

MAYA FOREST CORRIDOR REDD PROJECT

Project title	Maya Forest Corridor REDD Project
Project ID	5294
Crediting period	1 January 2022 – 31 December 2041
Project lifetime	1 January 2022 – 31 December 2041; 20-year lifetime
(CCB) GHG accounting period	1 January 2022 – 31 December 2041; 20-year lifetime
Original date of issue	17 October 2025 (Date of submission for pipeline listing as under validation)
Most recent date of issue	17 October 2025
Version	1.0
VCS Standard version	v4.7
CCB Standards version	v3.1
Project location	Belize, Belize and Cayo Districts
Project proponent(s)	Maya Forest Corridor Trust (MFCT) Nicole Auil Gomez, MFCT Secretary/ Wildlife Conservation Society Belize Director +501 223-3005; nauilgomez@wcs.org
Validation/verification body	TÜV SÜD America, Inc. Paulina Fernández, paulina.fernandez@tuvsud.com , +52 55 22343394
History of CCB status	No previous validations nor attempts at validation
Gold Level criteria	This project seeks recognition for Gold Level exceptional biodiversity benefits. The project zone includes sites of high biodiversity conservation

	priority as demonstrated by the regular occurrence of the critically endangered Central American river turtles (<i>Dermatemys mawii</i>) as well as that of the endangered Baird's tapirs (<i>Tapirus bairdii</i>). The management for conservation of the project area that would have otherwise been converted to agricultural production helps protect these species.
Expected verification schedule	Verification planned for 2025-2026.
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1 SUMMARY OF PROJECT BENEFITS

The project has five objectives:

1. Prevent the agricultural conversion of the project area to preserve its ecological role in the larger Maya Forest Corridor.
2. Conserve the project area to avoid GHG emissions, maintain carbon stocks, and carbon sequestration.
3. Preserve the project area to maintain its native biodiversity.
4. Empower local communities to lead conservation and climate resilience efforts by enhancing their awareness and understanding of critical environmental and climate adaptation issues.
5. Enhance community capacity for sustainable diverse livelihoods and nature-based solutions for climate adaptation.

The following sections summarize the unique and standard project benefits.

1.1 Unique Project Benefits

Outcome or impact estimated by the end of project lifetime	Section reference
1) Protects and encourages the dispersal of wildlife through connecting the Selva Maya of Belize, Guatemala, and Mexico and the Maya Mountains of southern Belize which are the largest tracts of intact forest in the Mesoamerica Biodiversity Hotspot	5
2) Protects wildlife and wildlife habitat through patrols that limit poaching, control, and mitigation of wildfire, monitoring of wildlife occurrence, and habitat use.	5
3) Improves communities' resilience by improving local fire management systems, supporting sustainable livelihoods, and supporting climate change adaptation.	4

1.2 Standardized Benefit Metrics

Category	Metric	Estimated by the end of project lifetime	Section reference
GHG emission reductions or carbon dioxide removals	<i>Net estimated removals in the project area, measured against the without-project scenario</i>	Not applicable	
	<i>Net estimated reductions in the project area, measured against the without-project scenario</i>	1,153,417 t CO ₂ e	3.2
Forest ¹ cover	<i>For REDD² projects: Estimated number of hectares of reduced forest loss in the project area measured against the without-project scenario</i>	10,795 ha	3.2
	<i>For ARR³ projects: Estimated number of hectares of forest cover increased in the project area measured against the without-project scenario</i>	Not applicable	
Improved land management	<i>Number of hectares of existing production forest land in which IFM⁴ practices are expected to occur as a result of project activities, measured against the without-project scenario</i>	Not applicable	
	<i>Number of hectares of non-forest land in which improved land management practices are expected to occur as a result of project activities, measured against the without-project scenario</i>	Not applicable	

¹ Land with woody vegetation that meets an internationally accepted definition (e.g., UNFCCC, FAO, or IPCC) of what constitutes a forest, which includes threshold parameters, such as minimum forest area, tree height and level of crown cover, and may include mature, secondary, degraded and wetland forests (VCS Program Definitions)

² Reduced emissions from deforestation and forest degradation (REDD) - Activities that reduce GHG emissions by slowing or stopping conversion of forests to non-forest land and/or reduce the degradation of forest land where forest biomass is lost (VCS Program Definitions)

³ Afforestation, reforestation and revegetation (ARR) - Activities that increase carbon stocks in woody biomass (and in some cases soils) by establishing, increasing and/or restoring vegetative cover through the planting, sowing and/or human-assisted natural regeneration of woody vegetation (VCS Program Definitions)

⁴ Improved forest management (IFM) - Activities that change forest management practices and increase carbon stock on forest lands managed for wood products such as saw timber, pulpwood, and fuelwood (VCS Program Definitions)

Training	<i>Total number of community members who are expected to have improved skills and/or knowledge resulting from training provided as part of project activities</i>	260 persons Firefighting: 80 persons (20 persons every 5 years for 20 years) Ranger training: 20 (5 every 5 years for 20 years) 160 in sustainable livelihoods (40 every five years for 20 years)	4.2
	<i>Number of female community members who are expected to have improved skills and/or knowledge resulting from training as part of project activities</i>	116 females Firefighting: 32 females Currently 40% female. No significant increase expected due to strict gender norms. Ranger training: 4 Currently no females. Estimate an increase to 20%. Significant increase not expected due to strict gender norms. Sustainable livelihoods: 80 females (Currently 33%. Due to the expressed interest by women, this can approach 50%).	4.2
Employment	<i>Total number of people expected to be employed in project activities⁵, expressed as number of full-time employees⁶</i>	12 persons To date, there have been 8 persons employed in the project: 4 rangers, 4 Technical/Managerial, and 2 field assistants in biomass measurements. Temporary and seasonal employees have been converted to full-time equivalency.	4.2

⁵ Employed in project activities means people directly working on project activities in return for compensation (financial or otherwise), including employees, contracted workers, sub-contracted workers and community members that are paid to carry out project-related work.

⁶ Full time equivalency is calculated as the total number of hours worked (by full-time, part-time, temporary and/or seasonal staff) divided by the average number of hours worked in full-time jobs within the country, region or economic territory (adapted from the UN System of National Accounts (1993) paragraphs 17.14[15.102];[17.28])

		Moderate increase (50% over 20 years) expected since project area is set, and community population will grow very slowly.	
	<i>Number of women expected to be employed as a result of project activities, expressed as number of full-time employees</i>	5 women To date, there have been 3 women employed (30% of total): 0 rangers, 3 Technical/Managerial, 0 biomass measurements. Efforts to improve gender parity expected to increase it to 40%, considering strict gender norms relating to field work.	4.2
Livelihoods	<i>Total number of people expected to have improved livelihoods⁷ or income generated as a result of project activities</i>	92 persons 21 farmers and 2 households to date. Estimating 50% (80) of persons trained in sustainable livelihoods and 100% (12) of employed persons.	4.2
	<i>Number of women expected to have improved livelihoods or income generated as a result of project activities</i>	45 women Estimating 50% of persons trained in sustainable livelihoods and 100% of employed persons.	4.2
Health	<i>Total number of people for whom health services are expected to improve as a result of project activities, measured against the without-project scenario</i>	Not applicable	N/A
	<i>Number of women for whom health services are expected to improve as a result of project activities, measured against the without-project scenario</i>	Not applicable	N/A

⁷ Livelihoods are the capabilities, assets (including material and social resources) and activities required for a means of living (Krantz, Lasse, 2001. The Sustainable Livelihood Approach to Poverty Reduction. SIDA). Livelihood benefits may include benefits reported in the Employment metrics of this table.

Education	Total number of people for whom access to, or quality of, education is expected to improve as result of project activities, measured against the without-project scenario	Not applicable	N/A
	Number of women and girls for whom access to, or quality of, education is expected to improve as result of project activities, measured against the without-project scenario	Not applicable	N/A
Water	Total number of people who are expected to experience increased water quality and/or improved access to drinking water as a result of project activities, measured against the without-project scenario	Not applicable	N/A
	Number of women who are expected to experience increased water quality and/or improved access to drinking water as a result of project activities, measured against the without-project scenario	Not applicable	N/A
Well-being	Total number of community members whose well-being ⁸ is expected to improve as a result of project activities	1,026 persons Calculated at 10% of the estimated population of 10,264 in 20 years. 2022 population of 12 communities is approximately 7,621; population growth rate approximately 1.5% per annum.	4.2
	Number of women whose well-being is expected to improve as a result of project activities	513 women and girls Half of total since Belize's population exhibits near gender parity.	4.2
Biodiversity conservation	Expected change in the number of hectares managed significantly better by the project for biodiversity	10,795 ha of forests conserved and managed for conservation that would have otherwise been cleared in the	2.1.14 & 5

⁸ Well-being is people's experience of the quality of their lives. Well-being benefits may include benefits reported in other metrics of this table (e.g. Training, Employment, Livelihoods, Health, Education and Water), and may also include other benefits such as strengthened legal rights to resources, increased food security, conservation of access to areas of cultural significance, etc.

	<i>conservation⁹, measured against the without-project scenario</i>	without-project scenario over the course of the project life.	
	<i>Expected number of globally Critically Endangered or Endangered species¹⁰ benefiting from reduced threats as a result of project activities¹¹, measured against the without-project scenario</i>	2 species in total: 1 globally Critically Endangered species, the Central American river turtle (<i>Dermatemys mawii</i>) 1 globally Endangered species, the Baird's tapir (<i>Tapirus bairdii</i>)	5

⁹ Managed for biodiversity conservation in this context means areas where specific management measures are being implemented as a part of project activities with an objective of enhancing biodiversity conservation, e.g. enhancing the status of endangered species

¹⁰ Per IUCN's Red List of Threatened Species

¹¹ In the absence of direct population or occupancy measures, measurement of reduced threats may be used as evidence of benefit

2 PROJECT DETAILS

2.1 Project Goals, Design and Long-Term Viability

2.1.1 Summary Description of the Project (VCS, 3.2, 3.6, 3.10, 3.11, 3.13, 3.14; CCB, G1.2)

The goal for the Maya Forest Corridor REDD Project (MFC REDD project), located approximately 37 km west of Belize City in the Belize and Cayo districts, is to protect and conserve tropical lowland forest for long-term carbon storage, biodiversity preservation, and the promotion of community resilience.

The 10,795-ha MFC REDD project area is part a larger 11,856-ha property (referred to as the MFC property) privately held on trust for people and Government of Belize by the Maya Forest Corridor Trust (MFCT) and is embedded within the larger Maya Forest Corridor (MFC) in Belize. The REDD project is included in a landscape-wide initiative to protect the MFC being spearheaded by the MFCT.

The MFC, formerly part of what was known as the Central Belize Corridor, is comprised of approximately 37,858-ha of privately-owned lowland forests and savannas in central Belize. The MFC provides the last critical link to Belize's two largest intact forest blocks: the privately owned northern forest block managed under Trust for the people and government of Belize¹² and the largely publicly owned Maya Mountain Massif in southern Belize (Briggs et al., 2013; Mitchell et al., 2017). The MFC is part of the larger Mesoamerican corridor which connects forests across three central American countries (Belize, Mexico, and Guatemala known as the Selva Maya forest) (Hilty et al., 2012). The MFC provides essential ecosystem services to Belize including climate mitigation, maintenance of biodiversity, forest products, pollination services, land for subsistence agriculture, and livelihoods through tourism and commercial agriculture.

The property was previously owned in multiple parcels: Darling Hall and Coquericot Logging Works combined and Big Falls/Monkey Run and Erindale Logging Works. As the names indicate, these parcels had been selectively logged over time. The previous owner was looking to sell the property and had received multiple offers from entities hoping to convert the property to agriculture. Several other nearby forests in the vicinity had recently been cleared for agriculture. Thus, the property was under tangible threat of conversion from forest to agriculture.

The property was purchased and transferred to the MFCT at the end of 2021 with the intention that it would become a REDD project. In a small pocket in the northeast of the property, a local family has been cattle ranching and harvesting fruit trees since prior to the transfer of the property to the MFCT. Because this area was already mostly cleared of forest at the project start and because the focus of the project is on avoiding planned deforestation as opposed to unplanned deforestation, for GHG accounting purposes, this area and a surrounding buffer area were removed from the REDD project

¹² These privately managed lands include the Rio Bravo Conservation and Management Area, Gallon Jug, and the Belize Maya Forest lands - formerly known as Yalbac and Laguna Seca

area. The rest of the property that includes the project area (forest) and other non-forested ecosystems is referred to as the project boundary.

The objectives for the Project are to: 1) avoid the agricultural conversion of the project area to preserve its role in the larger Maya Forest Corridor; 2) conserve the forests on the project area to avoid GHG emissions, maintain carbon stocks, and carbon sequestration; 3) preserve the project area to maintain the native floral and faunal biodiversity; 4) Empower local communities to lead conservation and climate resilience efforts by enhancing their awareness and understanding of critical environmental and climate adaptation issues; and 5) Enhance community capacity for sustainable diverse livelihoods and nature-based solutions for climate adaptation

The primary methods employed to achieve the first three objectives are the purchase of the property for conservation and the management of the property by the Wildlife Conservation Society (WCS). This management includes the implementation of robust patrols of the property by trained local rangers that are employees of WCS. Their role is also to prevent illegal activities such as hunting, and to detect, mitigate, and control wildland fires. More details on the patrolling activities can be found in the Maya Forest Corridor Enforcement Plan (Appendix 5). The WCS Fire Management Plan for the property provides guidance for organizing a wildland fire response command system and outlines wildland fire mitigation measures throughout the year (Appendix 6). As described in the climate monitoring plan (section 3.3.3), WCS uses a combination of on-the-ground ranger patrols, automated fire detection platforms, and drones to monitor active fire in the MFC landscape including the MFC REDD project area. It uses remote sensing to estimate the burn scars. In addition, trained field ecologists from WCS and partners monitor and manage native biodiversity in and near the project area.

To achieve the fourth and fifth objectives, the MFCT members including WCS, the Belize Zoo and Tropical Education Center (TBZTEC), the Foundation for Wildlife Conservation (FWC), and the University of Belize Environmental Research Institute (UB-ERI) are conducting community outreach and environmental education to foster support for the MFC conservation and to create awareness of climate change impacts on communities. The team is also supporting the drafting and adoption of community conservation plans and community climate smart plans as well as training community members in fire management and protected area management. To further achieve the fifth objective, the project is providing training, material, and technical support for community-owned sustainable livelihoods and nature-based solutions for climate adaptation.

An estimated 1,153,412 tonnes of carbon dioxide equivalent (t CO₂e) emission reductions will be due to the conservation of the project area forests over 20 years, or an average annual amount of 57,671 t CO₂e. The project is not located within a jurisdiction covered by a jurisdictional REDD+ program.

2.1.2 Audit History (VCS, 4.1)

Project not yet been validated.

2.1.3 Sectoral Scope and Project Type (VCS, 3.2)

Sectoral scope	14: Agriculture, forestry, and other land use
AFOLU project category ¹³	Reduced Emissions from Deforestation and Degradation (REDD)
Project activity type	Avoiding planned deforestation

2.1.4 Project Eligibility (VCS, 3.1, 3.6, 3.8, 3.18, 4.1; CCB Program Rules, 4.2.4, 4.6.4)

The project complies with the requirements laid out in Sections 3.1, 3.6, 3.8, 3.18, and 4.1 of the VCS Standard v4.5 as well as CCB Program Rules 4.2.4 and 4.6.4 including the following:

- The project GHG accounting is guided by the following principles set out in section 2.2.1 of the Standard including relevance, completeness, consistency, accuracy, transparency, and conservativeness.
- The project applies in full the latest version of an eligible methodology under the VCS Program along with the full application of the tools and modules identified in the methodology specific to the project activity type.
- The project and implementation of project activities do not violate any laws.
- According to the VCS Methodology Requirements, eligible REDD activities are those that reduce GHG emissions by reducing deforestation and/or degradation of forests. Deforestation is the direct, human-induced conversion of forest land to non-forest land. As such, this is the correct project category under VCS Scope 14. The forests of the project area also meet the Belize national definition of forest according to its 2001-2015 Forest Reference Emission Level submitted to the UNFCCC (Forest Department, 2020). Only areas that met the definition of forests for a minimum of 10 years before the project start date were included to ensure that no ecosystems had been converted to generate GHG credits.
- In this project, the implementing partner, Wildlife Conservation Society, is acting in partnership with the project proponent, the Maya Forest Corridor Trust. Its roles and responsibilities are defined in section 2.1.8 of this document.
- The project proponent will demonstrate during each verification period that the project activities have led to the intended GHG benefits.
- The project will reassess the Avoiding Planned Deforestation (APD) baseline (where the agent is unknown) every six years according to the VCS Program rules and the appropriate methodology and will capture changes in the deforestation drivers and new relevant policies and circumstances.

¹³ See Appendix 1 of the VCS Standard

- The project is designed as a single installation of an activity rather than multiple project activities. It is also not a grouped project.
- The initiation of the pipeline listing process falls within three years of the start date January 1, 2022. Validation will be completed within five years of this date.
- The project is engaging with stakeholders in line with the requirements detailed in section 3.18 of the VCS Standard v4.5. The exception is that the stakeholder consultations were conducted after implementation of project activities began. While section 3.18.2 of the Standard states that the consultations must be done before this implementation, this does not apply to projects with a start date prior to 1 October 2023. Since the start date of this project is 1 January 2022, this requirement is not applicable.
- The project will follow the rules and requirements for its validation and verification in line with the requirements detailed in section 4.1 of the VCS Standard v4.5 and section 4.2.4 and 4.6.4 of the CCB Program Rules v3.1.

2.1.5 Transfer Project Eligibility (VCS, 3.23, Appendix 2)

Not applicable

2.1.6 Project Design (VCS, 3.6)

Indicate if the project has been designed as:

- ☒ Single location or installation
- ☐ Multiple locations or project activity instances (but not a grouped project)
- ☐ Grouped project

2.1.6.1 Eligibility Criteria for Grouped Projects (VCS, 3.6; CCB, G1.14)

Not applicable – project is in a single location.

2.1.7 Project Proponent (VCS, 3.7; CCB, G1.1)

Organization name	Maya Forest Corridor Trust (MFCT)
Contact person	Nicole Auil Gomez
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2.1.8 Other Entities Involved in the Project

Organization name	Wildlife Conservation Society (WCS)
Role in the project	WCS is the implementing partner. It is responsible for the management of the MFC REDD project area. It also oversees the monitoring, reporting, and verification of the project's climate, community, and biodiversity benefits. As a member of the MFCT Board of Directors, WCS also contributes to decision-making related to the development and implementation of the MFC REDD Project.
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Title	Forest Carbon Technical Advisor
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Email	amcmurray@wcs.org

Organization name	Belize Maya Forest Trust (BMFT)
Role in the project	As a member of the MFCT Board of Directors, the Belize Maya Forest Trust contributes to decision-making related to the development and implementation of the MFC REDD Project.
Contact person	Dr. Elma Kay
Title	Managing Director
Address	11 Garden City Plaza, Mountain View Blvd., Belmopan, Belize
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Email	ekay@bmft.org.bz

Organization name	The Belize Zoo and Tropical Education Center (TBZTEC)
Role in the project	As a member of the MFCT Board of Directors, the Belize Zoo and Tropical Education Center contributes to decision-making related to the development and implementation of the MFC REDD Project.
Contact person	Dr. Celso Poot
Title	Managing Director
Address	Mile 29 George Price Highway, P.O. Box 178, Belmopan, Belize
Telephone	+501-613-4966
Email	celso@belizezoo.org

Organization name	Foundation for Wildlife Conservation (FWC)
Role in the project	As a member of the MFCT Board of Directors, FWC contributes to decision-making related to the development and implementation of the MFC REDD Project.
Contact person	Dr. Wilber Martinez
Title	Coordinator
Address	Trinidad Village, Orange Walk District, Belize
Telephone	+501-607-0281
Email	wadmartinez@yahoo.com ; fwcbelize@gmail.com

Organization name	University of Belize Environmental Research Institute
Role in the project	As a member of the MFCT Board of Directors, UB-ERI contributes to decision-making related to the development and implementation of the MFC REDD Project.
Contact person	Dr. Jake L Snaddon
Title	Director
Address	Price Center Road, P.O. Box 340,

	Belmopan, Cayo District Belize, Central America
Telephone	+501 822-2701
Email	jsnaddon@ub.edu.bz

Organization name	Re:wild
Role in the project	As a member of the MFCT Board of Directors, UB-ERI contributes to decision-making related to the development and implementation of the MFC REDD Project.
Contact person	Dr. Chris Jordan
Title	Latin America Director
Address	PO Box 129, Austin, TX 78767 USA
Telephone	+1-512-686-6062
Email	cjordan@rewild.org

Organization name	Virginia Tech Conservation Management Institute, Department of Fish and Wildlife Conservation (VTCMI)
Role in the project	VTCMI is responsible for leading the initial field measurements for carbon and biodiversity and supporting the carbon and biodiversity assessments for this Project Description as well as the first Monitoring Report.
Contact person	Verl Emrick, PhD.
Title	Research Scientist Ecologist
Address	801 University City Blvd, Suite 12, Blacksburg, VA 24061
Telephone	+1-540-231-8851
Email	vemrick@vt.edu

Organization name	Compass Communication and Research
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Role in the project	Compass Communication and Research is responsible for leading the stakeholder mapping exercise and assessment of existing socioeconomic conditions and high conservation value areas; conducting the social impact assessment; preparing plans for the project to engage with stakeholders over project life; developing the community monitoring plan; conducting the first monitoring event; and organizing a series of events with stakeholder representatives to socialize the stakeholders about different aspects of the project.
Contact person	Sherlene Neal Tablada and Marydelene Vasquez
Title	Stakeholder Engagement Consultant and Social Impact Assessment Consultant
Address	Camalote Village, Cayo District, Belize
Telephone	+501 6316015
Email	compasscr2021@gmail.com

2.1.9 Project Ownership (VCS, 3.2, 3.7, 3.10; CCB, G5.8)

In December 2021, the MFCT acquired the property that includes the project area from Belize River Farms Limited. This is documented through the three Transfer Certificates of Titles signed by the Registrar of Lands in that month for the three parcels that make up the property: 1) Darling Hall and Coquericot, 2) Erindale, and 3) Monkey Run Work. See Appendix 8. Funding for the acquisition was provided by Re:wild, a global non-governmental organization focused on preserving biodiversity and wild places.

As noted in Section 2.5.12 below, project ownership is supported by national laws that recognize the ownership of the properties by MFCT, to be held in trust for the people of Belize, and the potential generation of carbon credits. As owner of the property, MFCT has the legal right to operate the project.

In September 2021, a motion was passed in the Belize House of Representatives formally authorizing the transfer of carbon rights and credits generated in lands held by the MFCT to the MFCT (see Appendix 9). As such, the MFCT is also the owner of the property's carbon rights.

2.1.10 Project Start Date (VCS, 3.8)

Project start date	1 January 2022
Justification	As indicated described in section 2.1.7, the title of the parcels making up the property were transferred to the MFCT in December 2021. As

	such, the project began generating GHG emission reductions from its avoiding planned deforestation activity on January 1, 2022.
	The initiation of the pipeline listing process falls within three years of the start date January 1, 2022. Validation will be completed within five years of this date.

2.1.11 Benefits Assessment and Project Crediting Period (VCS, 3.9; CCB, G1.9)

Crediting period	The crediting period is 20 years. This conforms with the VCS Program requirements that the crediting period of AFOLU projects be between 20 to 100 years.
Start date of first or fixed crediting period	1 January 2022 – 31 December 2041
CCB benefits assessment period	The period during which changes in biodiversity and community well-being resulting from project activities will be monitored will be the same as the 20-year VCS crediting period.

2.1.12 Differences in Assessment/Project Crediting Periods (CCB, G1.9)

There are no differences between the assessment periods for GHG emissions accounting and for biodiversity and community well-being.

2.1.13 Project Scale and Estimated Reductions or Removals (VCS, 3.10)

Indicate the estimated annual GHG emission reductions/carbon dioxide removals (ERRs) of the project:

☒ < 300,000 tCO₂e/year (project)

☐ ≥ 300,000 tCO₂e/year (large project)

Calendar year of crediting period	Estimated reductions or removals (tCO ₂ e)
1 January 2022 – 31 December 2041	1,153,417
Total estimated ERRs during the first or fixed crediting period	1,153,417
Total number of years	20 years

Calendar year of crediting period	Estimated reductions or removals (tCO ₂ e)
Average annual ERRs	57,671

2.1.14 Physical Parameters (CCB, G1.3)

Belize is a small country on the eastern Yucatan peninsula bordered by Mexico to the north and Guatemala to the west and south. Belize extends approximately 280 km north to south and 100 km east to west at its widest point covering a total area of approximately 22,966 km² (Bridgewater, 2012). There are 4 distinct physiographic regions in Belize, 1) northern lowlands, 2) coastal plain, 3) Maya Mountain massif, 4) cayes and atolls. The most unique physiographic feature is the offshore region, home to second longest barrier reef in the world after Australia's great barrier reef including approximately 1,000 Cayes. The northern lowlands support pine savannas on granite derived soils and tropical broadleaf forests on limestone soils interspersed with wetlands, rivers, and lagoons. They also support Belize's most important export crop, sugarcane, and many Mennonite farming communities growing a broad range of crops (Bridgewater, 2012). The coastal plain supports scrubland and pine savannas on relatively infertile acid soils. The Maya Mountain massif has a complex orogeny and is comprised of metamorphic, sedimentary, and igneous rock formations. As in the northern lowlands, alkaline soils support tropical broadleaf forests and acidic soils pine forests and savannas. Most elevation and relief found in the country is associated with the Maya Mountain (Briggs et al., 2013).



Figure 1. Overhead photo of the MFC REDD project area (Credit: J. Maaz)

The MFC REDD project area is in central Belize in the Belize and Cayo districts, approximately 37 km west of Belize City in the northern lowland physiographic province (Figure 2). The project is embedded within the Maya Forest Corridor (MFC) (Figure 3). The MFC is a relatively small band of tropical

broadleaf forest, forested savannas, wetlands, and grasslands in central Belize that connects the Selva Maya of Mexico, Guatemala and northern Belize to the Maya Mountains Massif and coastal reserves of southern Belize (Figure 4). Together, these represent the single largest forest block in Central America (Hofman et al., 2018). The MFC provides a vital connection between populations of iconic Mesoamerican species, such as the jaguar (*Panthera onca*), Baird's tapir (*Tapirus bairdii*), and the White-lipped peccary (*Tayassu pecari*). The MFC also supports several species categorized as endangered on the IUCN Red List including the Yucatan black Howler monkey (*Alouatta pigra*), Geoffroy's Spider Monkey (*Ateles geoffroyi*), and the critically endangered Central American River Turtle (*Dermatemys mawii*)¹⁴.



Figure 2. Maya Forest Corridor REDD project location at a regional scale.

¹⁴ <https://www.rewild.org/wild-about/maya-forest-corridor>

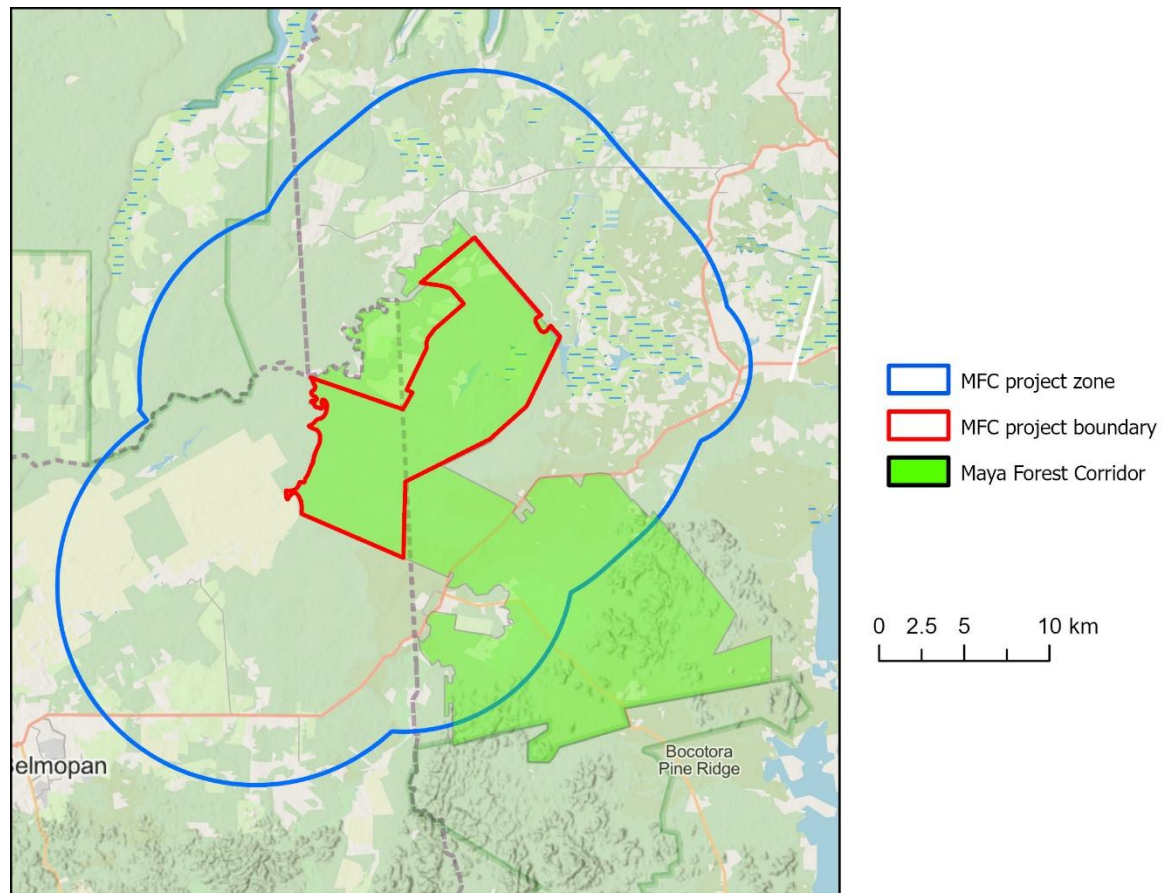


Figure 3. Maya Forest Corridor REDD project location within the Maya Forest Corridor.

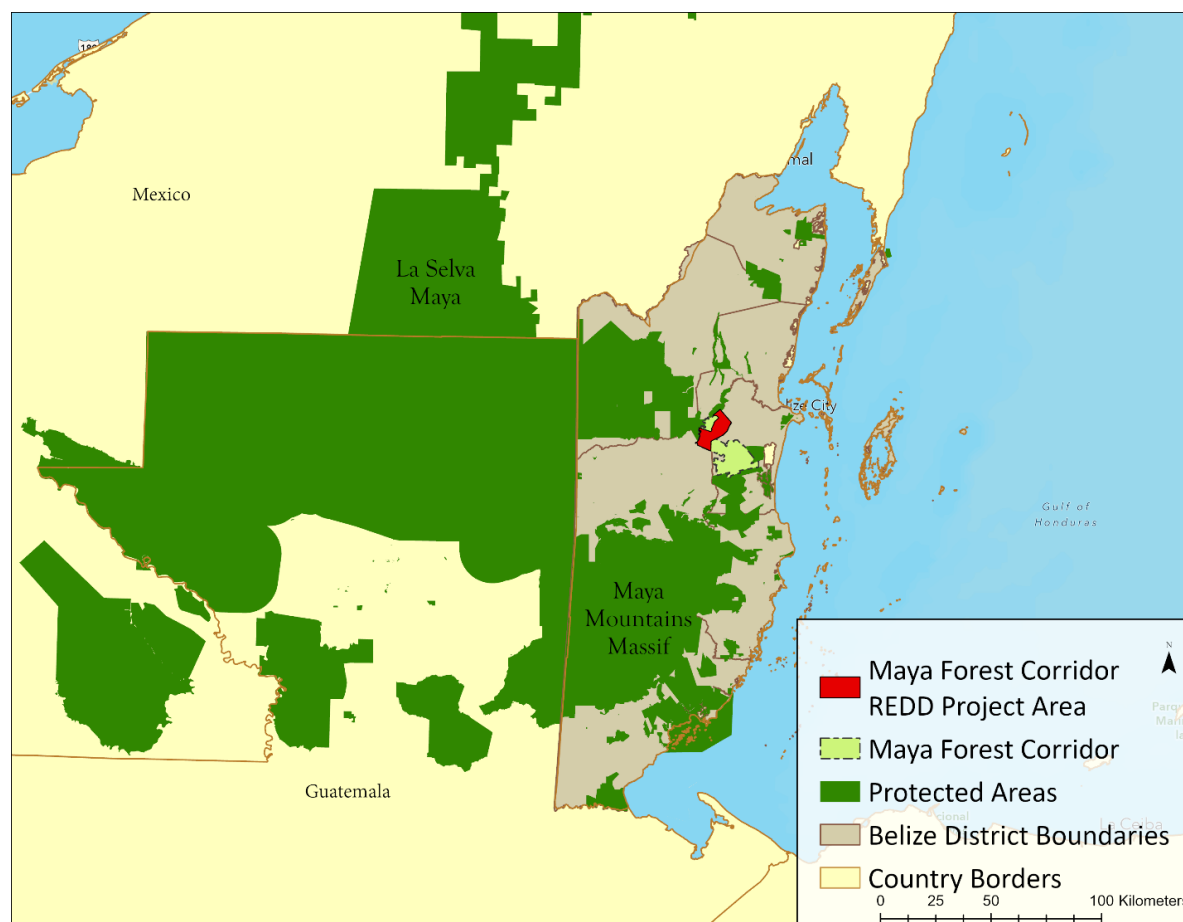


Figure 4. MFC and MFC REDD project area with the larger Selva Maya

The project area consists of 10,795 hectares (108 km²) of forests¹⁵. These forests have been managed by WCS since the purchase by the MFC REDD project area in late 2021 to promote native biodiversity, maintenance of carbon stocks, and other ecosystem services. The two forest types within the project area include lowland broadleaf moist forest and lowland broadleaf moist scrub forest (Meerman & Clabaugh, 2017). As the names indicate, the primary difference between the two is that the moist broad-leaved scrub forest contains sparser vegetation dominated by shorter trees and woody shrubs as compared to the lowland broad-leaved moist forest. Because the two types are intermixed in much of the project area and share the many of the same overstory species, it was not possible to map them as separate strata using available remote sensing data. As a result, the two were combined into a single stratum for the purposes of carbon accounting. These lowland broad-leaf forests within the project area support a high diversity of tree species (Meerman & Clabaugh, 2017). Common trees found on the project area include Santa Maria (*Calophyllum brasiliense*), black poisonwood (*Metopium brownei*), provision tree (*Pachira aquatica*) and coccoloba (*Coccoloba spp.*).

¹⁵ The forests of the project area meet the Belize national definition of forest according to its 2001-2015 Forest Reference Emission Level submitted to the UNFCCC (Forest Department, 2020). Only areas that met the definition of forests for a minimum of 10 years before the project start date were included to ensure that no ecosystems had been converted to generate GHG credits.

The remainder of the area within the project boundary consists of shrub/scrub, herbaceous vegetation, emergent herbaceous wetlands, open water, and developed/open space (Figure 5). The process to create the benchmark land use/land cover of the project area and conduct an accuracy assessment of this map is documented in Appendix 10.

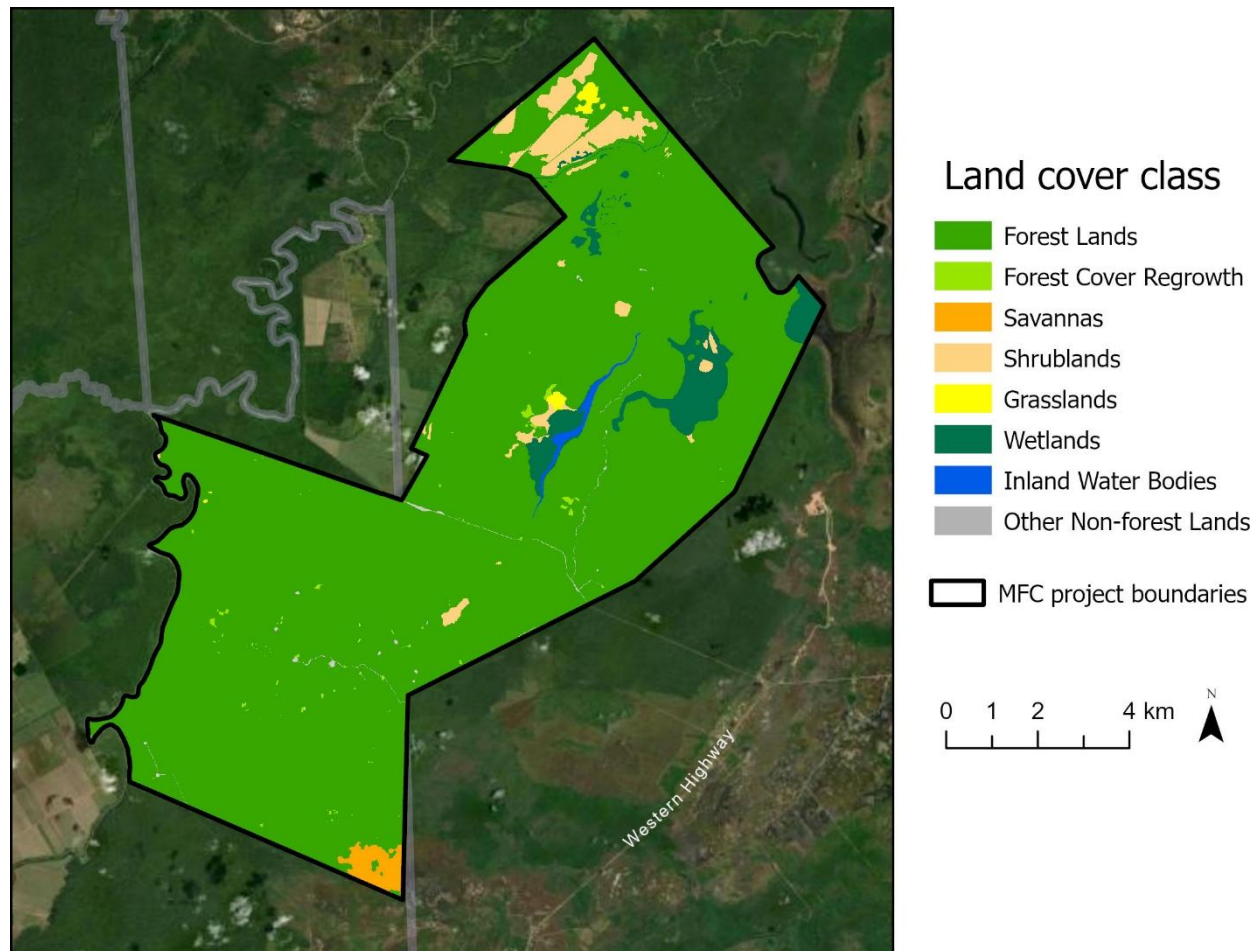


Figure 5. Forest cover/land use benchmark map

The entire project area exhibits very little topographic relief with elevation averaging between 20 and 25 meters above sea level. Hydrologically the project area is subject to frequent flooding during the wet season and periods of high rainfall associated with periodic tropical storms and hurricanes. Within the project area, the most important hydrological feature is Cox's Lagoon, an approximately 550 ha emergent wetland/open water lagoon in the northeast portion of the property. Cox's Lagoon has many small, intermittent creeks, waterways, and wetlands throughout the property that feed into the lagoon. The Belize River forms the southwestern border of the project area.

On sites close to wetlands and open water, soils are saturated for longer periods of time and canopy height is generally below 20 m and dense with areas of saturated scrub. However, in some areas there is enough light penetration to allow the development of a dense herb layer.

The project area is bordered by mostly undeveloped Caribbean pine savannas to the east and tropical seasonal evergreen broadleaf lowland forests to the west, beyond the Belize River (Meerman & Sabido,

2001). Immediately adjacent to the west of the project area is a large sugar cane plantation. Approximately 1.5 km southwest of the project area is a large area of agricultural fields growing a variety of products including sugarcane and corn.

Belize is considered a moist tropical climate with two distinct seasons, rainy and dry. The average temperature of Belize ranges from 23-27 degrees Celsius with the project area averaging 1,800 mm of rainfall/year. The driest and warmest months are from January to May while the wettest and coolest months are from June to October¹⁶.

The bedrock geology of most areas of Belize north of the Maya Mountains is underlain by limestone/mafic rock formations that get gradually younger the farther north in Belize. Most of the soils are shallow with deeper soils typically found in the floodplains and swamp margins. The soils in the project area consist primarily of the Altun Ha Suite, the Yaxa Suite, and the Chacalte Suite (Baillie et al., 1993; MapAction, 2024). The Altun Ha Suite is characterized by flinty dark and brownish loams and clays whose parent material is Late Tertiary limestone. The Yaxa Suite is characterized by dark and reddish neutral clays whose parent material is Early Tertiary limestone. The Chacalte Suite is characterized by shallow and stony dark slightly acid clays, with some brownish and reddish, and whose parent material is Cretaceous limestone (Baillie et al., 1993). A minimal portion of the soils in the project area also fall into the Puletan and Melinda Suites (Baillie et al., 1993; MapAction, 2024).

The project area forests were selectively logged prior to the purchase of the property in 2021 (see Appendix 11A and 11G). Historically, a small area in the northwest of the property was also used for rice production, but this production ended over 10 years prior to the purchase and transfer of the property to the MFCT in 2021. The land has since become shrublands. The WCS management team is in the process of restoring this area to forests, this restoration work is not included as a project activity for GHG accounting purposes. The project only counts emission reductions from avoiding planned deforestation in areas identified as forests at the beginning of the project.

In the northeast of the property, a local family has been engaged in production activities, including cattle ranching and harvesting of fruit trees, in a small area of approximately 12 hectares since prior to the transfer of the property to the MFCT. The project is engaging with the family to understand their perspective and circumstances, while working collaboratively toward a voluntary and dignified resolution to overlapping claims to the piece of the property. Because this area was already mostly cleared of forest at the project start and because the focus of project is on avoiding planned deforestation as opposed to unplanned deforestation, for GHG accounting purposes, this area and a surrounding buffer area were removed from the REDD project area.

Because of the frequency of hurricanes and tropical storms, the forested ecosystems of Belize, including the project area, have adapted to periodic disturbances. The effect of hurricanes on forested systems includes defoliation, loss of branches, minor or complete removal of crown, fallen trees from uprooting or snapping, tree mortality, and indirect effects from adjacent trees falling and creating forest gap (Brokaw & Walker, 1991; Lugo et al., 1983; Smith-Martin et al., 2022; Tanner et al., 1991). Post

¹⁶ <https://nms.gov.bz/>

hurricane tree mortality temporarily reduces aboveground biomass, but also allows the forest to sequester carbon at higher rates and forest recovery happens relatively quickly (Brokaw & Walker, 1991). New gaps in the canopy allow recruitment of new species, which can introduce new age classes to a forest. The large amount of biomass that is deposited on the forest floor rapidly decomposes, increasing nutrient availability for regeneration (Lugo 2000). Seedlings grow rapidly due to reduced competition for light and belowground resources and quickly revegetate canopy gaps. Section 3.3.3.3.2 provides details of how the project will monitor the impacts of hurricanes and tropical storms on the project area and its carbon stocks. In addition, potential impacts to the project's forest carbon stocks from hurricanes and tropical storms are accounted for in the non-permanence risk assessment and appropriate buffer contributions applied.

2.1.15 Social Parameters (VCS, 3.18; CCB, G1.3)

Belize lies at the geopolitical nexus of Central America and the Caribbean, a unique position which has distinctively shaped its demography, history, and economic development. Belize is a parliamentary democracy, having gained its independence from the United Kingdom in 1981. The nation's capital is Belmopan, while Belize City is the most populous city. The nation's government is spearheaded by the Prime Minister and is structured into three distinct branches. At the helm of the executive branch is the Cabinet, which implements government policies and oversees the administration of various sectors. Legislative power rests within a bicameral Parliament, consisting of an elected House of Representatives and an appointed Senate. Complementing these is an independent judiciary, which includes the Supreme Court, Court of Appeal, Magistrates' Court, and Family Court.

The country is divided into six administrative districts: Corozal, Orange Walk, Belize, Cayo, Stann Creek, and Toledo. The project area and the project zone, which is described in more detail in section 2.1.16, are located within the Belize and Cayo Districts in central Belize. There are no human settlements within the project area nor were there prior to the start of the project. Twelve MFC buffer communities within the project zone were identified as priority areas for community-based project activities: Cotton Tree, Franks Eddy, Mahogany Heights, La Democracia, Gracie Rock, Hattieville, Scotland Halfmoon, Bermudian Landing, Double Head Cabbage, Willows Bank, St. Paul's Bank, and Rancho Dolores (see map in 2.1.16). All 12 target buffer communities in the REDD Project Zone are governed by village councils.

The 2022 Population and Housing Census Key Findings Report (Statistical Institute of Belize, 2024b)) reported a population of 397,483 inhabitants. The population exhibits near gender parity, with females comprising 50.8% and males 49.2%. In the 12 communities in the project zone, the total population is 7,621, and the gender distribution is also balanced, with males and females constituting 50.3% and 49.7% of the population.

Migration patterns have significantly altered the ethnic landscape of post-independence Belize. Emigration of the Creole, primarily to the United States, coincided with an influx of Central American immigrants to shift the majority ethnic group from Creole to Mestizo/Hispanic/Latino (Acuña, 2012). At the time of the 2022 census, Belize's ethnic composition was 51.7% Mestizo/Hispanic/Latino, 25.2%

Creole, 9.8% Maya, 4.0% Garifuna, and 1.5% East Indian. Other ethnicities accounted for 5.6% of the population¹⁷.

Although Belize's official language is English, the population is multi-lingual. There are three dominant languages spoken – 75.5% of the population speaks English, 54% speaks Spanish, and 49% speak the local English-based Creole. Four indigenous languages are spoken: Kekchi Maya (6.3%), Mopan Maya (3.9%), Garifuna (2.0%) and Yucatec Maya (0.5%).

Creole is the dominant ethnicity in the 10 MFC buffer communities located in the Belize District. These include the Belize River Valley communities of Bermudian Landing, Double Head Cabbage, Willows Bank, St. Paul's Bank, Scotland Half Moon, and Rancho Dolores where the Creole comprise 94% of the population, as well as four communities along the Western Highway. The latter communities are more mixed but still predominantly Creole: Hattieville (75.5%), Gracie Rock (89%), La Democracia (71%), and Mahogany Heights (61%). Conversely, Mestizo/Hispanic/Latino is the dominant ethnicity in the two buffer communities in the Cayo District – Franks Eddy and Cotton Tree. The 2022 Census reported significant population increases in both Franks Eddy and Cotton Tree since 2010, with increases of 40% and 24%, respectively. This growth is primarily attributed to a steady influx of Central American migrants. Cotton Tree's population is now composed of 66% Mestizo/Latino/Hispanic and 25% Creole, while Franks Eddy's population is 97% Mestizo/Latino/Hispanic.

Belize has a youthful demographic profile, with 57% of its population below the age of 30 and a median age of 25. The estimated annual population growth rate stands at 1.47%, exhibiting a steady decline influenced by a reduction in the total fertility rate, which is partially offset by an increase in immigration.

Although education attainment levels have improved in the past decade, Belize still lags behind other nations in the Latin America and Caribbean region, where approximately 63% of young people complete secondary school (UNESCO, 2020). In Belize, nearly one-third (31%) of the population has not completed primary school. Thirty-seven percent (37%) have completed primary school, 19% have completed secondary school, and 12% have completed tertiary level education. There is a marked gender disparity in education attainment, with females demonstrating higher completion rates. At the secondary school level, 55% of graduates are female compared to 45% male. This disparity becomes even more pronounced at the university level, where two-thirds of graduates are female.

The 2022 Census reports a total of 110,719 households, two-thirds of which are headed by males. The majority of households (57.8%) are in rural areas, while 42.2% are urban. In the 12 communities in the project zone (all considered rural areas), there are a total of 4,319 households.

Public utility services are widely available across the country. The main water source for household use is public piped water (83.8% of households) while only 8.2% use private piped water and 3.1% rely on well water. However, the main source of drinking water is bottled/purified water (74.3%), while only 15.4% of households use public piped water, and 5.4% get their water from a private catchment. The great majority (87.4%) of households receive electricity from the national provider, the Belize Electricity

¹⁷ The 2022 Population and Housing Census Key Findings Launch (April 2024) reported 0.8% of responses as "Don't Know/Not Stated".

Limited. Ninety-one percent (91%) of households have mobile phone access and 71.3% of households have internet access.

Although Belize is classified as an upper middle-income country with a per capita GDP of US\$6,049 (BZ\$12,098) (World Bank, 2025), the 2023 Multidimensional Poverty Index (MPI) (Statistical Institute of Belize, 2024b) reports that 26.4% of the population is multidimensionally poor. Notably, the incidence of poverty was higher in male-headed households (29.6%), compared to female-headed households (19.7%). The MPI rate is significantly higher in rural areas (39.9%) compared to urban areas (8.3%). Ten of the MFC buffer communities lie within the Belize District which has the lowest MPI rate (8.6%), while the other two lie in the Cayo District, which has the second lowest MPI rate (23.3%).

The 2024 Labour Force Survey (Statistical Institute of Belize, 2024a) illustrated both strengths and areas of limited labor force participation. As of April 2024, the unemployment rate stood at a low 3%, with 165,808 individuals actively engaged in the workforce, translating to a labor force participation rate of 57.4%. Two of the project's buffer communities lie in the Cayo District which had the highest unemployment rate (3.7%). Ten buffer communities lie in the Belize District, which had the second highest (3.5%) unemployment rate. The average annual income for employed individuals was reported at US\$8,562 (BZ\$17,124). Despite the robust employment figures, it is noteworthy that 42.5% of the working-age population were classified as "outside of the labor force". This comprises individuals not seeking employment or unavailable for work due to various reasons such as pursuing an education, performing unpaid household duties, retirement, and being discouraged from seeking employment.

The demographic composition of the employed population revealed that half of all workers were between the ages of 25 to 44. Women's labor force participation rate is 44.8%, compared to men's, which is 71%. The unemployment rate for females is 3.9%, while for males it is 2.5%. At 6.5%, the youth unemployment rate (ages 14 to 24) is more than double the overall unemployment rate. The burden of unpaid labor overwhelmingly falls on women, since 95% of persons not seeking employment due to personal or family responsibilities are female.

Sector-wise, tourism emerged as a significant employer, accounting for 14.6% of all jobs, underscoring its vital role in Belize's economy. Agriculture, including fisheries and aquaculture, accounts for 13.4% of employment. In contrast, forestry's contribution to employment had diminished to just 0.8%, underscoring the shift away from the historical dominance of forestry toward more diversified economic activities. In the 12 communities in the project zone, the majority of the heads of household work in a profession or are employed in the private or public sector. Few heads of households depend directly on natural resources as their primary source of income (agriculture, livestock rearing, or hunting and fishing).

From the pre-colonial era to the current day, Belize's economy has been dependent on its natural resources. Before the arrival of Europeans, Belize was part of the Maya civilization whose advanced agricultural methods supported a population density significantly greater than modern-day Belize. Their economy was complemented by hunting, fishing, and gathering, which utilized the rich biodiversity of the area. Settlement by the British in the 17th century marked the beginning of the logwood trade, which became the cornerstone of Belize's colonial economy. This was eventually superseded by the

mahogany trade. Overexploitation and a lack of sustainable management practices led to the depletion of accessible mahogany stocks, resulting in a shift toward an agriculture-driven economy.

Following its independence in 1981, Belize actively pursued the expansion of its agricultural sector, emphasizing the export of sugar, bananas, and citrus fruits. By the mid-1980s, the emerging tourism sector, built on the country's distinctive and varied natural attractions, began to experience rapid growth, expanding significantly over the decades to become Belize's principal source of foreign exchange, outpacing agricultural exports. The tourism industry faced a substantial setback during the COVID-19 pandemic, which negatively impacted the wider economy. Belize's economy has since rebounded, leading to a GDP per capita that now exceeds pre-pandemic levels (World Bank, 2025).

The economic shock caused by the pandemic emphasized the need for economic diversification, which became a focal strategy in #PlanBelize 2022 – 2026 (Ministry of Economic Development, 2023), the country's medium-term development strategy. With Belize's abundant natural resources, green and blue financing offer viable pathways for Belize's sustainable development. The Government of Belize has demonstrated its commitment to pursuing Payment for Ecosystem Services by establishing a National Climate Change Office and the Belize Blue Bond and Finance for Permanence Unit. Furthermore, it has developed the National Climate Finance Strategy (2021 – 2026) and the Belize Blue Economy Development Policy and Strategy 2022 – 2027. These strategic measures demonstrate a proactive national approach to securing both environmental preservation and long-term economic resilience.

2.1.16 Project Zone Map and Project Location (VCS, 3.11, 3.18; CCB, G1.4-7, G1.13, CM1.2, B1.2)

A detailed description and map of the MFC REDD project area where the greenhouse gas emission reductions will be generated is found in Section 2.1.14. Coordinates describing the MFC project boundary are presented in Table 1. The precise definition of the MFC project boundary requires 615 vertices, largely due to the serpentine shape of the Belize river along the southwest boundary of the site. The fully detailed boundary coordinates were provided to the project by Belize Land Information Center, the national authority on land delineation. A simplified version is presented here that retains fidelity to the project boundary within +/- 25m. The KML provided accompanying this project document depicts the fully detailed project boundary defined by the 615 vertices.

Table 1. List of approximate project boundary coordinates represented in UTM 16N projection of NAD 1927 datum.

Vertex	X coordinate (m)	Y coordinate (m)	Vertex	X coordinate (m)	Y coordinate (m)
1	340624	1933271	41	327929	1929005
2	340811	1933337	42	327880	1929126
3	341040	1933632	43	327782	1929261
4	341601	1932986	44	327704	1929296
5	339643	1928923	45	327643	1929276
6	337471	1926973	46	327606	1929177

Vertex	X coordinate (m)	Y coordinate (m)	Vertex	X coordinate (m)	Y coordinate (m)
7	332512	1924481	47	327660	1928859
8	332398	1920015	48	327568	1928766
9	326434	1922593	49	327225	1928891
10	326445	1922916	50	327159	1929047
11	326393	1923333	51	326992	1929172
12	326205	1923714	52	327034	1929247
13	326045	1923838	53	327169	1929221
14	325875	1923786	54	327264	1929250
15	325684	1923587	55	327314	1929347
16	325626	1923455	56	327258	1929454
17	325576	1923467	57	327109	1929516
18	325527	1923605	58	327000	1929664
19	325527	1923967	59	326999	1929754
20	325667	1923945	60	327157	1929863
21	326015	1924012	61	327230	1930053
22	326223	1924212	62	327071	1930474
23	326327	1924466	63	326954	1930596
24	326522	1924440	64	332376	1928738
25	326595	1924468	65	332932	1929713
26	326638	1924662	66	332588	1929867
27	326769	1924853	67	333777	1932345
28	327093	1925578	68	333744	1932608
29	327158	1925969	69	333834	1932904
30	327474	1926734	70	334235	1933438
31	327518	1927134	71	335946	1934928
32	327473	1927312	72	335183	1935805
33	327335	1927519	73	334701	1935973
34	326853	1927744	74	333416	1936159
35	327051	1927852	75	336578	1938814
36	327309	1928110	76	340493	1934262
37	327572	1928195	77	340219	1934102
38	327693	1928287	78	340151	1933892
39	327849	1928514	79	340430	1933373
40	327927	1928876	80	340624	1933271

The project zone includes the project area where the greenhouse gas emission reductions are being generated as well as the area surrounding the project area in which the communities are impacted by the project.

As part of a larger effort to guide conservation interventions in the entire Maya Forest Corridor, WCS and the University of Belize Environmental Research Institute (UB ERI) carried out a feasibility study

that was completed in 2021 to build information to guide viable actions by both communities and managers for ensuring the persistence and ecological integrity of the MFC over the long term. This feasibility study can be found in Appendix 12.

In this feasibility study, a scoping exercise was initially completed to identify the communities with the most impact on the corridor. These communities were prioritized based on their direct and indirect impact on the degradation of the MFC due to the presence of community members' hunting grounds in the MFC; the number of cattle farms in areas bordering the MFC; and distance to the MFC. The exercise identified 13 priority communities: Camalote, Cotton Tree, Franks Eddy, Mahogany Heights, La Democracia, Gracie Rock, Hattieville, Scotland Halfmoon, Bermudian Landing, Double Head Cabbage, Willows Bank, St. Paul's Bank, and Rancho Dolores.

Given the fact that the REDD project area only makes up a portion of the MFC, the WCS team conducted further analysis to determine which of these 13 communities did not impact the project area. Based on this analysis, WCS removed Camalote because the hunting grounds of its community members are only in the southern section of the MFC landscape and, therefore, do not include the REDD project area. Figure 6 shows the location of the 12 communities, identified as target communities, included within the project zone.

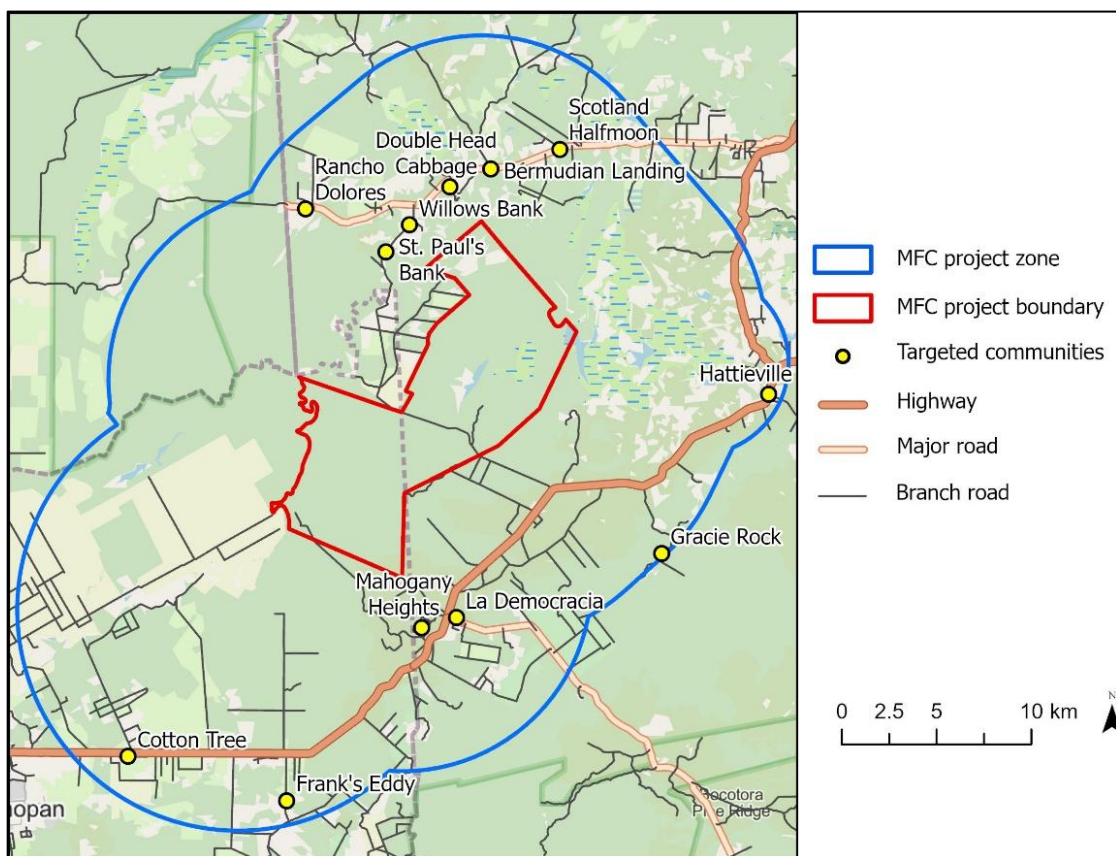


Figure 6. Extent of project zone

Figure 7 shows the ecosystems and land uses within the zone¹⁸. The vast majority of the zone is made up of lowland broadleaf forests, agricultural production areas, and lowland savannas.

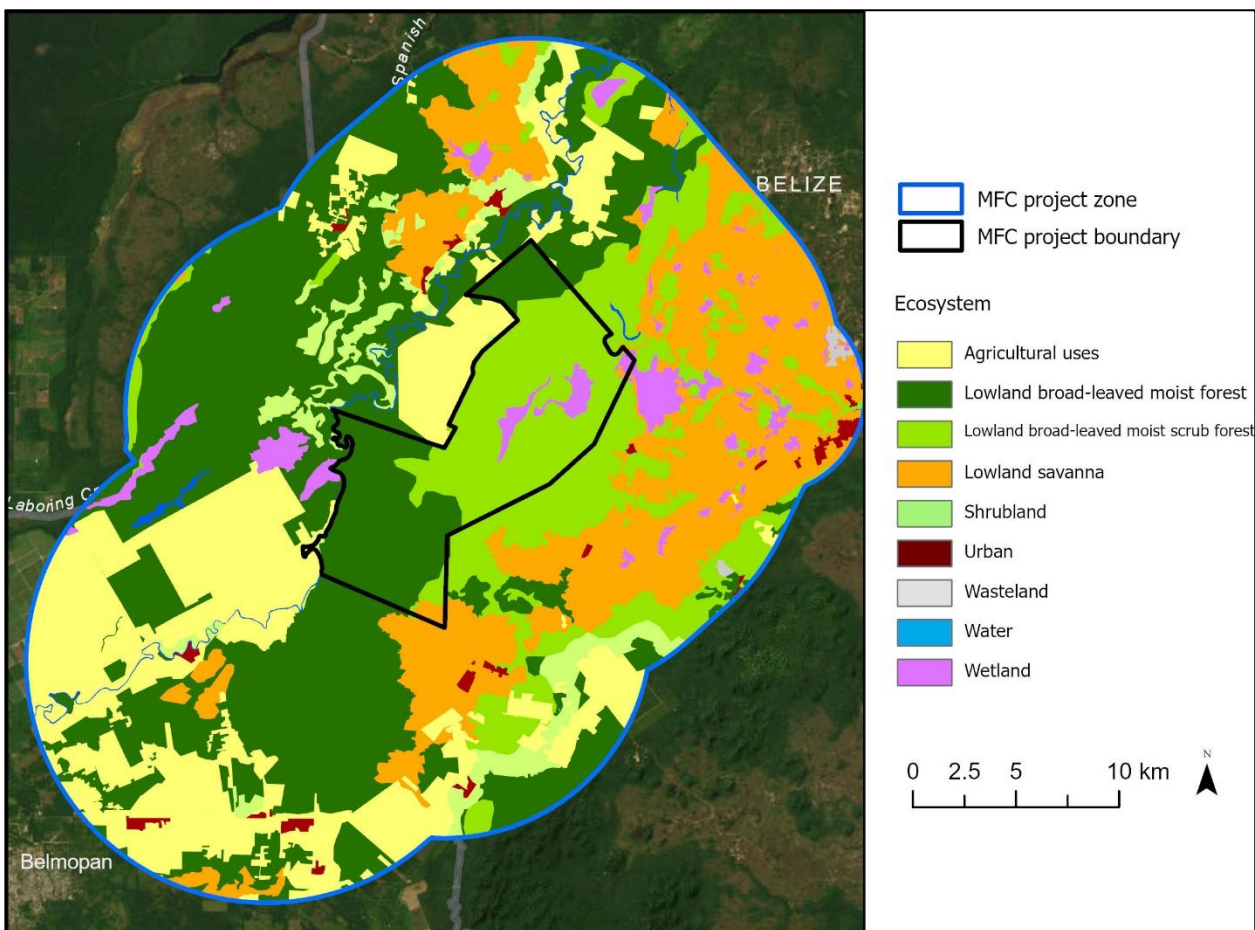


Figure 7. Ecosystems and land uses in the project zone

It is important to note that, as a wildlife corridor project, the offsite biodiversity benefits extend beyond the project zone and covers the entire Selva Maya forest in Belize, Mexico, and Guatemala that the Maya Forest Corridor helps connect. This is discussed in more detail in section 5.3.

