MAYA FOREST CORRIDOR REDD PROJECT FIRST MONITORING REPORT

Project title	Maya Forest Corridor REDD Project
Project ID	5294
Crediting period	1 January 2022 – 31 December 2041
Monitoring period	1 January 2022 – 31 December 2023
(CCB) GHG accounting period	1 January 2022 – 31 December 2041; 20 years
Original date of issue	Pending completion of the audit
Most recent date of issue	Pending completion of the audit
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 verifications nor attempts at these
Gold Level criteria	The project zone includes sites of high biodiversity conservation priority as demonstrated by the regular occurrence of the critically endangered Central American river turtles (*Dermatemys mawii*) as well as that of the endangered Baird's tapirs (*Tapirus bairdii*). The

	management for conservation of the project area that would have otherwise been converted to agricultural production has helped protect these species.
Prepared by	Anna McMurray, Wildlife Conservation Society Sherlene Neal Tablada and Marydelene Vasquez, Compass Communication and Research Verl Emrick, Virginia Tech Conservation Management Institute

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1 SUMMARY OF PROJECT BENEFITS

The project has five explicit objectives:

1. Prevent the agricultural conversion of the project area to preserve its ecological role in the larger Maya Forest Corridor.
2. Conserve the forests on the project area to avoid GHG emissions and maintain carbon stocks.
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	Achievements during the Monitoring Period	Section Reference	Achievements during the Project Lifetime
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.	The conservation of project area that would have otherwise been cleared for agriculture during the monitoring period has helped ensure the integrity of the Maya Forest Corridor and protects the wildlife that use the corridor.	5	The conservation of project area that would have otherwise been cleared for agriculture has helped ensure the integrity of the Maya Forest Corridor and protects the wildlife that use the corridor.
2) Protects wildlife and wildlife habitat through patrols that limit poaching, control, and mitigation of wildfire, monitoring of wildlife occurrence, and habitat use.	333 patrols in the project area were conducted over the course of the monitoring period. These patrols helped identify hotspots for illegal hunting activities and areas prone to fires. Because of this proactive approach, the area and quality of the wildlife habitat in the project area have been maintained, ensuring early response to fire and safeguarding the ecosystems.	2.2.1 and 5	333 patrols in the project area were conducted to date during the project lifetime. These patrols helped identify hotspots for illegal hunting activities and areas prone to fires.
3) Improves communities' resilience by improving local fire management systems and supporting sustainable	51 people were trained in fire management in and near the MFC, 25 fires were contained by persons trained in fire management during the monitoring period.	4.3.1.1	51 people were trained in fire management in and near the MFC, 25 fires were contained by persons trained in fire

Outcome or Impact	Achievements during the Monitoring Period	Section Reference	Achievements during the Project Lifetime
livelihoods and climate change adaptation.	The achievements associated with this outcome are expected to increase significantly in following monitoring periods.		management during the monitoring period. The achievements associated with this outcome are expected to increase significantly in following monitoring periods.

1.2 Standardized Benefit Metrics

Category	Metric	Achievements during Monitoring Period	Section Reference	Achievements during the Project Lifetime
GHG emission reductions & removals	*Net estimated emission removals in the project area, measured against the without-project scenario*	Not applicable	Not applicable	Not applicable
	Net estimated emission reductions in the project area, measured against the without-project scenario	127,853 t CO_2e	3.2	129,555 t CO_2e
Forest[1] cover	*For REDD[2] projects: Number of hectares of reduced forest loss in the project area measured against the without-project scenario*	2,373 ha	3.2	2,373 ha
	For ARR[3] projects: Number of hectares of forest cover increased in the project area measured against the without-project scenario	Not applicable	Not applicable	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*)

Category	Metric	Achievements during Monitoring Period	Section Reference	Achievements during the Project Lifetime
Improved land management	*Number of hectares of existing production forest land in which IFM[4] practices have occurred as a result of the project's activities, measured against the without-project scenario*	Not applicable	Not applicable	Not applicable
	Number of hectares of non-forest land in which improved land management has occurred as a result of the project's activities, measured against the without-project scenario	Not applicable	Not applicable	Not applicable
Training	*Total number of community members who have improved skills and/or knowledge resulting from training provided as part of project activities*	Firefighting: 51 persons Ranger training: 10 persons Sustainable livelihoods: Currently none but trainings on sustainable livelihoods will occur in subsequent monitoring periods	4.3.1	Firefighting: 51 persons Ranger training: 10 persons Sustainable livelihoods: Currently none but trainings on sustainable livelihoods will occur in subsequent monitoring periods
	Number of female community members who have improved skills and/or knowledge resulting from training	Firefighting: 22 females	4.3.1	Firefighting: 22 females

[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*)

Category	Metric	Achievements during Monitoring Period	Section Reference	Achievements during the Project Lifetime
	provided as part of project activities of project activities	Ranger training: Currently none but expected to increase in future monitoring periods. Sustainable livelihoods: Currently none but trainings on sustainable livelihoods will occur in subsequent monitoring periods		Ranger training: Currently none but expected to increase in future monitoring periods. Sustainable livelihoods: Currently none but trainings on sustainable livelihoods will occur in subsequent monitoring periods
Employment	*Total number of people employed in of project activities,[5] expressed as number of full-time employees[6]*	10 people employed in project activities: 4 rangers, 4 technical/ managerial staff, and 2 field assistants in forest carbon measurements	4.3.1	4 rangers, 4 technical/ managerial staff, and 2 field assistants in forest carbon measurements
	Number of women employed in project activities, expressed as number of full-time employees	3 women employed in project activities in the roles of technical/ managerial staff	4.3.1	3 women employed in project activities in the roles

[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 UN System of National Accounts (1993) paragraphs 17.14[15.102]; [17.28])

Category	Metric	Achievements during Monitoring Period	Section Reference	Achievements during the Project Lifetime
				of technical/ managerial staff
Livelihoods	*Total number of people with improved livelihoods[7] or income generated as a result of project activities*	0 – work related to improved livelihoods initiated after this monitoring period ended.	4.3.1	0 – work related to improved livelihoods initiated after this monitoring period ended.
	Number of women with improved livelihoods or income generated as a result of project activities	0 – work related to improved livelihoods initiated after this monitoring period ended.	4.3.1	0 – work related to improved livelihoods initiated after this monitoring period ended.
Health	*Total number of people for whom health services were improved as a result of project activities, measured against the without-project scenario*	Not applicable	Not applicable	Not applicable
	Number of women for whom health services were improved as a result of project activities, measured against the without-project scenario	Not applicable	Not applicable	Not applicable
Education	*Total number of people for whom access to, or quality of, education was*	Not applicable	Not applicable	Not applicable

[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.

Category	Metric	Achievements during Monitoring Period	Section Reference	Achievements during the Project Lifetime
	improved as a result of project activities, measured against the without-project scenario			
	Number of women and girls for whom access to, or quality of, education was improved as a result of project activities, measured against the without-project scenario	Not applicable	Not applicable	Not applicable
Water	*Total number of people who experienced increased water quality and/or improved access to drinking water as a result of project activities, measured against the without-project scenario*	Not applicable	Not applicable	Not applicable
	Number of women who experienced increased water quality and/or improved access to drinking water as a result of project activities, measured against the without-project scenario	Not applicable	Not applicable	Not applicable

Category	Metric	Achievements during Monitoring Period	Section Reference	Achievements during the Project Lifetime
Well-being	*Total number of community members whose well-being[8] was improved as a result of project activities*	0 - In this first monitoring report, only the number of persons who have been involved in project activities could be measured. In future monitoring exercises, project activities' impact on livelihood will be measured.	Not applicable	0
	Number of women whose well-being was improved as a result of project activities	0 - In this first monitoring report, only the number of persons who have been involved in project activities could be measured. In future monitoring exercises, project activities' impact on livelihood will be measured.	Not applicable	0
Biodiversity conservation	*Change in the number of hectares significantly better managed by the project for biodiversity conservation,[9] measured against the without-project scenario*	The entire project area of 10,795 was better managed by the project for biodiversity conservation. In addition to the protection of 2,373 ha of forests that would have been converted to agricultural production during the time period, the whole area was managed for conservation	5	As of the end of the first monitoring report, the entire project area of 10,795 was better managed by the project for biodiversity conservation. In addition to

[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, Health, Education, Water, etc.), but could also include other benefits such as empowerment of community groups, strengthened legal rights to resources, conservation of access to areas of cultural significance, etc.

[9] 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.

Category	Metric	Achievements during Monitoring Period	Section Reference	Achievements during the Project Lifetime
		during the time period including through robust patrols of the project area by trained local ranger to prevent illegal activities such as hunting, and to detect, mitigate, and control wildland fires.		the protection of 2,373 ha of forests that would have been converted to agricultural production during the time period, the whole area was managed for conservation during the time period including through robust patrols of the project area by trained local ranger to prevent illegal activities such as hunting, and to detect, mitigate, and control wildland fires.
	Number of globally Critically Endangered or Endangered species[10] benefiting from reduced threats as a result of project activities,[11] measured against the without-project scenario	The conservation of project area as well as the regular patrolling in the area during the monitoring period helped protect the critically endangered Central American river turtle (*Dermatemys mawii*) and the	5	The conservation of project area as well as the regular patrolling in the area to data has helped protect the critically endangered Central American river turtle (*Dermatemys mawii*) and

[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

Category	Metric	Achievements during Monitoring Period	Section Reference	Achievements during the Project Lifetime
		endangered Baird's tapir (*Tapirus bairdii*)		the endangered Baird's tapir (*Tapirus bairdii*)

2 PROJECT DETAILS

2.1 Summary Description of the Implementation Status of the Project

2.1.1 Summary Description of the Project (VCS, 2.1, 3.6; CCB, G1.2)

The five project activities identified to meet the climate, community, and biodiversity objectives include the following:

1. Purchase property under threat of conversion to commercial agriculture to maintain current carbon stocks and avoid GHG emissions associated with conversion.
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.

While WCS began managing the project area in late 2021 after the property was purchased prior to the project state date, management activities ramped up in 2022 and continued through the end of 2023. This included carrying out regular enforcement, reconnaissance, and biological research patrols. The project team also engaged in activities to control and extinguish wildfires in the area and used drone technology to monitor the fire behavior.

A comprehensive survey of the critically endangered Central American river turtle was carried out in early 2022, and in early 2023 the field measurements were conducted to identify the carbon stock of the forests within the project site. The project team also conducted community outreach and environmental education activities in local communities in 2022 and 2023, and fire management training in these communities was initiated in 2023.

Because of these activities, the project was able to meet its objectives of preserving the forests for its ecological role in the larger MFC, to avoid GHG emissions, and to protect its native biodiversity (objectives #1-3) as well as to empower local communities to lead conservation and climate resilience efforts by enhancing their awareness and understanding of critical environmental and climate adaptation issues (objective #4). The total GHG emission reductions generated during this monitoring period are 127,853 t CO_2e.

While no training, material, or technical support was provided during this first monitoring period for community-owned sustainable livelihoods and nature-based solutions, these activities were initiated in

2024 after the end of the monitoring period to meet objective #5 Enhance community capacity for sustainable diverse livelihoods and nature-based solutions for climate adaptation.

2.1.2 Audit History (VCS, 4.1)

Project has not yet been validated. The verification of the first monitoring period will occur jointly with the validation of the project.

2.1.3 Sectoral Scope and Project Type (VCS, 3.2)

Sectoral Scope	14: Agriculture, forestry, and other land use
AFOLU Project Category	Reduced Emissions from Deforestation and Degradation (REDD)
Project Activity Type	Avoiding planned deforestation

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

Organization name	Maya Forest Corridor Trust (MFCT)
Contact person	Nicole Auil Gomez
Title	Secretary
Address	1755 Coney Drive, Belize City, Belize
Telephone	+501-223-3271
Email	nauilgomez@wcs.org

2.1.5 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.
Contact person	Anna McMurray
Title	Forest Carbon Technical Advisor

Address	1400 K St. NW, Suite 600, Washington, DC 20005, USA
Telephone	+ 1 718 220-5100
Email	amcmurray@wcs.org

Organization name	Belize Maya Forest Trust
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
Telephone	+501 6103982
Email	ekay@bmft.org.bz

Organization name	The Belize Zoo and Tropical Education Center
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

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
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	Compass Communication and Research
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
Address	Camalote Village, Cayo District, Belize
Telephone	+501 6316015
Email	compasscr2021@gmail.com

Organization name	Virginia Tech Conservation Management Institute, Department of Fish and Wildlife Conservation
Role in the project	VTCMI was 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

2.1.6 Project Start Date (VCS, 3.8)

Project start date	1 January 2022
Justification	As 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.

2.1.7 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	01-January-2022
Total Number of Years of Crediting Period	20 years
CCB Benefits Assessment Period	20 years

2.1.8 Project Location (VCS, 3.11; CCB, G1.3)

The MFC REDD project area is located in central Belize in the Belize and Cayo Districts approximately 37 km west of Belize City in the northern lowland physiographic province (Figure 1). The project is embedded within and part of the Maya Forest Corridor (MFC) (Figure 2). 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 3).

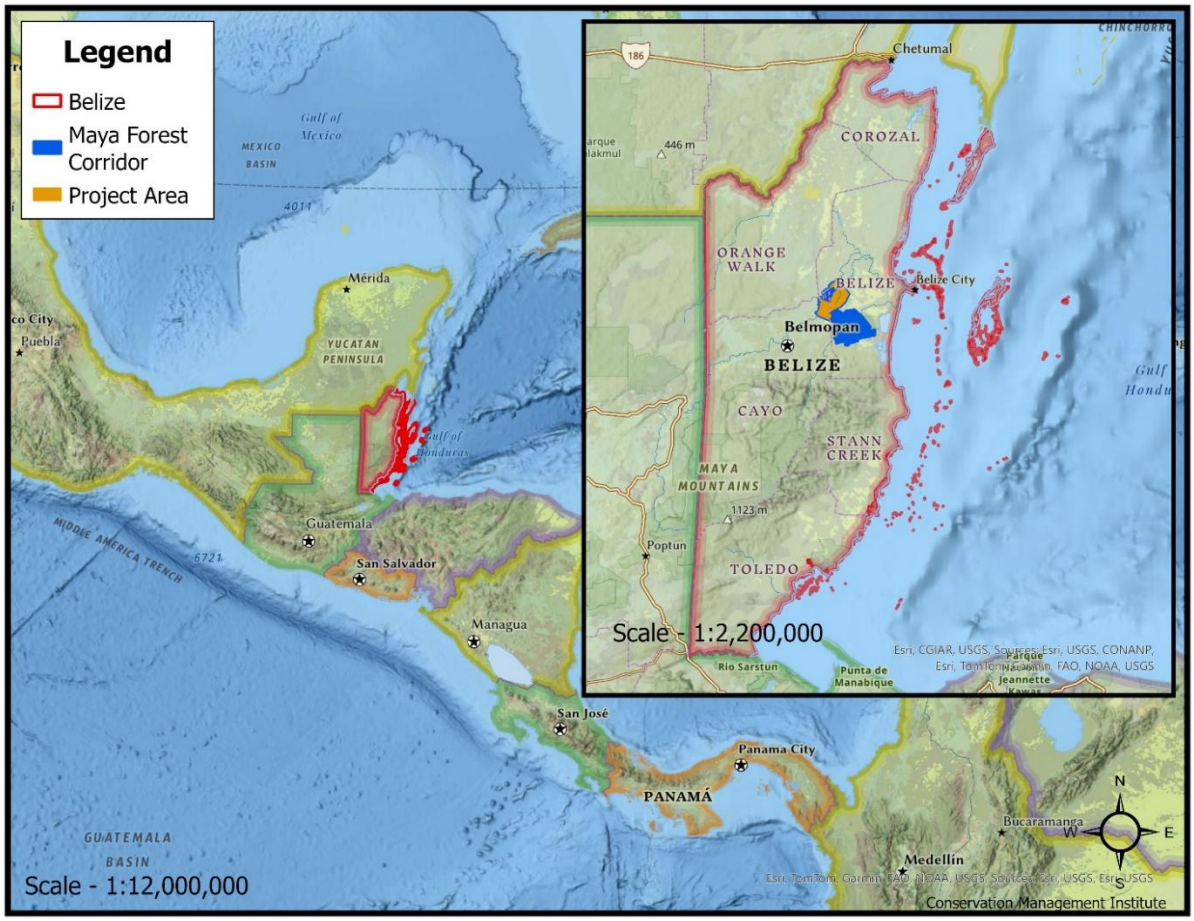

*Figure 1. **Maya Forest Corridor REDD project location at a regional scale.***

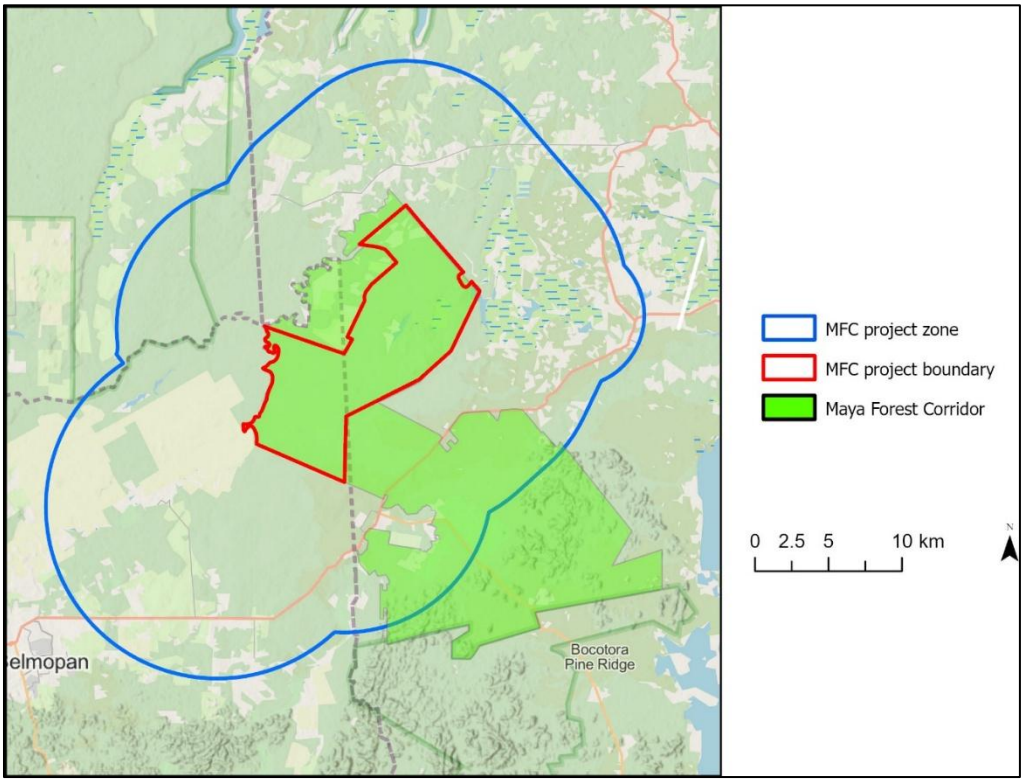

Figure 2. Maya Forest Corridor REDD project location within the Maya Forest Corridor.

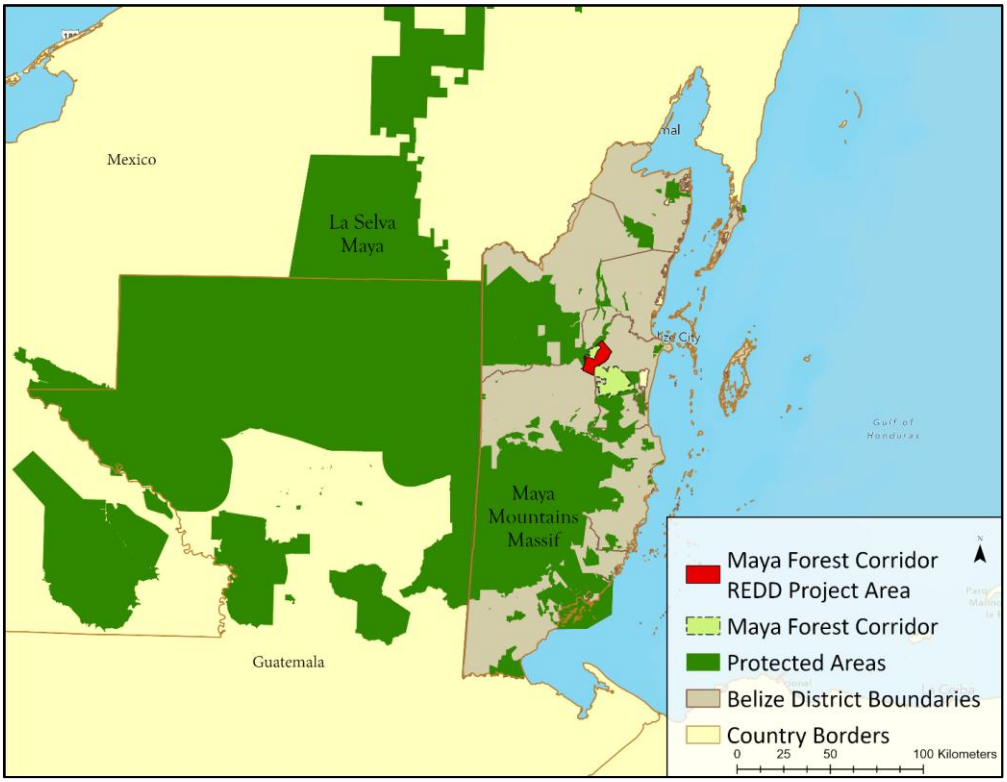

Figure 3. MFC and MFC REDD project area with the larger Selva Maya

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. Coordinates are 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
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

Vertex	X coordinate (m)	Y coordinate (m)	Vertex	X coordinate (m)	Y coordinate (m)
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

☒ KML file has been provided

2.1.9 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

Type (methodology, tool, module)	Reference ID (if applicable)	Title	Version
Tool		AFOLU Non-Permanence Risk Tool	4.2

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

2.1.10.1 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

2.1.10.2 Registration in Other GHG Programs

Was the project registered or seeking registration under any other GHG programs?

☐ Yes ☒ No

2.1.10.3 Projects Rejected by Other GHG Programs

Has the project been rejected by any other GHG programs?

☐ Yes ☒ No

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

2.1.11.1 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

2.1.11.2 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

2.1.11.3 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

2.1.12 Sustainable Development Contributions (VCS, 3.17)

The purchase and management for conservation of the project area in 2022 and 2023 contributed to SDG 11, 13, and 15 by ensuring the conservation of terrestrial and inland freshwater ecosystems. All the activities related to fire management and community outreach and environmental education contribute to SDG 11. The activities to conserve biodiversity within the project area and prevent poaching contribute to SDG 15. These activities also support nationally stated sustainable development priorities in particular the strategic objective "Protection of the Environment and Natural Resources" identified in #PlanBelize Medium-Term Development Strategy 2022 – 2026.

