2014 – 2016 MONITORING & IMPLEMENTATION REPORT FOR THE RUSSAS PROJECT

Document Prepared By
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Project Title	The Russas Project
Project Location	Acre, Brazil
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Project Start Date	17 March 2011
Monitoring Period and Project Lifetime	01-January-2014 to 31-December-2016; 60-year lifetime
Project Proponent	CarbonCo, LLC Brian McFarland 853 Main Street East Aurora, New York, 14052 - USA Email: BMcFarland@CarbonCoLLC.com Phone: (240) 247-0630
Prepared By	James Eaton[2] and Brian McFarland[1]

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History of CCB Status	The Russas Project's CCBS Project Design Document was validated in March 2014 and the initial CCBS Project Implementation Report (PIR) was verified in December 2014 to the Second Edition of the CCBS. This second VCS CCB Monitoring & Implementation Report covers the monitoring and reporting period of January 1, 2014 to December 31, 2016.
CCB Benefits Summary	Net climate, community and biodiversity benefits between March 17, 2011 and December 31, 2013 include, but are not limited to: a reduction in the Project Area's deforestation; preservation of biologically diverse habitats; community engagement; local hires and transfer of technical knowledge; offering agricultural extension courses to 101 community members; starting informal patrols for deforestation; and the overall development of the second-ever, VCS-CCBS validated REDD+ project in the State of Acre, Brazil. Many of these benefits, such as the knowledge gained from agricultural extension courses, the establishment of a local headquarters, and the preservation of biologically diverse habitats, carry over into future monitoring periods. The net climate, community and biodiversity benefits between January 1, 2014 to December 31, 2016 include, but are not limited to: a reduction in the Project Area's deforestation; preservation of biologically diverse habitats; initiation and completion of a biodiversity study utilizing 10 motion-sensitive wildlife cameras; continuing community engagement and awareness of the need to preserve the forests for future generations; and generating carbon finance. In addition, dozens of mosquito nets were distributed, hundreds of community members received attention from medical personnel (including 400 people being taught by the local nurse Sebastião Melo de Carvalho), renovations began on the local health clinic, and dozens of children received dental kits. Furthermore, Ilderlei hired SOS Amazonia which visited the communities on behalf of the Project Proponents at least 14 times throughout 2015 and 2016, with another 12 visits in 2017. Such visits included agricultural trainings and follow up visits on these activities taught by SOS Amazonia including, but not limited to: banana production and management; agroforestry workshops; organic horticulture courses; and small animal (e.g., chickens)
Gold Level Criteria	The Russas Project was validated and verified to the Gold Level for exceptional community benefits. The Project Proponents assisted all

	communities in and around the Russas Project, and specifically the most vulnerable communities within the Project. This includes providing free agricultural extension courses and free health care, along with free transportation assistance to encourage their participation.

In memory of Marmude Dene de Carvalho

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1 GENERAL

1.1 Summary Description of the Implementation Status of the Project (G3)

The Russas Project seeks to help protect and conserve tropical forest by providing payments for ecosystem services. This type of project is known as a Reducing Emissions from Deforestation and forest Degradation project (REDD project). Project activities intended to reduce deforestation are implemented in and around a privately-owned property in the State of Acre, Brazil and are funded by payments related to emission reduction credits generated by the project.