As detailed in section 4.1.3 and 5.1.2, the identifiable high conservation value (HCV) areas include the broadleaf forests and savannas of the project area (refer to Figure 5 in section 2.1.14); the Community Baboon Sanctuary and the Spanish Creek Wildlife Sanctuary adjacent to the project area (Figure 8); and the Belize and Sibun watersheds (Figure 9).

¹⁸ This map was created based on the 2017 version of the Belize Ecosystems Map originally developed by Meerman and Sabido (2001) available at the Spatial Data Warehouse (<http://www.biodiversity.bz/>) of the Biodiversity and Environmental Resource Data System of Belize (BERDS). It was revised 1) to take into account natural succession from abandoned cropland in the project boundary that has taken place since 2017, 2) to take into account areas that have been converted from forests to agriculture outside the project boundary since 2017, and 3) to correct for other misclassifications based on local knowledge of the land within the project boundary (e.g., wetlands misclassified as savanna). Where lands have undergone succession to forest since 2017, the ecosystem type of the adjacent forest type in 2017 was assigned.

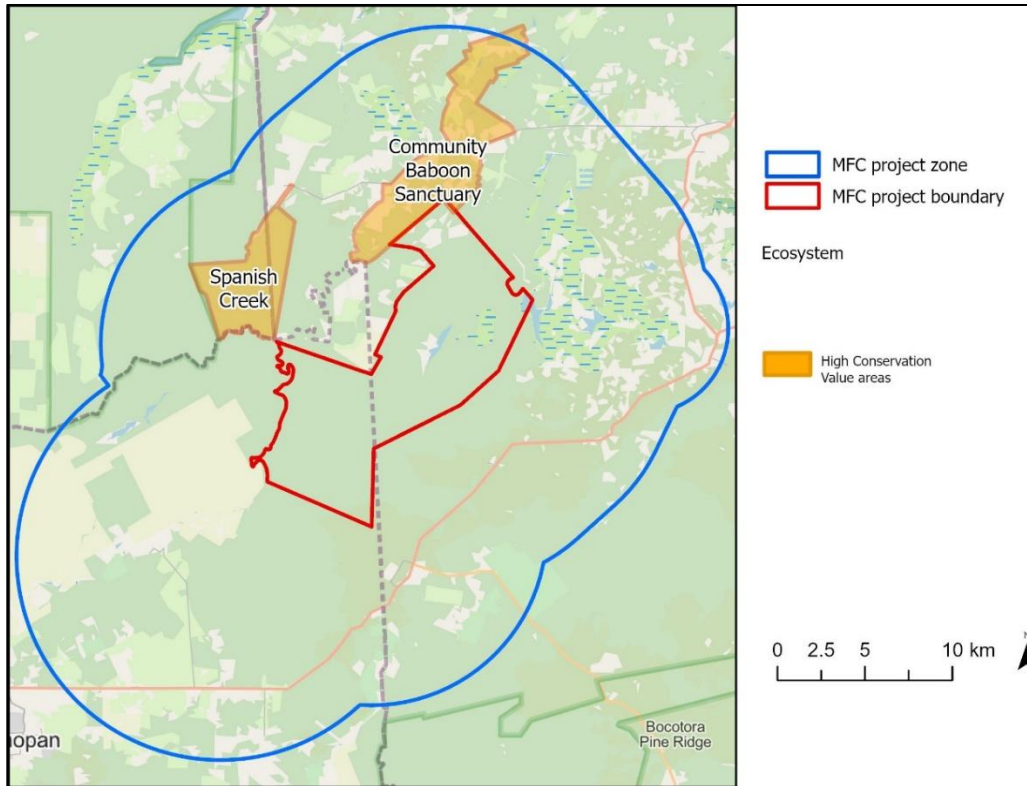


Figure 8. The Community Baboon Sanctuary and the Spanish Creek Wildlife Sanctuary identified as HCV areas

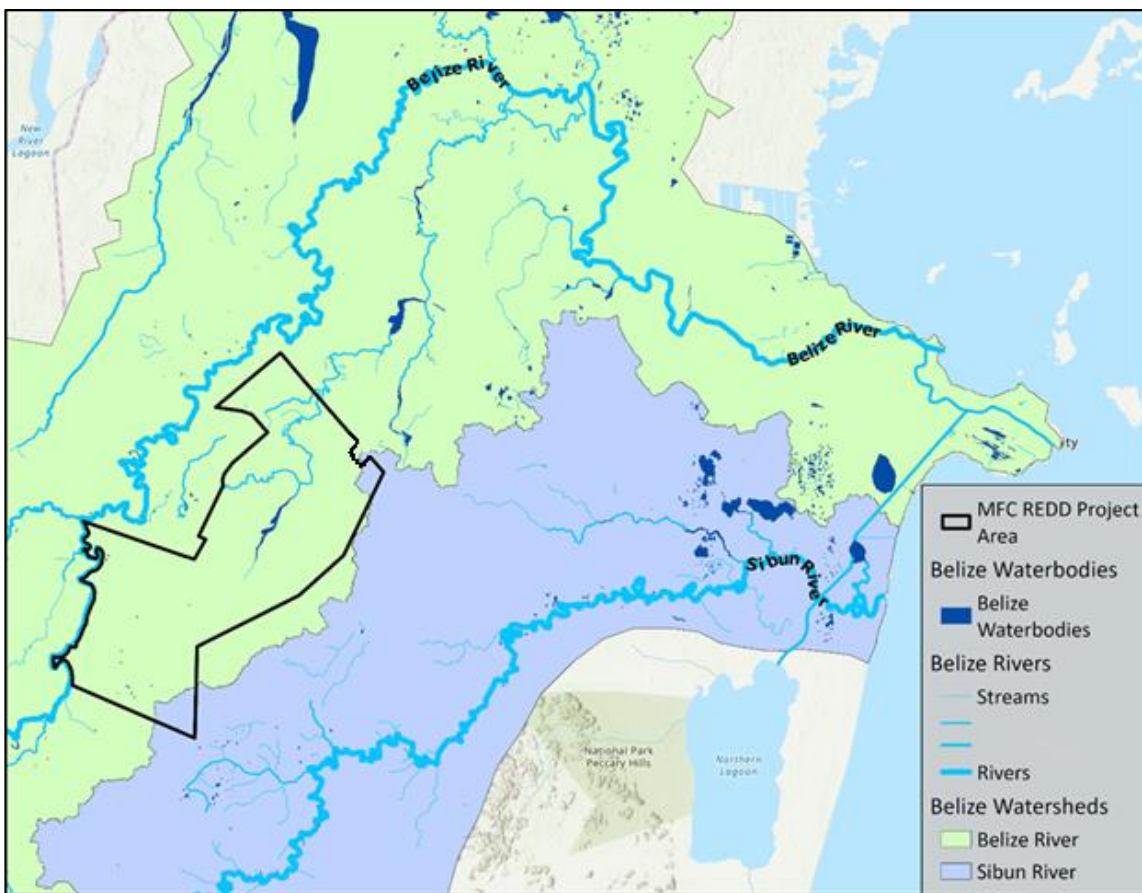


Figure 9. Belize River and Sibun River watersheds identified as HCV areas

2.1.17 Project Activities and Theory of Change (VCS, 3.6; CCB, G1.8)

Objectives:

1. Prevent the agricultural conversion of the project area to preserve its ecological role in the larger Maya Forest Corridor. The Maya Forest Corridor is a relatively small, forested area in central Belize that connects the Selva Maya of Belize, Guatemala, and Mexico and the Maya Mountains of southern Belize which are the largest tracts of intact forest in the Mesoamerica Biodiversity Hotspot
2. Conserve the project area forests to avoid GHG emissions, maintain carbon stocks, and carbon sequestration.
3. Preserve the project area to maintain the native biodiversity.
4. Empower local communities to lead conservation and climate resilience efforts by enhancing their awareness and understanding of critical environmental and climate adaptation issues.
5. Enhance community capacity for sustainable diverse livelihoods and nature-based solutions for climate adaptation.

Project Activities:

1. Purchase property under threat of conversion to commercial agriculture to maintain current carbon stocks and avoid GHG emissions.
2. Maintain natural ecosystems and current forest cover through the implementation of management strategies, such as detection, mitigation, and control of wildfires and surveillance and patrolling, to conserve and protect native biodiversity and ecosystem services supplied by the project area.
3. Conduct community outreach and environmental education to foster support for MFC conservation and to create awareness of critical environmental and climate adaptation issues.
4. Provide training, material, and technical support for community-owned sustainable livelihoods and nature-based solutions for climate adaptation.

The Project Activities and Theory of Change Table in Appendix 2 describes how these different activities contribute to desired outputs, outcomes, and impacts thereby helping meet the project's objectives.

2.1.18 Sustainable Development Contributions (VCS, 3.17)

Table 2 shows how the project activities contribute to different UN Sustainable Development Goals (SDGs).

Table 2. Project activities' contributions to the UN SDGs

UN SDG	How different project activities contribute to this SDG
11. Make cities and human settlements inclusive, safe, resilient and sustainable	• As part of the Maya Forest Corridor, the project area has been identified by both the Government of Belize (see text below) and by local communities (refer to section 4.1.3) as having high conservation value. As such, the project strengthens efforts to protect and safeguard natural heritage. • The conservation of this project area, including the detection, mitigation and control of wildfires in and around the MFC, helps keep the nearby communities safe from wildfire and strengthens their resilience. • The community outreach and environmental education activities create awareness of critical environmental and climate adaptation issues and ultimately enhances community resilience to natural disasters and climate change. • Providing training, material and technical support for community-owned sustainable livelihoods and nature-based

UN SDG	How different project activities contribute to this SDG
	solutions for climate adaptation also helps communities be safer, more resilient, and more sustainable.
13. Take urgent action to combat climate change and its impacts	• The purchase of the property under threat of conversion to agriculture and the ongoing maintenance of its natural ecosystems has prevented the emission of greenhouse gases. • The community outreach and environmental education activities create awareness of critical environmental and climate adaptation issues and ultimately enhances community resilience to natural disasters and climate change. • Providing training, material and technical support for community-owned sustainable livelihoods and nature-based solutions for climate adaptation also equip these communities to combat climate change and its impacts.
15. Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss	• Purchasing the property under threat of conversion to agriculture and maintaining its natural ecosystems. • Conducting community outreach and environmental education to foster support for MFC conservation and creating awareness of critical environmental and climate adaptation issues will ensure that local community members contribute to the sustainable use of nearby terrestrial ecosystems.

The **Horizon 2030 National Development Framework for Belize 2010-2030** presents the country's vision of itself for the year 2030 ("a country of peace and tranquility, where citizens live in harmony with the natural environment and enjoy a high quality of life") and the core values that are to guide citizen behavior and inform the strategies to achieve this vision. The project contributes to the following pillar of this framework "The Bricks and the Mortar: Healthy Environment" which states that "Belizeans have a deep appreciation and love for Belize's natural resources and work collectively to protect the natural heritage and the economic value of these natural resources is quantified and officially recognized" (Government of Belize, n.d.). Through the outreach that the project has done and will continue to do with local communities and the benefits that the project will produce for these local communities, the project will increase this awareness and appreciation for the natural resources within the project area and throughout Belize.

Within the Horizon 2030 framework, **#PlanBelize Medium-Term Development Strategy 2022 – 2026** identifies the following as a strategic objective "Protection of the Environment and Natural Resources" which includes "...promoting sustainable use of our natural forest ecosystems by halting land degradation and biodiversity loss..." (Ministry of Economic Development, 2023). The conservation of

the MFC REDD project area is key to sustaining the natural and environmental assets. In Belize National Protected Areas System Plan¹⁹, the Central Belize Corridor (renamed the Maya Forest Corridor including the project area) is identified as the most critical corridor in the country to main species diversity and ecosystem services, preventing genetic isolation of populations and allowing migration of species and ecosystems over time.

2.1.19 Implementation Schedule (CCB, G1.9)

Date	Milestone(s) in the project's development and implementation
October, 2020	Agreement signed between the Government of Belize and Re:wild (formerly Global Wildlife Conservation) in which Re:wild agrees to finance the acquisition of lands located in the Maya Forest Corridor for conservation and to establish the Maya Forest Corridor Trust to hold title to the properties. See Appendix 13.
December, 2020	The MFCT is registered as a not-for-profit company limited by guarantee pursuant to the provisions of the Companies Act of Belize.
September, 2021	A motion is passed in the Belize House of Representatives formally authorizing the transfer of carbon rights and credits generated in lands held by the MFCT, including the MFC REDD project area, to the MFCT.
October, 2021	WCS begins conducting forest protection patrols in the project area based on good faith understanding that a management agreement will be signed with the MFCT.
December, 2021	The parcels making up the property area are legally transferred from the previous owner to the MFCT as indicated in the Transfer Certificates of Title. See Appendix 8.
January, 2022	Project start date
February, 2022	Construction of ranger station is completed. Constant presence of WCS rangers and daily patrols in the site begins. WCS's management of the site will continue for 50 years as stipulated in the Management Agreement described below.
March, 2022	Initiation of biological monitoring activities in the project area. Central American river turtle population survey conducted.
June, 2022	MFCT members initiate fire management training and awareness raising with local community members and the MFC Fire Working Group. This work is

¹⁹ <https://www.fao.org/faolex/results/details/en/c/LEX-FAOC178772/>

Date	Milestone(s) in the project's development and implementation
	expected to continue for at least 50 years as part of the community engagement work stipulated in the Management Agreement.
July, 2022	MFCT members initiate engagement in community outreach and environmental education activities in local communities. This work is expected to continue for at least 50 years as part of the community engagement work stipulated in the management agreement.
August, 2022	Management agreement signed between the MFCT and WCS in which the MFCT assigns the management of Trust Properties, including the MFC REDD project area, to WCS for a term of 50 years commencing on October 11, 2021, with the option to extend the agreement beyond this period. See Appendix 14.
February – June 2023	Forest carbon field measurements conducted.
As needed	During the fire season, MFCT members in collaboration with the broader Maya Forest Corridor Fire Working Group (MFCFWG) will conduct firefighting activities when fires are identified.
May, 2024	MFCT members initiate work with local communities to support the development of sustainable livelihoods in communities (e.g., climate-smart agriculture, production of sustainable products like coconut oil, cohune oil, honey, etc.). This work is expected to continue for at least 50 years as part of the community engagement work stipulated in the management agreement. .
May-June, 2024	Project team conducts introductory meetings with leaders and councils of the 12 communities in the project zone to introduce them to the concept of REDD and the goal of the MFC REDD project.
June-August, 2024	Socioeconomic survey and community monitoring event take place and community meetings conducted to present the results of the survey, event, and social impact assessment.
October, 2025	Project Description document and Monitoring Report for first two years (January 2022 – December 2023) submitted for public comment and validation and verification.
Every 2-5 years	Monitoring events for climate, community, and biodiversity benefits followed by verification.
December 31, 2041	Project crediting period ends

Date	Milestone(s) in the project's development and implementation
In perpetuity	As stated in the MFCT's Executed Declaration of Trust, the MFC property will be managed in perpetuity for conservation and protection of natural ecosystems.

2.1.20 Risks to the Project (CCB, G1.10)

A comprehensive assessment of the risks to the permanence of the carbon stored in the project area has been conducted, including internal, external and natural risks to the project. This identified both natural and human induced risks which are documented in the VCS AFOLU Non-Permanence Risk Tool.

The biggest risks to climate benefits include hurricanes and tropical storms as well as wildfires. Poaching in the project area poses a risk to biodiversity benefits. Insufficient community and other stakeholder support is a risk for the entire project and the benefits it provides, although the project has a number of actions in place designed to mitigate this risk. These are described in Table 3.

Table 3. Likely natural and human-induced risks to the project benefits and mitigation actions

Identified Risk	Potential impact of risk on climate, community and/or biodiversity benefits	Actions needed and designed to mitigate the risk
Hurricanes/ Tropical storms	Risks to climate benefits: The primary effect to climate benefits of hurricanes and tropical storms is the impact on forested ecosystems and above ground biomass. The effect of hurricanes on forested systems include defoliation, loss of branches, minor or complete removal of crown, fallen trees from uprooting or snapping, tree mortality, and indirect effects from adjacent trees falling and creating forest gaps (Brokaw & Walker, 1991; Lugo et al., 1983; Tanner et al., 1991). Risks to biodiversity benefits: The effects of hurricanes on biodiversity vary between different vertebrate groups, and sometimes even within groups. In general, the greatest threat hurricanes pose to animal communities living in forests is not	Mitigation of risks to climate benefits: A natural phenomenon, nothing can directly be done to mitigate hurricane occurrence. However, many of the tree species that comprise Belizean forests have developed and evolved with hurricanes and these tropical forests are generally resilient to these disturbances (Johnstone et al., 2016; Lugo, 2008; Zimmerman et al., 2021). Thus, the maintenance of forest cover and corridors (Maya Forest Corridor/Mesoamerican Biological Corridor) that link the damaged forest with intact forests will help mitigate long term detrimental effects of hurricanes and severe tropical storms (Bonilla-Moheno,

Identified Risk	Potential impact of risk on climate, community and/or biodiversity benefits	Actions needed and designed to mitigate the risk
	direct mortality from the storm, but rather the major alterations to the forest and the availability of resources (Waide, 1991). In general, herpetofauna experienced the lowest impacts from hurricanes/tropical storms and mammals the greatest with avifauna experiencing modest impacts. In addition, there is some evidence that hurricanes contribute to higher tree diversity through the increase in spatial heterogeneity (Vandermeer et al., 2000).	2010; Kongsager & Corbera, 2015). Mitigation of risks to biodiversity benefits: Mitigation of the impact to hurricanes and tropical storms to biodiversity is the same as the mitigation for climate. The maintenance of forest cover and connection, through corridors, to undamaged forests and ecosystems will allow the recovery and recolonization of flora and fauna to damaged forests and ecosystems.
Wildfire	Risks to climate benefits: Fire has the potential to adversely affect climate benefits of the project through the direct combustion of vegetation and the concomitant release of GHG and the indirect effect of damage to forest resources, particularly the tropical broadleaved forest that comprises 99% of the forest cover in the project area. However, fire is not always deleterious to all ecosystems. The pine savanna ecosystem, which is present in the project zone, is dependent upon fire for its continued existence (Laughlin, 2002). Risks to biodiversity benefits: In the tropical broadleaf forests, fire can damage and kill overstory tree species and have local impacts to herpetofaunal taxa in particular but recover over a period of time depending upon the severity of the event (Meerman & Sabido, 2001). When combined with the hurricane damage the synergistic effects can be more	Mitigation of risks to climate and biodiversity benefits: WCS, the managers of the property/project are part of the Maya Forest Corridor Fire Working Group whose purpose is to improve fire management practices in the MFC. The managers and rangers are provided with training and equipment to manage and control fires that threaten the tropical broadleaf forest. The local WCS team responsible for managing the project area are part of the Maya Forest Corridor Fire Working Group whose purpose is to improve fire management practices in the MFC. The managers and rangers are provided with training and equipment to manage and control fires that threaten the Tropical Broadleaved Forest.

Identified Risk	Potential impact of risk on climate, community and/or biodiversity benefits	Actions needed and designed to mitigate the risk
	pronounced and recovery take longer. Conversely, the lowland pine savanna ecosystem that is prominent in the project zone requires periodic fire to maintain its biodiversity and ecosystem structure and function (Hicks et al., 2011; Laughlin, 2002; Michelakis et al., 2016).	The WCS team also has a fire management plan in place to mitigate the risks of wildfires. The plan provides a guiding framework on how to organize a wildland fire response command system and outlines wildland fire mitigation measures throughout the year.
Poaching of flora and fauna	Risks to climate benefits: Illegal harvesting of timber is considered a low risk based on the socioeconomic assessment conducted (Appendix 15B) in the 12 communities in which very few households indicated that they extracted timber products within the Belize River Valley, Risks to biodiversity benefits: The risk to biodiversity comes largely from the illegal hunting that may occur of meso and large mammals such as the Central American agouti (<i>Dasyprocta punctata</i>), white lipped peccary (<i>Tayassu pecari</i>), White Tailed deer (<i>Odocoileus virginianus</i>), and Baird's Tapir (<i>Tapirus bairdii</i>) an endangered species among others. Illegal hunting of game birds such as the vulnerable Great curassow (<i>Crax rubra</i>) is also a risk. In addition, the project area supports a vibrant population of the Central American river turtle (<i>Dermatemys mawii</i>), a critically endangered species threatened by harvesting for consumption and the animal trade (Novelo-Fuentes and Arevalo 2022, Vogt et al 2006).	Mitigation of risks to climate benefits: WCS rangers conduct regular reconnaissance patrols to detect illegal logging in addition to other illegal activities, thereby discouraging if not eliminating any illegal timber harvesting. Mitigation of risks to biodiversity benefits: As with the climate risk mitigation the WCS ranger patrols are designed to discourage if not eliminate poaching of fauna that threaten biodiversity. The WCS rangers use the Spatial Monitoring and Reporting Tool (SMART) to facilitate the collection, storage, communication, and evaluation of data on patrol efforts, patrol results, and threat levels. SMART is a suite of best practices aimed at helping protected areas and wildlife managers better monitor, evaluate and adaptively manage patrolling activities.
Insufficient community and stakeholder support.	There is a risk that the project may not gain or maintain the necessary level of engagement and support from target communities and key stakeholders; for	Implement awareness and educational campaigns to keep the communities informed about project

Identified Risk	Potential impact of risk on climate, community and/or biodiversity benefits	Actions needed and designed to mitigate the risk
	example, if it is perceived that the project is “locking away” resources which would otherwise be used for economic development or that benefits to communities are not being delivered equitably. This is particularly a concern in the target communities where Spanish is the residents’ primary language and causes a language barrier. Franks Eddy’s population is 97% Mestizo/Latino/Hispanic, and Cotton Tree has a mixed demographic, composed of 67% Mestizo/ Latino/ Hispanic, 25% Creole and 3% comprising other ethnic groups. Many inhabitants of these communities are Central American migrants, with Spanish as their primary language. Given that English is the official language of Belize and is predominantly used in technical and formal communications, this language disparity could hinder these communities’ access to crucial information and services. Lack of community and stakeholder support can result in resistance or active opposition to the project, potentially escalating into conflicts with landowners, partner agencies, local communities, and key government and non-government stakeholders. This could disrupt project activities and lead to negative perceptions and publicity.	objectives, activities and results. • Conduct regular community consultations and participatory planning sessions to ensure that the project aligns with local needs and values and that communities are aware of economic opportunities and other benefits available to them. • Regularly share information and project results with key government and non-government stakeholders through meetings and electronic correspondence. • Establish an easily accessible and responsive Grievance Redress Mechanism. This provides the opportunity for the project to immediately resolve grievances, preventing them from negatively impacting relationships with communities and stakeholders. • Conduct community meetings and training courses in both English and Spanish, or in Spanish-only, to accommodate the language preferences of Franks Eddy and Cotton Tree communities.

Identified Risk	Potential impact of risk on climate, community and/or biodiversity benefits	Actions needed and designed to mitigate the risk
		Provide cultural sensitivity training for project staff to ensure effective communication and respectful engagement with the cultural nuances of community members.

2.1.21 Benefit Permanence (CCB, G1.11)

The risks to climate, biodiversity, and community after the conclusion of the project are the same as during the project (see 2.1.20). The MFCT executed a Deed and Declaration of Trust confirming that the properties are to be held in trust in perpetuity for the benefit of the people of Belize for conservation and protection of natural ecosystems. The Executed Declaration of Trust is in Appendix 16. The terms of the Trust are “irrevocable” and thus qualify as evidence that the management practices are a legal obligation for a minimum of 100 years.

As such, MFCT will ensure that the measures needed to mitigate the risks mentioned above are in place and safeguard the climate and biodiversity benefits derived from the project. These measures include maintaining forest cover, managing fires, and maintaining ranger patrols to discourage and prevent poaching and damage to biodiversity resources.

Inadequate stakeholder engagement and support from target communities and key stakeholders will also remain a risk after the conclusion of the project. Likewise, while the demographics of the communities may change in 20 years, it is probable that Spanish will remain the primary language for many community members leading to risks of limited engagement due to language barriers. In the 50-year Management Agreement between the WCS and MFCT, WCS is also committed to working in partnership with the different communities to foster positive attitudes and behaviors about the Maya Forest Corridor including towards the MFC REDD Project area.

Given the MFCT’s long-term commitment to continue to conserve the property, the management agreement with WCS will either be extended or another management agreement with another organization will be established.

2.1.22 Financial Sustainability (CCB, G1.12)

With funding from Re:wild, in 2021 the MFCT acquired the property in which the MFC REDD project is located with the expectation that it would be a carbon project. In 2022, the MFCT and WCS signed a Management Agreement pursuant to which both entities agreed to seek sustainable long-term financing mechanisms, such as a carbon project with continued fundraising to support long-term

management of the project area and ensuring that the project can meet its climate, community, and biodiversity goals.

The revenue generated from credit generation will be employed to compensate Re:wild for the funds expended to purchase the properties, Additional credit generation revenue along with additional long-term fundraising will be employed to support project implementation and reporting activities. Appendix 17 includes the project budget and revenue projections.

Since WCS began managing the project in late 2021, it has successfully fundraised to support the project activities. Appendix 17 provides a list of the projects and the associated funding amount that has been raised to date for the project. More broadly, WCS has a long-term record of successful fundraising to support conservation work in Belize, the Mesoamerica and Western Caribbean region, and globally. WCS, Re:wild and other members of the MFCT are committed to continue raising additional funds for the project through the life of the project and beyond, including through a carbon project.

2.2 Without-project Land Use Scenario and Additionality

2.2.1 Conditions Prior to Project Initiation and Land Use Scenarios without the Project (VCS, 3.13; CCB, G2.1)

The conditions existing prior to the project initiation are described in detail in Section 2.1.14 “Physical Parameters”, which includes information on ecosystem type, current and historical land use, and current environmental conditions in the project area.

As described below in sections 2.2.2 and 3.1.4, in the absence of the project, the project area would have most likely been cleared for agriculture. Belize's regulatory structure allows private landowners to harvest forests and convert natural ecosystems to agriculture. The different acts permitting this clearing are described in Table 4 describes the laws permitting this conversion.

Table 4. Laws in Belize that allow for the clearing of forests on private lands

Name of law	Description
ENVIRONMENTAL PROTECTION ACT CHAPTER 328 REVISED EDITION 2020	The Environmental Protection Act established the Department of the Environment (DOE) with the responsibility to monitor the implementation of the Act and subsequent Regulations. Private landowners are allowed to harvest forests and convert natural ecosystems to agriculture, as long as they are aligned with the Environmental Protection Act regulations for environmental impact assessment and, if required, an environmental compliance plan approved by the government.

Name of law	Description
	Environment is defined in the Act as including “water, coasts, seas, air and land and the interrelationship which exists among and between water, air, and land, and human beings, other living creatures, plants, micro-organisms and property.” “20.(1) Any person intending to undertake any project, programme or activity which may significantly affect the environment shall cause an environmental impact assessment to be carried out by a suitably qualified person, and shall submit same to the department for evaluation and recommendations.” “20.(7) A decision by the Department to approve an environmental impact assessment may be subject to the signing of an Environmental Compliance Plan, the payment of an environmental monitoring fee, the posting of guarantees or performance bonds, and such other conditions as may be reasonably required for environmental purposes.”
FORESTS ACT CHAPTER 213 REVISED EDITION 2003	The Forest Rules included in the Forest Act provides information on the process for gaining approval for forest clearing on private lands,
LAND UTILIZATION ACT CHAPTER 188 REVISED EDITION 2000 , amended 2017 and 2021	This Act lays out requirements for the subdivision of land outside of cities and towns in Belize under the authority of the Land Subdivision and Utilization Authority. It includes the language below enabling the Minister responsible for land to make regulations allowing for deforestation: “19.-(1) The Minister may, for the better utilization of land, make regulations:” “(e) for the clearing of any forest or the felling of any trees;”
PRIVATE FORESTS (CONSERVATION) ACT CHAPTER 217 REVISED EDITION 2011	This Act defines the process for private landowners to fell trees on their property. “3. Notwithstanding anything contained in the Forests Act, Cap. 213, no person shall fell, or cause to be felled, any tree on any land in Belize unless, (a) an application has been made to the Chief Forest Officer by the owner or by the person authorised by him to do the

Name of law	Description
	felling stating the type and location of the forest and the minimum girth of any tree to be felled; and (b) a permit authorising the felling has been obtained from the Chief Forest Officer, provided that no such application or permission shall be necessary to fell trees under two feet girth measured at one foot above the buttresses during the clearance of land for agriculture but no tree so felled may be sold as timber without a permit from the Chief Forest Officer.”
WILDLIFE PROTECTION ACT CHAPTER 220 REVISED EDITION 2000	Prohibits the hunting of certain species of wildlife and sets restrictions on the hunting of other species of wildlife, including requirement for duly issued hunting licenses and restrictions in forest reserves.

2.2.2 Most-Likely Scenario Justification (CCB, G2.1)

The most likely without-project scenario is that the project area would be cleared and converted to commercial agricultural production. In recent years, several areas around the property in which the MFC REDD project area is located have been cleared of forests and converted to agricultural production, evidence that the property was likely to follow this trend. In a letter written on March 1, 2021 by the Managing Member of the previous owner of the property to the President of Global Wildlife Conservation (See Appendix 11A), the Managing Member describes the various negotiations and offers they had received over the previous 11 years from different companies to purchase the land for conversion to industrial agriculture. The letter also documents the conversion of areas around the property to agricultural production, primarily for sugarcane production. The letter ends by stating that if the current deal with Global Wildlife Conservation cannot be finalized, “we are confident that we can sell out land to agricultural interest in the short term.”

2.2.3 Community and Biodiversity Additionality (CCB, G2.2)

In the absence of the project, the tropical forests of the project area would have been lost to agricultural production harming the biodiversity within these forests. The ecosystem services that these forests provide to communities would also have been lost if they have been deforested. These services include protection from flooding and hurricane damage, as well as preservation of watershed integrity, which provides healthy groundwater and well water for community use. As discussed in section 2.5.1, the conversion from forests to agriculture is legal.

Further, without the project’s investments, the following work on local community development and engagement would not occur:

- Improvement and expansion of local fire prevention and management capacity thereby reducing risks of wildfires exacerbated by longer dry seasons and rising temperatures due to climate change.
- Introduction and expansion of community-owned sustainable livelihoods and nature-based solutions for climate adaptation that increase livelihood diversification and economic security. .
- Local community outreach and engagement activities that increase communities' knowledge and awareness of critical environmental conservation and relevant climate change issues.

2.2.4 Benefits to be used as Offsets (CCB, G2.2)

While the project does expect to generate community and biodiversity benefits with the goal of being certified as a CCB project, it does not intend for said benefits to be used as offsets.

2.3 Safeguards and Stakeholder Engagement

2.3.1 Stakeholder Identification (VCS, 3.18, 3.19; CCB G1.5)

As part of a larger effort to guide conservation interventions in the entire Maya Forest Corridor, WCS and the University of Belize Environmental Research Institute (UB ERI) carried out a feasibility study that was completed in 2021 to build information to guide viable actions by both communities and managers for ensuring the persistence and ecological integrity of the MFC over the long term. This feasibility study can be found in Appendix 12.

In this feasibility study, a scoping exercise was initially completed to identify the communities with the most impact on the broader MFC. The exercise identified thirteen priority communities: Camalote, Cotton Tree, Franks Eddy, Mahogany Heights, La Democracia, Gracie Rock, Hattieville, Scotland Halfmoon, Bermudian Landing, Double Head Cabbage, Willows Bank, St, Paul's Bank, and Rancho Dolores. Given the fact that the REDD project area only makes up a portion of the MFC, the WCS team conducted further analysis to determine which of these 13 communities had no impact on the project area. Based on this analysis, WCS removed Camalote because the hunting grounds of its community members are only in the southern section of the MFC landscape and, therefore, do not include the REDD project area.

Further information gleaned from consultations and focus group discussions conducted as part of a Climate Adaptation and Protected Areas (CAPA) Initiative supported the identification of community subgroups, vulnerable groups, and stakeholders of interest and relevance to the MFC REDD Project. Data for each community was sourced from the 2022 Census which provided some information on education, household assets and characteristics, home ownership, and gender balance relevant to the heads of households.

Finally, the list of stakeholders was finalized through consultations with community leaders in all 12 communities. Consultations with the community leaders allowed for validation of the information from

the census and 2021 household survey as well as identification of specific subgroups or community-based organizations and vulnerabilities specific to each community.

The interests of community and community groups varied based on their proximity to the MFC and reliance on forest and other natural resource assets for livelihoods. Other stakeholder groups identified were from academia, non-government organizations, community-based organizations, the private sector, and government ministries and departments. Since the MFC REDD project area is privately owned, these stakeholders do not have rights in it, however, they are integral to management, planning, policies, and legislation relevant to the area as well as to national conservation efforts. Consequently, these stakeholders are important to the success of the project.

Monitoring actions will include monitoring stakeholder participation as well as identification of any new stakeholder and stakeholder groups relevant to the project to ensure the effective participation of all groups including underrepresented groups.

2.3.2 Stakeholder Descriptions (VCS, 3.18, 3.19; CCB, G1.6, G1.13)

The full descriptions of the communities, community groups, and other stakeholders can be found in Appendix 1.

2.3.3 Stakeholder Access to Project Documents (VCS, 3.18, 3.19; CCB, G3.1)

Full project documentation will be made available to all communities and stakeholders through a variety of channels. Community meetings with key community leaders and community groups have been the preferred channel for sharing project information with communities. In addition to interpersonal channels utilized, the Stakeholder Engagement Plan for the Project (Appendix 18A) outlines a variety of channels that will be used during the various project phases to ensure access to project documents.

Project documents and monitoring reports will be posted on the WCS website and will also be available on the project page on the Verra Registry, as per VCS standards. Links will also be provided through WCS's active Facebook and other social media pages. WhatsApp will also be utilized to provide updates on available reports and documents, providing links to the documents. The stakeholder database developed during ongoing consultations with communities, to develop the project, will be utilized to communicate with communities via WhatsApp. Documents will also be shared via emails to stakeholders in government and civil society who utilize emails as a main form of communication and information sharing. For communities and stakeholders with limited access to the internet, hard copies of documentation will be made available through key channels such as village chairpersons and other community leaders, the Community Baboon Sanctuary, high school libraries in the Belize River Valley, other sanctuaries in the area.

2.3.4 Dissemination of Summary Project Documents (VCS, 3.18, 3.19; CCB, G3.1)

Summary project documentation will be disseminated during community meetings and other community engagements within the MFC. Additionally, hard copies will be made available through

community leaders and at strategic locations in communities. Summary documents will also be disseminated electronically via WCS's website and social media pages, WhatsApp groups established with communities for communication and information sharing on the project, and via email.

For project transparency, accountability, and building community trust, monitoring reports must be easily accessible to a wide range of stakeholder groups. Key stakeholder groups targeted for the dissemination of monitoring results will include direct project beneficiaries, target communities, government agencies, NGO partners, and external auditors. In compliance with the Monitoring Plan outlined in the Project Description, the results of the first community monitoring exercise have been made accessible to targeted beneficiary communities, key stakeholder groups, and the public using the following methods:

The following specific strategies will ensure dissemination among all stakeholders:

- Presentations of the monitoring results will be made to community leaders at suitable community venues.
- A booklet with a summary report on the monitoring results, presented in language appropriate to the target audience, will be disseminated at community meetings. Additional copies will be left at multiple community venues which are regularly frequented by community members for all interested community members to read.
- Government and non-government partner agencies will receive electronic versions of the monitoring report via email from the MFCT.
- The results of each monitoring and verification exercise will be published on the Verra Registry.

In the communities of Franks Eddy and Cotton Tree where the main language spoke is Spanish, the information will also be disseminated in Spanish. In the other 10 MFC target communities where English is spoken, the information will be disseminated in English.

Beneficiary communities, as well as government and non-government partners, will be allowed a 30-day comment period at the start of project validation and verification events. All relevant public comments received during this period will be addressed appropriately.

2.3.5 Informational Meetings with Stakeholders (VCS, 3.18, 3.19; CCB, G3.1)

Informational meetings with communities and local stakeholders have been organized primarily through community leaders in each community and the CBSWCG, as the focal point for key communities. In June 2024 informational meetings were held with key leaders in all 12 communities to provide some background information on the project, present the community monitoring plan, and the household survey plan and seek community support to identify key stakeholders and stakeholder groups. A communication outline was developed to guide the discussions with community leaders and ensure that all key information was provided to community members. Community leaders provided valuable information on stakeholder and stakeholder groups, assisted with mapping communities, and also

provided insight into community dynamics and how to approach the household survey implementation in each community.

Community notices in English and Spanish were channeled through the community leaders, informing community members of the household survey, to secure maximum community participation. Once the household survey was completed and the draft report on findings from the household survey and the first community monitoring report was available, letters of invitation were sent out to community members through community leaders, focal points within each community, or community mobilizers. PowerPoint presentations were made to community leaders and community members, and the information was reinforced through a printed summary of the information in the presentations. Community members were allowed to ask questions, discuss, and validate key findings. At the end of all informational meetings community members were advised of the next steps in the process.

Documentation of these informational meetings and the materials provided to stakeholders can be found in Appendix 18B-18G.

2.3.6 Risks from the Project and No Net Harm (VCS, 3.18, 3.19)

The different natural and human-induced risks resulting from project activities during the project lifetime, as well as the commensurate mitigation or preventative measures in place to prevent or mitigate these risks, are described in detail in Appendix 3.

2.3.7 Community Costs, Risks, and Benefits (CCB, G3.2)

WCS is committed to identifying and addressing the costs, risks, and benefits to communities through participatory and transparent processes. To achieve this, WCS prepared and began implementing the Stakeholder Engagement Plan 2024 – 2030 (Appendix 15A), which is designed to enhance stakeholder participation and facilitate continuous communication between the project and target communities. This plan includes the following strategies for active collaboration, information sharing, and empowerment, ensuring that communities are well-informed about the potential impacts of project activities:

- In-person meetings with communities, community leaders, and community groups to share information on project activities and opportunities for community participation, as well as to discuss community perspectives and impacts. These meetings began in the project design phase and will continue throughout project execution.
- Technical orientation sessions and site visits relating to specific livelihood activities to ensure that community members are fully informed before deciding to participate.
- Community outreach and environmental education activities on the importance and benefits of MFC conservation to local communities.

Participatory data collection with beneficiaries and stakeholders to assess outcomes, challenges, and impacts on communities using methods that allow for community perspectives and experiences to be documented and analyzed.

It is important to note that the stakeholder engagement regarding the REDD project began in 2024. While section 3.18.2 of the VCS Standard states that the consultations must be done before this implementation, this does not apply to projects with a start date prior to 1 October 2023. Since the start date of this project is 1 January 2022, this requirement is not applicable.

2.3.8 Information to Stakeholders on Validation and Verification Process (VCS, 3.18.6, 3.19; CCB, G3.3)

Community members will be informed of the validation process through the steps outlined in the Stakeholder Engagement Plan (Appendix 15). Meetings will be held with community leaders in all 12 communities to provide information on the validation and verification process. Following meetings with community leaders, reader-friendly information in both English and Spanish on the validation and verification process will be developed and widely disseminated to community members in the 12 target communities.

2.3.9 Site Visit Information and Opportunities to Communicate with Auditor (VCS, 3.18.6; CCB, G3.3)

Communities and other stakeholders will be informed of the auditor's site visit through established and ongoing channels of communication with community leaders and key stakeholders within the MFC. Community leaders will be informed in advance and WCS's staff will coordinate with community leaders to ensure timely communication with community members. WCS's staff will also utilize established WhatsApp groups to ensure widespread dissemination of notice to community members. Stakeholders such as NGOs and government entities will be informed via emails followed by phone calls to confirm receipt of information. WCS will work with community leaders to organize suitable venues and other logistics, including transportation and translation services where relevant.

2.3.10 Stakeholder Consultations (VCS, 3.18; CCB, G3.4)

In April 2024 a socioeconomic survey plan and monitoring plan were designed for the MFC REDD Project. These were presented to the communities for their input and finalized based on the feedback provided. Communities were also consulted on effective channels for communication and engagement to ensure sustained communication with communities. Considerations were given to language barriers in some communities. Consequently, consultations in two communities were conducted in Spanish. In mobilizing participants, gender balance and inclusion of youth participants were also key considerations. Table 5 presents the details of these initial consultations.

All 12 communities participated in the socioeconomic survey and community monitoring event which provided valuable information to establish starting conditions for the project and to identify key interventions to be implemented in communities based on current knowledge, attitudes, and practices

regarding the use of forest resources, livelihoods, and other key project indicators. The outcome of these studies also informed the Theory of Change and the project implementation plan.

Findings from the socioeconomic survey and community monitoring report along with the Social Impact Assessment, inclusive of the Theory of Change and project activities, were presented to the community for their feedback and input. The details of these follow-up stakeholder consultations are presented in Table 6.

Consultations were also conducted with representatives from stakeholder organizations within the MFC. At least 6 in-depth interviews were held with WCS staff and members of the MFCT to secure information on activities being implemented and planned within the MFC, project risks and benefits to communities, and other information relevant to the project. Table 7 provides a summary of all the comments received during consultations and how the project has responded to these comments.

Table 5. Initial stakeholder consultations for the MFC REDD project

Date of stakeholder consultation	29 May 2024 to June 9, 2024
Stakeholder engagement process	Eight Community-level meetings were held with 35 community leaders in the 12 target communities to share information on the REDD proposal, secure commitment, and support from community leaders, identify key stakeholders and vulnerable groups within communities and channels for communication with communities, and discuss specific opportunities for community participation, including participation in the socioeconomic household survey to inform the REDD Proposal. Formal letters, in English and Spanish, were sent to community leaders. Letters were followed by in-person visits to each community leader to explain the purpose of the meeting and to solicit their participation. Notes from each meeting were documented (Appendix 18B) and follow-up actions were undertaken as necessary to address comments and concerns.
Consultation outcome	As per the Communication Outline developed for each community meeting, community members were provided with information on the Maya Forest Corridor and target communities of the MFC, utilizing a map of the area. The significance and use of the MFC by target communities was discussed. This was followed by a discussion on REDD Projects, what a REDD Project is, and plans to design a REDD Project for the MFC. Communities were informed of

	how the project intended to engage communities, the benefits to communities from the project, and the potential risks. Discussion was held on the Household Survey planned to gather socio-economic data and to collect monitoring information for the community monitoring report. Communities were informed of what to expect during the survey. Discussions were held on stakeholder groups within the community, and community leaders supported the identification of additional stakeholder/stakeholder groups, including vulnerable groups. Finally, discussions were held on the Monitoring Plan for the REDD Project Proposal
Stakeholder input	Communities expressed support for the project and asked that information be shared with the communities in a timely manner. Communities did not request any modification to the project information shared. The communities of Hattieville and Gracie Rock indicated that Freetown Sibun should be a part of the project. It was noted that Freetown Sibun does not fall within the MFC priority target communities. Community members provided valuable information on how to engage communities to secure maximum input in household surveys. They recommended using enumerators from the community to collect the data and also recommended that surveys be conducted during the evenings and weekends. These recommendations were implemented. Community members also assisted in mapping the communities based on existing clusters. Community recommendations and guidance on existing clusters were implemented during the household survey exercise.

Table 6. Follow-up stakeholder consultations to present findings from the household survey, community monitoring report, and findings from the social impact assessment

Date of stakeholder consultation	23 August 2024 to 28 August 2024
Stakeholder engagement process	Four community meetings were held with 54 community leaders and community members from the 12 target communities to present the findings from the household survey, the community monitoring report, and findings from the Social Impact

	Assessment. Invitations were disseminated in English and Spanish through community leaders, mobilizers, and other established channels of communication with communities. Community leaders were asked to invite a careful balance of men, women, and youth. Three meetings were held in English and one meeting was held in Spanish to cater to the Spanish-speaking communities. Notes from each meeting were documented and follow-up actions were undertaken as necessary to address comments and concerns.
Consultation outcome	PowerPoint presentations were made in English and Spanish on the key findings from the household survey and community monitoring report as well as the social impact assessment (Appendices 18D-18G). Spaces were provided for community members to validate findings from the survey findings and community monitoring report findings. A booklet summarizing key information was also disseminated to community members to solidify the information shared. The communities agreed with the findings presented as well as with the social impact assessment. The key feedback from communities included: • A call from the CBSWCG for increased coordination with WCS in the implementation of livelihoods activities to avoid duplication of efforts • Community members in the Belize River Valley recommended including support for the establishment of a market in the river valley as part of the project. • Community members in La Democracia indicated that they will not benefit from agriculture activities planned as part of the project as community members do not have agricultural lands.
Stakeholder input	WCS has increased efforts to strengthen coordination with the CBSWCG in planning and implementing livelihood activities. The request for a market in the Belize River Valley is not currently within the scope of the project, however, can be considered in the future. For the community of La Democracia, applicable activities such as backyard gardens will be implemented.

Table 7. Stakeholder comments received and actions taken

Summary of comment received	When comment was received	Actions taken
Request for inclusion of Freetown Sibun in the project	June 6, 2024	Although near to two project communities, Freetown Sibun was not identified as a priority MFC target community.
A call from the CBSWCG for increased coordination with WCS in the implementation of livelihoods activities to avoid duplication of efforts	August 23, 2024	WCS has increased coordination with the CBSWCG as this organization is a key coordination body within the Belize River Valley communities.
Community members in the Belize River Valley recommended including support for the establishment of a market in the river valley as part of the project.	August 23, 2024	The project cannot accommodate this request within the short term but will consider inclusion in the long term.
Community members in La Democracia indicated that they will not benefit from agriculture activities planned as part of the project as community members do not have agricultural lands.	August 28, 2024	Activities planned for La Democracia will include backyard gardens in consideration of the lack of access to agriculture lands.

2.3.11 Continued Consultation and Adaptive Management (VCS, 3.18; CCB, G3.4)

Continued communication and consultation between the communities and other stakeholders will be sustained through the implementation of the stakeholder engagement plan which outlines who needs to be engaged, key messages to be communicated, community and stakeholder inputs required for each engagement, and how these inputs will be utilized. The WCS team will be the lead persons engaged in communication with communities and stakeholders. Results from the implementation of the monitoring plan along with community and stakeholder input will provide information for regular updates of the work plan.

2.3.12 Stakeholder Consultation Channels (CCB, G3.5)

Within the 12 priority communities, interpersonal channels are the preferred channels for communication since the majority of communities are small and remote with inconsistent access to

internet and telephone services. Furthermore, low literacy levels in the communities of Frank's Eddy (53.2% with no formal education) and Cotton Tree (46% with no formal education) require interpersonal engagement in communication to ensure that technical language can be simplified and community members are provided with opportunities for meaningful exchange.

All background information on the project, the outcome of the household survey, the outcome of the community monitoring event, and project documents have been shared through community leaders. Community leaders in all 12 communities are the traditionally established entry points to these communities. This channel ensures that information reaches all subgroups. It should be noted that community leaders engaged are not always elected community leaders. Within the six Belize River Valley, two key conservation groups, CBSWCG, and the Rancho Dolores Environmental Group, provide an effective channel for communication with community members. Within the other six communities, the focal point for communication is the village council chairperson of the community. Village councils are recognized as the official governance bodies in these communities. All six chairpersons have been fully engaged from the inception and all communication with community members is facilitated through the chairperson.

Two rounds of engagements have occurred with the communities (June and August of 2024). During these engagements, presentations were made to all communities, and printed materials were disseminated to reinforce the information shared. Registration sheets from both community engagements are available. One follow-up engagement with the community is planned for the fourth quarter of 2025. This engagement will be to share the completed PD with communities and to inform communities of the process to submit comments on the Verra site once the PD is published.

Table 8. Number of participants per community in stakeholder consultations

Communities	Number of Male participants	Number of Female Participants	Total
Franks Eddy	5	3	8
Cotton Tree	4	3	7
Mahogany Heights	2	5	7
La Democracia	5	7	12
Gracie Rock	5	1	6
Hattieville	2	5	7
Rancho Dolores	3	11	14
Willows Bank	1	8	9
St. Paul's	2	4	6
Double Head Cabbage	0	2	2

Communities	Number of Male participants	Number of Female Participants	Total
Bermudian Landing	0	4	4
Scotland Halfmoon	0	4	4
Total	29	57	86

2.3.13 Stakeholder Participation in Decision-Making and Implementation (VCS, 3.18, 3.19; CCB, G3.6)

As described in 2.2.3, 2.3.4, 2.3.5, 2.3.10, and 2.3.12, the process employed to engage stakeholders has increased stakeholder participation and provided stakeholders with adequate information to enable decision-making and participation in the implementation of the project.

Utilizing established channels of communication in each community and engaging community leaders, ensuring that all community leaders receive the information and are supported to mobilize community members is a strategy that enables effective community participation. In Spanish-speaking communities, engagement of Community Health Workers also proved to be effective in securing community participation and understanding of the information.

The provision of transportation for community members within the Belize River Valley is also key to ensuring effective participation as access to public transportation is limited. For all communities, ensuring that meetings are planned during the evening and on weekends is also an important consideration in securing community participation. The participation of women and youth is also encouraged, and all mobilization efforts emphasize a gender balance. Notably, within the Belize River Valley Communities, more women were participating in information sessions than men.

2.3.14 Anti-Discrimination Assurance (VCS 3.19; CCB, G3.7)

The design of the project is rooted in WCS's anti-discrimination policies as well as its policies on diversity and inclusion which state that WCS values diversity and prohibits discrimination based on race, national origin, color, sex, sexual orientation, age, disability, veteran status and other protected classifications. The WCS community is committed to ensuring that no one, including our valued employees, diverse suppliers, interested job applicants, and guests to our facilities, is excluded or discriminated against in WCS's programs and activities.

WCS will ensure that staff and key project stakeholders are continuously sensitized and trained in adherence to its anti-discrimination policies and that channels are available and publicized for reporting any violations. WCS also promotes a zero-tolerance policy on sexual harassment.

2.3.15 Feedback and Grievance Redress Procedure (VCS, 3.18.4; CCB, G3.8)

Development process	A functioning grievance redress mechanism (GRM) is required for all WCS and WCS-sponsored programs. As the implementing partner, the project will adhere to WCS's Global GRM, which is already established. The GRM has been modified for this project, taking into consideration accessibility, and culturally appropriate conflict resolution methods for the 12 communities involved. https://grievance.wcs.org/en-us/ The objectives of the GRM are to: (a) Provide a mechanism for affected individuals or communities, and others with knowledge of the circumstances, to raise good faith grievances about the impacts or perceived impacts of projects or activities undertaken or sponsored by WCS; and (b) Provide a structure to ensure that human rights and safeguarding grievances are handled, provided with a resolution , and documented in a fair and timely manner. The GRM will be available to any “stakeholder” affected by the Project, such as (i) donors; (ii) partner organizations; (iii) individual members or representatives of a community, and (iv) third parties with knowledge of the circumstances. The person or entity filing the grievance is referred to as the “complainant”.
Grievance redress procedure	The GRM will have three components: Public Notice and Submitting a Grievance, Internal Management of the Grievance, and Resolution of the Grievance. Public Notice and Submitting a Grievance Affected Communities and other interested stakeholders may raise a grievance at any time to the MFCT or to any WCS staff working in the MFCT. Information about the GRM and contact information of the focal point for the GRM will be made publicly available to all affected communities and interested stakeholders in prominent, accessible locations in all project sites. A grievance form will be prepared, for completion by complainants or by the GRM focal point for grievances raised orally (in person, by phone, or at meetings). Grievance forms will be available in local languages in a prominent and accessible location in all 12 buffer communities. Grievances can be submitted orally to the GRM focal point (in person or by telephone), by email, or by mail, or online by completing the required form. Those wishing to by-pass the local

GRM may submit grievances to the WCS Global GRM system or directly to the MFCT.

A grievance submission should contain sufficient detail about the alleged conduct or activity to permit an investigation and an appropriate response implemented. Grievances should include, at a minimum, the following information:

- Name(s), affiliation(s), address(es) and other contact information of the complainant(s) and/or their representative(s).
- Representatives must identify the person(s) on whose behalf the grievance is made and provide evidence of the authority to represent such person(s), or
- Complainants may remain anonymous. Note, however, that anonymous grievances may limit the ability to properly investigate and respond to the grievance.
- A description of the specific facts, circumstances, and events giving rise to the grievance: location, date, time, names and descriptions of individuals involved, statements made including exact quotes where possible, actions observed or witnessed, and names or descriptions of any witnesses. The more specific and detailed information provided to support the grievance, the more thoroughly and effectively the grievance can be investigated and addressed.
- An explanation of the harm suffered and how the rights of an individual or community were violated. The complainant may refer to codes of conduct, standards, policies, or other frameworks pertinent to the case and, where applicable, should describe any efforts to resolve the grievance through other available redress mechanisms.
- A description of the relief requested, where relevant or appropriate.

Internal Management of the Grievance

Internal management of grievances is an essential component of the overall grievance system. It allows for the project implementing partner to track grievances from submission to resolution, to

ensure that serious grievances are immediately routed to the highest levels of the MFCT for review and action, to access and provide grievances to donors requesting such information - while maintaining confidentiality, and to ensure that all grievances are addressed within a reasonable timeframe.

1. Survivor-centered approach

A survivor-centered approach will be employed for all GBV and other serious grievances from initial submission to resolution. A survivor-centered approach will put the rights of each survivor at the forefront of all actions and ensure that each survivor is supported and treated with dignity and respect.

2. Receive, acknowledge, and log grievance

A Grievance Focal Person (GFP) will be designated before the project launch. The GFP will be the person who receives, collects, or coordinates the collection of grievances from all submission points. The GFP will maintain an electronic log of grievances that includes all formally submitted grievances as well as grievances recorded by project implementers at community gatherings and other meetings. The GFP will respond within 20 calendar days of receipt of the grievance, and claims will be filed and included in project monitoring processes. Complainants will be notified that the grievance has been received, and a point of contact (the GFP) will be identified.

The grievance log will register grievances and will be maintained in a database. The database will include information about the complaint and the resolution of the complaint, including the remedy provided, taking into consideration that complainants' identities can be kept anonymous if requested.

The grievance log will be shared with the MFC Site Manager, who will maintain the Project-wide database of grievances, and liaise with the MFCT and the WCS Social Safeguards Management Team as needed.

3. Screen eligibility

Upon receipt, the validity and severity of the complaint will be immediately assessed by the GFP. If the complaint is not relevant to the project, the GFP will conduct necessary intervention such as providing an explanation or education session to the complainant.

When the complainant accepts the explanation, he/she will need to sign a Resolution Form as an indication of the acceptance of the explanation.

If the complaint is project-related, the GFP may proceed to the necessary next steps.

Since the complaint may be directed at any level of the GRM, the GFP shall also verify if the case is rightfully intended for their level based on the nature and severity of the grievance. If assessed as not, the GFP shall notify and recommend the grievance to the appropriate level for proper resolution.

The Resolution Process

1. Investigate/assess

Once the complaint is assessed as valid and project-related and an acknowledgement provided the GFP shall organize meetings and/or site inspection visits together with the relevant parties to gather preliminary information about the case. This collection of information will follow best practices in investigation procedures to ensure any information collected at this stage can be contributed to an external investigation, should one be warranted.

Based on the initial meetings/site inspection visits, the GFP shall categorize the grievance on a 6-point scale (see below). The categorizing of the grievance will automatically alert the WCS Global GRM for category 4 and 5 grievances, after which arrangements for a grievance review plan by an independent investigation. For less serious grievances, the GFP will work to resolve the case, offer mitigation options to the aggrieved party, and seek his/her consent to implement such mitigation measures. All meetings should be recorded and copies of the minutes of meetings will be provided to the complainant.

The grievance review plan outlines the process for investigating and responding to the grievance, including identifying the focal point for communications with the complainant. This also includes special considerations for the rights, safety, and well-being of survivors of suspected safeguarding violations consistent with the WCS Safeguarding Policy. Independent Investigation of grievances may include interviews with project personnel, witnesses, and affected individuals (to the extent feasible and appropriate), reviewing relevant documentation and other materials, taking

photographs, as well as other information-gathering to ascertain the factual basis of the complaint. Claims determined to be false, frivolous, or submitted with malicious intent will be dismissed and excluded from further consideration.

Grade	Type
	NOT A GRIEVANCE
0	Positive Feedback Suggestions/Ideas Request for Information
1	REQUEST FOR ASSISTANCE
	NO SAFETY RISK/NOT SENSITIVE
2	Expressed minor dissatisfaction with WCS/site regulations or program activities. Requests to access natural resources. Tips or information on natural resources misuse.
	LOW TO MEDIUM SAFETY RISK/SENSITIVE
3	Expressed major dissatisfaction with WCS/site regulations or program activities, OR action/inaction of WCS/site personnel or partner staff. Tips on illegal activities. Potential human rights issues related to natural resource access.
	MEDIUM to HIGH SAFETY RISK/SENSITIVE
4	Major complaints or alleged human rights violations/abuses related to the action or inaction of WCS/site personnel or partner staff.
	HIGH SAFETY RISK/HIGHLY SENSITIVE
5	Major complaints or alleged serious human rights violations/abuses committed by WCS/site personnel or partners, which have or may have resulted in serious injury or death.

Categorization of grievances

2. Develop a response and communicate with the complainant

The results of the investigation and any recommendations for resolution or corrective action will be documented in writing. After the investigation, the results of the investigation and responsive actions will be communicated to the complainant.

3. Agreement and implementation of response or escalation

If the complainant agrees with the mitigation measure/resolution, the concerned office/level shall implement the agreed resolution.

The Resolution Form shall be signed by the complainant and a copy will be placed in secure storage by the GFP.

Confirmation that the case has been resolved from the anonymous complainant(s) and those who wouldn't be able to personally sign the resolution form due to security reasons will be communicated through their provided contact information and will be asked to confirm agreement on the resolution via text message or email.

If no understanding or amicable solution is reached, or if no response is received or no action is taken by the office or level to which the complainant filed the grievance within 25 working days after the registration of the complaint, the complainant may appeal/escalate the grievance to the higher office/level for appropriate action. This may include but is not limited to professional arbitration, competent courts in the relevant jurisdiction or a 3rd party external review.

For example, if no understanding or amicable solution is reached, or if no response is received from the WCS country office within twenty-five (25) days after the registration of the complaint, the complainant can appeal to the WCS Social Safeguards Management Team (SSMT) for an independent investigation. The SSMT will develop a grievance review plan appropriate to the location, nature, seriousness, and complexity of the grievance. The SSMT includes representatives from senior line management and the Office of General Counsel. To review the grievance, the SSMT may also involve relevant WCS staff as well as other subject matter experts, including external third parties, as warranted by the circumstances. Should this process not result in a satisfactory outcome for the complainant, it would then be referred to arbitration, a court in the relevant jurisdiction or for 3rd party external review.

4. Close, monitor and report

The GFP will maintain a database of grievances, outcomes, and responses. A quality control system will check that all grievances have been acted upon, that all aspects of the grievance have been addressed, and that all necessary follow-up action has been taken. As the implementing partner, WCS will monitor the implementation of any remedial actions taken, document progress on implementation, and revise the choice or execution of approach if the issue is not resolved.

2.3.16 Accessibility of the Feedback and Grievance Redress Procedure (VCS, 3.19; CCB, G3.8)

Information about the GRM will be disseminated to all stakeholders including target communities during project implementation. Contact names and phone numbers, mailing addresses, email addresses, and website information to access the online form will be included in the information disseminated.

The information will be shared via WhatsApp groups established for stakeholder engagement. Posters will also be prominently placed in strategic locations in project communities providing details on the mechanism and how to access it. Communities will also be provided with information on the mechanism during community meetings and engagements as a constant reminder of the availability of the mechanism. Information will be shared in English and Spanish.

The GFP will report the following indicators every quarter:

- a) Number of conflict and complaint cases reported to the Project's Grievance Redress Mechanism
- b) Percentage of conflict and complaint cases reported to the Project's Grievance Redress Mechanism that have been resolved.

In addition, the Programme Grievance Officer will produce an annual grievance report that includes data on the number of grievances received, compliance with time frames for acknowledgment and resolution of grievances, issues raised in grievances and trends over time, remedial actions, what redress was provided, and recommendations to prevent or limit future recurrences. All personal identifiers will be removed as well as any additional case materials that could inadvertently enable identification of involved persons. This annual report will be publicly available.

2.3.17 Worker Training (VCS, 3.19; CCB, G3.9)

WCS employs appropriately qualified staff to manage project activities and supervise all staff, whether permanent, temporary, seasonal, full-time, or part-time, ensuring that staff have the capacity and tools for safe and effective job performance. Orientation of new staff is a standard component of the onboarding process. Job-specific and specialized staff training is provided on an ongoing basis to develop comprehensive and transferable skill sets. Key training areas identified and initiated at the project startup are fire management, national environmental laws, surveillance and patrolling, use of the Spatial Monitoring and Reporting Tool (SMART) for effective monitoring and surveillance, and special constable certification training²⁰. Specialized training is also offered to community members who will participate in community-based project activities, such as fire management or climate smart agriculture.

²⁰ In Belize, special constable training is conducted by the Belize Police Department to strengthen nationwide capacity to apply biodiversity or "Green Laws." The program, usually one to two weeks, provides essential knowledge of legal frameworks, evidence gathering, chain of custody, investigation procedures, and case file preparation, alongside training in patrols, surveillance, arrests, reporting, and ethics. It also emphasizes community engagement and coordination with enforcement agencies. Upon completion, rangers are sworn in as Special Constables, granting them authority to detain and arrest offenders, thereby enhancing the enforcement of environmental laws and protection of natural resources in remote areas

2.3.18 Community Employment Opportunities (VCS, 3.19.13; CCB, G3.10)

WCS is an equal-opportunity employer. Although the project will not provide numerous employment opportunities, all recruitment conducted will be done through a standard job description or Terms of Reference (TOR) clearly outlining requirements and qualifications. All job opportunities are widely publicized through a variety of national and local channels. If a member of one of the target communities is qualified for the post, then preference will be given to that community member.