Table 2. The MFC REDD project's sustainable development contributions in 2022 and 2023

Row number	SDG target	SDG indicator	Net impact on SDG indicator	Current project contributions	Contributions over project lifetime
1)	11.4	Hectares of the Maya Forest Corridor protected and safeguarded	Purchase and management of the property in which the REDD project area is located for conservation that had been under imminent threat of conversion to agriculture	11,804 ha within the project boundary actively managed for conservation, including regular patrols throughout the area during monitoring period	10,795 ha within the project boundary actively managed for conservation, including regular patrols throughout the area over project lifetime
2)	11.5	Number of persons trained in fire management by community and organization	The project offers a series of fire management trainings to on-the-ground managers and community members	51 persons trained: 10 women, 37 men	51 persons trained: 10 women, 37 men

Row number	SDG target	SDG indicator	Net impact on SDG indicator	Current project contributions	Contributions over project lifetime
4)	11.5	% of fires contained by persons trained	The project provided trainings and helped set up fire brigades	No fires detected in 2022. In 2023, 29 fires were detected of which 25 were contained. As such, 86% of fires were contained	In 2023, 29 fires were detected of which 25 were contained. As such, 86% of fires were contained
5)	11.0	Number of community residents partaking in community outreach and environmental education activities	The project team is informing communities nearby communities about the work being done in the MFC and the importance of the MFC.	2022: 528 community members engaged. • 385 children and youth • 143 adults 2023: 340 community members engaged. • 755 children and youth • 175 adults	Total in 2022 and 2023: 868 community members
5)	13.0	Tonnes of greenhouse gas emissions avoided or removed	Purchase and management of forests for conservation that had previously been under imminent threat of conversion to agriculture	By conserving 2,373 ha of tropical moist forest, the project has prevented the release of 127,868 tonnes of carbon into the atmosphere during the monitoring period	Prevented the release of 127,868 tonnes of carbon into the atmosphere

Row number	SDG target	SDG indicator	Net impact on SDG indicator	Current project contributions	Contributions over project lifetime
6)	15.1	Hectares of the Maya Forest Corridor protected and safeguarded	Purchase and management of the project area for conservation that had previously been under imminent threat of conversion to agriculture	11,804 ha within the project boundary actively managed for conservation, including regular patrols throughout the area during monitoring period	11,804 ha within the project boundary actively managed for conservation, including regular patrols throughout the area during monitoring period
7)	15.5	Occurrence of the critically endangered Central American river turtle (*Dermatemys mawii*) and the endangered Baird's tapir (*Tapirus bairdii*) in the project area	Purchase and management of the property in which the project area is located for conservation that had previously been under imminent threat of conversion to agriculture	Monitoring efforts have confirmed the occurrence of both the turtles and tapirs in the project boundary (refer to section 5.3.1).	Monitoring efforts have confirmed the occurrence of both the turtles and tapirs in the project boundary (refer to section 5.3.1).

Row number	SDG target	SDG indicator	Net impact on SDG indicator	Current project contributions	Contributions over project lifetime
8)	15.7	Number of patrols conducted in the project area to discourage and eliminate poaching and trafficking of protected species and associated man hours	Regular patrols by WCS rangers conducted to monitor and secure the project area and explore for illegal poaching.	333 patrols in the project area were conducted over the course of the monitoring period. Rangers patrolled for approximately 837 man-hours in 2022 and 2249 man-hours in 2023.	333 patrols in the project area were conducted over the course of the monitoring period. Rangers patrolled for approximately 837 man-hours in 2022 and 2249 man-hours in 2023.

2.2 Project Implementation Status

2.2.1 Implementation Schedule (VCS, 3.2; CCB, G1.9)

The implementation status of the project activities is described as follows:

- In February of 2022, the construction of the ranger station in the MFC REDD project area was finalized allowing for the regular patrolling of the area by WCS rangers.
- 333 patrols in the project area were conducted over the course of the monitoring period. Rangers patrolled for approximately 837 man-hours in 2022 and 2249 man-hours in 2023. These included enforcement patrols to monitor and secure the project area, reconnaissance patrols where areas were explored for illegal activities, and research patrols that focused on collecting biological information in the project area. These patrols helped identify hotspots for illegal hunting activities and areas prone to fires. In these patrols, the rangers also recorded 387 fauna sightings or tracks.
- From March to June 2022, WCS Belize conducted a comprehensive survey confirming the presence of the critically endangered Central American river turtle (*Dermatemys mawii*) within the Cox Lagoon in the project area.
- Starting in July 2022, the MFCT members engaged in community outreach and environmental education activities in local communities. They informed nearby communities about the change in management of the MFC REDD project area (formerly known as the Big Falls Farm and currently referred to locally as the MFCT property) and the importance of the MFC. The team employed different strategies to engage stakeholders such as in-person meetings, focus groups, and an exchange trip.
- In August of 2022, the formal Management agreement was 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.
- Field measurements were conducted from February through June 2023 to estimate forest carbon stocks in the project area. With regards to the estimated carbon stocks in the project area, it is important to note that, in November 2022, Hurricane Lisa (Category 1) hit the MFC project area leading to some damage to its forests. However, because the forest carbon measurements were conducted after the hurricane, the reductions in carbon stocks are already accounted for in the field measurements.
- MFCT members engaged in firefighting activities during the fire season in 2023. The team detected 29 fires, although the fires had no impact on the forests of the MFC REDD project area. All the fires were human-induced and were lit as a hunting strategy. The team identified different hotspots where the team verified fires occurring within the MFC, and the Maya Forest Corridor Fire Working Group (MFCFWG) worked closely to control and extinguish fires in these hotspots. The team also used drone technology to monitor the fire behavior and make informed decisions.

- Fire management training was initiated in local communities in June 2022 and continued through the remainder of the monitoring period.
- Four hectares of forest loss occurred during the monitoring period leading to carbon stock losses totaling 746 t CO_2e. This loss was the result of damage from Hurricane Lisa in November 2022. This does not meet the definition of a loss event as described in the VCS Program Definitions v4.4 because no emissions reductions had been verified previously nor did the losses exceed five percent of the ex ante emission reduction estimates for the monitoring period which totaled 127,868 t CO_2e. This also does not meet the definition of a reversal as the net GHG benefits for the first monitoring period are still overwhelmingly positive.

The following project activities began to be implemented after the monitoring period ended including: formal stakeholder consultations, the formal stakeholder impact assessment, implementation of the grievance redress mechanism, the implementation of fire hazard alert systems, work with communities to design and adopt climate smart plans and community conservation plans, and trainings in community-owned sustainable livelihoods and nature-based solutions. These activities will be included in subsequent monitoring reports.

2.2.2 Baseline Reassessment (VCS, 3.2.6, 3.2.7)

Did the project undergo baseline reassessment during the monitoring period?

☐ Yes ☒ No

2.2.3 Methodology Deviations (VCS, 3.20)

One methodology deviation is applied.

According to the table on aboveground biomass of trees based on allometric equations for or species group j based on measured tree variable(s) (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 measurement 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 3.

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 4 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.

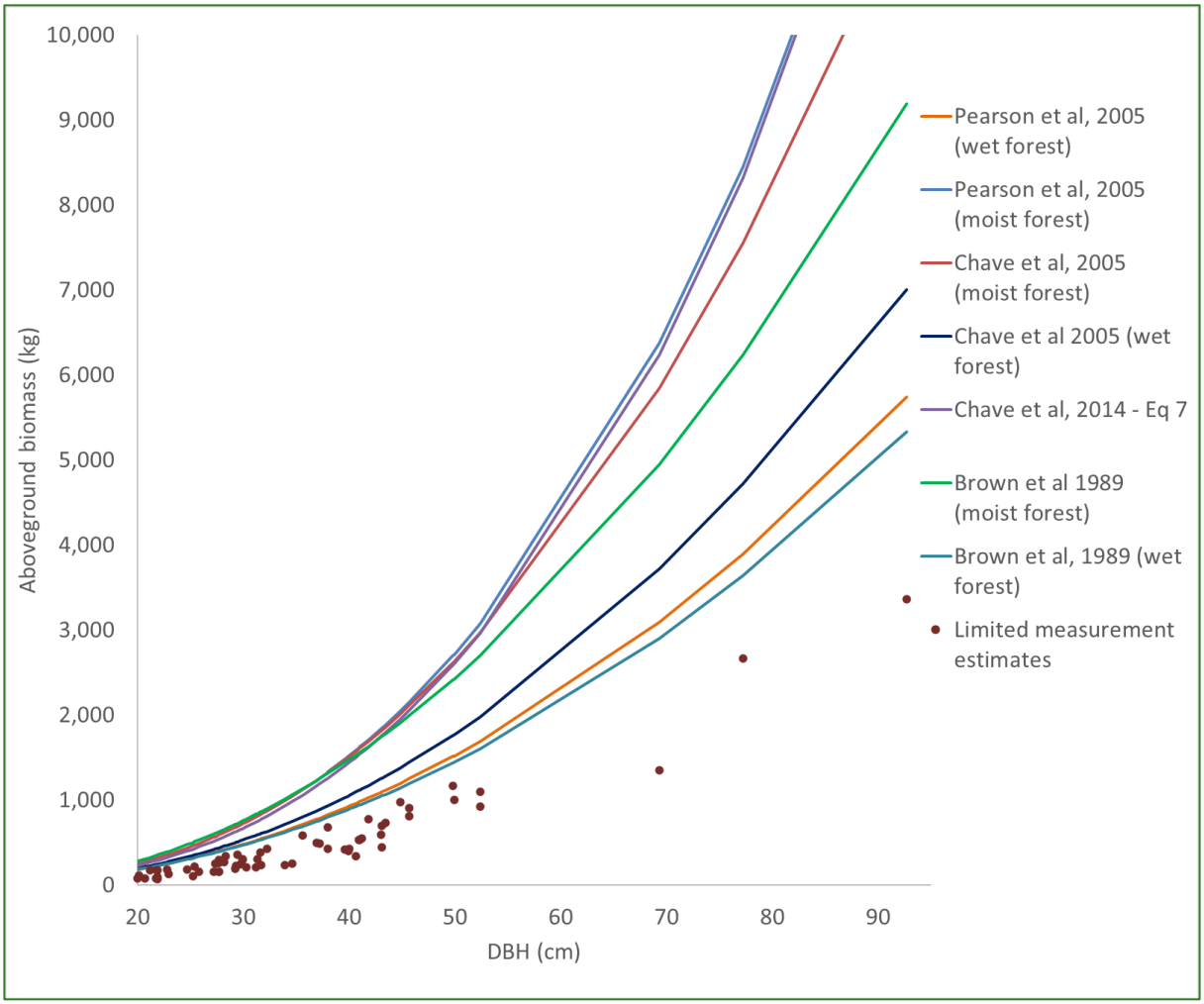

Figure 4. Relationship between DBH and AGB based on different allometric equations and based on limited measurement approach

The fact that these allometric equations consistently overestimate the biomass in the project area is likely due to 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 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 underestimate 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 5 shows the allometric equation (the red line) that was created based on the limited measurement estimations (the circles) from the 62 trees.

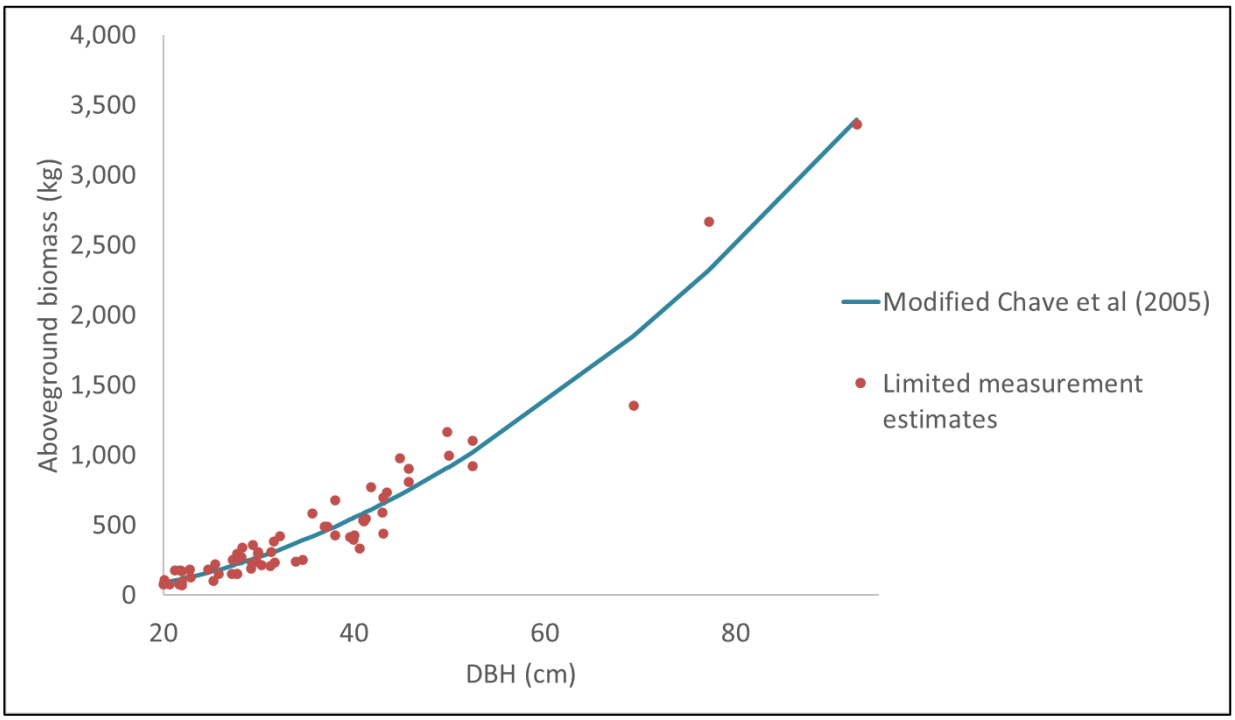

Figure 5. Biomass in MFC REDD project area estimated with the limited measurement approach compared with modified Chave et al (2005) allometric equation

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 is unrealistically low with value only slightly greater than zero kilograms (see Figure 6). 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 certainly yields conservative estimates.

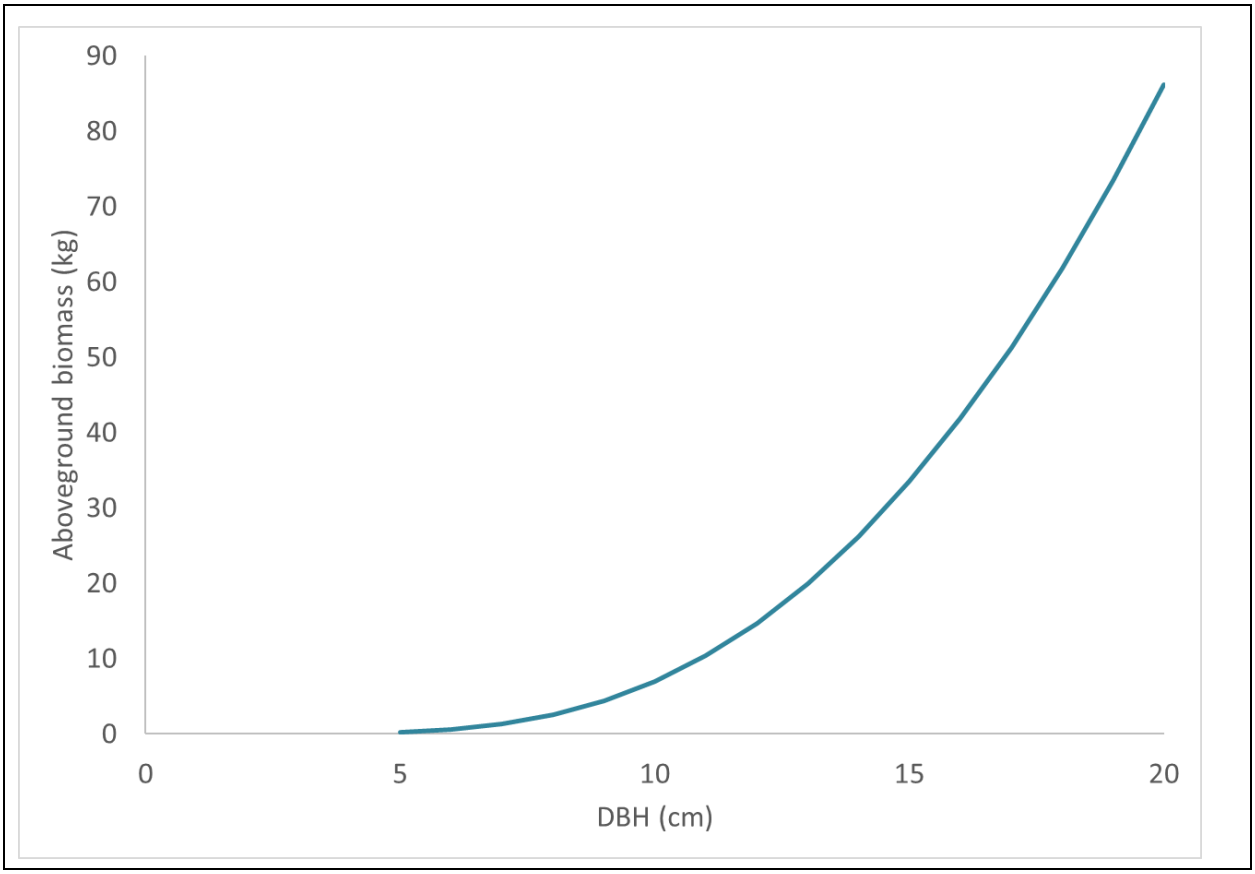

Figure 6. Aboveground biomass estimates of small diameter trees using the modified Chave et al (2005) equation

2.2.4 Minor Changes to Project Description (CCB Program Rules, 3.5.6)

As this first monitoring report is being submitted for verification at the same time as the project description is being submitted for validation, there are no changes from the project description.

2.2.5 Project Description Deviations (VCS, 3.21; CCB Program Rules, 3.5.7 – 3.5.10)

As this first monitoring report is being submitted for verification at the same time as the project description is being submitted for validation, there are no project description deviations.

2.2.6 Grouped Projects (VCS, 3.6; CCB, G1.13-G1.15, G4.1)

Not applicable.

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

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 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).	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, 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

Identified Risk	Potential impact of risk on climate, community and/or biodiversity benefits	Actions needed and designed to mitigate the risk
		fauna to damaged forests and ecosystems.
Fire (wild and natural)	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: The biodiversity risk is complex and dependent upon the ecosystem. In the tropical broadleaf forest 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 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).	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 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. Because of these efforts, in 2023, 25 fires were contained in or near the MFC were contained.
Poaching of flora and fauna	Risks to climate benefits: Illegal harvesting of timber is considered a low	Mitigation of risks to climate benefits: WCS rangers conduct

Identified Risk	Potential impact of risk on climate, community and/or biodiversity benefits	Actions needed and designed to mitigate the risk
	risk based on the socioeconomic assessment conducted (Appendix 4) 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 (*Dasyprocta punctata*), white lipped peccary (*Tayassu pecari*), White Tailed deer (*Odocoileus virginianus*), and Baird's Tapir (*Tapirus bairdii*) an endangered species among others. Illegal hunting of game birds such as the vulnerable Great currasow (*Crax rubra*) is also a risk. In addition, the project area supports a vibrant population of the Central American river turtle (*Dermatemys mawii*), a critically endangered species threatened by harvesting for consumption and the animal trade (Novelo-Fuentes and Arevalo 2022, Vogt et al 2006).	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 ae 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 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.	Activities to mitigate this risk were not implemented until 2024 after the monitoring period was completed. These activities include the following and are described in more detail in section 2.3: • 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

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

2.2.8 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 the Belize for conservation and protection of natural ecosystems. The Executed Declaration of Trust is in Appendix 5. 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.

2.3 Stakeholder Engagement & Safeguards

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

The stakeholder make up has not changed since validation. As such, the stakeholder identification process and the final list of stakeholders is the same as what is identified in the Project Description.

2.3.2 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 6A) 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.

2.3.3 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 Document, 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 the verification audit. All relevant public comments received during this period will be addressed appropriately.

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

Informational meetings were conducted in 2024. These meetings are described below.

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.

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

The different natural and human-induced risks resulting from project activities, as well as the commensurate mitigation or preventative measures in place to prevent or mitigate these risks, are described in detail in Appendix 1.

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

WCS began the process of identifying and addressing the costs, risks, and benefits to communities in 2024 after the first monitoring period was completed. WCS is committed to doing this through participatory and transparent processes. To achieve this, WCS has prepared the Stakeholder Engagement Plan 2024 – 2030 (Appendix 6A), 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.

2.3.7 Information to Stakeholder on Verification Process (VCS, 3.18.6, 3.19; CCB, G3.3)

Community members will be informed of the verification process through the steps outlined in the Stakeholder Engagement Plan (Appendix 6A). 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.

2.3.8 Site Visit Information and Opportunities to Communicate with Auditor (VCS, 3.18.6, 3.19; 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.

2.3.9 Stakeholder Consultation (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 3 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 4.

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 Maya Forest Corridor Trust 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 3. Initial stakeholder consultations for the MFC REDD project

Ongoing consultation	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. 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
Date(s) of stakeholder consultation	29 May 2024 to June 9, 2024
Communication of monitored results	As discussed in section 2.3.4, the results of these engagements and the entire monitoring period will be communicated to all stakeholders through the following strategies:

	• Presentations of the monitoring results will be 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, 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. Beneficiary communities, as well as government and non-government partners, will be allowed a 30-day comment period at the start of validation and verification events. All relevant public comments received during this period will be addressed appropriately.
Consultation records	Notes from each meeting were documented (Appendix 6B) and follow-up actions were undertaken as necessary to address comments and concerns.
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 4. Follow-up stakeholder consultations to present findings from the household survey, community monitoring report, and findings from the social impact assessment

Ongoing consultation	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. PowerPoint presentations were made in English and Spanish on the key findings from the household survey and community monitoring report as well as the stakeholder impact assessment. 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 stakeholder. 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.
Date(s) of stakeholder consultation	23 August 2024 to 28 August 2024
Communication of monitored results	As discussed in section 2.3.4, the results of these engagements and the entire monitoring period will be communicated to all stakeholders through the following strategies: • Presentations of the monitoring results will be 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, 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. 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.
Consultation records	Notes from each meeting were documented (Appendix 6C) and follow-up actions were undertaken as necessary to address comments and concerns.
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.

2.3.10 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 inputs will provide information for continuous updates of the work plan. Table 5 provides a summary of the comments received as part the project's stakeholder consultations that took place in 2024.

Table 5. Summary of comments received as part the project's 2024 stakeholder consultations

Summary of comment received	Actions taken
Request for inclusion of Freetown Sibun in the project	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	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.	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.	Activities planned for La Democracia will include backyard gardens in consideration of the lack of access to agriculture lands.

2.3.11 Stakeholder Consultation Channels (CCB, G3.5)

Within the 12 priority communities, interpersonal channels are the preferred channels for communication. This is the preferred channel as the majority of communities are small, remote

communities, several 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). 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 6. Number of community participants 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

Communities	Number of Male participants	Number of Female Participants	Total
St. Paul's	2	4	6
Double Head Cabbage	0	2	2
Bermudian Landing	0	4	4
Scotland Halfmoon	0	4	4
Total	29	57	86

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

As described in 2.3.2, 2.3.3, 2.3.4, 2.3.9, and 2.3.11, 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.

2.3.13 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.

