

TC Document

I. Basic Information for TC

▪ Country/Region:	PANAMA
▪ TC Name:	Valuing, Protecting and Enhancing Coastal Natural Capital
▪ TC Number:	PN-T1233
▪ Team Leader/Members:	Watson, Gregory (CSD/CSD) Team Leader; Piedrafit, Carolina (CSD/CSD) Alternate Team Leader; Acosta, Keyla (CSD/CSD); Alleng, Gerard (CSD/CCS); Bucaram, Santiago (CSD/RND); Cambiasso, Ezequiel (VPC/FMP); Dequech Napo (CSD/CSD); Gomez, Juan (CSD/CCS); Le Pommellec, Marion (CSD/RND); Sanmartin Alvaro (LEG/SGO); Weekes, Khafi (CSD/RND)
▪ Taxonomy:	Client Support
▪ Operation Supported by the TC:	N/A
▪ Date of TC Abstract authorization:	12 Sep 2019.
▪ Beneficiary:	Panama
▪ Executing Agency:	National Audubon Society
▪ Donors providing funding:	UK Blue Carbon Fund(BLU)
▪ IDB Funding Requested:	Total: US\$2,307,408.00
▪ Local counterpart funding, if any:	US\$659,232.00 (Cash)
▪ Disbursement period (Execution period):	40 months (36 months)
▪ Types of consultants:	N/A
▪ Prepared by Unit:	CSD-Climate Change and Sustainable Development Sector
▪ Unit of Disbursement Responsibility:	CSD-Climate Change and Sustainable Development Sector
▪ TC included in Country Strategy:	Sí
▪ TC included in CPD:	No
▪ Alignment to the Update to the Institutional Strategy 2010-2020:	Productivity and innovation; Institutional capacity and rule of law; Environmental sustainability

2. Objectives and Justification of the TC

- 2.1 Panama is in the top 20 countries in the world for mangrove cover (Hamilton & Casey, 2016). Along with its associated wetlands, these provide important ecosystem services including coastal protection, carbon sequestration and habitats for a range of biodiversity as well as support for economic activities. To illustrate, Panama's mangroves provide nurseries for shrimp and commercial fish, supporting a diverse industry valued at over \$400 million/year in 2007 (*Atlas Nacional de la República de Panamá*, 2007). Mangroves in the Bay of Panama are also the most important site for migratory shorebirds in the Americas, with over 2.5 million birds utilizing the area annually alongside over 200 resident bird species (8 IUCN¹ Endangered), 74 fish species, 50 mammals, 295 plant species and 25 mollusk and crustaceans (*Sociedad Audubon de Panamá, Fundación Natura, FIDECO*, 2016). As mangroves and associated wetlands sequester more carbon than their terrestrial counterparts do, Panama's mangroves have a huge potential to sequester carbon through improved management and restoration, up to 9.8×10^7 tons CO₂².
- 2.2 Despite these benefits, unchecked development urbanization, and weak law enforcement has led to mangrove damage and degradation or loss of habitat. This has negatively impacted local communities and resulted in coastal flooding and erosion,

¹ International Union for Conservation of Nature.

² Based on current mangrove cover estimates for Bay of Panama (37,919 ha) and Bay of Parita (30,740 ha) and globally averaged carbon stock estimates for mangroves (Howard et al., 2014).

loss of livelihood opportunities, etc. The Pacific coast of Panama hosts nearly 90% of the country's mangroves. However, the coastline is experiencing rapid urban expansion and development which has contributed to a 68% loss of mangrove cover since 1980 (Lopez Angarita, 2016). The eastward expansion of Panama City (population 880,000³) has caused the greatest proportion of mangrove loss in the country (Kaufmann, 2012). Further west along the Pacific coast, the Bay of Parita faces mangrove losses due to clearing for shrimp farming and salt production (Bolanos, 2012). Plastic pollution associated with increasing urbanization has also been identified as a threat to Panama's mangroves (*Sociedad Audubon de Panamá*, 2015) as it builds up in mangrove sites, suffocating roots and causing die-offs. Given these pressures, the watersheds that feed into the bay are considered to be very vulnerable to climate change (*Tercera Comunicación Nacional Sobre Cambio Climático de Panamá*) causing major concerns for food security, local livelihoods, the economy and biodiversity. Despite the government's efforts to protect mangroves ([National Wetland Policy](#) 2018), regulations have not yet been implemented.