To date, the Project has employed 1 permanent managerial post (female), 4 permanent rangers (male), and 10 temporary male field assistants employed in carbon measurements. All personnel were recruited utilizing the process described above.

2.3.19 Occupational Safety Assessment (VCS, 3.19; CCB, G3.12)

WCS meets all national standards for workplace safety. Onboarding of all staff includes safety training, including training in first aid and response procedures. WCS will ensure ongoing training in safety procedures for all staff.

Table 9 below outlines some potential risks and hazards to workers engaged in field activities and some safety and mitigation strategies that will be employed.

Table 9. MFC REDD project occupational risks and hazards and mitigation strategies

Potential risks and hazards	Mitigation Strategies
Traffic Accidents	Training in first aid Availability of emergency contact numbers at all times Vehicles equipped with emergency radios
Fire	Ongoing training of staff in fire management Provision of adequate personal protective equipment (PPE) Provision of adequate firefighting equipment Training in first aid
Attack by persons intruding on MFC property	Equip field staff with satellite phone to maintain contact at all times Establish policies that ensure that lone staff members are not engaged in monitoring property (minimum of 2 persons per crew to increase safety)
Attack by wildlife	Training in first aid Campsite equipped with first aid equipment

	Available transportation to transport staff members to the nearest emergency services Establish policies that ensure that lone staff members are not engaged in monitoring property (minimum of 2 persons per crew to increase safety)
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2.4 Management Capacity

2.4.1 Project Governance Structures (CCB, G4.1)

The MFCT's Board of Directors is the ultimate decision- and policy-making body of the MFCT, and as such has the final say on matters related to project development and implementation. The Board of Directors includes representatives from the Belize Maya Forest Trust (BMFT), WCS, the Belize Zoo and Tropical Education Center (TBZTEC), Foundation for Wildlife Conservation (FWC), the University of Belize – Environmental Research Institute (UB-ERI), and Re:wild. The responsibilities of the board include delegating certain responsibilities to members of its board. For this project, the MFCT board has delegated the following roles and responsibilities to WCS including 1) the day-to-day management of the project site; 2) engagement with nearby communities and other stakeholders related to the project; 3) conducting all the field work and preparing all the required project documentation to register the project with the VCS and CCB; and 4) ensuring that the monitoring and verification events occur. In addition, different MFCT members will contribute to carrying out project activities benefiting local communities.

2.4.2 Required Technical Skills (VCS, 3.19; CCB, G4.2)

The required technical skills for successful implementation to ensure its climate, community, and biodiversity benefits include the following:

Land management for conservation purposes: The effective management of the Maya Forest Corridor site is key to ensuring the project's success. This includes implementing activities focused on fire prevention and management, patrolling to prevent illegal activities (e.g., hunting, fire, land clearing, etc.), and species monitoring.

Carbon measurement and monitoring: These skills are essential to ensuring that the project is generating real and additional verified carbon units. This includes expertise in Geographic Information Systems (GIS) and remote sensing.

Stakeholder engagement and safeguard implementation: While there are no human settlements within the project site, there are nearby communities and other stakeholders that are being impacted by the project area. Appropriate stakeholder engagement and implementation of measures to ensure that compliance with different social safeguards is required to ensure these communities and other stakeholders benefit from the project.

Biodiversity monitoring: To ensure that the wildlife corridor project is maximizing benefits to wildlife species, it is necessary to employ rigorous, science-based approaches to monitoring species.

Project management: The capacity to plan, organize, and execute the project is integral to ensuring the overall success. This includes effectively defining project goals and scope, planning and scheduling tasks, managing resources, monitoring progress and risks, and ensuring quality control.

2.4.3 Management Team Experience (VCS, 3.19; CCB, G4.2)

The Management Team, led by WCS with support from the MFCT and its different local and international member organizations, has extensive experience in all the required technical skills.

Wildlife Conservation Society (WCS)

WCS has strong management and technical capacity to ensure the success of the project. WCS, founded in 1895 as the New York Zoological Society, is an internationally recognized organization dedicated to preserving the Earth's wildlife and wild landscapes and seascapes. WCS currently oversees a portfolio of more than 500 conservation projects in 60 countries in Asia, Africa, Latin America, and North America. WCS works with national governments, universities, non-governmental organizations (NGOs) and dedicated individuals to increase understanding and awareness of the importance of wildlife through the establishment and strengthening of protected areas, conducting scientific research, strengthening national governmental organizations and NGO capacity, and training the next generation of conservation professionals.

WCS has helped establish and manage 245 protected areas in collaboration with government and Indigenous Peoples and local communities (IPLCs) across the globe over the last 100 years. More specifically related to carbon projects, WCS partners with host country governments, IPLCs, and land managers to design and implement high-quality projects. This approach enables WCS to achieve not only climate mitigation goals but also gains in the conservation and restoration of high biodiversity value forest landscapes, and improved tenure security and strengthened livelihoods for Indigenous Peoples and local communities (IPLCs). WCS has a team of international experts on carbon measurement and monitoring who provide technical assistance in ensuring this project meets VCS requirements.

A priority in all of WCS's work is collaborating with IPLCs and other stakeholders to achieve a shared vision for a more secure, inclusive, just, equitable, and resilient future, where wildlife remains a visible, thriving, and culturally valued part of the wild places where our partners live and we work. Through its Global Rights + Communities Program, WCS supports these local community-led conservation efforts in this shared vision and facilitates spaces to bring their perspective and rights into other conservation models.

WCS is also a global leader in the collection and monitoring of biodiversity data in all the protected areas it manages and on a global scale. It does this through a number of means including the development and deployment of [SMART ranger patrolling](#) as well as the use of camera traps to assess

the abundance, distribution, and diversity of animals in the areas we help manage, including the Maya Forest Corridor project area.

The WCS staff that make up the management team include the following:

Sarah M. Walker, PhD

Sarah M. Walker serves as the Director of WCS's REDD+ and Natural Climate Solutions team focused on employing climate finance for WCS's country landscapes and programs through the development of large-scale avoided deforestation and forest restoration carbon projects around the world. She also leads WCS's GHG global integrity work which includes leading the development of updated voluntary carbon market GHG accounting methodologies, providing technical guidance into the leading voluntary carbon market standards, and serving on various advisory groups.

With over twenty years of experience across more than 25 countries in designing and applying the requirements of national GHG inventories, national and jurisdictional REDD+, and the regulatory and voluntary carbon market, Sarah focuses on translating scientific and technical innovations into practical guidance, standards, methods, tools, and programs that can be applied to protect natural ecosystems and improve the sustainability of governance systems and commodity production. Sarah has served as a leading advisor to a range of national and jurisdictional REDD+ programs and regulatory market and voluntary carbon market projects along with authoring regulatory and voluntary carbon market approved methodologies and standards. Prior to joining WCS, Sarah served as the Chief Conservation Officer for Lestari Capital as the Director of the Ecosystem Services Unit at Winrock International. She holds a PhD in Environmental Science from the University of Virginia.

Anna McMurray, MSc

Anna McMurray is a Forest Carbon Technical Advisor at WCS. She provides technical and managerial support in the development and implementation of REDD+ and other carbon projects and programs in different WCS priority landscapes, with a special focus on those in Latin America and the Caribbean. Anna has over 15 years of professional experience in environmental conservation, including 10 years focused on developing and implementing international climate change mitigation and adaptation initiatives in the agriculture, forestry, and other land use (AFOLU) sector including projects and programs for the voluntary carbon market. Prior to WCS, Anna was a Technical Lead in the Ecosystem Services team at Winrock International where she worked with national and subnational governments, private sector entities, multilateral organizations, and NGOs in this field. Anna has a Master of Science in Sustainable Development and Conservation Biology from the University of Maryland, College Park.

Kevin Brown, MSc

Kevin Brown has 15 years of experience employing geospatial science and remote sensing in the monitoring of forests and associated estimation of greenhouse gas emissions. He currently leads the geospatial practice within WCS's Market's program. He has advised governments and major private sector companies on approach to monitor and model their land-based GHG footprint. Kevin has contributed to the development and authoring of multiple international REDD+ accounting

methodologies and standards. Kevin received his Master's degree in Environmental Studies from University of Michigan with a concentration in GIS and remote sensing.

Nicole Auil Gomez, MSc

For over 25 years, Nicole Auil Gomez has dedicated her career to species and ecosystem research, protected areas creation and management, policy reform, and public outreach in her home country, Belize. Since 2016, she has served as the Country Director for the Wildlife Conservation Society in Belize. Her work supporting a dynamic local team at WCS includes backing policy development for sustainable fisheries and endangered species trade, conducting biodiversity assessments, marine protected area expansion and effective management, combatting wildlife trafficking, and most recently using nature-based solutions to adapt to our changing climate while building understanding of communities' gender disparities and local traditions. Nicole started her career in 1996 establishing and promoting Antillean manatee species and habitat protection at the Coastal Zone Management Authority and Institute. From 2013 to 2015, Nicole was the Executive Director of the MPA-managing NGO Southern Environmental Association. Nicole holds the position of Mesoamerican Region Co-Chairperson for the IUCN SSC Sirenian Specialist Group. She is Belize's first Whitley Award winner (2005), an alumna of the WWF/Russell E. Train Education for Nature Program (2001), and an Organization of American States fellow. She earned her Master of Science degree in Wildlife and Fisheries Management from Texas A&M University in 2003.

Boris Arevalo, PhD

Boris Miguel Arevalo is a Belizean wildlife biologist, with many years of experience in applied natural resource management and conservation research. In 2021, he joined WCS Belize as the Assistant Country Director-Terrestrial. Prior to joining WCS, Mr. Arevalo worked for over 10 years in the Chiquibul Forest with Friends for Conservation and Developing spearheading the Biodiversity Research and Monitoring program. He has a Master of Science degree in management and conservation of tropical forests and biodiversity from The Tropical Agricultural Research and Higher Education Center (CATIE), Costa Rica and a PhD in Wildlife Ecology and Conservation from the University of Florida. During his PhD, he studied factors affecting nest success, resource use, and habitat suitability of the endangered northern sub-species of scarlet macaws in Belize and the broader Selva Maya region. Mr. Arevalo work interests range from protected areas management, landscape ecology, GIS for natural resource management, conservation and management of species, and agricultural practices to enhance biodiversity conservation in a human dominated matrix.

Yahaira Urbina, MSc

Yahaira Urbina joined WCS-Belize in 2021 as the Maya Forest Corridor Site Manager. She holds a Master of Science in Natural Resources and Rural Development with an orientation in Management and Conservation from El Colegio de la Frontera Sur, Mexico. Her MSc thesis focused on relative abundance index and activity patterns of five mammalian species within the Belize River Valley. She previously completed a postgraduate diploma in International Wildlife Conservation Practice from Oxford University as a Kaplan scholar and a Bachelor's Degree in Natural Resources Management from

the University of Belize. She has been working on the ground in the MFC for approximately 12 years. Yahaira was a field technician in the ground-truthing of the Maya Forest Corridor led by the NGO Panthera. Subsequently, she worked at the University of Belize, Environmental Research Institute, and Panthera as a junior wildlife biologist focusing on human-wildlife conflict in and around the Maya Forest Corridor. She was responsible for establishing experimental farms with anti-predation strategies, conducting questionnaires among farmers and hunters, and establishing camera trap surveys within the Belize River Valley and the experimental farms. She also led two national surveys focused on the level of wildlife law awareness and wildlife trade within Belize. Yahaira worked closely on collaborative work between UB ERI and WCS to understand wildlife use, agriculture activity, forestry extraction, and tourism within communities in and around the Maya Forest Corridor (MFC). One of her main interests is understanding the interface between human and wildlife interactions.

Kadisha Augustine, MSc

Kadisha Augustine serves as the Community Resilience Coordinator for WCS Belize. Kadisha has a background in social work and ten years of practicing experience that are grounded in the process of community and human development with a specific focus in Belize. Her professional experiences have equipped her with the competence to interact with individuals from varying demographic and social backgrounds, an adeptness in analyzing the issues affecting them, as well as implementing measures relevant to their needs. She is cognizant of how integral the aspects of citizen participation and ownership are to the development process. Whereby her commitment is to development, she seeks to ensure that all measures are tried and exhausted to promote solutions to sustainably attain this goal. For those reasons, she is willing to actively advocate for individuals' participation and benefit. Her yearn for development is attributed to her education from the University of the West Indies where she acquired a Master of Science in Development Studies (concentration in Social Development Policy). Her education at the University of Belize earned her a Bachelor of Science in Social Work and has contributed to her success as a social worker.

MFCT board members

In addition to the WCS team, the other MFCT board members bring a wealth of valuable expertise to the project:

Elma Kay, PhD

Dr. Elma Kay is the first Managing Director of the Belize Maya Forest Trust, a non-governmental organization (NGO) entrusted with the stewardship and management of Belize's second largest private protected area, the Belize Maya Forest. She is also co-founder of the University of Belize Environmental Research Institute where she served for a decade as Administrative Director and Science Director (Terrestrial). Dr. Kay combines 20 years of experience in research and teaching, conservation practice and policy, fundraising, mentorship, institutional building, and organizational leadership. Dr. Kay has experience in stakeholder engagement and coalition building to achieve larger outcomes including the private protection of over a quarter million acres of Belize's most threatened forests in the last four years.

Dr. Kay currently oversees the implementation of the Belize Maya Forest REDD+ project in partnership with The Nature Conservancy. She has served in numerous regional and national councils, Boards, and expert groups addressing protected areas policy and financing, REDD+, climate change and the implementation of international conventions such as the Convention on the International Trade in Endangered Species of Wild Fauna and Flora. She currently chairs the Belize Network of NGOs and the Maya Forest Corridor Trust, serves as Vice President of Friends for Conservation and Development and is a member of the Silk Grass Wildlife Reserve Board of Directors. She has and continues to mentor graduate students, young professionals, and community-based conservation groups.

Celso Poot, PhD

Celso Poot is a Belizean conservationist whose 30-year career in wildlife conservation and environmental education is grounded in the principle that lasting conservation outcomes emerge from working with local people. He currently serves as the Managing Director of The Belize Zoo and Tropical Education Center, the country's oldest wildlife rehabilitation center, where he leads a multidisciplinary team engaged in wildlife rescue and rehabilitation, public education, and applied conservation science. Under his leadership, the institution has deepened its national role as a center for community-based conservation, professional training, and youth and community engagement. Celso holds a Ph.D. in Interdisciplinary Ecology, with a major in Wildlife Ecology and Conservation, from the University of Florida. His doctoral research examined how human disturbance affects the occupancy and activity patterns of the Central American tapir (*Tapirus bairdii*) in a multi-use landscape. In addition to ecological modeling, his research explored how wildlife value orientations and demographic variables influence local attitudes toward the tapir, Belize's national animal.

A founding board member of the Maya Forest Corridor Trust, Celso contributes to the strategic direction, scientific integrity, and stakeholder engagement of the Trust. His expertise in wildlife monitoring, human-wildlife coexistence, community engagement, and road ecology has informed field-level actions aimed at conserving this critical habitat in central Belize. Celso continues to champion collaborative, science-based approaches to conservation that recognize the needs of both people and nature. His work in the Maya Forest Corridor reflects a lifelong dedication to preserving the ecological and cultural heritage of Belize for generations to come.

Wilber Martinez, PhD

Dr. Wilber Martinez is the Coordinator for the Foundation for Wildlife Conservation (FWC) and a board member of the MFCT. FWC owns and operates Runaway Creek Nature Preserve which includes over 6,000 acres of savanna and moist tropical forest also located within the MFC to the southeast of the MFC REDD project area. At FWC, Dr. Martinez oversees the management of Runaway Creek, wildlife research, environmental education and liaises with FWC USA. Dr. Martinez received his doctorate in Ecology and Sustainable Development at El Colegio de la Frontera Sur (ECOSUR) University in Campeche, Mexico. His dissertation was on the Baird's tapir spatial ecology, home range, and habitat use. Having worked in Runaway Creek since 1999 as well as having conducted his doctoral research there, he has a deep understanding of the MFC, the rich biodiversity it contains, and the threats it faces. Prior to working in Runaway Creek, he designed and implemented an environmental education

project plan to a population of 30,000 throughout 18 communities of central and southern Belize with the focus of protecting the Chiquibul Maya Mountains.

Jake L. Snaddon, PhD

Dr. Jake L. Snaddon is an ecologist and conservation scientist with over 20 years of experience in tropical forest ecology, biodiversity, and ecosystem services. He earned his PhD at the University of Cambridge, where he focused on the links between forest biodiversity and ecosystem functioning, before leading international research across Southeast Asia, Belize, and Europe. Over his career, he has led collaborations on forest ecology, topical agriculture and carbon, including the Biodiversity and Ecosystem Function in Tropical Agriculture (BEFTA) Programme and the Sabah Biodiversity Experiment, where he was actively involved in managing research on land-use change, restoration, and climate variability in relation to forest functioning and carbon storage. He has developed guidance on riparian forest management for tropical agricultural landscapes, pioneered the use of low-cost sensors for detecting forest disturbance and biodiversity, and authored over 60 scientific publications on tropical deforestation, forest management, and ecosystem services.

Since 2022, he has served as Director of the University of Belize Environmental Research Institute (UB-ERI), leading national terrestrial and marine programmes that support Belize's environmental agendas, including REDD+ and climate commitments. He serves on numerous national and regional working groups and expert committees addressing biodiversity monitoring, marine and coastal development, blue carbon, and conservation policy. These include the National Restoration Round Table, the Global Biodiversity Framework Early Action Support Steering Committee, and the Coastal Zone Management Advisory Council. Through these roles, he helps to align Belize's biodiversity and climate initiatives with international science and policy frameworks.

Christopher Jordan, PhD

Dr. Christopher Jordan is a researcher and conservationist who specializes in biodiversity conservation, protected area site security, indigenous peoples and conservation, and developing the capacity of local partners in the Americas. He is strongly interested in community-based conservation, citizen science, site security, indigenous rights, and applying interdisciplinary conservation philosophies. His work has spanned from working closely with indigenous communities on indigenous-led conservation and restoration programs, to collaborating with the private sector in Latin America to develop conservation platforms, to developing government level initiatives and campaigns with government institutions at UNFCCC COP. He currently serves as the Latin America Director for Re:wild.

2.4.4 Project Management Partnerships and Team Development (VCS, 3.19; CCB, G4.2)

WCS with support from the MFCT and its other member organizations, including the Belize Maya Forest Trust, the Belize Zoo and Tropical Education Center, Foundation for Wildlife Conservation, University of Belize - Environmental Research Institute, and Re:wild, have the capacity required to implement this project and ensure that the climate, community, and biodiversity benefits are achieved. When

appropriate, the team will hire short-term technical consultants to carry out specific tasks that will be overseen by the management team identified in 2.4.3.

2.4.5 Financial Health of Implementing Organization(s) (CCB, G4.3)

WCS is an internationally recognized not-for profit conservation organization dedicated to preserving the Earth's wildlife and wild landscapes and seascapes. WCS currently oversees a portfolio of more than 500 conservation projects in 60 countries in Asia, Africa, Latin America, and North America. WCS's financial position, as documented in its audited financial statements, is robust with ample liquidity and strong, consistent revenue generation. At the end of fiscal year 2023, WCS held over USD 150 million in cash and cash equivalents of total assets exceeding USD 1.3 billion and net assets of over USD 960 million. Operating revenues in each of the last two fiscal years (2022 and 2023) surpassed USD 380 million. The WCS Belize program has a strong record of financial health and effective financial management. It has maintained a broad base of donors that enables it to avoid an excessive reliance on any one source of funds.

2.4.6 Avoidance of Corruption and Other Unethical Behavior (VCS, 3.19; CCB, G4.3)

The MFCT, as the project proponent, and WCS, as the implementing partner, are not involved in or complicit in any form of corruption or other unethical behavior. Both entities have codes of conduct in place that are designed to ensure that directors and staff uphold the highest standards of honesty, integrity, and ethical behavior. These codes of conduct can be found in Appendix 19.

2.4.7 Commercially Sensitive Information (VCS, 3.5.2 – 3.5.4; CCB Rules, 3.5.13 – 3.5.14)

The commercially sensitive information is listed in Appendix 4.

2.5 Legal Status and Property Rights

2.5.1 National and Local Laws (VCS, 3.1, 3.6, 3.7, 3.14, 3.18, 3.19; CCB, G5.6)

The titles of the parcels of land that make up the MFC REDD project area were legally transferred from the previous landowner to the MFCT following the General Registry Act, Chapter 237 of the Substantive Law of Belize R.E 2000-2003, General Registry Rules. Copies of the Transfer Certificate of Title are in Appendix 8. There are no laws, statutes, nor regulatory frameworks that would prevent the land within the property from remaining in the same land use (forests) and being managed for conservation.

The enforcement activities that the implementing partner WCS conducts to safeguard the biodiversity and associated natural resources in the MFC REDD project area and other properties owned by the MFCT (refer to the Enforcement Plan in Appendix 5) are supported by the following national regulations and policies in Table 10.

Table 10. Laws supporting enforcement work in the MFC REDD project area

Name of law	Description
FORESTS ACT CHAPTER 213 REVISED EDITION 2003	This Act and its regulations provide the legal mechanism to control and regulate any forest resource's harvesting, use, or extraction. It focuses mainly on managing timber species utilized in furniture, construction, and other related industries. The Forest Act regulates the extraction and use of non-timber forest products like bay leaf and bush posts. Furthermore, the Act provides a mechanism to control and regulate resource use by controlling the issuing of licenses and permits for individuals or companies. Each permit or license has specific stipulations to minimize environmental impacts, promote sustainability, reduce effects on public roads and infrastructure, and ensure public safety. Any person or company that does not abide by the regulations of this Act shall commit an offense and is liable for conviction.
WILDLIFE PROTECTION ACT CHAPTER 220 REVISED EDITION 2000	The Wildlife Protection Act authorizes the Forest Department to have a legal mandate for the protection of wildlife species, control of the use of game species, regulation of wildlife trade, and monitoring of wildlife research in Belize. Hunting for game species is, for many communities, a form of supplementing dietary needs; in some cultures, hunting for specific species is tied to special celebrations and traditions. These aspects are essential for appropriate management measures for protected area managers. Any illegal hunting activity shall be an offense and is liable for conviction.
SUMMARY JURISDICTION (OFFENCES) ACT CHAPTER 98 REVISED EDITION 2003	The Summary Jurisdiction (Offences) Act provides the legal mandate to regulate the person who willfully trespasses on any area belonging to another (private property). The Act describes that once a trespasser is found on a private premise; they shall be apprehended and detained by any police officer or the owner/manager of the premises. A person not having any lawful business enters any private residence or enclosed land in the possession of any other person or land cultivated in any manner is classified as a trespasser and shall be charged.

2.5.2 Relevant Laws and Regulations Related to Worker's Rights (VCS, 3.18.2; CCB, G3.11)

Given WCS's role managing the project site and leading the monitoring, reporting, and verification work required, WCS is responsible for hiring appropriate staff and ensuring their rights. WCS is fully compliant with the laws that protect the rights of their employees. During onboarding, new employees are oriented on their rights as workers and the laws protecting employees from sexual harassment. In every district, there are Labor Department representatives to provide support to workers and ensure their rights are protected. As required by law, all employees are registered with the Social Security Board (SSB), which has a national program that provides benefits for sickness, disability, and retirement/pension. The SSB provides an online portal, which allows workers to know the status of their SSB account. Although not required by law, WCS also provides a private plan for health and life insurance for employees. Table 11 includes a list and brief description of all relevant labor laws in Belize.

Table 11. Relevant labor laws in Belize

Statute	Relevance and Compliance
Labor Act and Labor (Subsidiary Laws) Chapter 297 of 2011 (Revised)	Regulates non-government employment by prescribing minimum standards concerning contracts, wages, hours of work, overtime and holidays, safety, maternity, severance pay, and other employment terms and conditions. Ensures compliance through a complaints tribunal and offences.
Social Security Act, Chapter 55 and Subsidiary Laws	Social Security is social insurance that replaces part of your income from work when you become sick, pregnant or disabled. It also replaces part of your income when you retire or die leaving survivors. It provides social insurance for you and your family. It ensures that employers take injured insured for medical care and facilitate investigation for accidents
Protection Against Sexual Harassment Act and Protection Against Sexual Harassment Commencement Act Order	Compliance for this law ensures that WCS provides protection against sexual harassment for employees, students, inmates and wards, prospective employees etc., and persons seeking accommodation, and for the communities through awareness and training to employees on the laws that govern them.
Trade Unions Act, Trade Unions Regulations Trade Unions and Employers Organizations	Addresses the rights of workers to organize. Compliance involves informing workers of their

Statute	Relevance and Compliance
	right to unionize outlined in worker's agreements.
International Labor Organization Conventions	Belize is a signatory to many of the International Labor Organization's conventions ¹³ . Those conventions are addressed in Belize labor laws. The ILO Conventions Act commits Belize to following the ILO conventions.
Equal Pay Act, Chapter 302:01	This act seeks to ensure that employers pay equal pay for equal work without discrimination between male and female employees.

2.5.3 Human Rights (VCS, 3.19)

The MFC REDD Project recognizes, respects, and promotes the protection of the rights of Indigenous Peoples, local communities, and customary rights holders in line with applicable international human rights law, and the United Nations Declaration on the Rights of Indigenous Peoples and ILO Convention 169 on Indigenous and Tribal Peoples.

There are currently no communities in the project area nor were there communities before the property was purchased. In the project zone, there are 12 local communities made up of Creole, Garifuna, and Mestizo/Hispanic/Latino populations. There are no Indigenous communities in the project zone. The project has been engaging with the 12 communities and will continue to engage with them to ensure respect for their human rights and equity as detailed in sections 2.3 and section 4 of this document.

Outside of the REDD project area but within the property that the MFCT owns for conservation, there is a family from one of the local communities currently using a small area of about 12 hectares for cattle ranching and fruit tree production. This family had a 7-year lease issued by the Government of Belize from 2013-2020. This is a boundary overlap as a portion of the area under the family's lease falls within the MFC property. After the lease expired, the family has continued to occupy the area.

The MFCT is working to engage with the family with the goal of understanding their perspective and circumstances, while working collaboratively toward a voluntary and dignified resolution to the overlapping claims to the property. Emphasis is being placed on minimizing conflict, upholding his rights and well-being throughout the process, and informing the family of the MFCT legal rights to the land.

2.5.4 Indigenous Peoples and Cultural Heritage (VCS, 3.18, 3.19)

As detailed in section 4, the project has clear net benefits to local communities and is committed to preserving their cultural heritage. The conservation of the project area contributes to the health of local populations of wildlife, thereby supporting the livelihoods of nearby communities that depend on

ecotourism. In the case of game species and freshwater fish species, this also supports local communities that have traditionally hunted/fished these species to supplement their diets. Further, the conservation of the forests helps maintain the integrity of the Belize and Sibun River watersheds, thereby protecting the water supply of local communities and the recreational value of the water bodies within the watersheds. As mentioned previously, there are no Indigenous communities in the project zone.

2.5.5 Statutory and Customary Property Rights (VCS, 3.18, 3.19; CCB, G5.1)

As detailed in section 2.1.9, the MFC REDD project area is privately owned by the MFCT. No local communities nor other stakeholders have statutory or customary rights to the project area. Appendix 20 includes the documentation of the due diligence process taken to confirm there are no disputes over ownership or other competing rights in the project area. Since the property was purchased, the MFCT has become aware of one local family using a small area in the northeast of the MFC property (albeit outside of the MFC REDD project area) for cattle ranching and fruit production. This family had a 7-year lease issued by the Government of Belize from 2013-2020. After the lease expired, the family has continued to occupy this piece of land.

The project is engaging with the family with the goal of understanding their perspective and circumstances, while working collaboratively toward a voluntary and dignified resolution regarding the situation. Emphasis is being placed on minimizing conflict, upholding their rights and well-being throughout the process, and informing the family of the MFCT legal rights to the land.

The lands in the project zone outside of the project area consist of privately owned lands, publicly protected areas (including Monkey Bay National Park, the Manatee Forest Reserve, and Labouring Creek Wildlife Sanctuary), and other national lands (also referred to as crown lands) owned by the government as defined in the National Lands Act²¹. The project activities focus on conserving the area within the privately held project area, and as such, the project will have no impacts on the property rights of these other lands. The participation of local community members in the various project activities is completely voluntary and also does not affect property rights.

2.5.6 Recognition of Property Rights (VCS, 3.7, 3.18, 3.19; CCB, G5.1)

Outside of the REDD project area but within the property that the MFCT owns for conservation, there is a family from one of the local communities currently using a small area of about 12 hectares for cattle ranching and fruit production. This family had a 7-year lease issued by the Government of Belize from 2013-2020. This reveals a boundary overlap as a portion of the area falls within the property. After the lease expired, the family has continued to occupy this piece of land.

The project is engaging with the family with the goal of understanding their perspective and circumstances, while working collaboratively toward a voluntary and dignified resolution regarding the situation. Emphasis is being placed on minimizing conflict, upholding their rights and well-being throughout the process, and informing the family of the MFCT legal rights to the land.

²¹ National Lands Act Chapter 191 Revised Edition 2003. <https://faolex.fao.org/docs/pdf/blz4676.pdf>.

Aside from this small, isolated area, under the previous ownership of the land, there were no human communities nor individual households within the property when this land was purchased for the purposes of conservation and the establishment of a carbon project.

The project also recognizes, respects, and supports the property rights of the land outside of the project area within the zone. The project has no impact on these rights.

2.5.7 Free, Prior and Informed Consent (VCS, 3.18; CCB, G5.2)

The project area is privately held and designated for a carbon project in partnership with the Government of Belize. The project area has not been associated with any Indigenous communal land claims. No communities or individuals have user rights over resources from the project area; therefore, there is no need for free, prior, and informed consent.

A family from a local community does currently use a small area of the MFC property (outside of the REDD project area) for cattle grazing and fruit tree production based on a lease granted for the time period of 2013-2020 with the Government of Belize that was originally granted on privately-held lands, prior to the sale of the land to MFCT, creating a boundary overlap. The MFCT is currently engaging with this family to ensure a voluntary and dignified resolution regarding the situation.

2.5.8 Benefit Sharing Mechanisms (VCS, 3.18, 3.19;)

Not applicable as the project does not impact property rights.

2.5.9 Property Rights Protection (VCS, 3.18, 3.19; CCB, G5.3)

Refer to section 2.5.6.

2.5.10 Illegal Activity Identification (VCS, 3.19; CCB, G5.4)

Illegal activities that are a risk in the project area include illegal hunting, and associated with this hunting, the illegal setting of wildfires to scare target animals out of hiding places. Illegal logging is considered a minor risk given that the project area was previously selectively logged over many years leaving few high-quality timber trees and also because, in the socioeconomic survey (Appendix 15B), very few households indicated that they extracted timber products,

To prevent these activities, robust human-rights based patrolling practices of the project area by trained local rangers are implemented. This patrolling also helps detect, mitigate, and control wildfires. Refer to project area enforcement plan in Appendix 5.

As discussed in sections 2.5.2 Relevant Laws and Regulations Related to Worker's Rights, WCS is fully compliant with the laws that protect the rights of their employees and does not use victims of human trafficking, forced labor, nor child labor.

2.5.11 Ongoing Disputes (VCS, 3.18, 3.19; CCB, G5.5)

There are no ongoing or unresolved conflicts or disputes over rights to the MFC REDD project area nor have there been any disputes during the last twenty years.

Outside of the REDD project area but within the property that the MFCT purchased for conservation, there is a family from one of the 12 communities currently using a small area of about 12 hectares for cattle ranching and fruit tree production for personal consumption. This family had a 7-year lease issued by the Government of Belize from 2013-2020. However, the lease includes a portion of the area within the property under previous ownership, causing a boundary overlap. After the lease expired, the family has continued to occupy the area.

The MFCT is engaging with the family with the goal of understanding their perspective and circumstances, while working collaboratively toward a voluntary and dignified resolution of the situation. Emphasis is being placed on minimizing conflict, upholding the family's rights and well-being throughout the process, and informing them of the MFCT's legal rights to the land.

2.5.12 Approvals (CCB, G5.7)

In October 2020, a legally binding agreement was signed between the Government of Belize (GoB) and Re:wild (formerly Global Wildlife Conservation) included in Appendix 13. One of the obligations of the GoB in this agreement is to grant the carbon rights of the properties to the MFCT.

In September, 2021, a motion was passed in the Belize National Assembly formally approving the transfer of carbon rights and credits associated with the properties held by the MFCT to the MFCT, as agreed upon in the GoB-Re:Wild agreement, with any excess carbon rights and credits remaining with the GoB (see Appendix 9).

2.5.13 Double Counting and Participation under Other GHG Programs (VCS, 3.23; CCB G5.9)

2.5.13.1 No Double Issuance

Is the project receiving or seeking credit for reductions and removals from a project activity under another GHG program, or any other form of community, social, or biodiversity unit or credit?

☐ Yes

☒ No

2.5.13.2 Registration in Other GHG Programs

Has the project registered under any other GHG programs?

☐ Yes

☒ No

Is the project active under the other program?

☐ Yes

☒ No

2.5.13.3 Projects Rejected by Other GHG Programs

Has the project been rejected by any other GHG programs?

☐ Yes

☒ No

2.5.14 Double Claiming, Other Forms of Credit, and Scope 3 Emissions (VCS, 3.24)

2.5.14.1 No Double Claiming with Emissions Trading Programs or Binding Emission Limits

Are project reductions and removals or project activities also included in an emissions trading program or binding emission limit? See the *VCS Program Definitions* for definitions of emissions trading program and binding emission limit.

☐ Yes

☒ No

2.5.14.2 No Double Claiming with Other Forms of Environmental Credit

Has the project activity sought, received, or is planning to receive credit from another GHG-related environmental credit system? See the *VCS Program Definitions* for definition of GHG-related environmental credit system.

☐ Yes

☒ No

2.5.14.3 Supply Chain (Scope 3) Emissions

Do the project activities affect the emissions footprint of any product(s) (goods or services) that are part of a supply chain?

☐ Yes

☒ No

2.6 Additional Information Relevant to the Project

2.6.1 Leakage Management (VCS, 3.11, 3.15)

Not applicable. Refer to 3.2.3 Leakage Emissions.

2.6.2 Further Information

Not applicable.

3 CLIMATE

3.1 Application of Methodology

3.1.1 Title and Reference of Methodology (VCS, 3.1)

Type (methodology, tool, module)	Reference ID (if applicable)	Title	Version
Methodology	VM0007	VM0007 REDD+ Methodology Framework (REDD+MF)	1.8
Module	VMD0001	Estimation of carbon stocks in the above- and below-ground biomass in live tree and non-tree pools (CP-AB)	1.2
Module	VMD0002	Estimation of carbon stocks in the dead-wood pool (CP-D)	1.1
Module	VMD0004	Estimation of stocks in the soil organic carbon pool (CP-S)	1.1
Module	VMD0006	VMD0006 Estimation of baseline carbon stock changes and greenhouse gas emissions from planned deforestation and planned degradation (BL-PL)	1.3
Module	VMD0009	Estimation of emissions from activity shifting for avoiding planned deforestation/forest degradation and avoiding planned wetland degradation (LK-ASP)	1.4
Module	VMD0013	Estimation of Greenhouse Gas Emissions from Biomass and Peat Peat Burning (E-BPB)	1.3
Module	VMD0015	Methods for Monitoring of GHG Emissions and Removals in REDD and CIW Projects (M-REDD)	2.2
Module	VMD0017	Estimation of uncertainty for REDD project activities (X-UNC)	2.2
Tool	VT0001	Tool for the Demonstration and Assessment of Additionality in VCS Agriculture, Forestry and Other Land Use (AFOLU) Project Activities,	3.0
Tool		AFOLU Non-Permanence Risk Tool	4.2

3.1.2 Applicability of Methodology (VCS, 3.1)

Reference ID/Title	Applicability condition	Justification of conformance
VM0007	Land in the project area has qualified as forest for at least the 10 years prior to the project start date.	Remote sensing analyses clearly demonstrate that the project area was forest according to the VCS definition for 10 years before the start date of the project
VM0007	Where land within the project area is peatland or tidal wetlands and emissions from the SOC pool are deemed significant, the relevant WRC modules are applied alongside other relevant modules.	The project area contains no peatlands or tidal wetlands.
VM0007	Baseline deforestation in the project areas falls within either of the following categories: a) Unplanned deforestation (VCS category AUDef) b) Planned deforestation (VCS category APDef)	Because the baseline deforestation activities are legally permitted, baseline deforestation falls within the planned deforestation category.
VM0007	REDD activity types are not applicable under the following condition: 4) Leakage prevention activities include: a) Flooding agricultural lands to increase production (e.g., rice paddies); and/or b) Intensifying livestock production through use of feed-lots and/or manure lagoons	No leakage preventions activities are planned for the project that would involve the flooding of agricultural lands, the use of feedlots, or manure lagoons.

Reference ID/Title	Applicability condition	Justification of conformance
VM0007	Avoiding planned deforestation activities are applicable under the following condition: 7) Where conversion of forest land to a deforested condition is legally permitted	The conversion of the Project Activity Instance to agriculture is legal, as defined under the Land Utilization Act, Chapter 188, revised Edition 2000, the Private Forest (Conservation) Act, Chapter 217 Revised Edition 2000, and the Forest Act Chapter 213, Revised Edition 2003.
VMD0002	This module is applicable to all forest types and age classes. This module is applicable if the dead wood pool is included as part of the project boundary as per applicability criteria in the framework module REDD-MF.	Project area is forested.
VMD0004	This module is applicable to non-organic soils under all forest types and age classes.	All soils in the project area are non-organic.
VMD0006	The module is applicable for estimating the baseline emissions on forest lands (usually privately or government owned) that are legally authorized and documented to be converted to non-forest land.	Conversion of forestlands to a deforested condition is legally permitted.
VMD0009	The module is applicable for estimating the leakage emissions due to activity shifting from forest lands that are legally authorized and documented to be converted to non-forest land. The module is mandatory if Module BL-PL has been used to define the baseline.	Module BL-PL was used to define the baseline thus module is mandatory.
VMD0013	This module is applicable to REDD project activities with emissions from biomass burning and REDD-WRC project activities with emissions from biomass and/or peat burning.	The process to clear the land for agricultural production in the planned deforestation baseline scenario includes biomass burning.

Reference ID/Title	Applicability condition	Justification of conformance
VMD0015	The module is mandatory for REDD, CIW-REDD, RWE-REDD and stand-alone CIW project activities.	Project is a REDD based project thus the module is mandatory.
VMD0017	This module is mandatory for using REDD-MF	Project is a REDD based project thus the module is mandatory.
VT0001	AFOLU activities the same or similar to the proposed project activity on the land within the proposed project boundary performed with or without being registered as the VCS AFOLU project shall not lead to violation of any applicable law even if the law is not enforced;	The AFOLU activities of this project are not in violation of any law. There is a legal agreement in place with the government to carry out the project activities.
VT0001	The use of this tool to determine additionality requires the baseline methodology to provide for a stepwise approach justifying the determination of the most plausible baseline scenario. Project proponent(s) proposing new baseline methodologies shall ensure consistency between the determination of a baseline scenario and the determination of additionality of a project activity.	The project's methodology follows the stepwise approach to determine the most plausible baseline scenario.

3.1.3 Project Boundary (VCS, 3.12)

3.1.3.1 Geographic boundaries

The geographic boundaries, including the geodetic coordinators, of the MFC REDD project area where the GHG emission reductions are taking place are described in Section 2.1.16. The shapefiles are available to Verra and the VVB, and the kml file of the project boundaries was uploaded to the Verra registry.

Figure 10 presents the forest cover benchmark map for the project area. The process to create the benchmark land use/land cover of the project area and conduct an accuracy assessment of this map is

documented in Appendix 10. Only lands that qualified as forests during the entire 10 years prior to the project start data are included in the project area.

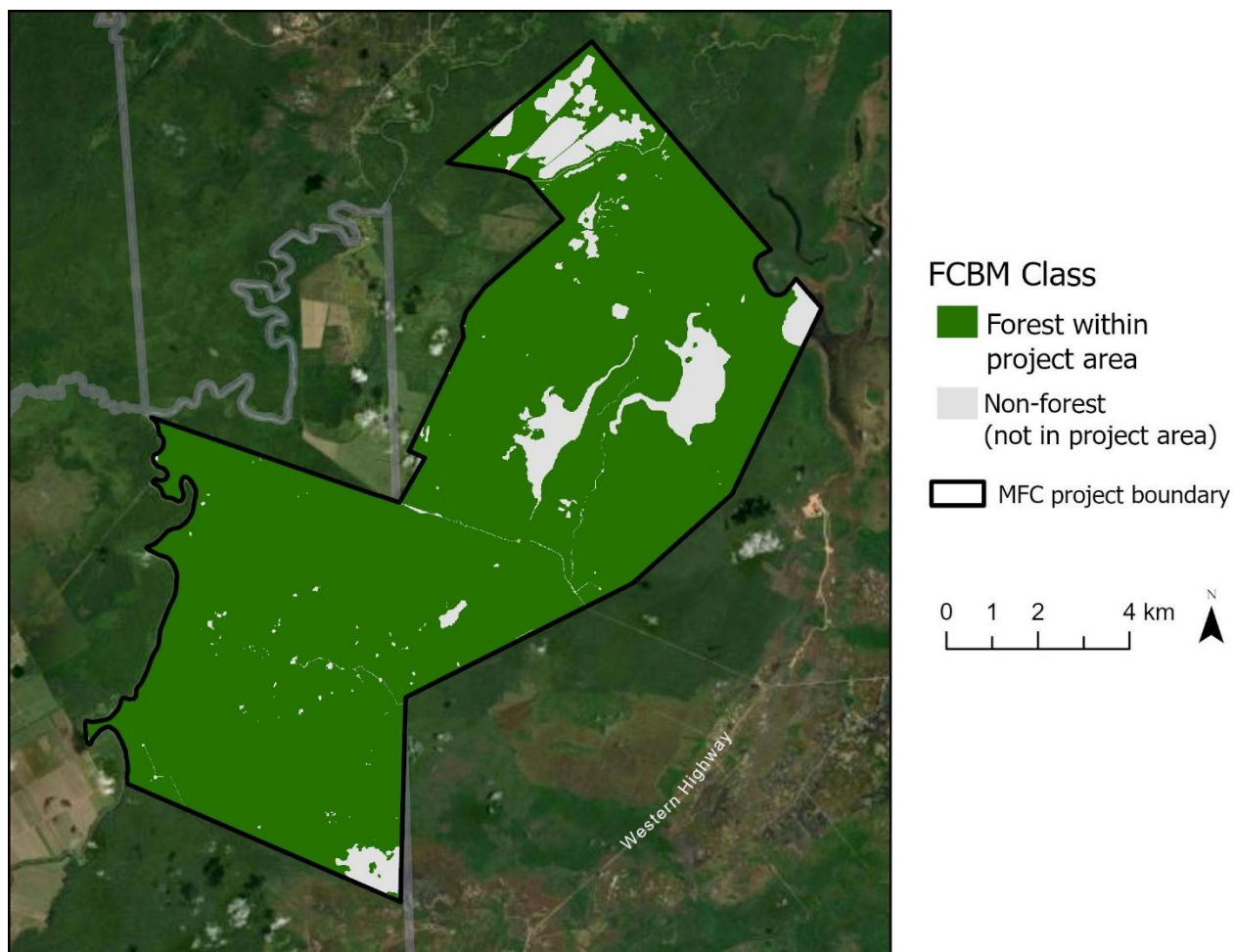


Figure 10. Forest Cover Benchmark Map

3.1.3.2 Temporal boundaries

Start and End Dates of the Historical Reference Period

To estimate baseline deforestation rates, historical deforestation of proxy parcels was analyzed between January 1, 2012 and December 31, 2021.

Start and End Dates of the Project Crediting Period

The start date of the crediting period is January 1, 2022, and the end date is December 21, 2041.

3.1.3.3 Carbon pools

The following carbon pools are accounted for: aboveground tree biomass (for trees with a diameter at breast height of greater than or equal to 5 cm), belowground tree biomass, aboveground biomass for palms, standing and lying dead wood, and soil organic carbon. Harvested wood products and

belowground palm biomass are excluded because they were deemed *de minimis* following the guidance provided in VM0007's Appendix 1: Testing Significance of GHG Emissions. Appendix 21 includes information on how carbon stocks in the harvested wood product pool were estimated. Tab "Test of sig - 6 year bsl valid" of Appendix 22 provides the details of these significance testing calculations.

Belowground palm carbon stocks are calculated the same way as belowground tree carbon stocks, the details of which are provided in section 3.2.1.2.1. While dead wood was also identified as *de minimis*, given the potential future increase in the size of this pool in the event of a hurricane or tropical storm, it was deemed important to include.

All the included carbon pools are accounted for in the baseline and project scenarios as well as in the accounting of activity shifting leakage. Given the fact that harvested wood products are identified as *de minimis*, market effects leakage due to decreased timber harvest was also excluded from the analysis.

Leaf litter, herbaceous vegetation, and lianas were not measured, which resulted in a conservative estimation of carbon stocks in the project area. The carbon stocks in post-deforestation agricultural biomass in the baseline scenario are also accounted for.

3.1.3.4 Sources of GHG Emissions

The sources of GHG emissions relevant to the baseline and project scenarios are detailed below.

Table 12. Source of GHG emissions included in the MFC REDD project

Source		Gas	Included?	Justification / Explanation
Baseline	Burning of woody biomass	CO ₂	Yes	Carbon stock decreases due to burning are accounted for as a carbon stock change.
		CH ₄	Yes	After timber species are removed from the land, the remaining biomass is burned, so CH ₄ and N ₂ O emissions from this activity are calculated. Expected biomass burning as part of post-deforestation agricultural production is conservatively excluded.
		N ₂ O	Yes	
	Combustion of fossil fuels	CO ₂	No	Conservatively excluded
		CH ₄	No	
		N ₂ O	No	
	Use of fertilizers	CO ₂	No	Conservatively excluded
		CH ₄	No	
		N ₂ O	No	
Project	Burning of woody biomass	CO ₂	Yes	In the event that wildfires impact the project area, carbon stock decreases will be accounted as a carbon stock change.
		CH ₄	Yes	
		N ₂ O	Yes	

Source		Gas	Included?	Justification / Explanation
	Combustion of fossil fuels	CO ₂	No	Conservatively excluded from baseline therefore excluded from project scenario
		CH ₄	No	
		N ₂ O	No	
	Use of Fertilizers	CO ₂	No	No fertilizer use will occur under the project scenario.
		CH ₄	No	
		N ₂ O	No	

3.1.4 Baseline Scenario (VCS, 3.13)

As described in section 3.1.5 Additionality, the identified baseline scenario of the Maya Forest Corridor REDD project area consists of sanctioned deforestation caused by conversion to industrial agriculture.

In a letter written on March 1, 2021 by the Managing Member of the previous owner of the property to the President of Global Wildlife Conservation (Appendix 11A), the Managing Member describes the various negotiations and offers they had received over the previous 11 years from different companies to purchase the land for conversion to industrial agriculture. Additional documentation providing evidence of these different offers is also included in Appendix 11. The letter ends by stating that if the current deal with Global Wildlife Conservation cannot be finalized, “we are confident that we can sell out land to agricultural interest in the short term.”

In addition, in recent years, large areas around the REDD MFC property have been cleared of forests and converted to agricultural production (Figure 11), further evidence that the property was likely to follow this trend. The previously mentioned letter also discusses the recent conversion of areas around the property to agricultural production, primarily for sugarcane production.

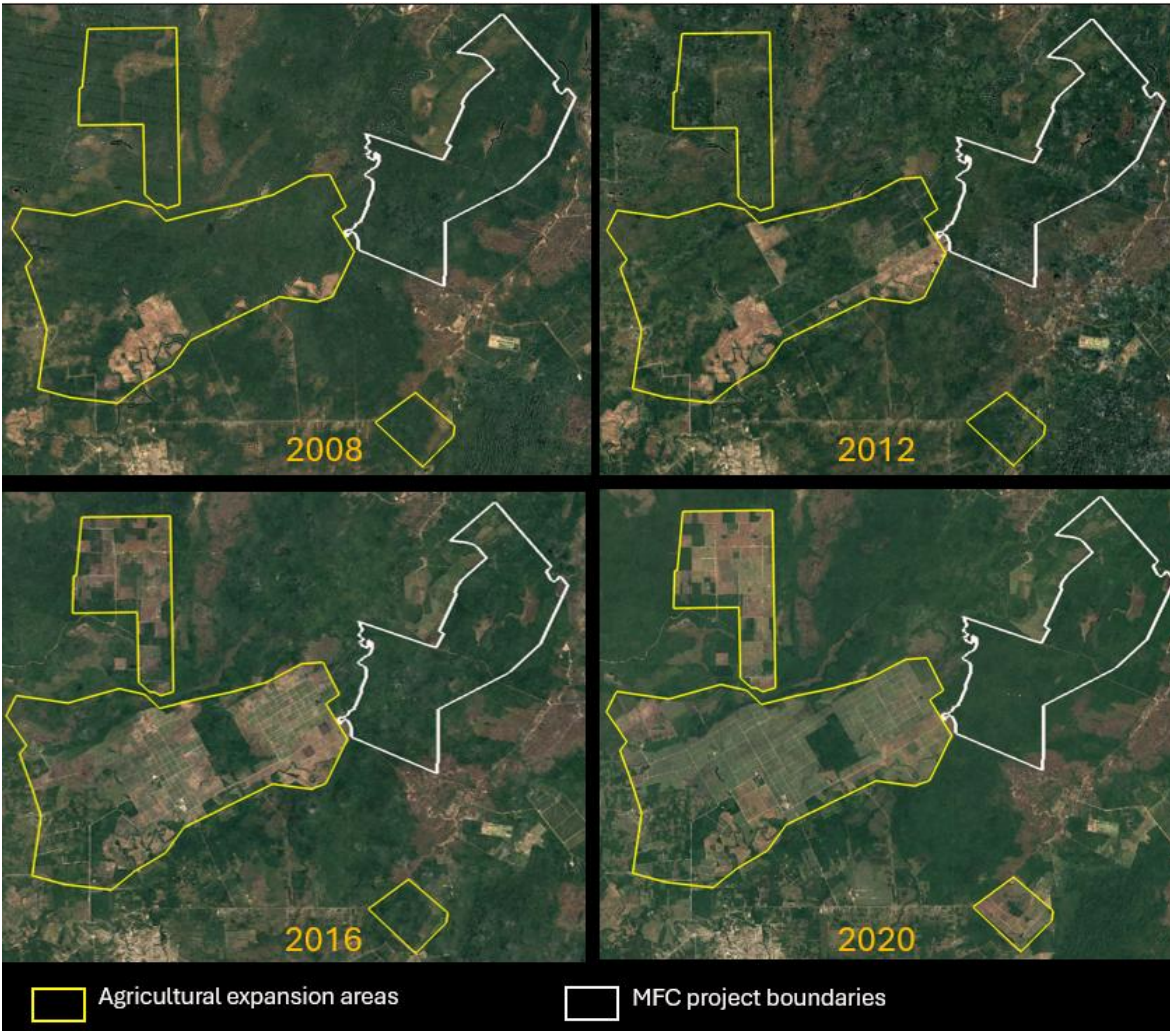


Figure 11. Examples of areas converted from forests to agriculture near the MFC project boundary in recent years

A full assessment of expected deforestation rates in the project area due to conversion to agriculture can be found in Section 3.2.1.

3.1.5 **Additionality** (VCS, 3.14)

3.1.5.1 **Regulatory Surplus** (VCS, 3.14)

Is the project located in an UNFCCC Annex 1 or Non-Annex 1 country?

☐ Annex 1 country ☒ Non-Annex 1 country

Are the project activities mandated by any law, statute, or other regulatory framework?

☐ Yes ☒ No

If the project is located inside a Non-Annex 1 country and the project activities are mandated by a law, statute, or other regulatory framework, are such laws, statutes, or regulatory frameworks systematically enforced?

Not applicable since the project activities are not mandated by any laws, statutes, or other regulatory frameworks.

3.1.5.2 Additionality Methods (VCS, 3.14)

The following analysis was conducted to determine alternative baseline scenarios according to the procedure presented in “VT0001 Tool for the Demonstration and Assessment of Additionality in VCS Agriculture, Forestry and Other Land Use (AFOLU) Project Activities (Version 3.0).”

3.1.5.2.1 Step 1: Identification of alternative land use scenarios to the proposed AFOLU Project activity.

Sub-step 1a. Identify credible alternative land use scenarios to the proposed VCS AFOLU project activity.

There are three credible alternative land use scenarios:

A. Clearing of Forest and Conversion to Agriculture

The clearing of the forest and conversion to commercial agriculture is the most probable land use under the baseline scenario. Evidence of the credibility and likelihood of this alternative land use can be found in section 3.1.4.

B. Continuation of Pre-Project Land Use

In the pre-project land-use scenario, the project area was maintained as forest and selectively logged over time. The previous owners could not economically support maintenance of pre-project land use of maintaining forest cover including paying property taxes, especially given that most of the high value timber in the site had been already extracted. This is why they were selling the property where the project area is located.

C. Project activity on the land within the Project boundary performed without being registered as the VCS AFOLU project

In this scenario, the land would have still been purchased and managed for conservation purposes.

Income from the project area would be zero where in the project scenario, income from carbon revenue would help cover the project costs. Therefore, conducting the Project activity without registration as a VCS AFOLU Project is unsustainable.

Sub-step 1b. Consistency of credible land use scenarios with enforced mandatory laws and regulations.

Because the project is private property, all alternatives presented in **1a** are legal under Belizean law (see section 2.5.1).

“Alternative A”, The subdivision of forests and conversion to agriculture on private lands is legal under Belizean law. Table 4 in section 2.2.1 documents the different laws that permit the clearing of forests for other land uses.

“Alternative B”, This requires no change in ownership and no change in previous land management thus these alternatives would be legal under Belizean Law.

“Alternatives C”, As is the case in the project scenario, the purchase and management of the property for conservation is legal. Registration as a VCS AFOLU project does not change the legality of the activities conducted.

Sub-step 1c. Selection of the baseline scenario

Alternative A - Clearing of Forest and Conversion to Agriculture - is selected as the baseline scenario. While all the alternatives are legal under Belizean law, Alternatives B and C were not financially viable options for the reasons presented in sub-step 1a. Furthermore, the previous owner of the property confirmed that it had received multiple offers to purchase the property from buyers interested in converting the property to industrial agricultural production.

3.1.5.2.2 Step 2. *Investment Analysis*

Sub-step 2a. Determine appropriate analysis method

Because the Project generates no financial or economic benefits other than VCS related income, the simple cost analysis (Option 1) is selected.

Sub-step 2b. Option 1. Apply simple cost analysis.

Costs have been documented for the MFC REDD project. The project does not expect financial benefits other than VCU-related income. Please refer to Appendix 17 documenting project costs.

3.1.5.2.3 Step 4. *Common Practice Analysis*

Similar activities to the proposed project occurring in Belize over the previous 10 years from project initiation were analyzed for common practice. The owners of officially recognized and unofficial private protected areas voluntarily accept terms and conditions of use to conserve biological diversity and other ecosystem services. When official private protected areas are designated, the central Belizean government does not compensate owners for land use restrictions.

There are multiple private properties both officially recognized as private protected areas (e.g. Runaway Creek Nature Reserve, Monkey Bay Wildlife Sanctuary) and unofficial, privately owned conservation areas (e.g. Tropical Education Center and Belize Zoo) located within the MFC. Each of these private protected areas are in the same geographic area (i.e. MFC), exist under the same regulatory framework, and have comparable environmental and ecological settings.

The key distinction between the MFC REDD project and these other lands managed as private protected areas, is that other areas can support the annual costs of management through outside means such as

ecotourism (Monkey Bay Wildlife Sanctuary and Tropical Education Center and Belize Zoo) or direct support by NGO's, or private funds (Runaway Creek Nature Reserve). In contrast, the justification for purchasing the property in which the MFC REDD project is located was that revenue from the sale of carbon credits could support the project costs as documented in the Agreement between the Government of Belize and Re:wild (Appendix 13).

Furthermore, the Management Agreement (2022) found in Appendix 14 between the MFCT and WCS prohibits the construction of commercial infrastructure, thereby limiting potential ecotourism activities. Because these activities run in contrary to the conservation goals of the project and because there are no ecotourism activities being seriously contemplated within the MFC REDD project area, these sources of funds for the management of the project are not available to MFCT and WCS, and the project is additional.

3.1.6 Methodology Deviations (VCS, 3.20)

One methodology deviation is requested and described as follows.

According to the table for the parameter $f_j(X,Y)$ in VMD0001, allometric equations for regional or pantropical forest types can be used provided that their accuracy has been validated with direct site-specific data. VTCMI gathered site-specific data from 65 trees to validate the equations by applying the "Limited Measurements" approach described in the same table in which stem volume is estimated and then multiplied by wood density to estimate the biomass of the tree bole. To estimate the total tree biomass, biomass expansion factors are applied. The details of this process can be found in Appendix 23.

The total tree biomass data derived from these 65 trees were plotted against with the curve of the diameter to biomass relationship predicted by several different tropical forest allometric equations. Figure 12 shows the diameter at breast height (DBH) to total aboveground biomass (AGB) relationship based on these models as compared to the DBH to total AGB derived using the limited measurement approach.

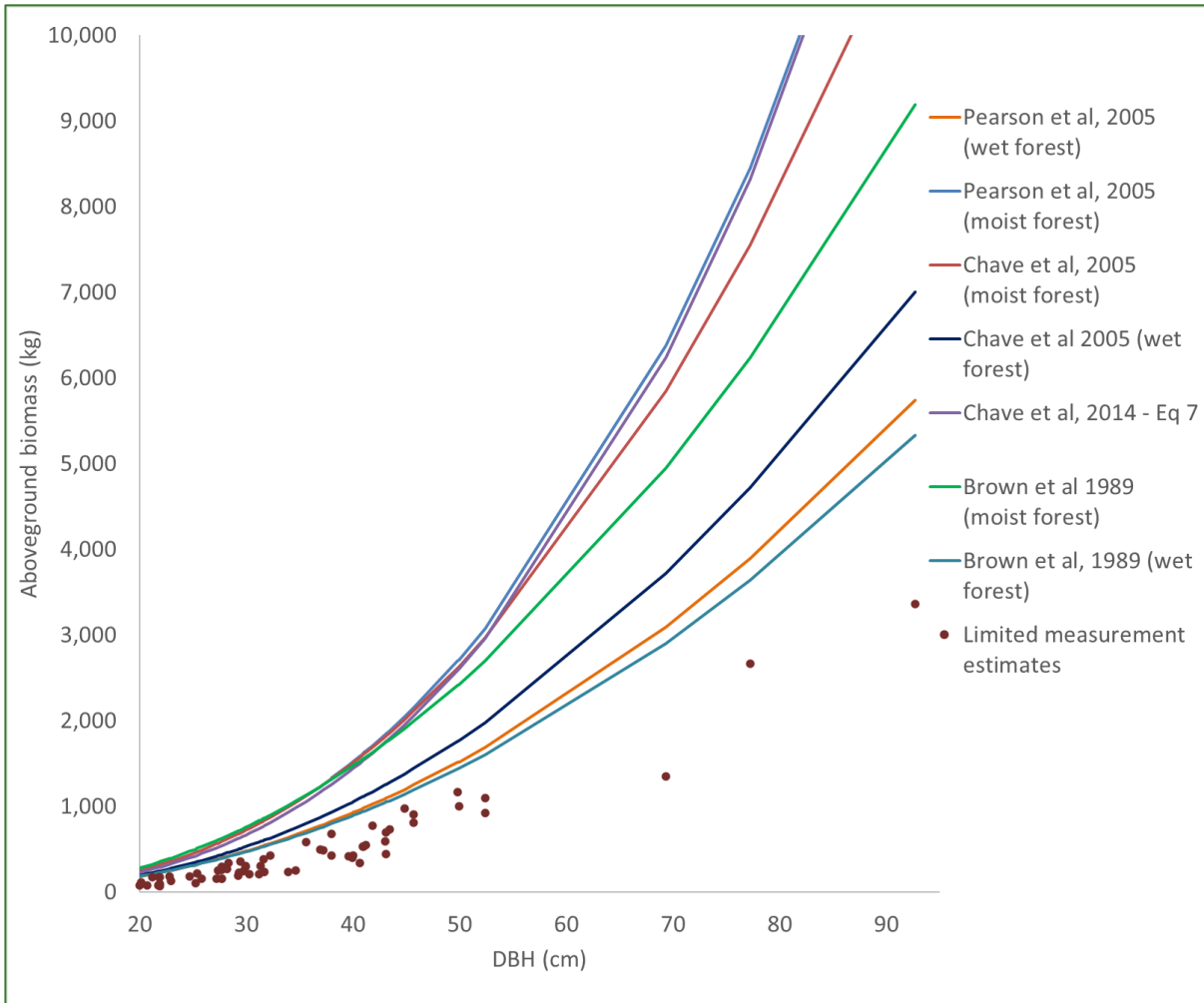


Figure 12. Relationship between DBH and AGB based on different allometric equations and based on limited measurement approach

The fact that these allometric equations consistently overestimate the biomass in the project area is likely due to a combination of the regular logging of the project area over several years that had thinned out the forest as well as the repeated impacts of hurricanes and tropical storms on the forest.

In the same table in VMD0001, it states that “if plotting the biomass of the measured trees indicates a systematic bias to overestimation of biomass (>75% of the trees above the predicted curve) then destructive sampling must be undertaken, or another equation selected.” Once destructive sampling has been conducted, VMD0001 states that the diameter to biomass curve of all the harvested trees should be plotted against the curve of the same relationship modeled by the allometric equations.

Given the regular damage that the forest has incurred due to hurricanes, however, the project team judged that the results of the destructive sampling would yield the same result as that of the limited measurements, i.e., all published allometric equations would systematically overestimate biomass.

As such, the team applied the following equation structure used in Chave et al (2005) and fit it to the biomass data estimated in the limited measurement approach described above using R (v 4.2.2).

$$AGB = WD * \exp(a + b * \ln(DBH) + c * (\ln(DBH))^2 + d * (\ln(DBH))^3)$$

Where:

AGB = Aboveground biomass, kg

WD = wood density, g cm⁻³

DBH = diameter at breast height, cm

The final modified Chave et al (2005) equation is the following:

$$AGB = WD * \exp(-14.521 + 11.325 * \ln(DBH) - 2.073 * (\ln(DBH))^2 + 0.1549 * (\ln(DBH))^3)$$

Figure 13 shows the allometric equation (the red line) that was created based on the limited measurement estimations (the circles) from the 62 trees.

