners and government agencies is demonstrably strong. This is evidenced by the fact that project partners have been provided unprecedented access to vessel monitoring system (VMS) data, fisheries monitoring and enforcement patrol and reporting data, invited to take a key role in shaping a new fisheries law (**see section 3**) and provided letters of support for new projects that build on current momentum to improve marine resource governance.

3 Project Achievements

3.1 Outputs

Green shading represents indicator achieved; and **orange shading** represents substantial progress towards indicator, with a small shortfall in target attainment. Please see Annex 2 for a detailed summary of progress and achievements against Logical Framework.

Output 1:	Marine spatial planning			Comments
	Baseline	Change recorded	Evidence	
Indicator 1.1 - Policy relevant realistic targets and management scenarios identified through a 2-day stakeholder workshop.	Baseline = 0 national scale marine planning workshops	A 2-day participatory workshop was held in Pointe Noire on the 7th – 8th April 2017. Based on this workshop a total of ~10 goals (i.e. high-level statements of desired outcomes) were identified. The outcome of this workshop is detailed in the national marine spatial planning strategy document.	See section 3.2 of the report and Annex 7 Fig S1 for evidence.	This 2 day participatory workshop was attended by 60 stakeholders representing 12 organisations from across 6 sectors.
Indicator 1.2 -	Baseline =	Total number of data layers	See	All data layers

Enhanced capacity and technical expertise to deliver a scientifically evidenced marine spatial plan as a result of updated Darwin Marine Biodiversity Atlas (incorporating ≥ 20 new data layers).	113 spatial data layers	available to support marine spatial planning, biodiversity conservation and fisheries resource management now total >200 data layers – (inclusive of 15 data layers on industrial fisheries and 7 on artisanal fisheries).	sections 3.2 and Annex 7 Fig S2 for detailed information and examples of spatial data layers.	have been incorporated into the national strategy document that was formally handed over to government in October 2018.
Indicator 1.3 - Participatory planning workshop implemented to develop marine spatial plan using available information on marine biodiversity, resource extraction (e.g. petrochemical extraction) artisanal and industrial fisheries data and supported by Marxan analyses.	Baseline = 0 spatial planning workshops	A 1-day participatory marine spatial planning and evaluation workshop was held in Brazzaville on the 22 nd November 2017 that demonstrated how international best practice could be used to achieve identified policy goals (see indicator 1.1 above). The outcome of this workshop is detailed in the national marine spatial planning strategy document.	See section 3.2 of the report and Annex 7 Fig S3 for evidence.	This 1 day workshop was attended by 30 stakeholders from government, as well as a small number of representatives from artisanal and industrial fishers.
Output 2:	Enforcement efforts and local capacity			Comments
	<i>Baseline</i>	<i>Change recorded</i>	<i>Evidence</i>	
Indicator 2.1 - Increase in the number of formally trained Congolese boat pilots to ≥ 2.	Baseline = 1	As of December 2018 each enforcement patrol is supported by two Congolese boat pilots (one senior and one junior employed by Rénatura). Rénatura are also supporting training pilot training for two new pilots.	See section Annex 7 Fig. S4 for evidence of training.	
Indicator 2.2 - Increased capacity for marine surveillance and enforcement initiatives enhanced by marine teams attending study exchange with enforcement teams from WCS and ANPN in Mayumba National Park which borders CDNP in neighbouring Gabon (1 x 10 day training workshop).	Baseline = 0 days	13 days of training on the planning and execution of maritime surveillance missions (including 2 days at sea) were provided to 15 individuals from the fishing brigade in Pointe Noire (MAEP) in November 2018.	See Annex 7 Fig. S4 for photos from training as well as training modules.	No international exchanges were conducted. This was at the behest of MAEP , who felt that the most pressing need was to undertake training in Congo. This cost saving allowed the project to increase the number of training days to 13 from previously allocated 10.
Indicator 2.3 - Increase in the number of regular enforcement patrols at sea by 200% to a minimum of 3 per month.	Baseline = est. between 0 – 1 per month.	Analysis of historical patrol data revealed that between 2006 and 2016 an average of 0.7 patrols were conducted per month (baseline). This average increased to 2.3 between 2017 and 2018, representing a 228% increase.	See section 3.2 and Annex 7 Fig S5 for evidence on patrol effort.	Higher target achievement impacted by periods in August and September 2018 during which the patrol boat was out of the water for repairs/servicing.

Indicator 2.4 - At least 25% of 28 fisheries dependent communities engaged in collecting IUU fishing data to inform targeted enforcement efforts based on participatory data collection.	Baseline = 0	Baseline social, economic and IUU data available for 100% (n = 29) of fisheries communities along the coast. Follow up surveys were also conducted in 100% of fishing communities in 2018 as part of evaluating project progress (see indicator 2.5 below).	See sections 3.2, 6 and Annex 7 Fig. S6 – S7.	Pre- and post-intervention survey data from fisheries dependent communities exceeded project target with 100% of communities engaged in participatory research.
Indicator 2.5 - Effectiveness of increased enforcement and surveillance initiatives on marine biodiversity (ecological spill-overs) and fisheries livelihoods will be assessed in 25% of 28 fishing communities to identify positive or negative impacts on fisheries catches, and economic losses.	Baseline = 0	Follow up surveys were conducted in 100% (n = 29) of fishing communities in 2018 as part of evaluating project progress. Long-term evaluation of fisheries catches also conducted with a 64 days monitoring conducted during the study period.	See section 3.2 for detailed description of findings.	Pre- and post-intervention survey data from fisheries dependent communities exceeded project target with 100% of communities engaged in participatory research
Output 3:	Industrial and IUU fisheries			Comments
	<i>Baseline</i>	<i>Change recorded</i>	<i>Evidence</i>	
Indicator 3.1 - Baseline knowledge of spatiotemporal patterns of industrial fisheries activity and its conflict / overlap with artisanal fisheries quantified and described. Minimum 5 data layers developed.	Baseline = 0	Detailed spatial analyses of vessel monitoring system (VMS) data from 2012, 2016 and 2017 has resulted in 3 annual and 12 monthly data layers on the spatial distribution of industrial fisheries activity and effort for each year (total = 45 data layers).	See section 3.2 and Annex 7 Figs. S8 – S9 for maps and spatial statistics.	Several metrics derived from VMS data including annual occupancy, intensity and fishing effort.
Indicator 3.2 - Baseline knowledge of magnitude and spatiotemporal patterns of IUU fisheries using data collected by fishers engaged in participatory research. Extent of area illegally exploited quantified and described. Minimum 5 data layers incorporated into existing Marine Biodiversity Atlas for the Republic of Congo by year 2 Q3-Q4.	Baseline = 0	Detailed spatial analysis of VMS data from 2012 has revealed that an estimated 30.4% of total fishing effort was associated with IUU fisheries activity. Additionally, fisher surveys have revealed the scale of economic losses associated with IUU fishing, which at a national scale is equivalent to 5% of annual revenue generated by artisanal fisheries.	See sections 3.2, 6 and Annex 7 Figs. S6 - S9 for maps, spatial statistics and economic data.	Socioeconomic surveys allowed the impact of IUU fishing to be quantified for individual fishers, communities and at a national scale.
Indicator 3.3 - Distribution maps for at least 10 species of conservation concern	Baseline = 0	Using all available data species distribution models have been developed for 5 species of conservation	See section Annex 7 Figs. S10 – S11 for	Evaluation of available data revealed that there was only

(i.e. sharks, turtles and cetaceans) developed through analysis of existing available field data (e.g. satellite tracking / boat surveys) and overlap with industrial and IUU fisheries quantified.		concern, comprising 3 marine mammals (humpback whale, humpback dolphin and bottlenose dolphin) and 2 species of marine turtle (olive ridley and leatherback sea turtles).	example data incorporated into the national marine spatial planning strategy document.	enough data to develop robust distribution models for 5 species (not the targeted 10). However, to ensure that use of available data was maximised, project partners developed species distribution models for each of the 3 key life history stages for sea turtles (e.g. migratory, foraging and inter-nesting areas), as well as at-sea density maps. Thus resulting in a total of 11 data layers.
Indicator 3.4 - Potential interventions to reduce bycatch in each fishery sector identified, costed, and species action plans developed for marine mammals, sharks, and turtles.	Baseline = 0	Comprehensive data for 5 species of conservation concern (see indicator 3.3 above), such as their spatial distribution, and threats have been incorporated into the national strategy document.	See Annex 7 Figs. S10 – S11.	
Output 4:	Engagement and awareness raising			Comments
	<i>Baseline</i>	<i>Change recorded</i>	<i>Evidence</i>	
Indicator 4.1 - Engagement with industrial fishing operators (n = 5 companies) underway by year 1 Q3 facilitating awareness raising initiatives and contribution to stakeholder-led marine spatial planning process (Output 1) with participatory research underway in year 1 Q4.	Baseline = 0	Participatory data collection and analysis of industrial fishing vessel data was incorporated into development and evaluation of marine spatial planning scenarios. Furthermore, industrial fishing operators continue to be engaged in activities to transform marine resource governance, such as the revision of national fisheries law.	See sections 3.2, 6.2 and Annex 7 Fig. S12 for an example of how incorporating fisheries data influences (i.e. changes) the location of priority areas.	
Indicator 4.2 - Representatives from each industrial fishing operator (n = 5 companies) attend 1-day workshop to establish current knowledge of rules and regulations and the perceived level of	Baseline = 0	As of the end of the project 4 industrial fishing operators engaged in participatory data collection using GPS trackers and/or attended marine spatial planning and fisheries law workshops.	See section 3.2 and Annex 7 Figs. S13 - S14.	Understanding drivers behind IUU fishing has been one of the most ambitious components of the project as it required building relationship with individuals

<p>enforcement and risk to help understand the drivers behind IUU fisheries activity.</p>				<p>engaged in illegal activities. Unfortunately, we could not conduct a workshop to evaluate social drivers of IUU fishing. However, analysis of enforcement patrol data indicates that illegal activities are pervasive with reductions in one activity leading to increases in others – highlighting that there is little fear of legal repercussions.</p>
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Comment: Please note that many of the findings from the activities associated with each of these outputs are presented within the Republic of Congo’s first National Marine Spatial Planning Strategy (see Fig 2 and Annex 7 Figs. S2, S10, S11, S15). This document is organised into three sections. **Section one** provides background to the purpose of this document, who should use it, and how to obtain access to the information presented within. This section also defines the Marine Spatial Planning (MSP) process, why it is needed, the benefits of adopting such an approach and its expected outputs and provides background context to the current situation in the Republic of Congo; and finally, outlines the Republic of Congo’s desired goals and objectives derived from stakeholder workshops. **Section two** describes the current spatial, social and economic data available to support MSP in the Republic of Congo, including the current extent of maritime boundaries and the physical environment, the present status and distribution of species and habitats and ecological processes, as well as providing the most comprehensive description of human activities within the Republic of Congo’s marine area to date. **The third section** illustrates how the described spatial, social and economic data in section two can be combined to develop a range of management scenarios that reflect the Republic of Congo’s desired goals and objectives (described in section 1). Finally, this section presents the results of stakeholder evaluation of different planning scenarios and the identification of a consensus marine spatial plan.

3.2 Outcome

The following section provides a summary of progress towards the project Outcome as described in the Logical Framework (Annex 1).

Indicator 0.1 - Marine protected area network that covers at least 10% of Republic of Congo’s EEZ, including community and industrial fishing zones based on robust research and participatory design (baseline = 3%). **Change Recorded:** The project has resulted in increased knowledge to support marine spatial planning (MSP) and the expansion of the Republic of Congo’s marine protected area (MPA) network - with fine-scale spatial, and socioeconomic data on all key ocean user-groups and marine biodiversity (particularly threatened species) collated within the first national marine spatial planning strategy for the Republic of Congo. The project also facilitated a participatory planning process with local stakeholders with a 2-day stakeholder workshop in April 2017 that identified broad goals that a marine spatial plan should aim to achieve. The overarching goals of which were to increase marine protection, protect local livelihoods and food security, and minimise impacts on other sectors of the economy. A subsequent workshop in November 2017 was also convened with local stakeholders to demonstrate how international best practice can be applied to achieve such stated goals (inc. examples from partners in Gabon), with participants

contributing to the design and evaluation of three different scenarios based on the proposed goals and potential impacts outlined at the first workshop. As a result one scenario was identified and refined following consultation with different stakeholders that if implemented would see MPA coverage increase from 3% to 11% of Congo's EEZ (**Fig. 2**). The final consensus plan and supporting documents from this participatory planning process were formally presented to government (i.e. Directeur Générale des Eaux et Forêts) in October 2018 and now awaits final government approval. **Evidence and means of verification:** Please see **section 3.1, 3.2 and Annex 7 Figs. S2, S10, S11, S15** for further examples of evidence.