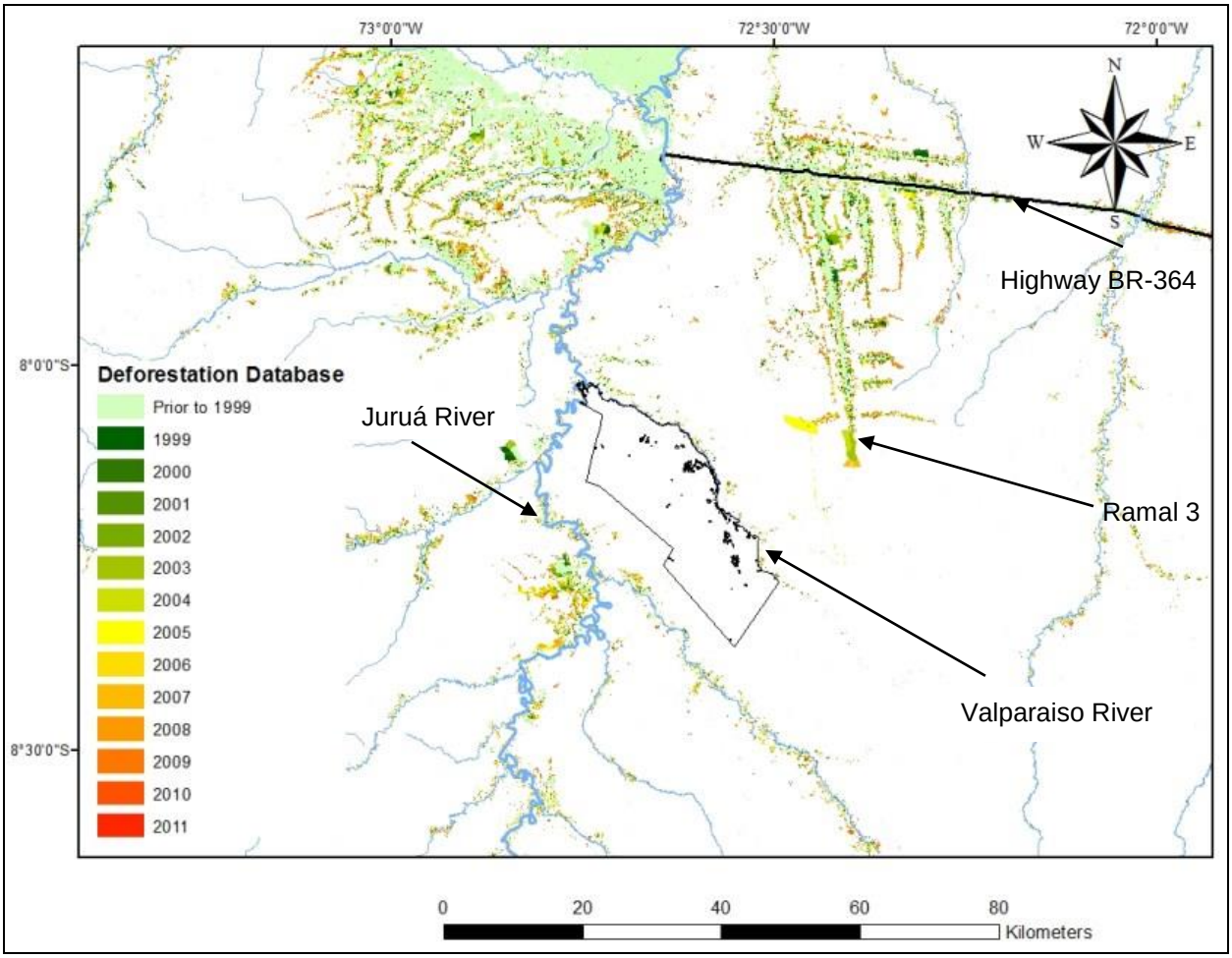
This project was developed and registered under the Verified Carbon Standard (VCS) and the Climate, Community and Biodiversity Standard (CCBS). Project development involved meeting with the local communities surrounding the project area, engaging Acre state officials working on similar strategies at a regional/state level, developing a plan which will result in lowering the pressure on land and forest resources in consultation with the local community, and putting into operation the REDD+ project implementation plan with the help of local partners and Russas Project staff. Activities implemented and/or planned as part of the project to reduce deforestation include:

- Community outreach and education;
- Employment of local community members as forest guards or other project staff (to replace other sources of income associated with deforestation and land use);
- Providing agricultural extension training which will help baseline agents to increase productivity on current lands (thus reducing the pressure to expand their farms in the adjacent forest);
- Supporting local farmers association;
- Assist communities in obtaining land tenure; and
- Sharing a portion of carbon related revenue for communities living on the Russas property (replacing other sources of income associated with deforestation and land use).

The above activities directly address deforestation pressures in the region which are becoming more prevalent.

While the State of Acre historically has a low deforestation rate and a high level of forest governance, the paving of two primary roads BR-364 and BR-317 has greatly increased destruction of primary forests and conversion to cattle pastures. Deforestation pressures in the project region have increased significantly in the past several years as the paving of BR-364 has been completed. Upon being fully paved, BR-364 now allows for year-round transportation and will increase property values and market access and facilitate immigration. The Juruá River, a major tributary of the Amazon River, borders the project property and connects areas upstream and downstream of BR-364 to consumer markets. Further, secondary roads, such as “Ramal 3”, are fast approaching the project area (Figure 1.1) providing access to previously hard to reach areas for the agents of deforestation, small scale/subsistence farmers.

Figure 1.1. Deforestation in and around the project area (outlined in black) in the historical reference period.



There are approximately 20 communities living on the project property, all of which live in close proximity to the Valparaiso River.[1] These small scale and subsistence farming communities are the agents of deforestation and clear a portion of forest for land to engage in small scale farming and ranching for their livelihoods. Forest is generally cleared over a period of months. The process most often starts in May or June at the beginning of the dry season with the cutting of small trees and vines by machete. Next, the farmer or someone with a chainsaw cuts the larger trees down. The farmer then waits for the dead vegetation to dry for a period of time ranging from two weeks to several months. A portion of the farmers, then use fire to clear the land. Finally crops are planted or the land is converted to pasture.