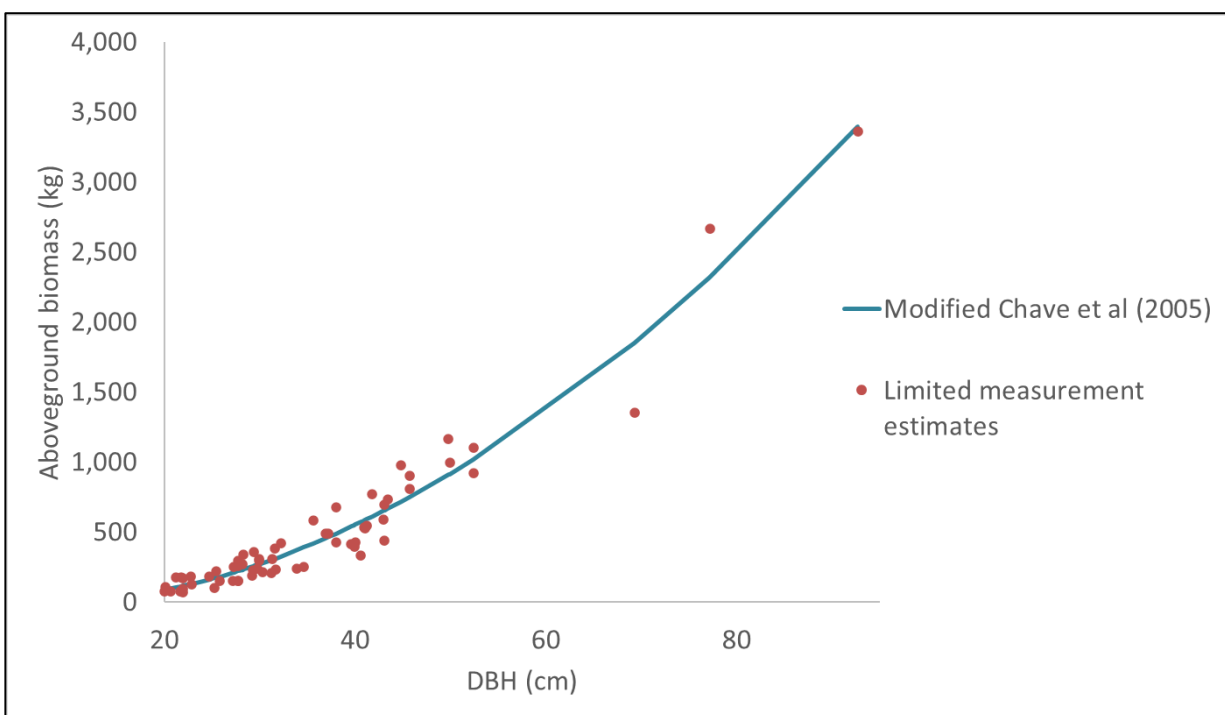


Figure 13. Biomass in MFC REDD project area estimated with the limited measurement approach compared with modified Chave et al (2005) allometric equation

This methodology deviation maintains the conservativeness of the quantification of GHG emission reductions by ensuring that aboveground tree biomass, and hence the carbon stocks, of the forests in project area is not being overestimated. As stated above, the module's criteria for a systematic bias to overestimation of biomass is if the modeled biomass of more than 75% of the trees is greater than the measured biomass. With this allometric equation developed specifically for the project area, 49% of the modeled biomass (representing 32 of the measured 65 trees) is less than the measured biomass and 51% is greater.

Further, when this modified equation is applied for trees with DBHs between 5 cm and 10 cm, the modeled aboveground biomass yields values only slightly greater than zero kilograms (see Figure 14). Given the fact that 35% of all the trees measured in the sample plots were between 5 cm and 10 cm, this is further evidence that the use of this equation yields conservative estimates.

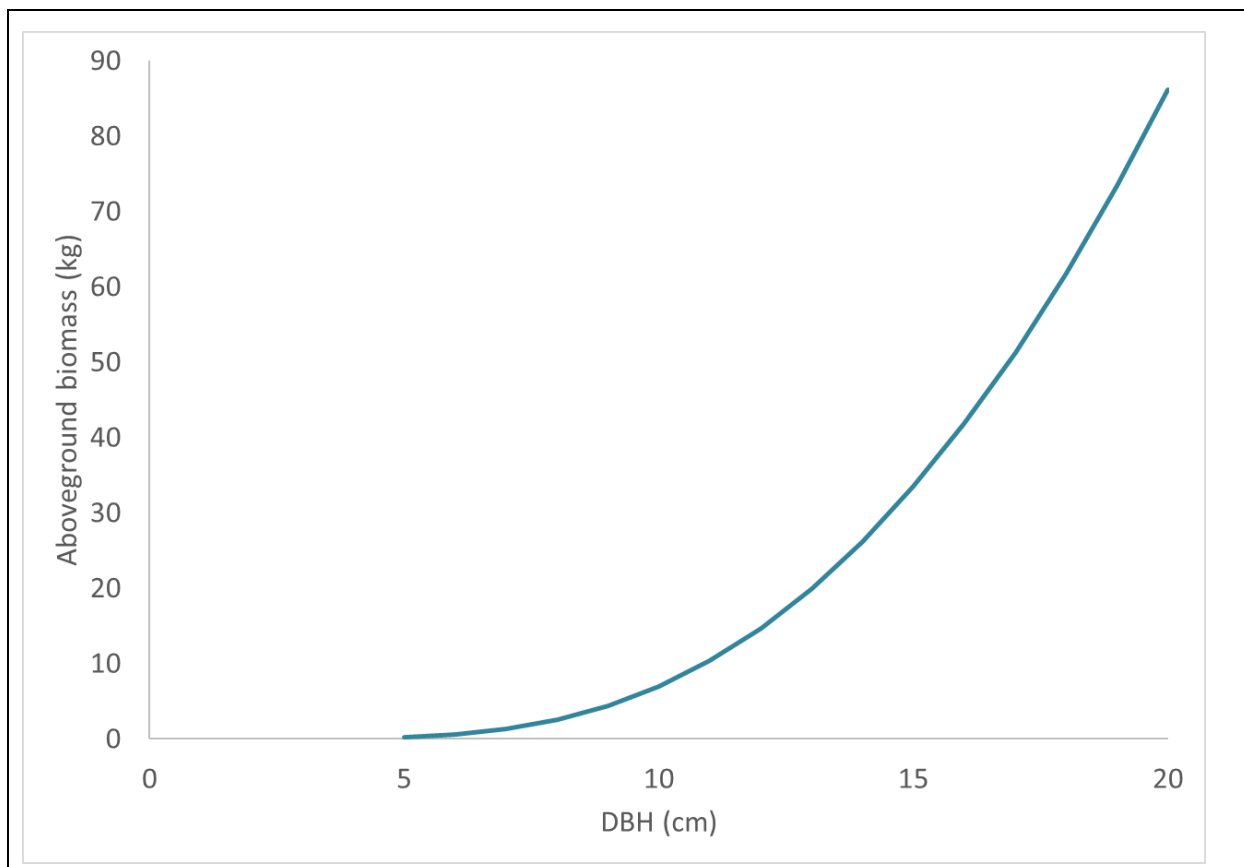


Figure 14. Aboveground biomass estimates of small diameter trees using the modified Chave et al (2005) equation

3.2 Quantification of Estimated GHG Emission Reductions and Removals

3.2.1 Baseline Emissions (VCS, 3.15)

Baseline GHG emissions from planned deforestation were estimated by applying the steps outlined in VMD0006 (BL-PL).

3.2.1.1 Part 1. Calculating annual area of land deforested

3.2.1.1.1 Identify the agent of planned deforestation

The agent of deforestation was not specifically identified for the project. As a result, the project team identified the most likely “class of deforestation agents”. The project team identified the class as those entities deforesting properties for the purposes of commercial agriculture in Belize. The region in which

the project is located in central Belize is home to a large concentration of agribusiness in Belize. Because of this fact, the project team focused on an area (i.e. stratum) within approximately 50 km of the project area to analyze land use by the class of deforestation agents. This stratum is similar, in terms of the biophysical parameters, related to forest productivity and common practice for forest conversion (Table 14, Table 15, Table 16, Table 17).

As described in the baseline scenario (section 3.1.4) there is an immediate site-specific threat of deforestation and conversion to agriculture.

3.2.1.1.2 Area of deforestation $A_{planned}$

The project area can be legally cleared and converted to agriculture (section 2.2.1). Because its soils are appropriate for agricultural production, it has negligible slope, and because low areas can be drained (as stated in the Broker's Opinion of Value available in Appendix 11D), the entire area of the existing forest in the project area (10,795 ha) is suitable for conversion to agriculture and thus is the area of deforestation $A_{planned}$.

3.2.1.1.3 Rate of deforestation $D\%_{planned,t}$

To calculate the baseline rate of deforestation, 6 proxy areas were selected west of the project area. These proxy areas are based on official parcel registry data provided by the Belizean government entity, Land Information Center (LIC). The parcel numbers associated with each proxy area is in Table 13. The original data provided by LIC can be found in Appendix 24.

Table 13. LIC parcel numbers for each proxy area

Proxy number	LIC parcel registry number(s)
1	14-44-9
2	14-44-5
3	14-47-4
4	14-44-7
5	19-41-1975
6	20-29-53, 20-29-51, 20-29-68

For each of the proxy areas:

- Land conversion practices were the same as those used by the baseline agent or class of agent
- The post-deforestation land use was the same in the proxy areas as expected in the project area under business as usual

- The proxy areas had the same management and land use rights type as the proposed project area under business as usual
- The proxy areas were in the immediate area of the project (within 50 Km).
- Agents of deforestation in proxy areas deforested their land under the same criteria that the project lands would follow
- Deforestation in the proxy area occurred within the 10 years prior to the baseline period.
- Proxy areas exhibited similar pre-deforestation forest type as the PA (Table 14)
- Proxy areas represented similar elevation and slope categories as the PA (Table 15, Table 16)
- Soil types are similar (Table 17)

For ecological and physical similarity characteristics, VMD0006 requires that the proxy sites deviate by no more than 20% from the proportion of the categories represented within the project area (soil types, elevation, slope, forest class). This standard is met for all proxy sites.

Table 14. Proxy similarity to project area of pre-deforestation forest type. Source: ESA (2017) land cover representing 2010.

Proxy Zone	Percent				Absolute percent deviation from project area			
	Tree cover broad-leaved evergreen closed to open (>15%)	Mosaic natural vegetation (tree shrub herbaceous cover) (>50%) / cropland (<50%)	Mosaic tree and shrub (>50%) / herbaceous cover (<50%)	Tree cover flooded saline water	Tree cover broad-leaved evergreen closed to open (>15%)	Mosaic natural vegetation (tree shrub herbaceous cover) (>50%) / cropland (<50%)	Mosaic tree and shrub (>50%) / herbaceous cover (<50%)	Tree cover flooded saline water
PA	98.3%	0.0%	1.4%	0.3%	-	-	-	-
1	94.6%	5.4%	0.0%	0.0%	1.6%	3.3%	1.4%	0.3%
2	88.1%	10.5%	1.4%	0.0%	8.0%	8.3%	0.0%	0.3%
3	94.2%	5.8%	0.0%	0.0%	1.9%	3.6%	1.4%	0.3%
4	91.2%	8.8%	0.0%	0.0%	5.0%	6.7%	1.4%	0.3%
5	87.9%	12.1%	0.0%	0.0%	8.2%	9.9%	1.4%	0.3%
6*	67.1%	32.6%	0.3%	0.0%	29.1%	30.5%	1.1%	0.3%

The proxy areas all contained a majority of broadleaved evergreen forest. Only proxy 6 apparently deviated by more than 20%. This can be explained because deforestation had already commenced prior to 2010, resulting in some areas already registering as mosaic cropland in the ESA CCI land cover map used in this analysis. Mosaic vegetation with cropland is a hybrid natural/anthropogenic class that does not differentiate forest type. It is reasonable to assume that prior to cropland, the area would have been covered by the same forest class as the surrounding non-agricultural lands.

The MFC site is larger than most eligible proxy areas, so to avoid the potential bias of very small parcels exhibiting an apparent higher rate of deforestation, only parcels with more than 600ha of forest at the time of initial clearing were selected. This is the largest minimum area threshold that could be selected will still retaining a population of a minimum of six eligible proxies. One of the proxies, site 6, is the aggregation of three official parcels in order to allow it to collectively meet the minimal area threshold. Because they are all owned by the same party and were effectively cleared as a single agricultural conversion event, it is reasonable and conservative to consider them as a single proxy site.

Table 15. Proxy similarity to project area elevation in 500m bins. Source: USGS EROS (2018)

Proxy Zone	Percent	Absolute percent deviation from project area
	0-500m above sea level	0-500m above sea level
PA	100%	-
1	100%	0%
2	100%	0%
3	100%	0%
4	100%	0%
5	100%	0%
6	100%	0%

All proxies are entirely below 500m above sea level and therefore do not deviate from the project area.

Table 16. Proxy similarity to project area topographic slope. Source: USGS EROS (2018)

Proxy Zone	Percent		Absolute percent deviation from project area	
	Gentle slope (<15%)	Steep slope (>15%)	Gentle slope (<15%)	Steep slope (>15%)
PA	99.7%	0.3%		
1	100.0%	0.0%	0.3%	0.3%
2	97.0%	3.0%	2.7%	2.7%
3	100.0%	0.0%	0.3%	0.3%
4	96.4%	3.6%	3.2%	3.2%
5	99.7%	0.3%	0.0%	0.0%
6	100.0%	0.0%	0.3%	0.3%

All proxies are dominated by gentle slopes.

Table 17. Proxy similarity to project area soil family. Source: FAO & IIASA (2023)

Proxy Zone	Percent		Absolute percent deviation from project area	
	Cambisols	Gleysols	Cambisols	Gleysols
PA	98.6%	1.4%	-	-
1	100%	0%	1.4%	1.4%
2	100%	0%	1.4%	1.4%
3	100%	0%	1.4%	1.4%
4	100%	0%	1.4%	1.4%
5	100%	0%	1.4%	1.4%
6	100%	0%	1.4%	1.4%

All proxy sites are dominated by Cambisols.

Deforestation in the proxy sites was estimated using University of Maryland (UMD) global forest change maps (Hansen et al., 2013). The UMD dataset provides for a tree cover estimate in 2000, and an estimate of the year of clearing. A forest/non-forest mask was derived from these maps representing the year 2011 by filtering out pixels with less than 30% tree cover and any that were deforested prior to 2012. 30% was selected out of consistency with the Belize forest definition. The area of deforestation within each year 2012-2021 was derived from the UMD map time series.

The selection of proxy sites is depicted in Figure 15. Deforestation calculations associated with numbered parcels are presented in Table 18.

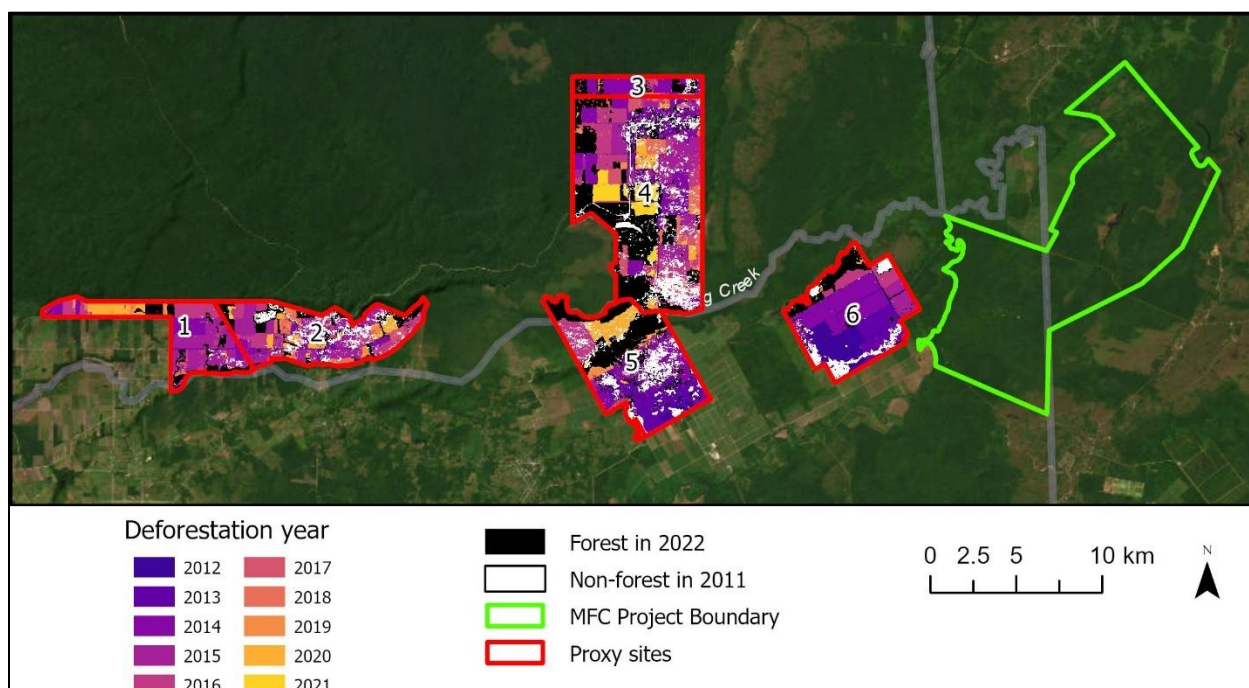


Figure 15. Change in forest cover over 10 years in six proxy areas used to determine average baseline deforestation rate.

The deforestation rates of the six proxy areas were calculated to estimate deforestation rate using the following equation.

$$D\%_{planned,t} = \left(\sum_{pn=1}^{n*} \left(\frac{D\%_{pn}}{Yrs_{pn}} \right) \right) / n$$

Where:

$D\%_{planned,t}$ = Projected annual proportion of land that will be deforested during year t .

$D\%_{pn}$ = Percent of deforestation in land parcel pn etc. of a proxy area as a result of planned deforestation as defined in this module; %;

Yrs_{pn} = Number of years over which deforestation occurred in land parcel pn in proxy area; years

n = Total number of land parcels examined

pn = 1, 2, 3, ... n^* land parcels examined in proxy area

i = 1, 2, 3, ... M strata

The amount of years deforestation occurred over (Yrs_{pn}) was calculated separately for each proxy based on the year when deforestation appears to begin and cease.

In some proxies, deforestation starts prior to the start of the 2012-2021 historical period, and in others it starts several years after 2012. For each proxy, the first year that demonstrated a dramatic increase in deforestation rate from a previous negligible or nonexistent level, consistent with widescale agricultural clearing, was identified as the starting year of deforestation.

Similarly, the year in which deforestation substantially plateaus or ceases is taken to be the end year of deforestation. Deforestation in a proxy was considered to have stopped once the area of forest changed by no more than one percent between years, considering that such a small area of change is more likely to be noise than represent a continuing deforestation process.

Yrs_{pn} was calculated as the difference between the beginning and end year of apparent deforestation within the 2012-2021 period of analysis. In the case that deforestation started before or ended after this period, the start and end dates are treated as 2012 or 2021, respectively.

The percent of the proxy area deforested by the end of deforestation ($D\%_{pn}$) was calculated by dividing the number of hectares deforested over the years represented by Yrs_{pn} , by the area of forest present in the year representing the start of Yrs_{pn}

Deforestation occurring outside of this period is not represented in the calculation of $D\%_{planned,t}$.

Table 18. Calculation of $D\%_{pn}$ and Yrs_{pn} for the 6 proxy areas

Proxy number	Deforestation start year	Deforestation end year	$D\%_{pn}$	Yrs_{pn}	Annual deforestation rate per parcel
1	2014	2021	81%	7	11.6%
2	2014	2022	77%	8	9.6%
3	2014	2019	64%	5	12.9%
4	2014	2022	70%	8	8.7%
5	2012	2021	63%	9	7.0%
6	2012	2017	81%	5	16.3%

Based on these calculations, mean annual rate of deforestation was:

$$D\%_{planned,t} = 11.0\%$$

3.2.1.1.4 Likelihood of deforestation $L - D$

Estimating the likelihood of deforestation is only applicable when the forest areas are under government control and, as such, is not applicable to this project. Thus, L-D is equal to 100%.

3.2.1.1.5 Risk of abandonment

Eight proxy areas were identified that were deforested by the same class of deforestation agent, in this case Agriculture (Figure 16). The same criteria used to select the proxy areas to estimate baseline deforestation rates, described in section 3.2.1.1.3 Rate of deforestation, were also used to select these proxy areas.

All sites were within 20km of the project area and were deforested for use as cropland. The dates of deforestation of the selected sites range from predating 1990 to as recently as 2011. Deforestation was analyzed using Tropical Moist Forest Dataset (Vancutsem et al., 2021), as it provides annual classification of both deforestation and forest regrowth from 1990 and later.

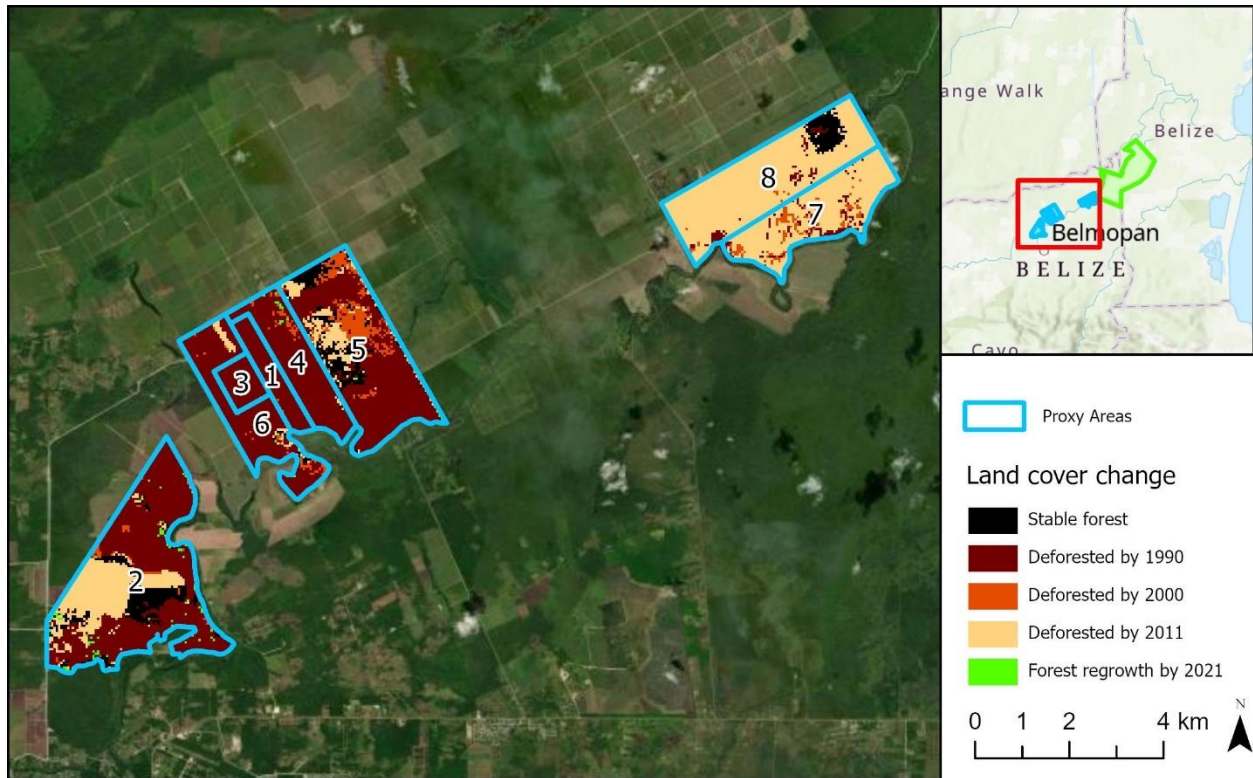


Figure 16. Analysis of proxy areas for risk of abandonment. See Table 19 for Parcel IDs.

Six of the eight proxy areas experienced no forest regrowth since the deforestation originally occurred (Table 19). Two of the eight parcels experienced minimal regrowth of less than 2% of the total parcel, indicating no abandonment has occurred.

Table 19. Eight proxy areas deforested by the same class of deforestation agent demonstrating minimal forest regrowth occurring over a 10-year period.

Parcel ID	Map Key	Total area (ha)	Area deforested by 1990 (ha)	Area deforested by 2000 (ha)	Area deforested by 2011 (ha)	Area regrowth by 2021 (ha)
19-41-10	1	124	122	123	123	0
19-41-693	2	960	603	623	845	3
19-41-5	3	82	82	82	82	0
19-41-3	4	287	271	285	286	0
19-41-2	5	691	404	500	581	9
19-41-149	6	337	296	310	329	0
20-29-5	7	398	38	69	394	0
20-29-46	8	605	22	25	556	0

3.2.1.1.6 Annual area of deforestation $AA_{planned,i,t}$

Equation 5 of VMD0006 was applied to estimate the annual area of deforestation in the baseline case:

$$AA_{planned,t} = (A_{planned} * D\%_{planned,t}) * L - D_i$$

Where:

$AA_{planned,i,t}$ = Annual area of baseline planned deforestation at time t ; ha

$D\%_{planned,i,t}$ = Projected annual proportion of land that will be deforested during year t . 11.0%.

$A_{planned}$ = Total area of planned deforestation over the baseline period; ha. 10,824 ha

$L - D_i$ = Likelihood of deforestation; 100%

Based on the equations above and the analysis of proxy parcels, the annual area of deforestation in the baseline is 1,188.6 ha for the first 9 years. In the 10th year, the rate of deforestation is 97.9 ha as that is the remaining area of forest.

3.2.1.2 Part 2. Baseline carbon stock change

3.2.1.2.1 Baseline Pre-Deforestation Carbon Stocks

Baseline carbon stocks in forests include the following pools: aboveground tree (≥ 5 cm diameter at breast height - DBH) tree biomass, belowground biomass, aboveground biomass for palms, standing and lying dead wood biomass, and soil organic carbon. These were calculated following the guidance laid out in VMD0001 (v1.1), VMD0002 (v1.1), and VMD0004 (v1.1). Leaf litter, herbaceous vegetation, and lianas were not measured, which resulted in a conservative estimation of carbon stocks in the project area. As discussed in section 3.1.3, belowground biomass for palms is also excluded as it was identified as *de minimis*.

The mean total carbon stock was based on field data collected in the MFC REDD project area in 2023. See Appendix 25A for detailed field methods, Appendix 23 for the process to validate the allometric equation, and Appendix 19 for the full calculations to estimate carbon stocks and greenhouse gas emissions.

As discussed in section 2.1.14, the two forest types that are found in the project area include lowland broad-leaved moist forests and lowland broad-leaved moist scrub forests (Meerman & Sabido, 2001). Because the two types are intermixed in much of the project area and share the many of the same overstory species, it was not possible to map them as separate strata using available remote sensing data. As a result, the two were combined into a single stratum for the purposes of assessing above and below ground biomass, deadwood, and soil organic carbon. Because of this, references to different strata are removed when evaluating carbon stocks.

3.2.1.2.1.1 Tree and palm biomass

Aboveground tree biomass (in kilograms, or kg) was calculated using the Chave et al (2005) equation modified based on field data gathered in the project area (refer to section 3.1.6 for more information).

In this equation, the wood density value of 0.6 g cm⁻³ for tropical America was applied from Reyes et al. (1992).

Separate allometric equations were applied for trees in the *Cecropia* genus and *Pinus* genus as well as for different palms. No allometric equations could be identified for the palm species *Roystonea regia*. As such, biomass from this species was conservatively excluded. There were other unidentified palm species measured but excluded from measurements due to the lack of generic allometric equations for palms. Table 20 includes the list of allometric equations applied.

Table 20. Allometric equations to estimate aboveground biomass applied in the project

Taxa	Allometric Equations for Aboveground Biomass (kg)	Source
<i>Cecropia spp</i>	$AGB = 12.764 + 0.2588 * DBH^{2.0515}$	Pearson et al (2005)
<i>Pinus spp</i>	$AGB = 0.887 + \frac{10486 * DBH^{2.84}}{DBH^{2.84} + 376901}$	Penman et al (2003)
<i>Attalea cohune</i>	$AGB = 10.856 + 176.76 * HT - 6.898 * HT^2$	
<i>Sabal spp</i>	$AGB = 24.559 + 4.921 * HT + 1.017 * HT^2$	
<i>Crysophylla spp</i>	$AGB = 0.182 + 0.498 * HT + 0.049 * HT^2$	
All other tree species in the project site	$AGB = WD * \exp(-14.521 + 11.325 * \ln(DBH) - 2.073 * (\ln(DBH))^2 + 0.1549 * (\ln(DBH))^3)$	Chave et al (2005) modified based on tree measurements in project site

The aboveground biomass for each tree and palm was converted from kilograms to metric tons (by dividing by 1000), followed by a conversion of total aboveground biomass to aboveground carbon stock by multiplying the mass by the carbon fraction of biomass (0.47). The aboveground biomass data collected was conducted using a nested circular plot design (refer to Appendix 25A). Because of this, the biomass for the trees and palms of each diameter class used in this design were summed and then multiplied by a scaling factor, calculated using the equation below, to estimate the biomass on a per hectare basis.

$$Scaling\ factor = \frac{10,000\ m^2}{\pi * (radius\ in\ meters\ of\ nested\ plot)^2}$$

The per hectare biomass for trees and palms respectively in each plot was then averaged across the plots to estimate carbon stocks in aboveground biomass in trees (C_{AB_tree}) and palms (C_{AB_palm}) in the forests of the project area.

Belowground tree biomass for each plot was estimated using the root-to-shoot ratios for tropical moist forests in North and South America identified in Table 4.4 of Volume 4 of the 2019 Refinements to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories (IPCC, 2019). For plots with aboveground biomass less than or equal to 125 dry matter tonnes per hectare, a ratio of 0.2845 was applied. For plots with aboveground biomass greater than 125 dry matter tonnes per hectare, a ratio of 0.284 was applied. Belowground palm biomass was excluded as *de minimis*.

3.2.1.2.1.2 Dead wood

Standing dead biomass was estimated based upon the decomposition class (see VMD0002). For decomposition class 1, biomass was estimated using the same allometric equation developed for the project site in the same manner as with a live tree. In decomposition class 2, the volume of the main trunk was calculated and converted to biomass using the appropriate dead wood class using Equation 1 from VMD0002.

$$B_{SDWL,sp} = \frac{1}{3} * \pi * \left(\frac{BDia_{SDWL,sp}}{200} \right)^2 * H_{SWDL,sp} * D_{DWdc}$$

Where:

$B_{SDWL,sp}$ = Biomass of standing dead tree *l* from sample plot *sp*; t d.m.

$BDia_{SDWL,sp}$ = Basal diameter of standing dead tree *l* from sample plot *sp*; cm

$H_{SWDL,sp}$ = Height of standing dead tree *l* from sample plot *sp*; m

D_{DWdc} = Mean wood density of dead wood in the density class (*dc*) – sound (1), intermediate (2), and rotten (3); t d.m. m⁻³

To calculate lying dead wood biomass each measured section was placed into one of the three density classes (sound, intermediate and rotten) using the ‘machete test’ (Penman et al., 2003). The volume of the dead wood was calculated using a modified version of equation 7 in VMD0002:

$$V_{LDW} = \pi^2 * \frac{(\sum_{n=1}^N Dia_{dc,n}^2)}{8L}$$

Where:

V_{LDW_i} = Volume of lying dead wood per unit area in density class in plot; m³ ha⁻¹

Dia = Diameter of piece *n* of dead wood along the transect in plot; cm

L = Length of the transect; 100 m

dc = Dead wood density class – sound (1), intermediate (2), and rotten (3); dimensionless

To estimate the biomass of the lying dead wood, its volume is multiplied by the mean wood density in the identified density class.

For both standing and lying dead wood, values for mean wood density of dead wood in different density classes in tropical forests were taken from Pfeifer et al (2015) (Table 21). For lying dead wood, density classes (sound, intermediate, and rotten) were determined in the field using the ‘machete test’ as described in Appendix 25A. For standing dead wood, density classes were all conservatively assumed to be rotten.

Table 21. Dead wood density classes based on Pfeifer et al (2015)

Decay Class	Mean Wood Density (t m ⁻³)
Sound	0.49
Intermediate	0.37
Rotten	0.21

As was the case for live tree and palm carbon stocks, the carbon stocks in dead wood in each plot were averaged across the plots to estimate carbon stocks in dead wood in the project area.

3.2.1.2.1.3 Soil organic carbon

Soil organic carbon (SOC) was calculated from soil samples collected following the protocol outlined in Appendix 25A. The soil depth to which these samples were collected was 30 cm. These samples were then analyzed to estimate soil organic carbon and bulk density in a lab at the University of Belize. The SOC of each sample was calculated using the Walkley-Black method. The average soil organic carbon of the samples ($C_{SOCsample,sp}$) was 2.70 g C/100 g soil, and the average bulk density of the samples ($BD_{sample,sp}$) was 2.05 g cm⁻³. The original lab reports can be found in Appendix 26. The following equation modified from equation 1 in VMD0004 was applied to estimate the carbon stock in soil organic carbon for each plot:

$$C_{SOC,sp} = C_{SOCsample,sp} * BD_{sample,sp} * Dep_{sample,sp} * 100$$

Where:

$C_{SOC,sp}$ = Carbon stock in soil organic carbon for sample plot sp ; t C ha⁻¹

$C_{SOCsample,sp}$ = Soil organic carbon of the sample in sample plot sp ; determined in the laboratory in g C/100 g soil (fine fraction < 2 mm)

$BD_{sample,sp}$ = Bulk density of fine (<2 mm) fraction of mineral soil in sample plot sp ; determined in the laboratory in g fine fraction cm⁻³ total sample volume

$Dep_{sample,sp}$ = Depth to which soil sample is collected in sample plot sp ; cm

sp = 1, 2, 3, ... P_i sample plots

The carbon stocks for soil organic carbon in each plot were averaged across the plots to estimate carbon stocks in soils of the project area forests ($C_{SOC,forest}$).

3.2.1.2.1.4 Total estimated pre-deforestation carbon stocks

Table 22 summarizes the aboveground and belowground tree biomass, aboveground palm biomass, dead wood biomass, and SOC carbon stocks within the project area.

To estimate the stocks of these different pools in tonnes of carbon dioxide equivalent (t CO_{2e}), the carbon stocks were multiplied by the molecular weight conversion of carbon to carbon dioxide ($^{44}/_{12}$). The uncertainty calculations per pool are also provided.

Table 22. Summary of tree aboveground and belowground biomass, palm aboveground biomass, dead wood, and SOC stocks and associated uncertainty calculations within the project area.

	Tree AGB	Tree BGB	Palm AGB	Dead wood	Soil
Mean t C ha ⁻¹	21.6	6.1	3.0	1.3	146.1
Mean t CO _{2e} ha ⁻¹	79.2	22.5	11.0	4.6	535.5
Standard Deviation	50.5	14.3	26.8	6.9	290.8
Standard Error	5.5	1.6	2.9	0.7	31.5
T-value	2.0	2.0	2.0	2.0	2.0
95% confidence interval	10.9	3.1	5.8	1.5	62.7
Uncertainty of the mean	13.8%	13.7%	52.7%	32.2%	11.7%

3.2.1.2.2 Baseline Post-Deforestation Carbon Stocks

As discussed in section 3.1.4, the project area forests would have been cleared and converted to agriculture in the baseline scenario. To estimate post-deforestation biomass stocks, the biomass (both above and belowground) carbon stock 4.7 t C ha⁻¹ of annual croplands was applied from Table 5.9 of the Cropland Chapter in Volume 4 of IPCC (2019). The associated error value of $\pm 75\%$, equivalent to two times standard deviation as a percentage of the mean is applied when estimating total uncertainty.

To estimate post-deforestation carbon stocks in soil, the pre-deforestation soil organic carbon stock (535.5t CO_{2e}) was multiplied by different stock change factors using Equation 3 in VMD0004.

$$C_{SOC,PD-BSL} = C_{SOC,forest} * F_{LU} * F_{MG} * F_I$$

Where:

$C_{SOC,PD-BSL,i,t}$ = Mean post-deforestation stock in soil organic carbon in the post deforestation baseline; t CO₂e ha⁻¹

$C_{SOC,forest}$ = Mean carbon stock in soil organic carbon in the forest; t CO₂e ha⁻¹

F_{LU} = Stock change factor for land use type after conversion to agriculture; dimensionless

F_{MG} = Stock change factor for management regime after conversion to agriculture; dimensionless

F_I = Stock change factor for input of organic matter after conversion to agriculture

Stock change factors were applied from Table 5.5 of the Cropland chapter in Volume 4 of IPCC (IPCC, 2019). For F_{LU} , a value representing long-term cultivated usage for tropical moist/wet forests was applied (0.83). For F_{MG} , a value representing full till for dry and moist/wet climates was applied (1.0). Since the land in the project area would have been converted to industrial agriculture, it is reasonable to assume that full till practices would have been applied. This is also consistent with common agricultural practices in Belize (Chi et al., 2017). For F_I , a value representing medium inputs for dry and moist/wet climates was applied (1.0). This value is considered conservative. It is probable that the soil inputs would be in fact be low since crop residue burning is common practice in Belize (Chi et al., 2017).

The post-deforestation SOC stock is calculated as 444.5 t CO₂e.

3.2.1.2.3 Calculating baseline carbon stock change

To estimate the baseline carbon stock change in the terrestrial pools in different years of the project, the following equation was applied based on Equation 12 in VMD0006.

$$\Delta C_{BSL,CS,t} = AA_{planned,t} * (\Delta C_{AB_{tree}} + \Delta C_{AB_{palm}} + \Delta C_{AgBiomass}) + (\sum_{t-10}^t AA_{planned,t}) * (\Delta C_{BB_{tree}} + \Delta C_{DW}) * \left(\frac{1}{10}\right) + (\sum_{t-20}^t AA_{planned,t}) * (\Delta C_{SOC}) * \left(\frac{1}{20}\right)$$

Where:

$\Delta C_{BSL,CS,t}$ = Sum of the baseline carbon stock change in all terrestrial pools in year t; t CO₂e

$AA_{planned,t}$ = Annual area of baseline planned deforestation in year t; ha

$\Delta C_{AB_{tree}}$ = Baseline carbon stock change in aboveground tree biomass; t CO₂e ha⁻¹

$\Delta C_{BB_{tree}}$ = Baseline carbon stock change in belowground tree biomass; t CO₂e ha⁻¹

- $\Delta C_{AB_{palm}}$ = Baseline carbon stock change in aboveground palm biomass; t CO_{2e} ha⁻¹
- $\Delta C_{AgBiomass}$ = Baseline carbon stock change in biomass in agricultural production area; t CO_{2e} ha⁻¹
- ΔC_{DW} = Baseline carbon stock change in dead wood; t CO_{2e} ha⁻¹
- ΔC_{SOC} = Baseline carbon stock change in soil organic carbon; t CO_{2e} ha⁻¹

Following deforestation, emissions from belowground biomass, dead wood, and soil take place gradually over time. Following VMD0006 guidance, carbon is lost and emitted as carbon dioxide in belowground biomass and dead wood at an annual rate of 1/10 of the total stock change for 10 years and, for soil organic carbon, at an annual rate of 1/20 of the stock change for 20 years.

3.2.1.3 Part 3. Greenhouse gas emissions

GHG emissions are calculated using Equation 15 of VMD0006:

$$GHG_{BSL,t} = E_{FC,t} + E_{BiomassBurn,t} + N_2O_{direct-N,t}$$

Where:

- $GHG_{BSL,t}$ = Greenhouse gas emissions as a result deforestation activities within the project boundary in year t ; t CO_{2e}
- $E_{FC,t}$ = Net CO_{2e} emission from fossil fuel combustion in year t ; t CO_{2e}
- $E_{BiomassBurn,t}$ = Non-CO₂ emissions due to biomass burning in year t ; t CO_{2e}
- $N_2O_{direct-N,i,t}$ = Direct N₂O emission as a result of nitrogen application on the alternative land use within the project boundary in year t ; t CO_{2e}

Emissions from transportation fuel use ($E_{FC,i,t}$) are conservatively omitted in the baseline scenario. N₂O emissions from nitrogen application for agricultural production ($N_2O_{direct-N,i,t}$) is also conservatively excluded.

Non-CO₂ emissions from the burning of all remaining aboveground biomass that was bulldozed in the project area is included in the baseline scenario, while the burning of crop residue in agricultural practices is conservatively excluded. While the wood products pool is excluded from the carbon stock assessment, the *de minimis* amount of wood that is expected to be harvested for commercial timber is deducted prior to estimating emissions from biomass burning.

To estimate these non-CO₂-emissions from burning of remaining aboveground biomass, VMD0013 v1.3 (E-BPB) is applied. In particular, Equation 1 is applied.

$$E_{biomassburn,t} = \sum_{g=1}^G \left((A_{burn,t} * B_t * COMF * G_g) * 10^{-3} \right) * GWP_g$$

Where:

- $E_{biomassburn,t}$ = Greenhouse gas emissions due to biomass burning in year t of each GHG (CH₄ and N₂O), t CO₂e
- $A_{burn,t}$ = Area burnt in year t, ha
- B_t = Average aboveground biomass stock before burning stratum i, year, t d.m. ha⁻¹
- $COMF$ = Combustion factor for stratum i, unitless
- G_g = Emission factor for stratum i for gas g, kg t⁻¹ d.m. burnt
- GWP_g = Global warming potential for gas g, t CO₂/t gas g
- g = 1, 2, 3 ... G greenhouse gases including carbon dioxide¹, methane and nitrous oxide (unitless)
- t = 1, 2, 3, ... t* time elapsed since the start of the project activity (years)

Given the fact that the burning is part of the practice to clear the land for agricultural production, $A_{burni,t}$ is the same as annual area of deforestation $AA_{planned,i,t}$.

Average aboveground biomass stock ($B_{i,t}$) is calculated using a modified version of Equation 2 of VMD0013.

$$B_t = (C_{AB,t} - C_{XB,ty} + C_{palms_t} + C_{DW_t}) * \frac{12}{44} * \left(\frac{1}{CF}\right)$$

Where:

- B_t = Average aboveground biomass stock before burning, year, t d.m. ha⁻¹
- $C_{AB,t}$ = Carbon stock in aboveground biomass in trees in year t, t CO₂e ha⁻¹
- $C_{XB,ty}$ = Mean stock of extracted biomass carbon, t CO₂e ha⁻¹
- C_{palms_t} = Carbon stock in aboveground biomass in palms in year t, t CO₂e ha⁻¹
- C_{DW_t} = Carbon stock in dead wood in year t, t CO₂e ha⁻¹
- $\frac{12}{44}$ = Inverse ratio of molecular weight of CO₂ to carbon, t CO₂e t C⁻¹
- CF = Carbon fraction of biomass, t C t d.m.
- i = 1, 2, 3, ...M strata, unitless
- t = 1, 2, 3, ... t* time elapsed since the start of the project activity, years

The final value for B_t is 53.5 t d.m. ha⁻¹.

To estimate combustion factor ($COMF$), the value for secondary forests – 0.55 - from Table 2.6 in Chapter 4 of IPCC (2019) was applied. Given all the disturbances the project area has faced in recent decades as described in section 2.1.14, the project deemed it appropriate to assign it the value of secondary forests.

Emission factors ($G_{g,i}$) for nitrous oxide (N_2O) and methane (CH_4) come from Table 2.5 in Chapter 4 of IPCC (2019) and are found in Table 23.

Table 23. Emission factors ($g\ kg^{-1}$ dry matter burnt) for burning in tropical forest

Category	CH_4	N_2O
Tropical forest	6.8	0.2

The uncertainty of greenhouse gas emissions from biomass burning is calculated by propagating the errors of the average aboveground biomass stock (B_t), the combustion factor ($COMF$), and the emission factors (G_g). The full calculations can be found in Appendix 22.

Global warming potentials for N_2O and CH_4 come from Table 7.SM.6 in the Earth's Energy Budget, Climate Feedbacks and Climate Sensitivity Supplementary Material of the Sixth Assessment Report of the IPCC (Smith et al 2021) and are found in Table 24.

Table 24. Global Warming Potentials of CH_4 and N_2O over a 100-year time horizon

	CH_4	N_2O
GWP-100	27.9	273

3.2.1.4 Uncertainty Analysis

Uncertainty for baseline emissions was calculated following the steps laid out in the module VMD0017 (X-UNC).

3.2.1.4.1 Step 1: Assess Uncertainty in Projection of Baseline Rate of Deforestation

The uncertainty is equal to the 95% confidence interval, as a percentage of the mean of the area deforested in each proxy ($D\%pn$), divided by the number of years over which deforestation occurred in each proxy ($Yrspn$). The uncertainty of baseline deforestation rate ($Uncertainty_{BSL,RATE}$) is 31.7% as shown in Table 25.

Table 25. Uncertainty of the baseline rate of deforestation

Parcel Name	$D\%_{pn}$	Yrs_{pn}	Annual rate of deforestation per parcel
1	70%	8	8.7%
2	63%	9	7.0%
3	81%	5	16.3%
4	77%	8	9.6%
5	81%	7	11.6%
6	64%	5	12.9%
Mean ($D\%_{planned,t}$)			11.0%
Standard deviation			3.3%
Standard error			1.4%
T-value			2.6
95% confidence interval			3.5%
Uncertainty _{BSL,RATE}			31.7%

3.2.1.4.2 Step 2: Assess Uncertainty of Emissions and Removals in Project Area in Baseline Scenario

To estimate the uncertainty of carbon stocks and greenhouse gas sources, the following equation based on Equation 4 from X-UNC is applied:

$$Uncertainty_{REDD-BSL,SS} = \frac{\sqrt{\sum_1^n (Uncertainty_{REDD-BSL,SS,pool\#} * E_{REDD-BSL,SS,pool\#})^2}}{\sum_1^n E_{REDD-BSL,SS,pool\#}}$$

Where:

$Uncertainty_{REDD-BSL,SS}$ = Percentage uncertainty in the combined carbon stocks and greenhouse gas sources in the REDD baseline scenario, %

$Uncertainty_{REDD-BSL,SS,pool\#}$ = Percentage uncertainty for carbon stocks and greenhouse gas sources in the REDD baseline scenario, %

$E_{REDD-BSL,SS,i,pool\#}$ = Carbon stock and greenhouse gas source in the REDD baseline scenario, t CO₂e

The carbon stocks, greenhouse gas sources, and their associated uncertainties can be found in Table 26.

Table 26. Uncertainties of the carbon stocks and greenhouse gas emissions

	Tree AGB stocks	Tree BGB stocks	Palm AGB stocks	Dead wood stocks	Soil organic carbon stocks	Agricultural biomass stocks	Biomass burning emissions	Combined uncertainty
Mean t CO ₂ e ha ⁻¹	79.2	22.5	11.0	4.6	535.5	17.2	7.2	
% of uncertainty	14%	14%	53%	32%	12%	75%	49%	9.7%

3.2.1.4.3 Step 3: Estimate Total Uncertainty in REDD Baseline Scenario

To estimate the total uncertainty, Equation 6 in X-UNC is applied:

$$Uncertainty_{REDD-BSL,t*} = \sqrt{Uncertainty_{BSL,RATE,t*}^2 + Uncertainty_{REDD-BSL}^2}$$

Where:

$Uncertainty_{REDD-BSL,t*}$ = Cumulative uncertainty in REDD baseline up to year t*, %

$Uncertainty_{BSL,RATE,t*}$ = Cumulative uncertainty in the baseline rate of deforestation up to year t, %

$Uncertainty_{REDD-BSL,SS}$ = Total uncertainty in the combined carbon stocks in the REDD baseline scenario, %

t = 1, 2, 3, ...t* time elapsed since the start of the project activity, years

The final uncertainty for the project is 33.1%.

3.2.1.5 Baseline reassessment

As an avoiding planned deforestation project where the agent of deforestation is unknown, the baseline will be reassessed every six years following the requirements set out in 3.2.5 of the VCS Standard v4.7.

3.2.2 Project Emissions (VCS, 3.15)

The net greenhouse gas emissions under the project scenario will be calculated based on Equation 1 from VMD0015 Methods for Monitoring of GHG Emissions and Removals in REDD and CIW Projects (M-REDD).

$$\Delta C_{WPS-REDD} = \sum_{t=1}^{t*} (\Delta C_{P,DefPA,t} + \Delta C_{P,DistPA,t} + E_{biomassburn,t} + \Delta C_{P,Deg,t})$$

Where:

$\Delta C_{WPS-REDD}$ = Net greenhouse gas emissions within the project area under the project scenario up to year t^* , t CO₂e

$\Delta C_{P,DefPA,t}$ = Net carbon stock change as a result of deforestation in the project area in the project case in year t , t CO₂e

$\Delta C_{P,DistPA,t}$ = Net carbon stock change as a result of natural disturbance in the project area in the project case in year t , t CO₂e

$E_{biomassburn,t}$ = Greenhouse gas emissions due to biomass burning during monitoring period t of each GHG (CH₄ and N₂O), t CO₂e

$\Delta C_{P,Deg,t}$ = Net carbon stock change as a result of degradation in the project area in the project case in year t , t CO₂e

$GHG_{P-E,t}$ = Greenhouse gas emissions as a result of deforestation and degradation activities within the project area in the project case in year t , t CO₂e

t = 1, 2, 3, ... t^* years elapsed since the start of the REDD project activity

Under the project scenario there are no planned activities that will cause changes to carbon stocks and or greenhouse gas emissions. No deforestation is expected given the management agreement in place, although land use change and resulting changes in carbon stocks will be monitored, nonetheless. If deforestation does occur ex-post, GHG emissions from biomass burning associated with the land clearing with also be accounted for. Logging and fuelwood collection are not concerns in the project area, and as such are not considered. Because greenhouse gas emissions from fossil fuel combustion is conservatively excluded from the baseline scenario, it is also excluded in the project scenario. Fertilizer use will not occur in the project scenario.

Disturbance by extreme weather (tropical storms/hurricanes) and wildfire may occur over the course of the project and will be accounted for ex-post. The risk of these events happening is also accounted for in the non-permanence risk assessment and the appropriate deductions accounted for in section 3.2.4. When these natural disasters do occur, the project team will follow the protocols detailed in section 3.3.3 Monitoring Plan to estimate emissions. Until such events occur and can be quantified, $\Delta C_{P,DistPA,i,t} = 0$.

3.2.3 Leakage Emissions (VCS 2.5, 3.2, 3.6, 3.15, 4.3)

Leakage was determined following the steps described in module VMD0009 Estimation of emissions from activity shifting for avoiding planned deforestation/forest degradation and avoiding planned wetland degradation (LK-ASP).

Since a specific agent of deforestation is not identified, a class of deforestation is used to determine activity shifting leakage using approach 2 Market Leakage Assessment.

As described in section 3.1.3, given the fact that harvested wood products are identified as *de minimis*, market effects leakage due to decreased timber harvest was excluded from the analysis.

3.2.3.1 STEP 1: Identify commodity produced by baseline class of agent

The most likely commodity for the class of deforestation agent is **Sugarcane** (*Saccharum officinarum*). Given the proximity to the Santander sugar mill, many nearby properties have been converted to sugarcane production. The active farm immediately to the northeast of the project area is used almost exclusively for sugarcane production. Further, as indicated in Appendix 11, the previous owner of the MFC REDD project area had actually signed a 5-year agreement in 2016 with a sugar company to supply them with sugarcane annually. Prior to the agreement expiring in 2021, Santander had confirmed they still needed more acres of sugarcane. Sugarcane is Belize's chief agricultural export accounting for an estimated 6% of currency income and 7.8% of GDP (Tun et al., 2023).

3.2.3.2 STEP 2: Assess Proportion of Available Areas that are Forested

Sugarcane is grown in tropical and subtropical regions around the world. It has a broad geographic range of where it can be grown, thus making it a challenge to limit its geographic scope within Belize (FAO, n.d.). Sugarcane flourishes under a long and warm growing season with plenty of moisture. It also requires a dry and relatively cool ripening and harvesting period that is free from frost. Sugarcane has a relatively long growing season which ranges from 9-15 months. The long growing season is necessary for high yields (FAO, n.d.).

In order to assess areas available for sugarcane production in Belize that are forested, access to markets; protected areas; as well as soil type, elevation, and precipitation were all evaluated.

Access to markets

The country of Belize has two sugar mills: the Tower Hill mill run by Belize Sugar Industries (BSI) located in the district of Orange Walk in the north and the other run by Santander Sugar located in the district of Corozal in the center of the country. When measured in a straight line from the project area Santander mill is 7.5 miles away from the project area and the Tower Hill mill is 34.5 miles away.

National experts on sugarcane confirmed to WCS staff through personal communications that distance to mills is the key limiting factor to the production of sugarcane with regards to access to markets. These experts on sugarcane production confirmed that the farthest parcel where sugarcane is sourced for processing is approximately 40 miles away from the mill. See Appendix 27 for communications.

Based on this information, to be conservative, the project team assessed that sugarcane production in the country was only possible within a 50-mile radius of the two mills. The distance from mills is depicted in Figure 17.

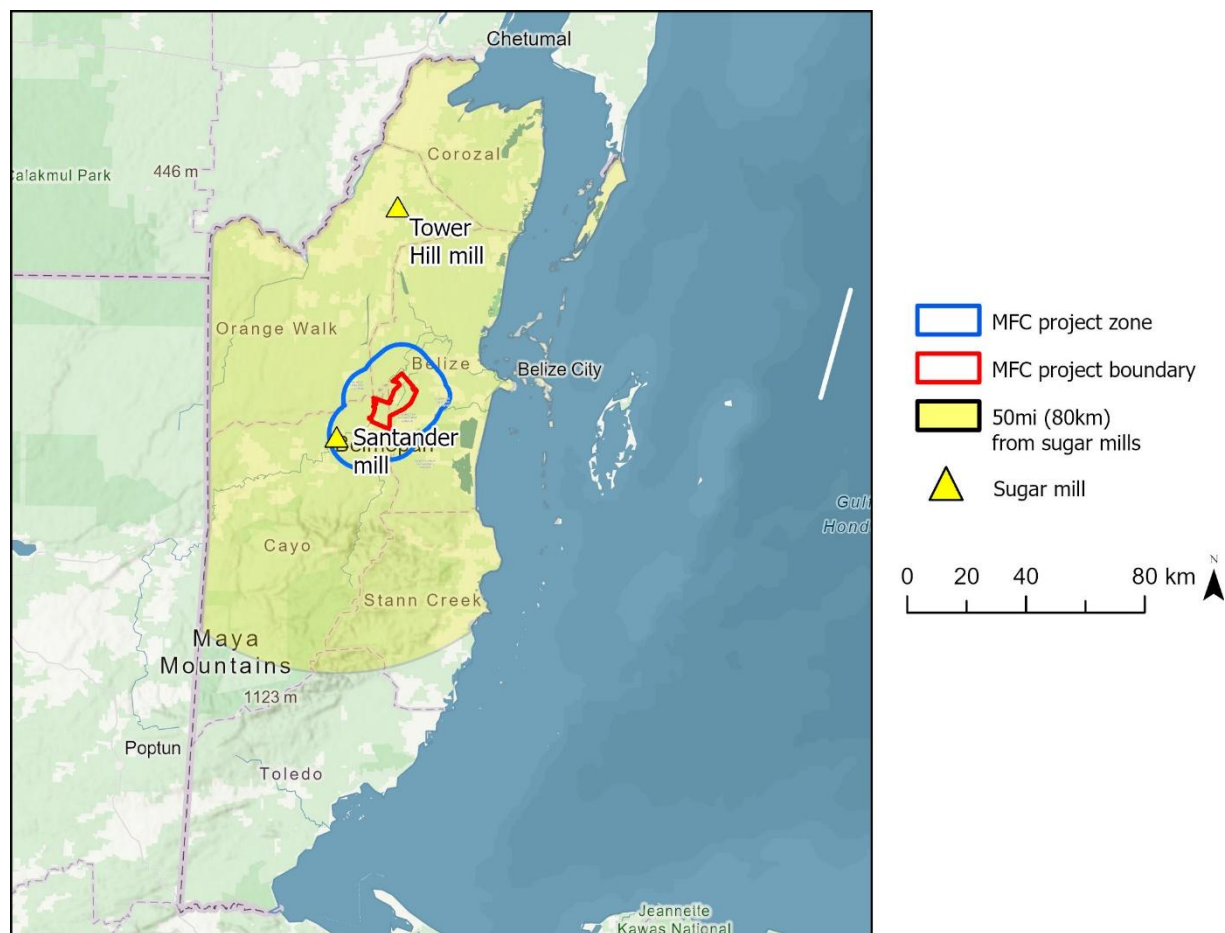


Figure 17. 50-mile buffer in Belize from the two sugar mills

Biophysical conditions: soils, elevation, and precipitation

According to personal communications with national sugarcane experts (Appendix 27), sugarcane adapts to a wide range of environmental conditions and, as such, soil type, elevation, and precipitation do not limit where it can be grown in the country. Best management practices (e.g., soil amendments) can and are readily applied to remedy limitations due to environmental conditions. To verify this, the project team researched the impact these variables have on sugarcane production.

Information provided by the FAO supports the national expert's assertion that biophysical characteristics are not limitations to growing sugarcane in certain areas of the countries. With regards to soil, sugarcane does not need a special type of soil to ensure high yields as long as it has a depth of one meter, is well aerated, and has a water content of 15 percent or more (FAO, n.d.). Sugarcane grows best in soils with a pH of 5 to 8.5 although issues with pH could be remedied with certain soil amendments (FAO, n.d.).

Regarding elevation, data were sourced from USGS EROS Archive Digital Elevation SRTM model (USGS EROS, 2018). No high or low elevation limit was found for sugarcane production. As such, it was assumed that everywhere above sea level was eligible for sugarcane production. A map showing elevation in Belize can be found below in Figure 18.

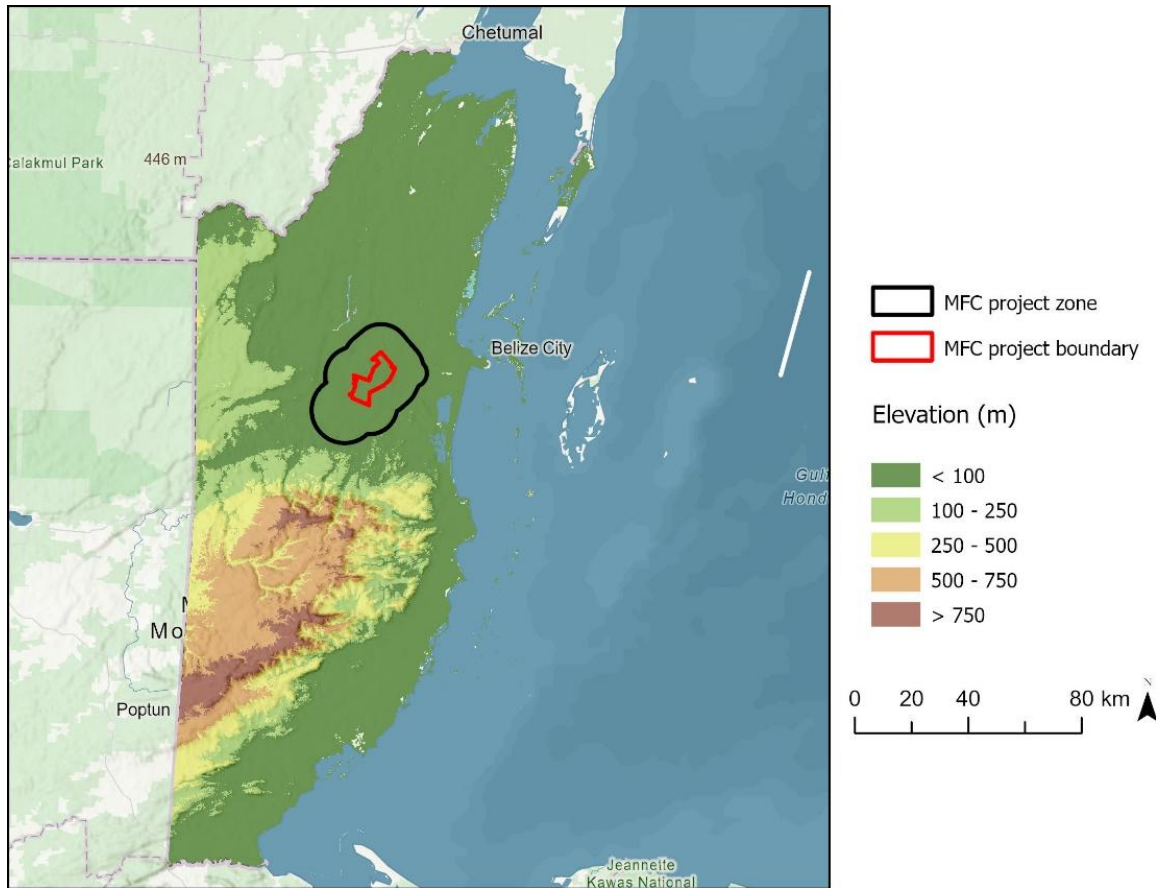


Figure 18. Belize SRTM elevation in meters

Within Belize, rainfall is within 1,223 mm to 4,000 mm yearly (Fick & Hijmans, 2017). According to the FAO, sugarcane requires between 1500 to 2500 mm evenly distributed over the growing season (FAO, n.d.). That being said, other countries such as China, Colombia, and Indonesia, produce sugarcane in areas with annual precipitation rates that fall outside this range (Headley et al., 2024). As such, with regards to precipitation, the entire country of Belize is conservatively deemed suitable to grow sugarcane.