FINAL SPATIAL PLAN

PHASE I - PROPOSED PROTECTED AREAS

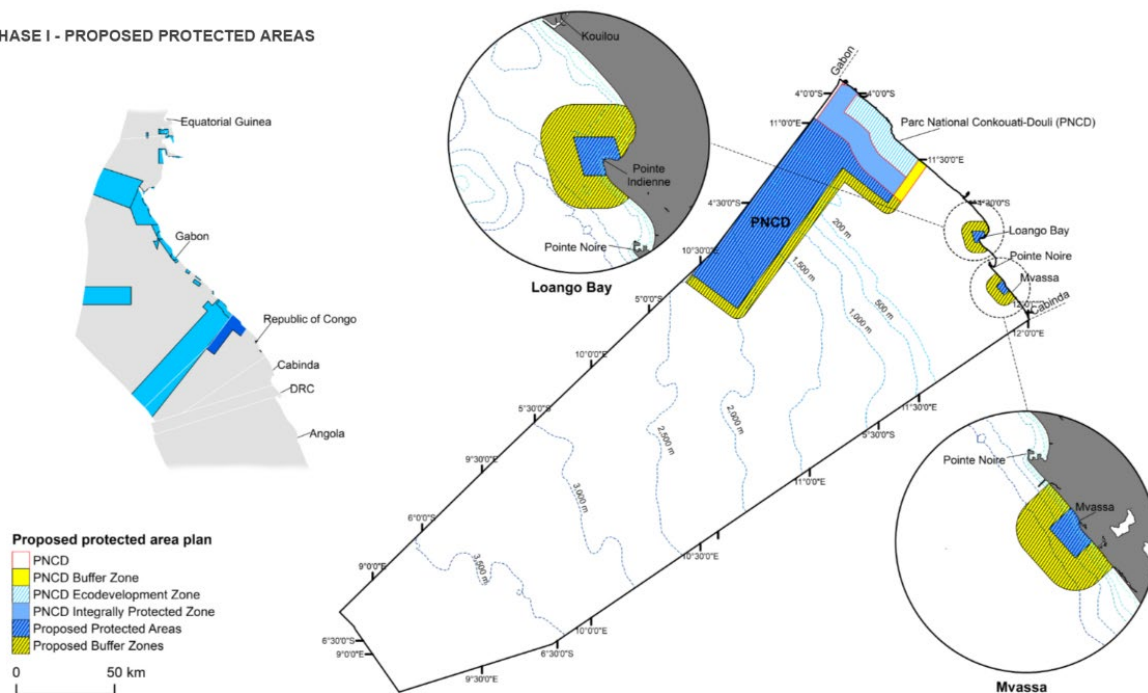


Fig. 137 The final spatial plan of proposed marine protected areas (Phase I) that make a significant contribution to biodiversity conservation whilst minimising impacts on ocean user-groups in the Republic of Congo. Small inset highlights how this proposed network of protected areas will contribute to regional efforts to increase biodiversity protection along the central

Fig. 2 Proposed marine spatial plan for the expansion of the Republic of Congo's marine protected area network based on a participatory planning process.

Indicator 0.2 - Increased knowledge of the spatial distribution of industrial and IUU fisheries activity, based on participatory research leading to increased effectiveness and targeted enforcement initiatives to support fisheries regulations (baseline = 0). **Change Recorded:** As a result of increase collaboration with **MAEP** the project obtained access to vessel monitoring system (VMS) data (i.e. 2012, 2016 and 2017) as well as historical enforcement patrol reports that had not been previously analysed by government. The former was used to highlight and quantify areas subject to illegal fishing to support more targeted enforcement efforts, with results indicating that 30% of total fishing effort occurs within prohibited areas and thus can be classified as illegal. The latter was used to generate baseline measures of patrol effort and compliance from which to evaluate the effectiveness of project interventions. Analyses of these data revealed that between 2006 and 2016 (pre-intervention period) the national fisheries agency conducted an average of 0.7 patrols per month, and that 100% of vessels stopped at sea were non-compliant (i.e. undertaking activities contrary to fisheries laws and regulations). As a result of increased capacity and knowledge on the spatial distribution of IUU fishing, patrol effort increased to an average of 2.4 and 2.3 patrols per month in 2017 and 2018, respectively, leading to a demonstrable increase in compliance from 0% between 2006 and 2016 to 9% in 2017 and 15% in 2018 (**Fig. 3**). **Evidence and means of verification:** Please see **section 3.1, 3.2 and Annex 7 Figs. S4 – S9** for further evidence of data obtained, spatial analyses that describe the extent of industrial fishing effort and

figures on the impact of changing patrol effort relative to baseline data from pre-intervention period 2006 – 2016.

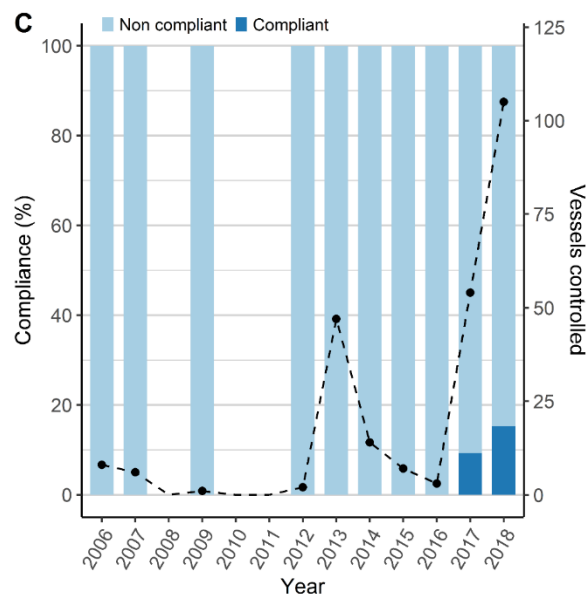


Fig. 3 Changing behaviour (i.e. patrol effort and fisher compliance) reported as the number of vessels controlled each year (dashed black line), and the percentage of those that are non-compliant (i.e. committing infractions) and compliant with fisheries laws and regulations (please note: pre-intervention period between 2006 and 2016).

Indicator 0.3 - Increased knowledge of drivers behind IUU fisheries activity based on participatory research will provide decision makers with data to promote more effective governance of marine resources and reduce illegal fishing (baseline = 0). **Change Recorded:**

Promoting more effective marine resource governance to reduce illegal fishing was one of the most ambitious components of the project and required providing building a body of evidence to lobby for fisheries reform. However, as a result of continued and regular engagement with **MAEP** project partners were able to quantify the scale and distribution of illegal fishing through access to VMS data and patrol reports (see **Annex 7 Fig. S4 – S5**). This in combination with socioeconomic surveys focused on ‘*Quantifying the social and economic contribution of small-scale fisheries and their vulnerability to illegal, unreported and unregulated (IUU) fishing*’ resulted in a comprehensive overview of the fisheries sector and the impact of IUU fishing on fisheries dependent communities (see **Annex 7 Fig. S6 – S7**). Most notably these surveys revealed that the economic impact of IUU fishing to the artisanal fisheries sector was estimated to cost \$2,541,076 USD per annum; equivalent to 5% of the total revenue generated by artisanal fisheries per annum. This body of evidence was submitted to the national fisheries administration in early 2017 and led to an invitation to organise a workshop on the revision of national fisheries law (which was last revised in February 2000 when the mechanised fishing fleet comprised ~29 vessels compared to ~108 vessels as of today). A first workshop was held with representatives from **MAEP**, **WCS**, **Rénatura**, and the artisanal and industrial fisheries sector on 23rd November 2017 in Brazzaville (see **Annex 7 Fig. S13 – S14**). At this workshop participants were invited to comment on the text of the first draft – with data gathered as part of this project used to evidence current weaknesses and impacts. A second participatory workshop was then held exclusively with representatives of the artisanal fisheries sector on the 26th November 2017 in Pointe Noire. This approach was adopted to ensure that artisanal fishers, who are typically marginalised from decision making processes, were able to discuss their specific concerns. A final draft based on the outcome of these workshops was submitted to **MAEP** in April 2018 and is under consultation. **Evidence and means of verification:** Please see **section 3.1, 3.2 and Annex 7 Figs. S4 – S9** for evidence of this workshop.

Indicator 0.4 - Economic losses for fishers associated with loss of equipment by industrial and IUU fisheries activity (e.g. nets and buoys) reduced by 50% in focal fishing communities (baseline = 0). **Change Recorded:** Pre-intervention surveys focused on ‘*Quantifying the social and*

economic contribution of small-scale fisheries and their vulnerability to illegal, unreported and unregulated (IUU) fishing were conducted with a total of 326 fishers from 29 small-scale fishing communities. Follow up (or post intervention) surveys were then completed at the end of 2018 with a total of 257 fishers from 29 small-scale fishing communities to evaluate changes in economic losses following increased patrol/enforcement efforts. The results of these surveys show that increases in patrol effort and compliance (see [indicator 0.3](#) above) have not translated to a decrease in economic impact on focal communities. The results indicate that: (1) communities are still observing similarly high levels of IUU fishing; (2) the proportion of individuals within communities impacted by IUU has increased; and (3) that economic impact has increased in the majority of communities – with only 6 of 27 communities reported a decrease in economic losses associated with IUU fishing (**Fig. 4**). These results could indicate that the scale of IUU fishing is much larger than previously envisaged, that the size of the illegal fleet is larger or has grown in size, and/or that existing legal and regulatory frameworks are not a deterrent. **Evidence and means of verification:** Please see [section 3.1](#), [3.2](#) and [Annex 7 Figs. S6 – S7](#) for further examples of evidence.

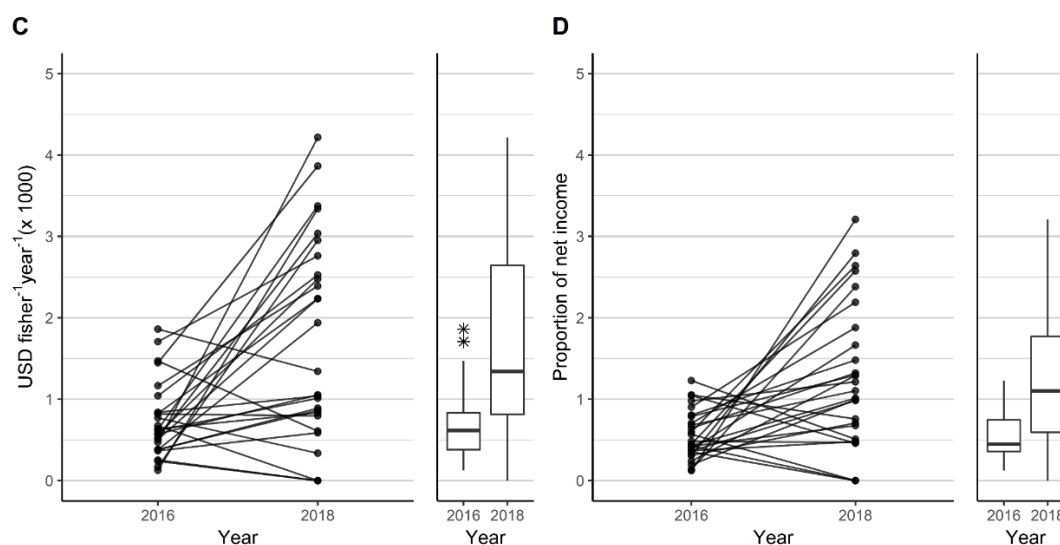


Fig. 4 Paired responses from pre- and post-intervention surveys conducted in 27 fishing communities in 2016 (n = 321 respondents) and 2018 (n = 257 respondents): (C) average economic losses associated with IUU fisheries activity in each community; and (D) economic losses as a proportion of estimated net income in each community.