The project baseline has been developed after meeting with local communities to understand their use of the land, and in light of the above mentioned increased accessibility of the project area in the near future. Further, the Russas Project is working closely with the State of Acre and is using a simple historic

[1] To the best of the Project Proponents' knowledge as a result of a local census conducted by Ilderlei Cordeiro, there were 20 households living on the Russas Project and all such households were consulted. However, a high-level survey by the Ministry of Health for the Municipality of Cruzeiro do Sul suggests there may be more households than originally thought.

approach to setting the baseline to conform to Acre State's approach, which is still in development. Finally, data and information provided by the UCEGEO, the Climate Change Institute's GIS department of the state of Acre, was used in the development of the baseline.

There are three project proponents undertaking the Russas Project including CarbonCo, LLC ("CarbonCo"), Freitas International Group, LLC ("Carbon Securities"), and I.S.R.C. Investimentos e Acessória LTDA ("I.S.R.C."). CarbonCo, the wholly-owned subsidiary of Carbonfund.org, is responsible for project finance and managing project development. Carbon Securities acts as a liaison between CarbonCo and I.S.R.C. and provides logistical support during site visits. Ilderlei Souza Rodrigues Cordeiro is the landowner and sole proprietor of I.S.R.C., an Acre-based organization which is primarily responsible for implementation of project activities and day-to-day management of the Russas Project.

Implementation Status of the Project

The Russas Project was validated to the CCBS with Gold Distinction in March 2014 and was validated to the VCS in May 2014. The initial verification covered the monitoring and reporting period of March 17, 2011 to December 31, 2013. The following measures were implemented at the Russas Project during this time period. The Project Proponents successfully reduced deforestation in the Project Area, which led to the preservation of biologically diverse habitats. The Project Proponents, and particularly I.S.R.C., undertook numerous community engagement meetings and presented the Russas Project to diverse stakeholders such as the mayor of Cruzeiro do Sul and the Climate Change Institute. The Russas Project made some initial hires of local staff and contributed to the transfer of technical knowledge. For example, I.S.R.C. hired a local project manager and forest patrollers, while CarbonCo hired the local forestry firm TECMAN to undertake the forest carbon inventory. The Project Proponents established a baseline of community impacts through community surveys and designed a biodiversity monitoring plan that will utilize motion-sensitive, wildlife camera traps. I.S.R.C. offered the first five agricultural extension courses to 101 local communities on the production of soursop (i.e., also known as graviola), passion fruit, banana, maize, and cassava. The Russas Project established a local headquarters to serve as a meeting place for local communities and to host visitors. Furthermore, the Russas Project became the second-ever, VCS-CCBS validated REDD+ project in the State of Acre, Brazil. Many of these benefits, such as the knowledge gained from agricultural extension courses, the establishment of a local headquarters, and the preservation of biologically diverse habitats, carry over into future monitoring periods.

This second verification covers the monitoring and reporting period of January 1, 2014 to December 31, 2016. The following measures were implemented at the Russas Project: a reduction in the Project Area's deforestation; preservation of biologically diverse habitats; initiation and completion of a biodiversity study utilizing 10 motion-sensitive wildlife cameras; continuing community engagement and awareness of the need to preserve the forests for future generations; and generating carbon finance. In addition, dozens of mosquito nets were distributed, hundreds of community members received attention from medical personnel (including 400 people being taught by the local nurse Sebastião Melo de Carvalho), the health clinic's renovation began, and dozens of children received dental kits. Furthermore, Ilderlei hired SOS Amazonia which visited the communities on behalf of the Project Proponents at least 14 times throughout 2015 and 2016, with another 12 visits in 2017. Such visits included agricultural trainings and follow up visits on these activities taught by SOS Amazonia including, but not limited to: banana production and

management; agroforestry workshops; organic horticulture courses; and small animal (e.g., chickens) breeding courses.

GHG Emission Reductions and Removals for the current Monitoring Period

The total emissions reduced by the Russas Project over the course of the 2014-2016 monitoring period is 526,030 tCO_2e.

Years	GHG emission reductions (tCO2e)
2014	162,177
2015	179,634
2016	184,219
Total	526,030

Project Objectives

The overarching objective of the Russas Project is to generate sustainable economic opportunities for the local communities and to implement social projects, while mitigating deforestation (i.e., which results in less greenhouse gas emissions) and preserving the Project's rich biodiversity.

By mitigating deforestation, payments for ecosystem services are generated which enable the implementation of local social projects and the creation of economic opportunities for the communities. Similarly by improving local livelihoods and creating alternative economic opportunities, there are less pressures on the forests and a reduction in deforestation. Improving local livelihoods and reducing deforestation are key mechanisms to preserve the Project's biodiversity.