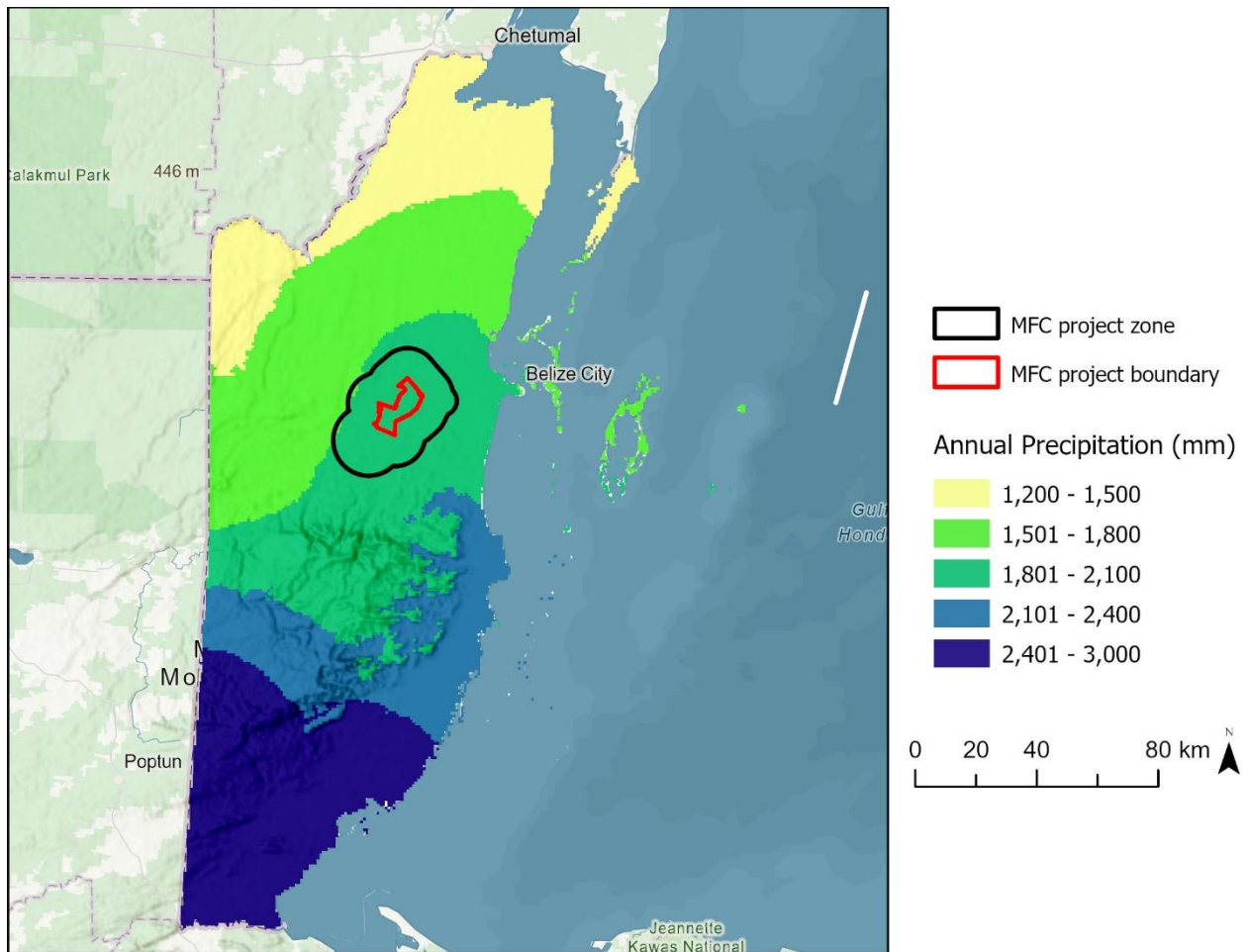


Figure 19. Annual precipitation in Belize

Protected areas excluded from the analysis

To define areas of the country that are available for conversion to sugarcane, it is necessary to remove forested areas within protected areas from the areas considered eligible. It is illegal to clear forests in these protected areas, and this is enforced in Belize. The protected areas layer was sourced from the Biodiversity and Environmental Resource Data System of Belize (Meerman & Clabaugh, 2017). Protected areas within the country can be found in Figure 20.

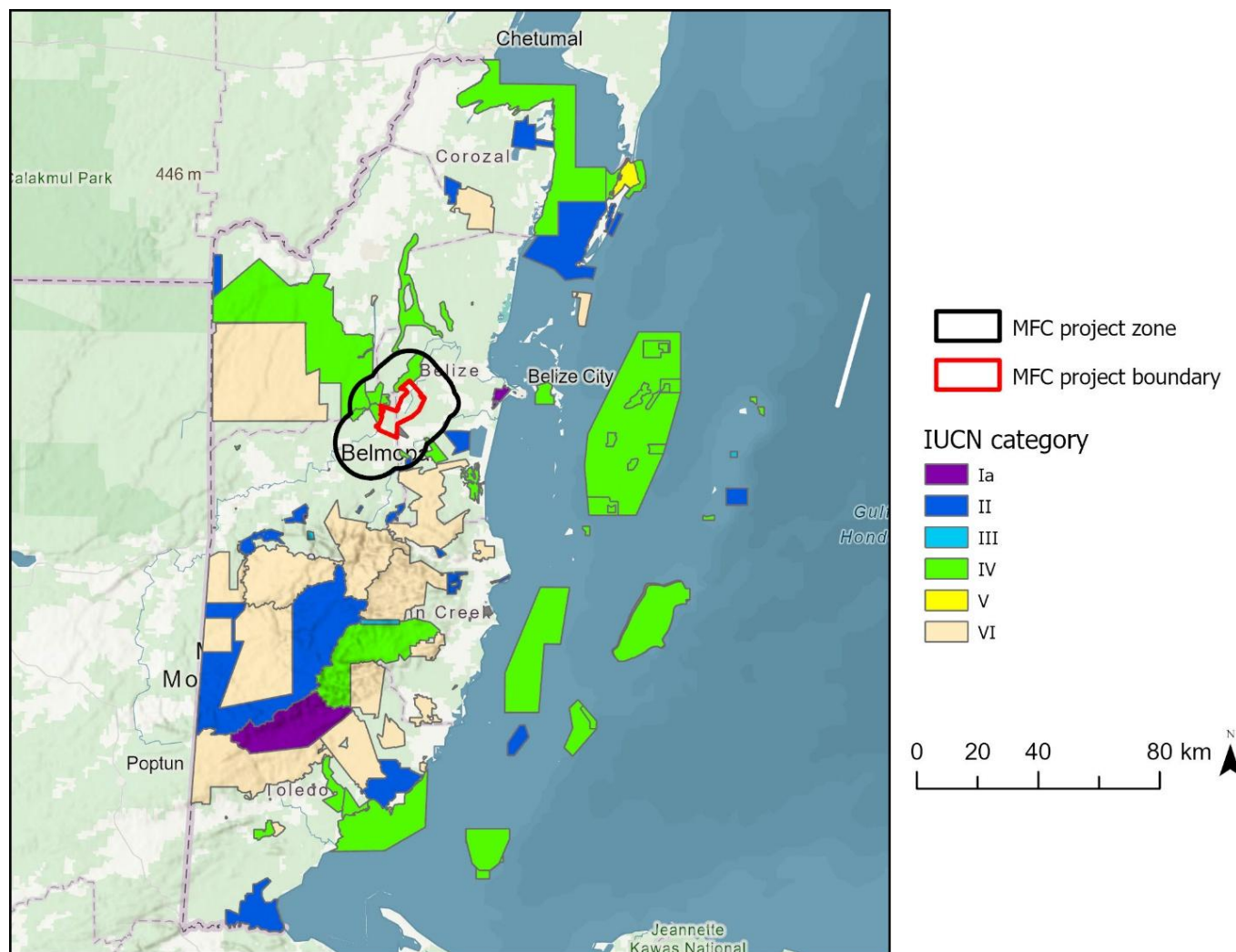


Figure 20. Protected areas in the country of Belize

Available areas for sugarcane

Based on the assessment above, the only limiting factors to sugarcane production in Belize is distance to mills. After combining the distance to mill and elevation data layers with the 2023 forested area and other land cover types sourced from ESRI (Karra et al., 2021) (Figure 21), it was found that 1,637,133 hectares of land in the country are suitable for growing sugarcane. 523,990 of those hectares are forested lands outside of protected areas. The forested lands outside of protected areas that are suitable for the agent can be seen in Figure 22. The proportion of available forested areas suitable for sugarcane in the country (PF_c) is 32% (Table 27).

Table 27. Alternative areas for growing sugarcane (PF_c)

Land Cover Type	Area (ha)	Proportion (%) of total area eligible for sugarcane production
Forest in unprotected areas	523,990	32%

Land Cover Type	Area (ha)	Proportion (%) of total area eligible for sugarcane production
Non-Forest in protected and unprotected lands	521,303	32%
Protected forest	591,840	36%
Total	1,637,133	100%

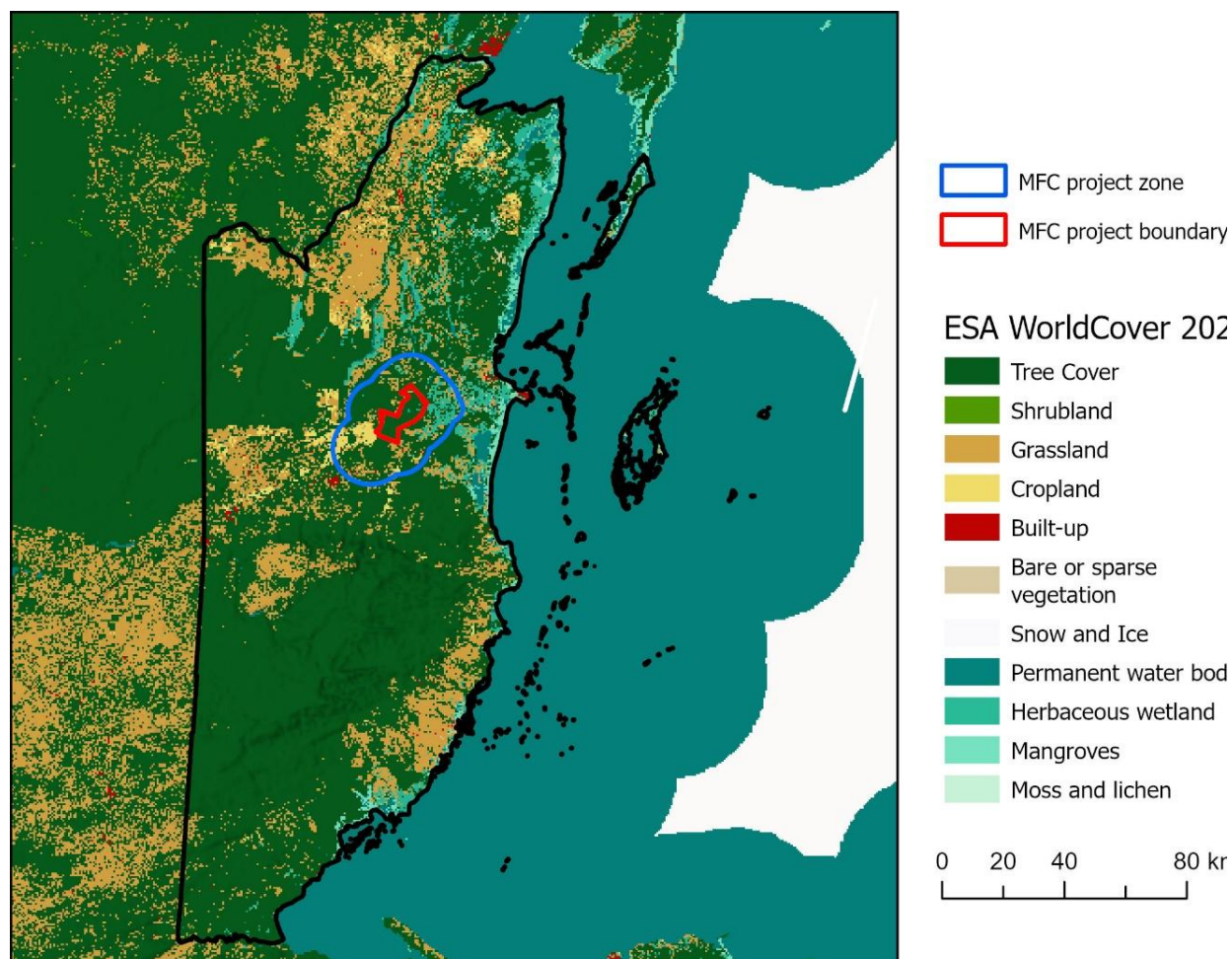


Figure 21. ESRI Sentinel-2 2023 landcover

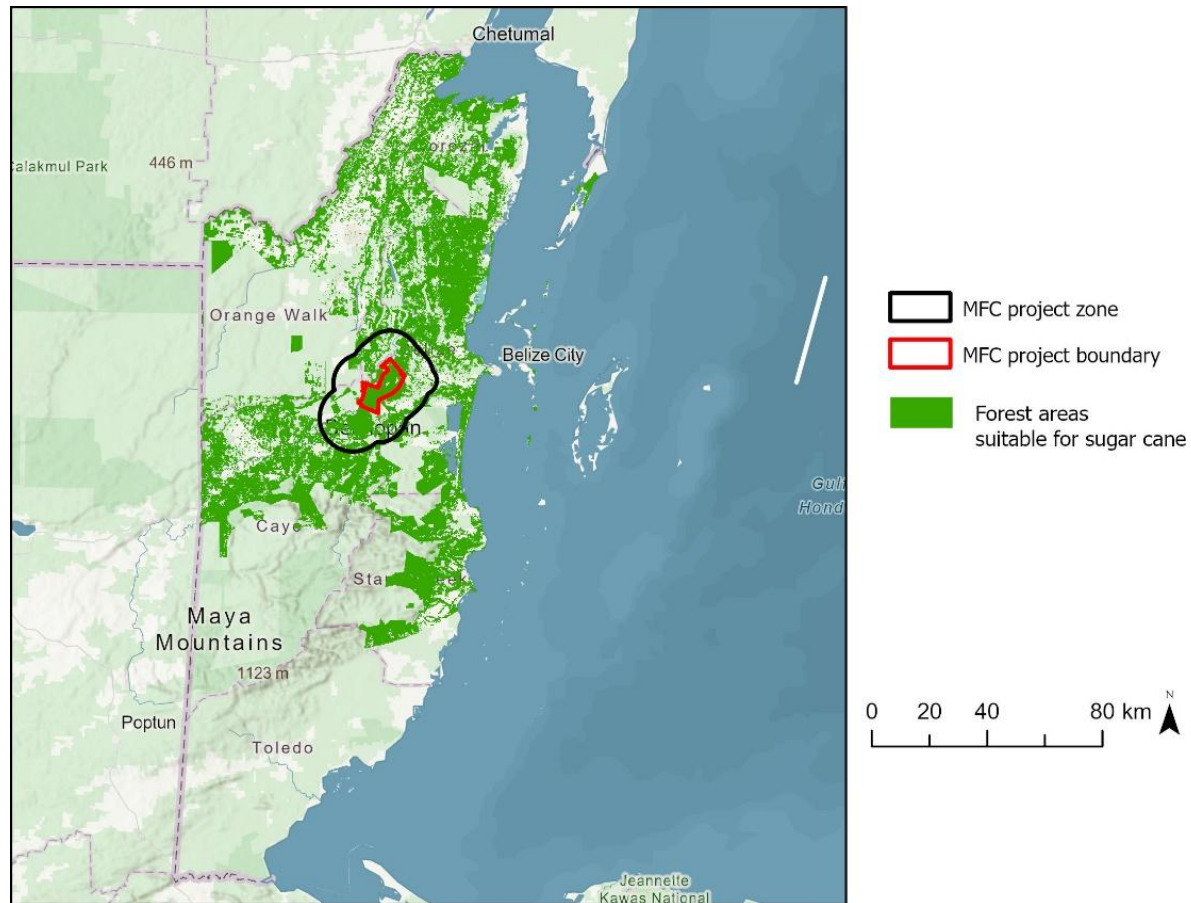


Figure 22. Unprotected forests in Belize that are suitable for growing sugarcane

3.2.3.3 STEP 3: Evaluate Project Area Relative to Other Forested Areas for Commodity Production in the Country and STEP 4: Assess Proportional Leakage Factor

As discussed above, the only limiting factors to the production of sugarcane in the country is distance to mill and elevation. The project team could find no biophysical characteristics of a site that would impact how productive it was in comparison to other areas. As one of the sugarcane expert that the project team consulted stated, the key factor in determining sugarcane yield is what agricultural best management practices are practiced (Appendix 27). Given this, it was determined that the average productivity of alternatively areas was within the same range ($\pm 15\%$) as the productivity of the project area. As such, $LK_{CP-ME,C} = 0.4$.

Given the fact that forest conservation and sugarcane production in the project area cannot happen simultaneously and the other areas where forests could be converted to sugarcane production are beyond the control of the project proponent, no leakage management activities could be applied to minimize displacement. Therefore, the leakage adjustment management factor (LK_{MAF}) is 1.

3.2.3.4 STEP 5: Estimate Leakage

Activity-shifting leakage is estimated using the following equation modified from Equation 9 of LK-ASP:

$$\Delta C_{LK-AS,REDD} = \sum_{t=1}^{t^*} \Delta C_{BSL,REDD} * PF_c * LK_{CP-ME} * LK_{MAF}$$

Where:

$\Delta C_{LK-AS,REDD}$ = Net CO₂ emissions due to activity shifting leakage for projects preventing planned deforestation, t CO₂e

$\Delta C_{BSL,REDD}$ = Net CO₂ emissions in the baseline from planned deforestation in the project area, t CO₂e

PF_c = Proportion of available area for production of commodity that is currently forested, unitless

LK_{CP-ME} = Leakage factor for displacement of class of planned deforestation agents, unitless

LK_{MAF} = Leakage management adjustment factor, unitless

t = 1, 2, 3, ... t^* years elapsed since the start of the project activity

As demonstrated above, the percentage of available areas for production of sugarcane that is currently forested and not under protection (PF_c) was 32%. The leakage factor for displacement of class of planned deforestation agents (LK_{CP-ME}) was 0.4, and the leakage management adjustment factor (LK_{MAF}) was 1.

3.2.4 Estimated GHG Emission Reductions and Carbon Dioxide Removals (VCS, 3.15, 4.1)

The estimated net GHG emission reductions are based on carbon stock changes and GHG emissions estimated in the baseline scenario minus net GHG emissions in the project scenario minus emissions due to leakage as shown in the following equation:

$$NER_t = \Delta C_{BSL-REDD,t} - \Delta C_{WPS-REDD,t} - \Delta C_{LK-AS,REDD,t}$$

Where:

NER_t = Net GHG emission reductions of avoiding planned deforestation in year t, t CO₂e

$\Delta C_{BSL-REDD,t}$ = Net GHG emissions in the REDD baseline scenario in year t, t CO₂e

$\Delta C_{WPS-REDD,t}$ = Net GHG emissions in the REDD project scenario in year t, t CO₂e

$\Delta C_{LK-AS,planned,t}$ = Net GHG emissions due to leakage from the REDD project activity in year t, t CO₂e

To calculate $\Delta C_{BSL-REDD}$, the following equation is applied:

$$\Delta C_{BSL-REDD} = \Delta C_{BSL,CS,t} + GHG_{BSL,t}$$

Where:

$\Delta C_{BSL,t}$ = Sum of the baseline carbon stock change in all terrestrial pools in year t, t CO₂e

$GHG_{BSL,t}$ = Greenhouse gas emissions as a result of deforestation activities within the project boundary in year t, t CO₂e

As described in section 3.2.2, there are no planned activities that will cause changes to carbon stocks and/or greenhouse gas emissions in the project scenario. As such, $\Delta C_{WPS-REDD,t}$ is equal to zero.

Once these net GHG emission reductions have been calculated, following VM0007 requirements, they must be adjusted to account for the 33.1% uncertainty ($Uncertainty_{REDD-BSL}$), as calculated in section 3.2.1.4, using the following modified version of equation 22 from VMD0015:

$$Adjusted_NER_t = NER_t * (100\% - Uncertainty_{REDD-BSL,t} + 15\%)$$

Where:

$Adjusted_NER_t$ = Total net GHG emission reductions of avoiding planned deforestation in year t after deducting for uncertainty, t CO₂e

NER_t = Net GHG emission reductions of avoiding planned deforestation in year t, t CO₂e

$Uncertainty_{REDD-BSL,t}$ = Uncertainty in REDD baseline up in year t, %

To calculate contributions to the AFOLU pooled buffer account, the following equation is applied:

$$Buffer_{Planned,t} = \Delta C_{BSL-REDD} * Buffer\%$$

Where:

$Buffer_{Planned}$ = Total permanence buffer withholding for avoiding planned deforestation project activities in year t, t CO₂e

$\Delta C_{BSL-REDD,t}$ = Net GHG emissions in the REDD baseline scenario in year t, t CO₂e

$Buffer\%$ = Buffer withholding percentage (percent)

The $Buffer\%$ is based on the risk classification identified through the use of the AFOLU Non-Permanence Risk Tool and is calculated to be 12.0%. Neither leakage deductions nor uncertainty deduction factor into buffer calculations.

The final number of Verified Carbon Units that the project can generate in a given year is based on the following equation:

$$VCU_t = Adjusted_NER_t - Buffer_{Planned,t}$$

Where:

VCU_t = Number of Verified Carbon Units for year t

Table 28. Non-permanence risk rating and expected total GHG benefits

State the non-permanence risk rating (%)	12.0%
Has the non-permanence risk report been attached as either an appendix or a separate document?	☒ Yes ☐ No
For ARR and IFM projects with harvesting, state, in tCO ₂ e, the Long-term Average (LTA).	N/A
Has the LTA been updated based on monitored data, if applicable?	☐ Yes ☒ No Not applicable.
State, in tCO ₂ e, the expected total GHG benefit to date.	1,153,417
Is the number of GHG credits issued below the LTA?	N/A

Table 29. VCUs per vintage period

Vintage period	Estimated baseline emissions (tCO ₂ e)	Estimated project emissions (tCO ₂ e)	Estimated leakage emissions (tCO ₂ e)	Estimated buffer pool allocation (tCO ₂ e)	Estimated reduction VCUs (tCO ₂ e)	Estimated removal VCUs (tCO ₂ e)	Estimated total VCU issuance (tCO ₂ e)
01-Jan-2022 to 31-Dec-2022	103,803	0	-13,287	-12,456	61,674	0	61,674
01-Jan-2023 to 31-Dec-2023	112,440	0	-14,392	-13,493	66,805	0	66,805
01-Jan-2024 to 31-Dec-2024	121,076	0	-15,498	-14,529	71,936	0	71,936
01-Jan-2025 to 31-Dec-2025	129,712	0	-16,603	-15,565	77,067	0	77,067

Vintage period	Estimate d baseline emission s (tCO2e)	Estimate d project emissions (tCO2e)	Estimate d leakage emissions (tCO2e)	Estimate d buffer pool allocation (tCO2e)	Estimate d reduction VCUs (tCO2e)	Estimate d removal VCUs (tCO2e)	Estimate d total VCU issuance (tCO2e)
01-Jan-2026 to 31-Dec-2026	138,348	0	-17,709	-16,602	82,198	0	82,198
01-Jan-2027 to 31-Dec-2027	146,984	0	-18,814	-17,638	87,329	0	87,329
01-Jan-2028 to 31-Dec-2028	155,621	0	-19,919	-18,674	92,460	0	92,460
01-Jan-2029 to 31-Dec-2029	164,257	0	-21,025	-19,711	97,592	0	97,592
01-Jan-2030 to 31-Dec-2030	172,893	0	-22,130	-20,747	102,723	0	102,723
01-Jan-2031 to 31-Dec-2031	86,276	0	-11,043	-10,353	51,260	0	51,260
01-Jan-2032 to 31-Dec-2032	75,211	0	-9,627	-9,025	44,686	0	44,686
01-Jan-2033 to 31-Dec-2033	71,986	0	-9,214	-8,638	42,770	0	42,770
01-Jan-2034 to 31-Dec-2034	68,760	0	-8,801	-8,251	40,853	0	40,853
01-Jan-2035 to 31-Dec-2035	65,534	0	-8,388	-7,864	38,936	0	38,936
01-Jan-2036 to 31-Dec-2036	62,308	0	-7,975	-7,477	37,020	0	37,020
01-Jan-2037 to 31-Dec-2037	59,082	0	-7,563	-7,090	35,103	0	35,103
01-Jan-2038 to 31-Dec-2038	55,856	0	-7,150	-6,703	33,186	0	33,186
01-Jan-2039 to 31-Dec-2039	52,630	0	-6,737	-6,316	31,270	0	31,270
01-Jan-2040 to 31-Dec-2040	49,404	0	-6,324	-5,929	29,353	0	29,353

Vintage period	Estimated baseline emissions (tCO ₂ e)	Estimated project emissions (tCO ₂ e)	Estimated leakage emissions (tCO ₂ e)	Estimated buffer pool allocation (tCO ₂ e)	Estimated reduction VCU (tCO ₂ e)	Estimated removal VCU (tCO ₂ e)	Estimated total VCU issuance (tCO ₂ e)
01-Jan-2041 to 31-Dec-2041	49,139	0	-6,290	-5,897	29,195	0	29,195

3.3 Monitoring

3.3.1 Data and Parameters Available at Validation (VCS, 3.16)

All the data and parameters presented in this section will be reevaluated as part of the baseline reassessment required to be conducted every 6 years following the VCS Standard v4.7.

Data / parameter	A _{planned}
Data unit	ha
Description	Total area of planned deforestation over the fixed baseline period
Source of data	Remote sensing
Value applied	10,795
Justification of choice of data or description of measurement methods and procedures applied	As described in section 3.2.1.1.2 “Area of deforestation”, the entire area of the existing forest in the project area (10,795 ha) is suitable for conversion to agriculture and thus is the area of deforestation. The process of identifying this area of existing forests through remote sensing is described in Appendix 10.
Purpose of data	Calculation of baseline emissions
Comments	-

Data / parameter	D _{%planned t}
Data unit	% year ⁻¹
Description	Projected annual proportion of land that will be deforested i during year t.
Source of data	Remote sensing and Proxy Parcels

Value applied	11.0%
Justification of choice of data or description of measurement methods and procedures applied	See section 3.2.1.1 “Calculating annual area of land deforested” for full description of measurement methods
Purpose of data	Calculation of baseline emissions
Comments	-

Data / parameter	L-D
Data unit	%
Description	Likelihood of deforestation
Source of data	-
Value applied	100%
Justification of choice of data or description of measurement methods and procedures applied	Estimating the likelihood of deforestation is only applicable when the forest areas are under government control and, as such, is not applicable to this project. Thus, L-D is equal to 100%
Purpose of data	Calculation of baseline emissions
Comments	-

Data / parameter	<i>CF</i>
Data unit	t C t ⁻¹ d.m.
Description	Carbon fraction of tree biomass
Source of data	Table 4.3 in Chapter 4 of Volume 4 of IPCC (2006)
Value applied	0.47
Justification of choice of data or description of	-

measurement methods and procedures applied	
Purpose of data	Calculation of baseline, project, and leakage emissions
Comments	-

Data / parameter	A_{sp}														
Data unit	Ha														
Description	Area of sample plots														
Source of data	Recording and archiving the size of sample plots used.														
Value applied	<table><tr><th>Tree Class</th><th>Plot Radius</th><th>Plot Area</th></tr><tr><td>$\geq 5.0\text{cm}$</td><td>4.0m</td><td>50m²</td></tr><tr><td>$\geq 20.0\text{cm}$</td><td>14.0m</td><td>616m²</td></tr><tr><td>$\geq 50.0\text{cm}$</td><td>20.0m</td><td>1256m²</td></tr></table>			Tree Class	Plot Radius	Plot Area	$\geq 5.0\text{cm}$	4.0m	50m ²	$\geq 20.0\text{cm}$	14.0m	616m ²	$\geq 50.0\text{cm}$	20.0m	1256m ²
Tree Class	Plot Radius	Plot Area													
$\geq 5.0\text{cm}$	4.0m	50m ²													
$\geq 20.0\text{cm}$	14.0m	616m ²													
$\geq 50.0\text{cm}$	20.0m	1256m ²													
Justification of choice of data or description of measurement methods and procedures applied	-														
Purpose of data	Calculation of baseline and project emissions														
Comments	-														

Data / parameter	N
Data unit	Dimensionless
Description	Number of sample plots
Source of data	Recording and archiving the number of sample points
Value applied	85 forest plots
Justification of choice of data or description of measurement methods and procedures applied	The Winrock sample plot calculator is used to determine number of plots needed (Walker et al., 2014).

Purpose of data	Calculation of baseline and project emissions
Calculation method	Winrock Sample calculator
Comments	-

Data / parameter	DBH
Data unit	cm
Description	Diameter at breast height of a tree in cm
Source of data	Field measurements in sample plots
Value applied	Unique values recorded for each tree
Justification of choice of data or description of measurement methods and procedures applied	Measured at 1.3m above-ground, unless tree has buttresses or irregular growth. Minimum diameter is 5cm. See Appendix 25A for detailed field methods.
Purpose of data	Calculation of baseline and project emissions
Comments	-

Data / parameter	WD
Data unit	g cm ⁻³
Description	Wood density
Source of data	Mean value for Tropical America from Figure 4 of Reyes et al (1992)
Value applied	0.6
Justification of choice of data or description of measurement methods and procedures applied	Given the fact that the species of most of the trees measured could not be identified, this value was selected
Purpose of data	Calculation of baseline, project, and leakage emissions

Comments	-														
Data / parameter	f(X,Y)														
Data unit	t d.m. tree ⁻¹														
Description	Allometric equation for linking measured tree variable(s) to aboveground biomass of living trees														
Source of data	Aboveground tree biomass (in kilograms, or kg) was calculated using the Chave et al (2005) equation modified based on field data gathered in the project area (refer to section 3.1.6 for more information). The allometric equation applied to trees in the <i>Cecropia</i> genus is from Pearson et al (2005). The allometric equations for trees in the <i>Pinus</i> genus and for different palms are from Penman et al (2003).														
Value applied	<table> <tr> <th>Taxa</th><th>Allometric</th></tr> <tr> <td><i>Cecropia spp</i></td><td>$AGB = 12.764 + 0.2588 * DBH^{2.0515}$</td></tr> <tr> <td><i>Pinus spp</i></td><td>$AGB = 0.887 + \frac{10486 * DBH^{2.84}}{DBH^{2.84} + 376901}$</td></tr> <tr> <td><i>Attalea cohune</i></td><td>$AGB = 10.856 + 176.76 * HT - 6.898 * HT^2$</td></tr> <tr> <td><i>Sabal spp</i></td><td>$AGB = 24.559 + 4.921 * HT + 1.017 * HT^2$</td></tr> <tr> <td><i>Crysophylla spp</i></td><td>$AGB = 0.182 + 0.498 * HT + 0.049 * HT^2$</td></tr> <tr> <td>Other tree species in the project site</td><td>$AGB = WD * \exp(-14.521 + 11.325 * \ln(DBH) - 2.073 * (\ln(DBH))^2 + 0.1549 * (\ln(DBH))^3)$</td></tr> </table>	Taxa	Allometric	<i>Cecropia spp</i>	$AGB = 12.764 + 0.2588 * DBH^{2.0515}$	<i>Pinus spp</i>	$AGB = 0.887 + \frac{10486 * DBH^{2.84}}{DBH^{2.84} + 376901}$	<i>Attalea cohune</i>	$AGB = 10.856 + 176.76 * HT - 6.898 * HT^2$	<i>Sabal spp</i>	$AGB = 24.559 + 4.921 * HT + 1.017 * HT^2$	<i>Crysophylla spp</i>	$AGB = 0.182 + 0.498 * HT + 0.049 * HT^2$	Other tree species in the project site	$AGB = WD * \exp(-14.521 + 11.325 * \ln(DBH) - 2.073 * (\ln(DBH))^2 + 0.1549 * (\ln(DBH))^3)$
Taxa	Allometric														
<i>Cecropia spp</i>	$AGB = 12.764 + 0.2588 * DBH^{2.0515}$														
<i>Pinus spp</i>	$AGB = 0.887 + \frac{10486 * DBH^{2.84}}{DBH^{2.84} + 376901}$														
<i>Attalea cohune</i>	$AGB = 10.856 + 176.76 * HT - 6.898 * HT^2$														
<i>Sabal spp</i>	$AGB = 24.559 + 4.921 * HT + 1.017 * HT^2$														
<i>Crysophylla spp</i>	$AGB = 0.182 + 0.498 * HT + 0.049 * HT^2$														
Other tree species in the project site	$AGB = WD * \exp(-14.521 + 11.325 * \ln(DBH) - 2.073 * (\ln(DBH))^2 + 0.1549 * (\ln(DBH))^3)$														
Justification of choice of data or description of measurement methods and procedures applied	For justification of the modified allometric equation from Chave et al (2005), refer to section 3.1.6. The other allometric equations are genus-specific and recommended sources for these equations in VMD0001.														
Purpose of data	Calculation of baseline and project emissions														

Comments	-
Data / parameter	R
Data unit	t root d.m. t ⁻¹ shoot d.m.
Description	Root-to-shoot ratio appropriate to biome
Source of data	Table 4.4 of Volume 4 of IPCC (2019)
Value applied	0.2845 for trees in plots with less than or equal to 125 dry matter tonnes per ha of aboveground biomass (measured for aboveground tree and palm aboveground biomass), 0.284 for trees in plots with more than 125 dry matter tonnes per ha.
Justification of choice of data or description of measurement methods and procedures applied	These are the values provided in the table for Tropical Moist zones in North and South America.
Purpose of data	Calculation of baseline and project emissions
Comments	-

Data / parameter	$C_{AB,tree}$
Data unit	t CO ₂ e ha ⁻¹
Description	Carbon stock in aboveground biomass in trees
Source of data	Field measurements and allometric equations
Value applied	79.2
Justification of choice of data or description of measurement methods and procedures applied	Aboveground tree biomass (in kg) was calculated using the Chave et al (2005) equation modified based on field data gathered in the project area (refer to section 3.1.6 for more information). Separate allometric equations were applied for trees in the <i>Cecropia</i> and <i>Pinus</i> genera. The above-ground biomass for each tree was converted from kilograms to metric tons (by dividing by 1000), followed by a conversion of total aboveground biomass to aboveground carbon

	stock by multiplying the mass by the carbon fraction of biomass (0.47). The aboveground biomass data collected was conducted using a nested circular plot design. Because of this, the biomass for the trees of each diameter class used in this design were summed and then a scaling factor was applied to estimate the biomass on a per hectare basis. $\text{Scaling factor} = \frac{10,000 \text{ m}^2}{\pi * (\text{radius in meters of nested plot})^2}$ The per hectare biomass for trees in each plot was then averaged across the plots to estimate carbon stocks in aboveground biomass in trees in the forests of the project area. To get the value in tonnes of carbon dioxide equivalent, the value was multiplied by the molecular weight conversion of carbon to carbon dioxide ($^{44}/_{12}$).
Purpose of data	Calculation of baseline and project emissions
Comments	-

Data / parameter	$C_{AB,palm}$
Data unit	t CO ₂ e ha ⁻¹
Description	Carbon stock in aboveground biomass in palms
Source of data	Field measurements and allometric equations
Value applied	11.0
Justification of choice of data or description of measurement methods and procedures applied	Aboveground palm biomass (in kg) was calculated using different genus and species-specific allometric equations for the palms identified in the plots. The above-ground biomass for each palm was converted from kilograms to metric tons (by dividing by 1000), followed by a conversion of total aboveground biomass to aboveground carbon stock by multiplying the mass by the carbon fraction of biomass (0.47). The aboveground biomass data collected was conducted using a nested circular plot design. Because of this, the biomass for the trees and palms of each diameter class used in this

	design were summed and then a scaling factor was applied to estimate the biomass on a per hectare basis. $Scaling\ factor = \frac{10,000\ m^2}{\pi * (radius\ in\ meters\ of\ nested\ plot)^2}$ The per hectare biomass for palms in each plot was then averaged across the plots to estimate carbon stocks in aboveground biomass in palms in the forests of the project area. To get the value in tonnes of carbon dioxide equivalent, the value was multiplied by the molecular weight conversion of carbon to carbon dioxide ($^{44}/_{12}$).
Purpose of data	Calculation of baseline and project emissions
Comments	-
Data / parameter	$C_{BB,tree}$
Data unit	t CO ₂ e ha ⁻¹
Description	Carbon stock in belowground biomass in trees
Source of data	Carbon stock in aboveground biomass in trees and root-to-shoot ratio
Value applied	22.5
Justification of choice of data or description of measurement methods and procedures applied	The carbon stock of aboveground biomass of trees is multiplied by the root-to-shoot ratio.
Purpose of data	Calculation of baseline and project emissions
Comments	-
Data / parameter	$BDia_{SDWL,sp}$
Data unit	cm
Description	Basal diameter of standing dead tree / from sample plot <i>sp</i>

Source of data	Field measurements from sample plots
Value applied	Unique values recorded for each standing dead tree in the tree measurements database
Justification of choice of data or description of measurement methods and procedures applied	Measured at ground level
Purpose of data	Calculation of baseline and project emissions
Comments	-

Data / parameter	$H_{SWDI,sp}$
Data unit	m
Description	Height of standing dead tree i from sample plot sp
Source of data	Field measurements from sample plots
Value applied	Unique value for each standing dead tree measured
Justification of choice of data or description of measurement methods and procedures applied	Height measured from ground level to the top of a standing bole. Height is measured using a clinometer.
Purpose of data	Calculation of baseline and project emissions
Comments	-

Data / parameter	D_{DWdc}
Data unit	t d.m. m ⁻³
Description	Mean wood density of dead wood in the density class (dc) – sound (1), intermediate (2), and rotten (3) of tree i from sample plot sp
Source of data	Peer-reviewed scientific article (Pfeifer et al., 2015) on deadwood biomass in tropical humid forests

Value applied		
	Decay Class	Mean Wood Density (t m ⁻³)
	Sound	0.49
	Intermediate	0.37
	Rotten	0.21
Justification of choice of data or description of measurement methods and procedures applied	Values for mean wood density of dead wood in tropical forests were taken from Pfeifer et al (2015). This study identified wood density for 5 decay classes as shown in the below table (taken from Table 1 in the study) ²² .	
	Decay class	Description
	1	Little decay, bark cover extensive, leaves and fine twigs present
	2	No leaves and fine twigs, bark starting to fall off, logs relatively undecayed
	3	No bark and few branch stubs (not moving when pulled), sapwood decaying
	4	No branches and bark, outer wood case hardened, inner wood decomposing
	5	Wood often scattered across the soil surface, logs elliptical in cross-section
	The average of the wood densities for decay classes 1 and 2 in this table was taken to estimate the wood density the sound (1) density class. The wood density of decay class 3 in the table above was applied for the intermediate (2) density class. The average of the wood densities 4 and 5 in this table was taken to estimate the wood density for the rotten (3) density class.	
Purpose of data	Calculation of baseline and project emissions	

²² Values presented as g cm⁻³ in the study (1 g cm⁻³ = 1 t m⁻³)

Comments	-
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Data / parameter	<i>Dia</i>
Data unit	cm
Description	Diameter of piece n of dead wood along the transect in plot
Source of data	Field measurements in sample transects
Value applied	Unique to each piece of lying dead wood
Justification of choice of data or description of measurement methods and procedures applied	Four 25-meter line transects were established in each sample plot. Because of the density of the forests in the project area, the project team considered this more efficient and would cause less disturbance to the surrounding forest than establishing two 50-meter transects. The diameters were measured, using calipers of the lying dead wood (≥ 10 cm diameter) intersecting the lines at each point. The diameter was only measured (a) if more than 50% of the log was above ground and (b) the sampling line crosses through at least 50% of the diameter of the piece of wood. If the piece of wood was hollow at the intersection point, it was conservatively excluded.
Purpose of data	Calculation of baseline and project emissions
Comments	-

Data / parameter	C_{DW}
Data unit	t CO ₂ e ha ⁻¹
Description	Carbon stock in dead wood
Source of data	Field measurements
Value applied	4.6
Justification of choice of data or description of	Carbon stock calculated from both standing and lying dead wood in each plot.

measurement methods and procedures applied	The per hectare deadwood carbon stock in each plot was then averaged across the plots to estimate carbon stocks in deadwood in the forests of the project area. To get the value in tonnes of carbon dioxide equivalent, the value was multiplied by the molecular weight conversion of carbon to carbon dioxide ($^{44}/_{12}$).
Purpose of data	Calculation of project emissions
Comments	-

Data / parameter	$C_{SOCsample,sp}$
Data unit	g C/100 g soil (fine fraction < 2 mm)
Description	Soil organic carbon of the sample in g C/100 g soil.
Source of data	Field-based data collection and laboratory determination
Value applied	Unique to each sample. The average of all the samples was 2.70 g C/100 g of soil.
Description of measurement methods and procedures to be applied	For soil carbon determination, soil samples were collected to a depth of 30 cm at 4 locations within each plot. See Appendix 25A for detailed field methods. The samples were analyzed in the lab using the Walkley-Black method. WCS Belize field team collected data in the field, and Hummingbird Research Laboratory of the University of Belize conducted the lab work.
Purpose of data	Calculation of baseline and project emissions
Comments	-

Data / parameter	$BD_{sample,sp}$
Data unit	g cm ⁻³
Description	Bulk density of fine (< 2 mm) fraction of mineral soil per unit volume of sample in g cm ⁻³ ; bulk density equals the oven dry weight of the fine fraction (< 2 mm) of the soil core divided by the core volume
Source of data	Field-based data collection and laboratory determination

Value applied	Unique to each sample. The average of all the samples was 2.05 g cm ⁻³ of soil.
Justification of choice of data or description of measurement methods and procedures applied	For bulk density determination, samples (cores) of known volume were collected in the field by the WCS Belize field team as detailed in the field methods in Appendix 25A. The samples were analyzed at the Hummingbird Research Laboratory of the University of Belize. Based on the lab work done, the bulk density of each sample was estimated as: $BD_{sample} = \frac{ODW - RF}{CV}$ Where: BD_{sample} = Bulk density of the < 2 mm fraction, in grams per cubic centimeter (g/cm³) ODW = Oven dry mass total sample in grams CV = Core volume in cm³ RF = Mass of coarse fragments (> 2 mm) in grams
Purpose of data	Calculation of baseline and project emissions
Comments	-

Data / parameter	$C_{SOC_{forest}}$
Data unit	t CO ₂ e ha ⁻¹
Description	Carbon stock in soil organic carbon in project area forests
Source of data	Field-based data collection and laboratory-based analysis
Value applied	535.5
Justification of choice of data or description of measurement methods and procedures applied	The following equation modified from equation 1 in VMD0004 to estimate the carbon stock in soil organic carbon for each plot: $C_{SOC,sp} = C_{SOCsample,sp} * BD_{sample,sp} * Dep_{sample,sp} * 100$ Where:

	$C_{SOC,sp}$	= Carbon stock in soil organic carbon for sample plot sp ; t C ha ⁻¹
	$C_{SOCsample,sp}$	= Soil organic carbon of the sample in sample plot sp ; determined in the laboratory in g C/100 g soil (fine fraction < 2 mm)
	$BD_{sample,sp}$	= Bulk density of fine (<2 mm) fraction of mineral soil in sample plot sp ; determined in the laboratory in g fine fraction cm ⁻³ total sample volume
	$Dep_{sample,sp}$	= Depth to which soil sample is collected in sample plot sp ; cm
	sp	= 1, 2, 3, ... P_i sample plots
The per hectare soil organic carbon stock in each plot was then averaged across the plots to estimate carbon stocks in soil organic carbon in the forests of the project area. To get the value in tonnes of carbon dioxide equivalent, the value was multiplied by the molecular weight conversion of carbon to carbon dioxide (⁴⁴ / ₁₂).		
Purpose of data	Calculation of baseline and project emissions	
Comments	-	

Data / parameter	F_{LU}
Data unit	Dimensionless
Description	Land use factor after conversion
Source of data	Table 5.5 of Chapter 5 in Volume 4 of IPCC (2019)
Value applied	0.83
Justification of choice of data or description of measurement methods and procedures applied	Value for long-term cultivated use in tropical moist/wet climates
Purpose of data	Calculation of baseline emissions

Comments	-
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Data / parameter	F_{MG}
Data unit	Dimensionless
Description	Management factor after conversion
Source of data	Table 5.5 of Chapter 5 in Volume 4 of IPCC (2019)
Value applied	1.0
Justification of choice of data or description of measurement methods and procedures applied	Value for full till, for dry and moist/wet climates. Since the land in project area would have been converted to industrial agriculture, it is reasonable to assume that full tillage practices would have been applied. Consistent with the common agricultural practice of full tillage in Belize (Chi et al., 2017).
Purpose of data	Calculation of baseline emissions
Comments	-

Data / parameter	F_i
Data unit	Dimensionless
Description	Input factor after conversion,
Source of data	Table 5.5 of Chapter 5 in Volume 4 of IPCC (2019)
Value applied	1.0
Justification of choice of data or description of measurement methods and procedures applied	Value for medium inputs for dry and moist/wet climates. This value is considered conservative as it is probable that the soil inputs would be in fact be low since crop residue burning is common practice in Belize (Chi et al., 2017).
Purpose of data	Calculation of baseline emissions
Comments	-

Data / parameter	$C_{SOC,PD-BSL}$
Data unit	t CO ₂ e ha ⁻¹
Description	Post-deforestation carbon stock in soil organic carbon in baseline scenario
Source of data	Carbon stock in soil organic carbon in project area forests and IPCC (2019) stock change factors
Value applied	444.5
Justification of choice of data or description of measurement methods and procedures applied	The following equation modified from equation 3 in VMD0004 was applied: $C_{SOC,PD-BSL_t} = C_{SOC} * F_{LU} * F_{MF} * F_I$ The per hectare soil organic carbon stock in each plot was then averaged across the plots to estimate carbon stocks in soil organic carbon in the forests of the project area. To get the value in tonnes of carbon dioxide equivalent, the value was multiplied by the molecular weight conversion of carbon to carbon dioxide (⁴⁴/₁₂).
Purpose of data	Calculation of baseline emissions
Comments	-

Data / parameter	$C_{AgBiomass}$
Data unit	t CO ₂ e ha ⁻¹
Description	Ex-ante post-deforestation biomass carbon stock
Source of data	Table 5.8 of Chapter 5 in Volume 4 of IPCC (2019)
Value applied	17.2
Justification of choice of data or description of measurement methods and procedures applied	Carbon stocks in biomass after conversion to annual cropland. In the IPCC table, the value of 4.7 is presented in tonnes of C. This value is multiplied by the molecular weight conversion of carbon to carbon dioxide to get tonnes of carbon dioxide equivalent.
Purpose of data	Calculation of baseline emissions

Comments	-
Data / parameter	$\Delta C_{BSL,CS,t}$
Data unit	t CO ₂ e
Description	Sum of the baseline carbon stock change in all terrestrial pools in year t
Source of data	-
Value applied	Refer to “Ex ante VCU calcs” tab in Carbon Calculations spreadsheet in Appendix 22.
Justification of choice of data or description of measurement methods and procedures applied	To estimate the baseline carbon stock change in the terrestrial pools in different years of the project, the following equation was applied based on Equation 12 in VMD0006. $\Delta C_{BSL,CS,t} = AA_{planned,t} * (\Delta C_{AB_{tree}} + \Delta C_{AB_{palm}} + \Delta C_{AgBiomass}) + (\sum_{t-10}^t AA_{planned,t}) * (\Delta C_{BB_{tree}} + \Delta C_{DW}) * (\frac{1}{10}) + (\sum_{t-20}^t AA_{planned,t}) * (\Delta C_{SOC}) * (\frac{1}{20})$ Where: $AA_{planned,t}$ = Annual area of baseline planned deforestation in year t; ha $\Delta C_{AB_{tree}}$ = Baseline carbon stock change in aboveground tree biomass; t CO₂e ha⁻¹ $\Delta C_{BB_{tree}}$ = Baseline carbon stock change in belowground tree biomass; t CO₂e ha⁻¹ $\Delta C_{AB_{palm}}$ = Baseline carbon stock change in aboveground palm biomass; t CO₂e ha⁻¹ $\Delta C_{AgBiomass}$ = Baseline carbon stock change in biomass in agricultural production area; t CO₂e ha⁻¹ ΔC_{DW} = Baseline carbon stock change in dead wood; t CO₂e ha⁻¹ ΔC_{SOC} = Baseline carbon stock change in soil organic carbon; t CO₂e ha⁻¹

Purpose of data	Calculation of baseline emissions
Comments	-

Data / parameter	$A_{burn,t}$
Data unit	ha
Description	Area burnt in year t
Source of data	Based on the projected annual proportion of land that will be deforested during year t, $D\%_{plannedt}$
Value applied	1188.6 ha per year for the first 9 years. In the 10th year, the rate of deforestation is 97.9 ha as that is the remaining area of forest.
Justification of choice of data or description of measurement methods and procedures applied	When forests are converted to agriculture in Belize, the land is bulldozed then burned. As such, this parameter is set to the same area as the area of planned deforestation.
Purpose of data	Calculation of baseline emissions
Comments	-

Data / parameter	$COMF$
Data unit	Dimensionless
Description	Combustion factor
Source of data	Table 2.6 of Chapter 2 in Volume 4 of IPCC (2019)
Value applied	0.55
Justification of choice of data or description of measurement methods and procedures applied	Value for all secondary tropical forests. Given the historic frequency of disturbance in the project area, this value was applied.
Purpose of data	Calculation of baseline and project emissions

Comments	-
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Data / parameter	G_g
Data unit	kg t ⁻¹ d.m. burnt
Description	Emission factor for gas g
Source of data	Table 2.6 of Chapter 4 in IPCC (2019)
Value applied	CH ₄ : 6.8 N ₂ O: 0.20
Justification of choice of data or description of measurement methods and procedures applied	Values for tropical forests selected
Purpose of data	Calculation of baseline and project emissions
Comments	The unit for the values presented in the IPCC is g kg ⁻¹ d.m. burnt. Because these values are multiplied aboveground biomass stocks that are in tonnes of dry matter, these emission factor values were converted to kg t ⁻¹ d.m. burnt. The conversion rate is 1.

Data / parameter	GWP_g
Data unit	t CO ₂ /t gas g
Description	100-year global warming potential for non-CO ₂ greenhouse gasses
Source of data	Table 7.SM.6 in the Earth's Energy Budget, Climate Feedbacks and Climate Sensitivity Supplementary Material of the Sixth Assessment Report of the IPCC (Smith et al., 2021).
Value applied	27.9 for methane (CH ₄) and 273 for Nitrous oxide (N ₂ O)
Justification of choice of data or description of measurement methods and procedures applied	-

Purpose of data	Calculation of baseline and project emissions
Comments	-
Data / parameter	$E_{biomassburn,t}$
Data unit	t CO ₂ e
Description	Greenhouse gas emissions due to biomass burning in year t of each GHG (CH ₄ and N ₂ O)
Source of data	-
Value applied	For years 1-9 of project: 8.546 For year 10: 704
Justification of choice of data or description of measurement methods and procedures applied	To estimate these non-CO₂-emissions from burning of remaining aboveground biomass, VMD0013 v1.3 (E-BPB) is applied. In particular, Equation 1 is applied. $E_{biomassburn,t} = \sum_{g=1}^G \left((A_{burn,t} * B_t * COMF * G_g) * 10^{-3} \right) * GWP_g$ Where: $A_{burn,t}$ = Area burnt in year t, ha B_t = Average aboveground biomass stock before burning stratum i, year, t d.m. ha⁻¹ $COMF$ = Combustion factor for stratum i, unitless G_g = Emission factor for stratum i for gas g, kg t⁻¹ d.m. burnt GWP_g = Global warming potential for gas g, t CO₂/t gas g g = 1, 2, 3 ... G greenhouse gases including carbon dioxide¹, methane and nitrous oxide (unitless) t = 1, 2, 3, ... t* time elapsed since the start of the project activity (years)

	Given the fact that the burning is part of the practice to clear the land for agricultural production, $A_{burni,t}$ is the same as annual area of deforestation $AA_{planned,i,t}$.
Purpose of data	Calculation of baseline emissions
Comments	-

Data / parameter	$GHG_{BSL,t}$
Data unit	t CO ₂ e
Description	Greenhouse gas emissions as a result deforestation activities within the project boundary in year t
Source of data	-
Value applied	For years 1-9 of project: 8.546 For year 10: 704
Justification of choice of data or description of measurement methods and procedures applied	GHG emissions are calculated using Equation 15 of VMD0006: $GHG_{BSL,t} = E_{FC,t} + E_{BiomassBurn,t} + N_2O_{direct-N,t}$ Where: $GHG_{BSL,t}$ = Greenhouse gas emissions as a result deforestation activities within the project boundary in year t; t CO₂e $E_{FC,t}$ = Net CO₂e emission from fossil fuel combustion in year t; t CO₂e $E_{BiomassBurn,t}$ = Non-CO₂ emissions due to biomass burning in year t; t CO₂e $N_2O_{direct-N,i,t}$ = Direct N₂O emission as a result of nitrogen application on the alternative land use within the project boundary in year t; t CO₂e Emissions from transportation fuel use ($E_{FC,i,t}$) are conservatively omitted in the baseline scenario. N₂O emissions from nitrogen application for agricultural production ($N_2O_{direct-N,i,t}$) is also conservatively excluded. As such, $GHG_{BSL,t} = E_{BiomassBurn,t}$

Purpose of data	Calculation of baseline emissions
Comments	-
<i>Data / parameter</i>	$\Delta C_{BSL,REDD}$
Data unit	t CO ₂ e
Description	Net GHG emissions in the REDD baseline scenario in year t
Source of data	-
Value applied	Refer to “Ex ante VCU calcs” tab in Carbon Calculations spreadsheet in Appendix 22.
Justification of choice of data or description of measurement methods and procedures applied	To calculate $\Delta C_{BSL-REDD}$, the following equation is applied: $\Delta C_{BSL-REDD} = \Delta C_{BSL,CS,t} + GHG_{BSL,t}$ Where: $\Delta C_{BSL,CS,t}$ = Sum of the baseline carbon stock change in all terrestrial pools in year t, t CO₂e $GHG_{BSL,t}$ = Greenhouse gas emissions as a result of deforestation activities within the project boundary in year t, t CO₂e
Purpose of data	Calculation of baseline emissions
Comments	-

<i>Data / parameter</i>	$Uncertainty_{BSL,RATE}$
Data unit	%
Description	Cumulative uncertainty in the baseline rate of deforestation
Source of data	Calculated from field data
Value applied	31.7%

Justification of choice of data or description of measurement methods and procedures applied	Equal to the 95% confidence interval as a percentage of the mean of the area deforested in each proxy area divided by the number of years over which deforestation occurred in each proxy.
Purpose of data	Calculation of uncertainty of baseline emissions
Comments	-

Data / parameter	$E_{REDD-BSL,SS,pool\#}$						
Data unit	t CO ₂ e						
Description	Carbon stock and greenhouse gas source in the REDD baseline scenario						
Source of data	-						
Value applied	Tree AGB	Tree BGB	Palm AGB	Dead wood	Soil	Post-defo cropland	Biomass burning
	79.2	22.5	11.0	4.6	535.5	17.2	7.2
Justification of choice of data or description of measurement methods and procedures applied	-						
Purpose of data	Calculation of uncertainty of baseline emissions						
Comments	-						

Data / parameter	$Uncertainty_{REDD\ BSL,SS,pool\#}$
Data unit	%
Description	Percentage uncertainty for forest carbon stocks in different pools and greenhouse gas sources
Source of data	-

Value applied	Tree AGB	Tree BGB	Palm AGB	Dead wood	Soil	Post-defo cropland	Biomass burning
	13.8%	13.7%	52.7%	32.2%	11.8%	5.3%	49.1%
Justification of choice of data or description of measurement methods and procedures applied	The uncertainty for each pool and GHG source is equal to the 95 th confidence interval as a percentage of the mean of the value						
Purpose of data	Calculation of uncertainty of baseline emissions						
Comments	-						

Data / parameter	$Uncertainty_{REDD-BSL,SS}$
Data unit	%
Description	Percentage uncertainty in the combined carbon stocks and greenhouse gas sources in the REDD baseline scenario
Source of data	-
Value applied	9.7%
Justification of choice of data or description of measurement methods and procedures applied	To estimate the uncertainty of carbon stocks and greenhouse gas sources, the following equation based on Equation 4 from X-UNC is applied: $Uncertainty_{REDD-BSL,SS} = \frac{\sqrt{\sum_1^n (Uncertainty_{REDD-BSL,SS,pool\#} * E_{REDD-BSL,SS,pool\#})^2}}{\sum_1^n E_{REDD-BSL,SS,pool\#}}$ Where: $Uncertainty_{REDD-BSL,SS,pool\#}$ = Percentage uncertainty for carbon stocks and greenhouse gas sources in the REDD baseline scenario, %

	$E_{REDD-BSL,SS,i,pool\#}$	= Carbon stock and greenhouse gas source in the REDD baseline scenario, t CO _{2e}
Purpose of data	Calculation of uncertainty of baseline emissions	
Comments	-	

Data / parameter	$Uncertainty_{REDD-BSL,t*}$	
Data unit	%	
Description	Cumulative uncertainty in REDD baseline up to year t*	
Source of data	-	
Value applied	33.1%	
Justification of choice of data or description of measurement methods and procedures applied	To estimate the total uncertainty, Equation 6 in VMD0017 is applied: $Uncertainty_{REDD-BSL,t*} = \sqrt{Uncertainty_{BSL,RATE,t*}^2 + Uncertainty_{REDD-BSL}^2}$ Where: $Uncertainty_{BSL,RATE,t*}$ = Cumulative uncertainty in the baseline rate of deforestation up to year t, % $Uncertainty_{REDD-BSL,SS}$ = Total uncertainty in the combined carbon stocks in the REDD baseline scenario, % t = 1, 2, 3, ...t* time elapsed since the start of the project activity, years	
Purpose of data	Calculation of uncertainty of baseline emissions	
Comments	-	

Data / parameter	PF_c
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Data unit	Dimensionless
Description	Proportion of available area for production of commodity that is currently forested
Source of data	Published literature, data, and expert opinion on sugarcane cultivation and processing.
Value applied	32%
Justification of choice of data or description of measurement methods and procedures applied	The area of the country that is potentially suitable for sugarcane production was identified using factors including elevation, distance from processing mills, and protection status. The proportion of forested areas that are suitable for sugar cane cultivation was then calculated.
Purpose of data	Calculation of leakage
Comments	

Data / parameter	<i>LK_{CP-ME}</i>
Data unit	Dimensionless
Description	Leakage factor for displacement of class of planned deforestation agents
Source of data	Expert opinion and spatial data files of the landscape
Value applied	0.4
Justification of choice of data or description of measurement methods and procedures applied	The only limiting factors to the production of sugarcane identified were distance to mill and elevation. The key factor in determining sugarcane yield is what agricultural best management practices are applied. As such, the average productivity of alternative areas was identified to be $\pm 15\%$ as the average productivity in the project area.
Purpose of data	Calculation of leakage
Comments	-

Data / parameter	LK_{MAF}
Data unit	Dimensionless
Description	Leakage management adjustment factor
Source of data	-
Value applied	1
Justification of choice of data or description of measurement methods and procedures applied	The other areas where forests could be converted to sugarcane production are beyond the control of the project proponent. Therefore, no leakage management activities could be applied to minimize displacement.
Purpose of data	Estimating Leakage
Calculation method	Calculation of leakage
Comments	-

Data / parameter	<i>Buffer%</i>
Data unit	%
Description	Buffer withholding percentage
Source of data	Risk classification identified through the use of AFOLU Non-Permanence Risk Tool
Value applied	12%
Justification of choice of data or description of measurement methods and procedures applied	-
Purpose of data	Determination of buffer contributions
Comments	-

3.3.2 Data and Parameters Monitored (VCS, 3.16)

Data / parameter	Project Forest Cover Benchmark Map (<i>FCBM</i>)
Data unit	-
Description	Map showing the location of forest land within the project area at the beginning of each monitoring period.
Source of data	Remote sensing in combination with ground truthing by local experts on the project area
Description of measurement methods and procedures applied	The FCBM was created by using a combination of multispectral Landsat 9 and Sentinel-2 images acquired on October 31, 2021. A deep learning pixel classification approach was employed to classify the landscape into seven land cover types: Forest Lands, Wetlands, Croplands, Shrublands, Grasslands, Forest Cover Regrowth, Other Lands and Inland Water Bodies. To produce the FCBM, all forest lands areas were reclassified as forest, and all other land cover classes were reclassified as non-forest. In future monitoring periods, should a substantially different remote sensing data source be employed in FCBM development, cross-calibration procedure will be undertaken to minimize error due to data compatibility issues. A complete description of the process to develop this map can be found in Appendix 10.
Frequency of monitoring/recording	Monitoring will occur at least every 5 years prior to each verification event.
Value applied	-
QA/QC procedures	Prior to analysis, remotely sensed data will be pre-processed according to guidance laid out in GOF-C-GOLD (2016). Preprocessing steps will include running satellite imagery through geometric corrections, cloud and cloud shadow detection and removal, and radiometric corrections. Visual interpretation by an experienced analyst will be employed when classifying remote sensed images for the creation of LULC maps. Where Landsat images are ambiguous or obscured by clouds, additional imagery will be used to aid in interpretation. Subject matter experts with significant field experience in the project area will also provide input and assistance during the mapping process.

Accuracy assessments for each map will be produced to report on the classification accuracy of areas identified as forest and non-forest. A statistical sampling approach will be used in which random points are generated within the project area. Depending on the distribution of predicted land cover change in the evaluated FCMM, various sampling strategies may be employed, such as stratified random with equal samples or with area-weighted samples.

At each point, the land cover (i.e., forest, non-forest or deforested) designated in the land use maps will be extracted and compared to the land cover identified by a secondary satellite image analyst with no prior experience with the dataset. The percent classification accuracy will be reported for the forest, non-forest and deforested areas in the map. If the accuracy does not meet the current requirements of the FCMM for the methodology (90% in VMD0015 v2.3), it will be revised until meeting the required accuracy threshold.

A geodatabase will be produced for each independent verification audit, and a report of the results will be produced for each independent verification audit.

During the remotely sensed data collection and cleaning process, the following meta data will be gathered and included in documentation:

- a. Data sources and pre-processing: Type, resolution, source, and acquisition date of the remotely sensed data (and other data) used; geometric, radiometric, and other corrections performed will be recorded. Additional details including any spectral bands and indexes used (such as NDVI); projection and parameters used to geo-reference the images; error estimate of the geometric correction; software and software version used to perform tasks.
- b. Data classification: Definition of the forest and non-forest classification, the criteria for visually determining the classification, coordinates and description of the ground-truth data collected for training purposes and any ancillary data used in the classification will be documented. Any additional spatial data used to supplement Landsat image that were obscured by clouds or ambiguous will be documented.

	c. <u>Classification accuracy assessment</u>: The methods, data, and location of sampling points used in the accuracy and final classification of accuracy will be reported. d. <u>Changes in Data sources and pre-processing / Data classification</u>: in the event that remotely sensed data sources or the uses of data sets are changed, each change and its justification will be documented; and when data from new satellites are used documentation will follow a) to c) above. All work will be conducted by experts with sufficient domain knowledge of imagery analysis and local forest conditions to make reliable, accurate determinations of land cover changes relevant to the production of the FCBM.
Purpose of data	Calculation of baseline and project emissions
Calculation method	-
Comments	-

Data / parameter	Project Forest Cover Monitoring Map
Data unit	-
Description	Map showing the location of forest land within the project area at the end of each monitoring period. If within the project area some forest land is cleared, the monitoring map must show the deforested areas at each monitoring event.
Source of data	Remote sensing in combination with ground truthing by local experts on the project area
Description of measurement methods and procedures to be applied	In general, the approach employed will likely include the collection of wall-to-wall remotely sensed data and analysis into a dichotomous deforestation/non-deforestation map. Regardless of the technology employed, fundamental principles will be adhered to: • Data collected will be spatially and temporally inclusive and comprehensively representative of the project area and monitored period.