Indicator 0.5 - Number of IUU fisheries infractions reduced by 50% (baseline = 0). **Change Recorded:** Reducing illegal behaviour was one of the most ambitious components of the project with analysis of enforcement patrol reports revealing that the number of recorded infractions increased over time compared to pre-intervention period between 2006 and 2016. This can be attributed to an increase in patrol effort and number of vessels controlled (see [indicator 0.2](#) above), as well as capacity building initiatives such as training in data collection and reporting associated with at-sea patrols. However, when evaluating changes in individual vessel behaviour in 2017 and 2018 compared to 2016 there was a 41% and 42% decrease, respectively, in the average number of infractions reported per vessel (2016: 3.7 infractions; 2017: 2.2 infractions; and 2018 2.1 infractions **see Annex 7 Fig S5**). In addition, we are able to demonstrate changes in the prevalence of some illegal behaviours between 2017 and 2018 (**Fig. 5**). Most notably a decrease in the number of vessels without licenses or authorisation to fish, obscuring identification marks, repeat offenders and transshipping. There was, however, an increase in some other behaviours such as obstruction of fisheries agents, absences of logbooks and fishing in prohibited areas or using prohibited gear – thus indicating that fishers were complying with minimum requirements of the law but ignoring specific regulations related to fishing zones, practices and reporting. **Evidence and means of verification:** Please see [section 3](#) and [Annex 7 Fig. S5](#) for detailed information relating to enforcement patrols.

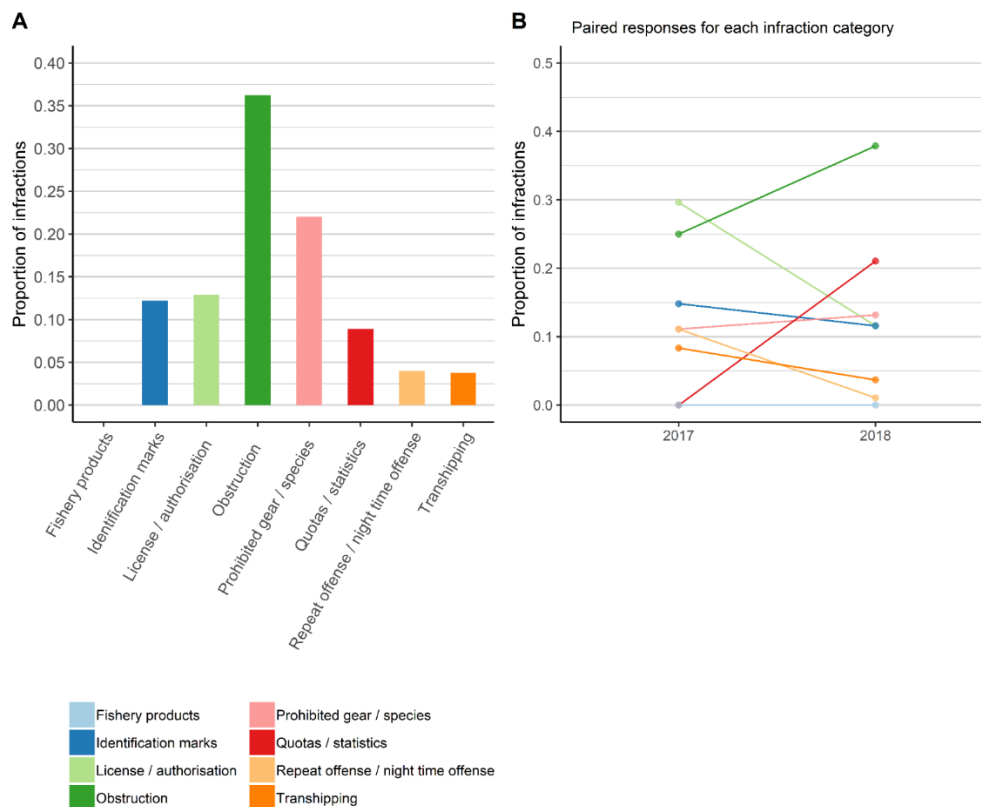


Fig. 5 Fisheries infractions: (A) proportion of all recorded infractions as assigned to eight categories; and (B) changing proportion of infractions between 2017 and 2018.

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

Impact statement: *Poverty alleviation, increased food security and sustainable use of marine biodiversity through improved governance and regulation of fisheries resources and the implementation of an effectively managed marine protected area network.*

Poverty alleviation and food security: prior to this project small-scale fisheries were marginalised from decision-making processes. To address this issue this project implemented a collaborative and participatory research program in local fisheries dependent communities to provide this sector with a voice. The results being one of the most comprehensive overviews of a small-scale fisheries sector in Central Africa (providing detailed information on: demographics, household dependency, revenue, operating costs, net income, profitability, economic losses associated with IUU, and spatiotemporal patterns of resource use **see Annex 7 Fig. S6 – S7**) that can be used to inform future policy, and evaluate potential impacts associated with proposed management decisions (**see section 3 and 4.5**). These data were also instrumental in supporting more targeted enforcement efforts to reduce pressures on fisheries resources by IUU fishing leading to increased compliance by industrial fishing vessels – thereby empowering fishers and government to work together to promote sustainable use of resources (**see section 3**).

Sustainable use of marine biodiversity through improved governance and regulation of fisheries resources: prior to this project there was very little understanding of the current extent of fisheries activity in Congo. Through a program of participatory research with local fisheries dependent communities and national fisheries agency, this project has generated a detailed profile of the small-scale (non-motorised pirogues), semi-industrial (motorised pirogues) and industrial fishing sectors, as well as a greater understanding of the extent and impact of IUU fishing (**see sections 3, 6.2 and Annex 7**). Project partners were thus able to submit a body of evidence to the government to lobby for fisheries reform. This led to an invitation to organise a workshop on the revision of national fisheries law (last revised in February 2000) which is currently under consultation, and aims to promote sustainable fishing practices in line with international guidelines for best practice (**see section 3**).

Implementation of an effectively managed marine protected area network: prior to this project less than 3% of the Congo's EEZ was subject to formal conservation or zoning designation, despite the importance of fisheries to coastal communities and marine biodiversity of global significance. Addressing this shortfall was thus a key priority – with a participatory planning process involving multiple stakeholders leading to the creation of a national marine spatial planning strategy that includes a proposal for three new MPAs that would see MPA coverage increase to 11% of Congo's EEZ, if formally accepted (**see sections 3 and 4.5**). Spatial prioritisation analyses were conducted in Marxan and incorporated data on a total of 804 unique conservation features that comprised 29 broad-scale habitats, 45 geomorphic and topographic features, 3 coastal habitat types, 691 species (including 3 marine mammals 3 marine turtles and 671 fish species) and 36 oceanographic processes (**see Annex 7**).

4 Contribution to Darwin Initiative Programme Objectives

4.1 Contribution to Global Goals for Sustainable Development (SDGs)

This project has contributed to the 5 UN SDGs detailed below:

Goal 2: Zero hunger increased understanding of the importance of, and the measures required to ensure sustainable use of fisheries resources, thereby contributing to increased food security.

Goal 4: Quality education increased knowledge and skills through technical and field-based training required to support employment opportunities in the environmental sector and promote sustainable development (Goal 4 - target 4.4).

Goal 5: Gender equality commitment to ensuring equal access, participation and opportunities for under-represented and vulnerable groups (**see section 4.4**) leading to increased participation of women (and marginalised groups) in decision making processes (Goal 5 – target 5.5).

Goal 12: Ensure sustainable consumption and production patterns increased focus on fisheries reform resulting from greater knowledge on the spatiotemporal extent and impact of IUU fishing (Goal 12 – target 12.2).

Goal 14: Life below water increased awareness of the spatial distribution of marine biodiversity and measures that can be implemented to protect at least 10% of marine environment, supported by scientific evidence (Goal 14 – target 14.4).

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

This project has contributed to two of the main objectives of the Convention on Biological Diversity (CBD; ratified by Republic of Congo in 1996) – 'conservation of biodiversity' and 'sustainable use of its components' and addresses several of the CBD's core principles for the programme of Work on Marine and Coastal Biodiversity. In particular, the project: (1) addresses current challenges (i.e. limited expertise and empirical data) through the development of a national strategy that broadens the knowledge base on marine biodiversity, fisheries and natural resource use (Article 6); (2) has promoted community participation in research and decision making processes - corresponding to decision VII/28 on protected areas (Article 17), thereby ensuring that traditional and ecological knowledge and practices have been incorporated (Targets 18 and 19); (3) provided skills training to enhance local capacity and ensure science underpins decision making processes (Articles 7 and 12); and (4) supported a stakeholder-driven planning process that underpins the design of area-based conservation measures such as MPAs (Article 8), that were designed to ensure the conservation and sustainable use of marine biological diversity (Articles 10 and 11; Target 6) and contribute to health, livelihoods and well-being of coastal and fisheries-dependent communities (Target 14). In addition, by ensuring national biodiversity strategies and management plans are underpinned by scientific evidence and stakeholder involvement, this project has also contributed to commitments under the Strategic Plan for Biodiversity 2011-2020 to mainstream biodiversity across government and civil society (Aichi Biodiversity Targets 1, 2, 4).

4.3 Project support to poverty alleviation

In terms of indirect benefits, the increased availability of fine-scale spatial, social and economic data has improved the integration of marginalised groups and such as small-scale fisheries into: (1) national biodiversity planning processes; and (2) fisheries management. For the former this has involved incorporating data on commercially valuable target species into planning processes on the ecological basis that increased protection will enhance the size and abundance of target species that spill-over into surrounding (fished) areas, and so have positive impacts on fishers' livelihoods and downstream economic activities. Data on spatial patterns of resource use have also been used within a stakeholder driven MPA planning process to ensure that proposed MPAs minimise impacts on the most vulnerable fishing communities and achieve no loss of fishing areas for fisheries dependent communities using non-motorised pirogues - communities that have higher dependency on nearshore coastal fishing grounds (**see section 6.2**). For the latter, participatory research in fishing communities has led to greater awareness of the extent and scale of impact of IUU fishing on the small-scale fisheries sector at an individual, community and national scale – that led to concrete steps towards reform of fisheries governance. In terms of direct benefits, training of local staff has led to improvements in fisheries surveillance and enforcement capacity that has led to increasing compliance within industrial fisheries – whilst there is no immediate evidence of positive impacts on fisheries communities in terms of a decrease in economic losses (**see sections 3 and 6.2**) such a shift in government efforts demonstrate that the government is working towards achieving sustainable and legal extraction of resources that promote the long-term resilience of the fisheries sector.

4.4 Gender equality

The primary aim of this project was to transform marine resource governance with respect to fisheries and marine management practices through the implementation of a national network of marine protected areas and fisheries reform. As such there were no explicit gender targets. This project was, however, designed to increase awareness, provide a broad range of technical, field-based and analytical skills to local staff at a range of levels from locally trained research assistants to senior programme officers and government officials. All project partners have a strong commitment to ensuring equal access, participation and opportunities in line with [Sustainable Development Goal 5](#), and as such actively encouraged the participation of under-represented and vulnerable groups during training events and workshops. In terms of indirect gender impacts, project reporting showed that female representation at national workshops increased from 10% in April 2017 (2-day marine spatial planning workshop) to 20% in November 2017 (1-day participatory planning and evaluation workshop). These findings should be considered against the current proportion of seats held by women in national parliament (i.e. [11.3%](#)).

4.5 Programme indicators

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

A substantial component of the projects activities was directed at ensuring all ocean-user groups (e.g. maritime shipping, petrochemicals and fisheries sectors) were represented in decision-making processes. For small-scale fisheries this was achieved by actively engaging local communities in participatory and collaborative research activities (i.e. social and economic surveys, reporting of IUU fishing, and GPS tracking), as well as providing nominated representatives of this sector (i.e. presidents of fisheries associations) with a voice and platform to work with government at stakeholder planning workshops (**see section 6.2** for example of the potential impact of not involving fisheries in decision making processes related to biodiversity conservation). In addition, data derived from participatory research now provides one of the most comprehensive overviews of a small-scale fisheries sector in Central Africa (providing detailed information on: demographics, household dependency, revenue, operating costs, net income, profitability, economic losses associated with IUU, and spatiotemporal patterns of resource use) that can serve as a baseline from which future policy and management decisions can be evaluated.

- **Were any management plans for biodiversity developed? / Were these formally accepted? Were they participatory in nature or were they ‘top-down’? How well represented are the local poor including women, in any proposed management structures?**

One of the outputs of this project was the creation of a national marine spatial planning strategy and the expansion of Congo’s existing MPA network that was the result of a participatory and collaborative planning process (see sections 3 and 4) with > 60 stakeholders from 12 organisations across 6 sectors (including fisheries dependent communities as outlined above). The final consensus plan and supporting documents from this participatory planning process were formally presented to government (i.e. Directeur Générale des Eaux et Forêts) in October 2018 and now await final government approval. It is also worth noting that Government partners continue to acknowledge their commitment to honouring an announcement made at the ‘Our Ocean’ conference in 2016 to create a ‘special marine conservation zone’ in Loango Bay - an area identified during the stakeholder planning process as a priority area for conservation.