2.3.14 Grievances (VCS, 3.18.4; CCB, G3.8)

Grievances received	Resolution and outcome
N/A – No grievances were raised during the monitoring period. It is important to note that the GRM was not designed until after the end of the monitoring period. That being said, as described in section 2.3.9, formal stakeholder consultations were conducted in 2024 after the end of the monitoring period during which grievances could have been raised. While the stakeholders provided feedback as discussed in 2.3.9, they did not have any specific grievances related to the project. Moving forward, affected communities and other interested stakeholders may raise a grievance at any time to the MFCT. Therefore, 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 target 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.	N/A

2.3.15 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. During the monitoring period, WCS rangers in the project area received training on the following key topics: Search and Rescue, Fire Management, Wildland Fire Behavior, and Fire Effects Monitoring. They also received training to become Special Constables[12] (Appendix 7).

2.3.16 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 project 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.

2.3.17 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 ensures ongoing training in safety procedures for all staff.

Table 7 outlines some potential risks and hazards to workers engaged in field activities and some safety and mitigation strategies that are being employed.

Table 7. 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

[12] 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

Potential risks and hazards	Mitigation Strategies
	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)

2.4 Management Capacity

2.4.1 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.

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

The Management Team, led by WCS with support from the Maya Forest Corridor Trust 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 us 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 WCS's Global Rights + Communities Program, we support these local community-led conservation efforts in this shared vision, and facilitate 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, scientific, 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 8 years focused on developing and implementing international climate change mitigation and adaptation initiatives in the agriculture, forestry, and other land use 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 Masters in Environmental Studies from University of Michigan with a concentration in GIS and remote sensing.

Nicole Auil Gomez, MSc

Mrs. Auil Gomez has led WCS Belize's Program as the Country Director since 2016. In this role, she supports a team of about 25 to meet strategic objectives related to three main pillars: resilient and prosperous communities, biodiversity protection, and applied science in key marine and terrestrial systems in Belize. Mrs. Auil Gomez brought a wealth of experience from both NGO and government sectors. Prior to joining WCS, she was Executive Director of Belize's Southern Environmental Association (SEA), a local NGO responsible for managing two community-lead marine protected areas. She also worked in technical positions at the Coastal Zone Management Authority and Wildlife Trust Belize, and undertaken manatee research in conjunction with Sea to Shore. She holds a Master's Degree in Wildlife and Fisheries Science from Texas A&M University, with a research focus on coastal zone management and expertise in the endangered Antillean manatee. She has ample experience in management, fundraising, politics, and policy.

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 interest 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 humans and wildlife interactions.

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.

2.4.3 Project Management Partnerships/Team Development (VCS, 3.19; CCB, G4.2)

WCS with support from the MFCT and its member organizations has 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 2.4.2.

2.4.4 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.

2.4.5 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 8.

2.4.6 Commercially Sensitive Information (VCS, 3.5.2-3.5.4; CCB Program Rules, 3.5.13 – 3.5.14)

The commercially sensitive information is listed in Appendix 2.

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)

As this first monitoring report is being submitted for verification at the same time as the project description is being submitted for validation, the same list of national and local laws and regulations listed in the Project Description are relevant to this monitoring report.

2.5.2 Relevant Laws and Regulations Related to Worker's Rights (VCS, 3.18, 3.19; 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 access to 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 8 provides a brief description of all relevant labor laws in Belize.

Table 8. 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

Statute	Relevance and Compliance
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 right to unionize outlined in worker's agreements.
International Labor Organization Conventions	Belize is a signatory to many of the International Labor Organization's conventions13. 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 Recognition of Property Rights (VCS, 3.7, 3.18, 3.19; CCB, G5.1)

Disputes over rights to territories and resources	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.
Respect for property rights	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.

	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

2.5.6 Benefit Sharing Mechanism (VCS, 3.18, 3.19)

Not applicable as the project does not impact property rights.

2.5.7 Free, Prior, and Informed Consent (VCS, 3.18, 3.19; 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 Property Right Protection (VCS, 3.18, 3.19; CCB, G5.3)

Refer to section 2.5.5.

2.5.9 Identification of Illegal Activity (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 starting 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 4), 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 9.

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.

2.5.10 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.

3 CLIMATE

3.1 Monitoring GHG Emission Reductions and Removals

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

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 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	CF
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	Tree Class (DBH) / Plot Radius / Plot Area ≥5.0cm / 4.0m / 50m² ≥20.0cm / 14.0m / 616m² ≥50.0cm / 20.0m / 1256m²
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 11 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 2.2.4 for more information). The allometric equation applied to trees in the *Cecropia* genus is from Pearson et al (2005). The allometric equations for trees in the *Pinus* genus and for different palms are from Penman et al (2003).
Value applied	

Taxa	Allometric
Cecropia spp	$AGB = 12.764 + 0.2588 * DBH^{2.0515}$
Pinus spp	$AGB = 0.887 + \frac{10486 * DBH^{2.84}}{DBH^{2.84} + 376901}$
Attalea cohune	$AGB = 10.856 + 176.76 * HT - 6.898 * HT^2$
Sabal spp	$AGB = 24.559 + 4.921 * HT + 1.017 * HT^2$

	Crysophylla spp	$AGB = 0.182 + 0.498 * HT + 0.049 * HT^2$
	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, 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_2e 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 Cecropia and Pinus gen*era.* 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. $$Scaling\ factor = \frac{10{,}000\ m^2}{\pi * (radius\ in\ meters\ of\ nested\ plot)^2}$$ 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 multipled 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_2e 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 multipled 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_2e 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 *l* from sample plot *sp*
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	-

<table>
<tr><td>Data / parameter</td><td>D_{DWdc}</td></tr>
<tr><td>Data unit</td><td>t d.m. m^{-3}</td></tr>
<tr><td>Description</td><td>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</td></tr>
<tr><td>Source of data</td><td>Peer-reviewed scientific article (Pfeifer et al., 2015) on deadwood biomass in tropical humid forests</td></tr>
<tr><td>Value applied</td><td>
<table>
<tr><th>Decay Class</th><th>Mean Wood Density (t m^{-3})</th></tr>
<tr><td>Sound</td><td>0.49</td></tr>
<tr><td>Intermediate</td><td>0.37</td></tr>
<tr><td>Rotten</td><td>0.21</td></tr>
</table>
</td></tr>
<tr><td>Justification of choice of data or description of measurement methods and procedures applied</td><td>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 table below (taken from Table 1 in the study)[13].
<table>
<tr><th>Decay class</th><th>Description</th><th>Wood density (t m^{-3})</th></tr>
<tr><td>1</td><td>Little decay, bark cover extensive, leaves and fine twigs present</td><td>0.4</td></tr>
<tr><td>2</td><td>No leaves and fine twigs, bark starting to fall off, logs relatively undecayed</td><td>0.58</td></tr>
<tr><td>3</td><td>No bark and few branch stubs (not moving when pulled), sapwood decaying</td><td>0.37</td></tr>
<tr><td>4</td><td>No branches and bark, outer wood case hardened, inner wood decomposing</td><td>0.26</td></tr>
</table>
</td></tr>
</table>

[13] Values presented as g cm^{-3} in the study (1 g cm^{-3} = 1 t m^{-3})

	<table><tr><td>5</td><td>Wood often scattered across the soil surface, logs elliptical in cross-section</td><td>0.16</td></tr></table> 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
Comments	-

Data / parameter	*Dia*
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 ($\geq$ *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_2e ha^{-1}
Description	Carbon stock in dead wood
Source of data	Field measurements
Value applied	6.9
Justification of choice of data or description of measurement methods and procedures applied	Carbon stock calculated from both standing and lying dead wood in each plot. 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 multipled 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 11 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 11. 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/cm^3) ODW = Oven dry mass total sample in grams CV = Core volume in cm^3 RF = Mass of coarse fragments (> 2 mm) in grams
Purpose of data	Calculation of baseline and project emissions
Comments	-

Data / parameter	$C_{SOCforest}$
Data unit	t CO_2e 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, … *Pi* 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	-

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, full till practices would have been applied. Consistent with the common agricultural practices 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 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	$C_{SOC,PD\text{-}BSL}$
Data unit	t CO_2e 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_2e 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_2e
Description	Sum of the baseline carbon stock change in all terrestrial pools in year t
Source of data	-
Value applied	Refer to "Base emis calcs - final" tab in Carbon Calculations spreadsheet in Appendix 12.
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: $\Delta C_{BSL,CS,t}$ = Sum of the baseline carbon stock change in all terrestrial pools in year t, t CO_2e $AA_{planned,t}$ = Annual area of baseline planned deforestation in year t; ha $\Delta C_{AB_{tree}}$ = Baseline carbon stock change in aboveground tree biomass; t CO_2e ha^{-1} $\Delta C_{BB_{tree}}$ = Baseline carbon stock change in belowground tree biomass; t CO_2e 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}
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	-

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_2O: 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_2O)
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_2e
Description	Greenhouse gas emissions due to biomass burning in year t of each GHG (CH4 and N2O)
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-CO_2-emissions from burning of remaining aboveground biomass, VMD0013 v1.3 (E-BPB) is applied. In particular, Equation 1 is applied. $$E_{biomassburn,t} = \sum_{g=1}^{G} \left(\left(A_{burn,t} * B_t * COMF * G_g \right) * 10^{-3} \right) * GWP_g)$$ 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 CO_2/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_2e
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 CO_2e $E_{FC,t}$ = Net CO_2e emission from fossil fuel combustion in year t; t CO_2e

	$E_{BiomassBurn,t}$ = Non-CO_2 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. N_2O 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	-

Data / parameter	$\Delta C_{BSL,REDD}$
Data unit	t CO_2e
Description	Net GHG emissions in the REDD baseline scenario in year t
Source of data	-
Value applied	Refer to "Base emis calcs - final" tab in Carbon Calculations spreadsheet in Appendix 12.
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 CO_2e $GHG_{BSL,t}$ = Greenhouse gas emissions as a result of deforestation activities within the project boundary in year t, t CO_2e
Purpose of data	Calculation of baseline emissions
Comments	-

Data / parameter	$Uncertainty_{BSL,RATE}$
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_2e
Description	Carbon stock and greenhouse gas source in the REDD baseline scenario
Source of data	-
Value applied	Tree AGB: 79.2; Tree BGB: 22.5; Palm AGB: 11.0; Dead wood: 4.6; Soil: 535.5; Post-defo cropland: 17.2; Biomass burning: 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	See table below
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% confidence interval as a percentage of the mean of the value.
Purpose of data	Calculation of uncertainty of baseline and project emissions
Comments	-

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%

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

	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: $Uncertainty_{REDD-BSL,t*} = \sqrt{Uncertainty^2_{BSL,RATE,t*} + Uncertainty^2_{REDD-BSL}}$ 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
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 identifieded 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	$LK_{CP\text{-}ME}$
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	$Buffer\%$
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	-

3.1.2 Data and Parameters Monitored (VCS, 3.16)

Data / parameter	Project Forest Cover Benchmark Map *(FCBM)*
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 13.
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 GOFC-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.* Classification accuracy assessment: The methods, data, and location of sampling points used in the accuracy and final classification of accuracy will be reported. *d.* 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 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	To maintain consistency of representation of the project area, the forest cover benchmark map (FCBM) was used as the starting point for creating of the FCMM. Areas mapped as forest with the FCBM were analyzed using multispectral remote sensing

	imagery from a combination of Landsat and Sentinel platforms representing the start and end dates of the monitoring period. Landsat and Sentinel images were reviewed and three were selected that minimized cloud cover and that most closely represented either the start or end date of the monitoring period. All images meet the requirement of pixel resolution of 30m or finer. Deforestation was evaluated primarily using visual interpretation, aided with a principal component analysis of an NDVI time series meant to highlight localized anomalies forest cover. A full description of the process to develop this map can be found in section 3.1.3.
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 GOFC-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. 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 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	2022: 4 ha 2023: 0 ha
Monitoring equipment	-
QA/QC procedures to be applied	-
Purpose of data	Calculation of project emissions
Calculation method	-
Comments	-

Data / parameter	$C_{P,post,u}$
Data unit	t CO_2e 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 the 2022-2023 monitoring period, given the small area identified as experiencing deforestation (4 ha) during the monitoring period, rather than conducting field measurements of the carbon stocks post-deforestation, a complete loss of aboveground and belowground tree and palm biomass stocks was assumed. No change in dead wood stocks (4.6 t CO_2e ha^{-1}) was applied. This is considered conservative given the fact that no downed trees/palms were removed from the area and, as such, the dead wood carbon stocks likely increased. The post-deforestation biomass carbon stocks for agricultural production (17.2 t CO_2e ha^{-1}) of annual croplands was applied as was the post-deforestation soil organic carbon stock (444.5 t CO_2e^{-1}). These are considered conservative assumptions because 1) natural vegetation regrowth occurred following the events, and 2) soil organic carbon stocks remained more intact after the events as compared to what they would have been under long-term cultivation.
Frequency of monitoring/recording	Monitoring will occur at least every 5 years prior to each verification event.
Value applied	466.3
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_2e
Description	Net carbon stock change as a result of deforestation in the project area 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	2022: 746 t CO_2e 2023: 0 t CO_2e
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 *t*, t CO_2e $A_{DefPA,u}$ = 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 CO_2e 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 of the PD.
Frequency of monitoring/recording	Monitoring will occur at least every 5 years prior to each verification event.
Value applied	• Zero (0) ha of project areas impacted by fires; • Regarding this impacts of Hurricane Lisa in November 2022, initial field survey indicated that some damage was apparent, mostly in the form of broken limbs. Review of NDVI time series before and after the hurricane did not reveal any particular spatial pattern, indicating that any impact lacked localized severe events. This storm occurred prior to complete biomass inventory of the entire site, and therefore any potential impact from the storm is already accounted for in the baseline carbon stocks. Accounting for additional emissions from the storm would be double counting the same loss, so is not undertaken. The full forest carbon inventory of the project area did not identify any unique strata related to the storm or other landscape factors, so no strata were delineated associated with the storm.
Monitoring equipment	-
QA/QC procedures to be applied	Details can be found in section 3.3.3.3.2 of the PD.
Purpose of data	Calculation of project emissions
Calculation method	-
Comments	-

Data / parameter	$C_{ABtree,dist,q}$
Data unit	t CO_2e 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 and procedures to be applied	Carbon stock in aboveground 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 of the PD.
Frequency of monitoring/recording	Monitoring will occur at least every 5 years prior to each verification event.
Value applied	Not measured. The complete biomass inventory of the entire site occurred after Hurricane Lisa, and therefore any potential impact from the storm is already accounted for in the baseline carbon stocks.
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_2e 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 in the PD.
Frequency of monitoring/recording	Monitoring will occur at least every 5 years prior to each verification event.
Value applied	Not measured. The complete biomass inventory of the entire site occurred after Hurricane Lisa, and therefore any potential impact from the storm is already accounted for in the baseline carbon stocks.
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_2e 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 in the PD.
Frequency of monitoring/recording	Monitoring will occur at least every 5 years prior to each verification event.
Value applied	Not measured. The complete biomass inventory of the entire site occurred after Hurricane Lisa, and therefore any potential impact from the storm is already accounted for in the baseline carbon stocks.

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_2e 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 in the PD.
Frequency of monitoring/recording	Monitoring will occur at least every 5 years prior to each verification event.
Value applied	Not measured. The complete biomass inventory of the entire site occurred after Hurricane Lisa, and therefore any potential impact from the storm is already accounted for in the baseline carbon stocks.
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	$C_{SOC,dist,q}$
Data unit	t CO_2e ha^{-1}
Description	Carbon stock in soil organic carbon in post-natural disturbance stratum *q*
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 in the PD.
Frequency of monitoring/recording	Monitoring will occur at least every 5 years prior to each verification event.
Value applied	Not measured. The complete biomass inventory of the entire site occurred after Hurricane Lisa, and therefore any potential impact from the storm is already accounted for in the baseline carbon stocks.
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	Details of the measurement methods can be found in section 3.3.3.3.2.

and procedures to be applied	
Frequency of monitoring/recording	Monitoring will occur at least every 5 years prior to each verification event.
Value applied	0 – no portion of the project area forests were burned during the monitoring period
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	$\Delta C_{P,DegW,t}$
Data unit	t CO_2e
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	0 – illegal logging not detected with project area
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_2e
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	2022: 746 t CO_2e 2023: 0 t CO_2e
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: $\Delta C_{P,DefPA,t}$ = Net carbon stock change as a result of deforestation in the project area in year *t*, t CO_2e $\Delta C_{P,DistPA,t}$ = Net carbon stock change as a result of natural disturbance in the project case in the project area in year *t*, t CO_2e $E_{biomassburn,t}$ = Greenhouse gas emissions due to biomass burning in year *t* of each GHG (CH_4 and N_2O), t CO_2e $\Delta C_{P,DegW,t}$ = Net carbon stock changes as a result of illegal logging in year *t*, t CO_2e 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_2e
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	2022: 13,287 t CO_2e 2023: 14,392 t CO_2e
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 CO_2e 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_2e
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	2022: 89,771 t CO_2e 2023: 98,047 t CO_2e
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 CO_2e

	$\Delta C_{WPS-REDD,t}$ = Net GHG emissions in the REDD project scenario in year t, t CO_2e $\Delta C_{LK-AS,planned,t}$= Net GHG emissions due to leakage from the REDD project activity in year t, t CO_2e $\Delta C_{LK-AS,planned,t}$= Net GHG emissions due to leakage from the REDD project activity in year t, t CO_2e
Comments	-

Data / parameter	$Adjusted\_NER_t$
Data unit	t CO_2e
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	2022: 73,519 t CO_2e 2023: 80,298 t CO_2e
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 CO_2e $Uncertainty_{REDD-BSL,t}$ = Uncertainty in REDD baseline up in year t, %
Comments	-

Data / parameter	$Buffer_{Planned,t}$
Data unit	t CO_2e
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	2022: 12,456 t CO_2e 2023: 13,493 t CO_2e
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 CO_2e $Buffer\%$ = Buffer withholding percentage, %

Comments	-

Data / parameter	VCU_t
Data unit	t CO_2e
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	2022: 61,063 t CO_2e 2023: 66,805 t CO_2e
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_2e $Buffer_{Planned}$ = Total permanence buffer withholding for avoiding planned deforestation project activities in year t, t CO_2e
Comments	-

3.1.3 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.

For the first 2022-2023 monitoring period, the monitoring tasks detailed below were carried out.

3.1.3.1 Organization and responsibilities of parties

For the first monitoring period, WCS was responsible for implementing all the monitoring tasks including collecting, summarizing, analyzing, and archiving all of the data required to perform the monitoring tasks.

3.1.3.2 Monitoring tasks

Following the guidance provided in VMD0015, tasks conducted included 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.

3.1.3.2.1 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.

For each monitoring period, geospatial data is gathered showing the location of the 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). As this is the first monitoring period, the project forest cover benchmark map (Figure 7), hereinafter referred to as the FCBM, is the same as the forest cover benchmark map presented in the PD. The process to create the forest cover benchmark map of the project area and conduct an accuracy assessment of this map is documented in Appendix 13.

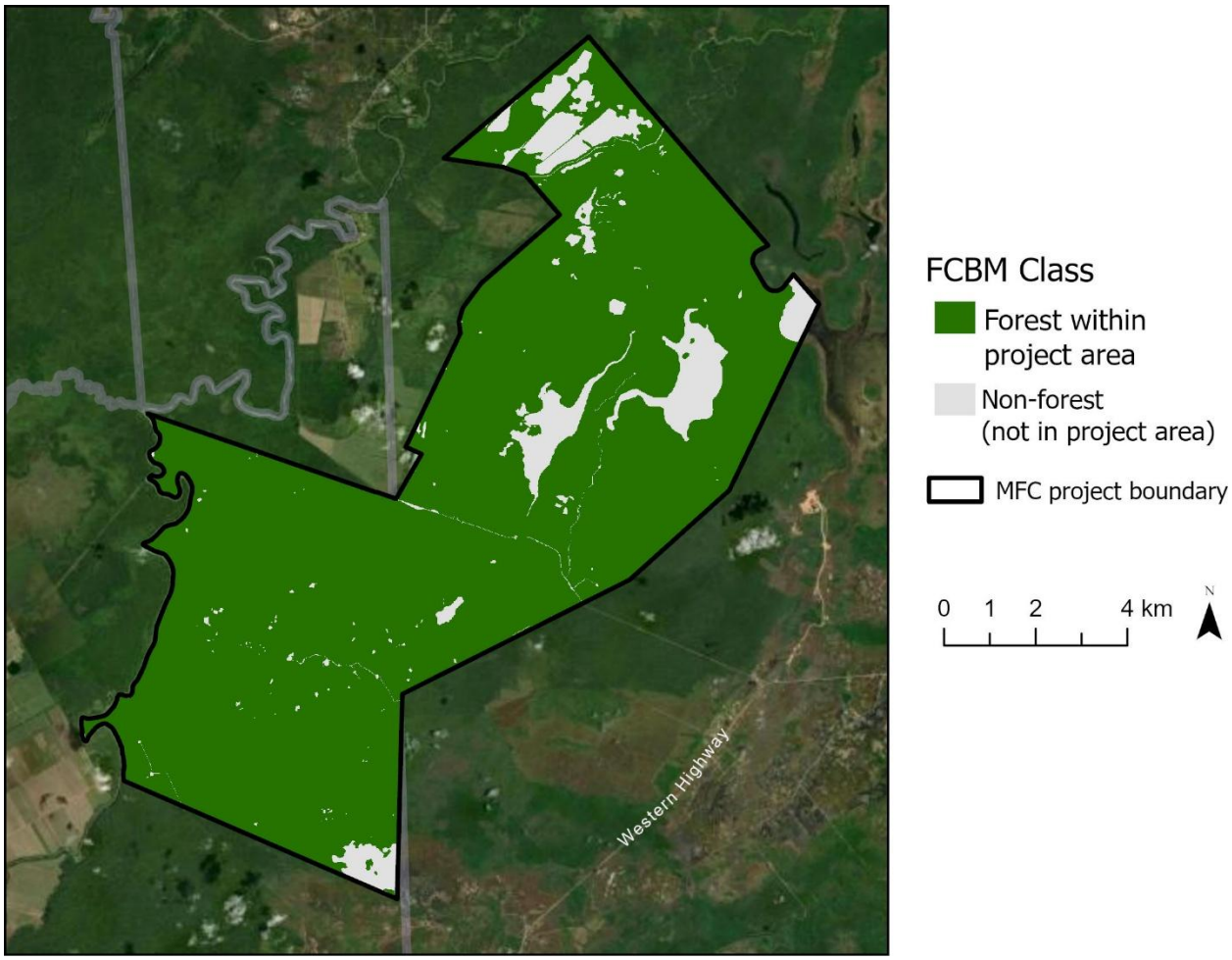

Figure 7. Forest Cover Benchmark Map

Module VMD0015 (M-REDD) describes the requirement for projects to develop a Forest Cover Monitoring Map (FCMM) representing forest cover and forest cover change within the project area during the monitoring period.

To maintain consistency of representation of the project area, the FCBM (Figure 7) was used as the starting point for creating of the FCMM. Areas mapped as forest with the FCBM were analyzed using multispectral remote sensing imagery from a combination of Landsat and Sentinel platforms representing the start and end dates of the monitoring period.