	• Data source and type (e.g. optical, radar, lidar) will be selected based on well-established, documented best practices and those that have demonstrated clear utility in identifying forests considering the forest definition of the project. • Analysis will typically include a combination of machine-aided and human classification. • Only the project area, as defined at the start date of the project, will be monitored. • Analysis will be fully described and accompany each monitoring report, including specific data sources and techniques, employed in each monitoring period • The accuracy of the resulting FCMM, and the associated estimate of deforested area, will be independently evaluated using a statistical sampling approach
Frequency of monitoring/recording	Monitoring will occur at least every 5 years prior to each verification event.
Value applied	-
Monitoring equipment	-
QA/QC procedures to be applied	Prior to analysis, remotely sensed data will be pre-processed according to guidance laid out in GOF-C-GOLD (2016). Preprocessing steps will include running satellite imagery through geometric corrections, cloud and cloud shadow detection and removal, and radiometric corrections. Visual interpretation by an experienced analyst will be employed when classifying remote sensed images for the creation of LULC maps. Where Landsat images are ambiguous or obscured by clouds, additional imagery will be used to aid in interpretation. Subject matter experts with significant field experience in the project area will also provide input and assistance during the mapping process. Accuracy assessments for each map will be produced to report on the classification accuracy of areas identified as forest and non-forest. A statistical sampling approach will be used in which random points are generated within the project area. Depending

on the distribution of predicted land cover change in the evaluated FCMM, various sampling strategies may be employed, such as stratified random with equal samples or with area-weighted samples.

At each point, the land cover (i.e., forest, non-forest or deforested) designated in the land use maps will be extracted and compared to the land cover identified by a secondary satellite image analyst with no prior experience with the dataset. The percent classification accuracy will be reported for the forest, non-forest and deforested areas in the map. If the accuracy does not meet the current requirements of the FCMM for the methodology (90% in VMD0015 v2.3), it will be revised until meeting the required accuracy threshold.

A geodatabase will be produced for each independent verification audit, and a report of the results will be produced for each independent verification audit.

During the remotely sensed data collection and cleaning process, the following meta data will be gathered and included in documentation:

- e. Data sources and pre-processing: Type, resolution, source, and acquisition date of the remotely sensed data (and other data) used; geometric, radiometric, and other corrections performed will be recorded. Additional details including any spectral bands and indexes used (such as NDVI); projection and parameters used to geo-reference the images; error estimate of the geometric correction; software and software version used to perform tasks.
- f. Data classification: Definition of the forest and non-forest classification, the criteria for visually determining the classification, coordinates and description of the ground-truth data collected for training purposes and any ancillary data used in the classification will be documented. Any additional spatial data used to supplement Landsat image that were obscured by clouds or ambiguous will be documented.
- g. Classification accuracy assessment: The methods, data, and location of sampling points used in the accuracy and final classification of accuracy will be reported.

	h. <u>Changes in Data sources and pre-processing / Data classification</u>: in the event that remotely sensed data sources or the uses of data sets are changed, each change and its justification will be documented; and when data from new satellites are used documentation will follow a) to c) above. All work will be conducted by experts with sufficient domain knowledge of imagery analysis and local forest conditions to make reliable, accurate determinations of land cover changes relevant to the production of the FCBM.
Purpose of data	Calculation of project emissions
Calculation method	-
Comments	-

Data / parameter	$A_{DefPA,u,t}$
Data unit	Ha
Description	Area of recorded deforestation within the Project Activity Instance that is converted to land use u in year t.
Source of data	Forest Cover Monitoring Map
Description of measurement methods and procedures to be applied	-
Frequency of monitoring/recording	Monitoring will occur at least every 5 years prior to each verification event.
Value applied	Determined at monitoring event
Monitoring equipment	-
QA/QC procedures to be applied	-
Purpose of data	Calculation of project emissions
Calculation method	-

Comments	This is presumed to be zero ex ante. The project has in place a clear management strategy, infrastructure, and personnel in place to restrict access to the project area for the purposes of harvesting trees.
Data / parameter	$C_{P,post,u}$
Data unit	t CO ₂ e ha ⁻¹
Description	Carbon stock in all pools in post-deforestation land use u
Source of data	-
Description of measurement methods and procedures to be applied	For each post-deforestation land use (u), the long-term carbon stock will be estimated for the same pools as those included in the baseline pre-deforestation carbon stock estimate (described in section 3.2.1.2.1). When agriculture is the post-deforestation land use, the same values used to estimate post-deforestation carbon stocks in the baseline scenario (described in section 3.2.1.2.2) will be applied. In the event that there are other post-deforestation land uses, carbon stocks will be measured and estimated following the methods in VMD001, VMD002, and VMD004. The project may elect to conservatively apply a post deforestation stock associated with agriculture in the case that land use is not readily apparent at the end of the monitored period. This is conservative because agriculture has the lowest carbon stocks of any non-deforestation land use identified in the vicinity of the project area.
Frequency of monitoring/recording	Monitoring will occur at least every 5 years prior to each verification event.
Value applied	Determined at monitoring event
Monitoring equipment	-
QA/QC procedures to be applied	-
Purpose of data	Calculation of project emissions
Calculation method	-

Comments	-
Data / parameter	$\Delta C_{P,DefPA,t}$
Data unit	t CO ₂ e
Description	Net carbon stock change as a result of deforestation in the project area in year <i>t</i>
Source of data	-
Description of measurement methods and procedures to be applied	-
Frequency of monitoring/recording	Monitoring will occur at least every 5 years prior to each verification event.
Value applied	Determined at monitoring event
Monitoring equipment	-
QA/QC procedures to be applied	-
Purpose of data	Calculation of project emissions
Calculation method	To estimate total emissions due to forest cover loss during the monitoring period, Equation 3 from VMD0015 v 2.3 will be applied: $\Delta C_{P,DefPA,t} = \sum_{u=1}^U (A_{DefPA,u,t} * \Delta C_{pools,P,Def,u})$ Where: $\Delta C_{P,DefPA,t}$ = Net carbon stock change as a result of deforestation in the project area in year <i>t</i>, t CO₂e $A_{DefPA,u}$ = Area of recorded deforestation in the project area converted to land use <i>u</i> in year <i>t</i>, ha $\Delta C_{pools,P,Def,u,t}$ = Net carbon stock changes in all pools in the project case in land use <i>u</i> in year <i>t</i>, t CO₂e ha⁻¹

Comments	-
Data / parameter	$A_{DisPA,q,t}$
Data unit	Ha
Description	Area impacted by natural disturbance in the project area converted to natural disturbance stratum q in year t
Source of data	Forest patrols, drones, and remote sensing
Description of measurement methods and procedures to be applied	Details of the measurement methods can be found in section 3.3.3.3.2.
Frequency of monitoring/recording	Monitoring will occur at least every 5 years prior to each verification event.
Value applied	Determined at monitoring event
Monitoring equipment	-
QA/QC procedures to be applied	Details can be found in section 3.3.3.3.2.
Purpose of data	Calculation of project emissions
Calculation method	-
Comments	-

Data / parameter	$C_{ABtree,dist,q}$
Data unit	t CO ₂ e ha ⁻¹
Description	Carbon stock in aboveground tree biomass in post-natural disturbance stratum q
Source of data	Field-based data collection
Description of measurement methods	Carbon stock in aboveground tree biomass in the post-natural disturbance strata will be measured and estimated following

and procedures to be applied	methods outlined in VMD0001 and those outlined in section 3.2.1.2 Part 2. Baseline carbon stock change.
Frequency of monitoring/recording	Monitoring will occur at least every 5 years prior to each verification event.
Value applied	Determined at monitoring event
Monitoring equipment	-
QA/QC procedures to be applied	-
Purpose of data	Calculation of project emissions
Calculation method	-
Comments	Value will be used to calculate carbon stock change in post-natural disturbance stratum q .

Data / parameter	$C_{BB,tree,dist,q}$
Data unit	t CO ₂ e ha ⁻¹
Description	Carbon stock in belowground tree biomass in post-natural disturbance stratum q
Source of data	Field-based data collection
Description of measurement methods and procedures to be applied	Carbon stock in belowground tree biomass in the post-natural disturbance strata will be measured and estimated following methods outlined in VMD0001 and those outlined in section 3.2.1.2 Part 2. Baseline carbon stock change.
Frequency of monitoring/recording	Monitoring will occur at least every 5 years prior to each verification event.
Value applied	Determined at monitoring event
Monitoring equipment	-
QA/QC procedures to be applied	-
Purpose of data	Calculation of project emissions

Calculation method	-
Comments	Value will be used to calculate carbon stock change in post-natural disturbance stratum q .

Data / parameter	$C_{AB,palm,dist,q}$
Data unit	t CO ₂ e ha ⁻¹
Description	Carbon stock in aboveground palm biomass in post-natural disturbance stratum q
Source of data	Field-based data collection
Description of measurement methods and procedures to be applied	Carbon stock in aboveground palm biomass in the post-natural disturbance stratum will be measured and estimated following methods outlined in VMD0001 and those outlined in section 3.2.1.2 Part 2. Baseline carbon stock change.
Frequency of monitoring/recording	Monitoring will occur at least every 5 years prior to each verification event.
Value applied	Determined at monitoring event
Monitoring equipment	-
QA/QC procedures to be applied	-
Purpose of data	Calculation of project emissions
Calculation method	-
Comments	Value will be used to calculate carbon stock change in post-natural disturbance stratum i

Data / parameter	$C_{DW,dist,q}$
Data unit	t CO ₂ e ha ⁻¹
Description	Carbon stock in dead wood in post-natural disturbance stratum q
Source of data	Field-based data collection

Description of measurement methods and procedures to be applied	Carbon stock in dead wood biomass in the post-natural disturbance stratum will be measured and estimated following methods outlined in VMD0002 and those outlined in section 3.2.1.2 Part 2. Baseline carbon stock change.
Frequency of monitoring/recording	Monitoring will occur at least every 5 years prior to each verification event.
Value applied	Determined at monitoring event
Monitoring equipment	-
QA/QC procedures to be applied	-
Purpose of data	Calculation of project emissions
Calculation method	-
Comments	Value will be used to calculate carbon stock change in post-natural disturbance stratum i

Data / parameter	$CS_{OC, dist, q}$
Data unit	t CO ₂ e ha ⁻¹
Description	Carbon stock in soil organic carbon in post-natural disturbance stratum <i>q</i>
Source of data	Field-based data collection and laboratory-based analysis
Description of measurement methods and procedures to be applied	Carbon stock in soil organic carbon in the post-natural disturbance stratum will be measured and estimated following methods outlined in VMD0004 and those outlined in section 3.2.1.2 Part 2. Baseline carbon stock change.
Frequency of monitoring/recording	Monitoring will occur at least every 5 years prior to each verification event.
Value applied	Determined at monitoring event
Monitoring equipment	-
QA/QC procedures to be applied	-

Purpose of data	Calculation of project emissions
Calculation method	-
Comments	Value will be used to calculate carbon stock change in post-natural disturbance stratum i

Data / parameter	$A_{burn,q,t}$
Data unit	Ha
Description	Area burnt in post-natural disturbance stratum q in year t
Source of data	Forest patrols, drones, and remote sensing
Description of measurement methods and procedures to be applied	Details of the measurement methods can be found in section 3.3.3.3.2.
Frequency of monitoring/recording	Monitoring will occur at least every 5 years prior to each verification event.
Value applied	Determined at monitoring event
Monitoring equipment	-
QA/QC procedures to be applied	-
Purpose of data	Calculation of project emissions
Calculation method	-
Comments	Where the natural disturbance that occurred is fire, the area burned shall be assumed to be equal to the area impacted by natural disturbance. For stratum where the natural disturbance included fire: $A_{burn,q,i,t} = A_{DisPA,q,i,t}$

Data / parameter	$\Delta C_{P,DegW,t}$
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Data unit	t CO ₂ e
Description	Net carbon stock change as a result of degradation from illegal logging in the project area in year t
Source of data	Forest patrols
Description of measurement methods and procedures to be applied	Reconnaissance patrols conducted by WCS include identifying incidents of illegal activities (including but not limited to illegal logging), key locations, wildlife, and points of interest. The information gathered enables the team to identify hotspots and strategically plan enforcement activities. It is assumed that the entire project area is the area potentially impacted by this logging ($A_{DegW,i}$). Along the patrol routes, the rangers will identify trees that have been illegally harvested. These routes can be considered transects. Patrols walk along these routes and monitor for illegal logging within a distance of 10 meters from the transect. Locations of patrol paths and observations are recorded in the site's SMART (Spatial Monitoring and Reporting Tool) data management system. If there is no evidence that trees are being harvested during the patrols, then degradation from illegal logging is assumed to be zero. If the patrols do detect that trees are being removed during the patrols, more systematic sampling will be implemented in the area where the logging is detected. A detailed standard operating procedure will be developed to conduct this systematic sampling and quantify carbon stock changes from logging ($\Delta C_{P,DegW,t}$).
Frequency of monitoring/recording	Monitoring will occur at least every 5 years prior to each verification event.
Value applied	Determined at monitoring event
Monitoring equipment	-
QA/QC procedures to be applied	-
Purpose of data	Calculation of project emissions

Calculation method	-
Comments	-

Data / parameter	$\Delta C_{WPS-REDD}$
Data unit	t CO ₂ e
Description	Net greenhouse gas emissions within the project area under the project scenario up to year t
Source of data	-
Description of measurement methods and procedures to be applied	-
Frequency of monitoring/recording	Monitoring will occur at least every 5 years prior to each verification event.
Value applied	Determined at monitoring event
Monitoring equipment	-
QA/QC procedures to be applied	-
Purpose of data	Calculation of project emissions
Calculation method	The ex-post project emissions are estimated based on a modified version of equation 1 from VMD0015: $\Delta C_{WPS-REDD} = \sum_{t=1}^{t^*} (\Delta C_{P,DefPA,t} + \Delta C_{P,DistPA,t} + E_{biomassburn,t} + \Delta C_{P,DegW,t})$ Where: $\Delta C_{WPS-REDD}$ = Net greenhouse gas emissions within the project area under the project scenario up to year t^*, t CO₂e

	$\Delta C_{P,DefPA,t}$	= Net carbon stock change as a result of deforestation in the project area in year t , t CO ₂ e
	$\Delta C_{P,DistPA,t}$	= Net carbon stock change as a result of natural disturbance in the project case in the project area in year t , t CO ₂ e
	$E_{biomassburn,t}$	= Greenhouse gas emissions due to biomass burning in year t of each GHG (CH ₄ and N ₂ O), t CO ₂ e
	$\Delta C_{P,DegW,t}$	= Net carbon stock changes as a result of illegal logging in year t , t CO ₂ e
	t	= 1, 2, 3, ... t^* years elapsed since the start of the REDD project activity
Comments	-	

Data / parameter	$\Delta C_{LK-AS,planned}$
Data unit	t CO ₂ e
Description	Net CO ₂ emissions due to activity shifting leakage for projects preventing planned deforestation
Source of data	-
Description of measurement methods and procedures to be applied	-
Frequency of monitoring/recording	Monitoring will occur at least every 5 years prior to each verification event.
Value applied	Determined at monitoring event
Monitoring equipment	-
QA/QC procedures to be applied	-
Purpose of data	Calculation of leakage

Calculation method	Activity-shifting leakage is estimated using the following equation modified from Equation 9 of LK-ASP: $\Delta C_{LK-AS,planned} = \sum_{t=1}^{t^*} \Delta C_{BSL,REDD} * PF_c * LK_{CP-ME} * LK_{MAF}$ Where: $\Delta C_{BSL,REDD}$ = Net GHG emissions in the REDD baseline scenario in year t, t CO₂e PF_c = Proportion of available area for production of commodity that is currently forested, unitless LK_{P-ME} = Leakage factor for displacement of class of planned deforestation agents, unitless LK_{MAF} = Leakage management adjustment factor, unitless t = 1, 2, 3, ... t^* years elapsed since the start of the project activity
Comments	-

Data / parameter	NER_t
Data unit	t CO ₂ e
Description	Net GHG emission reductions of avoiding planned deforestation in year t
Source of data	-
Description of measurement methods and procedures to be applied	-
Frequency of monitoring/recording	Monitoring will occur at least every 5 years prior to each verification event.
Value applied	Determined at monitoring event
Monitoring equipment	-

QA/QC procedures to be applied	-
Purpose of data	Calculation of VCUs
Calculation method	The estimated net GHG emission reductions are based on carbon stock changes and GHG emissions estimated in the baseline scenario minus net GHG emissions in the project scenario emissions due to leakage as shown in the following equation: $NER_t = \Delta C_{BSL-REDD} - \Delta C_{WPS-REDD} - \Delta C_{LK-AS,planned,t}$ Where: $\Delta C_{BSL-REDD,t}$ = Net GHG emissions in the REDD baseline scenario in year t, t CO₂e $\Delta C_{WPS-REDD,t}$ = Net GHG emissions in the REDD project scenario in year t, t CO₂e $\Delta C_{LK-AS,planned,t}$ = Net GHG emissions due to leakage from the REDD project activity in year t, t CO₂e $\Delta C_{LK-AS,planned,t}$ = Net GHG emissions due to leakage from the REDD project activity in year t, t CO₂e
Comments	-

Data / parameter	$Adjusted_NER_t$
Data unit	t CO ₂ e
Description	Total net GHG emission reductions of avoiding planned deforestation in year t after deducting for uncertainty
Source of data	-
Description of measurement methods and procedures to be applied	-
Frequency of monitoring/recording	Monitoring will occur at least every 5 years prior to each verification event.

Value applied	Determined at monitoring event
Monitoring equipment	-
QA/QC procedures to be applied	-
Purpose of data	Calculation of VCUs
Calculation method	The following modified version of equation 22 from VMD0015 is applied: $Adjusted_NER_t = NER_t * (100\% - Uncertainty_{REDD-BSL,t} + 15\%)$ Where: NER_t = Net GHG emission reductions of avoiding planned deforestation in year t, t CO₂e $Uncertainty_{REDD-BSL,t}$ = Uncertainty in REDD baseline up in year t, %
Comments	-

Data / parameter	$Buffer_{Planned,t}$
Data unit	t CO ₂ e
Description	Total permanence buffer withholding for avoiding planned deforestation project activities in year t
Source of data	-
Description of measurement methods and procedures to be applied	-
Frequency of monitoring/recording	Monitoring will occur at least every 5 years prior to each verification event.
Value applied	Determined at monitoring event
Monitoring equipment	-

QA/QC procedures to be applied	-
Purpose of data	Determination of buffer contributions and calculation of VCUs
Calculation method	The following equation is applied: $Buffer_{Planned,t} = \Delta C_{BSL-REDD} * Buffer\%$ Where: $\Delta C_{BSL-REDD,t}$ = Net GHG emissions in the REDD baseline scenario in year t, t CO₂e $Buffer\%$ = Buffer withholding percentage, %
Comments	-

Data / parameter	VCU_t
Data unit	t CO ₂ e
Description	Number of Verified Carbon Units for year t
Source of data	-
Description of measurement methods and procedures to be applied	-
Frequency of monitoring/recording	Monitoring will occur at least every 5 years prior to each verification event.
Value applied	Determined at monitoring event
Monitoring equipment	-
QA/QC procedures to be applied	-
Purpose of data	Calculation of VCUs
Calculation method	The following equation is applied: $VCU_t = Adjusted_{NER_t} - Buffer_{Planned,t}$ Where:

	$Adjusted_NER_t$	= Total net GHG emission reductions of avoiding planned deforestation in year t after deducting for uncertainty, t CO ₂ e
	$Buffer_{Planned}$	= Total permanence buffer withholding for avoiding planned deforestation project activities in year t, tCO ₂ e
Comments	-	

3.3.3 Monitoring Plan (VCS, 3.16, 3.20)

The Maya Forest Corridor REDD project area monitoring plan for climate benefits was developed to assess compliance with the overall goals of the project and ensure proper project implementation to the different VCS methodologies applied in the project.

Specifically, monitoring is designed to ensure that emission reductions from avoiding planned deforestation are achieved.

To accomplish the overall goals and objectives the monitoring plan will implement the following monitoring tasks detailed below.

This monitoring plan will be carried out over 40 years, including 20 years after the project crediting period ends.

3.3.3.1 Organization and responsibilities of parties

WCS will be responsible for implementing all the monitoring tasks. This may include contracting qualified organizations and/or individuals to perform the tasks. These tasks will include collecting, summarizing, analyzing, and archiving all of the data required to perform the monitoring tasks.

3.3.3.2 Frequency of monitoring tasks

The tasks described below will be conducted prior to each verification event that will happen at a maximum of every 5 years.

3.3.3.3 Monitoring tasks

Following the guidance provided in VMD0015, tasks will include monitoring of forest cover changes, monitoring of loss in carbon stocks resulting from natural disturbances, monitoring of GHG emissions from wildfires (i.e., biomass burning), and estimating ex-post net carbon stock changes and greenhouse gas emissions.

3.3.3.3.1 Monitoring of forest loss and resulting emissions

This monitoring task is designed to identify and delineate transitions from forest to non-forest within the project area and account for resulting emissions due to loss of carbon stocks from monitored pools.

3.3.3.3.1.1 New data to be collected

Geospatial data will be gathered showing the location of forest land within the project area at the beginning of each monitoring period (the project forest cover benchmark map) and at the end of each monitoring period (the project forest cover monitoring map). Based on current technology, we expect these data to include medium resolution wall-to-wall spaceborne multispectral imagery, and opportunistically collected high resolution remotely sensed optical imagery. Where warranted, ground measurements of the locations of deforestation sites may also be collected.

3.3.3.3.1.2 Data collection, analysis, and QA/QC procedures

The production of an updated forest cover monitoring map (FCMM), as described in VMD0015, represents the primary means by which the area of deforestation within the monitored period will be calculated. The FCMM will be developed using analysis of remotely sensed data, using a variety of techniques as indicated by current best practices. Remote sensing remains a rapidly evolving space and best practices, sensors, and analytical tools are likely to change substantially over the course of the project.

General approach

In general, the approach employed will likely include the collection of wall-to-wall remotely sensed data and analysis into a dichotomous deforestation/non-deforestation map. Regardless of the technology employed, fundamental principals will be adhered to:

- Data collected will be spatially and temporally inclusive and comprehensively representative of the project area and monitored period.
- Data source and type (e.g. optical, radar, lidar) will be selected based on well-established, documented best practices and those that have demonstrated clear utility in identifying forests considering the forest definition of the project.
- Analysis will typically include a combination of machine-aided and human classification.
- Only the project area, as defined at the start date of the project, will be monitored.
- Analysis will be fully described and accompany each monitoring report, including specific data sources and techniques, employed in each monitoring period
- The accuracy of the resulting FCMM, and the associated estimate of deforested area, will be independently evaluated using a statistical sampling approach.

For the first monitoring period, we expect that medium resolution multispectral imagery such as Landsat and Sentinel-2 will serve as primary data sources. Current VMD0015 guidance for FCMM

creation stipulates use of medium resolution (30m or better), cloud free imagery. Landsat and Sentinel-2 data will meet these criteria. In subsequent monitored periods, should a substantially different remote sensing data source be employed in FCMM development, we will undertake a cross-calibration procedure to minimize error due to data compatibility issues.

Quality control

Prior to analysis, remotely sensed data will be pre-processed according to guidance laid out in GOF-GOLD (2016). Preprocessing steps will include running satellite imagery through geometric corrections, cloud and cloud shadow detection and removal, and radiometric corrections. Visual interpretation by an experienced analyst will be employed when classifying remote sensed images for the creation of LULC maps. Where Landsat images are ambiguous or obscured by clouds, additional imagery will be used to aid in interpretation. Subject matter experts with significant field experience in the project area will also provide input and assistance during the mapping process.

Accuracy assessments for each map will be produced to report on the classification accuracy of areas identified as forest and non-forest. A statistical sampling approach will be used in which random points are generated within the project area. Depending on the distribution of predicted land cover change in the evaluated FCMM, various sampling strategies may be employed, such as stratified random with equal samples or with area-weighted samples.

At each point, the land cover (i.e., forest, non-forest or deforested) designated in the land use maps will be extracted and compared to the land cover identified by a secondary satellite image analyst with no prior experience with the dataset. The percent classification accuracy will be reported for the forest, non-forest and deforested areas in the map. If the accuracy does not meet the current requirements of the FCMM for the methodology (90% in VMD0015 v2.3), it will be revised until meeting the required accuracy threshold.

A geodatabase will be produced for each independent verification audit, and a report of the results will be produced for each independent verification audit.

During the remotely sensed data collection and cleaning process, the following meta data will be gathered and included in documentation:

- i. Data sources and pre-processing: Type, resolution, source, and acquisition date of the remotely sensed data (and other data) used; geometric, radiometric, and other corrections performed will be recorded. Additional details including any spectral bands and indexes used (such as NDVI); projection and parameters used to geo-reference the images; error estimate of the geometric correction; software and software version used to perform tasks.
- j. Data classification: Definition of the forest and non-forest classification, the criteria for visually determining the classification, coordinates and description of the ground-truth data collected for training purposes and any ancillary data used in the classification will be documented. Any additional spatial data used to supplement Landsat image that were obscured by clouds or ambiguous will be documented.

- k. Classification accuracy assessment: The methods, data, and location of sampling points used in the accuracy and final classification of accuracy will be reported.
- l. Changes in Data sources and pre-processing / Data classification: in the event that remotely sensed data sources or the uses of data sets are changed, each change and its justification will be documented; and when data from new satellites are used documentation will follow a) to c) above.

All work will be conducted by experts with sufficient domain knowledge of imagery analysis and local forest conditions to make reliable, accurate determinations of land cover changes relevant to the production of the FCMM.

Calculation of monitored area of deforestation

The resulting FCMM will include the following classes:

- 1) Forests remaining forest
- 2) Areas deforested in a previous monitoring period
- 3) Areas deforested in the current monitored period

The FCMM will be used to calculate the total area deforested during the monitored period. This amount will be annualized by dividing by the length of the monitored period, in years, to generate $A_{DefPA,u,t}$.

Estimation of monitored emissions due to deforestation

To estimate total emissions due to forest cover loss in a given year, Equation 3 from VMD0015 v 2.3 will be applied:

$$\Delta C_{P,DefPA,t} = \sum_{u=1}^U (A_{DefPA,u,t} * \Delta C_{pools,P,Def,u})$$

Where:

$\Delta C_{P,DefPA,t}$ = Net carbon stock change as a result of deforestation in the project area in year t , t
CO₂e

$A_{DefPA,u}$ = Area of recorded deforestation in the project area converted to land use u in year t ,
ha

$\Delta C_{pools,P,Def,u,t}$ = Net carbon stock changes in all pools in the project case in land use u in year t , t
CO₂e ha⁻¹

To calculate $\Delta C_{pools,P,Def,u,t}$, the following equation will be applied:

$$\Delta C_{pools,P,Def,u,t} = C_{BSL,CS,t} - C_{P,post,u}$$

Where:

$C_{BSL,CS,t}$ = Carbon stock in all pools in the baseline case, t CO₂e ha⁻¹

$C_{P,post,u}$ = Carbon stock in all pools in the post-deforestation land use u , t CO₂e ha⁻¹

For each post-deforestation land use (u), the long-term carbon stock will be estimated for the same pools as those included in the baseline pre-deforestation carbon stock estimate (described in section 3.2.1.2.1). When agriculture is the post-deforestation land use, the same values used to estimate post-deforestation carbon stocks in the baseline scenario (described in section 3.2.1.2.2) will be applied. In the event that there are other post-deforestation land uses, carbon stocks will be measured and estimated following the methods in VMD001, VMD002, and VMD004. The project may elect to conservatively apply a post deforestation stock associated with agriculture in the case that land use is not readily apparent at the end of the monitored period. This is conservative because agriculture has the lowest carbon stocks of any non-deforestation land use identified in the vicinity of the project area.

3.3.3.3.2 Monitoring areas undergoing natural disturbance and resulting emissions

Where natural disturbances such as extreme weather or wildfires occur ex-post in the project area resulting in degradation of forest carbon stocks, the area disturbed will be delineated in GIS and the resulting emissions estimated.

3.3.3.3.2.1 New data to be collected

It will be necessary to delineate the area of disturbance such as extreme weather or fire that result in the degradation of forest carbon stocks during the monitoring period. Data will also be collected on carbon stocks within the disturbed area to estimate emissions. In situations where the impact of disturbances on forest carbon stocks varies spatially within the area where the disturbance takes place, the stratum may be further stratified based on post-natural disturbance carbon stocks.

3.3.3.3.2.2 Data collection, analysis, and QA/QC procedures

Data collection procedures will follow and be consistent with those described in VMD0015.

The area subject to disturbance will be delineated in GIS using remote sensing and field monitoring. Carbon stocks must be measured and estimated using the methods given in VMD0001, VMD0002, and VMD0003.

Forest disturbances may be identified from a range of natural causes such as fire, storms, or pests and disease outbreak. The spatial pattern and severity of such disturbances can vary widely, requiring multiple approaches for identification, delineation, and quantification.

For natural disturbance degradation monitoring, a general three-step approach will be followed, although this may be modified as technology and data availability evolve. The first step in this approach is that the project area is continuously surveilled for signs of degradation or for events that might cause degradation. This surveillance will include a combination of forest patrols, remote sensing, and records of any known events. Secondly, when a potentially degradation-causing natural disturbance is

identified, a combination of remote sensing and ground-based surveys will be undertaken to evaluate the potential need to define a degradation stratum and calculate revised carbon stocks. Finally, were it found that a new stratum is required, a field-based biomass inventory will be undertaken to calculate the revised carbon stocks and associated emissions from degradation. When conducting these post-disturbance measurements, the same QA/QC procedures described in the MFC REDD Project Area Field Monitoring and Forest Carbon Assessment Methods (Appendix 25A) will be applied.

While this approach applies generally to any potential natural disturbance, it is expected that fires and hurricanes are the events most likely to occur and thus require additional guidance.

Fire

The MFC site is regularly patrolled, and the site managers are typically aware of fires either while active or shortly after. Additionally, the project makes use of automated fire detection platforms, including the Fire Information for Resource Management System (FIRMS). Additionally, during the fire season (March to May) drones are used to monitor any potential fires. Drones will be deployed during the morning, noon and afternoon to detect potential signs of fire.

Whenever a fire is detected, either via remote sensing or ground observation, an exploratory patrol is sent to assess impact once safe to do so. In the case of small or clearly defined burned areas, the ground patrol will conduct a rapid survey of the severity of burn damage, taking opportunistic samples to record the proportion of trees suffering various degrees of fire damage.

As medium resolution remote sensing data becomes available following the event, the spatial boundaries of the burn scar will be delineated using a spectral index designed for burn monitoring, such as the Burn Area Index or the Normalized Burn ratio.

If field survey indicates that sufficient aboveground tree biomass was potentially lost from fire to warrant delineating a new stratum, a full re-inventory of the carbon stocks of the burned area will be undertaken. If this inventory confirms that tree biomass has been reduced by more than 20%, a new stratum will be defined and associated loss in tree biomass calculated.

Hurricanes

The MFC site does experience tropical storms and hurricanes of varying severity. In the case that a storm produces sustained winds of 120 km/hr or higher over an area intersecting the project area (equal to a category 1 or higher Hurricane on the Saffir-Simpson scale), a rapid assessment will be conducted of the potential for storm damage within the affected area. Hurricanes are typically widespread events in relation to the scale of the project area, and we expect that impact may result in a mix of extensive disturbance and more severe disturbance from localized gusts or tornadoes, and gradients between. Assessing both the extensive and localized severe disturbances will require a combination of approaches.

First, once it is safe to access the site, usually within days of the storm, patrols will be used to characterize the severity of damage from locations. A simplified rapid survey protocol will be employed that utilizes opportunistically selected transects and a tally of the number of trees experiencing

uprooting or breakage of large limbs or at the trunk. Drone based surveillance of transects may also be employed where safety of accessibility is a concern.

Ground based patrols will be supplemented with a time series of remotely sensed images spanning the period before and following the event. Analysis techniques will be determined by data availability, and may include multispectral analysis, NDVI time series, or visual interpretation of high-resolution imagery. The relative degree of impact apparent from remote sensing will be cross-checked to the locations of ground surveys.

If this analysis shows that impact is sufficiently severe (>20% loss in carbon stocks) and extensive (>1ha), the boundaries of a potential new forest stratification will be drawn that best approximates the spatial patterns apparent from remote sensing imagery.

A full re-inventorying of the candidate natural disturbance stratum will be undertaken using field-based forest carbon measurement techniques. These techniques may be supplemented with remote sensing derived carbon stock change maps in the future if such products become readily available. If this field inventory confirms sufficient loss of biomass to warrant the stratification, the new stratum will be defined and all related emission factors updated.

In the case that a hurricane causes widespread impact without clearly definable boundaries within the project area, the entire remaining forest area will be treated as a single new stratum and re-inventoried following the same protocol used to develop the baseline carbon stock estimates.

Carbon stock change resulting from disturbance

The net carbon stock change as a result of the disturbance is equal to the area disturbed multiplied by the emission per unit area.

$$\Delta C_{P,DistPA,t} = \sum_{q=1}^Q (A_{DisPA,q,t} * \Delta C_{P,Dist,q,t})$$

Where:

$\Delta C_{P,DistPA,t}$ = Net carbon stock change as a result of natural disturbance in the project case in the project area in year t ; t CO₂e

$\Delta C_{P,DistPA,t}$ = Net carbon stock change as a result of natural disturbance in the project case in the project area in year t ; t CO₂e

$A_{DisPA,q,i,t}$ = Area impacted by natural disturbance in post-natural disturbance stratum q , in year t ; ha

$\Delta C_{P,Dist,q,i,t}$ = Net carbon stock changes in pools as a result of natural disturbance in post- natural disturbance stratum q in year t ; t CO₂e ha⁻¹

q = 1, 2, 3, ...Q post-natural disturbance strata

t = 1, 2, 3, ... t^* years elapsed since the start of the project activity

Where the natural disturbance that occurred included fire, the area burned shall be assumed to be equal to the area impacted by natural disturbance. For stratum where the natural disturbance included fire:

$$A_{burn,q,t} = A_{DisPA,q,t}$$

Where:

$A_{DisPA,q,t}$ = Area impacted by natural disturbance in post-natural disturbance stratum q in stratum i , in year t ; ha

$A_{burn,q,t}$ = Area burnt in post-natural disturbance stratum q in stratum i , in year t ; ha

q = 1, 2, 3, ... Q post-natural disturbance strata where natural disturbance included fire

i = 1, 2, 3, ... M strata

t = 1, 2, 3, ... t^* years elapsed since the start of the project activity

The emission per unit area is equal to the difference between the stocks before the disturbance and the stocks after the natural disturbance:

$$\Delta C_{P,Dist,q,t} = C_{BSL} - C_{P,Dist,q}$$

Where:

$\Delta C_{P,Dist,q,t}$ = Net carbon stock changes in pools from natural disturbance in the project case in post-natural disturbance stratum q in year t ; t CO₂e ha⁻¹

C_{BSL} = Carbon stock in all pools in the forest pre-disturbance; t CO₂e ha⁻¹

$C_{P,Dist,q}$ = Carbon stock in pools in post-natural disturbance strata q ; t CO₂e ha⁻¹

q = 1, 2, 3, ... Q post-natural disturbance strata where natural disturbance included fire

i = 1, 2, 3, ... M strata

t = 1, 2, 3, ... t^* years elapsed since the start of the project activity

The pre-disturbance forest carbon stock (C_{BSL}) in all pools is equivalent to the pre-deforestation baseline carbon stocks described in section 3.2.1.2.1.

For each post-natural disturbance stratum (q), the carbon stock is estimated following the natural disturbance. Carbon stocks must be measured and estimated using the methods given in modules VMD0001, VMD002, and VMD0004.

$$C_{P,Dist,q} = C_{AB_tree,dist,q} + C_{BB_tree,dist,q} + C_{AB_palm,dist,q} + C_{BB_palm,dist,q} + C_{DW,dist,q} + C_{SOC,dist,q}$$

Where:

$CP_{Dist,q}$ = Carbon stock in all pools in post-natural disturbance stratum q ; t CO₂e ha⁻¹

$CAB_{tree,dist,q}$ = Carbon stock in aboveground tree biomass in post-natural disturbance stratum q ; t CO₂e ha⁻¹

$CBB_{tree,dist,q}$ = Carbon stock in belowground tree biomass in post-natural disturbance stratum q ; t CO₂e ha⁻¹

$CAB_{palm,dist,q}$ = Carbon stock in aboveground palm biomass in post-natural disturbance stratum q ; t CO₂e ha⁻¹

$CBB_{palm,dist,q}$ = Carbon stock in belowground palm biomass in post-natural disturbance stratum q ; t CO₂e ha⁻¹

$CDW_{dist,q}$ = Carbon stock in dead wood in post-natural disturbance stratum q ; t CO₂e ha⁻¹

$CSOC_{dist,q}$ = Mean stock in soil organic carbon in post-natural disturbance stratum q ; t CO₂e ha⁻¹

q = 1, 2, 3, ...Q post-natural disturbance strata

3.3.3.3.3 Monitoring Non-CO₂ Emissions from Biomass Burning

As discussed in sections 3.1.3, 3.2.1, and 3.2.2, greenhouse gas emissions from fossil fuel combustion and nitrogen application are excluded from calculations and, as such, not monitored. The project team will monitor biomass burning if wildfires occur or some of the forests do end up being cleared ex-post for agricultural production and the remaining aboveground biomass is burned (although this is not expected).

3.3.3.3.3.1 New data to be collected

Data will be collected on the area impacted by biomass burning ($A_{burn,t}$).

3.3.3.3.3.2 Data collection, analysis, and QA/QC procedures

To estimate these non-CO₂-emissions from burning of remaining aboveground biomass, the following equation modified from VMD0013 is used:

$$E_{biomassburn,t} = \sum_{g=1}^G \left((A_{burn,t} * B_t * COMF * G_g) * 10^{-3} \right) * GWP_g$$

Where:

$E_{biomassburn,t}$	= Greenhouse gas emissions due to biomass burning in year t of each GHG (CH_4 and N_2O); t CO_2e
$A_{burn,t}$	= Area burnt in year t ; ha
B_t	= Average aboveground biomass stock before burning, year t ; t d.m. ha^{-1}
$COMF$	= Combustion factor for stratum i ; unitless
G_g	= Emission factor for stratum i for gas g ; $kg\ t^{-1}\ d.m.\ burnt$
GWP_g	= Global warming potential for gas g ; t $CO_2/t\ gas\ g$
g	= 1, 2, 3 ... G greenhouse gases including methane and nitrous oxide; unitless
t	= 1, 2, 3, ... t^* time elapsed since the start of the project activity; years

To estimate $A_{burn,t}$ due to wildfires, data collected on areas impacted by wildfires ($A_{DisPA,q,t}$) described in section 3.3.3.2.2 will be used. To estimate $A_{burn,t}$ due to conversion from forests to another land use, data collected on area deforested ($A_{DefPA,u,t}$) described in section 3.3.3.2.1 will be used.

For the aboveground biomass stock before burning (B_t), combustion factor ($COMF$), emission factors (G_g), and global warming potentials (GWP_g), the same values used to estimate ex-ante non- CO_2e emissions from biomass burning (section 3.2.1.3) are also applied here.

3.3.3.3.4 Monitoring degradation from extraction of trees

The risks of degradation from the extraction of trees due to illegal logging are expected to be low. Based on the socioeconomic assessment conducted in the 12 communities, only 0.25% of households (5 out of 1,928) surveyed extract timber products. Nonetheless, as part of the Maya Forest Corridor Enforcement Plan (Appendix 5), the WCS rangers will conduct regular patrols of the project area and identify incidents of illegal logging.

Based on interviews conducted with local community members, firewood is only gathered in the immediate vicinity of the homes and, therefore, has no impact on the MFC REDD project area. Furthermore, as documented in the Socio-economic Assessment of 12 Maya Forest Corridor Buffer Communities (Appendix 15), the primary source of cooking fuel in the communities is butane rather than wood or charcoal. As such, emissions from firewood extraction are minimal even outside the project area and not monitored.

3.3.3.3.4.1 New data to be collected

Data on illegal logging incidents in the project area will be gathered through regular reconnaissance patrols. When an incident is detected, the aboveground and belowground carbon stock of each harvested tree will be estimated.

3.3.3.3.4.2 Data collection, analysis, and QA/QC procedures

Reconnaissance patrols are when the rangers gather information about the area they patrol. It includes identifying incidents of illegal activities (including but not limited to illegal logging), key locations, wildlife, and points of interest. The information gathered enables the team to identify hotspots and strategically plan enforcement activities. It is assumed that the entire project area is the area potentially impacted by this logging ($A_{DegW,i}$).

Along the patrol routes, the rangers will identify trees that have been illegally harvested. These routes can be considered transects. Patrols walk along these routes and monitor for illegal logging within a distance of 10 meters from the transect. Locations of patrol paths and observations are recorded in the site's SMART (Spatial Monitoring and Reporting Tool) data management system.

If there is no evidence that trees are being harvested during the patrols, then degradation from illegal logging is assumed to be zero.

If the patrols do detect that trees are being removed during the patrols, more systematic sampling will be implemented in the area where the logging is detected. A detailed standard operating procedure will be developed to conduct this systematic sampling and quantify carbon stock changes from logging ($\Delta C_{P,DegW,t}$).

3.3.3.3.5 Estimation of ex-post net carbon stock changes and greenhouse gas emissions

Based on the monitoring of forest cover change, areas that have undergone natural disturbance, and biomass burning discussed above, ex-post carbon stock changes and greenhouse gas emissions will be calculated and reported.

3.3.3.3.5.1 Overview of new data to be collected

No new data needs to be collected. The data collection in the previous monitoring tasks on forest cover change, areas undergoing natural disturbance, and biomass burning will inform the calculation of carbon stock changes and greenhouse gas emissions in this task.

3.3.3.3.5.2 Data collection, analysis, and QA/QC procedures

The ex-post project emissions will be estimated based on a modified version of equation 1 from VMD0015:

$$\Delta C_{WPS-REDD} = \sum_{t=1}^{t*} (\Delta C_{P,DefPA,t} + \Delta C_{P,DistPA,t} + E_{biomassburn,t} + \Delta C_{P,DegW,t})$$

Where:

$\Delta C_{WPS-REDD}$	= Net greenhouse gas emissions within the project area under the project scenario up to year t^* ; t CO ₂ e
$\Delta C_{P,DefPA,t}$	= Net carbon stock change as a result of deforestation in the project area in year t ; t CO ₂ e
$\Delta C_{P,DistPA,t}$	= Net carbon stock change as a result of natural disturbance in the project case in the project area in year t ; t CO ₂ e
$E_{biomassburn,t}$	= Greenhouse gas emissions due to biomass burning in year t of each GHG (CH ₄ and N ₂ O); t CO ₂ e
$\Delta C_{P,DegW,t}$	= Net carbon stock changes as a result of illegal logging in the project area during the monitoring period t ; t CO ₂ e
t	= 1, 2, 3, ... t^* years elapsed since the start of the REDD project activity

3.3.3.4 Data archiving

All data collected and documents created as part of the monitoring program will be archived electronically by WCS on secure servers with cloud-based storage. Final tabular data will be compiled in MS-excel compatible spreadsheets, and final documents will be maintained in MS-word. Geospatial data will be compiled in ESRI or ARC compatible geodatabases with appropriate meta-data that meets industry standards. All data and documents will be kept at a minimum for the 40-year period during which the permanence of carbon stocks shall be monitored. A mirror copy of the databases will also be maintained on secure cloud or offsite storage, based on the advisement of technology professionals regarding evolving best practices. Scanned images of any handwritten records, such as those associated with biomass monitoring, will be stored alongside digital data.

3.3.3.5 Procedures for handling non-conformances with the validated monitoring plan

When non-conformances arise related to the validated monitoring plan, the team in charge of monitoring will first attempt to take necessary compensation measures (such as redoing measurements and calculations) to ensure that the plan is in conformance. If the non-conformances are unable to be corrected, the project team will update the monitoring plan and justify the updates as a project description deviation according to the requirements of Section 3.21 of the VCS Standard.

3.3.4 Dissemination of Monitoring Plan and Results (VCS, 3.18; CCB, CL4.2)

This monitoring plan, as well as results of the monitoring undertaken, will be publicly available on the Verra registry.

For project transparency, accountability, and building community trust, it is essential that monitoring reports are easily accessible to a wide range of stakeholder groups. Key stakeholder groups targeted for the dissemination of monitoring results will include direct project beneficiaries, target communities, government agencies, NGO partners, and external auditors. These monitoring plans and the monitoring

results will be made accessible to targeted beneficiary communities, and key stakeholder groups using the following methods:

- Presentations of the monitoring results are made to community leaders at suitable community venues.
- A booklet with a summary report of the monitoring results, presented in language appropriate to the target audience, are disseminated at community meetings. Additional copies were left at multiple community venues which are regularly frequented by community members for all interested community members to read.
- Government and non-government partner agencies receive electronic versions of the monitoring report via email from the MFCT.

The project will give beneficiary communities, as well as government and non-government partners, a 30-day comment period. All relevant public comments received during this period will be addressed appropriately.

3.4 Optional Criterion: Climate Change Adaptation Benefits

Not applicable.

3.4.1 Regional Climate Change Scenarios (CCB, GL1.1)

Not applicable.

3.4.2 Climate Change Impacts (CCB, GL1.2)

Not applicable.

3.4.3 Measures Needed and Designed for Adaptation (CCB, GL1.3)

Not applicable.

4 COMMUNITY

4.1 Without-Project Community Scenario

4.1.1 Descriptions of Communities at Project Start (CCB, CM1.1)

The Maya Forest Corridor REDD Project is working with 12 communities situated within the Project Zone which includes the project area as well as a buffer zone surrounding the project area. The rationale for selecting these communities can be found in Section 2.1.16. Community characterizations provided here are derived from two sources:

- Demographic and housing information (Table 30, Table 31, and Table 34) from the 2022 Population and Housing Census was obtained directly by the project from the Statistical Institute of Belize.
- Compass Communication and Research, hired by WCS, conducted a Community Household Survey in the 12 target communities between June and July 2024 to generate a baseline socioeconomic assessment. The survey collected data on household characteristics, land tenure and land use, livelihoods and income, food security, communities' use of forest and protected areas products and services, participation in protected areas governance, identification of areas of high conservation value, community well-being, and climate resilience (Table 32, Table 33, and Table 35). Both the final survey plan and the results of the survey are available in Appendix 15.

Population and Ethnic Composition

The population and ethnicity²³ of the 12 communities of interest to this Project are provided in Table 30 and Table 31.

Table 30. Population by Sex (Statistical Institute of Belize, 2022)

District	Community	Male	Female	Total Population	Number of Households
Belize	Bermudian Landing and Double Head Cabbage	524	510	1,034	265
	Willows Bank and St. Paul's Bank	309	305	614	173
	Rancho Dolores	121	117	238	72
	Scotland Half Moon ²⁴	128	131	259	70
	Hattieville	1,108	1,163	2,271	701
	Gracie Rock	167	147	314	87
	La Democracia	167	133	300	117
	Mahogany Heights	411	458	869	264
Cayo	Franks Eddy	333	298	631	171
	Cotton Tree	1,051	1,005	2,056	537
	Total	4,319	4,267	8,586	2,457

²³ Preliminary findings on total population, ethnicity and education attainment from the Belize Population and Census 2022 were shared with WCS for the purpose of this report. Data for some villages were aggregated as represented in the table.

²⁴ Data from the 2022 Census was not available separately for Scotland Half Moon so the data from the Belize Population and Housing Census Country Report 2010 was used.

The gender distribution within these communities is balanced, with males and females constituting 50.3% and 49.7% of the population, respectively, aligning closely with the national gender split of 49.2% males and 50.8% females.

Creole is the predominant ethnicity in the 10 target communities in the Belize District while the two target communities in the Cayo District are primarily Mestizo/Hispanic/Latino, as shown in Table 31.

Table 31. Ethnicity (Statistical Institute of Belize, 2022)

Community	Creole	Mestizo/ Hispanic/ Latino	Kekchi Maya	Garifuna	Mopan Maya	East Indian	Other
Bermudian Landing and Double Head Cabbage	94%	3%	0%	0%	0%	0%	3%
Willows Bank and St. Paul's Bank	94%	4%	0%	0%	0%	0%	2%
Rancho Dolores	94%	6%	0%	0%	0%	0%	0%
Scotland Half Moon* ²⁵	-	-	-	-	-	-	-
Hattieville	75.5%	12.5%	1%	4%	1%	4%	2%
Gracie Rock	89.2%	6.4%	0%	0%	0%	0%	4.4%
La Democracia	71%	25%	0%	0%	0%	0%	4%
Mahogany Heights	61%	12%	0%	23%	0%	0%	4%
Franks Eddy	0%	97%	0%	0%	0%	0%	3%
Cotton Tree	25%	67%	5%	0%	2%	0%	1%

Consistent with the ethnic composition, the main language spoken in Franks Eddy and Cotton Tree is Spanish. In all other communities, the predominant languages are English and Creole.

Livelihoods and Income

The majority of the heads of household work in a profession or are employed in the private or public sector. Only 8% of heads of households depend directly on natural resources as their primary source of income (agriculture, livestock rearing, or hunting and fishing). Although the survey indicated that 15% of heads of household are not employed or engaged in any livelihood activities, the majority of these indicated that they are retired, while some receive funds from employed family members.

²⁵ Data from the 2022 Census was not disaggregated for Scotland Half Moon.

Table 32. Main Occupation of Heads of Household (WCS, 2024)

Main Occupation of Heads of Household	Percent
Professional ²⁶ (Plumber, Electrician, Doctor, Teacher, Lawyer, etc.)	19%
NOT engaged in any livelihood activity	15%
Private Sector	14%
Public Officer	13%
Domestic	9%
Business Owner	8%
Tourism	5%
Agriculture	4%
Livestock	3%
Fishing/Hunting	1%
Other	9%

Number of Respondents = 408

Sixty-six percent (66%) of survey respondents provided information on the head of household's income. Of these, 41.5% earn less than \$1,000 Belize dollars (\$500 USD) per month; 36.3% earn between BZ\$ 1,000 and 2,000 per month; and 22.2% earned above BZ\$ 2,000 per month.

Table 33. Monthly Income of Heads of Households (WCS, 2024)

Income Range in Belize Dollars	Percentage
\$1 to \$500	17.4%
\$501-\$1,000	24.1%
\$1,001- \$1,500	23.3%
\$1,501- \$2,000	13.0%
\$2,001- \$2,500	9.6%
\$2,501-\$3,000	7.4%

²⁶ The term "professional" here refers to occupations that require specialized knowledge and typically post-secondary education qualifications. It includes occupations in healthcare, legal practice, education, engineering, information technology, finance, and skilled trades.

Income Range in Belize Dollars	Percentage
Above \$3,000	5.2%

Number of Respondents = 270

Twenty-four percent (24%) of respondents indicated that their main income is supplemented by another source. Of these, 40% indicated some form of natural resource dependent livelihood such as farming, fishing, hunting, ecotourism, and livestock rearing. Twenty-eight percent (28%) are engaged in small business and 32% in some other livelihood activity.

Table 34. Household operated any land for farming (Statistical Institute of Belize, 2022)

Community	YES	NO
Bermudian Landing and Double Head Cabbage	2%	98%
Willows Bank and St. Paul's Bank	4%	96%
Rancho Dolores	8%	92%
Scotland Half Moon ²⁷	-	-
Hattieville	7%	93%
Gracie Rock	21%	79%
La Democracia	4%	96%
Mahogany Heights	7%	93%
Franks Eddy	29%	71%
Cotton Tree	13%	87%

Governance systems

All 12 communities are governed by village councils whose administrative responsibilities and authority are defined under the Village Council Act of Belize. Councils are elected by registered voters through a democratic process, although in some villages, the elections are uncontested. Each village council consists of 7 persons, which includes a chairperson. In the 2022 village council elections, women gained 42% of the seats and one-third of the chairperson positions, while men gained 58% and two-thirds of the chairperson positions (Statistical Institute of Belize, 2022). None of the 12 communities have Indigenous or traditional governance systems.

Community Well-Being

The Community Household Survey was conducted between June and July 2024 to support the preparation of this project document. Survey respondents reported their experiences of their own well-being in the following five dimensions.

²⁷ Data from the 2022 Census was not available separately for Scotland Half Moon.

Table 35. Community perceptions of their well-being (WCS, 2024)

Survey Questions/Responses	Better Off Now	No Change	Worse Off Now	Number of Responses
How would you rate the physical well-being of your household today compared to 2 years ago?	52%	27%	21%	398
How would you rate the financial security of your household today compared to 2 years ago?	50%	27%	23%	393
	Yes	Partly	No	Number of Responses
Do you consider your community a good place to live?	86.7%	9.6%	3.7%	407
Do you trust people in the community?	52%	31%	17%	408
Do community members actively participate in community actions/events that benefit the community?	39%	24%	37%	406

4.1.2 Interactions between Communities and Community Groups (VCS, 3.19; CCB, CM1.1)

The Community Baboon Sanctuary Women's Conservation Group (CBSWCG) manages the Community Baboon Sanctuary, which lies to the north of the project area. The Sanctuary is a Community Conserved Area comprising private land parcels voluntarily under conservation management by seven (7) village communities in the Belize River Valley: Big Falls/St. Paul's Bank, Willows Bank, Double Head Cabbage, Bermudian Landing, Isabella Bank, Scotland Half Moon, and Flowers Bank. The role and influence of the CBSWCG are significant in the Belize River Valley. The CBSWCG manages the funds collected through visitation to the Sanctuary and obtains grants for a range of community development and conservation activities. They maintain a strong network with national and international conservation organizations, which creates opportunities for like-minded agencies to implement new initiatives in collaboration with the communities.

The Rancho Dolores Environmental and Development Co. Ltd. (RDEDCL) manages the Spanish Creek Wildlife Sanctuary. This community-based organization comprises 10 members of the Rancho Dolores community who are responsible for the management and daily operations of the sanctuary. In addition to protecting the native flora and fauna, RDEDCL seeks to create economic opportunities and preserve the cultural heritage of Rancho Dolores and nearby villages in the Belize River Valley by engaging residents in environmental education, volunteerism, and sustainable development activities. It is

connected to the national network of conservation NGOs through its membership in the Association of Protected Areas Management Organizations.

4.1.3 High Conservation Values (CCB, CM1.2)

The target communities identified the following high conservation values within the project zone (WCS, 2024).

Table 36. HCVs related to livelihoods and cultural values in the MFC REDD project zone

High Conservation Value	Applicable CCB Community HCV indicators: - 2.b: Areas that are fundamental for the livelihoods of communities. - 2.c: Areas that are critical for the traditional cultural identity of communities. Applicable HCVs as identified by the HCV Network: - 5: Community Needs: Sites and resources fundamental for satisfying the basic necessities of local communities or indigenous people (for livelihoods, health, nutrition, water, etc.) identified through engagement with these communities or indigenous peoples. - 6: Cultural Values. Sites, resources, habitats and landscapes of global or national cultural, archaeological or historical significance, and/or of critical cultural, ecological, economic or religious/sacred importance for the traditional cultures of local communities or indigenous peoples, identified through engagement with these local communities or indigenous peoples.
Qualifying Attribute	1. Community Baboon Sanctuary (CBS) The CBS is a wildlife sanctuary established on February 23, 1985, for the protection of the Black Howler Monkey (<i>Alouatta pigra</i>). It is designated as a Community Conserved Area comprising private land parcels voluntarily placed under conservation management by seven (7) village communities within the Belize River Valley, five (5) of which are beneficiaries of this REDD Project. The community conservation value derives from its cultural, biodiversity, and ecotourism significance to the Belize River Valley communities. The Belize River Valley from Bermudian Landing to Rancho Dolores and Lemonal villages is recognized as a cultural heartland of Kriol history and culture in Belize. These Kriol communities have historically valued the black howler

	monkeys, known locally as the “baboon”, as an integral part of their rural landscape. The CBS and the black howler monkey have now become emblematic of the Belize River Valley and provide ecotourism opportunities for the area. The communities are interested in increasing tourism-based economic opportunities offered by the CBS. 2. Spanish Creek Wildlife Sanctuary Spanish Creek Wildlife Sanctuary was declared a protected area in July 2002 through the efforts of the Rancho Dolores Environmental & Development Co. Ltd. (RDEDCL), a community-based organization and the Rancho Dolores community members. It is designated as a Community Conserved Area. The area is managed to support environmental education and sustainable development. It provides recreational, educational, and ecotourism opportunities to Rancho Dolores and other nearby villages, enriching the ecotourism attractions of the Belize River Valley. These communities are interested in increasing the ecotourism opportunities in the valley. 3. Broadleaf forests and lowland savanna of the MFCT-owned property in which the MFC REDD project is located The forests and savanna provide habitat for wildlife species that support the livelihoods of communities. Although the property is not open for recreational or extractive use, protection of the area will have spillover effects that benefit communities. In addition to the natural habitats enhancing the ecotourism product in the wider project zone, the project area’s target communities traditionally depend on game meat and freshwater fish to supplement their weekly diet. It is expected that wild populations outside of the Project Area will be maintained or increased as a spillover from the protection of wild populations in the project area.
Focal Area	The CBS borders the project area to the northwest. Although outside of the REDD Project Area, it overlaps with the Project Zone. Spanish Creek Wildlife Sanctuary is situated in the vicinity of Rancho Dolores village, bordered to the east and the south by the Labouring Creek Jaguar Corridor. Its boundary converges with the REDD Project Area at a single point on the sanctuary’s southeastern border. The MFC REDD project area is defined in Section 2.1.16 above.

Table 37. HCVs related to ecosystem services in the MFC REDD project zone

High Conservation Value	Applicable CCB Community HCV indicators: - 2.a: Areas that provide critical ecosystem services; Applicable HCVs as identified by the HCV Network: - 4: Ecosystem Services: Basic ecosystem services in critical situations, including protection of water catchments and control of erosion of vulnerable soils and slopes.
Qualifying Attribute	1. The Belize River and the Sibun River watersheds Ecosystem services from these watersheds are vital to local lifestyles and economies. Communities rely on rivers, creeks, springs, and ponds for fishing to supplement their family diet. These natural water bodies are also critical sources of clean drinking water. Additionally, groundwater supports agricultural activities and is crucial for households that depend on well water. Finally, these natural water bodies have high recreational value for both residents and tourism activities.
Focal Area	The Belize River Watershed and the Sibun River Watershed intersect with the Project Zone.

4.1.4 Without-Project Scenario: Community (CCB, CM1.3)

As described in Section 2.2, the most likely without-project scenario is that the project area would be cleared and converted to commercial agricultural production. Without this REDD Project, deforestation would lead to significant adverse effects on the local communities due to the loss of crucial ecosystem services provided by the high-biodiversity, lowland broadleaf forests.

Expected impacts on communities in the without-project scenario would include:

- Loss of natural protection from hurricanes and flooding.
- Decreased watershed protection, affecting flood control and water quality.
- Destruction of critical habitats for wildlife species on which the communities depend for game meat and fish as well as charismatic species which are important for the area's ecotourism product.

- Increased pollution of rivers, streams, and groundwater sources by agricultural runoff.

Furthermore, the MFC REDD Project offers targeted community development opportunities that would not be available in the without-project scenario. These project investments are additional to the business-as-usual case and are targeted to the needs specifically identified by these communities through local surveys. Without the project therefore, the communities in the project zone would have:

- Reduced capacity for managing wildfires leading to inadequate responses to the heightened risks of wildfires exacerbated by longer dry seasons and rising temperatures due to climate change.
- Reduced opportunities for livelihood diversification through the promotion of community-owned sustainable livelihoods and nature-based solutions for climate adaptation.
- Reduced community-level education and awareness regarding critical environmental issues and climate change preparation, which would weaken the communities' capacity for climate adaptation.
- Reduced community cohesion and organizational capacity for climate adaptation and proactive community conservation action.

4.2 Net Positive Community Impacts

4.2.1 Expected Community Impacts (CCB, CM2.1)

The 12 target communities being engaged through project activities were identified as those most likely to be impacted.

Table 38. Community impact: Decreased vulnerability to wildfires

Community group	Cotton Tree, Franks Eddy, Mahogany Heights, La Democracia, Hattieville, Gracie Rock, Scotland Halfmoon, Bermudian Landing, Double Head Cabbage, Rancho Dolores, Willows Bank, and St. Paul's Bank
Impact(s)	Decreased vulnerability to wildfires. The project will pursue a multi-pronged strategy for wildfire management, including building capacity for fighting wildfires; preventing fires through controlled burns and creating fire breaks; public education to reduce fires caused by human activities; and supporting the community fire management efforts.
Type of benefit/cost/risk	This is a predicted, direct benefit.

Change in well-being	Reduced health hazards and property damage from wildfires.
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Table 39. Community impact: Increased economic security through livelihood diversification

Community group	Mahogany Heights, La Democracia, Scotland Halfmoon, Bermudian Landing, Double Head Cabbage, Willows Bank, and St. Paul's Bank
Impact(s)	Increased economic security through livelihood diversification. The project will support the adoption of sustainable livelihoods and nature-based solutions for climate adaptation. Examples of these include climate-smart agriculture and the production of sustainable products such as coconut oil, cohune oil, and honey. The project will also offer select permanent, temporary, and seasonal employment opportunities through an open selection process.
Type of benefit/cost/risk	This is a predicted, direct benefit.
Change in well-being	- Increased household self-sufficiency in food production - Increased household income from regenerative agriculture and other sustainable livelihoods

Table 40. Community impact: Increased knowledge of critical environmental conservation and climate adaptation issues relevant to their communities

Community group	Cotton Tree, Franks Eddy, Mahogany Heights, La Democracia, Hattievill, Gracie Rock, Scotland Halfmoon, Bermudian Landing, Double Head Cabbage, Rancho Dolores, Willows Bank, and St. Paul's Bank
Impact	Increased knowledge of critical environmental conservation and climate change issues relevant to their communities. The majority of community members in the Project Zone perceive that the protection of the MFC is very important (65.7%) or essential (13.7%), which suggests a strong collective commitment to conservation. Further, communities in the project zone have reported experiencing several impacts

	of climate change (WCS, 2024), primarily increased temperatures, drought, and changes in rainfall patterns. Increased knowledge of environmental conservation and climate change issues enables community members to make informed decisions about managing natural resources and adapting to climate change, which directly contributes to sustainable development and improved quality of life. Informed communities can better advocate for policies and practices that ensure long-term environmental health and economic stability.
Type of benefit/cost/risk	This impact is a predicted, direct benefit.
Change in well-being	• Increased knowledge of the importance of environmental conservation and its benefits to community well-being. • Increased capacity to address environmental issues that are negatively impacting their communities. • Increased capacity to access the community benefits of conserving the MFC. • Reduced vulnerability to the negative impacts of climate change such as fires and drought. • Improved community cohesion and mutual support in addressing negative impacts of climate change at the community level.