- **Were there any positive gains in household (HH) income as a result of this project? / How many HHs saw an increase in their HH income? / How much did their HH income increase (e.g. x% above baseline, x% above national average)? / How was this measured?**

No baseline data is available to measure positive gains in household income – social and economic surveys were targeted at individual fishers as outlined in the logical framework (see Annex 1) with surveys focused on evaluating the impact of increased fisheries patrols on changes in economic losses for individual fishers and communities associated with IUU fishing (see section 3.2 indicator 0.4 and section 6.2).

4.6 Transfer of knowledge

Project partners have employed a diversity of approaches to increase awareness and disseminate findings to a diverse audience including conservation practitioners, policy makers, and the public. This has included: (1) scientific publications focused on increasing knowledge of the pressures on the regions marine biodiversity and fisheries resources (see section 7 and Annex 5); (2) social and national media platforms and outreach (e.g. quarterly newsletter) to disseminate findings to the general public and local stakeholders (see section 7 audience reach; Fig 6); (3) workshops and research activities implemented within a strong collaborative and participatory framework involving local communities and government agencies (see section 3 and Annex 2); (4) diverse skills training to enhance individual and institutional capacity (see section 4.7 capacity building); and (5) the production of materials to support decision making processes, such as species action plans, GIS and fisheries patrol and enforcement databases, as well as national strategy documents (see section 3 and Annex 7). All data developed as part of this project has also been shared with the Ministry of Scientific Research and Technological Innovation a national agency tasked with providing research permits and acting as a repository for scientific research data thereby facilitating inter-agency access to data.

With regard to the following questions (*Did the project result in any formal qualifications? / How many people achieved formal qualifications? / Were they from developing countries or developed countries? / What gender were they?*) – this project was not designed to focus on any one individual but to increase awareness and provide a broad range of technical, field-based and analytical skills to local staff at a range of levels from locally trained research assistants, to senior programme officers within NGOs, and government officials (see sections 4.4 and 4.7). Whilst training did not result in any formal qualifications all training was underpinned by robust scientific methods that were adapted to the local context to ensure rigorous data collection standards and quality.

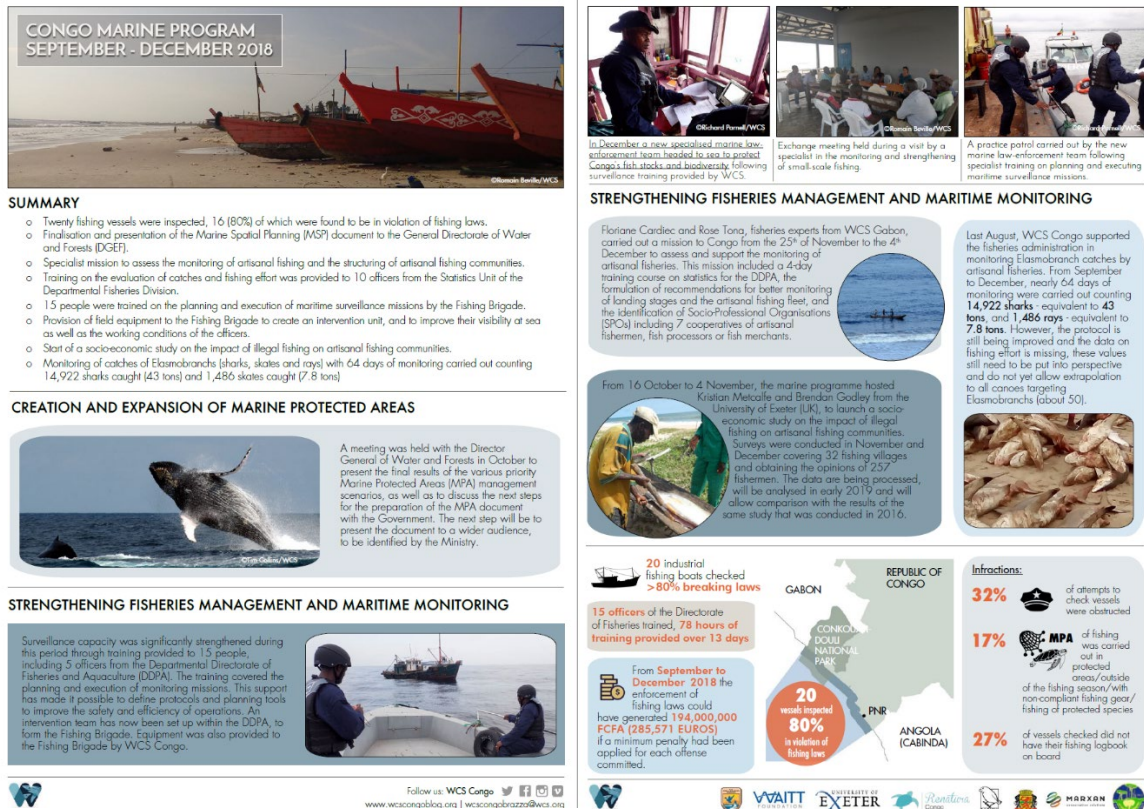


Fig. 6 Quarterly newsletter detailing project findings and activities for Congo Marine program. Produced and disseminated by Wildlife Conservation Society (WCS) on behalf of all partners.

4.7 Capacity building

Capacity building was an integral component of the Darwin Project, and was focused on building skills, knowledge, opportunities and influencing behaviours across three levels of organisation:

Individuals: local field data collection capacity has been enhanced as a result of diverse set of skills training, including biodiversity monitoring, fisheries research (e.g. community engagement, landings data collection, socioeconomic surveys and GPS tracking of fishing vessels) as well as the planning and execution of maritime surveillance missions and reporting – thereby enhancing local expertise.

Institutions: training was provided to in-country partners (**WCS** and **Rénatura**) and government agencies (e.g. **MAEP**), with marine spatial planning workshops attended by >60 individuals from 12 organisations across 6 sectors, leading to greater awareness on how international best practice can be adapted to the national context (demonstrating the values of 'best fit' for the context over 'best practice'). In addition, by targeting training of individuals across several organisations and engaging with a diverse group of stakeholders the legacy of the project will not depend disproportionately on any one individual or organisation, thereby ensuring increased institutional capacity and memory across a range of stakeholders.

Society: the datasets (and national marine spatial planning strategy) developed through this project provide the most comprehensive description of marine biodiversity and human activities within the Republic of Congo's waters, to date; and have been disseminated widely, providing individuals, organisations and society with the knowledge (and data) to make more informed decisions. An emphasis on participatory research and data collection has also ensured that there has been transfer of knowledge and expertise, with high-level of engagement by local communities reflecting the success of partner efforts to improve local capacity to manage marine resources.

With regard to the following questions (*Did any staff from developing country partners see an increase in their status nationally, regionally or internationally? For example, have they been invited*

to participate in any national expert committees, expert panels, have they had a promotion at work? / What gender were they?) – one research assistant has seen improvements in their employment situation (i.e. contract extensions and pay rises) to reflect their increasing responsibilities, and a further research assistant was appointed to allow for greater scope of work than originally planned (e.g. fisheries engagement and landings data collection).

5 Sustainability and Legacy

National: In terms of sustainability and legacy within the Republic of Congo, the project adopted two complementary approaches that were directed at building national awareness and knowledge. The first involved hosting workshops, meetings and training sessions that: (1) promoted awareness about marine spatial planning and the use of best practice to identify priority areas for inclusion within marine protected areas; and (2) contributed to transforming marine resource governance with respect to fisheries management, specifically efforts to increase surveillance capacity and fisheries compliance, and revise national laws (**see section 3.1 and Annex 7**). The second involved compiling fine-scale and comprehensive spatial, social, and economic data collated for key ocean user-groups and marine biodiversity (particularly threatened species many of which are covered by CITES and CMS) into the first national marine strategy document for Congo (**see section 3 and Annex 7 Fig S2**). This comprehensive document (and supporting synthesis document) available in French and English was formally presented to stakeholders in October 2018; providing a legacy benefit by ensuring that all data gathered during the project is freely available to support decision making processes related to the marine environment long-after the project. The impact of a small increase in fisheries patrol effort on compliance (**see section 3**) was also fundamental in helping to secure further funding (**see section 8.2**) to employ several project staff in the UK and Republic of Congo for 2 years on a follow up project that will work closely with **MAEP** to try and understand and reduce the prevalence of illegal fishing in Congo – a key priority given the recent results of pre and post-intervention surveys (**see section 3**).

International: Beyond the Republic of Congo there is also increasing awareness and interest in the projects activities and findings in other countries in central Africa – such as neighbouring Gabon and Sao Tome & Principe – with 2 week visits by project staff occurring in February 2017 (**DRF**) and January 2018 (**PI, DRF**), respectively. In addition, the **UoE** was invited by a local NGO Conservation des Espèces Marines (**CEM**) in Cote D'Ivoire to develop a project that builds on current initiatives to promote biodiversity conservation and alternative livelihoods. This resulted in a successful Darwin Partnership Grant and Darwin main bid that is currently under consideration at Stage 2 titled: **'Empowering Ivorian coastal communities to conserve biodiversity and secure livelihoods'**.

6 Lessons learned

As a result of lessons learned during this project we recommend that similar projects consider the following:

Political timetables: Future projects should look at the timeframe for national, regional or local elections during their proposed project cycle, and consider what impact this may have on the delivery of project outputs. As we detailed in annual report 1 a national election in April 2016 led to delays in arranging workshops as the project partners had to wait for the new ministers to nominate their technical teams and take a direct role in inviting participants to the workshop. The importance of ministers inviting participants should not be underestimated, and in the context of the Republic of Congo was key to the success of workshops. This is because it is essential to have buy-in for the project at senior levels before participants from different agencies will attend; having national partners involved in the project ensured that we were aware of this protocol and so were able to carefully navigate these issues.

6.1 Monitoring and evaluation

For details about monitoring and evaluation of individual project activities please see **section 3.1 - 3.3**. With respect to evaluating progress towards overall project outcome Dr Richard Parnell of **WCS**, who coordinated the **Gabon Bleu** initiative (see: [WCS](#) and [National Geographic](#)) visited

Congo each year (Year 1: November 2016; Year 2: April and November 2017; and Year 3: November 2018) to provide an impartial evaluation of the project and identify key priorities for forthcoming year. To support quarterly evaluations a record of progress, changes in timeframes and delivery of activities was also available in the form of a reporting database that was shared with project partners (see Annex 7 Fig S16). This approach ensured that all partners were able to allocate resources and staff time appropriately for the forthcoming quarter within each financial year.

6.2 Actions taken in response to annual report reviews

Reviewer comment: “The contribution to poverty alleviation and to gender could be better explained in the final report – it is unclear what the plan is in relation to the follow up with fishers or in terms of an end line survey to assess impact. In the final report it would be good to be clear on these”

Response: In terms of contribution to poverty alleviation, whilst fisheries patrols have not translated into positive impacts (i.e. reduced economic losses) for fishers (see below) – other activities have been targeted at increasing the resilience of the fisheries sector to factors such as over exploitation. For instance, commercially valuable species were also included as targets for protection within spatial prioritisation analyses on the ecological basis that increased protection will enhance the size and abundance of target species that spill-over into surrounding (fished) areas, and so have positive impacts on fishers’ livelihoods and downstream economic activities. In addition, participatory planning workshops highlighted that stakeholders preferred scenarios in which human uses were incorporated into the planning process (see Fig. 7 for example). The result of this being that the final marine spatial plan includes defined community fishing zones and meets biodiversity targets whilst minimising impacts on fisheries sector and achieving no loss of fishing areas for fisheries dependent communities utilising non-motorised pirogues (i.e. communities that have higher dependency on nearshore coastal fishing grounds).