- 2.3 After decades of deterioration, mangroves, related wetlands and tidal habitat are now being recognized globally (Primavera et al. 2019) for the important role they play in mitigating and building resilience to climate change alongside other ecosystem services that benefit people and biodiversity. Broad scale global assessments estimate that mangroves provide at least US\$1.6 billion each year in ecosystem services that capture carbon, support coastal livelihoods and communities around the world (Costanza et al., 1997). However, in Panama, the ecosystem services provided by mangroves and its related wetlands are rarely quantified in economic terms and are not disseminated among decision makers or the general public (Recio et al., 2016). Thus, decision-making is based on incomplete assessments of ecosystems value, and the value of Panama's mangroves is often reduced to conversion for commercial development (Recio et al. 2016).
- 2.4 The objective of this technical cooperation (TC) is to promote the conservation and protection of Panama's coastal natural capital (mangrove and related wetlands) by quantifying, the carbon they sequester and the biodiversity and livelihoods they support and then promoting policy and behavioral change. The project will undertake a multi-pronged approach including: (i) delivering robust science that establishes a blue carbon baseline; (ii) establishing economic valuation of the ecosystem services provided by mangroves and related wetlands; (iii) building knowledge, awareness and engagement with key stakeholders to drive action that increases protection of these ecosystems; and (iv) strengthening regulations that will promote mangrove conservation and reforestation. These efforts will be applied in two pilot sites: (i) the Bay of Panama and its mosaic of urban landscape and mangrove habitat; and (ii) the Bay of Parita, a site in transition, where the connection between mangroves and livelihoods is more apparent.
- 2.5 These investments are expected to better enable Panama to: (i) include blue carbon associated with coastal natural capital into the country's Nationally Determined Contribution (NDC); (ii) support stronger climate adaptation efforts; (iii) reduce degradation and deforestation; and (iv) build mechanisms to drive funding toward mangrove and coastal conservation. By integrating coastal natural capital into the country's mitigation calculations under the Paris Agreement and building awareness around carbon and ecosystem service values, this project is expected to help secure habitats over the long term and identify funding mechanisms for their management. Given the multiple ecosystem services of mangroves, the project has the support of the

³ According to latest Census data from Panama's *Instituto Nacional de Estadística y Censo*.

Ministry of Environment, the Aquatic Resources Authority, the Municipality of Panama City, and the National Secretary of Science Technology, and Innovation.

- 2.6 This TC is consistent with the Second Update to the Institutional Strategy (AB-3190-2), and is aligned with the development challenge of productivity and innovation, as it will quantify the economic value of the services provided by Panama's mangroves to protect crucial biodiversity and livelihoods, and ultimately drive funding for their preservation. The TC is also aligned with the cross-cutting themes of: (i) institutional capacity and rule of law, as it develops tools to assist in the incorporation of mangroves into national climate change strategies and policies; and (ii) climate change and environmental sustainability, as it supports adaptation efforts, reduces degradation and deforestation and intends to preserve the productivity of key ecosystems. Finally, it is aligned with the institutional goals of strengthening responsiveness to clients, seeking a multisectoral approach to delivering high-quality solutions to the region and leveraging partnerships and resource mobilization. This TC also is consistent with the "Innovation, Science and Technology Sector Framework Document" (GN-2791-8) by supporting Panama's progression towards developing highly skilled human capital necessary to support and further develop national innovation systems. Additionally, the operation is consistent with the "Environment and Biodiversity Sector Framework Document" (GN-2827-8), as the operation intends to produce sector assessments relevant for stakeholder mapping and gap analyses that will serve as the base for future policymaking, as well as new projects' design and implementation.
- 2.7 This TC is closely aligned with the current "IDB Country Strategy" with Panama which earmarks investments to improve the delivery of basic services for populations living in poverty, while focusing on sustainability and resilience to natural disasters. This TC supports the climate change objectives defined in the strategy by delivering specific climate resilience building products that will result from its implementation. These products will support the delivery of basic services in two ways: (i) increasing the ability of nature-based solutions to provide services such as water provision and filtration to populations; and (ii) using nature to increase the resilience of built service infrastructure.
- 2.8 With regards to the complementarity with ongoing IDB Group activities in Panama, this TC will also compliment the "Resilient Urban Watershed Program" (4704/OC-PN) as it furthers the sustainable improvement of the socio-environmental and urban conditions of the population in the Juan Díaz watershed through flood mitigation actions, improvement in public space quality and access, and strengthening of water and land management capacities. Also this TC builds on the work of the IDB Network of Mayors, which seeks to work with municipalities to improve capacity to support sustainable development, especially low-carbon and resilient development.
- 2.9 This project will be financed from the UK Blue Carbon Fund (GN-2949), which seeks to promote the sustainable management of mangrove forests and accelerate the Blue Economy and sustainable development in countries with important mangrove ecosystems in the Caribbean, South and Central America. This project is aligned with the expected outcomes of the fund as it intends to promote biodiversity conservation, climate change adaptation, poverty alleviation and coastal zone management while mobilizing the public and private sectors, reducing and avoiding greenhouse gas emissions, and promoting sustainable management. The indicators of this project are aligned with the results framework of the fund.