4.2.2 Negative Community Impact Mitigation (VCS, 3.19; CCB, CM2.2)

The MFC REDD Project's strategy for avoided deforestation involves the acquisition of private land. Minimal negative community impacts are expected. There is one family from one of the local communities currently using a small area (approximately 12 hectares) for cattle ranching and fruit harvesting outside of the MFC REDD project area but within the property that the MFCT purchased for conservation. The MFCT is engaging with the family with the goal of understanding their perspective and circumstances, while working collaboratively toward a voluntary and dignified resolution to the situation. Emphasis is being placed on minimizing conflict, upholding the family's rights and well-being throughout the process, and informing them of the MFCT's legal rights to the land.

Aside from this one case, since the communities in the project zone neither owned, occupied, nor utilized the land prior to the project, they have not experienced a loss of access to natural resources.

Furthermore, communities did not lose opportunities for land purchase or agricultural expansion since, in the most likely without-project scenario, the lands would have been purchased by large commercial agricultural interests outside of the target communities.

The project poses no threat to existing livelihoods or lifestyles, since community participation in project activities will be entirely voluntary. Where sustainable livelihood opportunities are offered, orientation sessions and field visits will be organized for interested community members before they embark on the activity. This ensures that participants are well-informed before commencing any project-related activities.

The project exclusively promotes environmentally sustainable livelihood activities, thereby reducing the risk of negative environmental impacts, such as pollution or damage to areas of high conservation value.

In compliance with the precautionary principle, the project conducts community outreach and education activities to maintain community awareness about project activities and outcomes, and to proactively address any concerns regarding potential negative impacts.

Furthermore, as outlined in Section 2.3, the project's stakeholder engagement strategy includes detailed principles and methodologies for effective information sharing and features an accessible grievance redress mechanism to ensure all stakeholder concerns are appropriately managed.

4.2.3 Net Positive Community Well-Being (VCS, 3.19; CCB, CM2.3, GL1.4)

Given the significant positive community impacts described in Section 4.2.1 and the minimal negative community impacts discussed in 4.2.2, the project is expected to have a net positive impact on community well-being. Specific improvements are expected in the following well-being dimensions:

- Decreased vulnerability to wildfires.
- Economic resiliency increased through livelihood diversification and increased food self-sufficiency.
- Community cohesion improved through community participation in community conservation plans, community fire hazard alert systems, fire brigades, and participation in outreach and education activities.
- Physical well-being protected from maintenance of ecosystems services such as watershed conservation and recreational value.

4.2.4 High Conservation Values Protected (CCB, CM2.4)

The HCVs identified by the 12 target communities are all natural ecosystems or protected areas. By placing the project area under conservation management, the project will contribute to the conservation of these HCVs.

1. The project area is in close proximity to both the Community Baboon Sanctuary and the Spanish Creek Wildlife Sanctuary, areas identified as contributing to the following community HCVs: community needs and cultural values. The wildlife within these areas is a key component to these HCVs as a main attraction for ecotourism and, in the case of the black howler monkey, as an emblem of Kriol culture in the Belize river valley. The conservation of the nearby MFC REDD project area forests will maintain nearby wildlife habitat space that would have been otherwise been lost, thereby enabling migration between the areas and preventing genetic isolation. Further, the project efforts to detect, mitigate, and control wildfires in and around the MFC help reduce wildfire risks in these sanctuaries.
2. The broadleaf forests and savannas of the MFC property including the MFC REDD project area also contribute to community needs and cultural values as described in section 4.1.3. As such, the project's conservation of these ecosystems also protects these HCVs that would have otherwise been lost when the property was converted to agriculture.
3. The conservation of the MFC REDD project area will contribute to maintaining the integrity of the Belize and Sibun River watersheds which provide critical ecosystem services including protecting water supply and providing recreational opportunities. Standing forests such as those being protected in the project area contribute to the overall health of watersheds in a number of ways such as controlling water flow and filtering out pollutants (Ellison et al., 2017).

4.3 Other Stakeholder Impacts

4.3.1 Impacts on Other Stakeholders (VCS, 3.18, 3.19; CCB, CM3.1)

Some of the positive impacts of project activities will extend beyond the 12 target communities. Fire management will benefit all communities and protected areas within the Maya Forest Corridor and the Project Zone. Additionally, the maintenance of ecosystem services and watershed integrity will benefit the health and economic productivity of all communities and industries that depend on these including the agriculture and ecotourism sectors.

4.3.2 Mitigation of Negative Impacts on Other Stakeholders (VCS, 3.18, 3.19; CCB, CM3.2)

No negative impacts on other stakeholders are foreseen since the project will not displace communities, halt economic productivity, or introduce any environmental hazards. By maintaining open communication with the conservation community and government partners the project will be able to address any issues which may arise. Furthermore, it will establish a Grievance Redress Mechanism accessible to the public through which anyone can report negative impacts.

4.3.3 Net Impacts on Other Stakeholders (VCS, 3.18, 3.19; CCB, CM3.3)

Due to its critical role in consolidating the Maya Forest Corridor and protecting natural ecosystems, project activities are expected to have a net positive impact on other stakeholders which include

government partners and protected area managers across Belize. Project activities will support national commitments and strategies for low emissions development, biodiversity protection, climate resilience, and sustainable development.

4.4 Community Impact Monitoring

4.4.1 Community Monitoring Plan (CCB, CM4.1, CM4.2, GL1.4, GL2.2, GL2.3, GL2.5)

This Community Monitoring Plan describes measurable and verifiable indicators designed to assess the benefits derived by communities from project activities. These benefits are classified as short-term (outputs), medium-term (outcomes), and long-term (impacts). They are designed:

- 1) To demonstrate that the claimed net community benefits are being achieved.
- 2) To facilitate adaptive management where they are not being achieved.
- 3) To assess and mitigate any adverse social impacts on the target communities.

Section 1.1 above names three “Unique Project Benefits” to be realized by the Maya Forest Corridor REDD+ Project. Community monitoring seeks to measure the achievement of Outcome/Impact (4) *Improves communities’ resilience by improving local fire management systems, supporting sustainable livelihoods, and supporting climate change adaptation.*

4.4.1.1 Description of Stakeholders to be Monitored

Section 2.3 above provides a description of all project stakeholders. Of these, the following communities, community groups, and protected area management organizations will be monitored:

Table 41. Communities to be monitored.

Communities	Description
Bermudian Landing Double Head Cabbage Flowers Bank Rancho Dolores Scotland Halfmoon St. Paul’s Bank Willows Bank	These predominantly Creole communities are situated within the Belize River Valley and share a common post-colonial history and culture. They lie along the mostly paved tertiary Bermudian Landing Road. Private landowners from these communities (except for Rancho Dolores) established the Community Baboon Sanctuary (CBS) - a Community Conserved Area - to protect the habitat of the black howler monkey.
Gracie Rock Hattieville La Democracia Mahogany Heights	These communities are mixed, with Creole being the largest ethnic group, followed by Mestizo/Hispanic/Latino and Garifuna. They lie along the George Price Highway with easy access to Belize City - the largest urban center - and Belmopan City - the nation’s capital.

Communities	Description
Franks Eddy Cotton Tree	These communities are predominantly Mestizo/Hispanic/Latino with a significant population of Central American immigrants. They lie along the George Price Highway with easy access to Belize City - the largest urban center - and Belmopan City - the nation's capital.

Table 42. Community-based organizations to be monitored.

Community-based Organizations (CBOs)	Description
Community Baboon Sanctuary Women's Conservation Group (CBSWG)	The Community Baboon Sanctuary Women's Conservation Group (CBSWCG) is a women-led CBO that manages the 13,000-acre Community Baboon Sanctuary, which abuts the REDD+ project site to the north. The CBSWG is a principal entity for mobilization, communication, and coordination with communities in the Belize River Valley and has been a key partner in promoting the conservation of the MFC.
Rancho Dolores Environmental & Development Co. Ltd. (RDEDCL)	RDEDCL is a CBO that promotes the conservation of the 5,900-acre Spanish Creek Wildlife Sanctuary, which constitutes part of the Tri-national Selva Maya. The RDEDCL engages in environmental education, volunteerism, and sustainable development of Rancho Dolores and nearby villages.

Table 43. Non-government Stakeholders to be monitored.

Protected Areas Management Agencies	Description
Maya Forest Corridor Trust (MFCT)	The MFCT is the Project Proponent for this REDD Project. It is responsible for the governance of the Trust and coordination of conservation management and planning for the MFCT's protected areas. Its board of directors includes members of the following organizations: the Belize Maya Forest Trust, Wildlife Conservation Society, the Belize Zoo and Tropical Education Center, Foundation for Wildlife Conservation, University of Belize - Environmental Research Institute, and Re:wild,
Wildlife Conservation Society (WCS)	WCS is responsible for the conservation management of the REDD Project Site on behalf of the MFCT. It implements conservation management activities including protection, patrols and enforcement, wildfire management, research, and restoration of natural ecosystems. Additionally, it implements community-based interventions to promote the

Protected Areas Management Agencies	Description
	sustainable development of the 12 target communities in the project zone.
Belize Zoo Tropical Education and Wildlife Center (TBZTEC)	TBZTEC is an environmental NGO that owns and manages nearly 3,000 acres of protected areas within the MFC, including the Sharon Matola Wildlife Sanctuary, which abuts the REDD project site on the southeast. TBZTEC is a member of the MFCT and a key partner in implementing conservation and sustainable development initiatives in the MFC. Initiatives implemented by TBZTEC contribute to the realization of community benefits for the 12 target communities.
Foundation for Wildlife Conservation (FWC)	FWC is an environmental NGO that owns and manages the 6,000-acre Runaway Creek Nature Reserve within the MFC. The FWC is a member of the MFCT and a key partner in implementing conservation and sustainable development initiatives in the MFC. Initiatives implemented by FWC contribute to the realization of community benefits for the 12 target communities.
University of Belize (UB) - Environmental Research Institute (ERI)	The ERI is a semi-autonomous department within UB dedicated to conducting research and monitoring to support the sustainable management of Belize's natural resources. The ERI is a member of the MFCT and a key partner in conducting research in the MFC and surrounding communities. Initiatives implemented by UB ERI contribute to the realization of community benefits for the 12 target communities.
Monkey Bay Wildlife Sanctuary (MBWS)	MBWS is a private protected area that supports and safeguards landscape connectivity, ecosystem services, and socioeconomic benefits. MBWS is a member of the MFC Coalition and as such has a high interest in conservation and protection of the MFC.

4.4.1.2 Responsible entity

WCS will be responsible for implementing all the monitoring tasks. This will include contracting qualified organizations and/or individuals to perform the tasks, especially those tasks related to the monitoring of Non-government Stakeholders including WCS. These tasks will include collecting, summarizing, analyzing, and archiving all of the data required to perform the monitoring tasks. WCS will secure a third-party auditor to verify that the monitoring is in compliance with all VCS requirements.

4.4.1.3 Data collection methods and frequency

The indicator framework in 4.4.1.3 describes what indicators that will be monitored. A variety of data collection methods will be used depending on the type of indicator (output, outcome, impact) and the

nature of the data itself. Data collection instruments and methods will provide for disaggregation by gender, age, ethnicity, income bracket, and other socioeconomic factors that are directly relevant to measuring net positive community benefits, with particular consideration of marginalized groups.

Activity records. Records will be kept for project activities and procurement according to standard operating procedures. These will include:

- Attendance sheets and agendas for training courses.
- Proof of purchase and receipts for items procured.
- Photographs of goods procured, and activities conducted.
- Fire management records.
- Logs of community visits such as agriculture extension visits and education outreach to schools.

This type of monitoring data will be collected during or immediately following the activity occurrence. The required data will be extracted and aggregated for inclusion in the Community Monitoring Report prior to the verification audit expected to happen every 2 years.

Administrative Documents

- Minutes and proceedings from meetings with stakeholders such as communities, conservation partners, and the MFCT.
- Annual progress reports for projects implemented within the MFC and the 12 target buffer communities.

Progress reports will be prepared according to project and program cycles. Requirements vary by project, but these are prepared at least once annually. Minutes and proceedings from meetings will be generated following the meeting event. The required data will be gathered from these documents every two years for inclusion in the Community Monitoring Report prior to the biennial verification audit.

Project-generated Documents. The following types of documents produced by REDD project activities and complementary initiatives will serve as the means of verification for assessing the implementation of the corresponding project activities:

- Community plans such as Community Climate Smart Plans and Community Conservation Plans.
- Protected area management plans.
- Maps produced from field surveys or drone imagery.

Verification of the completion of such documents will be done during the preparation of the Community Monitoring Report prior to the biennial verification audit.

Spatial Monitoring and Reporting Tool (SMART). SMART technology consists of a suite of software tools that can be used on mobile, desktop, and cloud-based platforms to collect, visualize, analyze, and report on conservation management activities. For this REDD Project, information on ranger patrols, illegal use of the project area, and other forest protection incidents will be collected on an ongoing basis. Periodic reports will be compiled according to existing operational schedules. Prior to the

biennial verification audit, the relevant data will be extracted and compiled for inclusion in the Community Monitoring Report.

Household Surveys in Target Communities

Household surveys will be the primary means of community participation in project monitoring. The surveys will collect both quantitative and qualitative data on demographics, livelihoods and income, use of natural resources, level of participation in project activities and protected areas management, as well as knowledge, attitudes and perceptions regarding the MFC, changes in ecosystem services, well-being, and climate change.

The sampling strategy for the monitoring will include both direct project beneficiaries and the general community. This will support the attribution of measured impacts to the REDD project. It will also allow for the identification of both positive and negative unintended consequences and spillover effects.

A comprehensive baseline household survey was conducted during the project design phase during June and July 2024. Household surveys of direct project beneficiaries will be conducted prior to verification audits, expected to happen every two to five years, to inform the Community Monitoring Report. These beneficiary household surveys will be with community members who are beneficiaries of project activities or who participate otherwise to monitor outcomes and impacts on livelihoods and income, well-being, capacity for climate adaptation, use of natural resources, level of participation in project activities, and protected areas management, as well as knowledge, attitudes and perceptions regarding the MFC, changes in ecosystem services, well-being, and climate change. These will be conducted prior to the verification audit to inform the preparation of the Monitoring Report.

4.4.1.4 Indicator Framework

Table 44 through Table 46 in this section describe the community impact indicators, organized by broad activity areas, that will be monitored and assessed for preparation of the Community Monitoring Report. All data involving community members will be disaggregated by gender and age group. As appropriate, it will also be summarized and analyzed by other descriptors, e.g., by community and by year.

For the preparation of the comprehensive verification report, community monitoring data will be compiled and aggregated to align with the Standard Benefit Metrics table given in Section 1.2 above. Specifically, the community monitoring results will inform reporting on the following benefit categories: (i) Improved Land Management; (ii) Training; (iii) Employment; (iv) Livelihoods; and (v) Well-being.

Table 44. Indicators for Project Activity 2: Maintain natural ecosystems and current forest cover for the conservation of native biodiversity.

Activity Area: Detection, mitigation, and control of wildfires in and around the MFC			
Level	No.	Monitoring Indicator	Means of Verification
Output	1	# of persons trained in fire safety and management by community and organization	• Attendance sheet • Training agenda • Photos

Output	2	# of communities with Fire Hazard Alert System	• Early Warning System Protocols • Photos of signage
Output	3	# of MFC communities served by fire brigades	• Fire Management Records
Outcome	4	Annual % of fires contained by persons trained	• Fire Management Records
Activity Area: Protected area management			
Output	5	# of persons trained in environmental laws and enforcement by community and organization	• Attendance sheet • Training agenda
Output	6	# of special constables certified for enforcement by community and organization	• Training syllabus • Attendance sheets • Special constable certification
Output	7	# of persons employed in protected area management by community and organization	• Employment letters
Output	8	# of persons employed in forest restoration activities	• Employment letters
Outcome	9	% change in illegal intrusions	• SMART data

Table 45. Indicators for Project Activity 3: Conduct community outreach and environmental education to foster support for MFC conservation and to create awareness of critical environmental and climate adaptation issues.

Activity Area: Community outreach to foster support for MFC conservation and climate adaptation			
Level	No.	Monitoring Indicator	Means of Verification
Output	10	# of community residents partaking in community outreach and education activities	• WCS Community Outreach Database • Social media posts
Outcome	11	Level of knowledge and support for the MFC	• Household survey
Output	12	# of young participants from target communities participating in continuous engagement sessions to strengthen conservation stewardship as well as introduce a variety of STEM oriented themes and professional and career building skills.	• Attendance sheet • Engagement session agenda • Certificate of completion
Outcome	13	Level of knowledge of climate change impacts and adaptation	• Household survey
Outcome	14	Community perception of ecosystem benefits from conservation	• Household survey
Output	15	# of communities that have adopted Climate Smart Plans	• Community Climate Smart Plans
Output	16	# of communities that have adopted Community Conservation Agreements	• Community Conservation Agreement documents

Table 46. Indicators for Project Activity 4: Provide training, material and technical support for community-owned sustainable livelihoods and nature-based solutions for climate adaptation.

Activity Area: Provide training, material and technical support for community-owned sustainable livelihoods and nature-based solutions for climate adaptation			
Level	No.	Monitoring Indicator	Means of Verification
Output	17	# of persons who receive training in sustainable livelihoods in the communities (e.g., climate smart agriculture, production of sustainable products like coconut oil, cohune oil, honey, etc.)	Attendance sheet Training agenda Regenerative Agriculture Technical Guide
Output	18	# of households or community agencies that establish sustainable livelihoods initiatives (e.g., climate smart agriculture, production of sustainable products like coconut oil, cohune oil, honey, etc.)	Log of extension visits
Output	19	# of extension service visits per household/farm/agency per quarter	Log of extension visits
Outcome	20	% increase in self-sufficiency in food production	Log of extension visits
Output	21	# of farms improved through climate-smart practices	Farm maps
Outcome	22	# of acres of agricultural land converted to climate-smart agriculture management	Farm maps
Output	23	# of community-owned nature-based livelihood solutions in MFC communities	Project progress reports
Outcome	24	% increase in household income through implementation of sustainable livelihoods	Household survey
Impact	25	Livelihood diversification index	Household survey
Impact	26	Gender parity index of economic contributions to households (both income and non-income activities)	Household survey
Impact	27	Holistic Well-being Index (composite of physical, social and economic factors)	Household survey

4.4.2 Monitoring Plan Dissemination (CCB, CM4.3)

This monitoring plan, as well as results of the monitoring undertaken, will be publicly available on the Verra registry.

For project transparency, accountability, and building community trust, it is essential that monitoring reports are easily accessible to a wide range of stakeholder groups. Key stakeholder groups targeted

for the dissemination of monitoring results will include direct project beneficiaries, target communities, government agencies, NGO partners, and external auditors. This monitoring plan and the monitoring results will be made accessible to targeted beneficiary communities, and key stakeholder groups using the following methods:

- Presentations of the monitoring results are made to community leaders at suitable community venues.
- A booklet with a summary report of the monitoring results, presented in language appropriate to the target audience, are disseminated at community meetings. Additional copies were left at multiple community venues which are regularly frequented by community members for all interested community members to read.
- Government and non-government partner agencies receive electronic versions of the monitoring report via email from the MFCT.

The project will give beneficiary communities, as well as government and non-government partners a 30-day comment period. All relevant public comments received during this period were addressed appropriately.

4.5 Optional Criterion: Exceptional Community Benefits

Not applicable.

5 BIODIVERSITY

5.1 Without-Project Biodiversity Scenario

5.1.1 Existing Conditions (VCS, 3.19; CCB, B1.1)

The MFC REDD project area is embedded within the Maya Forest Corridor. The MFC is a relatively small band of tropical broadleaf forest, forested savannas, wetlands, and grasslands in central Belize that connects the Selva Maya of Mexico, Guatemala and northern Belize to the Maya Mountains Massif and coastal reserves of southern Belize (refer to Figure 4 in section 2.1.14). Together, these represent the single largest forest block in Central America (Hofman et al., 2018).

The MFC (formerly referred to as the Central Belize Corridor) is the most important of the wildlife corridors that provide biological connectivity to the Belize National Protected Areas System (NPAS) (Kay et al., 2015). Wildlife corridors overall can enhance gene flow between disjunct populations, support recolonization from local extinction, and facilitate range shifts in response to climate change (Latha et al., 2016). The MFC provides a vital connection between populations of iconic Mesoamerican species, such as the jaguar (*Panthera onca*), Baird's tapir (*Tapirus bairdii*), and the White-lipped peccary (*Tayassu pecari*). The MFC also supports several species categorized as endangered on the IUCN Red List including the Yucatan black howler monkey (*Alouatta pigra*), Geoffroy's spider monkey (*Ateles*

geoffroyi), and the critically endangered Central American river turtle (*Dermatemys mawii*) (Re:wild, n.d.). In addition, MFC provides essential ecosystem services to Belize including climate mitigation, maintenance of biodiversity, forest products, pollination services, land for subsistence agriculture, and livelihoods through tourism and commercial agriculture. Prior to the project's commencement, this area's forests, though not formally protected, supported these species relatively undisturbed aside from some selective logging and local hunting.

Belize, and therefore the MFC and project zone, are part of the broadly recognized “Mesoamerica Biodiversity Hotspot”, which spans most of Central America and serves as a bridge between the biogeographic regions of North and South America (Bridgewater, 2012). The hotspot supports an estimated 17,000 species of vascular plants, 1,120 species of birds, 440 species of mammals, 690 species of reptiles, 550 species of amphibians, and more than 500 species of fish (*Mesoamerica - Species* | CEPF, n.d.). Many of these species are endemic to Mesoamerica and found nowhere else in the world. The survival of these unique species is dependent on the protection of their habitats and preserving the connections between otherwise isolated populations (Bridgewater, 2012).

The primary threat to biodiversity in the project zone is deforestation and conversion to agriculture. Secondary anthropogenic threats to biodiversity include illegal hunting, wildfire, and illegal harvesting of timber and non-timber forest products, poor waste management, and settlement expansion (Kay et al., 2015). The project zone is subjected to periodic hurricanes and/or tropical storms that can impact biodiversity. However, the ecosystems in the project zone are adapted to these storms and recover relatively quickly if not subjected to other disturbances such as wildland fires.

The project zone supports a diverse array of ecosystems ranging from wetlands, shrublands, lowland savannas, and deciduous broadleaf forests (refer to Figure 7 in section 2.1.16). In terms of total area, the primary natural ecosystem types in the project zone described and classified by Meerman and Sabido (2001) are lowland broad-leaved moist forest, lowland broad-leaved moist scrub forest, and lowland savanna.

The lowland broad-leaved moist forest closely resembles the “tropical evergreen seasonal broad-leaved lowland forest on calcareous soil” UNESCO ecosystem (UNESCO Classification code I.A.2.a.(1).(b).K) (Meerman & Sabido, 2001). The plant communities that occur in this ecosystem are a variety of moisture dependent lowland species and tropical hardwoods, most of which display some level of drought tolerance. Soils are generally deep and with abundant in calcium and moderately well drained (Meerman & Sabido, 2001).

The lowland broad-leaved moist scrub forest ecosystem approximates the “deciduous broadleaf lowland well drained shrubland over poor soils” UNESCO ecosystem (UNESCO Classification code III.B.1.b.(a) (Meerman & Sabido, 2001). The plant communities within this ecosystem are comprised of disturbance tolerant species (e.g. flooding, fire, and other natural or anthropogenic disturbances. In addition to native plant communities, pockets of “weedy” nonnative plant species may also be present. Soils are generally well drained, nutrient poor sandy soils with some clay and gravel (Meerman & Sabido, 2001).

The lowland savanna ecosystem follows most closely the “short-grass savanna with needle-leaved trees UNESCO ecosystem classification (UNESCO Classification code V.A.2.a.(1).(2).) (Meerman & Sabido, 2001). This ecosystem is characterized by the presence of Caribbean Pine (*Pinus caribaea*) as the dominant tree species with an herbaceous layer dominated by graminoids, sedges, and herbs present. The communities in this ecosystem are dependent upon periodic fire to maintain their ecosystem structure and function (Hicks et al., 2011; Laughlin, 2002; Michelakis et al., 2016). Soils are characterized by their pale, coarse topsoils covering a mottled bright red and white subsoil. Both layers are acidic and nutrient deficient (Meerman & Sabido, 2001). This ecosystem is an important breeding/nesting habitat for the endangered Yellow-headed Amazon (*Amazona oratrix*) (BirdLife International, 2024).

Two species known to occur in the project area and project zone, Baird’s tapir (*Tapirus bairdii*) and Central American river turtle (*Dermatemys mawii*), are considered Endangered and Critically Endangered respectively on the IUCN Red List (Garcia et al., 2016; Vogt et al., 2006). In addition, the ecosystems documented in the project zone provide suitable habitat for other endangered species, such as the Yucatan black howler monkey (*Alouatta pigra*), Geoffroy’s Spider monkey (*Ateles geoffroyi*), and the Yellow-headed Amazon parrot (*Amazona oratrix*) (BirdLife International, 2024; Cortes-Ortiz et al., 2020, 2021). In addition to endangered species, the project zone and the MFC are critical to the maintenance of genetic diversity of large mammals such as the Jaguar (*Panthera onca*), white lipped peccary (*Tayassu pecari*), pumas (*Puma concolor*) and ocelots (*Leopardus pardalis*) (Menchaca et al., 2019).

As shown in Figure 23, the project area has significant overlap with the Crooked Tree and associated wetlands “Key Biodiversity Area” (KBA). The broader project area has even greater overlap with this KBA as well as with Rio Bravo CMA Gallon Jug Estate KBA. The project will benefit each of these areas by conserving habitat for species within or near the KBAs.

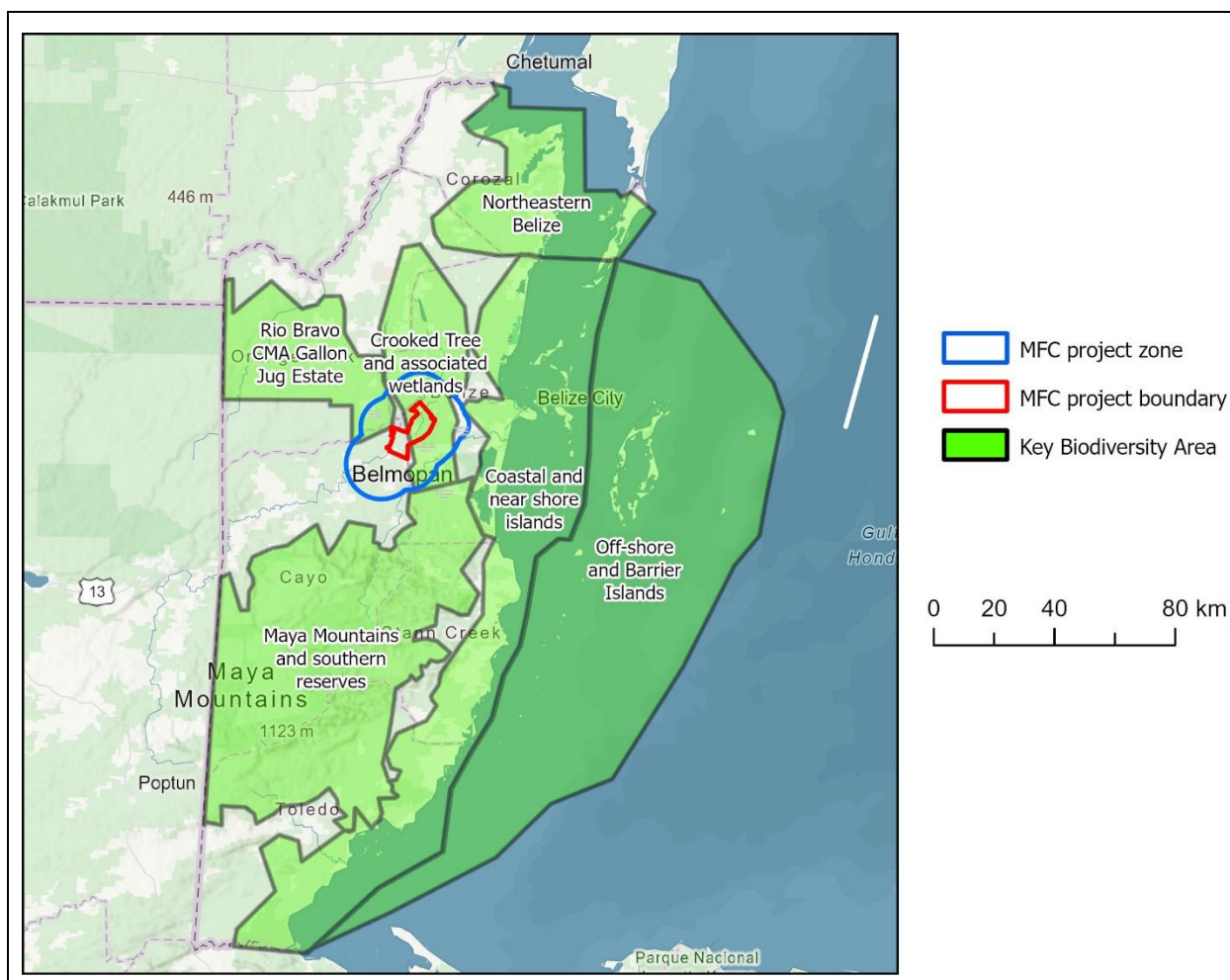


Figure 23. Key Biodiversity Areas and the project area and zone

Because the parcels comprising the formal MFC REDD project area were privately owned until the recent transfer in 2022 to the MFCT, limited formal species surveys have taken place on the property. WCS formally manages the property and has begun, in concert with other partners, to perform formal species surveys to document the biodiversity within the project area to support the project and general biodiversity resource management.

Avifauna have been documented in the project area over several years on eBird (2021). Applying the movement pattern categories of BirdLife International²⁸, a total of 209 species have been identified with 129 being non-migrants, 77 species being full migrants, 2 being altitudinal migrants, and 2 being nomadic (Table 47). On the IUCN Red List (2025), one species is listed as Vulnerable, 7 as Near Threatened, and 199 as Least Concern²⁹. In addition to avifauna, the endangered Baird's tapir and the critically endangered Central American river turtle have been confirmed in the project area.

²⁸ <https://datazone.birdlife.org/>

²⁹ Note, the differing taxonomies used by eBird and the IUCN Red List mean for a small number of species an assessment is not available or is under an alternative scientific name.

Table 47. List of birds identified within the Project Area through eBird.

Common Name	Species Name	Movement patterns	Red List Category ³⁰
Agami Heron	<i>Agamia agami</i>	Non-migrant	NT
Acorn Woodpecker	<i>Melanerpes formicivorus</i>	Non-migrant	LC
Amazon Kingfisher	<i>Chloroceryle amazona</i>	Non-migrant	LC
American Pygmy Kingfisher	<i>Chloroceryle aenea</i>	Non-migrant	LC
American Redstart	<i>Setophaga ruticilla</i>	Full migrant	LC
Anhinga	<i>Anhinga anhinga</i>	Non-migrant	LC
Aplomado Falcon	<i>Falco femoralis</i>	Full migrant	LC
Baltimore Oriole	<i>Icterus galbula</i>	Full migrant	LC
Bananaquit	<i>Coereba flaveola</i>	Non-migrant	LC
Bare-throated Tiger-Heron	<i>Tigrisoma mexicanum</i>	Non-migrant	LC
Barred Antshrike	<i>Thamnophilus doliatus</i>	Non-migrant	LC
Bat Falcon	<i>Falco rufigularis</i>	Non-migrant	LC
Black Vulture	<i>Coragyps atratus</i>	Full migrant	LC
Belted Kingfisher	<i>Megaceryle alcyon</i>	Full migrant	LC
Black-and-white Warbler	<i>Mniotilta varia</i>	Full migrant	LC
Black-bellied Whistling Duck	<i>Dendrocygna autumnalis</i>	Full migrant	LC
Black-cheeked Woodpecker	<i>Melanerpes pucherani</i>	Non-migrant	LC
Black-collared Hawk	<i>Busarellus nigricollis</i>	Non-migrant	LC
Black-cowled Oriole	<i>Icterus prosthemelas</i>	Non-migrant	LC
Black-crowned Night Heron	<i>Nycticorax nycticorax</i>	Full migrant	LC
Black-faced Grosbeak	<i>Caryothraustes polioaster</i>	Non-migrant	LC
Black-headed Saltator	<i>Saltator atriceps</i>	Non-migrant	LC
Black-headed Trogon	<i>Trogon melanocephalus</i>	Non-migrant	LC
Black-necked Stilt	<i>Himantopus mexicanus</i>	Full migrant	LC
Black-throated Bobwhite	<i>Colinus nigrogularis</i>	Non-migrant	LC
Black-throated Green Warbler	<i>Setophaga virens</i>	Full migrant	LC
Blue Grosbeak	<i>Passerina caerulea</i>	Full migrant	LC
Blue Ground Dove	<i>Claravis pretiosa</i>	Non-migrant	LC
Blue-black Grassquit	<i>Volatinia jacarina</i>	Non-migrant	LC
Blue-black Grosbeak	<i>Cyanoloxia cyanoides</i>	Non-migrant	LC
Blue-gray Tanager	<i>Thraupis episcopus</i>	Non-migrant	LC
Blue-winged Teal	<i>Spatula discors</i>	Full migrant	LC
Blue-winged Warbler	<i>Vermivora cyanoptera</i>	Full migrant	LC
Boat-billed Flycatcher	<i>Megarynchus pitangua</i>	Non-migrant	LC
Boat-Billed Heron	<i>Cochlearius cochlearius</i>	Non-migrant	LC
Bright-rumped Attila	<i>Attila spadiceus</i>	Non-migrant	LC

³⁰ LC = Least Concern, NT = Near Threatened, VU = Vulnerable.

Common Name	Species Name	Movement patterns	Red List Category 30
Bronzed Cowbird	<i>Molothrus aeneus</i>	Full migrant	LC
Brown Jay	<i>Cyanocorax morio</i>	Non-migrant	LC
Brown-hooded Parrot	<i>Pyrilia haematotis</i>	Altitudinal migrant	LC
Buff-bellied Hummingbird	<i>Amazilia yucatanensis</i>	Full migrant	LC
Canivet's Emerald	<i>Cynanthus canivetii</i>	Non-migrant	LC
Caspian Tern	<i>Hydroprogne caspia</i>	Full migrant	LC
Chestnut-colored Woodpecker	<i>Celeus castaneus</i>	Non-migrant	LC
Chestnut-sided Warbler	<i>Setophaga pensylvanica</i>	Full migrant	LC
Cinnamon Becard	<i>Pachyramphus cinnamomeus</i>	Non-migrant	LC
Cinnamon Hummingbird	<i>Amazilia rutila</i>	Non-migrant	LC
Cinnamon-bellied Saltator	<i>Saltator grandis</i>	Non-migrant	LC
Clay-colored Thrush	<i>Turdus grayi</i>	Non-migrant	LC
Collared Aracari	<i>Pteroglossus torquatus</i>	Non-migrant	LC
Collared Forest-Falcon	<i>Micrastur semitorquatus</i>	Non-migrant	LC
Common Black Hawk	<i>Buteogallus anthracinus</i>	Full migrant	LC
Common Pauraque	<i>Nyctidromus albicollis</i>	Non-migrant	LC
Common Tody-Flycatcher	<i>Todirostrum cinereum</i>	Non-migrant	LC
Common Yellowthroat	<i>Geothlypis trichas</i>	Full migrant	LC
Couch's Kingbird	<i>Tyrannus couchii</i>	Non-migrant	LC
Crested Guan	<i>Penelope purpurascens</i>	Non-migrant	NT
Dot-winged Antwren	<i>Microrhopias quixensis</i>	Non-migrant	LC
Dusky Antbird	<i>Cercomacroides tyrannina</i>	Non-migrant	LC
Dusky-capped Flycatcher	<i>Myiarchus tuberculifer</i>	Non-migrant	LC
Eastern Meadowlark	<i>Sturnella magna</i>	Full migrant	NT
Ferruginous Pygmy Owl	<i>Glaucidium brasilianum</i>	Full migrant	LC
Fork-tailed Flycatcher	<i>Tyrannus savana</i>	Full migrant	LC
Gartered Trogon	<i>Trogon caligatus</i>	Non-migrant	LC
Gray Catbird	<i>Dumetella carolinensis</i>	Full migrant	LC
Gray Hawk	<i>Buteo plagiatus</i>	Full migrant	LC
Gray-breasted Crake	<i>Laterallus exilis</i>	Non-migrant	LC
Gray-breasted Martin	<i>Progne chalybea</i>	Full migrant	LC
Gray-collared Becard	<i>Pachyramphus major</i>	Altitudinal migrant	LC
Gray-crowned Yellowthroat	<i>Geothlypis poliocephala</i>	Non-migrant	LC
Gray-headed Dove	<i>Leptotila plumbeiceps</i>	Non-migrant	LC
Gray-headed Kite	<i>Leptodon cayanensis</i>	Non-migrant	LC
Great Antshrike	<i>Taraba major</i>	Non-migrant	LC
Great Blue Heron	<i>Ardea herodias</i>	Full migrant	LC
Great Crested Flycatcher	<i>Myiarchus crinitus</i>	Full migrant	LC
Great Curassow	<i>Crax rubra</i>	Non-migrant	VU

Common Name	Species Name	Movement patterns	Red List Category ³⁰
Great Egret	<i>Ardea alba</i>	Full migrant	LC
Great Black Hawk	<i>Buteogallus urubitinga</i>	Non-migrant	LC
Great Kiskadee	<i>Pitangus sulphuratus</i>	Full migrant	LC
Great Tinamou	<i>Tinamus major</i>	Non-migrant	LC
Greater Yellowlegs	<i>Tringa melanoleuca</i>	Full migrant	NT
Green Heron	<i>Butorides virescens</i>	Full migrant	LC
Green Jay	<i>Cyanocorax yncas</i>	Non-migrant	LC
Green Kingfisher	<i>Chloroceryle americana</i>	Non-migrant	LC
Green-backed Sparrow	<i>Arremonops chloronotus</i>	Non-migrant	LC
Golden-fronted Woodpecker	<i>Melanerpes aurifrons</i>	Non-migrant	LC
Golden-olive Woodpecker	<i>Colaptes rubiginosus</i>	Non-migrant	LC
Golden-winged Warbler	<i>Vermivora chrysoptera</i>	Full migrant	NT
Groove-billed Ani	<i>Crotophaga sulcirostris</i>	Nomadic	LC
Hooded Warbler	<i>Setophaga citrina</i>	Full migrant	LC
Hook-billed Kite	<i>Chondrohierax uncinatus</i>	Non-migrant	LC
Indigo Bunting	<i>Passerina cyanea</i>	Full migrant	LC
Ivory-billed Woodcreeper	<i>Xiphorhynchus flavigaster</i>	Non-migrant	LC
Jabiru	<i>Jabiru mycteria</i>	Non-migrant	LC
Keel-billed Toucan	<i>Ramphastos sulfuratus</i>	Non-migrant	NT
King Vulture	<i>Sarcoramphus papa</i>	Non-migrant	LC
Laughing Falcon	<i>Herpetotheres cachinnans</i>	Non-migrant	LC
Least Bittern	<i>Botaurus exilis</i>	Full migrant	LC
Least Flycatcher	<i>Empidonax minimus</i>	Full migrant	LC
Lesser Greenlet	<i>Pachysylvia decurtata</i>	Non-migrant	LC
Lesser Swallow-tailed Swift	<i>Panyptila cayennensis</i>	Non-migrant	LC
Lesser Yellow-headed Vulture	<i>Cathartes burrovianus</i>	Non-migrant	LC
Lesson's Motmot	<i>Momotus lessonii</i>	Non-migrant	LC
Lineated Woodpecker	<i>Dryocopus lineatus</i>	Non-migrant	LC
Little Blue Heron	<i>Egretta caerulea</i>	Full migrant	LC
Little Tinamou	<i>Crypturellus soui</i>	Non-migrant	LC
Limpkin	<i>Aramus guarauna</i>	Full migrant	LC
Long-billed Gnatwren	<i>Ramphocaenus melanurus</i>	Non-migrant	LC
Long-billed Hermit	<i>Phaethornis longirostris</i>	Non-migrant	LC
Louisiana Waterthrush	<i>Parkesia motacilla</i>	Full migrant	LC
Magnolia Warbler	<i>Setophaga magnolia</i>	Full migrant	LC
Mangrove Swallow	<i>Tachycineta albilinea</i>	Non-migrant	LC
Mangrove Vireo	<i>Vireo pallens</i>	Non-migrant	LC
Masked Tityra	<i>Tityra semifasciata</i>	Non-migrant	LC
Mayan Antthrush	<i>Formicarius moniliger</i>	Non-migrant	LC

Common Name	Species Name	Movement patterns	Red List Category 30
Merlin	<i>Falco columbarius</i>	Full migrant	LC
Montezuma Oropendola	<i>Psarocolius montezuma</i>	Non-migrant	LC
Morelet's Seedeater	<i>Sporophila moreletii</i>	Non-migrant	LC
Mottled Owl	<i>Strix virgata</i>	Non-migrant	LC
Muscovey Duck	<i>Cairina moschata</i>	Non-migrant	LC
Neotropical Cormorant	<i>Nannopterum brasilianum</i>	Non-migrant	LC
Northern Barred-Woodcreeper	<i>Dendrocolaptes sanctithomae</i>	Non-migrant	LC
Northern Beardless-Tyrannulet	<i>Camptostoma imberbe</i>	Non-migrant	LC
Northern Bentbill	<i>Oncostoma cinereigulare</i>	Non-migrant	LC
Northern Jacana	<i>Jacana spinosa</i>	Non-migrant	LC
Northern Rough-winged Swallow	<i>Stelgidopteryx serripennis</i>	Full migrant	LC
Northern Parula	<i>Setophaga americana</i>	Full migrant	LC
Northern Plain-Xenops	<i>Xenops mexicanus</i>	Non-migrant	
Northern Tropical Pewee	<i>Contopus bogotensis</i>	Full migrant	LC
Northern Waterthrush	<i>Parkesia noveboracensis</i>	Full migrant	LC
Ochre-bellied Flycatcher	<i>Mionectes oleagineus</i>	Non-migrant	LC
Olive Sparrow	<i>Arremonops rufivirgatus</i>	Non-migrant	LC
Olive-backed Euphonia	<i>Euphonia gouldi</i>	Non-migrant	LC
Olive-throated Parakeet	<i>Eupsittula nana</i>	Non-migrant	NT
Orchard Oriole	<i>Icterus spurius</i>	Full migrant	LC
Osprey	<i>Pandion haliaetus</i>	Full migrant	LC
Ovenbird	<i>Seiurus aurocapilla</i>	Full migrant	LC
Pale-billed Woodpecker	<i>Campephilus guatemalensis</i>	Non-migrant	LC
Pale-vented Pigeon	<i>Patagioenas cayennensis</i>	Non-migrant	LC
Pinnated Bittern	<i>Botaurus pinnatus</i>	Full migrant	LC
Plain Chachalaca	<i>Ortalis vetula</i>	Non-migrant	LC
Prothonotary Warbler	<i>Protonotaria citrea</i>	Full migrant	LC
Purple Gallinule	<i>Porphyrio martinica</i>	Full migrant	LC
Red-billed Pigeon	<i>Patagioenas flavirostris</i>	Non-migrant	LC
Red-legged Honeycreeper	<i>Cyanerpes cyaneus</i>	Non-migrant	LC
Red-lore Amazon	<i>Amazona autumnalis</i>	Non-migrant	LC
Red-throated Ant-Tanager	<i>Driophlox fuscicauda</i>	Non-migrant	LC
Red-winged Blackbird	<i>Agelaius phoeniceus</i>	Non-migrant	LC
Ringed Kingfisher	<i>Megaceryle torquata</i>	Full migrant	LC
Roadside Hawk	<i>Rupornis magnirostris</i>	Non-migrant	LC
Roseate Spoonbill	<i>Platalea ajaja</i>	Full migrant	LC
Rose-breasted Grosbeak	<i>Pheucticus ludovicianus</i>	Full migrant	LC
Rose-throated Tanager	<i>Piranga roseogularis</i>	Non-migrant	LC

Common Name	Species Name	Movement patterns	Red List Category 30
Rufous-browed Peppershrike	<i>Cyclarhis gujanensis</i>	Non-migrant	LC
Rufous-tailed Hummingbird	<i>Amazilia tzacatl</i>	Non-migrant	LC
Snail Kite	<i>Rostrhamus sociabilis</i>	Full migrant	LC
Snowy Egret	<i>Egretta thula</i>	Full migrant	LC
Social Flycatcher	<i>Myiozetetes similis</i>	Non-migrant	LC
Sora	<i>Porzana carolina</i>	Full migrant	LC
Southern House Wren	<i>Troglodytes musculus</i>	Non-migrant	
Spot-breasted Wren	<i>Pheugopedius maculipectus</i>	Non-migrant	LC
Squirrel Cuckoo	<i>Piaya cayana</i>	Non-migrant	LC
Streak-headed Woodcreeper	<i>Lepidocolaptes souleyetii</i>	Non-migrant	LC
Stripe-throated Hermit	<i>Phaethornis striigularis</i>	Non-migrant	LC
Sulphur-bellied Flycatcher	<i>Myiodynastes luteiventris</i>	Full migrant	LC
Summer Tanager	<i>Piranga rubra</i>	Full migrant	LC
Sungrebe	<i>Heliornis fulica</i>	Non-migrant	LC
Thick-billed Seed-finch	<i>Sporophila funerea</i>	Non-migrant	LC
Thicket Tinamou	<i>Crypturellus cinnamomeus</i>	Non-migrant	LC
Tree Swallow	<i>Tachycineta bicolor</i>	Full migrant	LC
Tricolored Heron	<i>Egretta tricolor</i>	Full migrant	LC
Tropical Kingbird	<i>Tyrannus melancholicus</i>	Full migrant	LC
Tropical Mockingbird	<i>Mimus gilvus</i>	Non-migrant	LC
Turkey Vulture	<i>Cathartes aura</i>	Full migrant	LC
Variable Seedeater	<i>Sporophila corvina</i>	Non-migrant	LC
Vaux's Swift	<i>Chaetura vauxi</i>	Full migrant	LC
Vermilion Flycatcher	<i>Pyrocephalus rubinus</i>	Full migrant	LC
Western Cattle-Egret	<i>Ardea ibis</i>	Non-migrant	LC
White Ibis	<i>Eudocimus albus</i>	Non-migrant	LC
White-bellied Emerald	<i>Chlorestes candida</i>	Non-migrant	LC
White-breasted Wood-Wren	<i>Henicorhina leucosticta</i>	Non-migrant	LC
White-collared Manakin	<i>Manacus candei</i>	Non-migrant	LC
White-collared Swift	<i>Streptoprocne zonaris</i>	Full migrant	LC
White-crowned Parrot	<i>Pionus senilis</i>	Non-migrant	LC
White-eyed Vireo	<i>Vireo griseus</i>	Full migrant	LC
White-fronted Amazon	<i>Amazona albifrons</i>	Non-migrant	LC
White-necked Jacobin	<i>Florisuga mellivora</i>	Non-migrant	LC
White-necked Puffbird	<i>Notharchus hyperrhynchus</i>	Non-migrant	LC
White-tailed Kite	<i>Elanus leucurus</i>	Full migrant	LC
White-tipped Dove	<i>Leptotila verreauxi</i>	Non-migrant	LC
White-winged Becard	<i>Pachyramphus polychopterus</i>	Full migrant	LC
Wood Stork	<i>Mycteria americana</i>	Full migrant	LC

Common Name	Species Name	Movement patterns	Red List Category ³⁰
Wood Thrush	<i>Hylocichla mustelina</i>	Full migrant	LC
Yellow Warbler	<i>Setophaga petechia</i>	Full migrant	LC
Yellow-backed Oriole	<i>Icterus chrysater</i>	Non-migrant	LC
Yellow-bellied Elaenia	<i>Elaenia flavogaster</i>	Non-migrant	LC
Yellow-bellied Flycatcher	<i>Empidonax flaviventris</i>	Full migrant	LC
Yellow-billed Cacique	<i>Amblycercus holosericeus</i>	Non-migrant	LC
Yellow-breasted Chat	<i>Icteria virens</i>	Full migrant	LC
Yellow-breasted Crake	<i>Laterallus flaviventer</i>	Non-migrant	LC
Yellow-crowned Night Heron	<i>Nyctanassa violacea</i>	Full migrant	LC
Yellow-faced Grassquit	<i>Tiaris olivaceus</i>	Non-migrant	LC
Yellow-green Vireo	<i>Vireo flavoviridis</i>	Full migrant	LC
Yellow-lored Amazon	<i>Amazona xantholora</i>	Non-migrant	LC
Yellow-rumped Warbler	<i>Setophaga coronata</i>	Full migrant	LC
Yellow-tailed Oriole	<i>Icterus mesomelas</i>	Non-migrant	LC
Yellow-throated Euphonia	<i>Euphonia hirundinacea</i>	Non-migrant	LC
Yellow-winged Tanager	<i>Thraupis abbas</i>	Non-migrant	LC
Yucatan Flycatcher	<i>Myiarchus yucatanensis</i>	Non-migrant	LC
Yucatan Nightjar	<i>Antrostomus badius</i>	Non-migrant	LC

Baird's Tapir

Baird's tapir (*Tapirus bairdii*) is a tapir species native to Central and South America. The genus *Tapirus* belongs to the family Tapiridae, which in turn belongs to the order Perissodactyla, the odd-toed ungulates, along with equines and rhinos (Garcia et al., 2016). *Baird's tapir* is the largest of the three tapir species found in Central and South America. Adults range from 6 to 8 feet in length and 2 to 4 feet in height and weigh from 300 to 600 lbs. Adults are covered in dark, greyish-brown fur with cream-colored markings around the face, throat, and ears. Like other tapirs, the snout and upper lip have fused to create a flexible proboscis. The proboscis is used for grasping and detecting physical stimuli in addition to its olfactory. The average lifespan is up to 30 years (Schank et al., 2020).

Ecology

Baird's tapir is native to Central America and parts of northern South America and is found in all districts of Belize (Garcia et al., 2016; Monette et al., 2020). This species is typically found in tropical forests with bodies of water nearby as well as in lowland savannas, pine woodlands, riparian forests, mangroves, coastal scrub forests, and montane forests and is primarily nocturnal, but may be active at any time of day (Meyer et al., 2022). *Baird's tapir* is herbivorous, foraging for leaves in the forest understory as well as grasses and fallen fruits. Tapirs are generally solitary, though individuals will sometimes congregate in areas with abundant food (Meyer et al., 2022).

Female tapirs produce one offspring at a time with a gestation period of approximately 13 months. Young tapirs are born with reddish brown hair with white spot and stripe patterns. The patterns provide camouflage for the baby tapir when it hides in the forest understory while its mother forages (Schank et al., 2020). Tapirs are considered important environmental engineers. They help maintain forest dynamics through selective herbivory, seed predation and dispersal, trampling, and soil plowing (Falconi-Briones et al., 2025). Because of their large size, they have relatively few predators. Jaguars and large crocodiles have been known to kill adults. Humans are the tapirs' most common predator, both intentionally through hunting and accidentally by car strike (Meyer et al., 2022; Poot & Clevenger, 2018).

Conservation

Baird's tapir is classified as Endangered according to the IUCN Red List of Threatened Species (Garcia et al., 2016). The primary threats to *Baird's tapir* are habitat loss due to deforestation and hunting. (Schank et al., 2020). The Selva Maya in Mexico, Guatemala, and Belize (including the Maya Forest Corridor project area) is highly important to wide-ranging species that require extensive tracts of intact forest to sustain viable populations, including Baird's tapir (Martinez et al., 2021).

In addition to environmental threats, tapirs face increased pressure from interactions with humans and are hunted for their meat and hides. Though hunting tapir is illegal, the laws protecting them often go unenforced (Garcia et al., 2016). As forests become more fragmented by development and deforestation, tapirs must traverse greater distances to forage and often must cross roads (Garcia et al., 2016). Their muted coloration and tendency to move at night when visibility is reduced increases the risk of collision with cars (Poot & Clevenger, 2018).

Baird's tapir is covered at a regional level under CITES Appendix I (Garcia et al., 2016). Belize is of particular importance to conservation efforts. The country is situated in the middle of the tapir's range and contains a wide variety of suitable habitats. According to a national study, 22.6% of the country is considered a protected area with some level of legal protection (Convention on Biological Diversity, n.d.). The protection of these areas and the species found within them are legislated by the Forest Act, National Parks System Act, Fisheries Act, National Lands Act, Wildlife Protection Act, and the National Institute for Culture and History Act (Convention on Biological Diversity, n.d.) (Convention on Biological Diversity, *Belize-Country Profile* 2023). Other pieces of legislation may provide support to conservation efforts depending on the situation. Most conservation and managements are coordinated under Belize's National Biodiversity Strategy and Action Plan, which was adopted in 1998 and last updated in 2016 (Convention on Biological Diversity, *Belize-Country Profile* 2023). While there is no legislation directed specifically at *Baird's tapir*, several NGO groups, like the Belize Tapir Project and the Baird's Tapir Survival Alliance focus their efforts on educating the public on the importance of the species, as well as working to restoring forests to suitable conditions for the species. In addition, projects to protect critical areas of biodiversity, such as the Maya Forest Corridor, also benefit the species (Re:wild, n.d.).

Baird's tapir is commonly seen by WCS rangers and researchers in the project area (B. Arevalo personal communication February 2023) and tracks and other signs of occupancy are frequently encountered.

Central American River Turtle

The Central American River Turtle (*Dermatemys mawii*) is also known as the “Hicatee.” It is the only living species in the genus *Dermatemys*, which in turn is the only extant genus in the family Dermatemydidae (Lowry, 2001). Dermatemydidae belongs to the order Testudines, which comprise the terrestrial and aquatic turtle lineages, along with tortoises, sea turtles, and terrapins. Females average between 34.2 and 42 cm carapace, while males are generally smaller, averaging between 32 and 38 cm (Lowry, 2001). The largest turtle reported was 60 cm and weighed 22 kg. In adults, the carapace is olive green in color and smooth. The top is somewhat flattened, with serrations on the hind end; the fleshy parts of the turtle mostly an olive gray color (Lowry, 2001).

Nesting occurs during the rainy season from September through December, when waterways have swelled and provide access to more secluded areas (Ellsworth, 2021). Nests are generally excavated within 3 m of the shore, often under overhanging river banks or protective vegetation (Vogt et al., 2006) and clutch size ranging from six to twenty eggs (Lowry, 2001). Because water levels are dynamic, nests may end up completely submerged during incubation (Lowry, 2001). Inundation does not seem to have a negative effect on the developing eggs, with documented hatching success of 80% to 100% from nests that were submerged for more than 30 days (Vogt et al., 2006).

Ecology

Populations of Central American river turtle are known to exist in waterways of Mexico, Guatemala, and Belize (Vogt et al., 2006) and is fully aquatic inhabiting rivers, lakes, lagoons, and creeks in Belize (Rainwater et al., 2012). They are poorly designed for terrestrial locomotion and rely on annual flooding to move between bodies of water (Ellsworth, 2021). They are excellent swimmers and are capable of swimming up rapids to reach new areas (often found in fast-moving sections of river), likely because the water is more oxygenated, but will also seek shelter in the calmer pools associated with fallen trees (Dyslin, 2023). Large individuals often embed themselves in detritus while resting on the river bottom, while smaller individuals will hide among fallen branches closer to shore (Vogt et al., 2006). The Central American river turtle does not bask in the sun as other turtle species do, and most activity occurs at night (Lowry, 2001).

The Central American river turtle is herbivorous and eats a wide variety of aquatic vegetation, fallen leaves and fruits, and leaf detritus (Lowry, 2001). Populations in Belize are known to enter estuaries to feed on mangrove vegetation and sea grasses (Ellsworth, 2021; Vogt et al., 2006). All life stages are hunted and eaten by crocodiles, raccoons, coatimundis, river otters, and many species of wading birds (Lowry, 2001).

Conservation

The Central American River Turtle is listed as Critically Endangered on the IUCN Red List (Vogt et al., 2006). The greatest threat to this species is human harvesting for consumption and the animal trade (Rainwater et al., 2012; Vogt et al., 2006). Turtle meat is a prized traditional dish for communities in all parts of its range and individuals fetch a high price at local markets (Vogt et al., 2006). Water pollution

due to human development is also a threat to the turtles due to their entirely aquatic existence (Briggs-Gonzalez et al., 2019; Ellsworth, 2021).

In Belize, formal legislation (Statutory Instrument No. 55, of April 1993) has been adopted to control the level of harvest and establish some protected populations. Populations in some sections of Rio Bravo and Irish Creek, Spanish Creek, Cox Lagoon also have partial protection as these water ways are within protected areas. Part of the Sibun River has been designated a Hicatee Conservation Area (Vogt et al., 2006). Outside of Belize, Central American river turtle is listed in Appendix II of CITES and is categorized as a highly protected species by the U.S. Endangered Species Act (Vogt et al., 2006).

Novelo-Fuentes and Arevalo (2022) captured 29 individual Central American river turtles at the Cox lagoon aquatic habitat in their baseline study of the species in the project area. Because of the trapping methods used, smaller juveniles were not captured due to the mesh size of the trap used, which strongly indicates the population is in fact much larger. Furthermore, because of the sex/age distribution being skewed toward females and juveniles, it is likely that this population could serve as a source to other suitable aquatic habitats in the project zone (Novelo-Fuentes & Arevalo, 2022). The relative isolation of the population, coupled with the presence of WCS rangers patrolling the area, should further secure the population as a potential source to repopulate appropriate habitat in the project zone.



Figure 24. Male D. mawii captured during surveys of the species in the project area in 2022

Table 48. Vulnerable, endangered, and critically endangered species confirmed from the project zone and areas needed for habitat connectivity.

Species and habitat	The following threatened and endangered species will benefit from the project:
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1. **Baird's tapir (*Tapirus bairdii*).** Baird's tapir is classified as endangered on the IUCN Red List. In Belize, this ungulate species is found in tropical forests with bodies of water nearby as well as in lowland savannas, pine woodlands, riparian forests, mangroves, coastal scrub forests, and montane forests (Garcia et al., 2016; Martinez et al., 2021). Belize is of particular importance to conservation efforts since the country is situated in the middle of the tapir's range and contains a wide variety of suitable habitats. Baird's tapir is relatively common within the project area, the project zone, and the larger MFC. The project will directly benefit the species by the maintenance and preservation of forest cover and other critical habitat in the project area. Baird's tapir is a species that is commonly hunted/poached in Belize (Waters & Ulloa, 2007)..
2. **Central American river turtle (Hicatee) (*Dermatemys mawii*).** The Central American river turtle, or hicatee as it is commonly known in Belize, is classified as critically endangered on the IUCN Red List. The hicatee is fully aquatic and inhabits rivers, lakes, lagoons, and creeks in Belize (Vogt et al., 2006). They are poorly designed for terrestrial locomotion and rely on annual flooding during the rainy seasons to move between bodies of water. They are excellent swimmers and are capable of swimming up rapids to reach new areas (Vogt et al., 2006). They are often found in fast-moving sections of river, likely because the water is more oxygenated, but will also seek shelter in the calmer pools associated with fallen trees. Large individuals often embed themselves in detritus while resting on the river bottom, while smaller individuals will hide among fallen branches closer to shore (Vogt et al., 2006). It does not bask in the sun as other turtle species do, and most activity occurs at night (Lowry, 2001). The greatest threat to this species is human harvesting for consumption and the animal trade. Turtle meat is a prized traditional dish for communities in all parts of its range and individuals fetch a high price at local markets. Capture of live individuals to export to other areas is also of concern (Vogt et al., 2006)(Vogt et al 2006). The hicatee occurs within the project area, the project zone, and the larger MFC. A large population occurs within the project area at Cox lagoon (Novelo-Fuentes & Arevalo, 2022). The patrolling of the project area by WCS rangers will substantially curtail poaching on the project area lands and discourage it in the project zone. Further, the conservation of the forest helps protect the health of Cox lagoon that would have otherwise been contaminated from increased sedimentation as well as fertilizer and pesticide runoff from agriculture.
3. **Yucatán black howler monkey (*Alouatta pigra*).** The Yucatan Black Howler is classified as endangered on the IUCN Red List. Their habitat in Belize is

primarily tropical broadleaved deciduous forests and riparian broadleaved forests generally at lower elevations (Pavelka et al., 2007; Trollet, 2010). Populations have been confirmed within the project zone (e.g. Monkey Bay) and in the project area. The project will benefit the species by the maintenance and preservation of forest cover.

4. **Geoffroy's spider monkey (*Ateles geoffroyi*).** Geoffroy's Spider Monkey is classified as endangered on the IUCN Red List. Spider Monkey habitat in Belize is like that of the Yucatan Howler and in fact the species overlap in many areas of Belize (Waters & Ulloa, 2007). Spider Monkeys are widespread in less disturbed tropical broadleaved forests in Belize (Champion, 2013; Griffin, 2013). Spider monkey populations have been confirmed on at least two properties (e.g. Runaway Creek, Rio Bravo Conservation and Management Area) portions of which are in the project zone and are part of the larger MFC. The project will benefit the species by the maintenance and preservation of forest cover.
5. **Yellow-headed amazon (*Amazona oratrix*).** The Yellow-headed amazon is a parrot species, classified as endangered on the IUCN Red List. Their habitat in Belize is almost exclusively lowland and coastal pine savanna, using cavities in the Caribbean pine for nesting (Tarazona-Tubens et al., 2022). The Yellow-headed Amazon has been confirmed using the lowland pine savanna within the MFC and likely the project area (Tarazona-Tubens et al., 2022). While the project area has very little pine savanna to protect, the project will seek to encourage and work with partners in the project zone to conserve and manage lowland pine savanna.
6. **White-lipped peccary (*Tayassu pecari*).** The White-lipped peccary is classified as vulnerable on the IUCN Red List. While 60% of the species' distribution is in humid tropical forests, they are also found in a diversity of habitats such as wet and dry grasslands and woodlands, tropical dry forests, and coastal mangroves (Keuroghlian et al., 2013). They travel in large herds sometimes exceeding 100 individuals and require large contiguous areas of habitat in order to ensure sufficient resources (Hofman et al., 2018; Keuroghlian et al., 2013). Because of this and the fact that they do not normally disperse over long distance, they are particularly sensitive to changes in landscape connectivity (Falconi-Briones et al., 2025; Hofman et al., 2018). Widespread deforestation and hunting pressure are the main causes for the species' decline (Keuroghlian et al., 2013). As with Baird's tapirs, they are important ecosystem engineers contributing to maintaining forest dynamics through selective herbivory, seed predation and dispersal, trampling, and soil plowing (Falconi-Briones et al., 2025). Groups have been observed in the

	project area and throughout the project zone. The project will benefit the species by the maintenance and preservation of habitat and ensuring connectivity between the two intact forest blocks to the north and south. The patrolling of the project area by WCS rangers will also curtail illegal hunting on the project area lands and discourage it in the project zone. 7. Great curassow (<i>Crax rubra</i>). The Great curassow is classified as vulnerable on the IUCN RED List. Its habitat is restricted to undisturbed humid evergreen forests and mangroves with some evidence that it tolerates limited disturbance. It has also been found to use secondary forests where there is no hunting (Birdlife International, 2020). These large pheasant-like birds forage for food, primarily fruit, on the forest floor and can be found in groups or by themselves. They play an important ecological role as seed dispersers (Pérez-Irineo & Santos-Moreno, 2017). Their populations are threatened from overhunting and habitat loss and fragmentation (Birdlife International, 2020; Pérez-Irineo & Santos-Moreno, 2017). Individuals have been observed in the project area and throughout the project zone. The project will benefit the species by the maintenance and preservation of habitat. The patrolling of the project area by WCS rangers will also curtail illegal hunting on the project area lands and discourage it in the project zone.
Areas needed for habitat connectivity	This project conserves a key area of the Maya Forest Corridor, which provides that last critical link between Belize's two largest intact forest blocks: the privately managed northern forest block (Rio Bravo Conservation and Management Area, The Belize Maya Forest Trust Lands, and Gallon Jug) and the largely publicly owned Maya Mountain Massif in southern Belize (Briggs et al., 2013; Mitchell et al., 2017). As such, habitat connectivity will benefit from the project as opposed to being adversely affected.