Landsat and Sentinel images were reviewed and three were selected that minimized cloud cover and that most closely represented either the start or end date of the monitoring period. All images meet the requirement of pixel resolution of 30m or finer.

The nominal dates of the monitoring period are Jan 1, 2022 and Dec 31, 2023. In all cases, the images selected are within 90 days of the nominal monitoring dates. The selected images are presented in Table 9.

Table 9. FCMM imagery sources

Source	Acquisition date	Image ID	Representing	Pixel Resolution	Deviation from nominal monitoring dates (days)
Copernicus Sentinel-2 L1C	October 31, 2021	S2A_MSIL2A_20211031T162421_N0500_R040_T16QCE_20230108T050217.SAFE	Start of period	10m	-62
Landsat 9,	October 31, 2021	LC09_L2SP_019048_20211031_20230507_02_T1	Start of period	30m	-62
Copernicus Sentinel-2 L1C	January 09, 2024	S2A_MSIL1C_20240109T162641_N0510_R040_T16QCE_20240109T182220.SAFE	End of period	10m	9

Analysis of imagery

Deforestation was evaluated primarily using visual interpretation, aided with a principal component analysis of an NDVI time series meant to highlight localized anomalies forest cover. NDVI (normalized difference vegetation index) is one of the earliest developed spectral indices for vegetation interpretation in remote sensing. Higher NDVI scores on a scale of 1.0 to -1.0 indicate photosynthetic vegetation, while lower scores indicate non-photosynthetic surfaces like bare ground, burn scars, and senescent vegetation. While not regularly used as a primary classifier in land cover change mapping, sudden changes in NDVI can be an indication of deforestation in areas previously mapped as forest.

For this analysis, NDVI images were calculated from Table 9. Due to differences in the season of acquisition and the overall level of senescence, NDVI differences between images may mask changes due to land cover change. To overcome this, the NDVI images were compiled into a time series and analyzed using principal component analysis. A principal component analysis identifies statistical relationships between pixel values in multiple rasters and transforms the rasters to produce a series of uncorrelated rasters. This has the effect of allowing more clear visualization of subtle patterns in a time series. The outcome of this transformation are presented in Figure 8. The assigned colors are arbitrary but facilitate visual identification of anomalies.

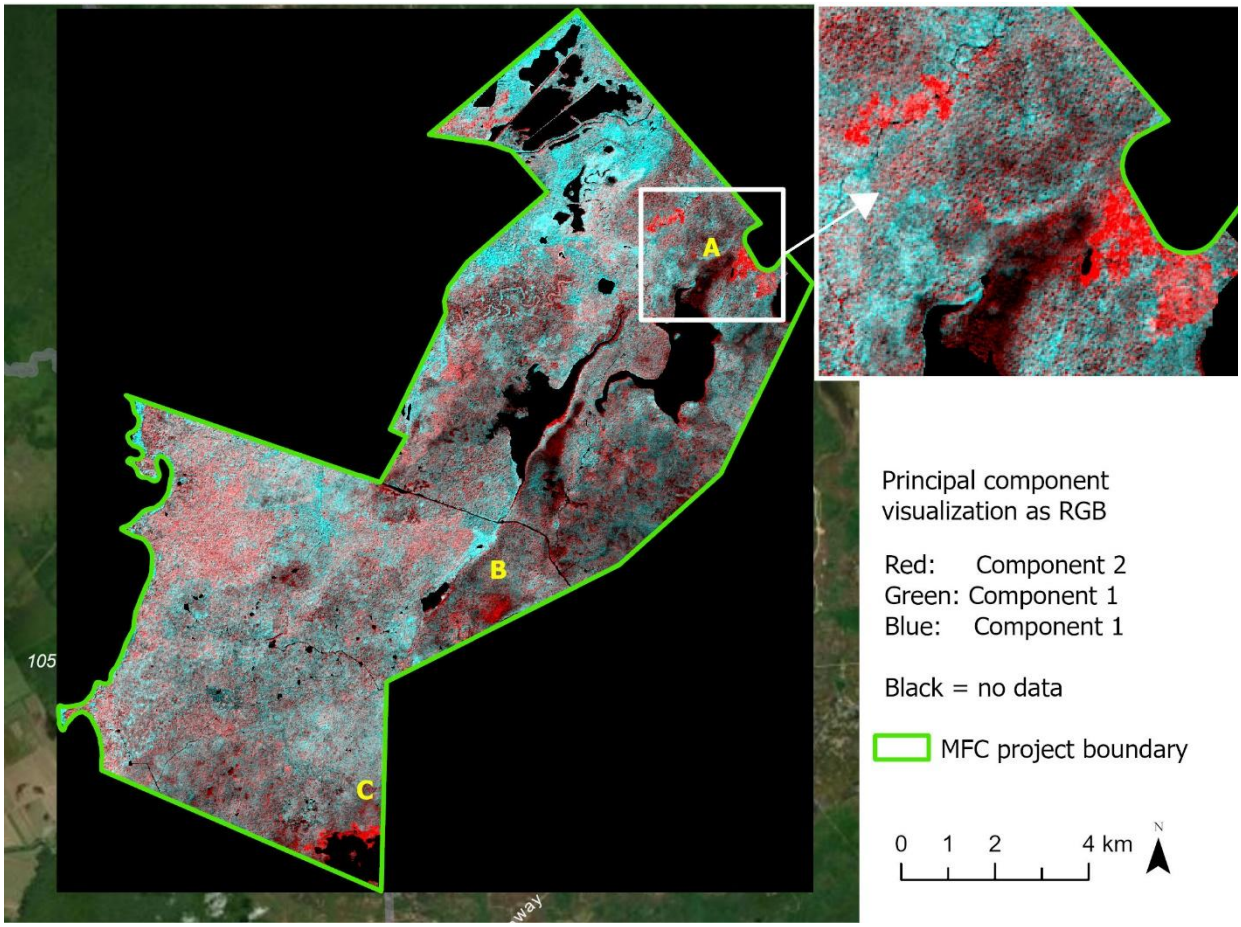

Figure 8. Visualization of the outcome of principal component analysis. Note on colorization – because there are only 2 components, component 1 is assigned to two components of an RGB screen pixel: green and blue. Areas high in component 1 therefore appear cyan.

In this analysis we identified several areas of potential steep NDVI decrease, indicated by letters A-C on Figure 8. Each of these potential disturbance areas was visually inspected using high resolution imagery with sufficient resolution to resolve individual tree crowns.

In the case of areas B and C, high resolution imagery indicated no loss of tree cover. Area C abuts a wetland that experiences seasonal changes in water table below vegetation that can have a strong influence on NDVI. Area B appears to be a zone of younger trees that may have different phenological properties than other areas, resulting in more pronounced senescence in dry periods.

Locations within Area 1 that were observed in high resolution imagery to no longer meet the forest definition were hand digitized as deforestation. The resulting forest cover monitoring map is presented in Figure 9. The associated areas of each land cover class in the FCMM are presented in Table 10. Based on on-site assessments conducted by WCS rangers of these areas, it was determined that the tree loss in the areas to the upper left was the result of wind damage due to Hurricane Lisa in November 2022. The small areas in the lower right that experienced tree loss were identified as being prone to flooding, referred to as “bajo” areas, and the tree loss was the result of flooding caused by the hurricane.

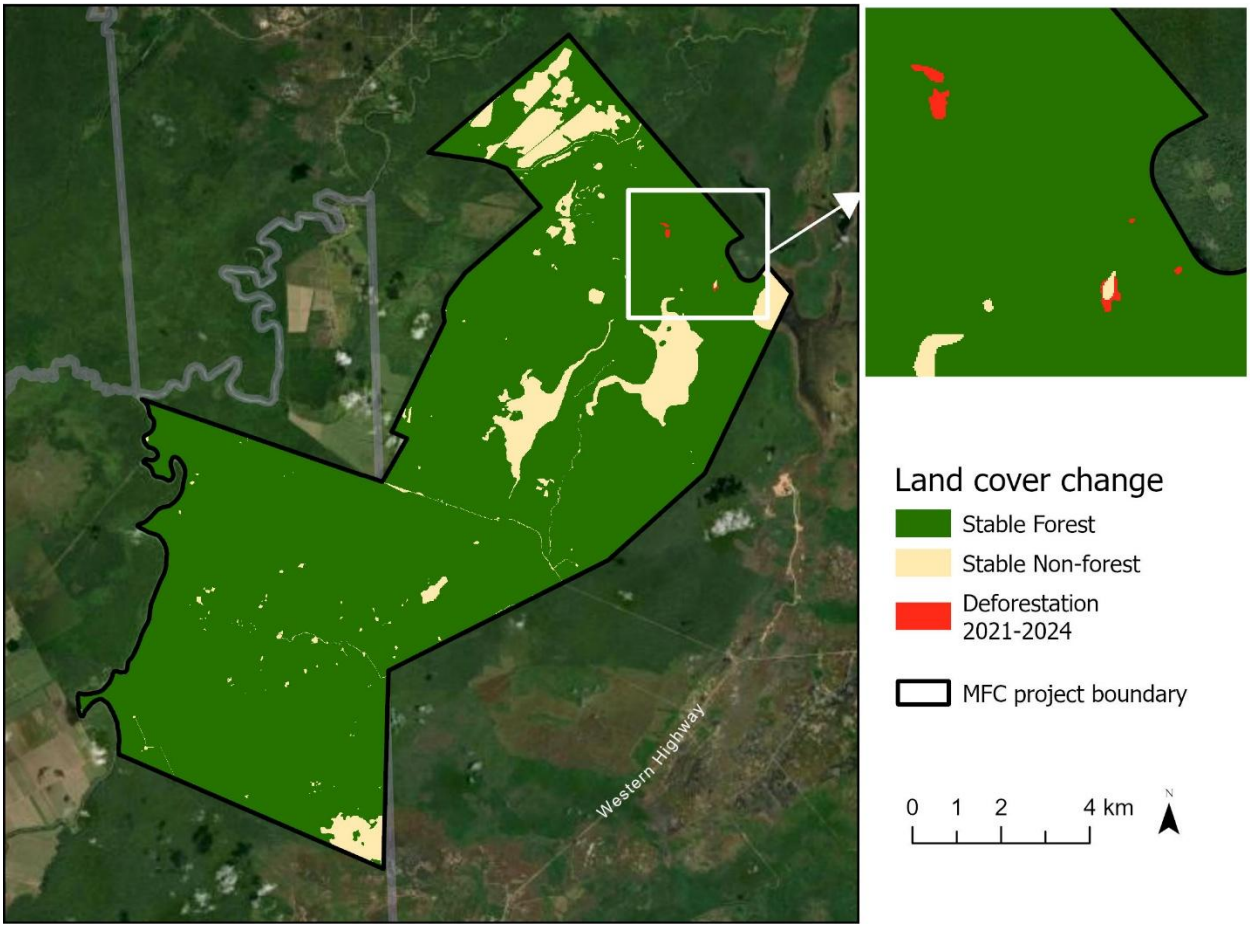

Figure 9. Forest Cover Monitoring Map 2021-2024

Table 10. Mapped area of land cover classes in the FCMM

Land cover class	Area (ha)
Stable forest	10,791
Deforestation 2021-2024	4
Stable non-forest within project boundary (not part of PA)	1,008
Project Area (ha)	10,795
Project boundary (ha)	11,804

Accuracy Assessment of Project Forest Cover Monitoring Map

The project forest cover monitoring map was assessed for classification accuracy using a stratified random sample of plots assessed visually against high resolution imagery. Because deforestation is a very rare event, representing only 0.037% (1/2700th) of the project area, a simple random sample would likely not result in any samples of the deforestation class. Furthermore, a sample that treated

stable forest as a single class might bias results by oversampling areas of low risk in the forest interior, and under sampling areas where we expect deforestation risk (and therefore classification error) to be higher in areas near forest edges.

Three sampling strata were thus used: interior forest, edge forest, and predicted deforestation. Interior and edge forests were delineated based on a 200m distance buffer from the mapped forest/non-forest boundary.

110 points were generated, with 50 in each of the forest classes and 10 in the deforestation class (Table 11, Figure 10). A balanced sample design would have been preferred, but the small size of the deforestation stratum (4ha) made it impossible to place any additional plots further than 25m from existing plots.

Table 11. Sampling design for accuracy assessment of FCMM

Sampling Strata	Stratum definition	Mapped (predicted) class	Mapped area (ha)	Stratum proportion of sampled area	Samples collected	Sampling Intensity (ha/plot)
Forest (interior)	Mapped stable forest ≥200m from forest edge	Forest	7,615	70.5%	50	152.3
Forest (edge)	Mapped stable forest <200m from forest edge	Forest	3,176	29.4%	50	63.5
Deforestation	Mapped as deforestation	Deforestation	4	<0.1%	10	0.4
TOTAL			10,795	1	110	

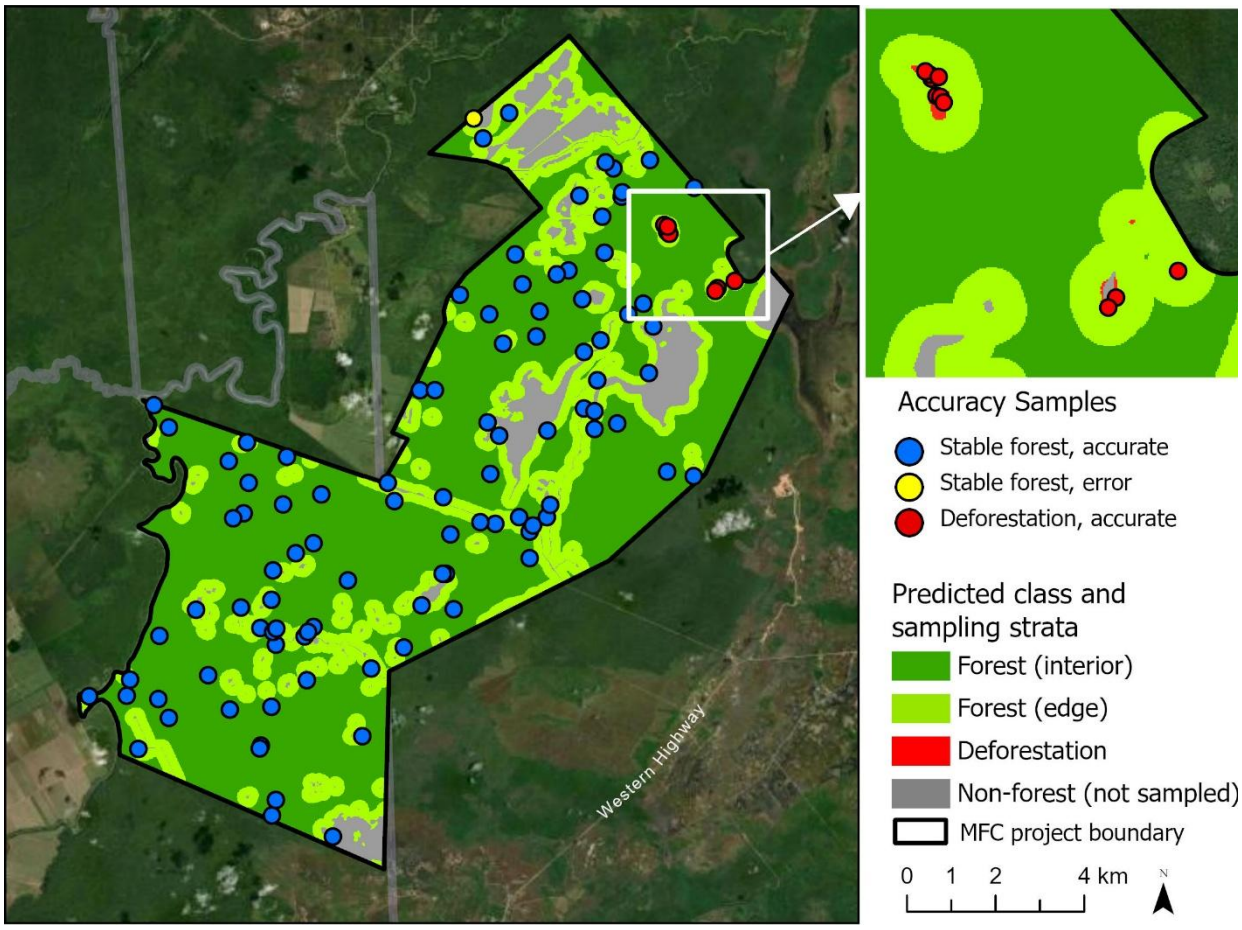

Figure 10. Accuracy assessment plots within the Project Forest Cover Monitoring Map

An image interpreter identified the land cover at each allocated point without prior knowledge of the map-assigned land cover class. A second interpreter, with no prior contact with either dataset, then made another independent observation of the points against dame imagery. Where any disagreements between interpreters were found, the analysts consulted as a group with a wider set of experts familiar with the project site to arrive at a consensus decision about the observed land class. Note that although stable non-forest was not an assessed class as it does not exist within the project area at the start of the project, it was nevertheless included as an observation category. Accuracy of forest/non-forest is presented separately within documentation of the development of the project forest cover benchmark map.

The resulting observations, compared to their original predicted class, were used to calculate the accuracy of both the deforestation and forest class. Because of the use of a stratified sample design with different strata area, a traditional confusion matrix relying on only sample counts could not be used (see the column “Stratum proportion of sampled area” in Table 11). Rather, sample observations are area weighted and converted into the estimated total area of both correctly classified land cover classes and error. The final accuracy is calculated on the basis of these area weighted values.

The calculated area weighted proportions of the assessed area are presented in Table 12 under 'Proportion AOI observed as LC.' Multiplying this proportion by the total sample produces the actual area estimates in Table 12.

Table 12. Estimation of bias-corrected area of land cover change classes

Sampling Strata	Mapped (predicted) class	Observed class	Stratum proportion of sampled area	Samples (n)	Proportion of samples observed as LC within stratum	Proportion AOI observed as LC	Estimated adjusted observed area (ha)
Deforestation	Deforestation	Forest	0.0%	-	0%	0.00%	-
Deforestation	Deforestation	Deforestation	0.0%	10	100%	0.04%	4
Deforestation	Deforestation	Non-forest	0.0%	-	0%	0.00%	-
Forest (interior)	Forest	Forest	70.5%	50	100%	70.54%	7,615
Forest (interior)	Forest	Deforestation	70.5%	-	0%	0.00%	-
Forest (interior)	Forest	Non-forest	70.5%	-	0%	0.00%	-
Forest (edge)	Forest	Forest	29.4%	49	98%	28.84%	3,113
Forest (edge)	Forest	Deforestation	29.4%	-	0%	0.00%	-
Forest (edge)	Forest	Non-forest	29.4%	1	2%	0.59%	64
TOTAL				**110**		**100%**	**10,795**

Of the 110 observations, only one error was found in a Forest edge observation that was identified as non-forest. There were no cases of deforestation being identified within areas mapped as forest, and all deforestation samples were assessed as accurate.

Stratified area estimates are simplified into the two assessment categories of forest and deforestation and formatted as a confusion matrix in Table 13.

Table 13. Accuracy of monitoring map and estimated deforestation

Mapped class	Observed class			Total Predicted	User's Accuracy
	Forest	Deforestation	Non-forest		
Forest	10,728	-	64	10,791	99.4%
Deforestation	-	4	-	4	100.0%
TOTAL OBSERVED	10,728	4	64	10,795	

Based on this accuracy assessment, the total accuracy of the map is **99.4%,** and clearly meets the requirements of the VMD of 90% accuracy. A full record of accuracy assessment samples is provided in Appendix 14.
The estimation of emissions from this deforestation is presented in section 3.2.2.

3.1.3.2.2 Monitoring areas undergoing natural disturbance (M-REDD)

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 is be delineated in GIS and the resulting emissions estimated.

During the monitoring period, the project area was affected by hurricanes. Hurricane Lisa made landfall near Belize City in November 2022 as a Category 1 Hurricane with maximum winds of 145km/hr. The eye of the hurricane passed roughly 20km to the south of the project area.

Initial field surveys indicated that some damage was apparent, mostly in the form of broken limbs. Review of NDVI time series before and after the hurricane did not reveal any particular spatial pattern, indicating that any impact lacked localized severe events.

This hurricane occurred prior to completing forest carbon field inventory of the entire site (described in Appendix 11), and therefore any potential impact from the storm is already accounted for in the baseline carbon stocks. Accounting for additional emissions from the storm would be double counting the same loss, so was not undertaken.

While there were some grasslands and shrublands within the project boundary impacted by wildfires, NASA Fire Information for Resource Management System (FIRMS) did not indicate any fires in the project area forests during the monitoring period. Ground patrols also did not identify any evidence of fires in the forests.

3.1.3.2.3 Monitoring Non-CO_2 Emissions from Biomass Burning

As stated above, there were no wildfires in the project area forests during the project area and, as such, it was not necessary to account for non-CO_2e emissions from biomass burning.

3.1.3.2.4 Monitoring degradation from extraction of trees

The risks of degradation from the extraction of trees due to illegal logging low in the project area. Based on the socioeconomic assessment conducted in the 12 communities (Appendix 4), 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 9), the WCS rangers conduct regular patrols of the property and identify incidents of illegal logging.

Based on the same socioeconomic assessment, firewood is only gathered in the immediate vicinity of the homes and, therefore, has no impact on the MFC REDD project area. Furthermore, 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.

To facilitate monitoring within the project area, six patrol areas were identified: Restoration, Eastern Boundary, River Farm, Quarry, Old Road, and Cox (Figure 11). During the monitoring period, illegal logging incidents in the project area were monitored through regular reconnaissance patrols. Table 14 shows the frequency of patrols in each of the patrol areas.