3. Description of Activities/Components and Budget

- 3.1 **Component 1. Deliver robust science to establish a Blue Carbon Baseline in Panama's mangroves (US\$1,040,000).** As mangrove conservation and restoration

has been identified as one of the best opportunities for climate mitigation through the long-term storage of carbon, this component will analyze the current mangrove coverage at two project sites, the Bay of Panama and Bay of Parita. This assessment will be completed using the most current Global Mangrove Watch data layers of mangrove cover and will be compared to the 2000 and 2010 coverages found by Panama's National Environmental Authority (now the Ministry of Environment), using the Google Earth Engine. The analysis will be used to create an online map and included interpretive text that can serve as a communication tool with key stakeholders, and its findings will be used to prioritize sites for mangrove restoration through the broad scale assessments made in the [restoration potential map](#) by Ocean Wealth. In line with assessing mangrove cover, the project will: (i) develop a baseline on existing carbon storage; and (ii) establish a methodology to monitor carbon accumulation. The analysis will cover aboveground (biomass) and belowground (biomass and soil) carbon stocks. With the above findings in hand, the project will explore voluntary and regulatory carbon market options for Panama's mangroves.

3.2 Component 2. Establish economic valuation of coastal natural capital. (US\$341,000).

In order to highlight the economic value and importance of coastal natural capital, the project will: (i) work with Stanford University's Natural Capital team to perform a natural capital analysis of three target ecosystem services: carbon sequestration, fisheries and storm protection; (ii) highlight the key role that mangroves play in providing natural protection of the Tocumen International Airport, the newly developed wastewater treatment plant for Panama City, and related infrastructure and other industrial facilities; and (iii) present the results of this analysis to local politicians to inform decision-making and integrate it into a communications campaign with public and private stakeholders. To achieve these objectives, the project will collect inputs and apply Stanford's Integrated Valuation of Ecosystem Services and Tradeoffs ([InVEST](#)) models to project sites. InVEST allows stakeholders and decision makers to assess quantified tradeoffs associated with alternative management and planning scenarios. It enables these groups to identify areas where investment in natural capital can enhance sustainable development and conservation. In this project, the Coastal Blue Carbon model, Fisheries model, and Coastal Vulnerability models will be used.⁴ Model outputs will highlight current and future scenarios of carbon sequestration, prioritize restoration areas, demonstrate volumes and economic values of fish harvests dependent on coastal ecosystems under different scenarios, and highlight areas of coastal hazard risk and the protection offered by natural infrastructure (including specifically to the airport, wastewater, and industrial plants.) These outputs will be developed into communications materials for meetings with public authorities at relevant ministries, and for the general public. It is noteworthy that the dialogue has already begun with these stakeholders on the value of nature-based infrastructure.

3.3 Component 3. Build knowledge, awareness and engagement with key stakeholders to drive action that increases protection of coastal natural capital. (US\$348,400).