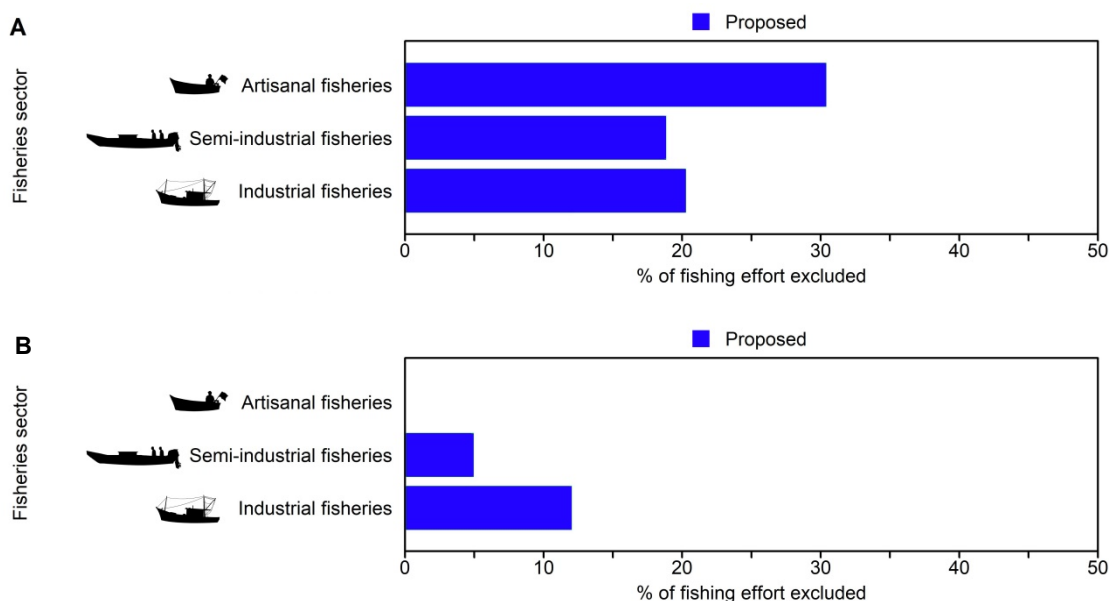


Fig. 7 Comparisons of the percentage of artisanal (non-motorised pirogues), semi-industrial (motorised pirogues) and industrial fishing effort excluded from proposed marine protected areas for planning scenarios that focused on: (A) exclusively meeting biodiversity goals; and (B) meeting biodiversity goals whilst minimising social and economic impacts on extractive industries – note decreased impact on fisheries sectors.

Post-intervention surveys were completed at the end of 2018 with a total of 257 fishers from 29 small-scale fishing communities to evaluate changes in economic losses following increased fisheries patrol/enforcement efforts. These data were compared to the baseline data and revealed that increases in patrol effort and compliance did not translate to a decrease in economic impact on

focal communities (see section 3 indicator 0.4 for more details). These findings could be indicative of: (1) the economic gain obtained from fishing illegally exceeding the likelihood of detection and the severity of the sanction, thereby creating incentives for non-compliance by industrial fishers; (2) changing social norms and the behaviour of other fishers and enforcement of regulations, where for example chronic-violators that break the rules and remain unpunished create strong incentives for others to follow; or (3) overcapacity of the fisheries fleet increasing competition for resources, thereby creating incentives for non-compliance in order for operators to turn a profit. Further funding has been secured to work with MAEP to try and understand drivers behind IUU fishing to reduce the prevalence of illegal behaviours (see sections 2 and 3).

7 Darwin identity

All project presentations, maps, training materials and survey instruments included the Darwin Initiative logo and acknowledged the financial support provided by the UK government through (Defra) the Department for Environment, Food and Rural Affairs (see Annex 7 Fig S2). Given that a previous Darwin Initiative funded project covered the Republic of Congo (Ref: 20-009) the Darwin Initiative was already recognised at both a non-governmental and governmental (i.e. Ministerial) level as a distinct project where it comprised the key funding partner in an action (e.g. socio-economic and participatory data collection), and as a collaborative partner in larger programmes where actions covered established efforts such as marine mammal and sea turtle monitoring (e.g. training / enforcement / awareness raising). However, to ensure that the project had a long-term identity and legacy all project activities and outputs were conducted and disseminated under the umbrella of ‘Congo Marine’ – which represents all partners involved in the project (Fig 6; Fig. 8). Please note, all documents, reports and maps clearly state that *Congo Marine* was supported by funding from Darwin Initiative through the UK government and Defra.



Fig. 8 ‘Congo Marine’ logo.

Project partners also regularly publicised project activities and findings through a number of social media platforms, such as twitter (see Annex 7 Fig S17 -S18), using @Darwin_Defra (4.7K followers), @wcs_congo (2.8K followers) @GatelyMark (36.8K followers) @BrendanGodley (12.7K followers) and @ KMETCALFE (935 followers). This approach was particularly effective at disseminating key results to an international audience with 3 published studies (see Annex 5) reaching between 217,464 and 482,596 followers. As a result these studies are classified in the top 5% of all research outputs scored by Altmetric for social media impact (see Altmetric scores for Conservation Letters, Journal of Applied Ecology and Biological Conservation papers). In addition, project partners led by MAEP published an article on current efforts to address illegal fishing in ‘BRAZZAMAG’; which also included a paragraph on the Congo Marine Project (see Annex 7 Fig. S19). This national magazine is freely available at airports and other venues – thereby contributing to awareness raising at a national scale.

8 Finance and administration

8.1 Project expenditure

Project spend (indicative) since last annual report	2017/18 Grant (£)	2017/18 Total actual Darwin Costs (£)	Variance %	Comments (please explain significant variances)
Staff costs (see below)			+3.56	
Overhead Costs			+0.14	Includes draft figure of £1,500 for audit costs.
Travel and subsistence			-15.04	Significant savings have resulted from reduced travel costs for airfrance

				flights from UK to Congo compared to previous years which were used to forecast during grant application.
Operating Costs			-15.10	Savings made
Capital items (see below)			0	
Monitoring & Evaluation (M&E)			-30.27	Partners have reported M&E expenditure within staff costs
Others (see below)			-17.74	Savings made on consumable costs.
TOTAL				

Staff employed (Name and position)	Cost (£)
Kristian Metcalfe – Research Fellow (UoE)	
Haley Dolton – Research Assistant (UoE)	
Romain Beville - Project manager (WCS)	
Jean Romeo Batissana - Administrator (WCS)	
Kevin Koubemba- Watchman (WCS)	
Moise Makosso – Watchman (WCS)	
Caroline Mboundou – Housekeeper (WCS)	
Nina Ngoulhoud – Housekeeper (WCS)	
Appolinaire Ibinda – Driver (WCS)	
Nathalie Bréheret, director (Rénatura)	
Eva Chauvet (Laurene Poli as of August 2018) deputy director (Rénatura)	
Emmanuelle Mahe, "sustainable fisheries program" coordinator (Rénatura)	
TOTAL	

Capital items – description	Capital items – cost (£)
No capital items purchased in 2017/2018	
TOTAL	

Other items – description	Other items – cost (£)
UoE consumables while in Congo including visa costs, phone credit etc	
TOTAL	

8.2 Additional funds or in-kind contributions secured

Source of funding for project lifetime	Total (£)
2019 Marine spatial planning across the Gulf of Guinea to promote sustainable fisheries and marine conservation (Funder: GCRF Facilitation Fund)	
2018 Seasonality of marine turtle nesting in the Republic of Congo (Funder: Kore Potash Ltd.)	
2017 Open Innovation Platform, Impact Fund - MSP, Central Africa	

University of Exeter (salaries and overheads)	
WCS / Rénatura (salaries and overheads)	
WCS / Renatura (travel and operating costs)	
TOTAL	

Source of funding for additional work after project lifetime	Total (£)
2018 Transforming local capacity to reduce the prevalence of IUU fishing in Congo (Funder: The Waterloo Foundation)	
TOTAL	

8.3 Value for Money

Darwin Initiative funding has been hugely successful in contributing towards the increased management and awareness of marine ecosystems in Central Africa, with participatory research and fine-scale spatial, and socioeconomic data on ocean user-groups and marine biodiversity contributing to the creation of Congo's first national marine spatial planning strategy. The comprehensive nature of this document means that it can also be used to support a range of decision making processes beyond marine spatial planning, including: (1) protection of the marine environment; (2) protection of marine resources and local livelihoods; (3) strategic planning advice to industry and service sectors (i.e. petrochemical exploration and exploitation); (4) marine monitoring and surveillance programs (i.e. fisheries and shipping); and (5) help Congo fulfil national, regional and international commitments, such as outlined in the Convention on Biological Diversity, and Convention for Co-Operation in the Protection and Development of the Marine and Coastal Environment of the West and Central African Region (Abidjan Convention), of which Congo is a signatory.

In addition, the level of stakeholder and community engagement was far greater than planned, with the project: (1) delivering two national marine spatial planning workshops involving > 60 participants from across 12 organisations and 6 sectors; (2) conducting two national scale assessments in 100% (n = 29) of fishing communities (original target was 25%) thereby providing the first detailed description of the social and economic contribution of small-scale fisheries to the national economy, and their vulnerability to illegal, unreported and unregulated (IUU) fishing; (3) obtaining unprecedented access to vessel monitoring system (VMS) data and > decade of patrol reports that provided a greater understanding of spatiotemporal trends in IUU fishing; that were subsequently used to inform more targeted patrol efforts that led to increased compliance; and (4) delivering specialised training to enhance fisheries monitoring, control and surveillance efforts.

All these activities were achieved within the same budget, and as a result, there is a far greater capacity and awareness to transform marine resource management in Congo that will serve as the project's legacy.

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

Note: Insert your full logframe. If your logframe was changed since your Stage 2 application and was approved by a Change Request the newest approved version should be inserted here, otherwise insert the Stage 2 logframe.

Project summary	Measurable Indicators	Means of verification	Important Assumptions
<p>Impact: Poverty alleviation, increased food security and sustainable use of marine biodiversity through improved governance and regulation of fisheries resources and the implementation of an effectively managed marine protected area network.</p>			
<p>Outcome: Improved food security, poverty reduction and biodiversity conservation in coastal communities through effective governance of fisheries resources and implementation of evidence-based marine spatial plan that integrates MPAs and fisheries zones.</p>	<p>0.1 Marine protected area network that covers at least 10% of Republic of Congo's EEZ, including community and industrial fishing zones based on robust research and participatory design identified by year 3 Q2 (current baseline 3%).</p> <p>0.2 Increased knowledge of the spatial distribution of industrial and IUU fisheries activity, based on participatory research by year 3 Q2 leading to increased effectiveness and targeted enforcement initiatives to support fisheries regulations (current zero baseline).</p> <p>0.3 Increased knowledge of drivers behind IUU fisheries activity based on participatory research leading will provide decision makers with data to promote more effective governance of marine resources and reduce illegal fishing by year 3 Q2 (current zero baseline).</p> <p>0.4 Economic losses for fishers associated with loss of equipment by industrial and IUU fisheries activity (e.g. nets and buoys) reduced by 50% in focal fishing communities by year 3 Q2, based on more effective surveillance and enforcement efforts (Baseline established during Project 20-009 and re-examined in years 1, 2 and</p>	<p>0.1 Maps of candidate MPAs and fisheries zones (GIS data layers). Submission of reports and maps to Government agencies. Announcements, new legislation relating to designation of MPAs and community/industrial fishing zones. Press releases.</p> <p>0.2 Data collection. Distribution maps (GIS data layers). Government /partner reports relating to creation of community and industrial fishing zones. Peer reviewed publication on fisheries. National Fisheries Management Plan – covering all fisheries sectors (artisanal, semi-industrial, industrial and illegal).</p> <p>0.3 Data collection (IUU status report) Government /partner reports. Peer reviewed publication on IUU fisheries activity/behaviour.</p> <p>0.4 Socio-economic data collection (household surveys, focus groups /fisher surveys to generate baseline data) to monitor effectiveness of interventions, and assess positive or negative impact on economic losses associated with gear loss.</p> <p>0.5 Data collection (IUU reporting data to monitor effectiveness of improved enforcement efforts and increased engagement with industrial</p>	<p>Government remains committed to establishing MPA network, as well as improving fisheries enforcement and developing national fisheries management plan to support the sustainable use of marine resources. Note 1: MEFDDE is a project partner, and was involved in identifying priorities, will benefit from capacity building and expansion of staff and will remain fully involved throughout the project.</p> <p>Host country remains politically stable. Note 2: Congo is generally peaceful and has been stable for several decades as stated by Foreign & Commonwealth Office (FCO).</p> <p>Fisheries sectors continue to engage in participatory research, and IUU reporting to inform targeted enforcement efforts. Note 3: Project 20-009 engaged with 82% of 28 fishing communities, the majority of which highlighted threat from IUU fishing that led to development of this project. These communities will thus be engaged to contribute to research to address this threat.</p> <p>Retention of key staff / ability to appoint replacements. Note 4: All partner staff involved in Project 20-009 will be engaged</p>