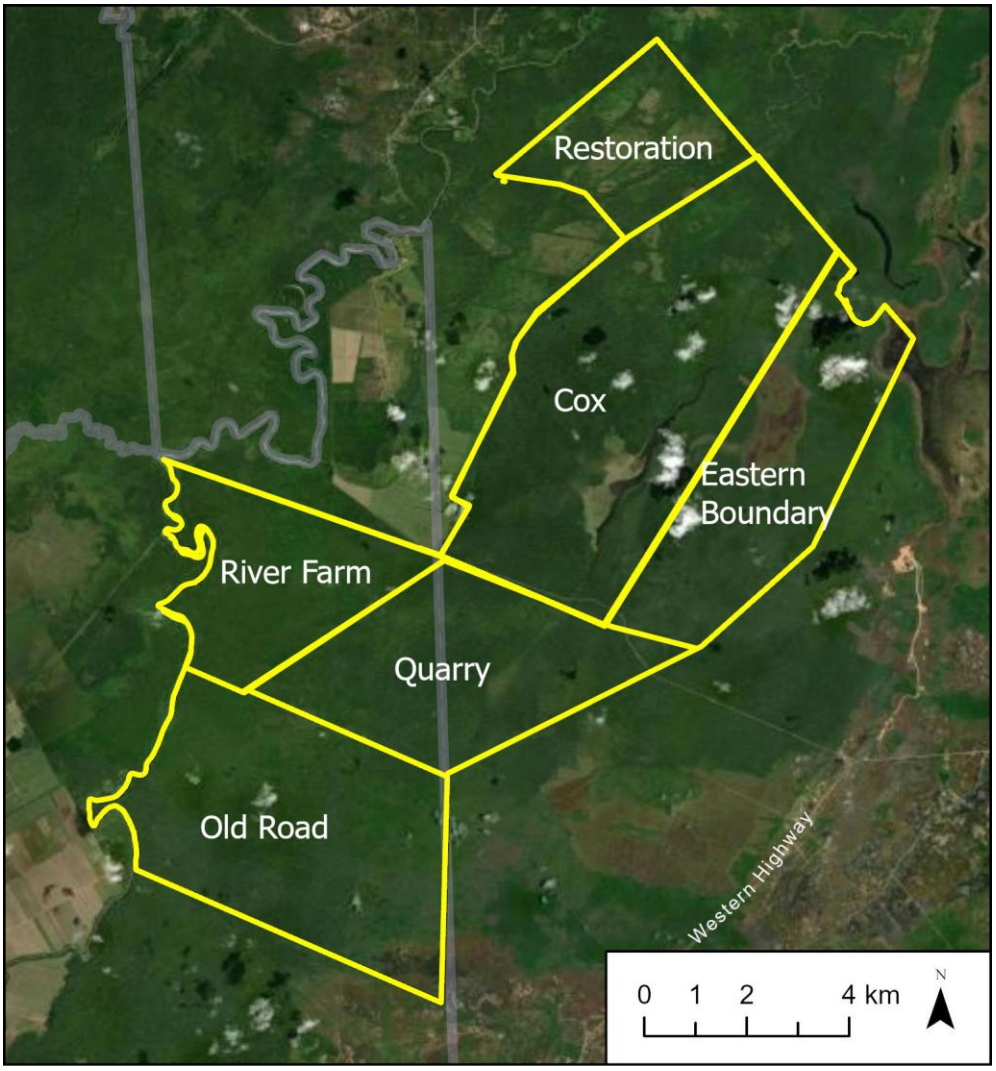

Figure 11. Patrol areas

Table 14. Patrol frequency in each patrol area

Patrol Area	Number of Patrols
Cox	174
Eastern Boundary	177
Old Road	65
Quarry	330

Patrol Area	Number of Patrols
Restoration	40
River Farm	60

Over the monitored period, twelve incidents of logging were detected. However, these incidents were determined by the rangers to have happened before the project area was under conservation management when the property was still being selectively logged. This was determined based the condition of the tree stumps which were covered in moss and showing substantial decay.

3.1.3.2.5 Estimation of ex-post net carbon stock changes and greenhouse gas emissions

These calculations are described in section 3.2.2 Project emissions.

3.1.4 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. This 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 were addressed appropriately.

3.2 Quantification of GHG Emission Reductions and Removals

For each year in the monitoring period, the significance of the different carbon pools, GHG emissions from biomass burning, and activity-shifting leakage emissions were evaluated following the guidance provided in VM0007's Appendix 1 to ensure that the pools that were omitted as *de minimis* in the ex ante carbon calculations provided in the Project Description remain *de minimis* when estimating total

emission reductions during these years. Tabs "Test of sig – 2022" and "Test of sig – 2023" of Appendix 12 provides the details of these significance testing calculations. It was confirmed that the contributions of harvested wood products and belowground palm biomass remained *de minimis* and as such were excluded from the calculations described below.

3.2.1 Baseline Emissions (VCS, 3.15)

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 16, Table 17, Table 18, Table 19).

As described in section 3.1.4 of the PD, 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, 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 15. The original data provided by LIC can be found in Appendix 15.

Table 15. LIC parcel numbers for each proxy area

Proxy number	LIC parcel registry number(s)
1	14-44-9
2	14-44-5

Proxy number	LIC parcel registry number(s)
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 16)
- Proxy areas represented similar elevation and slope categories as the PA (Table 17, Table 18)
- Soil types are similar (Table 19)

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 16. 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 flood-ed salin e 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 17. 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 18. 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 19. 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 12. Deforestation calculations associated with numbered parcels are presented in Table 20.

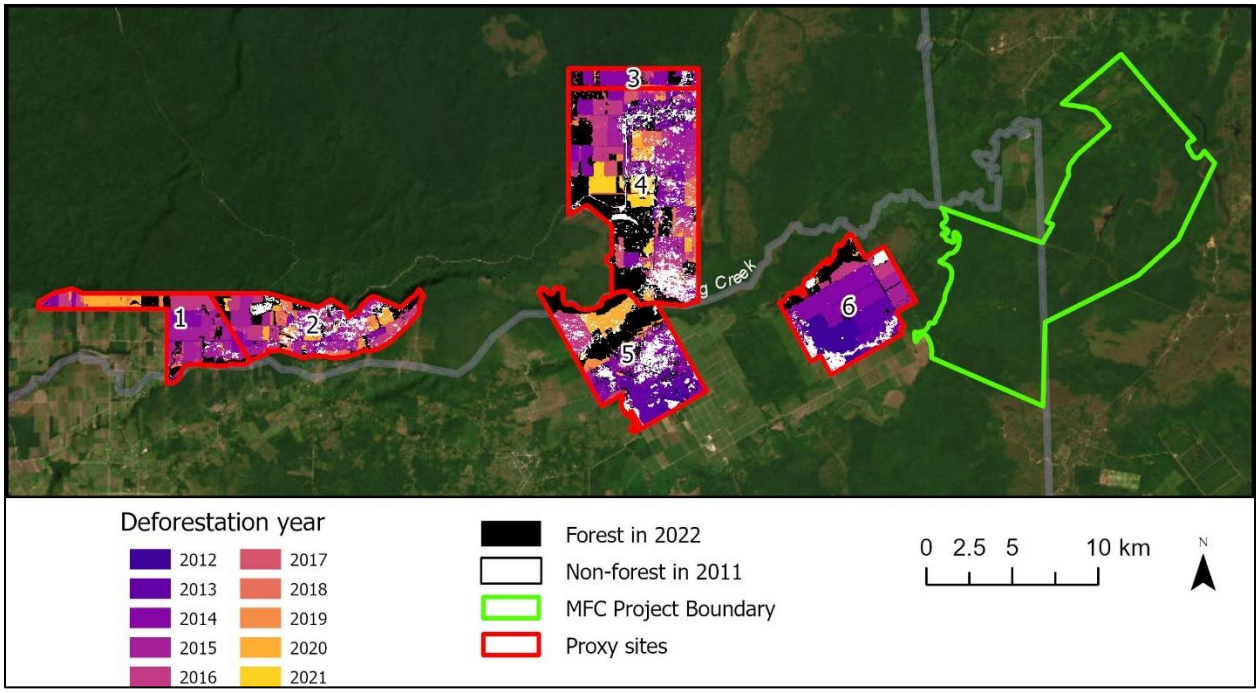

Figure 12. Change in forest cover over 10 years in six proxy areas used to determine average baseline deforestation rate.

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

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

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's 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 20. 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 13). 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.

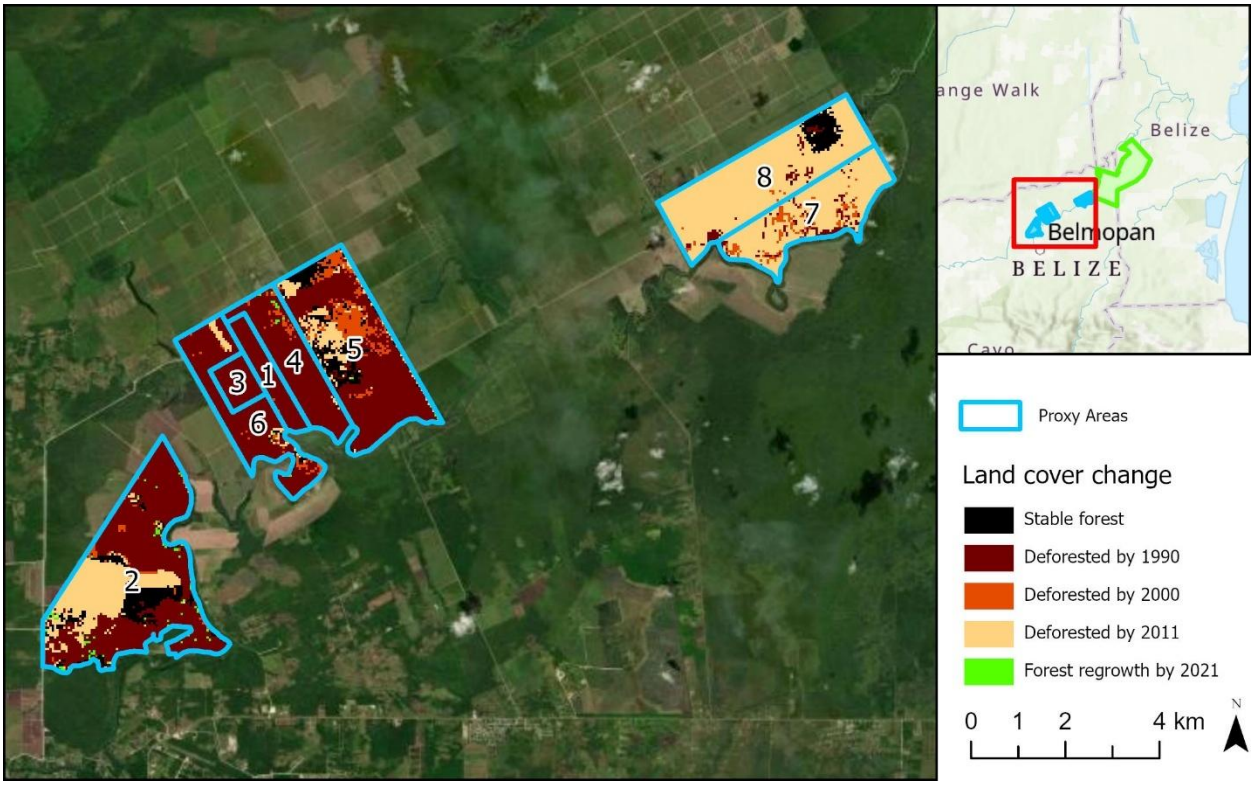

Figure 13. Analysis of proxy areas for risk of abandonment. See Table 21 for Parcel ID's.

Six of the eight proxy areas experienced no forest regrowth since the deforestation originally occurred (Table 21). Two of the eight parcels experienced minimal regrowth of less than 2% of the total parcel, indicating no abandonment has occurred.

Table 21. 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 BL-PL was applied to estimate the annual area of deforestation in the baseline case:

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

Where:

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

$D\%_{plannedi,t}$ = 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

Biomass measurements conducted for project validation were also used for this first verification, and the field measurements were carried out during this monitoring period. 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. Belowground biomass for palms is also excluded as it was identified as de minimis (Appendix 12).

The mean total carbon stock was based on field data collected in the MFC REDD project area in 2023. See Appendix 11 for detailed field methods, Appendix 3 for the process to validate the allometric equation, and Appendix 12 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.

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 2.2.3 for more information). In this equation, the wood density value of 0.6 g cm^{-3} for tropical America was applied from Reyes at 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 22 includes the list of allometric equations applied.

Table 22. Allometric equations to estimate aboveground biomass applied in the project

Taxa	Allometric Equations for Aboveground Biomass (kg)	Source
Cecropia spp	$AGB = 12.764 + 0.2588 * DBH^{2.0515}$	Pearson et al (2005)

Taxa	Allometric Equations for Aboveground Biomass (kg)	Source
Pinus spp	$AGB = 0.887 + \frac{10486 * DBH^{2.84}}{DBH^{2.84} + 376901}$	Penman et al (2003)
Attalea cohune	$AGB = 10.856 + 176.76 * HT - 6.898 * HT^2$	
Sabal spp	$AGB = 24.559 + 4.921 * HT + 1.017 * HT^2$	
Crysophylla spp	$AGB = 0.182 + 0.498 * HT + 0.049 * HT^2$	
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 11). 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*.

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 fromVMD0002.

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

Where:

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

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

$H_{SWDl,sp}$ = Height of standing dead tree *l* from sample plot s*p*; 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; m^3 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 23). For lying dead wood, density classes (sound, intermediate, and rotten) were determined in the field using the 'machete test' as described in Appendix 11. For standing dead wood, density classes were all conservatively assumed to be rotten.

Table 23. 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 the project area.

Soil organic carbon

Soil organic carbon (SOC) was calculated from soil samples collected following the protocol outlined in Appendix 11. 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 Walkey-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 16. 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, … *Pi* 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 ($C_{SOC,forest}$).

Total estimated pre-deforestation carbon stocks

Table 24 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 24. Summary of tree aboveground and belowground biomass, palm aboveground biomass, dead wood biomass, 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

Without the project, 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).

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 CO_2e ha^{-1}

$C_{SOC,forest}$ = Mean carbon stock in soil organic carbon in the forest; t CO_2e 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 CO_2e.

3.2.1.3 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.

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

Where:

$\Delta C_{BSL,CS,t}$ = Sum of the baseline carbon stock change in all terrestrial pools in year t, t CO_2e

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

$\Delta C_{AB_{tree}}$ = Baseline carbon stock change in aboveground tree biomass; t CO_2e ha^{-1}

$\Delta C_{BB_{tree}}$ = Baseline carbon stock change in belowground tree biomass; t CO_2e 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.

3.2.1.4 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-CO_2 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. N_2O emissions from nitrogen application for agricultural production ($N_2O_{direct-N,i,t}$) is also conservatively excluded.

Non-CO_2 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-CO_2-emissions from burning of remaining aboveground biomass, VMD0013 v1.3 (E-BPB) is applied. In particular, Equation 1 is applied.

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

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 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 CO_2/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.

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

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 CO_2e ha^{-1}

$C_{XB,ty}$ = Mean stock of extracted biomass carbon, t CO_2e ha^{-1}

C_{palms_t} = Carbon stock in aboveground biomass in palms in year t, t CO_2e ha^{-1}

C_{DW_t} = Carbon stock in dead wood in year t, t CO_2e ha^{-1}

$\frac{12}{44}$ = Inverse ratio of molecular weight of CO_2 to carbon, t CO_2e 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 25.

Table 25. 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 12.

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 26.

Table 26. Global Warming Potentials of CH4 and N2O over a 100-year time horizon

	CH_4	N_2O
GWP-100	27.9	273

3.2.1.5 Uncertainty Analysis

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

3.2.1.5.1 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 27.

Table 27. 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%

Parcel Name	$D\%_{pn}$	Yrs_{pn}	Annual rate of deforestation per parcel
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%**

3.2.1.5.2 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:

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

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 CO_2e

The carbon stocks, greenhouse gas sources, and their associated uncertainties can be found in Table 28.

Table 28. 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_2e 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%**

3.2.1.5.3 Step 3: Estimate Total Uncertainty in REDD Baseline Scenario

To estimate the total uncertainty, Equation 6 in VMD0017 is applied:

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

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%.

3.2.2 Project Emissions (VCS, 3.15)

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 CO_2e

$\Delta C_{P,DefPA,t}$ = Net carbon stock change as a result of deforestation in the project area in year *t*, t CO_2e

$\Delta C_{P,DistPA,t}$ = Net carbon stock change as a result of natural disturbance in the project case in the project area in year *t,* t CO_2e

$E_{biomassburn,t}$ = Greenhouse gas emissions due to biomass burning in year *t* of each GHG (CH_4 and N_2O), t CO_2e

$\Delta C_{P,DegW,t}$ = Net carbon stock changes as a result of illegal logging in year *t*, t CO_2e

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

As discussed in detail in section 3.1.3, the only ex-post emissions are the result of 4 hectares of deforestation resulting from natural events (hurricane damage) in the project area. 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 monitoring period *t*, t CO_2e

$A_{DefPA,u}$ = Area of recorded deforestation in the project area converted to land use *u* in monitoring period *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 monitoring period *t*, t CO_2e ha^{-1}

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

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

Where:

$C_{BSL,t}$ = Carbon stock in all pools in the baseline case, t CO_2e ha^{-1}

$C_{P,post,u}$ = Carbon stock in relevant pools in the post-deforestation land use *u*, t CO_2e ha^{-1}

Given the small area identified as experiencing deforestation (4 ha) during the monitoring period, instead of conducting field measurements of the carbon stocks post-deforestation, a complete loss of aboveground and belowground tree biomass stocks as well as of aboveground palm biomass stocks

was assumed. Rather than assuming that carbon stocks from belowground tree biomass are lost at an annual rate of 1/10 of the total stock change for 10 years as in the baseline scenario, a 100% loss of these stocks in the year of loss is conservatively applied. No change in dead wood stocks (4.6 t CO_2e ha^{-1}) was applied. This is considered conservative given the fact that no downed trees/palms were removed from the area, and the dead wood carbon stocks likely increased due to the natural disturbances.

The post-deforestation biomass carbon stocks for agricultural production (17.2 t CO_2e ha^{-1}) of annual croplands was applied as was the post-deforestation soil organic carbon stock (427.5 t CO_2e ha^{-1}). These are conservative assumptions because 1) natural vegetation regrowth occurred following the events, and 2) soil organic carbon stocks remained more intact after the events as compared to what they would have been under long-term cultivation. Similar to the losses in belowground tree biomass, rather than assuming that carbon stocks from soil are lost at an annual rate of 1/20 of the total stock change for 20 years as in the baseline scenario, a 100% loss of these stocks in the year of loss is conservatively applied.

Following guidance in VMD0017, where no ex post (re-)measurements of carbon pools or GHG sources have been made as is the case in this first monitoring period, the uncertainty of emissions in the REDD project scenario is set equal to zero.

The total project emissions during the 2022-2023 monitoring period are presented in Table 29.

Table 29. Project emissions during the monitoring period

Year	Project emissions (t CO_2e)
2022	746
2023	0
Total	746

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, 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 17 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 14.

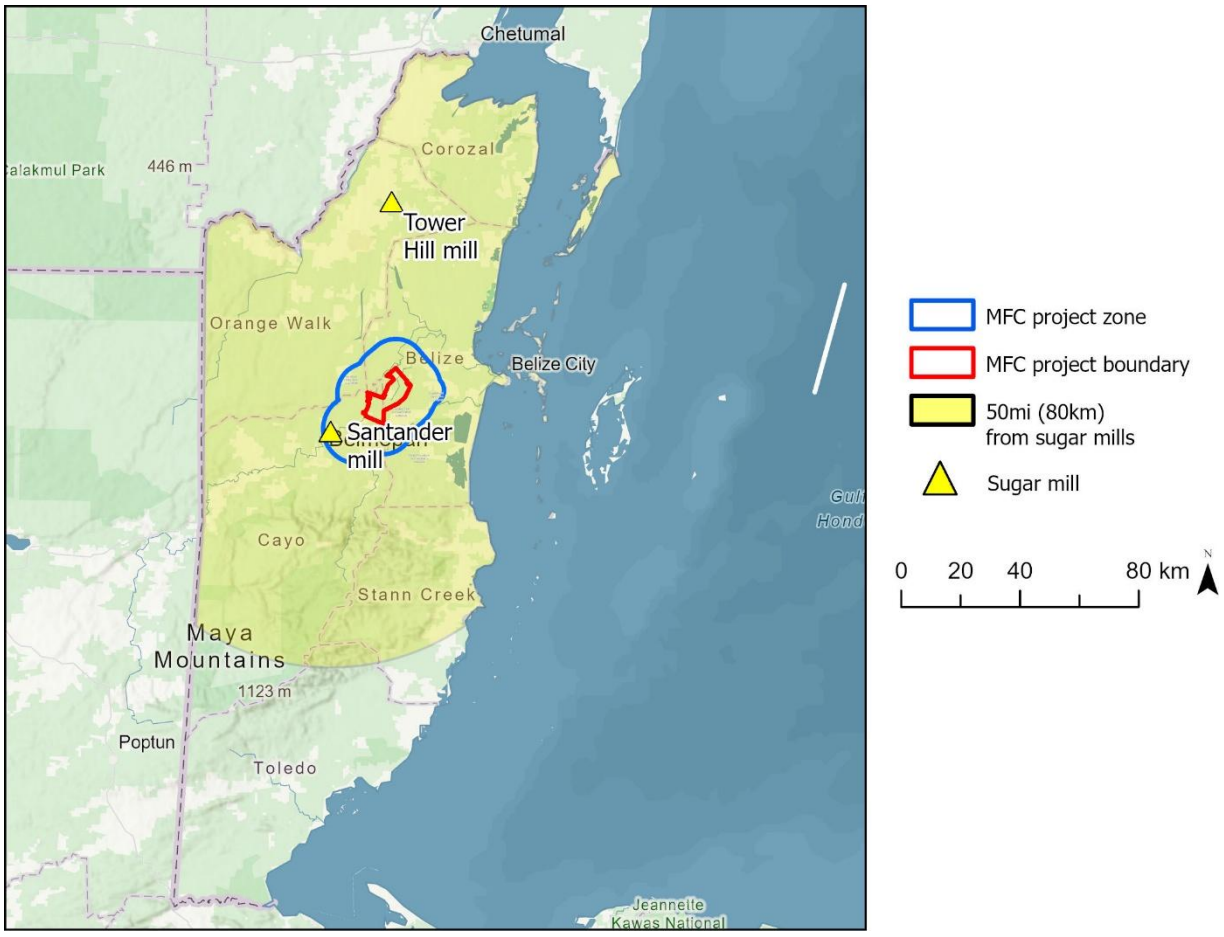

Figure 14. 50-mile buffer in Belize from the two sugar mills

Biophysical conditions: soils, elevation, and precipitation

According to personal communications with national sugarcane experts (Appendix 17), 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 15.

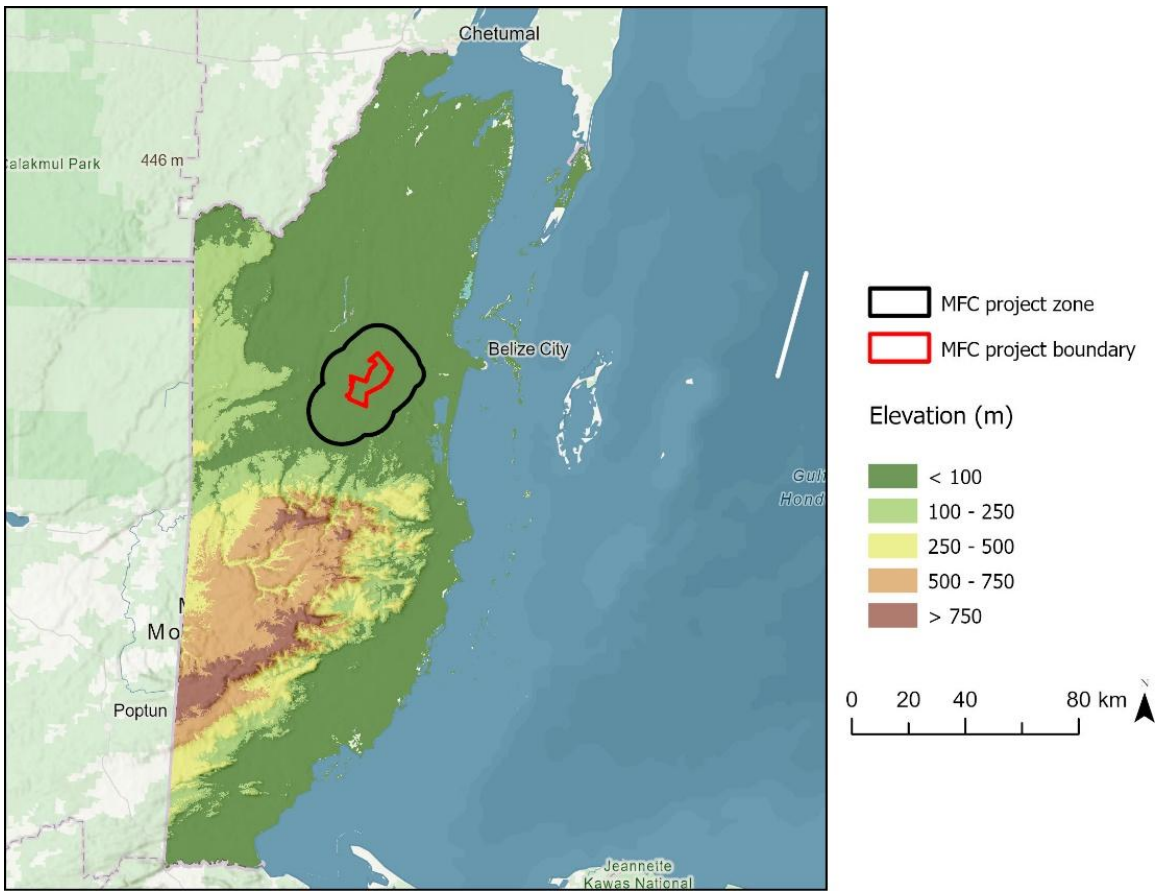

Figure 15. Belize SRTM elevation in meters

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.