In order to build local and national awareness on coastal natural capital and the services that it provides, this component will deliver community-based initiatives that educate, engage and empower people to value and better manage coastal wetlands. Building off of proven models, the project will execute a national communication strategy to engage and educate key stakeholders, including newly elected officials with two key goals: (i) highlight the value of coastal natural capital; and (ii) raise awareness on stresses to the environment, such as plastic pollution. The communication strategy will include infographics on mangrove

⁴ Similar approach to the one in IDB project ATN/OC-14719-BH, which resulted in a coastal planning loan.

value, a 3-minute video on plastic pollution, news features, radio and more. The campaign will help efforts to gain traction and influence policy decisions with Panama's new administration on solutions to plastic contamination. As part of the campaign, the project will work with local artists to highlight the cultural importance of mangroves and hold a mural competition, lacing the urban landscape with artistic imagery of mangrove habitat. This component will also build a coalition of public and private sector stakeholders to advocate for coastal natural capital. Building from a 2015 stakeholder coalition⁵ that advocated for the official protection of the Bay of Panama, this component will refresh and enhance the coalition. This will be done through creation of a roundtable with representation from government, civil society and the private sector to apply economic valuation data generated to engage with industry and others to contribute to the conservation and policy initiatives including protection of key infrastructure using mangrove restoration. Finally, this component will strengthen coastal wetland education for underserved students from low-income and vulnerable communities using the successful *Aulas Verdes* environmental education platform. Designed in 2009, *Aulas Verdes* is an environmental education program that focuses on how local ecosystems support birds, fish other biodiversity in and around the Bay of Panama. The curriculum is aligned with the national curriculum in Panama and is used in 20 schools around the country. With over 3,000 students participating annually, the platform provides lessons on carbon and ecosystem services, as well as field trips to mangrove sites, enabling underserved communities to experience wetlands.⁶ Past experience in the program has shown that reaching students at this age instills the values and beliefs to create a robust, conservation-minded constituency that advocates for the environment. The program focuses on low-income populations because these communities tend to live in areas that experience the largest impacts from climate change, including more significant flooding. By making links between mangrove destruction and increased flooding, students and their families are able to advocate for policy to promote mangrove protection. Currently, Audubon Panama, a partner organization to National Audubon Society, has a Memorandum of Understanding (MoU) with the Ministry of Environment to operate the *Aulas Verdes* program in public schools in one pilot site, and is set to sign an expanded MoU in the future to broaden the scope of the program at the national level. Audubon Panama has been operating for 50 years and is one of Panama's leading conservation organizations. It has partnered with National Audubon Society in the development of the conservation plan for the Bay of Panama and the establishment of the Bay of Panama Wildlife Refuge. They will work together during the execution of this TC.

- 3.4 **Component 4. Support and strengthen policies that incentivize mangrove conservation and restoration. (US\$345,500).** This component will use white papers, communication strategies, workshops and roundtables of stakeholders to educate policymakers to help inform policies that promote mangrove conservation and protection. Throughout the duration of the project's implementation, the project will engage with government officials as each new product is completed, to promote ownership and use of the information. In particular, the mangrove carbon analysis and study on entry to carbon market will be communicated to government through workshops. The Natural Capital valuation process will engage government from the initial workshops identifying priorities and data needs through to future scenario planning once analyses are complete. The results of both of these processes will be used to draft policy language for Panama to officially recognize mangroves in their

⁵ Alliance of 44 partner organizations. Some of its members include: Audubon Panama, Fundación MARVIVA, Wetlands International, Center of Environmental Impact and Conservation International.

⁶ Since 2006, Audubon Panama has implemented the [Aulas Verdes](#) environmental education program.

NDCs. Further, key government officials will participate in meetings of the public private roundtable. In developing this project the Ministry of Environment, Ministry of Health, Aquatic Resources Authority, and National Secretary of Science and Innovation have been engaged, and they will continue to be involved as stakeholders during implementation. In addition, given the importance of managing plastic waste, the component will support a roundtable to influence policymakers to enact policies to reduce the use of single-use plastic and incentivize recycling. Large-scale policy changes are needed to enable conditions in-country to bring plastic to market and to drive funding toward much needed recycling infrastructure in Panama City. In collaboration with the Technological University⁷ and the municipality, the project will identify business opportunities with a clear value chain and mechanisms for kick starting plastic recycling. Lastly, this component will work with Panama's Government to conduct a strategic environmental assessment on the Bay of Panama, which will be used to inform the creation of a management plan for a protected area. Major environmental stakeholders⁸ recognize the need to establish the "rules of the game" for mangroves in the protected area and beyond to establish a protocol for future development decisions. These biodiversity assessments will be done in partnership with the Smithsonian Tropical Research Institute and SENACYT.⁹