	<p>3).</p> <p>0.5 Number of IUU fisheries infractions reduced by 50% by end of year 3 Q2. (Baseline to be elaborated year 1 and re-examined in year 2 and 3).</p>	<p>fisheries).</p> <p>Note: To support achievement of sustainable development goals all data and reports will be disseminated to project partners for future management.</p>	<p>in this new project enhancing legacy and capacity of new Darwin Field Officers.</p> <p>No major economic changes / disasters that could affect fisheries management.</p>
<p>Output 1. Marine Spatial Planning: Evidence-based stakeholder-led process resulting in the implementation of a marine spatial plan that includes marine protected areas that protect at least 10% of the Republic of Congo's EEZ as well as community and industrial fishing zones based on realistic goals identified by stakeholder groups, research and participatory design.</p>	<p>1.1 Policy relevant realistic targets and management scenarios identified through a 2-day stakeholder (opening) workshop in year 1 Q1, with findings disseminated to local and national organisations by the end of year 1 Q4. Dissemination (closing) workshop year 3 Q2 will contribute to local and national awareness of project results and outcomes.</p> <p>1.2 Enhanced capacity and technical expertise to deliver a marine spatial plan as a result updated Darwin Marine Biodiversity Atlas (incorporating ≥ 20 new data layers; year 2 Q4) supported by training of 10 new biodiversity/fisheries professionals within government agencies to use data for marine spatial planning by year 3 Q1 (current baseline is 10).</p> <p>1.3 Participatory planning workshop implemented to develop marine spatial plan using available information on marine biodiversity, resource extraction (e.g. petrochemical extraction) artisanal and industrial fisheries data and supported by Marxan with Zones analyses of priority areas, community and industrial fishing zones (2 x 2 day participatory workshop in year 3 Q1). Workshop supported by GIS training in year 1 Q3-Q4 and year 3 Q1.</p>	<p>1.1 Workshops delivered (materials, number of attendees, certificates). Number of local, national and government agencies present. List of gaps/needs and key criteria to underpin marine spatial planning process disseminated to partners and government agencies.</p> <p>1.2 Number of practical training days. Number of government staff trained.</p> <p>1.3 Workshops delivered (number of attendees). Number of local, national and government agencies present. Marine spatial plan, candidate maps for the designation of marine protected areas, and community and industrial fisheries zones.</p>	<p>Partners remain committed to hosting training workshops.</p> <p>Trained individuals remain in employment with partner organisations.</p> <p>Retention of key staff / ability to appoint replacements.</p>
<p>Output 2. Enforcement Capacity: Increased number and</p>	<p>2.1 Increase in the number of formally trained Congolese boat pilots to ≥ 2 by end of year</p>	<p>2.1 Training course (attendance numbers and certificates), and number of practical training</p>	<p>Partners remain committed to hosting training workshops and study exchanges to improve</p>

<p>effectiveness of IUU fisheries monitoring, surveillance and enforcement initiatives as a result of increased capacity and technical expertise, leading to increased protection, reduced conflict and fishing pressure in coastal and nearshore waters legally reserved for artisanal fishers.</p>	<p>3, Q1 (Current number of pilots is 1 and lack of this capacity is a key factor impeding adequate marine enforcement efforts).</p> <p>2.2 Increased capacity for marine surveillance and enforcement initiatives enhanced by marine teams attending study exchange with enforcement teams from WCS and ANPN in Mayumba National Park, which borders CDNP in neighbouring Gabon (1 x 10 day training workshop in years 1 and 2 Q2). Training will focus on boat handling, safety, maintenance, surveillance, enforcement techniques and data collection and recording.</p> <p>2.3 Increase in the number of regular enforcement patrols at sea by 200% to a minimum of 3 per month in year 3 (baseline 0-1 per month).</p> <p>2.4 At least 25% of 28 fisheries dependent communities engaged in collecting IUU fishing data to inform targeted enforcement efforts based on participatory data collection by year 2 Q3 (2 x 2 day training workshops in year 1 Q2, current zero baseline).</p> <p>2.5 Effectiveness of increased enforcement and surveillance initiatives on marine biodiversity (ecological spill-overs) and fisheries livelihoods will be assessed in 25% of 28 fishing communities to identify positive or negative impacts on fisheries catches, and economic losses. Baseline generated year 1 and re-evaluated in years 2 and 3. Catch surveys will focus on catch-per-unit-effort, size, length, weight and community composition, which will contribute to monitoring and evaluation towards project outcomes.</p>	<p>days.</p> <p>2.2 Workshops delivered. Training course (attendance numbers and certificates), and number of practical training days.</p> <p>2.3 Number of day's boat operating at sea on surveillance/enforcement patrols (confirmed by GPS logs). Interim reports/maps on distribution of effort, and outcome of boat missions.</p> <p>2.4 Workshops delivered (attendance numbers). Surveillance underway in focal fishing communities (number of fishers contributing data). Fisher engagement facilitates participatory research.</p> <p>2.5 Fisheries landing surveys (catch-per-unit effort, size, length, weight, species composition). Socio-economic surveys targeted at identifying economic losses (protocol established in project 20-009) Fisher engagement facilitates participatory research.</p>	<p>fisheries management and reduce IUU fishing effort.</p> <p>Fishing communities continue to engage in participatory research and data collection.</p>
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<p>Output 3. Industrial and IUU fisheries: More effective governance and management of fisheries through increased knowledge of the operating behaviour, spatio-temporal patterns of industrial and IUU fisheries activity, leading to a more effective understanding of the scale of conflict with artisanal fishers and overlap with key biodiversity areas and species of conservation concern.</p>	<p>3.1 Baseline knowledge of spatiotemporal patterns of industrial fisheries activity and its conflict / overlap with artisanal fisheries quantified and described. Minimum 5 data layers incorporated into existing Marine Biodiversity Atlas for the Republic of Congo by year 2 Q1-Q4 (current zero baseline).</p> <p>3.2 Baseline knowledge of magnitude and spatiotemporal patterns of IUU fisheries using data collected by fishers engaged in participatory research. Extent of area illegally exploited quantified and described. Minimum 5 data layers incorporated into existing Marine Biodiversity Atlas for the Republic of Congo by year 2 Q3-Q4 (current zero baseline).</p> <p>3.3 Distribution maps for at least 10 species of conservation concern (i.e. sharks, turtles and cetaceans) developed through analysis of existing available field data (e.g. satellite tracking / boat surveys) and overlap with industrial and IUU fisheries quantified by year 2, Q4 (current zero baseline).</p> <p>3.4 Potential interventions to reduce bycatch in each fishery sector identified, costed, and species action plans developed for marine mammals, sharks, and turtles (year 2 Q3-Q4). Current number of interventions and action plans is zero.</p>	<p>3.1 National fisheries action plan. Maps, updated GIS database and Marine Biodiversity Atlas. Deposited with relevant government agencies.</p> <p>3.2 IUU status report, seasonal trends and patterns. Maps, updated GIS database and Marine Biodiversity Atlas.</p> <p>3.3 Species distribution maps, threat layers. Updated GIS database and Marine Biodiversity Atlas for the Republic of Congo.</p> <p>3.4 Partner reports. National species action plans.</p>	<p>Partners continue to collect and share data.</p> <p>Fishing communities continue to engage in participatory research and data collection.</p> <p>Government remains supportive of providing access to industrial fisheries data.</p> <p>Effective / appropriate measures can be identified for both fisheries and bycatch species.</p>
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<p>Output 4. Engagement & Awareness Raising: More effective governance and management of the fisheries resources as a result of increased knowledge and understanding of the drivers behind IUU fisheries (based on participatory research), that can be used to assess behaviour change resulting from increased surveillance and enforcement efforts.</p>	<p>4.1 Engagement with industrial fishing operators (n = 5 companies) underway by year 1 Q3 facilitating awareness raising initiatives and contribution to stakeholder-led marine spatial planning process (Output 1) with participatory research underway in year 1 Q4.</p> <p>4.2 Representatives from each industrial fishing operator (n = 5 companies) attend 1-day workshop to establish current knowledge of rules and regulations and the perceived level of enforcement and risk to help understand the drivers behind IUU fisheries activity (1 x 1-day assessment workshop in year 1 Q3). Evaluation workshop in year 2 Q4 following increased awareness raising and enforcement initiatives, current zero baseline).</p>	<p>4.1 Fisher engagement / focus groups / workshops participatory data collection.</p> <p>4.2 Workshops delivered (attendance numbers, training materials). Report on the drivers behind IUU. Evaluation report on level of information retained each year by boat operators to assess behaviour change (e.g. trends in number of recorded infractions elaborated in year 1 and re-examined in year 2 and year 3).</p>	<p>Representatives / owners of industrial boats willing to engage with partner organisations and explore role of fisheries management.</p> <p>Fishers continue to engage in participatory research and data collection.</p>
<p>Output 5. Project monitoring and evaluation:</p>	<p>5.1 Minimum of 2 steering group / committee meetings with partners each year to evaluate progress. Feedback to Outputs & Activities 1-4.</p> <p>5.2 Submission of half year and annual Darwin Reports. Feedback to Outputs and Activities 1-4.</p>	<p>5.1 Steering group / committee meetings and minutes. Interim partner reports on annual progress towards agreed goals.</p> <p>5.2 Darwin Reports. Darwin project website updated.</p>	
<p>Activities:</p> <p>Output 1</p> <p>1.1 Workshops: Project launch (opening workshop YR1 Q1) and dissemination of outputs (YR1 Q4), closing workshop & dissemination of project results (YR3 Q2).</p> <p>1.2 Darwin Marine Biodiversity Atlas: Data analysis (YR2 Q1-Q3), leading to updated atlas incorporating ≥ 20 new data layers (YR2 Q4).</p> <p>1.3 GIS Training: Field data collection techniques (YR1 Q3-Q4), introduction to biodiversity atlas, GIS data manipulation & tools for ≥ 10 national staff (YR3 Q1).</p> <p>1.4 Marine spatial planning: Spatial prioritisation analysis (YR2 Q3-Q4) and participatory planning workshops with stakeholders (YR1 Q3).</p> <p>1.5 Peer-reviewed paper: Preparation of peer-reviewed paper on stakeholder-led marine spatial planning outputs from participatory workshops (YR3 Q2)</p> <p>Output 2</p> <p>2.1 Training: Boat handling, maintenance, surveillance and enforcement techniques, data collection (reporting database), & international exchange (YR1 Q2, YR2 Q2).</p>			

2.2 Engagement with fishers: ≥ 25% of 28 fishing communities engaged, workshop to identify focal representative at each site established (YR1 Q2).

2.3 Field data collection: ≥ 25% of fishing communities engaged in participatory data collection, providing information on livelihoods, IUU fisheries activity, and fisheries catches (YR1-YR3).

2.4 Peer-reviewed paper: Preparation of peer-reviewed paper to demonstrate cost-benefits of stakeholder-led IUU reporting (YR3 Q2)

Output 3

3.1 Data analysis: Spatiotemporal patterns of industrial and IUU fisheries activity analysed leading to ≥ 5 new data layers on fisheries sector (YR2 Q1-Q4).

3.2 Threat mapping: Increased knowledge of scale conflict/overlap with small-scale fisheries sector, & marine biodiversity, leading to ≥ 10 new data layers (YR2 Q3-Q4).

3.3 Biodiversity (species) action plans: Preparation of species action plans for marine mammals, sharks, turtles, with interventions identified & costed (YR2 Q3-Q4).

3.4 Policy paper: Preparation of policy paper to government on the fisheries sector, and the socio-economic and ecological impact of IUU fishing activity (YR3 Q1-Q2).

Output 4

4.1 Workshops: ≥ 5 industrial fishing companies engaged to assess baseline levels of rules governing fisheries sector (YR1 Q3) re-evaluated (YR 2 Q4).

4.2 Engagement with industrial fishing sector: ≥ 5 industrial fishing companies engaged with participatory research and awareness raising initiatives (YR1 Q4).