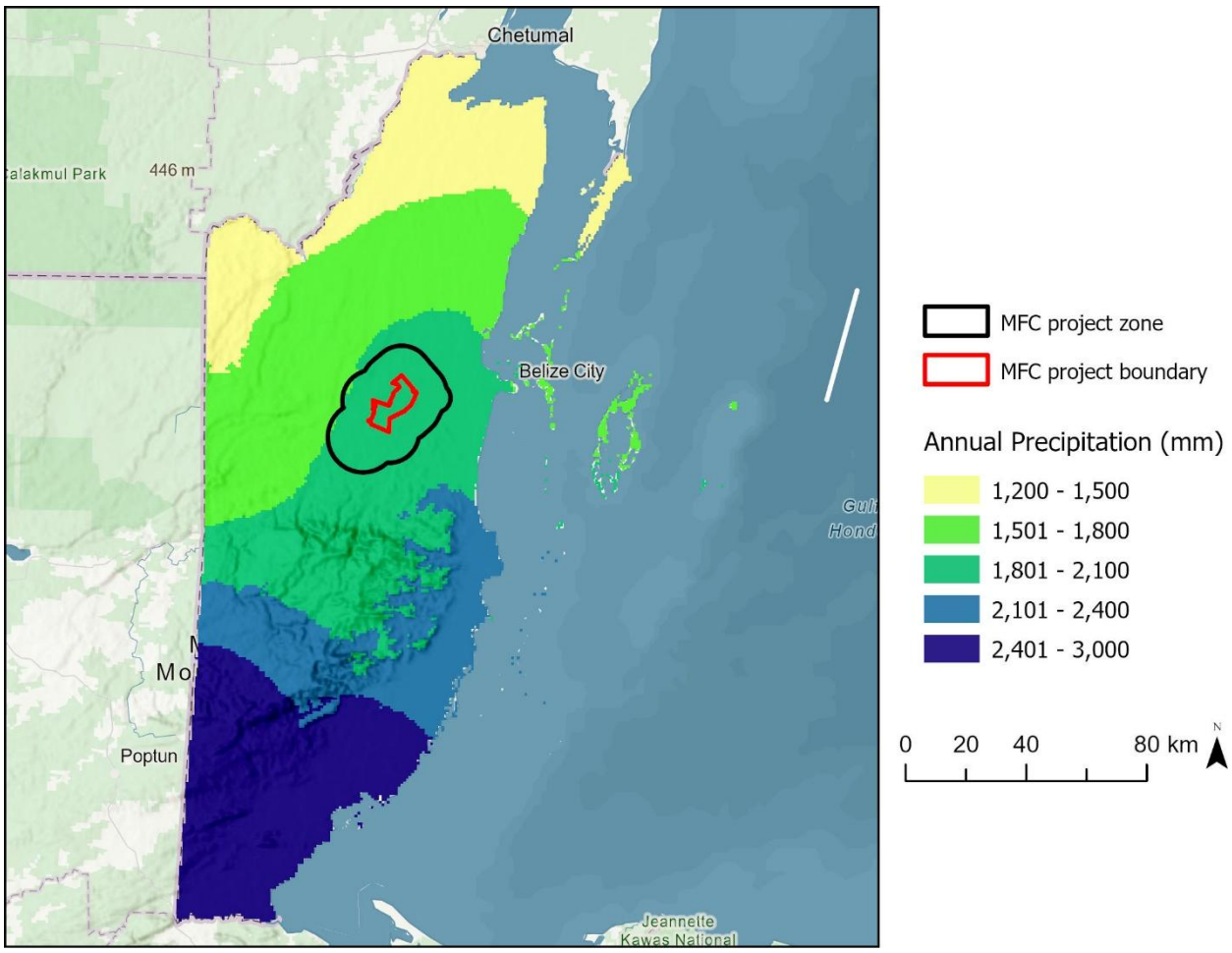

Figure 16. Annual precipitation in Belize

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 17.

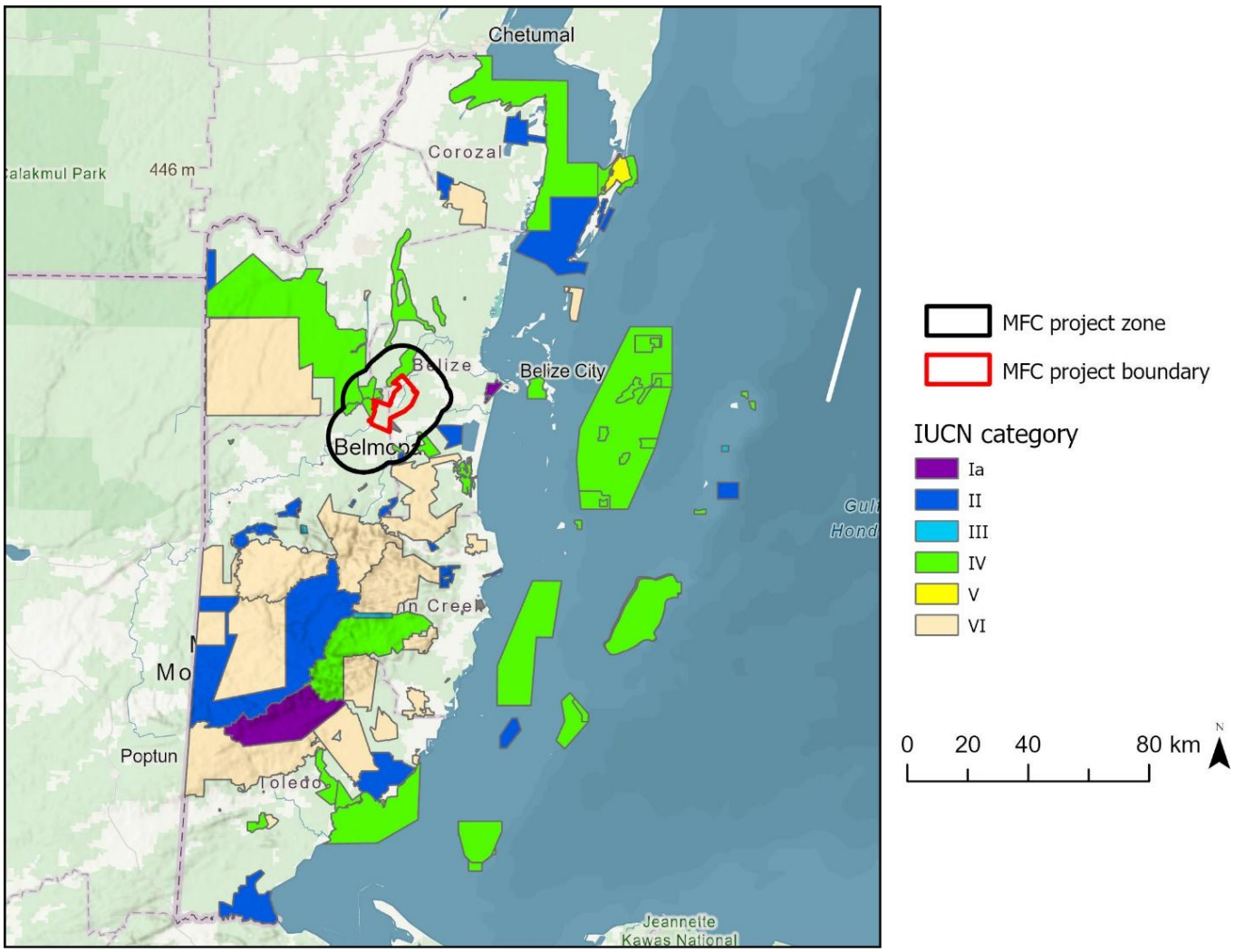

Figure 17. Protected areas in the country of Belize

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 18), 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 19. The proportion of available forested areas suitable for sugarcane in the country (PFc) is 32% (Table 30).

Table 30. Alternative areas for growing sugarcane (PFc)

Land Cover Type	Area (ha)	Proportion (%) of total area eligible for sugarcane production
Forest in unprotected areas	523,990	32%
Non-Forest in protected and unprotected lands	521,303	32%
Protected forest	591,840	36%
Total	1,637,133	100%

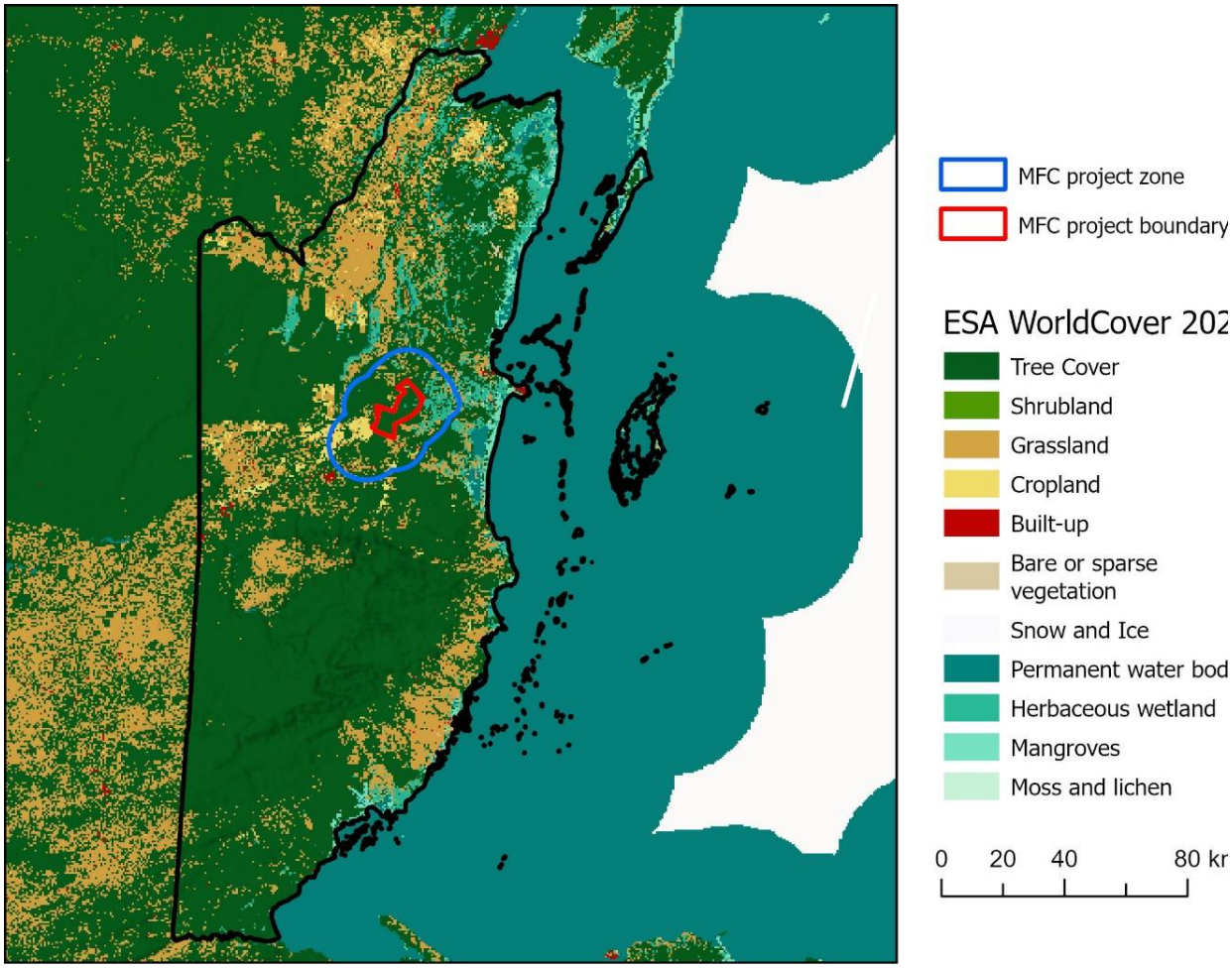

Figure 18. ESRI Sentinel-2 2023 landcover

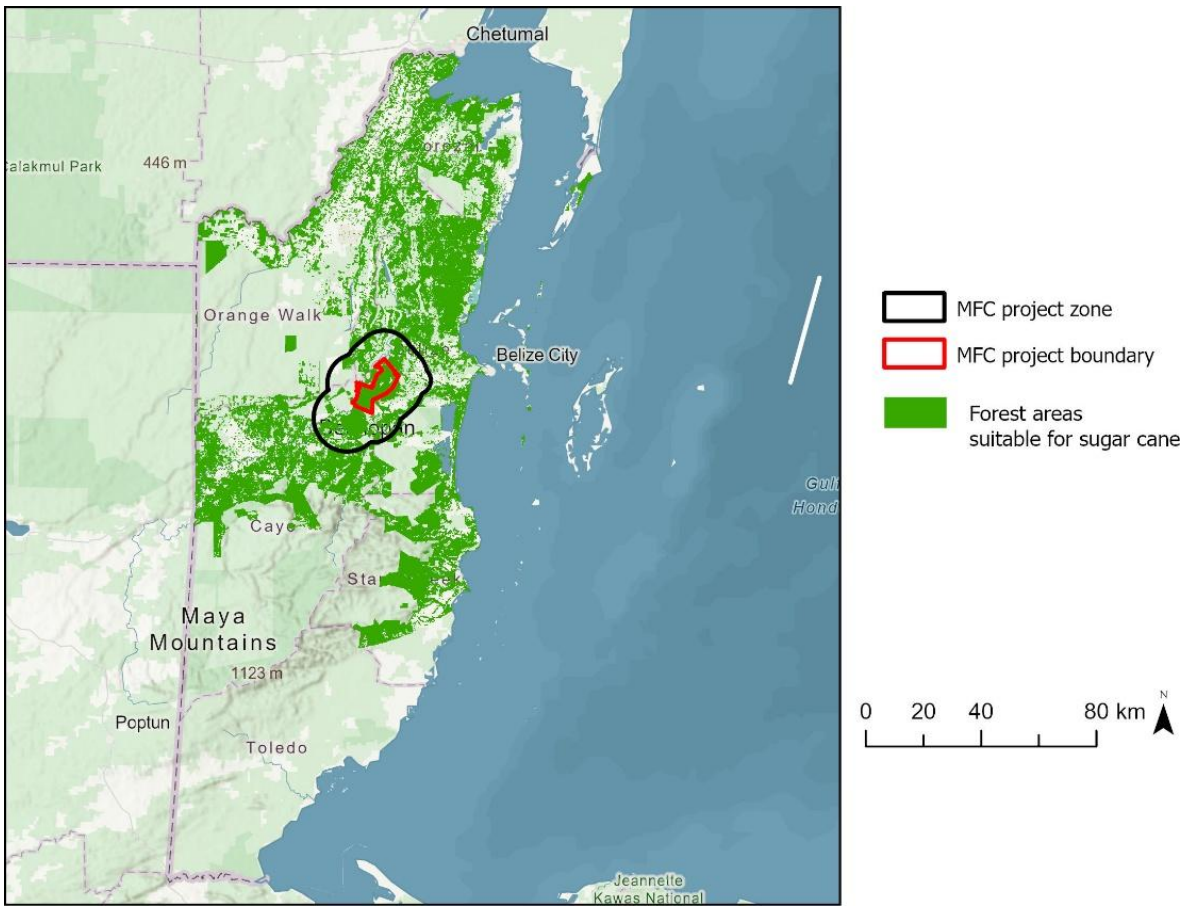

Figure 19. Unprotected forests in Belize that are suitable for growing sugarcane

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 17). 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:

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

Where:

$\Delta C_{LK-AS,planned}$ = Net CO_2 emissions due to activity shifting leakage for projects preventing planned deforestation, t CO_2e

$\Delta C_{BSL,REDD}$ = Net GHG emissions in the REDD baseline scenario in year t, t CO_2e

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

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_{mMAF}) was 1.

3.2.4 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:

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

Where:

NER_t = Net GHG emission reductions of avoiding planned deforestation in year t, t CO_2e

$\Delta C_{BSL-REDD,t}$ = Net GHG emissions in the REDD baseline scenario in year t, t CO_2e

$\Delta C_{WPS-REDD,t}$ = Net GHG emissions in the REDD project scenario in year t, t CO_2e $\Delta C_{LK-AS,planned,t}$= Net GHG emissions due to leakage from the REDD project activity in year t, t CO_2e

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 CO_2e

$GHG_{BSL,t}$ = Greenhouse gas emissions as a result of deforestation activities within the project boundary in year t, t CO_2e

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 CO_2e

NER_t = Net GHG emission reductions of avoiding planned deforestation in year t, t CO_2e

$Uncertainty_{REDD-BSL,t}$ = 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 CO_2e

$\Delta C_{BSL-REDD,t}$ = Net GHG emissions in the REDD baseline scenario in year t, t CO_2e

$Buffer\%$ = 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, t CO_2e

Table 31. Non-permanence risk rating and total GHG benefits to date

State the non-permanence risk rating (%)	12%

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 tCO2e, the Long-term Average (LTA).	N/A
Has the LTA been updated based on monitored data, if applicable?	☐ Yes ☒ No Not applicable
State, in tCO2e, the expected total GHG benefit to date.	127,868
If a loss occurred (including a loss event or reversal), state the amount of tCO2e lost:	No loss event has occurred.

Table 32. VCUs per vintage period

Vintage period	Baseline emissions (tCO_2e)	Project emissions (tCO_2e)	Leakage emissions (tCO_2e)	Buffer pool allocation (tCO_2e)	Reductions VCUs (tCO_2e)	Removals VCUs (tCO_2e)
01-Jan-2022 to 31-Dec-2022	103,803	746	13,287	12,456	61,063	0
01-Jan-2023 to 31-Dec-2023	112,440	0	14,392	13,493	66,805	0
Total	216,243	746	27,679	25,949	127,868	0

Table 33. Differences between ex-ante GHG emission reductions and achieved reductions during monitoring period

Vintage period	Ex-ante estimated reductions/ removals	Achieved reductions/ removals	Percent difference	Explanation for the difference
01-Jan-2022 to 31-Dec-2022	61,674	61,063	-0.99%	Carbon stock reductions due to forest loss from hurricane winds and flooding.
01-Jan-2023 to 31-Dec-2023	66,805	66,805	0.00%	

Vintage period	Ex-ante estimated reductions/ removals	Achieved reductions/ removals	Percent difference	Explanation for the difference
Total	128,479	127,868	-0.48%	

3.3 Optional Criterion: Climate Change Adaptation Benefits

Not applicable.

3.3.1 Activities and/or processes implemented for Adaptation (CCB, GL1.3)

Not applicable.

4 COMMUNITY

4.1 Net Positive Community Impacts

4.1.1 Community Impacts (CCB, CM2.1)

Table 34. 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	Decreased vulnerability to wildfires.
Type of benefit/cost/risk	This impact was predicted and is an actual direct benefit.
Change in well-being	Due to the increased fire management capacity, in 2023, of the 29 fires detected, 25 (86%) were successfully contained.

Table 35. 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	Increased economic security through livelihood diversification

Type of benefit/cost/risk	This impact is a predicted and actual, direct benefit.
Change in well-being	• No change during first monitoring period. Changes expected in following monitoring periods.

Table 36. 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, Hattieville, 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 adaptation issues relevant to their communities.
Type of benefit/cost/risk	This impact was predicted and is an actual direct benefit.
Change in well-being	Since project initiation in January 2022, different MFCT partners have been engaging with communities buffering the MFC to create awareness of the critical ecological function of the MFC, and the present-day impacts of climate change on their daily lives. These community and school engagements have served to establish foundations for future collaborations, build support for MFC conservation, and gain an understanding of community needs and aspirations. Household survey respondents demonstrated the following levels of awareness of the MFC REDD Project indicate that • 27% have heard of the MFC, of which 46% know where it is • 11% have heard of the MFC Trust • 56% have heard of the WCS • 20% are aware that the REDD Project Area is now being managed by WCS Household survey respondents expressed the following perceptions on the importance of protecting the MFC: • 13.7% - Absolutely essential • 65.7% - Very important • 14.7% - Of average importance • 3.7% - Of little importance • 2.2% - Not important Household survey respondents indicated that: • 90% have heard about climate change. • 77% could identify at least one climate change impact affecting them.

	This increased awareness and familiarity with the MFC REDD Project has empowered communities to participate actively in realizing the community benefits of conserving the MFC and to actively implement climate adaptation measures in their communities.

4.1.2 Negative Community Impact Mitigation (VCS, 3.19; CCB, CM2.2)

The MFCT REDD Project's strategy to avoid deforestation involves the acquisition and management of private land. Since the communities in the project zone neither owned, occupied, nor used the land prior to the project, they have not experienced a loss of access to natural resources. Furthermore, they 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.

It is important to mention there is one local family who has been using a small area (12 hectares) for cattle ranching and harvesting of fruit trees outside of the MFC REDD project area but within the property that the MFCT purchased for conservation since prior to the purchase of the property. During the 2022-2023 monitoring period, this individual continued to conduct these activities in this area. To mitigate negative impacts to this individual, after the monitoring period ended, the MFCT began working to engage with the individual with the goal of understanding his perspective and circumstances, while working collaboratively toward a voluntary and dignified resolution to the situation. Emphasis is being placed on minimizing conflict, upholding his rights and well-being throughout the process, and informing the individual of the MFCT legal rights to the land.

In addition to this issue, surveillance activities in the project area have identified a very small number of illegal intrusions: one hunting incident in 2022 involving five males, six incidents in 2023 involving six males and one female. These incidents were dealt with by advising the persons that the property is now under conservation management by WCS. The low number of incidents indicates that the project area is an insignificant source of subsistence for communities on the whole. Ongoing community education sessions to raise awareness of the location and protected status of the REDD Project Area are expected to decrease illegal encroachments. Additionally, signs have been installed along the boundary lines of the property in which the MFC REDD project is located to deter further incursions.