- 3.5 **Project Administration (US\$232,508).** The project management unit will be coordinated out of the National Audubon Society office in Washington, DC with active and robust participation of Audubon Panama and other consultants in Panama. The unit will consist of a Project Coordinator, Project Finance Specialist, and a project evaluation officer (part-time), based in Washington. These posts are key to manage the necessary inputs of the project and to comply with the fiduciary requirements of IDB financed operation technical specialists will be based in Panama.
- 3.6 The total cost of this operation is US\$2,966,640, of which US\$2,317,608 will come from the UK Blue Carbon Facility (GN-2949);¹⁰ and US\$659,232 correspond to the counterpart funding in cash.¹¹

Indicative Budget (US\$)

Component	IDB Funding	Counterpart	Total
1. Establish a blue carbon baseline in Panama's mangroves	1,040,000	100,000	1,140,000
2. Economic valuation of mangrove ecosystem services	341,000	31,000	372,000
3. Engagement with key stakeholders to protect natural capital	348,400	270,288	618,688
4. Strengthen policies to preserve and restore mangroves	345,500	174,332	519,832
Project Administration	232,508	83,612	316,120
Total	2,307,408	659,232	2,966,640

4. Executing Agency and Execution Structure

- 4.1 The client for this TC is the Ministry of Environment of Panama, which has an interest in the preservation and conservation of the mangrove ecosystems of the country. This TC will be executed by the National Audubon Society, a USA-based NGO dedicated to protecting birds and the habitat that supports them, in coordination with the project

⁷ Panama's Technological University, is an education institution with leadership in on-the-ground research in mangrove habitat. It has equipment that enables the measurement of carbon flux, required for project activities.

⁸ Including environmental leaders like Audubon Panama, Marea Verde, and others.

⁹ Panama's National Secretary of Science, Technology, and Innovation.

¹⁰ Funded by the UK, the Fund provides 12.75 million pounds sterling for IDB Blue Carbon projects. It supports the IDB's efforts to develop the Blue Economy in LAC by mobilizing investments in areas such as sustainable fisheries and aquaculture, coastal zone management, payment for ecosystem services, and marine protected areas.

¹¹ David and Lucile Packard Foundation, USFWS Neotropical Migratory Bird Conservation Act, National Geographic, Audubon Panama and others.

team. The main implementation responsibility will fall on the National Audubon Society, who will hire a project management unit to manage the program. The National Audubon Society is an independent 501 (c)(3) non-profit organization registered in the United States with the mission to protect birds and the places they need as habitat using science, advocacy, and conservation. Over a century it has grown to 464 local chapters, several international partners, one million members, and a dedicated professional staff. The 2016-2020 strategic plan of National Audubon Society includes a focus on protecting bird habitat in Panama, Chile, Colombia, Mexico, and the Bahamas as part of the Flyway of the Americas. In 2013 the National Audubon Society completed a \$1.3 million project with the IDB's Multilateral Investment Fund (MIF) entitled "Strengthening Bird-based Tourism as a Development Tool." This project had excellent results in the Bahamas, Belize, Guatemala, and Paraguay according to the MIF's internal evaluations. Highlights included trained guides seeing over 60% increases in revenue, 6,000 children receiving education on conservation, community support built for a new national park in the Bahamas, and poaching reduced to near zero in Belize.