Output 5

5.1 Steering committee: Project launch & annual progress meetings (monitoring and evaluation).

5.2 Progress reporting: Half year, annual & final reports.

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

Project summary	Measurable Indicators	Progress and Achievements
<p>Impact: Poverty alleviation, increased food security and sustainable use of marine biodiversity through improved governance and regulation of fisheries resources and the implementation of an effectively managed marine protected area network.</p>		<ul style="list-style-type: none"> ▪ The project has resulted in increased knowledge to support Marine Spatial Planning with data available for all key ocean user-groups, and increased knowledge on the spatial distribution of marine biodiversity (particularly threatened species). Furthermore, several participatory workshops have been held to identify policy goals and evaluate potential planning scenarios, leading to increased awareness about international best practice to identify priority areas and minimise impacts on ocean user groups. Additionally, increased capacity to undertake enforcement patrols has led to increased fisheries surveillance and a reduction in the number of vessels undertaking illegal activities contrary to fisheries regulations and laws
<p>Outcome: Improved food security, poverty reduction and biodiversity conservation in coastal communities through effective governance of fisheries resources and implementation of evidence-based marine spatial plan that integrates MPAs and fisheries zones.</p>	<ul style="list-style-type: none"> ▪ Marine protected area network that covers at least 10% of Republic of Congo's EEZ, including community and industrial fishing zones based on robust research and participatory design. ▪ Increased knowledge of the spatial distribution of industrial and IUU fisheries activity based on participatory research leading to increased effectiveness and targeted enforcement initiatives to support fisheries regulations. ▪ Increased knowledge of drivers behind IUU fisheries activity based on participatory research will provide decision makers with data to promote more effective governance of marine resources and reduce illegal fishing. ▪ Economic losses for fishers associated with loss of equipment by industrial and IUU fisheries activity (e.g. nets and buoys) reduced by 50% in focal fishing communities. ▪ Number of IUU fisheries infractions reduced by 50%. 	<ul style="list-style-type: none"> ▪ The project has resulted in increased knowledge to support marine spatial planning (MSP) and the expansion of the Republic of Congo's marine protected area (MPA) network - with fine-scale spatial, and socioeconomic data on all key ocean user-groups and marine biodiversity (particularly threatened species) collated within the first national marine spatial planning strategy for the Republic of Congo. ▪ The marine spatial plan developed in collaboration with stakeholders (both government and non-governmental) would see marine protected area (MPA) coverage increase from 3% to 11% if all priority areas were implemented. ▪ Analysis of industrial fishing data and engagement with fisheries dependent communities has resulted in increased understanding on the spatial distribution and scale of economic impact associated with IUU fishing. This body of evidence was submitted to the national fisheries administration to lobby for more effective governance of fisheries resources leading to a draft proposal (i.e. revision) of existing fisheries law. ▪ As a result of increased capacity and knowledge on the spatial distribution of IUU fishing, patrol effort increased by 228%, leading to a demonstrable increase in compliance from 0% to 15%, and a 42% reduction in the average number of infractions committed by individual fishing vessels. <p><i>See section 3.2 Outcome for more detailed information.</i></p>

<p>Output 1. Marine Spatial Planning: Evidence-based stakeholder-led process resulting in the implementation of a marine spatial plan that includes marine protected areas that protect at least 10% of the Republic of Congo's EEZ as well as community and industrial fishing zones based on realistic goals identified by stakeholder groups, research and participatory design.</p>	<ul style="list-style-type: none"> ▪ Policy relevant realistic targets and management scenarios identified through stakeholder workshop in with findings disseminated to local and national organisations. Dissemination workshop will contribute to local and national awareness of project results and outcomes. ▪ Enhanced capacity and technical expertise to deliver a scientifically evidenced marine spatial plan as a result of updated Darwin Marine Biodiversity Atlas supported by training of biodiversity/fisheries professionals within government agencies to use data for marine spatial planning. ▪ Participatory planning workshop implemented to develop marine spatial plan using available information on marine biodiversity, resource extraction, artisanal and industrial fisheries and supported by Marxan analyses of priority areas, community and industrial fishing zones. 	<ul style="list-style-type: none"> ▪ Evidence of progress towards implementing a marine spatial plan that includes protected areas is demonstrated by the delivery of two national stakeholder planning workshops that focused on building national capacity, awareness and technical expertise, with the output of these activities resulting in Congo's first national marine spatial planning strategy (to support decision making processes) which provides the most comprehensive description of human activities and marine biodiversity within the Republic of Congo's marine area. <p><i>See section 3.1 and 3.2 and Annex 7 for more detailed information and evidence of workshops and supporting documents.</i></p>
<p>Activity 1.1 Workshops (contributing to Activity 1.4 Marine spatial planning): Opening workshop; Marine spatial planning 'Congo Marine' stakeholder workshop; and participatory planning and evaluation workshop.</p>		<ul style="list-style-type: none"> ▪ Completed Activities: A 2-day stakeholder workshop to introduce marine spatial planning and identify broad policy goals was held in Pointe Noire on 7th – 8th April 2017 and attended by 60 stakeholders from 12 organisations across 6 sectors. A follow up 1-day participatory spatial planning and evaluation workshop was held hosted on 22nd November 2017 in Brazzaville involving 30 stakeholders, comprising representatives from major government agencies, local and international non-governmental organisations as well as from different ocean user-groups (notably artisanal and industrial fisheries). <p><i>See section 3 Annex 7 for evidence of outputs from spatial planning workshops and supporting documents</i></p>
<p>Activity 1.2. Darwin Marine Biodiversity Atlas: Spatial data analyses leading to updated atlas.</p>		<ul style="list-style-type: none"> ▪ Completed Activities: As specified by project partners and key stakeholders including government agencies all available information has been collated into a single document - the National Marine Spatial Planning Strategy document. This document is organised into three sections. Section one provides background to the purpose of this document, who should use it, and how to obtain access to the information presented within. This section

	<p>also defines the MSP process, why it is needed, the benefits of adopting such an approach and its expected outputs and provides background context to the current situation in the Republic of Congo; and finally, outlines the Republic of Congo's desired goals and objectives derived from stakeholder workshops. Section two describes the current spatial, social and economic data available to support MSP in the Republic of Congo, including the current extent of maritime boundaries and the physical environment, the present status and distribution of species and habitats and ecological processes, as well as providing the most comprehensive description of human activities within the Republic of Congo's marine area to date. The third section illustrates how the described spatial, social and economic data in section two can be combined to develop a range of management scenarios that reflect the Republic of Congo's desired goals and objectives (described in section 1). Finally, this section presents the results of stakeholder evaluation of different planning scenarios and the identification of a consensus marine spatial plan.</p> <p><i>See Annex 5 publications for evidence of project findings/outputs in support of increasing knowledge of marine biodiversity.</i></p>
<p>Activity 1.3 Training: Field data collection techniques.</p>	<ul style="list-style-type: none"> ▪ Completed Activities: Training on socioeconomic data collection was provided to 3 local staff members from Parc National Conkouati-Douli (PNCD) in May and June 2016 and refresher training held with 2 of these staff in October 2018. These training sessions were used to support pre- (baseline) and post-intervention surveys focused on '<i>Quantifying the social and economic contribution of small-scale fisheries and their vulnerability to illegal, unreported and unregulated (IUU) fishing</i>' that were conducted in April 2017 and again in December 2018, providing data from a total of 326 and 257 respondents from 100% of landing sites (n = 29), respectively. These data were used to evaluate changes in economic losses following increased patrol/enforcement efforts implemented during the project. For marine biodiversity, this has included analyses of satellite tracking data to describe important habitats for a range of marine vertebrates for which this region is globally important. <p><i>See section 3 and Annex 7 for more detailed information and evidence.</i></p>
<p>Activity 1.4 Marine spatial planning (see Activity 1.1 Workshops): Spatial prioritisation analysis and participatory planning workshops with stakeholders.</p>	<ul style="list-style-type: none"> ▪ Completed Activities: Based on the opening stakeholder workshop a total of ~10 goals (i.e. high-level statements of desired outcomes) were identified that could be broadly classified into 4 categories: (1) biodiversity conservation; (2) sustainable resource use; (3) local livelihoods; and (4) conflict reduction. Following this workshop project partners conducted three marine spatial planning analyses using Marxan to demonstrate how these goals could be achieved. Scenario 1 focused on enhancing biodiversity protection through both the expansion of existing and identification of new marine protected areas. Scenario 2 and 3 focused on identifying priority areas for conservation that increasingly incorporated important human-uses into the planning process to minimise conflict with stakeholders, and thus increase the likelihood of implementation. These analyses were completed in October

	<p>2017 and a participatory marine spatial planning workshop was hosted on 22nd November 2017 in Brazzaville involving 30 stakeholders, comprising representatives from major government agencies, local and international non-governmental organisations as well as from different ocean user-groups (notably artisanal and industrial fisheries) (see Annex 4 Fig. S3). The specific aim of this second workshop was to demonstrate international standards of best practice used to identify priority areas for conservation, provide detailed information on the positive and negative impacts of adopting different scenarios and work with participants to identify a scenario and priority areas that should be taken forward for further development – leading to the identification of three proposed MPAs; an extension to Parc National Conkouati-Douli, and new protected areas in Loango Bay and Mvassa. Subsequent stages then involved working with stakeholders to develop alternative boundary proposals for each priority area and identify the combination of boundaries that made the highest contribution to biodiversity goals, and correspondingly had the smallest combined social and economic impact.</p> <p><i>See Annex 5 publications for evidence of project findings/outputs in support of marine spatial planning, as well as Annex 7 for evidence of outputs from spatial planning workshops and supporting documents.</i></p>
<p>Activity 1.5 Preparation of peer-reviewed paper on stakeholder-led marine spatial planning outputs from participatory workshops</p>	<ul style="list-style-type: none"> ▪ Completed Activities: the national marine spatial planning strategy document evidences all available outputs from participatory planning process with a draft paper under development that synthesises this comprehensive 184 page document, and the stakeholder collaboration that underpinned its development.
<p>Output 2. Enforcement Capacity: Increased number and effectiveness of IUU fisheries monitoring, surveillance and enforcement initiatives as a result of increased capacity and technical expertise, leading to increased protection, reduced conflict and fishing pressure in coastal and nearshore waters legally reserved for artisanal fishers.</p>	<ul style="list-style-type: none"> ▪ Increase in the number of formally trained Congolese boat pilots. ▪ Increased capacity for marine surveillance and enforcement initiatives enhanced by marine teams attending exchange with enforcement teams from WCS and ANPN in Mayumba National Park, which borders CDNP in neighbouring Gabon. ▪ Increase in the number of regular enforcement patrols at sea by 200% to a minimum of 3 per month. ▪ At least 25% of 28 fisheries dependent communities engaged in collecting IUU fishing data to inform targeted enforcement efforts based on participatory <ul style="list-style-type: none"> ▪ Through increased support (financial, logistical and analytical) including specialised training on the planning and execution of maritime surveillance missions MAEP have increased marine surveillance and enforcement effort by 228%; with an increase in average number of patrols to 2.3 per month (baseline data of 0.7 patrols per month). This increase in patrol effort has also had a notable impact on fishers' behaviour, with compliance increasing to 9% in 2017 and 15% in 2018, from a baseline of 0% between 2006 and 2016. Furthermore, substantial engagement with fisheries communities has resulted in the first nationwide estimate of revenue generated by artisanal fisheries as well as economic losses associated with IUU fishing. These analyses were made possible through the collation of a national database that involved digitising all historical records to evaluate changes over time. <p><i>See section 3 for more detailed information on the impact of increased enforcement capacity.</i></p>

	<p>data collection.</p> <ul style="list-style-type: none"> ▪ Effectiveness of increased enforcement and surveillance initiatives on marine biodiversity (ecological spill-overs) and fisheries livelihoods will be assessed in 25% of 28 fishing communities to identify positive or negative impacts on fisheries catches, and economic losses. ▪ Development of a database to host IUU data collected by focal fishing communities and surveillance patrols leading to increased knowledge of spatiotemporal trends of IUU fisheries activity. 	
<p>Activity 2.1. Training: Boat handling, maintenance, surveillance and enforcement techniques, data collection.</p>		<ul style="list-style-type: none"> ▪ Completed Activities: a total of 13 days of training on the planning and execution of maritime surveillance missions (including 2 days at sea) was provided to 15 individuals from the fishing brigade in Pointe Noire (MAEP) in November 2018. This training was supported by context specific training modules and handbooks that covered Congo's rules and regulations, as well as international guidelines and best practice. To support community surveys of IUU fishing training on socioeconomic data collection was provided to 3 local staff members from Parc National Conkouati-Douli (PNCD) in May and June 2016 and refresher training held with 2 of these staff in October 2018. In addition, MAEP with the support of Rénatura, WCS and UoE have collated all available fisheries patrol data from 2006 into a simple database thereby ensuring that project partners are able to evaluate trends in patrol efforts, compliance, and types of infractions committed by fishing vessels <p><i>See Annex 7 for more evidence of this training and supporting materials.</i></p>
<p>Activity 2.2 and 2.3 Engagement with fishers and data collection: Fishing communities and government agencies engaged in participatory data collection providing information on livelihoods, IUU fisheries activity, and fisheries catches.</p>		<ul style="list-style-type: none"> ▪ Completed Activities: Fisher surveys were conducted in 100% of fishing communities (n = 29) far exceeding project target of 25% of fishing communities – representing a total of 326 and 257 respondents for pre- and post-intervention surveys, respectively, or equivalent 14.2% and 11.2% of the 2,301 individuals estimate to be directly engaged in fishing. As a result of increase collaboration with MAEP the project also obtained access to vessel monitoring system (VMS) data (i.e. 2012, 2016 and 2017) as well as historical enforcement patrol reports that had not been previously analysed by government. All these data have been digitised and analysed to support fisheries reform. <p><i>See section 3, 6.2 and Annex 7 for more detailed information and examples of evidence.</i></p>