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 promotes environmentally sustainable livelihood activities, reducing the risk of negative environmental impacts, such as pollution or damage to areas of high conservation value. Sustainable livelihood activities did not take place in the 2022-2023 monitoring period but will occur in subsequent monitoring periods beginning in 2024.

In compliance with the precautionary principle, the project conducts ongoing community outreach and education activities to maintain community awareness about project activities and outcomes, and proactively address any concerns regarding potential negative impacts.

Furthermore, the project's stakeholder engagement strategy includes effective means for information sharing and includes an accessible grievance redress mechanism to ensure that community and non-community stakeholders have the opportunity to register concerns, which are then appropriately addressed by WCS.

4.1.3 Net Positive Community Well-Being (VCS 3.19; CCB, CM2.3, GL1.4)

The community impacts described in Section 4.1.1 above indicate net positive impacts to communities. No negative community impacts have been recorded.

To measure net positive community well-being that is directly attributable to Project activities, WCSestablished a baseline assessment of livelihoods, income, gender participation, social cohesion, education attainment, and natural capital with direct beneficiaries when they are engaged for livelihood activities and employment. In this first monitoring period, livelihood activities had not yet begun so this baseline is not available.

The Community Household Survey conducted as a part of this Community Monitoring Event provided a baseline assessment of communities in terms of livelihoods, income, gender participation, social cohesion, education attainment, and natural capital, which is fully described in the **Socioeconomic Assessment of 12 Maya Forest Corridor Buffer Communities (WCS, 2024).** The survey results indicate the following community perceptions of well-being in terms of physical well-being, financial security, and community cohesion (which comprises trust in community members, participation in activities that benefit the community, and perception of the community as a good place to live).

Table 37. Perceptions of physical well-being

Physical well-being compared to 2 years ago	Count
1) Better Off Now	207
2) No Change	109
3) Worse Off Now	82
4) No Response	5
5) Household Was Not Formed 2 Years Ago	5
Total	408

Table 38. Perceptions of financial security

Financial security compared to 2 years ago	Count
1) Better Off Now	196
2) No Change	106
3) Worse Off Now	91
4) No Response	13
5) Household Was Not Formed 2 Years Ago	2
Total	408

Table 39. Perceptions of Community Cohesion

Do you trust people in the community?	Count
1) Yes	212
2) Partly, Trust Some but Not Others	127
3) No	69
Total	408
Do community members actively participate in community actions/events that benefit the community?	**Count**
1) Yes	159
2) Sometimes but Not Always	97
3) No	152
Total	408
Do you consider your community a good place to live?	**Count**
1) Yes	353
2) Partly	39
3) No	16
Total	408

4.1.4 Protection of High Conservation Values (CCB, CM2.4)

The Project has defined the following four (4) High Conservation Value areas (HCVs), which are all protected areas or natural ecosystems within the Project Zone:

- The Community Baboon Sanctuary
- The Spanish Creek Wildlife Sanctuary
- The broadleaf forests and lowland savanna of the MFCT-owned property in which the MFC REDD project is located
- The Belize River and Sibun Watersheds

Community Baboon Sanctuary, the Spanish Creek Wildlife Sanctuary, and the broadleaf and lowland savannas of the property qualified for the following HCVs as described 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.

The Belize River and the Sibun River Watersheds qualified for the following HCV as described 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.

The attributes qualifying them as having high conservation values for communities are their rich biodiversity and ecosystem services. Since all Project activities taking place within these areas or involving natural ecosystems seek to preserve or enhance their ecological integrity, the project's protection of the community HCVs is guaranteed.

4.2 Other Stakeholder Impacts

4.2.1 Mitigation of Negative Impacts on Other Stakeholders (VCS, 3.18, 3.19; CCB, CM3.2)

Project activities did not have any negative impacts on other stakeholders during this monitoring period. No negative impacts on other stakeholders are foreseen since the project will not displace communities, halt economic productivity, or introduce any environmental hazards. WCS and other members of the Maya Forest Corridor Trust maintain strong partnerships with the environmental conservation community, both in Belize and internationally, as well as with key government agencies

responsible for management of Belize's natural resources and the national climate change response. These relationships provide opportunities for information sharing and identification of emerging issues and unforeseen negative impacts.

4.2.2 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.

4.3 Community Impact Monitoring

4.3.1 Community Monitoring Plan (CCB, CM4.1, CM4.2, GL1.4, GL2.2, GL2.3, GL2.5)

The first Community Monitoring Exercise was held between May to July 2024. It involved the following activities:

1) A series of sensitization meetings were held with community leaders of the 12 target beneficiary communities to inform communities that a community household survey would be conducted. Since this was the first community monitoring event, coinciding with the project validation and first verification, the opportunity was taken to introduce the MFC REDD Project, its rationale, and its intended benefits to communities, within the context of climate change impacts being experienced by communities. The planned Community Household Survey exercise was described to the community leaders. Their feedback and advice on how best to approach the community was solicited and adopted. They were asked to identify capable local enumerators with whom the community would feel comfortable. Finally, their cooperation was solicited in spreading the word to community members. For this purpose, a written and electronic notice was provided to them for onward dissemination. For communities with a large percentage of Spanish speakers, the notice was provided in Spanish as well.

2) A Community Household Survey was conducted between June 15 and July 15, 2024, in the 12 target communities. Prior to launching the survey, WCS secured approval by the Wildlife Conservation Society's Institutional Review Board and Belize's Institute for Social and Cultural Research. Local enumerators from the target communities were trained in the technique and ethics of conducting household surveys, emphasizing the respect for human rights and diversity as well as the safety of both enumerators and community members. All 12 communities participated in the socioeconomic survey 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. Data was entered by trained personnel into a programmed Excel spreadsheet.

The dataset was then transferred to an SPSS database for analysis. Data is securely stored electronically in both Excel and SPSS databases by WCS Belize.

Based on data from SIB 2020 Population Estimates, there are a total of 1928 households in the 12 MFC communities. Using a confidence level of 95% and a margin of error 4, Cochran's sample size formula was utilized to generate the number of households (458) that would form a representative sample of the 1928 households. Cochran's sample size formula is as follows:

$$n_0 = \frac{z^2 * p * (1 - p)}{e^2}$$

Where:

z value = 1.96 for a confidence level of 95%

p = population size (1928)

e = margin of error (4)

The following method was used to identify the households to be sampled:

- In communities with number of households under 50, every other household was sampled.
- In communities with number of households between 100 and 200, cluster sampling was used to select households to be sampled. The natural geographic clusters that exist in each community was mapped and used to select every third household per cluster.
- In communities with number of households over 200, the natural geographic clusters that exist in each community was used to select every 6th household in each cluster.

Of the planned 492 household surveys, 453 surveys (92%) were conducted. Several households were abandoned, a few were inaccessible due to heavy rains and localized flooding, and some households had no one present during initial and follow up visits. Of the 453 households sampled, 408 surveys were completed (90.1%), 2 were partially completed (0.4%), 36 households refused (7.9%), and 7 households had no suitable respondent at home (1.5%).

The Community Household Survey provided the opportunity for community members to participate in the evaluation, describing their lives using their own knowledge and experiences. It provides a critical baseline of the socioeconomic status at the start of project activities, against which future community impacts and well-being will be measured.

3) WCS staff members completed surveys on REDD Project activities conducted during this monitoring period. These covered activities in the areas of (a) wildfire management, (b) patrolling and surveillance, (c) community outreach and environmental education, (d) community planning for conservation and climate adaptation, (e) forest restoration, and (d) promoting sustainable livelihoods. These surveys were conducted between July 29 and August 9, 2024. Survey results are being securely stored by WCS Belize.

4.3.1.1 Monitoring Indicator Framework

Section 2.1.17 and Appendix 2 of the Project Description outlines the following four project activities within the framework of the project's Theory of Change.

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.

Community benefits are derived from activities 2, 3, and 4 listed above. Detailed monitoring results for this community-related project activities are presented within the monitoring indicator framework below. The means of verification for these different results are found in Appendix 18.

Table 40. Community benefits from 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**	**Monitoring Results**
Output	1	# of persons trained in fire safety and management by community and organization	• Attendance sheet • Training agenda • Photos	51 persons trained: 22 women, 29 men including: ▪ 4 communities - Mahogany Heights, La Democracia, Franks Eddy, and Cotton Tree; and ▪ 10 organizations - WCS, Monkey Bay Wildlife Sanctuary, Foundation for Wildlife Conservation, Belize Maya Forest Trust, The Belize Zoo and Tropical Education Center, Belize Forest Department, Program of Belize, Belize Audubon, Karst Hills, and Health Department
Output	2	# of communities with a Fire Hazard Alert System	• Early Warning System Protocols • Photos of signage	No activity was conducted in the current monitoring period. Activities have started in 2024 and will be reported in the next monitoring event.

Output	3	# of MFC communities served by fire brigades	• Fire Management Records	No activity was conducted in the current monitoring period. Activities will start in 2026 and will be reported in later monitoring events.
Outcome	4	Annual % of fires contained by persons trained	• Fire Management Records	2022: None. Fire management training began in the last quarter of 2022. Firefighting activities began in 2023. 2023: 29 fires detected/ 25 contained; 86% of fires contained.
Activity Area: Protected Area Management				
Output	5	# of persons trained in environmental enforcement by community and organization	• Attendance sheet • Training agenda	10 persons: 0 females, 10 males including: ▪ 4 organizations: WCS, MBWS, FWC, BMFT; and ▪ 2 community participants from Mahogany Heights and La Democracia Note that additional trainings occurred during the monitoring period that are not counted because there were no attendance sheets. These include trainings on the use of the Spatial Monitoring and Reporting Tool (SMART) for effective monitoring and surveillance and Wilderness First Aid.
Output	6	# of special constables certified for enforcement by community and organization	• Training syllabus • Attendance sheets • Special constable certification	11 persons - 2 women, 9 men certified representing: 3 conservation organizations (WCS, MBWS, BMFT) and 1 community member from Rancho Dolores
Output	7	# of persons employed in protected area management	• Employment letters	1 permanent managerial post - female 4 permanent rangers - male 10 temporary male field assistants employed in carbon measurements. New staff appointments in 2024 will be reported in the next monitoring event.
Output	8	# of persons employed in forest restoration activities	• Employment letters	No staff were hired for this activity area in the current monitoring period. New staff appointments in 2024 will be reported in the next monitoring event.
Outcome	9	% change in illegal intrusions	• SMART data	2022: 1 hunting incident involving 5 males 2023: 4 incidents (hunting and fishing) involving 6 males and 1 female 300% increase in intrusions. The increase in detected intrusions may be attributed to the increased surveillance capacity during 2022 and 2023. Surveillance activities began in March 2022 with two rangers. Ongoing community education on the protected status of the REDD Project Area is expected to decrease illegal encroachments.

Table 41. Community benefits from 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 and environmental education to foster support for MFC conservation and create awareness of climate change impacts.				
Level	**No.**	**Monitoring Indicator**	**Means of Verification**	**Monitoring Results**
Output	10	# of community residents partaking in community outreach and education activities	• WCS Community Outreach Database • Social media posts	2022: **528** community members engaged. ▪ 385 children and youth ▪ 143 adults 2023: **930** community members engaged. ▪ 755 children and youth ▪ 175 adults (Gender disaggregation not available for this monitoring period. Data collection from 2024 onwards will include gender.)
Outcome	11	Level of knowledge and support for the MFC	• Household survey	Survey responses: ▪ 27% have heard of the MFC, of which 46% know where it is ▪ 11% have heard of the MFC Trust ▪ 56% have heard of the WCS ▪ 20% are aware that the REDD Project Area is now being managed by WCS ▪ 11% could name at least one MFC Trust member other than WCS working to protect the MFC

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	No activity was conducted in the current monitoring period. Activities are expected to start in upcoming years.
Outcome	13	Community perception of benefits of protecting the MFC	• Household survey	Survey responses on the importance of protecting the MFC: ▪ 13.7% - Absolutely essential ▪ 65.7% - Very important ▪ 14.7% - Of average importance ▪ 3.7% - Of little importance ▪ 2.2% - Not important at all

<table>
<tr><td>Outcome</td><td>14</td><td>Level of knowledge of climate change impacts and adaptation</td><td>• Household survey</td><td>Survey responses:
▪ 90% have heard about climate change
▪ 77% could identify at least one climate change impact affecting them

Respondents ranked the top three climate change impacts that were affecting them and indicated whether they have sufficient knowledge to understand and cope with these impacts.
<table>
<tr><th>Climate change impact</th><th>#of respondents affected</th><th>% of total respondents (n=368)</th><th>% with enough information on how this impact is affecting them</th><th>%that with enough information to cope with impact</th></tr>
<tr><td>Increase in Temperature</td><td>287</td><td>78%</td><td>77%</td><td>69%</td></tr>
<tr><td>Drought</td><td>184</td><td>50%</td><td>76%</td><td>31%</td></tr>
<tr><td>Increased Rainfall</td><td>159</td><td>43%</td><td>55%</td><td>19%</td></tr>
<tr><td>Flooding</td><td>109</td><td>30%</td><td>39%</td><td>19%</td></tr>
<tr><td>Storms/ Hurricanes</td><td>80</td><td>22%</td><td>5%</td><td>9%</td></tr>
<tr><td>Changes in the Agriculture Calendar</td><td>55</td><td>15%</td><td>15%</td><td>9%</td></tr>
<tr><td>Pests & Insects</td><td>46</td><td>13%</td><td>13%</td><td>17%</td></tr>
<tr><td>Diseases</td><td>28</td><td>7%</td><td>11%</td><td>4%</td></tr>
<tr><td>Erosion</td><td>16</td><td>4%</td><td>94%</td><td>31%</td></tr>
</table></td></tr>
<tr><td>Output</td><td>15</td><td># of communities that have adopted Climate Smart Plans</td><td>• Community Climate Smart Plans</td><td>No activity was conducted in the current monitoring period. Activities have started in 2024 and will be reported in the next monitoring event.</td></tr>
<tr><td>Output</td><td>16</td><td># of communities that have adopted Community Conservation Agreements</td><td>• Community Conservation Agreement documents</td><td>No activity was conducted in the current monitoring period. Activities have started in 2024 and will be reported in the next monitoring event.</td></tr>
</table>

Table 42. Community benefits Project Activity 5: 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**	**Monitoring Results**
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	No activity was conducted in the current monitoring period. Activities have started in 2024 and will be reported in the next monitoring event.
Output	18	• # of households or community agencies that establish sustainable livelihoods in the communities (e.g, climate smart agriculture, production of sustainable products like coconut oil, cohune oil, honey, etc)	• Log of extension visits	No activity was conducted in the current monitoring period. Activities have started in 2024 and will be reported in the next monitoring event.
Output	19	• # of extension service visits per household/farm/agency per quarter	• Log of extension visits	No activity was conducted in the current monitoring period. Activities have started in 2024 and will be reported in the next monitoring event.
Outcome	20	• % increase in self-sufficiency in food production	• Log of extension visits	Not measured since no activities were conducted in the current monitoring period. Baseline will be established with direct beneficiaries at the start of engagement in livelihood activities.
Output	21	• # of farms improved through climate-smart agriculture practices	• Farm maps	No activity was conducted in the current monitoring period. Activities have started in 2024 and will be reported in the next monitoring event.
Outcome	22	• # of acres of agricultural land converted to climate-smart agriculture management	• Farm maps	Not measured since no activities were conducted in the current monitoring period.
Output	23	• # of community-owned nature-based livelihood solutions in MFC communities	• Project progress reports	No activity was conducted in the current monitoring period. Activities have started in 2024 and will be reported in the next monitoring event.

<table>
<tr><th colspan="5">Activity Area: Provide training, material and technical support for community-owned sustainable livelihoods and nature-based solutions for climate adaptation</th></tr>
<tr><td>Outcome</td><td>24</td><td>• % increase in household income through implementation of sustainable livelihoods</td><td>• Household survey</td><td>Not measured since no activities were conducted in the current monitoring period. Baseline will be established with direct beneficiaries at the start of engagement in livelihood activities.</td></tr>
<tr><td>Impact</td><td>25</td><td>• Livelihood diversification index</td><td>• Household survey</td><td><u>Employment and Livelihoods of Heads of Household:</u>
85% of heads of households are employed or engaged in some livelihood activity.
Of these 29% stated that they had a secondary source of income.</td></tr>
<tr><td>Impact</td><td>26</td><td>• Gender parity index of economic contributions to households (both income and non-income activities)</td><td>• Household survey</td><td>62% of households were headed by males; 38% headed by females.
87% of male heads of households were employed; 81% of female heads of households were employed.

Only 78% of employed persons (270 respondents) provided an income range. The survey indicated the following gender parity across income ranges:

<table><tr><th>Gender</th><th>Count</th><th>BZ$0 to $1,500</th><th>BZ$1,501 to $3,000</th><th>Above BZ$3,000</th></tr><tr><td>Male</td><td>178</td><td>110</td><td>60</td><td>8</td></tr><tr><td>Female</td><td>92</td><td>65</td><td>21</td><td>6</td></tr><tr><td>Parity</td><td></td><td>0.59</td><td>0.35</td><td>0.75</td></tr></table>
The overall gender parity across all income ranges is 0.56.

These results demonstrate a notable gender disparity in income, particularly in the middle income range, where a significantly larger proportion of males are earning higher incomes compared to females. Insufficient data on non-income economic activities was available to include that data in the results.</td></tr>
<tr><td>Impact</td><td>27</td><td>• Holistic Well-being Index (composite of physical, social and economic factors)</td><td>• Household survey</td><td>Section 4.1.3 above provides the survey responses for each of 5 well-being questions posed.</td></tr>
</table>

4.3.2 Monitoring Plan Dissemination (CCB, CM4.3)

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 include direct project beneficiaries, target communities, government agencies, NGO partners, and external auditors. In compliance with the Monitoring Plan outlined in the Project Description Document, the results of this monitoring event have been made accessible to targeted beneficiary communities, key stakeholder groups, and the public using the following methods:

1) In August 2024, four community meetings were held to share the findings from the Community Household Survey and the community monitoring event, in the context of the project's objectives and intended medium- to long-term impacts. Meetings were held at centrally located community centers, and transportation was provided for participants. A total of 54 community members from across the 12 target communities attended. To maximize participation, invitations were disseminated in English and Spanish through community leaders, community mobilizers, and other established channels of communication with communities, with deliberate efforts made to have balanced representation by men, women, and youth. Three meetings were conducted in English for the predominantly Creole communities, while one meeting was conducted in Spanish to accommodate the predominantly Mestizo/Hispanic/Latino communities of Franks Eddy and Cotton Tree. A booklet with a summary report of the household survey and monitoring results was disseminated at community meetings. Feedback from each meeting was documented and follow-up actions were undertaken as necessary to address comments and concerns.

2) Government and non-government partner agencies received electronic versions of the final monitoring report via email from the MFCT.

3) The results of each monitoring and verification event are published on the Verra Registry.

4) A 30-day comment period will be provided to beneficiary communities, government and non-government partners, and the public at the start of verification events. All relevant public comments received during this period will be addressed appropriately.

4.4 Optional Criterion: Exceptional Community Benefits

Not applicable.

5 BIODIVERSITY

5.1 Net Positive Biodiversity Impacts

5.1.1 Biodiversity Changes (VCS, 3.19; CCB, B2.1)

The project is an avoiding planned deforestation project where two of the 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 project start were included in the project area.

Table 43. Change in total area of forests in the project area during the monitoring period

Change in Biodiversity	Total area of forest, in hectares, in the project area
Monitored Change	With the exception of 4 hectares that experienced forest loss due to natural causes, the forests in the project area remained intact.
Justification of Change	Due to the project activities described above, the forests have been conserved with the exception of the four hectares of loss due to natural disasters (hurricane winds and flooding) that could not have been prevented.

Table 44. Change in occurrence of medium-large mammals and terrestrial birds in the project zone during the monitoring period

Change in Biodiversity	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.

Monitored Change	None
Justification of Change	Without the project activities, the project area forests would have been cleared negatively impacting medium-large mammals. Regular monitoring of the occurrence of these indicator communities in the project zone ensures that the project effectively maintains forest health and its biodiversity.

Table 45. Changes in occurrence of Central American river turtles in the project zone during the monitoring period

Change in Biodiversity	Continued occurrence of the Central American river turtle 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.
Monitored Change	None
Justification of Change	Without the project activities, the project area forests would have been cleared negatively impacting these turtles. 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.

5.1.2 Mitigation Actions (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 nor have there been any during the monitoring period. 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 19.

5.1.3 Net Positive Biodiversity Impacts (VCS, 3.19; 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.

Table 46. 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 are benefiting from the project: 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 directly benefits 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). 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. 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 curtails poaching on the project area lands and discourages 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; Trolliet, 2010). Populations have been confirmed within the project zone (e.g. Monkey Bay) and in the project area. The project benefits 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 benefits 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 seeks 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 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 (*Crax rubra*)**. 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 benefits the species by the maintenance and preservation of habitat.
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.

5.1.4 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 the endangered and 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.

5.1.5 Species Used (VCS, 3.19; CCB, B2.5, 2.6)

No species are used for project activities.

5.1.6 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 47. Invasive species concerns

Existing invasive species	Mitigation measures to prevent the spread or continued existence of invasive species
Tilapia (*Oreochromys* 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 (*Pterygoplichthys pardalis*)	While armored catfish (*Pterygoplichthys pardalis*) 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

Existing invasive species	Mitigation measures to prevent the spread or continued existence of invasive species
	WCS rangers will continue to monitor their presence and potential ecological impact in the project area.

5.1.7 GMO Exclusion (CCB, B2.7)

No GMO species are used in any project activity.

5.1.8 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 Offsite Biodiversity Impacts

5.2.1 Negative Offsite Biodiversity Impacts (CCB, B3.1) and Mitigation Actions (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 Belize[14] 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 48, 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.

[14] 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 48. 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.

5.2.2 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.

5.3 Biodiversity Impact Monitoring

5.3.1 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 are 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 landscape.

2. **Continued occurrence of medium-large mammal 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-Irineo & Santos-Moreno, 2017; Thornton et al., 2012). Overhunting of many of these species has led to their population declines, and as such, monitoring also helps 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 exception 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 health of the project's 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.

5.3.1.1 Monitoring the total area of forests

The results of this monitoring area are presented in the Climate Monitoring Plan (section 3.1.3.2.1 Monitoring of forest loss and resulting emissions). Given the importance of these forests to biodiversity in addition to storing carbon, it is included in the biodiversity monitoring plan as well. As described in the previous section, 4 hectares of forests were lost in the project area due to natural disturbances that could not be mitigated. The other 10,791 ha of forests remained standing. As a comparison, in the baseline scenario, a total of 2,377 ha of these forests (1,188.6 ha per year as discussed in section 3,2,1,1,6 Annual area of deforestation) would have been cleared for agriculture during the monitoring period.

5.3.1.2 Monitoring the occurrence of large and medium mammal and terrestrial bird species

From January to March 2024, the project team surveyed a grid of 17 camera traps placed at a height of 30-40 cm above the ground, primarily on existing roads and trails (Figure 20), the results of which demonstrate continued occurrence of large and medium mammal species and terrestrial bird species. Placement on roads and trails enhances detectability for elusive wildlife in dense tropical ecosystems (Kelly et al., 2012). Cameras were set to take 3 photographs with each trigger event and they operated 24 hours a day for 2 months with no bait or lure used. Each station was equipped with one infrared or white flash camera trap. Distance between camera stations ranged from one to two kilometers to ensure systematic coverage of study area.