- 4.2 National Audubon Society, through Audubon Panama, has worked with conservation groups, government agencies and communities in Panama for over a decade (developing a conservation plan for the Bay of Panama, protecting 250,000 acres in the Bay of Panama Wildlife Refuge, and trained governmental staff). In addition, National Audubon Society will contract with the Audubon Panama to implement project activities, which include the development of the Conservation Plan for the Bay of Parita, national communication activities, environmental impact studies and shore bird monitoring, local capacity development, government engagement, and a plastic symposium. The Ministry of Environment will coordinate this work with other government entities.
- 4.3 An evaluation of the institutional capacity of the National Audubon Society was performed in November 2019 using the IDB's Institutional Capacity Assessment Platform (ICAP) tool and included a review of the relevant documentation –Financial Code and the Procurement Procedures Manual, in order to corroborate the findings of the assessment. The evaluation indicated that the program has a medium-low fiduciary risk, and as such, the institution will have the capacity to execute the operation based on its current structures and fiduciary systems in place.
- 4.4 Counterpart resources will come from the National Audubon Society. A [letter of commitment](#) of these resources is available in the project files. The project team will review counterpart expenditures to ensure compliance with IDB standards.
- 4.5 The Climate Change and Sustainable Development Sector of the Bank (CSD) has developed the Natural Capital Lab program (GN-2970) as a cross-bank initiative to work cross-sectorally with IDB, IDB Lab and IDB Invest departments, and as a one-stop shop for the IDB Group to drive innovation in the sustainable use and conservation of landscape and marine ecosystems. As a strategic resource of the IDB Group, the Natural Capital Lab serves as a new space where the public and private sectors can take risks, work together, and connect with IDBG programming. It seeks to bridge the gap between traditional environmental and financial actors from the public and private sectors to incubate, accelerate and scale new finance, technology and policy solutions to pressing problems. It is currently serving as the technical focal point for the UK Blue Carbon Facility. CSD, through the Natural Capital Lab program, will undertake the role of the Unit of Disbursement Responsibility. All administrative, technical supervision, internal and external coordination will be the responsibility of the National Audubon Society. The CSD project team will assist with the quality review of final products of consultancies.

- 4.6 The National Audubon Society, as the executing agency of the project, will hire individual consultants and/or firms to carry out relevant activities of the project. The procurement of goods, works and services, and the selection of consultants will be carried out in accordance with IDB policies related to: (i) Procurement of Goods and Works Financed by the IDB (GN-2349-9); and (ii) Policies for the Selection and Contracting of Consultants Financed by the IDB (GN-2350-9).

5. Major Issues

- 5.1 The government's capacity to implement the outputs from the operation: a key risk to coastal natural capital considerations being mainstreamed into a government's policies and decision making is its capacity to implement economic valuations and policy amendments. To mitigate this risk, the TC will host a round table with the government, civil society and the private sector to use economic valuation data generated to engage with industry and others to contribute to conservation and policy initiatives (participation of these stakeholders in the roundtable is crucial). In addition, development and construction priorities may be in conflict with conservation goals. It will be important to demonstrate the value of natural infrastructure to both sides of the issue.
- 5.2 The COVID-19 pandemic: this may affect initial work of the project. Some initial workshops and consultations may have to be virtual, and some travel may need to be delayed. Social distancing will need to be applied in the first several months of fieldwork.
- 5.3 Multi-stakeholder input required: buy-in from multiple government agencies, civil society and local stakeholders will be required for the shifts in policy and local perception about mangroves, wetlands and tidal ecosystems. To mitigate this risk, the program will actively work with local communities and maintain open and transparent lines of communication between members of the conservation coalition. In addition, a key output of this operation is the design of a communications strategy which will ensure continued engagement of all relevant sectors in society.
- 5.4 Availability of subject matter experts: the project has multiple elements that require the input of subject matter experts, and in the field of natural capital valuation these may be scarce. To mitigate, the terms of reference to hire consultants will be clearly articulated and disseminated through specialized networks such as the NatCap Program at the Stanford Woods Institute, the United Nations Ecosystem Accounting working group, and other networks. In addition, the IDB and the National Audubon society will establish connections with existing mangrove and blue carbon experts in the region¹².

6. Exceptions to Bank Policy

- 6.1 There are no exceptions to the Bank Policy.

7. Environmental and Social Strategy

- 7.1 Per the Environment and Safeguards Compliance Policy of the Bank (OP-703), the operation has been classified as "Category C". No environmental assessments are required (see the [Safeguard Policy Filter](#) and the [Safeguard Screening Form](#)).

Required Annexes

[Request from the Client 52637.pdf](#)

¹² For example, the Smithsonian Institution.

[Results Matrix_27744.pdf](#)

[Terms of Reference_6982.pdf](#)

[Procurement Plan_24951.pdf](#)