<p>Activity 2.4 Peer-reviewed paper: Preparation of peer-reviewed paper to demonstrate cost-benefits of stakeholder-led IUU reporting</p>	<ul style="list-style-type: none"> ▪ Completed Activities: as evidenced throughout this report all pre- and post- intervention socioeconomic survey data has been analysed (see section 3), with an outline for the paper currently in circulation amongst project partners for feedback (given the sensitive nature of this topic).
<p>Output 3. Industrial and IUU fisheries: More effective governance and management of fisheries through increased knowledge of the operating behaviour, spatiotemporal patterns of industrial and IUU fisheries activity, leading to a more effective understanding of the scale of conflict with artisanal fishers and overlap with key biodiversity areas and species of conservation concern.</p>	<ul style="list-style-type: none"> ▪ Baseline knowledge of spatiotemporal patterns of industrial fisheries activity and its conflict / overlap with artisanal fisheries quantified and described. ▪ Baseline knowledge of magnitude and spatiotemporal patterns of IUU fisheries using data collected by fishers engaged in participatory research. Extent of area illegally exploited quantified and described. ▪ Distribution maps for at least 10 species of conservation concern (i.e. sharks, turtles and cetaceans) developed through analysis of existing available field data (e.g. satellite tracking / boat surveys) and overlap with industrial and IUU fisheries quantified by year 2, Q4 (current zero baseline). ▪ Potential interventions to reduce bycatch in each fishery sector identified, costed, and species action plans developed for marine mammals, sharks, and sea turtles. <p><i>See section 3 for detailed evidence on fisheries, and Annex 5 publications for examples of threat mapping analyses.</i></p>
<p>Activity 3.1 Data analysis: Spatiotemporal patterns of industrial and IUU fisheries activity analysed.</p>	<ul style="list-style-type: none"> ▪ Completed Activities: detailed spatial analyses of vessel monitoring system (VMS) data from 2012, 2016 and 2017 has resulted in 3 annual and 12 monthly data layers on the spatial distribution of industrial fisheries activity and effort for each year (total = 45 data layers). Analysis of vessel monitoring system (VMS) data has also revealed that the spatial footprint of the industrial fisheries sector is equivalent to 22.3% of the Republic of Congo's exclusive economic zone (8,189 km²); of which 12% (1,080 km²) of fishing vessel activity occurs within the boundaries of Parc National Conkouati-Douli, and 14% (1,203 km²) within the artisanal fisheries zone, equivalent to 77% and 65% of their respective total area. Fisher surveys have also provided a unique insight into the location of communities

	<p>suffering the greatest impact from IUU fishing. These data have been provided to project partners to support more maritime enforcement patrols.</p> <p><i>See section 3 for evidence of findings on fisheries sector, and Annex 7 for examples of spatial analyses.</i></p>
<p>Activity 3.2 Threat mapping: Increased knowledge on the scale of conflict and overlap with small-scale fisheries sector and marine biodiversity.</p>	<ul style="list-style-type: none"> ▪ Completed Activities: Using available data species distribution models have been developed for 5 species of conservation concern, comprising 3 marine mammals (humpback whale, humpback dolphin and bottlenose dolphin) and 2 species of marine turtle (olive ridley and leatherback sea turtles). Evaluation of available data revealed that there was only enough data to develop robust distribution models for these 5 species (not the targeted 10). However, to ensure that use of available data was maximised, project partners developed species distribution models for each of the 3 key life history stages for sea turtles (e.g. migratory, foraging and inter-nesting areas), as well as at-sea density maps, thereby resulting in a total of 11 data layers. These data have been incorporated into marine spatial planning initiatives described in output 1 – with aim of identifying priority areas for protection of key habitats for species of conservation concern. <p><i>See Annex 7 for examples of outputs from spatial analyses.</i></p>
<p>Activity 3.3 Biodiversity (species) action plans: preparation of species action plans for marine mammals, sharks and turtles with interventions identified.</p>	<ul style="list-style-type: none"> ▪ Completed Activities: Comprehensive data for 5 species of conservation concern (see activity 3.2 above), such as their spatial distribution, and threats have been incorporated into the national strategy document and incorporated into stakeholder led spatial prioritisation analyses to identify priority areas for their protection. <p><i>See Annex 7 for examples of outputs from spatial analyses.</i></p>
<p>Activity 3.4 Policy paper: Preparation of policy paper to government on the fisheries sector, and the socio-economic and ecological impact of IUU fishing activity.</p>	<ul style="list-style-type: none"> ▪ Completed Activities: Analysis of industrial fishing data and engagement with fisheries dependent communities has resulted in increased understanding on the spatial distribution and scale of economic impact associated with IUU fishing – as evidenced throughout this report. This body of evidence was submitted to the national fisheries administration to lobby for more effective governance of fisheries resources leading to an invitation to organise a workshop on the revision of national fisheries law (which was last revised in February 2000) that resulted in a draft proposal (i.e. revision) of existing fisheries law that is currently under consultation by government. <p><i>See section 3.2 and Annex 7 for further details of evidence.</i></p>
<p>Output 4. Engagement & Awareness Raising: More effective governance and management of the fisheries resources as a</p>	<ul style="list-style-type: none"> ▪ Engagement with industrial fishing operator's underway, facilitating awareness raising initiatives and ▪ To address current knowledge gaps and increase awareness on the scale, impact and spatial distribution of fisheries and IUU fishing, project partners have worked closely with MAEP and fisheries stakeholders resulting in unprecedented access to vessel monitoring

<p>result of increased knowledge and understanding of the drivers behind IUU fisheries (based on participatory research), that can be used to assess behaviour change resulting from increased surveillance and enforcement efforts.</p>	<p>contribution to stakeholder-led marine spatial planning process using participatory research.</p> <ul style="list-style-type: none"> ▪ Representatives from each industrial fishing operator attend workshop to establish current knowledge of rules and regulations and the perceived level of enforcement and risk to help understand the drivers behind IUU fisheries activity. 	<p>system (VMS) data (i.e. 2012, 2016 and 2017) as well as historical enforcement patrol reports that had not been previously analysed by government. These data have been incorporated into stakeholder led marine spatial planning processes and used in support of fisheries reform (see output 3 above) with fishers actively involved in each of these processes.</p>
<p>Activity 4.1 and 4.2 Workshops and engagement with industrial fishing sector: industrial fishing companies engaged in participatory research and awareness raising initiatives.</p>		<ul style="list-style-type: none"> ▪ Completed Activities: As of the end of the project 4 (57%) of 7 industrial fishing operators engaged in participatory data collection using GPS trackers and/or attended marine spatial planning and fisheries law workshops. These were primarily national fishing companies, with most of the distant water fleet operators not respond to requests.

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						
3	Number of other qualifications obtained						
4a	Number of undergraduate students receiving training						
4b	Number of training weeks provided to undergraduate students						
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)						
6a	Number of people receiving other forms of short-term education/training (e.g., not categories 1-5 above)	71	**Congolesse / **French	**Male / **Female	2 x Marine spatial planning and participatory evaluation workshops, socioeconomic surveys, fisheries landing surveys and enforcement training.	French	
6b	Number of training weeks not leading to formal qualification	27	**Congolesse / **French	**Male / **Female	Socioeconomic survey instruments, GPS tracking, marine spatial	French	

					planning, enforcement and surveillance training and reporting		
7	Number of types of training materials produced for use by host country(s) (describe training materials)	7			Marine spatial planning strategy document and synthesis document, 2 x socioeconomic surveys, fisheries patrol data sheets and maritime surveillance and patrol training modules	French	
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 or other implementing agencies in the host country (ies)	6			Policy paper on illegal fisheries, and the national marine spatial planning (MSP) strategy document (inc. species action plans (x 4) and marine atlas)	French	The MSP document is the output of a participatory process
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	4			Sea turtles x 2, Marine spatial planning x 1,	English	Please note three have been published

					Fisheries x 1		and a fourth is in press (see Annex 5)
11b	Number of papers published or accepted for publication elsewhere						
12a	Number of computer-based databases established (containing species/generic information) and handed over to host country						
12b	Number of computer-based databases enhanced (containing species/genetic information) and handed over to host country	2			GIS atlas of spatial data used to support MSP process, and fisheries patrol and enforcement database	English / French	Databases created through collaboration of multiple stakeholders.
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	2			2 x Marine spatial planning and participatory evaluation workshops	French	
14b	Number of conferences/seminars/ workshops attended at which findings from Darwin project work will be presented/ disseminated.						
Physical Measures		Total	Comments				
20	Estimated value (£s) of physical assets handed over to host country(s)						
21	Number of permanent educational, training, research facilities or organisation established						

22	Number of permanent field plots established	29	Multiple fishing communities engaged in data collection through this project and previous Darwin Initiative project 20-009				
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	£406,041					

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 *	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)
Journal	Metcalfe, K., Bréheret, N., Bal, G., Chauvet, E., Doherty, P.D., Formia, A., Girard, A., Mavoungou, J.G., Parnell, R.J., Pikesley, S.K., Godley, B.J.G. (2019) Tracking foraging green turtles in Republic of Congo; insights into the spatial ecology from a data poor region.	UK	UK	Male (<i>N.B. Corresponding author is female and Congolese</i>)	Oryx	In press
Journal	Metcalfe, K. Bréheret, N., Chauvet, E., Collins, T., Curran, B.K., Parnell, R.J., Turner, R.A., Witt, M.J. & Godley, B.J. (2018) Using satellite AIS to improve our understanding of shipping and fill gaps in ocean observation data to support marine spatial planning.	UK	UK	Male	Journal of Applied Ecology	http://onlinelibrary.wiley.com/doi/10.1111/1365-2664.13139/pdf *
Journal	Pikesley, S.K., Agamboue, P.D., Asseko, G.M., Bayet, J.P., Bibang, J.N., Bonguno, E.A., Boussamba, F., Broderick, A.C., Coyne, M., Faure, F.E., Fay, J.M., Formia, A., Godley, B.J., Gnandji, M.S., Kema Kema, J.R., Mabert, B.D.K., Manfoumbi, J.C., Metcalfe, K., Minton, G., Nelms, S., Nzegoue, J., Ogandanga, C., Olwina, C.K.K., Otsagha, F., Parnell, R.J., du Plessis, P., Ngouessono, S., Sounguet, G.-P., Wada, M., White, L. & Witt, M.J. (2018) A novel approach to estimate the distribution, density and at-sea risks of a centrally-placed mobile marine vertebrate.	UK	UK	Male	Biological Conservation	https://www.sciencedirect.com/science/article/pii/S000632071730770X *
Journal	Metcalfe, K. Collins, T., Abernethy, K.E., Dengui, J.C., Boumba, R., Miyalou, R., Parnell, R., Plummer, K.E., Russell, D., Safou, G.K., Tilley, D., Turner, R.A., VanLeeuwe, H., Witt, M.J., Godley, B.J. (2017) Addressing Uncertainty in Marine Resource Management; Combining Community	UK	UK	Male	Conservation Letters (<i>open access</i>)	http://onlinelibrary.wiley.com/doi/10.1111/conl.12293/abstract *

	Engagement and Tracking Technology to Characterize Human Behavior					
MSP Strategy document	Congo Marine (2018) Strategic information to support marine spatial planning. Republic of Congo Version I May 2018. Centre for Ecology and Conservation (CEC), University of Exeter, Cornwall, United Kingdom. pp 184.	Consortium of authors (UK, Congolese, USA, French)	Consortium of authors (UK, Congolese, USA, French)	Consortium of authors (UK, Congolese, USA, French)		
Magazine	La Surveillance de la pêche illicite (2017)	French	French	Female	BRAZZAMAG, Republic of Congo	http://brazzomag.com/ and in print (see Annex 7 Fig. S19)

* Please note as part of the UoE's open access policy this paper has been archived in pre-submission format within the UoE's Open Research Exeter (ORE) online repository. See: <https://ore.exeter.ac.uk/repository/handle/10871/32052> for example

Annex 6 Darwin Contacts

Ref No	23-011
Project Title	Transforming marine resource management in the Republic of Congo
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