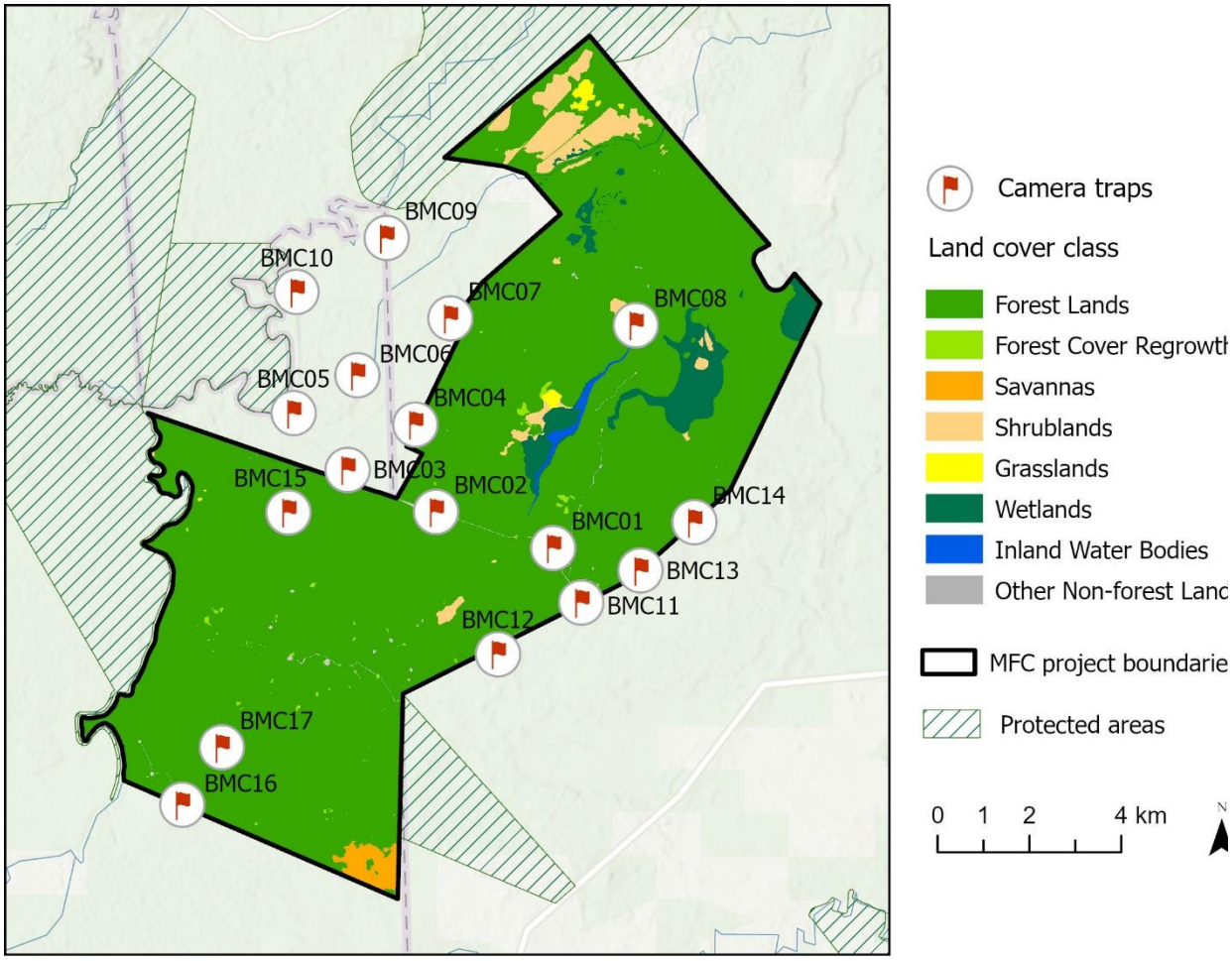

Figure 20. Camera trapping locations allocated with the project area and adjacent project zone

The team accumulated 943 total trap nights and 3,447 photographs of wildlife from 17 camera stations in and near the MFC REDD project area. A full report of the study can be found in Appendix 20. From the 3,447 total photographs, 492 were independent events of wildlife (not including human events). A total of 32 wildlife species were captured, consisting of 4 carnivores, 10 herbivores (including 2 domestics), 9 omnivores, 1 insectivore, and 8 bird species (Table 49).

The Baird's tapir was detected 54 times at 13 of the 17 camera stations and had an average trap rate of 5.52 per 100 trap nights (TN), evidence of the occurrence of this endangered species in and near the MFC REDD project area.

Aside from humans, the highest number of detections was exhibited by ocelots (98) followed by Baird's tapir (54) (Table 49). Several species were only detected once including: collared peccary, Mexican hairy dwarf porcupine (*Coendou mexicanus*), greater grison (*Galictis vittata*), northern raccoon (*Procyon lotor*), and stiped hog-nosed skunk (*Conepatus semistriatus*) (Table 49). Figure 21 through Figure 24 include select photos of different species from the camera traps.Figure 1

The highest trap rate recorded was from the ocelot at 9.91 photo events per 100 trap nights (TN) while the lowest trap rate recorded was from the collared peccary at 0.09 per 100TN. The range of species

recorded per camera station for non-human species ranged from 6 to 14 species per station with the lowest occurring at BMC12 and the highest occurring at BMC03. The jaguar was detected 14 times at 9 of the 17 camera stations and had an average trap rate of 1.46 per 100TN (Table 49).

With regards to terrestrial birds, the Great curassow was detected 11 times at 3 of the 17 camera stations and had an average trap rate of 1.24 per 100TN. The Great tinamou was detected 2 times at 1 of the stations with an average trap rate of 0.19 per 100TN. As shown in Table 49, other bird species were also detected although these species are not considered indicator species of ecosystem health.

Table 49. Numbered (No.) species list, with common name, scientific name, total detections, and average trap rate, of all captured species during camera trap survey in the Maya Forest Corridor from January-March, 2024.

No.	Common Name	Scientific Name	Total Events	*Avg Trap Rate	No. of Stations Detected Out of 17
Carnivore					
1	Jaguar	*Panthera onca*	14	1.46	9
2	Jaguarundi	*Herpailurus yagouaroundi*	11	1.13	7
3	Ocelot	*Leopardus pardalis*	98	9.91	12
4	Puma	*Puma concolor*	12	1.37	7
Herbivore					
5	Baird's Tapir	*Tapirus bairdii*	54	5.52	13
6	Central American Agouti	*Dasyprocta punctata*	34	3.52	10
7	Collared Peccary	*Dicotyles tajacu*	1	0.09	1
8	Domestic Livestock	*Bos taurus*	41	4.15	3
9	Horse	*Equus caballus*	6	0.61	2

No.	Common Name	Scientific Name	Total Events	*Avg Trap Rate	No. of Stations Detected Out of 17
10	Mexican Hairy Dwarf Porcupine	*Coendou mexicanus*	1	0.1	1
11	Lowland Paca	*Cuniculus paca*	13	0.31	6
12	Central American Red Brocket	*Mazama temama*	8	0.85	4
13	White-lipped Peccary	Tayassu pecari	3	0.31	2
14	White-tailed Deer	Odocoileus virginianus	8	0.80	6
Omnivore					
15	Deppe's Squirrel	*Sciurus deppei*	9	0.66	1
16	Gray Four-eyed Opossum	*Philander opossum*	3	0.33	2
17	Gray Fox	*Urocyon cinereoargenteus*	32	3.26	6
18	Greater Grison	*Galictis vittata*	1	0.1	1
19	Northern Raccoon	*Procyon lotor*	1	0.1	1
20	Opossum sp.	*Didelphis spp.*	9	0.92	4
21	Striped Hog-nosed Skunk	*Conepatus semistriatus*	1	0.1	1
22	Tayra	*Eira barbara*	6	0.61	3
23	White-nosed Coati	*Nasua narica*	7	0.76	5

No.	Common Name	Scientific Name	Total Events	*Avg Trap Rate	No. of Stations Detected Out of 17
24	Human	*Homo sapiens*	116	10.8	9
Insectivore					
25	Nine-banded Armadillo	*Dasypus novemcinctus*	5	0.67	2
Bird					
26	Bare Throated Tiger Heron	*Tigrisoma mexicanum*	5	0.51	2
27	Bird sp.	*Aves*	48	5.06	9
28	Common Pauraque	*Nyctidromus albicollis*	3	0.31	2
29	Dove	*Columbidae*	6	0.76	4
30	Gray-necked Wood-rail	Aramides cajaneus	28	1.22	5
31	Great Curassow	*Crax rubra*	11	1.24	3
32	Great Tinamou	*Tinamus major*	2	0.19	1
33	Plain Chachalaca	*Ortalis vetula*	11	1.68	4

Adult tapir

Adult tapir

Adult and young tapir

Adult tapir

Adult tapir

Adult tapir

Figure 21. Select photographs of Baird's Tapir (Tapirus bairdii) from the 2024 camera trap monitoring event

Jaguar *(Panthera onca)*

Jaguar *(Panthera onca)*

Jaguar cubs *(Panthera onca)*

Jaguar cubs and mom *(Panthera onca)*

Puma *(Puma concolor)*

Ocelot *(Leopardus pardalis)*

Ocelot *(Leopardus pardalis)*

Jaguarundi *(Hepalairus yagourundi)*

Figure 22. Select photographs of carnivores from the 2024 camera trap monitoring event

Great currasow (*Crax rubra*)

Great tinamou (Tinamus major)

Figure 23. Select photographs of terrestrial birds

Red brocket deer *(Mazama temama)*

White-tailed deer (Odocoileus virginianus)

Tayra (*Eira barbara*)

White-nosed coati (*Nasua narica*)

Bare Throated Tiger Heron (*Tigrisoma mexicanum*) Paca (*Cuniculus paca*)

Figure 24. Select photographs of other species from the 2024 camera trap monitoring event

5.3.1.3 Monitoring the occurrence of the Central American River Turtle

From March to June 2022, WCS conducted the first monitoring event of the occurrence of the Central American River Turtle or the "Hicatee" (*Dermatemys mawii*) in Cox Lagoon, located in the heart of the project area. The 10 sites used in this study can be found in Figure 25. The project used nets to capture individual turtles to determine occurrence. The results of this monitoring also confirm the continued occurrence of the Central American river turtle in the lagoon. The full details of this study can be found in Appendix 21.

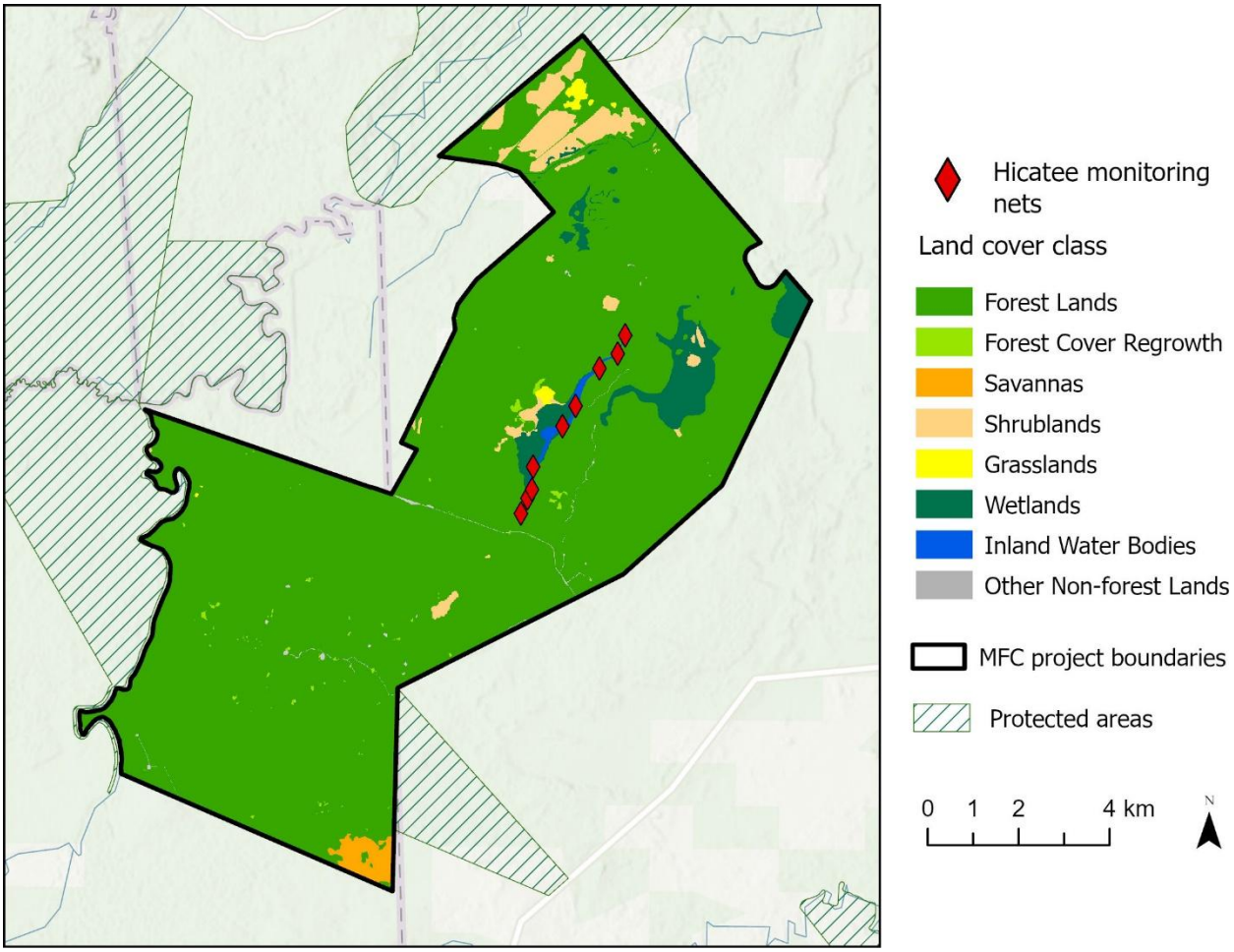

Figure 25. Core monitoring sites for the hicatee turtle for monitoring on Cox Lagoon

A total of 29 *D. mawii* were captured during the survey. Figure 26 shows selected photos of captured individual turtles. The distribution of gender were 9 female, 3 male, and 17 undetermined sexes, which was based on carapace size and head coloration and were classified as juveniles.

Male *D. mawii*

Female D. mawii

Figure 26. Selected photos of Hicatee turtles captured during the survey

The size distribution of *D. mawii* captured was between 200mm -450mm carapace length (CPL; Figure 3). The largest *D. mawii* captured was a female with a carapace length of 445 millimetre and weight of

11.9 kilograms. The largest male captured had a CPL of 400 and weight 8 kilograms, having 45 millimetres less in CPL and 3.9 kilograms less in weight than the largest female. The smallest captured was an unidentified sex/juvenile with a carapace length of 215 millimetre and weight 1.9 kilograms. In regards to sex distribution, the ration of female to male was 3:1 (female more abundant than males).

The size distribution of *D. mawii* captured was between 200mm -450mm carapace length (CPL; Figure 27). The largest *D. mawii* captured was a female with a carapace length of 445 millimetre and weight of 11.9 kilograms. The largest male captured had a CPL of 400 and weight 8 kilograms, having 45 millimetres less in CPL and 3.9 kilograms less in weight than the largest female. The smallest captured was an unidentified sex/juvenile with a carapace length of 215 millimetre and weight 1.9 kilograms. In regards to sex distribution, the ration of female to male was 3:1 (female more abundant than males).

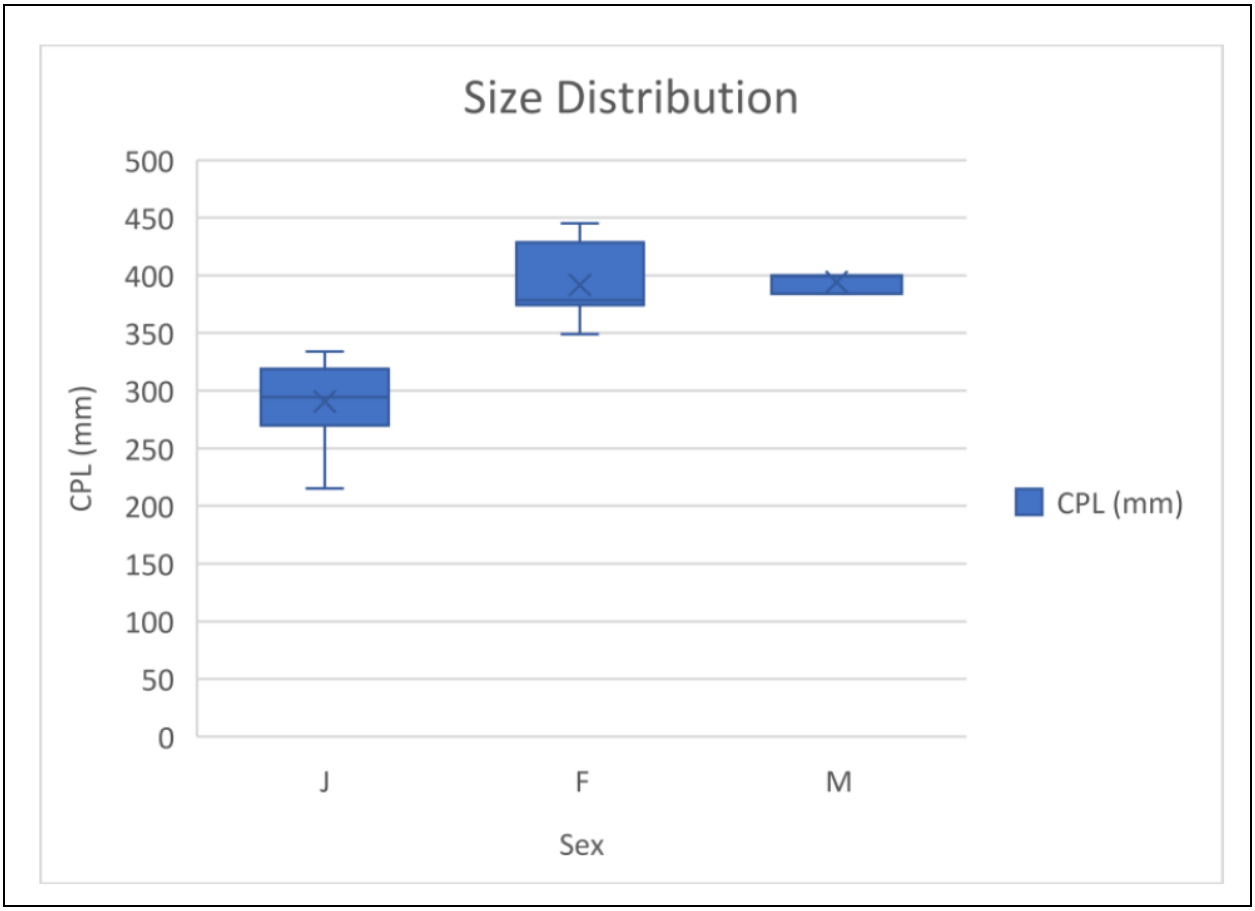

Figure 27. Carapace length of all D. mawii caught for the 2022 survey in Cox Lagoon. J=Juveniles, F=Females, M=Males, CPL = Carapace Length

In summary, this survey confirmed the presence of D. mawii within the Cox Lagoon. The capture of 58% juveniles suggests a young population or that Cox Lagoon is serving as a nursery ground for the species.

5.3.2 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 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.

5.4 Optional Criterion: Exceptional Biodiversity Benefits

As demonstrated in the monitoring results described above, the occurrence of the endangered species Baird's tapir has been confirmed in the project area, and the occurrence of the critically endangered Central American river turtle in Cox Lagoon has also been confirmed.

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. According to a national study, 37.3% of the country is considered a protected area with some level of legal protection (UNEP-WCMC, 2025). The Central American River Turtle is listed as Critically Endangered by the IUCN Redlist (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).

The regular, confirmed occurrence in the project area of the endangered Baird's tapir and the critically endangered Central American river turtle qualifies the project area/project zone as a Key Biodiversity Area under the "vulnerability" criterion (Bakarr et al., 2007).

5.4.1 Trigger Species Population Trends (CCB, GL3.2, GL3.3)

Table 50. Baird's Tapir population trends

Trigger Species	**Baird's Tapir** (*Tapirus bairdii*)
With-project Scenario	Through the protection of existing forests and other ecosystems in the project area, the project is 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. 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.

Table 51. Central American River Turtle population trends

Trigger Species	**Central American River Turtle** (Hicatee) *(Dermatemys mawii)*
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. 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.

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APPENDIX 1: 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 target 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,

	Identified risk(s)	Potential impact of risk on stakeholders, ecosystem health, and biodiversity	Mitigation or preventative measure(s) taken
			fostering coexistence and support for conservation efforts. 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	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 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 Limited engagement of Franks Eddy and Cotton Tree due to a language barrier.	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. 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	<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. Provide cultural sensitivity training for project staff to ensure effective communication and respectful

	Identified risk(s)	Potential impact of risk on stakeholders, ecosystem health, and biodiversity	Mitigation or preventative measure(s) taken
		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.	engagement with the cultural nuances of community members.

Working conditions	Traffic accidents Fire Attack by persons intruding on MFC REDD project area Attack by wildlife	Employees conduct patrolling events in motor vehicles. As such, traffic accidents are a risk. Wildfires pose a risk in the MFC project area, and one of the responsibilities of the staff in the area is to manage wildfires. 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. 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 may be attacked by wildlife.	Mitigation or preventative measure(s) taken for risk #1 Training in first aid Availability of emergency contact numbers at all times Vehicles equipped with emergency radios Mitigation or preventative measure(s) taken for risk #2 Ongoing training of staff in fire management Provision of adequate PPE Provision of adequate firefighting equipment Training in first aid Mitigation or preventative measure(s) taken for risk #3 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) Mitigation or preventative measure(s) taken for risk #4 Training in first aid

	Identified risk(s)	Potential impact of risk on stakeholders, ecosystem health, and biodiversity	Mitigation or preventative measure(s) taken
			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 2.3.13. 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 2.3.13. 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[15]	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.

[15] 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
Preserving and protecting cultural heritage	No risk identified	N/A	Refer to section 2.5.4 Indigenous Peoples and Cultural Heritage
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,

	Identified risk(s)	Potential impact of risk on stakeholders, ecosystem health, and biodiversity	Mitigation or preventative measure(s) taken
			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 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	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
	the area. These include tilapia (*Oreochromys* spp.) and Armored catfish (*Pterygoplichthys pardalis*)		
Ecosystem conversion	No risk identified	N/A	The main objective of the project to prevent the agricultural conversion of the property to preserve its ecological role in the larger Maya Forest Corridor. As such, ecosystem conversion is not a risk.

APPENDIX 2: COMMERCIALLY SENSITIVE INFORMATION

Section	Information	Justification
2.2.8. 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 5. 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.
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.