To achieve these overarching objectives, the following climate, community and biodiversity project activities were undertaken by the Project Proponents since March 2011 and especially between January 1, 2014 and December 31, 2016.

Major Climate Objective

To mitigate deforestation and reduce the amount of greenhouse gas (GHG) emissions, the Project Proponents undertook, or began to plan for, the following project activities since March 2011:

- Forest Carbon Inventory
- Regional Land-use and Deforestation Modeling
- Address Underlying Deforestation Drivers to Mitigate Release of GHGs
- Develop Climate Monitoring Plan
- Monitor Deforestation

Major Community Objective

To generate sustainable economic opportunities for the local communities living in and around the Russas Project and to implement local social projects, the Project Proponents undertook, or began to plan for, the following project activities since March 2011:

- Project Awareness, Meet Community, and Discuss Project
- Design Social Projects and Programs for Community
- Implement Social Projects and Programs for Community
- Develop Community Monitoring Plan
- Monitor Community Impacts

Major Biodiversity Objective

To preserve the Russas Project's rich biodiversity, the Project Proponents will generate sustainable economic opportunities for the local communities, implement social projects, and mitigate the release of GHGs from deforestation. Furthermore, to achieve this biodiversity objective, the Project Proponents undertook, or began to plan for, the following project activities since March 2011:

- Rapidly Assess Biodiversity on Project
- Develop Biodiversity Monitoring Plan
- Monitor Biodiversity Impacts

1.2 Project Location (G1 & G3)

The Russas Project area is located in Acre, Brazil along the southern bank of the Valparaiso River. The Valparaiso River is a tributary to the Juruá River and joins about 40 km south of the town Cruzeiro do Sul. The total project area (i.e., forested area of the property as of the project start date, and 10 years prior) is 41,976 hectares.

Figure 1.2. Map of the Russas Property.

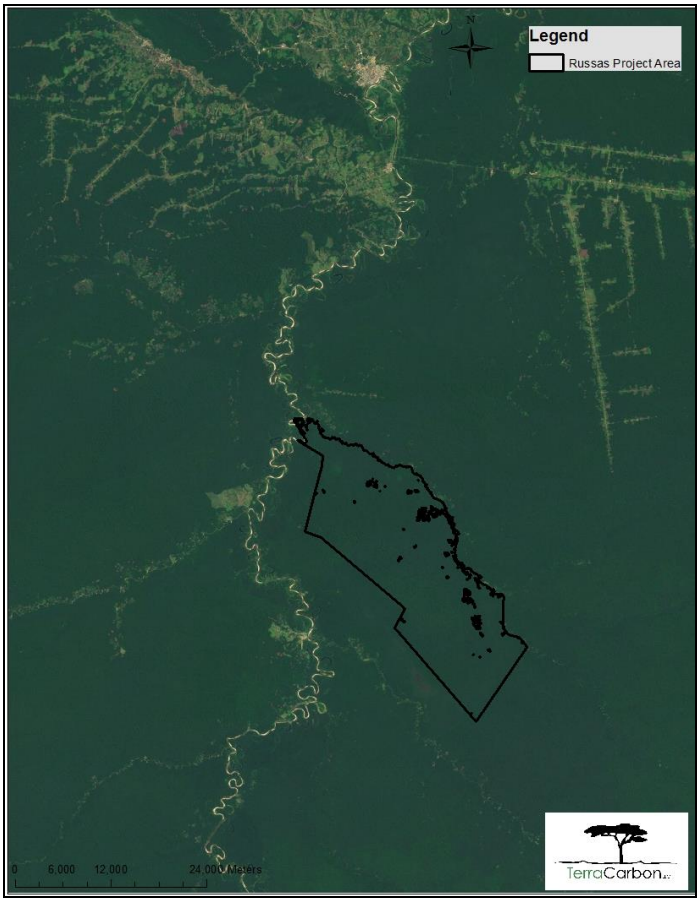


Figure 1.3. 2001 Forest Cover Map (Green = Forest; Red = Nonforest).