5.1.2 High Conservation Values (CCB, B1.2)

The following high conservation values are identified within the project zone.

Table 49. HCVs related to biodiversity in the MFC REDD project zone

High conservation value	CCB 3.1: Globally, regionally or nationally significant concentrations of biodiversity values: Threatened species HCV Network: HCV 1: Species diversity Concentrations of biological diversity, including endemic species, and rare,
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	threatened, or endangered species, that are significant at global, regional, or national levels.
Qualifying attribute	The MFC REDD project zone supports populations of the following species as documented in Table 48: • Baird's tapir (<i>Tapirus bairdii</i>) classified as "endangered" on the IUCN Red List. • Central American river turtles (Hicatee) (<i>Dermatemys mawii</i>) classified as "critically endangered" on the IUCN Red List. • Yucatán black howler monkey (<i>Alouatta pigra</i>) classified as "endangered" on the IUCN Red List. • Geoffrey's spider monkey (<i>Ateles geoffroyi</i>) classified as "endangered" on the IUCN Red List. • White-lipped peccary (<i>Tayassu pecari</i>) classified as "vulnerable" on the IUCN Red List • Great Curassow (<i>Crax rubra</i>) classified as "vulnerable" on the IUCN Red List
Focal area	MFC REDD project zone

5.1.3 Without-project Scenario: Biodiversity (CCB, B1.3)

Deforestation of the tropical broadleaf forest and conversion to agriculture is the most probable land use for the project area under the without project scenario. The most likely crop would be sugarcane. The cultivation of sugarcane involves the complete removal of the forest and subsequent deep plowing and furrowing of the soils prior to planting (James, 2004, Obidzinski et al 2015). Conversion of the forest includes bulldozing, piling, and burning the remaining vegetation and planting to sugarcane. The loss of forest cover due to agricultural conversion would have a profound effect on the two HCV's identified in 5.1.2. Local populations of medium-large mammals and terrestrial birds (indicators of forest health) and the Central American river turtle (indicator of aquatic health) would decline precipitously and likely become locally extinct within the project area and threatened in the project zone under the without project scenario.

5.2 Net Positive Biodiversity Impacts

5.2.1 Expected Biodiversity Changes (VCS, 3.19; CCB, B2.1)

The project is an avoiding planned deforestation project where primary project activities include: 1) the purchase of the property under threat of conversion to commercial agriculture; and 2) the maintenance of natural ecosystems and current forest cover for the conservation of native biodiversity through the implementation of management strategies, such as detection, mitigation, and control of wildfires and surveillance and patrolling. As described in Appendix 10 detailing the process to develop the project forest cover benchmark map, only areas meeting the definition of forest during the ten years prior to the start of the project were included in the project area. Because the project is designed to maintain the current ecological state throughout the entire project area and project zone, no changes in biodiversity are expected.

Table 50. Anticipated change in total area of forests in the project area

Biodiversity element	Total area of forest, in hectares, in the project area
Estimated change	None
Justification of change	Because of the project activities listed above, the area of forests is expected to remain unchanged.

Table 51. Anticipated change in occurrence of medium-large mammals and terrestrial birds in the project zone

Biodiversity element	Continued occurrence of medium-large mammals and terrestrial birds in the project zone with a special focus on the Baird's tapir. These communities play a variety of roles in the forest ecosystem including maintaining balance in the food chain, controlling the growth and density of forest plants, and dispersing seeds. As such, they are indicators of functioning forest ecosystems (Falconi-Briones et al., 2025; Mora, 2017; Pérez-Irineo & Santos-Moreno, 2017; Thornton et al., 2012). In particular, the preservation of the Species Diversity HCV is represented through the occurrence of the Baird's tapir, the White-lipped peccary, and the Great curassow.
Estimated change	None
Justification of change	The Maya Forest Corridor REDD Project aims to protect and conserve the tropical lowland forest and the biodiversity sustained by the forest. Without the project, the area would have been cleared for agricultural production. Regular monitoring of the occurrence of these indicator communities in the project zone ensures that the project is effectively maintaining forest health and its biodiversity.

Table 52. Anticipated change in occurrence of Central American river turtles in the project zone

Biodiversity element	Continued occurrence of the Central American river turtles in Cox Lagoon. This species was selected as an indicator of the project's impact on the freshwater system, Cox Lagoon, due to its sensitivity to changes in water quality, including increased sedimentation from the clearing of the land and agricultural runoff (Briggs-Gonzalez et al., 2019). Further, the preservation of the Species Diversity HCV is represented through the occurrence of the turtle.
Estimated change	None
Justification of change	The Maya Forest Corridor REDD Project aims to protect and conserve the tropical lowland forest and the biodiversity sustained by the forest. Without the project, the area would have been cleared for agricultural production. Regular monitoring of the occurrence of this indicator species in Cox Lagoon will ensure that the project is effectively protecting the critically endangered species and the lagoon on the whole.

5.2.2 Mitigation Measures (VCS, 3.19; CCB, B2.3)

Because the project is an avoiding deforestation project where the primary project activity is to protect the forest, there are not expected to be any significant negative impacts on biodiversity from project activities. WCS rangers and other WCS staff working in the project area must follow strict protocols laid out in the Maya Forest Corridor Field Station (MFCFS) Operations Manual to avoid causing negative impacts on the area's biodiversity including rules to avoid starting wildfires; rules prohibiting hunting, fishing, extraction, or defacing of forest products; and rules on proper garbage disposal. Refer to Appendix 28.

5.2.3 Net Positive Biodiversity Impacts (CCB, B2.2, GL1.4)

The project is an avoiding planned deforestation project where the primary project activities include: 1) the purchase of the property under threat of conversion to commercial agriculture; and 2) the maintenance of natural ecosystems and current forest cover for the conservation of native biodiversity through the implementation of management strategies, such as detection, mitigation, and control of wildfires and surveillance and patrolling. Through the protection of existing forests and other ecosystems in the project area, the project will be also actively conserving and protecting habitat for flora and fauna. The protection of habitat resulting from the maintenance of forest cover includes critical terrestrial and aquatic habitat for the IUCN endangered Baird's tapir and IUCN critically endangered the Central American river turtle.

5.2.4 High Conservation Values Protected (CCB, B2.4)

The protection of the forest in the project area that would have otherwise been cleared for agriculture and the patrolling activities to identify and prevent illegal hunting contribute to the maintenance of the Species Diversity HCV for the entire project zone. This forest serves as habitat for threatened species including Baird's tapirs, the Yucatan black howler monkeys, Geoffrey's spider monkeys, White-lipped peccaries, and Great curassows. The forests also help protect the aquatic habitat of the Central American river turtle. Not only does this benefit the wildlife that directly use the project area forests, but it more broadly benefits the species' local populations in the project zone and region by promoting migration and preventing genetic isolation through its role as a corridor. Furthermore, WCS has a robust and active ranger presence that patrols the entire project area to deter illegal poaching of the species and to prevent and control wildfires that would harm their habitat.

5.2.5 Species Used (VCS, 3.19; CCB, B2.5, B2.6)

No species are used for project activities.

5.2.6 Invasive Species (VCS, 3.19; CCB, B2.5)

While no invasive species have been identified as a threat to the forests in the project area, two non-native species have been identified as potential concerns for the freshwater ecosystems within the MFC property.

Table 53. Invasive species concerns

Existing invasive species	Mitigation measures to prevent the spread or continued existence of invasive species
Tilapia (<i>Oreochromys</i> spp.)	Tilapia have been detected in one water body within the project area. Tilapia are non-native to Belize and have spread in freshwater bodies throughout the country (Esselman et al., 2013). They are commonly believed to be invasive, although there have been no scientific studies to date documenting their negative ecological effects in the region (Elías et al., 2022; Esselman et al., 2013). The WCS rangers will continue to monitor their presence and potential ecological impact in the project area.
Armored catfish (<i>Pterygoplichthys pardalis</i>)	While armored catfish (<i>Pterygoplichthys pardalis</i>) have not been detected in the project area, they do pose a risk for its freshwater ecosystems as they have been found to outcompete native fish species (Quintana et al., 2023). The WCS rangers will continue to monitor their presence and potential ecological impact in the project area.

5.2.7 GMO Exclusion (CCB, B2.7)

No GMOs will be used in any project activity.

5.2.8 Inputs Justification (VCS, 3.19; CCB, B2.8)

No fertilizers, chemical pesticides, biological control agents or other inputs will be used for project activities.

5.2.9 Waste Products (VCS, 3.19; CCB, B2.9)

Garbage generated by WCS staff working in the project area will be collected and sorted into organic and non-organic items. The non-organic items will be further separated into paper, plastic and others. Items that be recycle will be taken to the recycling facility in the Belize City. Staff will ensure all liquids are removed from items and the garbage will be disposed weekly at the nearby landfill once a week. In the case of organic materials, rarely they are burnt in a designated area. Staff closely monitor the burning.

5.3 Offsite Biodiversity Impacts

5.3.1 Negative Offsite Biodiversity Impacts (CCB, B3.1) and Mitigation Measures (CCB, B3.2)

One of the stated outcomes of the project is that it protects and encourages the dispersal of wildlife through connecting the Selva Maya of Belize, Guatemala, and Mexico and the Maya Mountains Massif of southern Belize which are the largest tracts of intact forest in the Mesoamerica Biodiversity Hotspot. Specifically, the project is a key part of the MFC. The MFC, formerly known as the Central Belize Corridor is comprised of approximately 37,858 ha of largely privately-owned lowland forests and savanna in central Belize and is the most important corridor of the Belize national protected area system (Kay et al., 2015). The MFC provides the last critical link to Belize's two largest intact forest blocks: the privately owned northern forest block managed under Trust for the people and government of Belize³¹ and the largely publicly owned Maya Mountain Massif in southern Belize (Briggs et al., 2013; Mitchell et al., 2017). The protection and conservation of biodiversity across the entire Selva Maya is the explicit goal of the project.

As discussed in section 3.2.3 and described below in Table 54, the project's leakage risks could also negatively impact offsite biodiversity, although these risks are considered insignificant compared to the offsite benefits that the project provides as a critical wildlife corridor.

³¹ These privately managed lands include the Rio Bravo Conservation and Management Area, Gallon Jug, and the Belize Maya Forest lands - formerly known as Yalbac and Laguna Seca

Table 54. MFC REDD project negative offsite biodiversity impacts

Negative offsite impact	Mitigation measure(s)
Other forests are cleared for agricultural production due to displacement from the project area	Because the other areas where forests could be converted to sugarcane production are beyond the control of the project proponent, no leakage management activities could be applied to minimize displacement.

5.3.2 Net Offsite Biodiversity Benefits (VCS, 3.19; CCB, B3.3)

The MFC and the project zone is part of the larger tri-national corridor which connects forests across three central American countries (Belize, Mexico, and Guatemala known as the Selva Maya forest) (Hilty et al., 2012). Wildlife corridors overall can enhance gene flow between disjunct populations, support recolonization from local extinction, and facilitate range shifts in response to climate change (Latha et al., 2016). The project is explicitly designed to promote offsite benefits not only in Belize but across the Selva Maya in Central America. The additional habitat area provided by the avoided planned deforestation of the site will support population viability for a number of species across the wider area, reducing risks of extirpation through local stochastic events (e.g., diseases, natural disasters, etc.). The project's community engagement worked will influence positive land-use practices and environmental awareness outside the direct project area.

Given these substantial offsite biodiversity benefits as compared to the negative biodiversity impacts described above, net effect of the project on biodiversity is positive.

5.4 Biodiversity Impact Monitoring

5.4.1 Biodiversity Monitoring Plan (CCB, B4.1, B4.2, GL1.4, GL3.4)

The stated biodiversity objective of the project is the preservation of the MFC REDD project area to maintain its native biodiversity. Monitoring efforts will be focused on the following indicators:

- 1. Total area of forest, in hectares, in the project area.** The broadleaf forests in the project area are habitat for a huge array of flora and fauna and provide critical wildlife corridor functions within the larger MFC.
- 2. Continued occurrence of medium-large mammals and terrestrial birds in the project zone.** These communities play a variety of roles in the forest ecosystem including maintaining balance in the food chain, controlling the growth and density of forest plants, and dispersing seeds. As such, they are indicators of functioning forest ecosystems (Falconi-Briones et al., 2025; Mora, 2017; Pérez-Irinea & Santos-Moreno, 2017; Thornton et al., 2012). Overhunting of many of these species has also led to their population declines, and as such, monitoring will also help ensure that the efforts to control poaching are effective.

The monitoring of these communities will occur within the MFC REDD project area as well as in nearby areas in the project zone. This includes the monitoring of the endangered Baird's tapir, which will demonstrate the project's exceptional biodiversity benefits.

3. **Continued occurrence of the Central American river turtle in Cox Lagoon in the project area.** The Central American river turtle was selected as an indicator of the project's impact on the freshwater system, Cox Lagoon, due to its sensitivity to changes in water quality, including increased sedimentation from the clearing of the land and agricultural runoff (Briggs-Gonzalez et al., 2019). The monitoring of this critically endangered species will also demonstrate the project's exceptional biodiversity benefits.

5.4.1.1 Responsible entity

WCS will be responsible for implementing all the monitoring tasks. This may involve contracting qualified organizations and/or individuals to perform the tasks, especially those tasks related to the monitoring of Non-government Stakeholders including WCS. These tasks will include collecting, summarizing, analyzing, and archiving all of the data required to perform the monitoring tasks.

5.4.1.2 Monitoring the total area of forests

The full description of how this will be monitored can be found in the Climate Monitoring Plan (section 3.3.3.3.1). Given the importance of these forests to biodiversity in addition to storing carbon, it is included in the biodiversity monitoring plan as well.

5.4.1.3 Monitoring the occurrence of large and meso-mammal species and terrestrial birds

Inventory and monitoring of the distribution and occurrence of large and meso-mammal species, terrestrial birds, and their habitat relationships is essential to sound, ecosystem-based wildlife and land management. The use of camera traps is a scientifically accepted and effective method of providing this important population information (Monette et al., 2020; O'Connell et al., 2011; Satter et al., 2019). Camera traps are fixed cameras triggered by infra-red sensors that "capture" images of passing animals and is a non-invasive method of monitoring (Harmsen et al., 2019). Surveys using cameras is a quantitative technique that is applicable to many species and does not require physical capture.

While the camera trapping approach for this project was specifically designed to confirm the occurrence and distribution of Baird's Tapir, it has the added advantage of also serving as general monitoring effort for all large and meso-mammal species and terrestrial birds.

Camera trapping allows for the simultaneous survey of large areas by using a network, or grid, of cameras that run 24 hours a day. Once established, camera grids quickly accumulate trapping effort making it an efficient method of survey that produces a large amount of capture data in a relatively short period (Sunarto et al., 2013). Photographs obtained provide easily identifiable documentation and monitoring of species occurrence and distribution. Additionally, the round-the-clock surveillance that cameras provide makes them ideal for detecting elusive species (O'Connell et al., 2011). The project has established 17 camera monitoring stations distributed throughout the project area and in

the adjacent project zone to serve as the baseline to monitor trends (Figure 25). The sites are single camera sets, located along trails and gravel roads, where practical, to optimize capture frequency because they have been demonstrated as high traffic areas for wildlife. The camera sites are a minimum of 500 m from any adjacent site and active for a minimum of 2 weeks during the dry season in Belize (i.e. March- May). Cameras are not baited and placed on tree trunks or stakes approximately 35 cm off the ground. Cameras are active 24 hr/day and when triggered by motion are set to take 3 photographs. The date and time are recorded on each image and camera stations are checked every 10–14 days (Monette et al., 2020).

Image files will be downloaded for each camera station for analysis. A capture event is defined as the observation of an individual within a 30-minute time interval. If unidentifiable individuals were observed in succession, they are only counted as a new capture if they occurred at least 30 minutes after the initial capture event (Kelly & Holub, 2008; Silver et al., 2004). If more than one individual occurs in a photograph, each individual is counted as a capture the first time they were observed. Capture data for all wildlife are included and reported. Photographs are cataloged in a spreadsheet with records for camera station ID, number of photos taken, species, number of individuals in each photo, sex if possible, date, time, and capture event. Capture frequency, the captures events per 100 trap nights (events/100TN), will be determined for total captures and Baird's Tapir (Kelly & Holub, 2008; Tobler et al., 2008).

The entire grid will be surveyed prior to each verification event, expected to take place every 2 years. Trends in occurrence and distribution will be monitored through the comparison of mean capture of species/100TN for individual camera stations, the project area, project zone, and the overall camera trapping grid.

The target species for this survey will include the exceptional biodiversity benefits trigger species Baird's Tapir (*Tapirus bairdii*). The encounter rate for these species will be monitored over time, providing an index of population trend, as well as data on distribution and presence across the site. This will be combined with law enforcement patrol data, which will provide insights into the threats to the species.

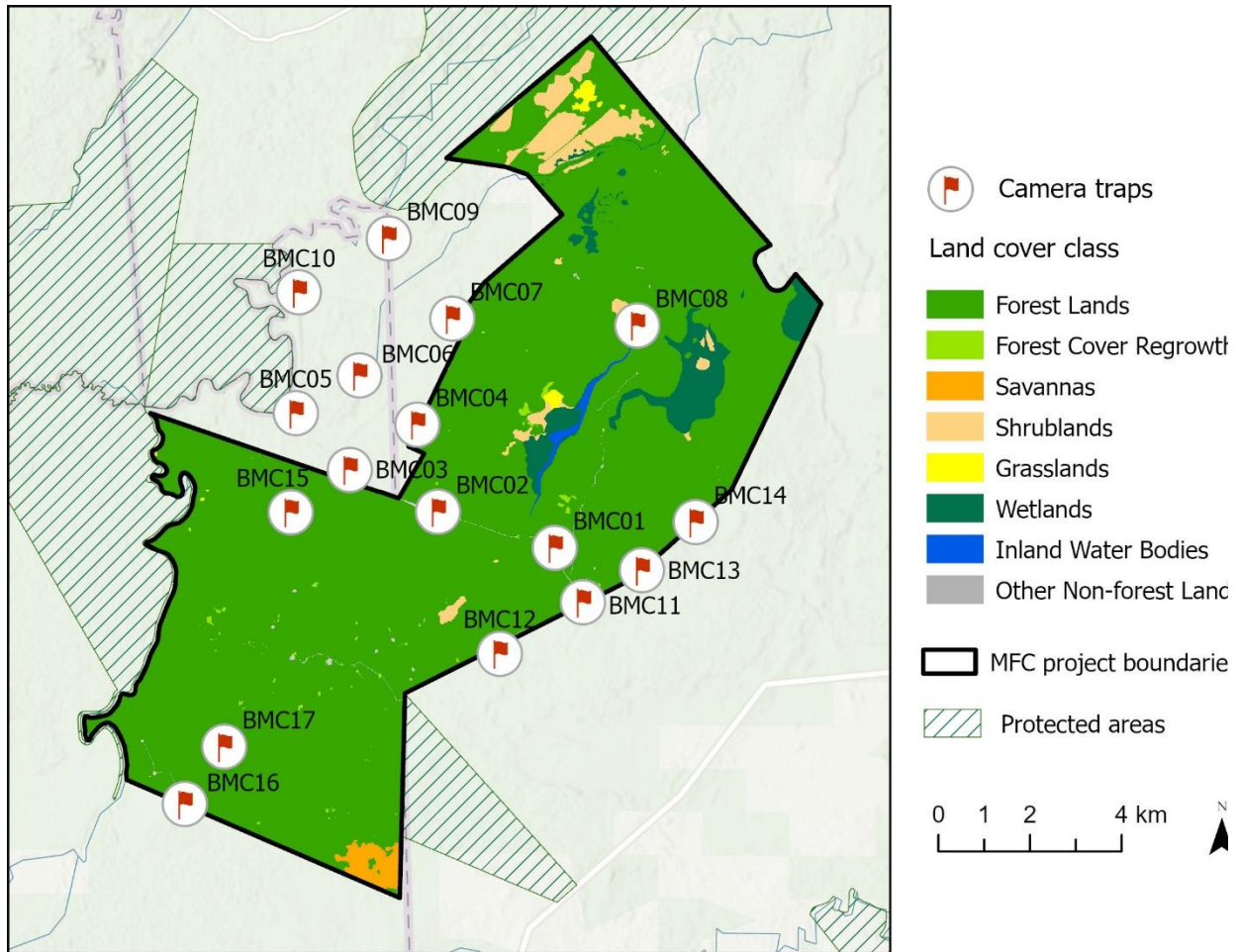


Figure 25. Camera trapping locations allocated with the project area and adjacent project zone

5.4.1.4 Monitoring the occurrence of the Central American River Turtle

The monitoring framework for the Central American River Turtle or the “Hicatee” within the project area is largely based upon the work of Novelo-Fuentes and Arevalo (2022). See Appendix 29. This study, conducted from March to June 2022, is also the first monitoring event for the occurrence of the turtle. Cox lagoon, located in the heart of the project area, is considered a stronghold of the hicatee in Central Belize. Surveys were conducted at Cox Lagoon in both 2021, which was considered a pilot study to document presence, and 2022 where a systematic, netting survey was conducted (Novelo-Fuentes & Arevalo, 2022).

The project will use nets to capture individual turtles to determine occurrence. These netting surveys will be conducted prior to each verification event, expected to take place every 2 years. The 9 sites established by Novelo-Fuentes and Arevalo (2022) will be used as the core monitoring sites (Figure 26).



Figure 26. Core monitoring sites for the hicatee turtle for monitoring on Cox Lagoon

Capture methods, using trammel nets, will occur at the same locations and using the same methods previously used by Novelo-Fuentes and Arevalo (2022). Trammel nets will be deployed perpendicular to the shoreline at each sample site from approximately 1800 – 0600 hours. Nets will be checked a minimum of every hour. Any by-catch such as fish and other turtles will be identified (if possible) and returned to the lagoon. Best practices, discussed in Novelo-Fuentes and Arevalo (2022), will also be followed to minimize stress on captured individuals.

The date, time, net number, and species were recorded for each hicatee captured. To determine the sex of all captured hicatee turtles, a combination of carapace size ranges reported by Polisar (1996) and head coloration will be used. Males typically display yellow-orange head and minimum carapace length of 328 mm and females have green to brown heads and a minimum carapace length 342 mm. If a turtle is less than the minimum size, they are considered juvenile. Other data collected will include plastron length, shell height, width, and weight.

The data will be summarized on a catch per unit (CPUE) effort basis for each survey site by dividing the number of turtles caught by the number of survey nights. The trends in CPUE will be monitored for each

site and Cox lagoon as a whole, providing an index of population trends over time. Combined with threat data from ranger patrols and observations made during netting surveys, this meets requirements for exceptional biodiversity benefits trigger species monitoring.

5.4.2 Biodiversity Monitoring Plan Dissemination (CCB, B4.3)

This monitoring plan, as well as results of the monitoring undertaken, will be publicly available on the Verra registry.

For project transparency, accountability, and building community trust, it is essential that monitoring reports are easily accessible to a wide range of stakeholder groups. Key stakeholder groups targeted for the dissemination of monitoring results will include direct project beneficiaries, target communities, government agencies, NGO partners, and external auditors. This monitoring plan and the monitoring results will be made accessible to targeted beneficiary communities, and key stakeholder groups using the following methods:

- Presentations of the monitoring results made to community leaders at suitable community venues.
- A booklet with a summary report of the monitoring results, presented in language appropriate to the target audience, disseminated at community meetings. Additional copies left at multiple community venues which are regularly frequented by community members for all interested community members to read.
- Government and non-government partner agencies receive electronic versions of the monitoring report via email from the MFCT.

The project will give beneficiary communities, as well as government and non-government partners a 30-day comment period. All relevant public comments received during this period were addressed appropriately.

5.5 Optional Criterion: Exceptional Biodiversity Benefits

5.5.1 High Biodiversity Conservation Priority Status (CCB, GL3.1)

The endangered Baird's tapir and the critically endangered Central American river turtle have been confirmed from the project area addressing the Key Biodiversity Area framework of vulnerability.

Baird's tapir is listed as Endangered on the IUCN Red List. It is also covered at a regional level under CITES Appendix I (Garcia et al., 2016). Belize is of particular importance to conservation efforts. The country is situated in the middle of the tapir's range and contains a wide variety of suitable habitats. 37.3% of the country is considered a protected area with some level of legal protection (UNEP-WCMC, 2025). Baird's tapir is commonly seen by WCS rangers and researchers in the project area (B. Arevalo personal communication February 2023) and tracks and other signs of occupancy are frequently encountered (Figure 27).



Figure 27. Track of the endangered Baird's tapir photographed in the project area in 2023.

The Central American River Turtle is listed as Critically Endangered on the IUCN Red List (Vogt et al., 2006). The greatest threat to this species is human harvesting for consumption and the animal trade (Rainwater et al., 2012; Vogt et al., 2006). Turtle meat is a prized traditional dish for communities in all parts of its range and individuals fetch a high price at local markets (Vogt et al., 2006). Water pollution due to human development is also a threat to the turtles due to their entirely aquatic existence (Ellsworth, 2021).

Novelo-Fuentes and Arevalo (2022) captured 29 individual Central American river turtles at the Cox lagoon aquatic habitat in their baseline study of the species in the project area. Because of the trapping methods used, smaller juveniles were not captured due to the mesh size of the trap used, which strongly indicates the population is in fact much larger.

The regular, confirmed occurrence in the project area of these species qualifies the project area/project zone as a Key Biodiversity Area under the “vulnerability” criterion (Bakarr et al., 2007).

5.5.2 Trigger Species Population Trends (CCB, GL3.2, GL3.3)

Trigger species have been selected based on the importance of the site for that species, those that would be significantly negatively impacted in the without-project scenario, and representing a range of taxa to act as indicator species across a broad range of other species facing similar threats.

Table 55. *Baird's Tapir population trends*

Trigger species	Baird's Tapir (<i>Tapirus bairdii</i>)
Population trend at start of project	Belize is of particular importance to conservation efforts since the country is situated in the middle of the tapir's range and contains a wide variety of suitable habitats. Baird's tapir is relatively common within the project area, the project zone, and the larger MFC. Baird's tapir is commonly seen by WCS rangers and researchers in the project area (B. Arevalo personal communication February 2023) and tracks and other signs of occupancy are frequently encountered. Only one monitoring event has taken place, so no trend data is available; from informal observation and expert opinion, the population in the project area is likely to be stable.
Without-project scenario	Conversion of the tropical broadleaf forest to agriculture is the most probable land use for the project area under the without project scenario. Conversion of the forest/includes bulldozing, piling, and burning the remaining vegetation and planting of crops. Baird's tapir would decline precipitously and likely become locally extinct within the project area and threatened in the project zone under the without project scenario.
With-project scenario	The overall goal of the project is avoiding deforestation where the primary project activity is to maintain current forest cover and avoid deforestation and degradation. Through the protection of existing forests and other ecosystems in the project area, the project will be also actively conserving and protecting habitat for flora and fauna. The protection of habitat resulting from the maintenance of forest cover includes critical terrestrial and aquatic habitat for the endangered Baird's tapir.

 Table 56. *Central American river turtle population trends*

Trigger species	Central American River Turtle (Hicatee) (<i>Dermatemys mawii</i>)
Population trend at start of project	Novelo-Fuentes and Arevalo (2022) captured 29 individual Central American river turtles at Central American river turtles in the Cox lagoon aquatic habitat in their baseline study of the species in the project area. Because of the trapping methods used smaller juveniles were not captured due to the mesh size of the trap used, which strongly indicates the population is in fact much larger. Furthermore, because of the sex/age distribution being skewed toward females

	and juveniles it is likely that this population could serve as a source to other suitable aquatic habitats in the project zone (Novelo-Fuentes and Arevalo 2022). Only one monitoring event has taken place, so no trend data is available; from informal observation and expert opinion, the population in the project area is likely to be stable.
Without-project scenario	Conversion of the tropical broadleaf forest and conversion to agriculture is the most probable land use for the project area under the without project scenario. Conversion of the forest/includes bulldozing, piling, and burning the remaining vegetation and planting of crops. This would lead to the contamination of the Cox lagoon where the hicatee population is found from increased sedimentation as well as fertilizer and pesticide runoff (Briggs-Gonzalez et al., 2019). The clearing of land and the lack of regular patrolling by rangers will also expose the population to higher risks of poaching. The hicatee population would decline precipitously and likely become locally extinct within the project area and threatened in the project zone under the without project scenario
With-project scenario	The overall goal of the project is avoiding deforestation where the primary project activity is to maintain current forest cover and avoid deforestation and degradation. Through the protection of existing forests and other ecosystems in the project area, the project will be also actively conserving and protecting habitat for flora and fauna. Avoiding the conversion of the project area's forest to agricultural land prevents the contamination of turtle's habitat, the Cox Lagoon. The regular patrolling of the lagoon by rangers also prevents the poaching of the turtles.

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APPENDIX 1: STAKEHOLDER DESCRIPTION TABLE

Stakeholder	Rights, interest, and overall relevance to the project
Communities	
Bermudian Landing and Double Head Cabbage Village Small scale farmers Women Youth Village Council	Bermudian Landing and Double Head Cabbage are key buffer communities and are both part of the Community Baboon Sanctuary (CBS), a neighboring protected area. The combined population is 589 with Double Head Cabbage having the larger population (409). There is gender parity in the population with 293 males and 296 females. These small communities comprised mostly Creoles (93%) who are the original occupants of the community and are engaged in activities to support the conservation of the CBS and cultural preservation. Sixty-three percent (63%) of the households are male-headed while 37% are female-headed households. Twenty-four (24%) of the population have no formal education, 34% have completed primary education, 34% have completed secondary education, and 7% have completed tertiary education. Most people in the community own land (93%). However, only a small percentage of the population is engaged in natural resource-dependent livelihoods, and most women and youth are not engaged in these livelihood activities. There are limited opportunities for youth employment and community leaders have noted that many youths leave the community after completing formal education, in search of employment. Small-scale agriculture is the main natural resource-dependent livelihood. However, this is done mostly for subsistence and not for income generation. Ninety-seven percent (97%) of households utilize butane as the main cooking fuel, 88% have potable water from the Belize Water Services piped into their dwelling or yard while 6% pipes water into their dwelling or yard from a private source. Seventy-seven percent (77%) of households utilize

Stakeholder	Rights, interest, and overall relevance to the project
	purified/bottled water as the main source of drinking water while 19% utilize a private catchment such as vats, drums, or water tanks. The communities have no rights on the project.
Scotland Halfmoon Village Small scale farmers Women Youth Village Council	Scotland Halfmoon is another MFC buffer community with a small population of 259 (128 males, and 131 females). Twenty-four percent (24%) of the population of households surveyed possess no formal education, 29% possess a primary education, 39% possess a secondary education, 4% possess tertiary education and 4% indicated some form of vocational or skills training. Seventy-three percent (73%) of households are male-headed while 23% are female-headed. Similar to other communities in the Belize River Valley, the main source of water is from the Belize Water Services which is piped into the yard or dwelling. Residents of Scotland Halfmoon are primarily Creole who practice some subsistence farming. However, there is limited reliance on forest resources for livelihood. Of the heads of households surveyed, only 15% indicated reliance on farming or livestock, which includes cattle rearing. The majority of heads of households are engaged in public or private sector employment. Most women and youth are not engaged in natural resource-dependent livelihood. The community has no rights on the project.
Willows Bank Village and St. Paul's Bank Village Small scale farmers Women Youth Village Council	St. Paul's Bank and Willows Bank are small communities in the Belize River Valley with a combined population of 338 (176 males and 166 females). In these predominantly Creole communities (94%), some 60% of the households are male-headed while 40% are female-headed. Twenty-two percent (22%) of the population do not possess any formal education, 38% possess primary level education, 30% possess secondary level education and 10% possess a tertiary level education.

Stakeholder	Rights, interest, and overall relevance to the project
	Similar to the other communities in the Belize River Valley, only a small number of women and youth are engaged in natural resource-dependent livelihoods, and many young people leave the community after obtaining formal education. Almost 100% of households own land. Butane is the main source of cooking fuel for almost 100% of households, 88% utilize water from Belize Water Services, pumped into their dwelling or yard, and 72% utilize purified/bottled water as the main source of drinking water. Some 26% utilize a private catchment.
Rancho Dolores Village Small scale farmers Women Youth Village Council	Rancho Dolores is an MFC buffer community with 237 residents (121 males and 117 females). The majority of households (62.5%) of households are male-headed while 37.5% are female-headed. Creole is the dominant ethnic group in Rancho Dolores (90%). Some 20% of the population possess no formal education, 39% possess a primary education, 33% possess a secondary education and 7% possess a tertiary education. 100% of households own land. Butane is the main source of cooking fuel for almost 100% of households, almost 100% utilize water from BWS which is piped into their dwelling or yard, and 64% utilize purified/bottled water as the main source of drinking water. The remaining 36% utilize a private catchment. In addition to being an MFC buffer community, Rancho Dolores is near a neighboring protected area, Spanish Creek Wildlife Sanctuary, and is involved in the management of Spanish Creek. Community members are actively engaged in self-policing and patrolling the Spanish Creek to deter illegal hunting and fishing from persons outside the community. The community has no rights on the project.
Hattieville Small scale farmers Women Youth	Hattieville is the largest MFC buffer community with a population of 2271 (1108 males and 1163 females). Some 58% of the households are male-headed while 42% are female-headed. The population represents a mix of ethnicities including Creole (75%), Mestizo/Hispanic/Latino 12.5% and East Indian

Stakeholder	Rights, interest, and overall relevance to the project
Village Council	4%. Just over 20% of the population have no formal education, 35% possess a primary level education, 28% possess a secondary education, and 14% possess a tertiary education. Some 88% of households own land while 7% reside on leased properties. Almost 100% of the population utilize butane as the main fuel for cooking, 59% of households rely on water from BWS piped into their dwelling or yard, 38% have water piped into their dwelling or yard from a private source, and 2% use private catchment. 83% of households utilize purified/bottled water as the main source of drinking water while 14% utilize a private catchment. Hattieville is of interest and relevance to the MFC because of its proximity to the MFC. However, there is a very low reliance on forest resources for livelihoods. Based on the MFC Feasibility Study, residents of Hattieville only engage in farming activities for subsistence purposes. The majority of the population is employed in public and private sector occupations in the nearby urban areas. The community has no rights on the project.
Mahogany Heights Small scale farmers Women Village Council Youth	Mahogany Heights is the third largest MFC buffer community and hosts a population of 869 (411 males and 458 females). Just over half of the households (51.5%) are male-headed and 48.5% are female-headed. The community hosts a mixed population with 61% Creole, 23% Garifuna, and 12% Mestizo/Hispanic/Latino. Some 33% of the population have no formal education, 33% possess a primary education, 28% possess a secondary education, and 6% possess a tertiary education. Forty percent (40%) of households own land while 60% lease land from the Government of Belize. Notably, there is a significant number of abandoned homes within the community. Almost 100% of households utilize butane as the main cooking fuel. Similarly, nearly 100% of households utilize piped water from Belize Water Services as the main source of water and almost 100% of households utilize purified/bottled water for drinking.

Stakeholder	Rights, interest, and overall relevance to the project
	Some small-scale subsistence farming occurs within the community. However, there is limited reliance on natural resources for livelihoods. The majority of the working population is engaged in public and private sector employment in nearby urban areas. The community has no rights on the project.
La Democracia Small scale farmers Women Village Council Youth	La Democracia shares a boundary with Mahogany Heights and hosts a population of 301 (167 males and 133 females). The majority of households (65%) are male-headed and 35% are female-headed. Creole is the major ethnic group in the community, representing 74% of the population. This is followed by Mestizo/Hispanic/Latino which represents 24% of the population. Some 32% of the population do not have a formal education, 37% possess a primary education, 26% possess secondary education and 5% possess tertiary education. 72% of households own land while the remaining households lease land from the Government of Belize. The majority of the population relies on butane as the main source of fuel for cooking while almost all households utilize water piped into the dwelling or yard by Belize Water Services. Similarly, almost 100% of households utilize purified/bottled water as the main source of drinking water. There is limited reliance on natural resources for livelihoods as no agricultural land is available to community members. The majority of the working population is engaged in public and private sector employment in nearby urban areas. The community has no rights on the project.
Gracie Rock Village Small scale farmers Women Youth	Gracie Rock is a small, predominantly Creole Community (86%) with a population of 315 (167 males and 147 females). Sixty-two percent (62%) of households are male-headed and 38% are female-headed. Thirty-one percent of the population has no formal education, 41% possess a primary education, and 28% possess a secondary education.

Stakeholder	Rights, interest, and overall relevance to the project
Village Council	Almost 100% of households own land. Eighty-four percent (84%) of households depend on butane as the main source of fuel for cooking, 33% utilize private water sources piped into their dwelling or yard and 51% utilize private catchment. There is limited reliance on natural resources to support livelihoods as most of the residents of the community have moved away from the forested areas due to flood hazards and are now occupying areas along the main highway. The community has no rights on the project.
Franks Eddy and Cotton Tree Villages Farmers Women (migrant women) Youth (migrant youth) Village Council	Cotton Tree and Franks Eddy are two buffer communities with large migrant populations originating from the Central American countries of El Salvador, Guatemala, Honduras, and Nicaragua. Cotton Tree is the 2nd largest MFC buffer community with a population of 1572 while Franks Eddy has a population of 631. The 2022 Census reported that the population of both Franks Eddy and Cotton Tree increased significantly since 2010 with a 40% and 24% increase, respectively. This is primarily due to a steady influx of migrants from Central American countries. Cotton Tree hosts a population of 66% Mestizo/Latino/Hispanic and 25% Creole while Franks Eddy hosts a population of 96% Mestizo/Latino/Hispanic. Franks Eddy has the highest percentage of male-headed households (77%) among the 12 target communities. It also has the highest percentage of persons who have no formal education (53.2%). Cotton Tree has the second-highest percentage of male-headed households (70%) and the second-highest percentage of persons with no formal education (46%). Sixty-one percent (61%) of households in Franks Eddy own land while 63% of households in Cotton Tree own land.

Stakeholder	Rights, interest, and overall relevance to the project
	Seventy-six percent (76%) of households in Franks Eddy depend on butane as the main source of fuel for cooking while 21% depend on wood or charcoal. In Cotton Tree, 91% depend on butane as the main source of fuel for cooking while 8% depend on charcoal. The majority of residents in both communities have water piped into their dwellings or yards by the Belize Water Services. In Cotton Tree, 8% have water piped to their dwelling or yard from a private source while 9% have a protected dug well in place as the main source of water. In Franks Eddy, 48% of households utilize purified/bottled water as the main source of drinking water. Some 33% utilize water piped from a private source while 18% utilize a private catchment as the main source of drinking water. These communities have no rights on the project. In Cotton Tree, 78% of households utilize bottled water as the main source of drinking water, 8% utilize water piped from a private source, and 4% utilize a private catchment as the main source of drinking water. Spanish is the main language of communication for both communities and can pose a barrier to communication since English is the official language of communication in Belize. Cultural and gender norms that promote traditional roles for women, such as women remaining at home to attend to the household, are prevalent in both communities and must be navigated when working with both communities.
Community Based Organizations	
Community Baboon Sanctuary Women's Conservation Group (CBSWCG)	Led by women from seven communities in the Belize River Valley, the Community Baboon Sanctuary Women's Conservation Group (CBSWCG) supports the conservation of the black howler monkey, in the 6,000-hectare Community Baboon Sanctuary. CBSWCG brings together 240 landowners, each of whom voluntarily participates in conservation efforts through a pledge system. The sanctuary has produced a sustainable land management plan that has environmental, economic, and social benefits that extend

Stakeholder	Rights, interest, and overall relevance to the project
	well beyond the protected area and include maintaining interconnected wildlife corridor integrity and a comprehensive sustainable natural resource management strategy. The CBSWG is of relevance to the MFC as it is the main entity for mobilization, communication, and coordination with communities in the Belize River Valley. Additionally, the CBSWCG has been a key partner in promoting the conservation of the MFC. The CBSWCG has no right on the project.
Rancho Dolores Environmental Development Company Limited	The Rancho Dolores Environmental Development Company is a community-based organization developed to support environmental conservation and protection. The Spanish Creek Wildlife Sanctuary was established by the Rancho Dolores Environment and Development Company Ltd. and is a 5900-acre protected area managed by the community. The RDEDCL is an important ally in conserving the MFC. The RDEDCL has no rights on the project.
Protected Areas Management Groups/Bodies/Academia	
Maya Forest Corridor Trust (MFCT)	The MFC REDD project area is owned by the Maya Forest Corridor Trust. The MFCT is also the MFC REDD project proponent. Its board of directors includes members of the following organizations: the Belize Maya Forest Trust, Wildlife Conservation Society, the Belize Zoo and Tropical Education Center, Foundation for Wildlife Conservation, University of Belize - Environmental Research Institute, and Re:wild. Ongoing management of the property has been delegated to WCS. WCS is responsible for implementing robust patrols of the property by trained local rangers to prevent illegal logging, hunting, and the detection, mitigation, and control of wildfires. In addition, trained field ecologists from WCS and partners will survey, assess, monitor, and manage native biodiversity.
The Belize Zoo and Tropical Education Center (TBZTEC)	The Belize Zoo & Tropical Education Center (TBZTEC) is nestled in the heart of the MFC and currently owns and manages nearly 3,000 acres of lowland savanna, pine and oak forest, broadleaf forest, and a host of creeks and ponds. These lands exist on both sides of the George Price Highway, which bisects the MFC and is the only location along the entire highway with protected lands on both sides. These acres provide safe passage for a multitude of wildlife moving through the area in search of food, habitat, and

Stakeholder	Rights, interest, and overall relevance to the project
	mates. They also provide important habitats for a variety of rare and endangered wildlife, including jaguars, tapirs (Belize's National animal), yellow-headed parrots, as well as a host of migratory birds. TBZTEC is also part of the Maya Forest Corridor Trust. TBZTEC is of great relevance to the project and has a high interest in the conservation of the MFC. The MFC has provided opportunities for TBZTEC to engage in biodiversity monitoring and research, wildlife rehab and release, protected area management, eco-tourism, and environmental education. TBZTEC is also a member of the MFCT
Monkey Bay Wildlife Sanctuary	MBWS is a private protected area that supports and safeguards landscape connectivity, ecosystem services, and socioeconomic benefits. MBWS is a member of the MFC Coalition and as such has a high interest in conservation and protection of the MFC.
Labouring Creek Jaguar Corridor Wildlife Sanctuary	The Labouring Creek Jaguar Corridor Wildlife Sanctuary is a 7,000-acre protected area near the MFC focused on the protection of the Jaguar.
Spanish Creek Wildlife Sanctuary	The Spanish Creek Wildlife Sanctuary was established by the Rancho Dolores Environment and Development Company Ltd. and is a 5900-acre protected area managed by the community.
Association of Protected Areas Management Organizations (APAMO)	The Association of Protected Areas Management Organizations, APAMO, is Belize's umbrella association for Protected Areas, (PAs) Co-managers. APAMO boasts sixteen protected areas co-manager members and a total of twenty-eight protected areas across Belize. This collectively helps to conserve approximately 1.5 million acres of Belize's biodiversity, and through this, improves the lives of thousands of stakeholders. APAMO's membership has fostered a platform and environment whereby PA co-managers have committed to join forces to build on opportunities that will improve the management and secure the integrity of Belize's protected areas. Similarly, co-managers can effectively address the various challenges and threats that may hinder progress toward effective management or the quality of Belize's natural resources. Therefore, APAMO's role as the unified voice that advocates for and

Stakeholder	Rights, interest, and overall relevance to the project
	contributes to the sustainability and effective management of Belize's protected areas has been demonstrated to be a critical one. ³²
Foundation for Wildlife Conservation (FWC)	FWC is an environmental NGO that owns and manages the 6,000-acre Runaway Creek Nature Reserve within the MFC. The FWC is a member of the MFCT and a key partner in implementing conservation and sustainable development initiatives in the MFC. Initiatives implemented by FWC contribute to the realization of community benefits for the 12 buffer communities.
University of Belize - Environmental Research Institute (UB-ERI)	The ERI is a semi-autonomous department within UB dedicated to conducting research and monitoring to support the sustainable management of Belize's natural resources. The UB ERI is a member of the MFCT and a key partner in conducting research in the MFC and surrounding communities. Initiatives implemented by UB ERI contribute to the realization of community benefits for the 12 buffer communities.
Government organizations	
Ministry of Sustainable Development, Climate Change, and Disaster Risk Management (prior to March 2024, named Ministry of Sustainable Development, Climate Change & Solid Waste Management)	The Ministry has the overall mandate for the environment and protected areas and leads in policy and legislation in this regard. Key departments under the MSDCCDRM include the Forest Department, the Department of the Environment, and the National Climate Change Office (NCCO). All three departments are key collaborators in the MFC REDD project.

³² <https://apamobelize.org/about-apamo-2/>

Stakeholder	Rights, interest, and overall relevance to the project
Ministry of Agriculture	The Ministry of Agriculture is relevant to the project as its laws and policies impact the development and use of land for agriculture. The MoA is a key partner in supporting capacity building for agroforestry and sustainable, climate-smart agriculture practices within the MFC.
Government of Belize	A formal agreement was signed with the Government of Belize for the establishment of the project proponent (MFCT) and protection of the MFC and for the generation of carbon credits from the project which will ultimately benefit buffer communities and the country. The Government of Belize granted carbon rights to the MFCT subject to certain requirements described in the formal agreement.

APPENDIX 2: PROJECT ACTIVITIES AND THEORY OF CHANGE TABLE

Activity description	Expected climate, community, and/or biodiversity			Relevance to project's objectives
	Outputs (short term)	Outcomes (medium term)	Impacts (long term)	
1. Purchase property under threat of conversion to commercial agriculture to maintain current carbon stocks and avoid GHG emissions.	Protects property from conversion to agriculture.	Avoids greenhouse gas emissions that would have resulted from the conversion to agriculture,	- Contributes to the mitigation of climate change - Increases the resilience to climate change of the local and regional landscape through maintenance of native forest cover, native species, and water quality.	Supports objectives 1-3

2. Maintain natural ecosystems and current forest cover through the implementation of management strategies, such as detection, mitigation, and control of wildfires and surveillance and patrolling, to conserve and protect native biodiversity and ecosystem services supplied by the project area.	• Maintains current habitat for a wide array of native flora and fauna including rare, threatened, and endangered species. • Improves wildlife and wildlife habitat through patrols that limit poaching, control, and mitigation of wildfire, monitoring of wildlife occurrence and habitat use. • Park rangers and community members trained and equipped for wildfire management. • Fire Early Warning systems implemented in communities. • Fire brigades established to serve MFC communities.	• Protects and encourages the dispersal of wildlife through connecting the Selva Maya of Belize, Guatemala, and Mexico and the Maya Mountains of southern Belize which are the largest tracts of intact forest in the Mesoamerica Biodiversity Hotspot. • Maintains and allows for the improvement of array of native flora and fauna habitat. • Enhances local capacity to detect, mitigate, and control wildfires . • Enhances success in controlling wildfires. • Reduces harmful impacts of wildfires on community	• Maintains and enhances the structure and function of native ecosystems. • Maintains and enhances the resilience of wildlife populations by promoting gene exchange and allowing migration through the corridor. • Maintains and enhances community resilience to natural disasters and climate change. • Enhances community support for conservation of the project area and the wider MFC . • Maintains and enhances ecosystem services, directly benefiting local communities.	Supports project objective 2, 3, 4, and 5.
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Activity description	Expected climate, community, and/or biodiversity			Relevance to project's objectives
	Outputs (short term)	Outcomes (medium term)	Impacts (long term)	
	- Community members employed in surveillance and patrolling for conservation. - Park rangers trained in environmental enforcement. - Park rangers certified as special constables. - Community members employed in forest restoration activities.	property and human health. - Decreases illegal encroachments on project area. - Increases employment for community members in conservation management. - Increases community support for conservation of the project area and the wider MFC.		

Activity description	Expected climate, community, and/or biodiversity			Relevance to project's objectives
	Outputs (short term)	Outcomes (medium term)	Impacts (long term)	
3. Conduct community outreach and environmental education to foster support for MFC conservation and to create awareness of critical environmental and climate adaptation issues.	- Ongoing community and school-based outreach activities conducted. - Community climate smart plans implemented. - Community Conservation Agreements adopted.	- Communities well-versed in climate change and climate adaptation topics. - Increases community support for conservation of the project area and the wider MFC. - Communities' adaptive capacity to climate impacts strengthened.	- Enhances community-based environmental stewardship of the MFC and community lands. - Maintains and enhances community resilience to natural disasters and climate change.	Directly contributes to objectives 4 and 5.
4. Provide training, material and technical support for community-owned sustainable livelihoods and nature-based solutions for climate adaptation.	Training, technical support and materials provided to households and community agencies in sustainable livelihoods (e.g., climate smart agriculture, production of	- Household income increased. - Self-sufficiency in food production increased. - Sources of income and subsistence at household level diversified.	- Adoption of climate-smart livelihood practices within communities increased. - Community households' economic resilience increased through livelihood diversification.	Directly contributes to objectives 5.

Activity description	Expected climate, community, and/or biodiversity			Relevance to project's objectives
	Outputs (short term)	Outcomes (medium term)	Impacts (long term)	
	sustainable products like coconut oil, cohune oil, honey, etc.). • Training, technical support, and materials provided to farmers in climate-smart agriculture. • Climate smart farms established by community members. • Community-owned nature-based solutions for sustainable livelihoods implemented.		• Participation of women in sustainable livelihoods increased. • Community resilience to climate change strengthened.	

APPENDIX 3: PROJECT RISKS TABLE

	Identified risk(s)	Potential impact of risk on stakeholders, ecosystem health, and biodiversity	Mitigation or preventative measure(s) taken
Natural and human induced risks to stakeholders' wellbeing	No risk identified	N/A	The potential for increased wildfire risks to local communities because of proximity to forests and savannas within the project area was examined. The wildfires in central Belize are set by humans for farming, hunting, and infrastructure development. The project area, being primarily a moist broadleaf forest, naturally resists wildfires due to its moisture-rich vegetation. As such, maintaining forest cover as part of the project will help reduce the risk of wildfires. As part of the conservation management of the project area, WCS will implement fire prevention measures to protect the forest cover and conserve carbon stocks. Since project initiation, WCS has been working with buffer communities and protected area managers in the MFC to build capacity and systems for wildfire management. On the contrary, agricultural practices in Belize include burning fields, posing a fire risk since these

	Identified risk(s)	Potential impact of risk on stakeholders, ecosystem health, and biodiversity	Mitigation or preventative measure(s) taken
			fires can spread to nearby communities and protected areas. The potential risk of increased human-wildlife conflict in local communities because of proximity to forests and savannas was also examined. Discussions with project staff as well as Jan Meerman, an expert in ecology and land use/land cover trends in Belize, confirmed that deforestation increases the risk of human-wildlife conflict. In Belize, a principal driver of human-wildlife conflict is habitat loss, which forces large mammals, especially wildcats, to intrude on farms and residential areas. In the short term, deforestation would immediately displace wildlife and increase the risk. Under this project, WCS, in collaboration with the Forest Department, will use strategically placed cameras to monitor predator movements. By understanding where and when animals are moving, strategies will be developed to mitigate potential conflicts. Furthermore, this practice of “camera trapping” can also be an effective tool in enhancing community awareness and education about wildlife, fostering coexistence and support for conservation efforts.

	Identified risk(s)	Potential impact of risk on stakeholders, ecosystem health, and biodiversity	Mitigation or preventative measure(s) taken
			In the longer term, the population of predatory wildlife is likely to remain stable, as these species require large, contiguous habitats. This project focuses on preserving existing forest cover, not expanding it, within a landscape dominated by human activity. This environment is not conducive to the expansion of large mammal populations that require extensive, contiguous habitats. No other potential risk to stakeholder wellbeing was identified

Risks to stakeholder participation	1. Community and Stakeholder Support: There is a risk that the project may not gain or maintain the necessary level of engagement and support from buffer communities and key stakeholders; for example, if it is perceived that the project is “locking away” resources which would otherwise be used for economic development or that benefits to communities are not being delivered equitably 2. Limited engagement of Franks Eddy and Cotton Tree due to a language barrier.	1. Lack of community and stakeholder support can result in resistance or active opposition to the project, potentially escalating into conflicts with landowners, partner agencies, local communities, and key government and non-government stakeholders. This could disrupt project activities and lead to negative perceptions and publicity. 2. Franks Eddy’s population is 97% Mestizo/Latino/Hispanic, and Cotton Tree has a mixed demographic, composed of 67% Mestizo/ Latino/ Hispanic, 25% Creole and 3% comprising other ethnic groups.	<u>Mitigation/preventative measure(s) taken for risk #1</u> • Implement awareness and educational campaigns to keep the communities informed about project objectives, activities and results. • Conduct regular community consultations and participatory planning sessions to ensure that the project aligns with local needs and values and that communities are aware of economic opportunities and other benefits available to them. • Regularly share information and project results with key government and non-government stakeholders through meetings and electronic correspondence. • Establish an easily accessible and responsive Grievance Redress Mechanism. This provides the opportunity for the project to immediately resolve grievances, preventing them from negatively impacting relationships with communities and stakeholders. <u>Mitigation/preventative measure(s) taken for risk #2</u> • Conduct community meetings and training courses in both English and Spanish, or in Spanish-only, to accommodate the language preferences of Franks Eddy and Cotton Tree communities.
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	Identified risk(s)	Potential impact of risk on stakeholders, ecosystem health, and biodiversity	Mitigation or preventative measure(s) taken
		Many inhabitants of these communities are Central American migrants, with Spanish as their primary language. Given that English is the official language of Belize and is predominantly used in technical and formal communications, this language disparity could hinder these communities' access to crucial information and services.	• Provide cultural sensitivity training for project staff to ensure effective communication and respectful engagement with the cultural nuances of community members.

Working conditions	1. Traffic accidents	1. Employees conduct patrolling events in motor vehicles. As such, traffic accidents are a risk.	<u>Mitigation or preventative measure(s) taken for risk #1</u>
	2. Fire	2. Wildfires pose a risk in the MFC project area, and one of the responsibilities of the staff in the area is to manage wildfires.	• Training in first aid • Availability of emergency contact numbers at all times • Vehicles equipped with emergency radios
	3. Attack by persons intruding on MFC REDD project area	3. While there is no history of attacks by humans in the MFC REDD project area nor is it considered a likely occurrence, there is always the risk that WCS staff may be attacked.	<u>Mitigation or preventative measure(s) taken for risk #2</u> • Ongoing training of staff in fire management • Provision of adequate PPE • Provision of adequate firefighting equipment • Training in first aid
	4. Attack by wildlife	4. Similar to risk #3, while there is no history of attacks by wildlife in the MFC REDD project area, there is always the risk that WCS staff	<u>Mitigation or preventative measure(s) taken for risk #3</u> • Equip field staff with satellite phones to maintain contact at all times • Establish policies that ensure that lone staff members are not engaged in monitoring property (minimum of 2 persons per crew to increase safety) <u>Mitigation or preventative measure(s) taken for risk #4</u>

	Identified risk(s)	Potential impact of risk on stakeholders, ecosystem health, and biodiversity	Mitigation or preventative measure(s) taken
		may be attacked by wildlife.	• Training in first aid • Campsite equipped with first aid equipment • Available transportation to transport staff members to the nearest emergency services • Establish policies that ensure that lone staff members are not engaged in monitoring property (minimum of 2 persons per crew to increase safety)
Safety of women and girls	No risk identified	N/A	None of the project activities will pose safety risks to women and girls.
Safety of minority and marginalized groups, including children	No risk identified	N/A	None of the project activities will pose safety risks to minority and marginalized groups, including children.
Pollutants (air, noise, discharges to water, generation of waste, and release of hazardous materials and chemical pesticides and fertilizers)	No risk identified	N/A	The conservation of the natural ecosystems in the project area and the associated activities with the communities will lead to no risks of increased pollutants. Without the project, the conversion of the project area to agriculture would have increased pollutant loads.
Discrimination	No risk identified	N/A	Refer to section 2.3.14. Anti-Discrimination Assurance.

	Identified risk(s)	Potential impact of risk on stakeholders, ecosystem health, and biodiversity	Mitigation or preventative measure(s) taken
Sexual harassment	No risk identified	N/A	Refer to section 2.3.14. Anti-Discrimination Assurance.
Equal pay for equal work	No risk identified	N/A	Refer to section 2.5.2. Relevant Laws and Regulations Related to Worker's Rights.
Gender equity in labor and work	No risk identified	N/A	Refer to section 2.5.2. Relevant Laws and Regulations Related to Worker's Rights.
Forced labor ³³	No risk identified	N/A	Refer to section 2.5.2. Relevant Laws and Regulations Related to Worker's Rights.
Child labor	No risk identified	N/A	Refer to section 2.5.2. Relevant Laws and Regulations Related to Worker's Rights.
Human trafficking	No risk identified	N/A	Refer to section 2.5.2. Relevant Laws and Regulations Related to Worker's Rights.
Recognition of, respect of, and promotion of the rights to IPs, LCs and customary rights holders	No risk identified	N/A	Refer to section 2.5.5 Statutory and Customary Property Rights.
Preserving and protecting cultural heritage	No risk identified	N/A	Refer to section 2.5.4 Indigenous Peoples and Cultural Heritage

³³ The identified risks and commensurate mitigation or preventative measure(s) for forced labor, child labor, and human trafficking, must be inclusive of staff and contracted workers employed by third parties.

	Identified risk(s)	Potential impact of risk on stakeholders, ecosystem health, and biodiversity	Mitigation or preventative measure(s) taken
Protecting and preserving property rights, customary rights, or protecting legal or customary tenure/access rights to territories, property, and resources, including collective and/or conflicting rights	No risk identified	N/A	Refer to section 2.5.5 Statutory and Customary Property Rights and section 2.5.6 Recognition of Property Rights.
Impacts on biodiversity and ecosystems	No risk identified	N/A	As detailed in section 5 Biodiversity, the project will have significant benefits to biodiversity and ecosystems. There are no associated risks.
Soil degradation and soil erosion	No risk identified	N/A	The conservation of the natural ecosystems in the project area will protect against soil degradation and soil erosion.
Water consumption and stress	No risk identified	N/A	The conservation of the natural ecosystems in the project area will help protect watershed integrity, which provides healthy groundwater and well water. No risks are expected.
Habitats (and areas needed for habitat connectivity) for rare, threatened, and endangered species	No risk identified	N/A	As detailed in section 5 Biodiversity, the conserved natural ecosystems in the project area are habitat for the endangered Baird's tapir and the critically

	Identified risk(s)	Potential impact of risk on stakeholders, ecosystem health, and biodiversity	Mitigation or preventative measure(s) taken
			endangered Central American river turtle. No risks are expected.
Areas needed for habitat connectivity	No risk identified	N/A	As detailed in section 5 Biodiversity, this project conserves a key area of the Maya Forest Corridor, which provides that last critical link between Belize's two largest intact forest blocks. As such, habitat connectivity will benefit from the project. No risks are expected.
Invasive species	While no invasive species have been identified as a threat to the forests or other terrestrial ecosystems in the project area, two non-native species have been identified as potential concerns for the freshwater ecosystems in the area. These include tilapia (<i>Oreochromys</i> spp.) and Armored catfish (<i>Pterygoplichthys pardalis</i>)	N/A	Project activities will not result in or encourage invasive species. The WCS rangers will continue to monitor for the presence of the non-native freshwater species of concern and their potential ecological impact in the project area.

	Identified risk(s)	Potential impact of risk on stakeholders, ecosystem health, and biodiversity	Mitigation or preventative measure(s) taken
Ecosystem conversion	No risk identified	N/A	A main objective of the project is to prevent the agricultural conversion of the project area to preserve its ecological role in the larger Maya Forest Corridor. As such, ecosystem conversion is not a risk.

APPENDIX 4: COMMERCIALY SENSITIVE INFORMATION

Section	Information	Justification
2.1.19 Implementation Schedule and 2.5.12 Approvals	In October 2020, a legally binding agreement was signed between the Government of Belize (GoB) and Re:wild (formerly Global Wildlife Conservation) in which Re:wild agreed to finance the acquisition of lands located in the Maya Forest Corridor for conservation and to establish the Maya Forest Corridor Trust to hold title to the properties. One of the obligations of the GoB in this agreement is to grant the carbon rights of the properties to the MFCT.	The agreement has a confidentiality clause.
2.1.21 Benefit Permanence	The MFCT executed a Deed and Declaration of Trust confirming that the properties are to be held in trust in perpetuity for the benefit of the people of the Belize for conservation and protection of natural ecosystems. The Executed Declaration of Trust is in Appendix 16. The terms of the Trust are “irrevocable” and thus qualify as evidence that the management practices are a legal obligation for a minimum of 100 years.	The preamble of the document includes confidential information regarding financial obligations associated with the purchase of the property.
2.2.2 Most-Likely Scenario Justification 3.1.4 Baseline Scenario	In a letter written on March 1, 2021 by the Managing Member of Belize River Farms Limited, the previous owner of the property, to the President of Global Wildlife Conservation (See Appendix 11A), the Managing Member describes the various negotiations and offers they had received over the previous 11 years from different companies to purchase the land for conversion to industrial agriculture. Additional documentation providing evidence of these different offers is also included in Appendix 11.	This letter and the documents backing up this letter include information on different offers that the previous owner received from different prospective buyers to sell the property. These entities did not give authorization to share the offers publicly.
2.5.5 Statutory and Customary Property Rights	Appendix 20 referenced in this section includes the documentation of the due diligence process taken to confirm there are no disputes over ownership or other competing rights in the project area.	Appendix 20C is a legal opinion on the validity of the title of the property intended only for the recipient of the legal advice and those who need to know or rely on it.

Section	Information	Justification
3.2.1.1.3 Rate of deforestation	To calculate the baseline rate of deforestation, 6 proxy areas were selected west of the project area. These proxy areas are based on official parcel registry data provided by the Belizean government entity, Land Information Center (LIC). The original data provided by LIC can be found in Appendix XYZ.	The original data includes information on current and previous proprietors and lessees of the parcels.