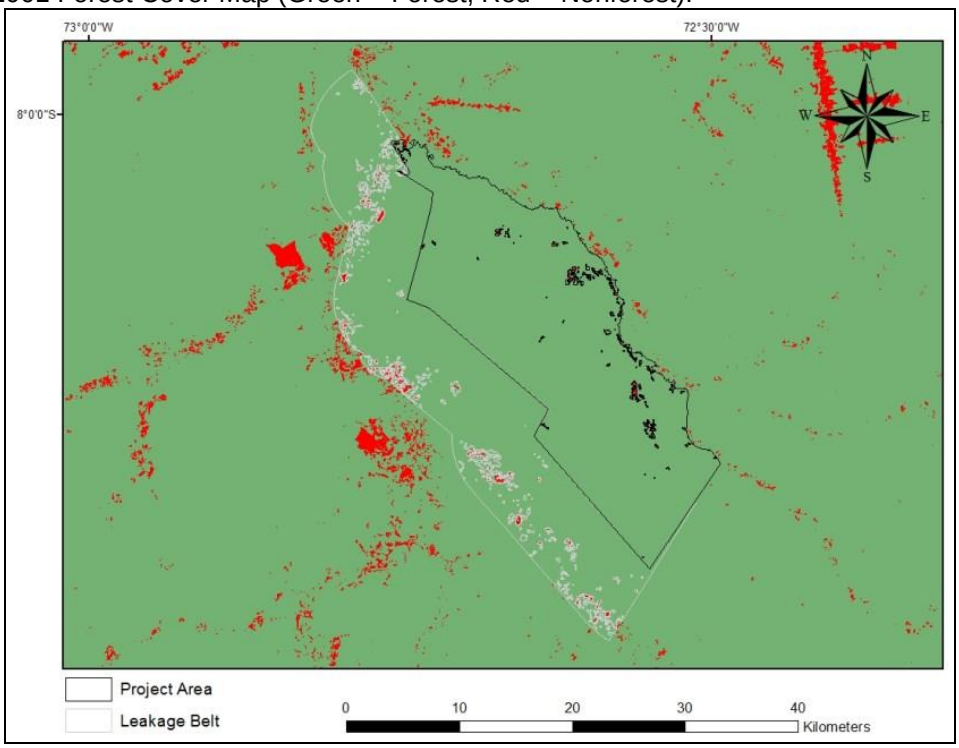


Figure 1.4. 2011 Forest Cover Map (Green = Forest; Red = Nonforest).

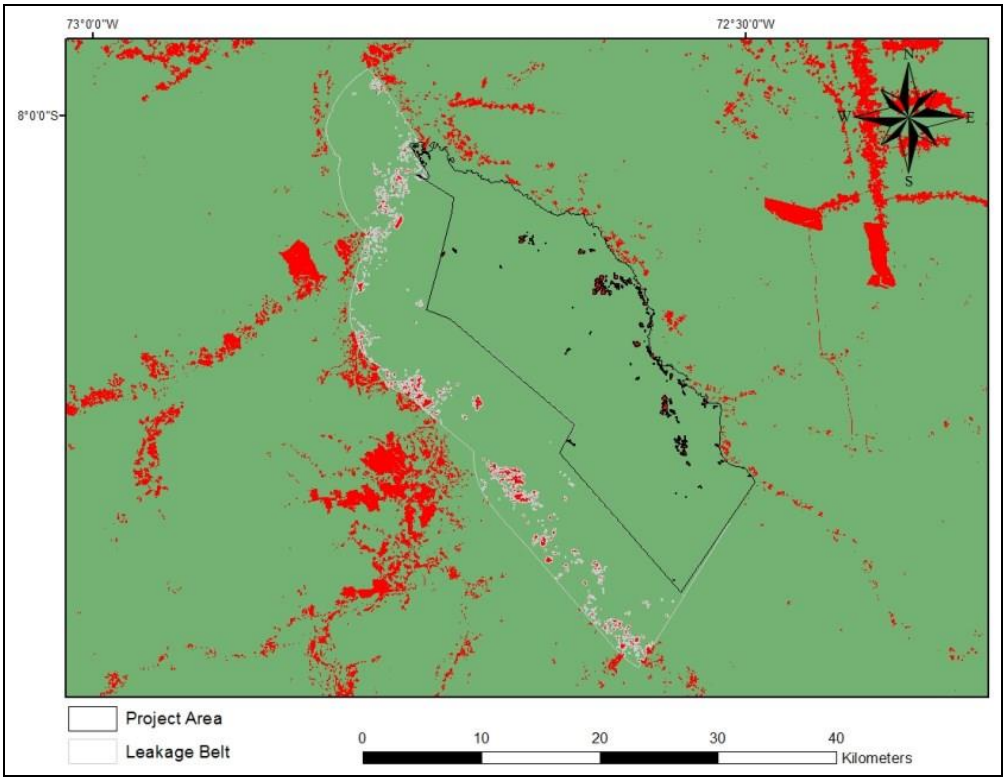
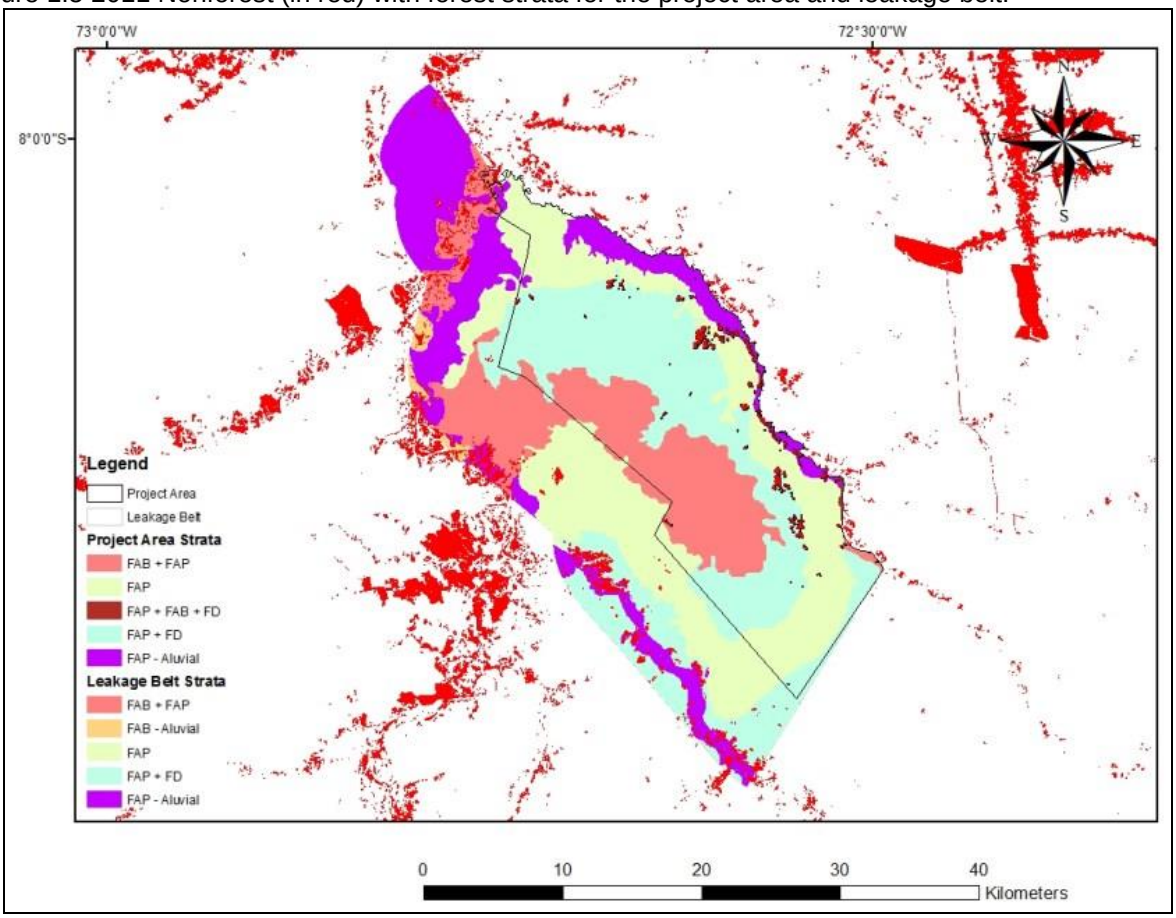
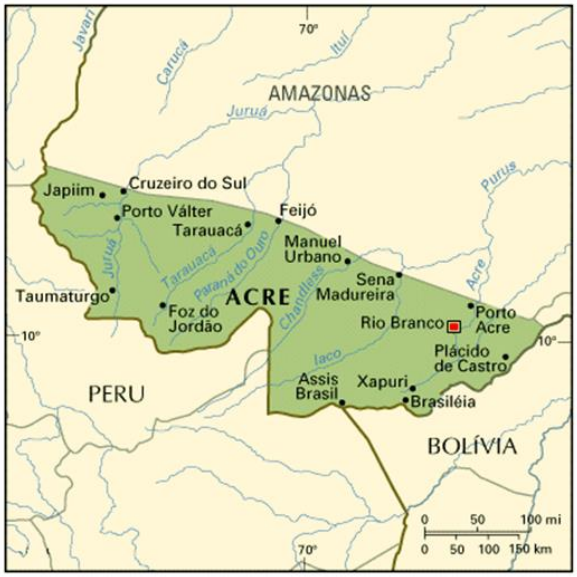


Figure 1.5 2011 Nonforest (in red) with forest strata for the project area and leakage belt.



The following political map is the State of Acre which borders the Brazilian state of Amazonas along with the countries of Peru and Bolivia:[2]



[2] V-Brazil.com, “Map of Acre, Brazil,” Available: http://www.v-brazil.com/tourism/acre/map-acre.html

The following map depicts the Russas Project vis-à-vis the Jurua and Valparaiso Rivers.

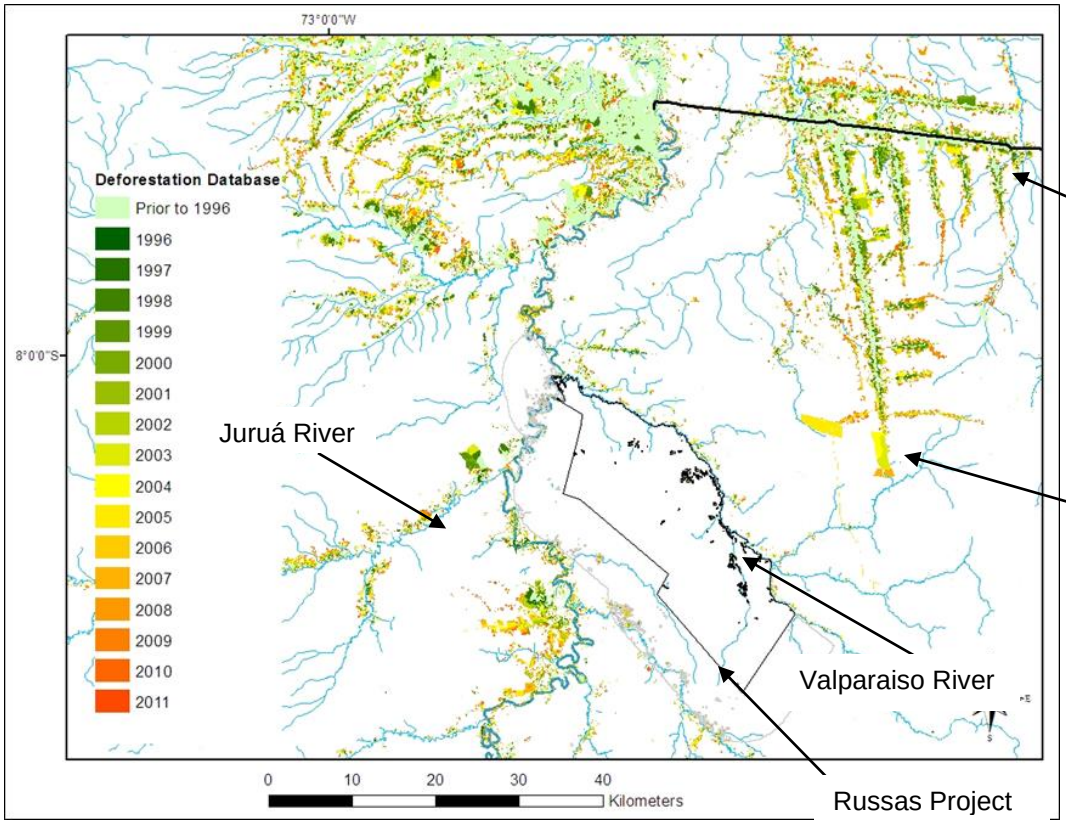


Figure 1.6: Map of Russas Project (Credit: TerraCarbon)

It is important to note that the property located on the opposite banks of the Valparaiso River and adjacent to the Russas Project is also being developed by the Project Proponents as a REDD+, forest conservation project. This project is known as the Valparaiso Project and this is the reason the Russas Project's leakage belt does not extend along the northeastern border of the property.

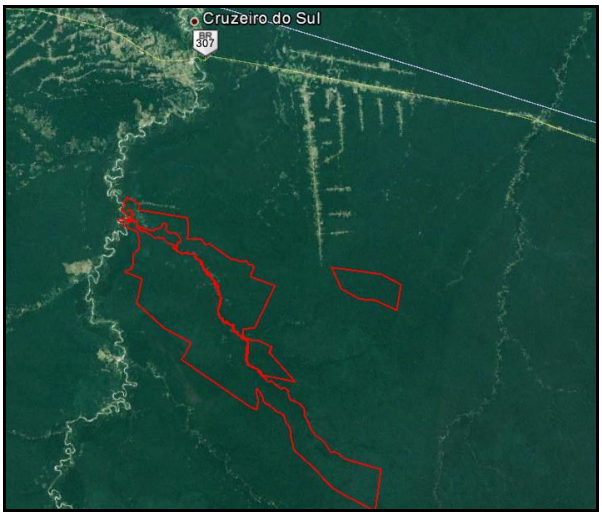


Figure 1.7: Map of Russas Project and Adjacent Valparaiso Project (Credit: TerraCarbon and Google Earth)

The geographic coordinates of these contiguous Projects are located below. The following map identifies the Project Area and the Project Zone (i.e., the Project Area and the Leakage Area):

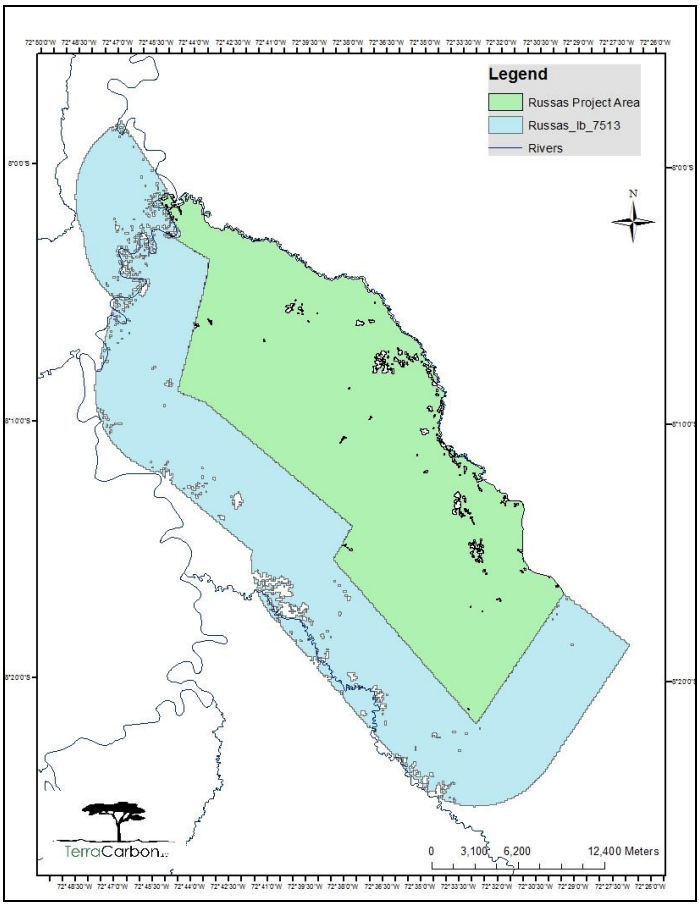


Figure 1.8: Map of Russas Project Area and Project Zone (Credit: TerraCarbon)

Project activities since March 2011 and especially between January 1, 2014 and December 31, 2016 – for example, hiring of local project managers, establishing Project headquarters, distributing dental kits, deploying wildlife cameras, and informally monitoring for deforestation – took place throughout the Project Area and Project Zone, with a particular emphasis on locations experiencing the greatest deforestation pressures (i.e., along the Juruá and Valparaiso Rivers inside the Project Area). Furthermore, the Leakage Area is the land surrounding the Project Area that is predicted to be most impacted by the Russas Project activities.

Basic Physical Parameters

The basic physical parameters of the Russas Project, including the soil, elevation and climate, remain unchanged from the validated Project Design Document (PDD). For this additional information on the Russas Project's basic physical parameters, please see the CCBS PDD here.

1.3 Project Proponent (G4)

The three main project proponents are CarbonCo, LLC ("CarbonCo"), Freitas International Group, LLC ("Carbon Securities"), and I.S.R.C. Investimentos e Acessória LTDA ("I.S.R.C.") which is a sole proprietorship managed by the Russas property landowner. CarbonCo, the wholly-owned subsidiary of Carbonfund.org, is responsible for getting the project certified and for project finance. Carbon Securities acts as a liaison between CarbonCo and I.S.R.C., acts as a translator, and assists with logistics for site visits. I.S.R.C. is an Acre, Brazil-based organization created by the Landowner and is primarily responsible for day-to-day management of the Project and the implementation of activities to stop deforestation. Table 1.1, below, details the role and responsibilities of each project proponent.

Table 1.1. List of Project Proponents.

Organization name	CarbonCo, LLC
Contact person	Brian McFarland
Title	Director
Address	853 Main Street, East Aurora, New York, 14052 - USA
Telephone	+1 (240) 247-0630
Email	BMcFarland@CarbonCoLLC.com

Organization name	I.S.R.C. Investimentos e Acessória LTDA
Contact person	Ilderlei Cordeiro
Title	Founder and Landowner
Address	Bairro: Zona Rural, Cidade: Cruzeiro do Sul - Acre - Brasil, CEP: 69.980-000
Telephone	+55 (68) 9993 35711
Email	ilderlei_cordeiro@hotmail.com

Organization name	Freitas International Group, LLC (Doing Business as Carbon Securities)
Contact person	Pedro Freitas
Title	Founder and President
Address	201 S. Biscayne Boulevard, 28th Floor, Miami, Florida, 33131 – USA
Telephone	+1 (305) 209-0909
Email	PedroFreitas@carbonsecurities.org

CarbonCo is the primary Project Proponent that was responsible for the Project's design and I.S.R.C. Investimentos e Acessória LTDA is the primary Project Proponent responsible for the Project's implementation.

1.4 Other Entities Involved in the Project (G4)

Figure 1.9 provides an overview of the relationship of the various project proponents and entities involved in the project. Table 1.2 lists the role of the other entities.

Figure 1.9. Organizational Chart for the Russas Project

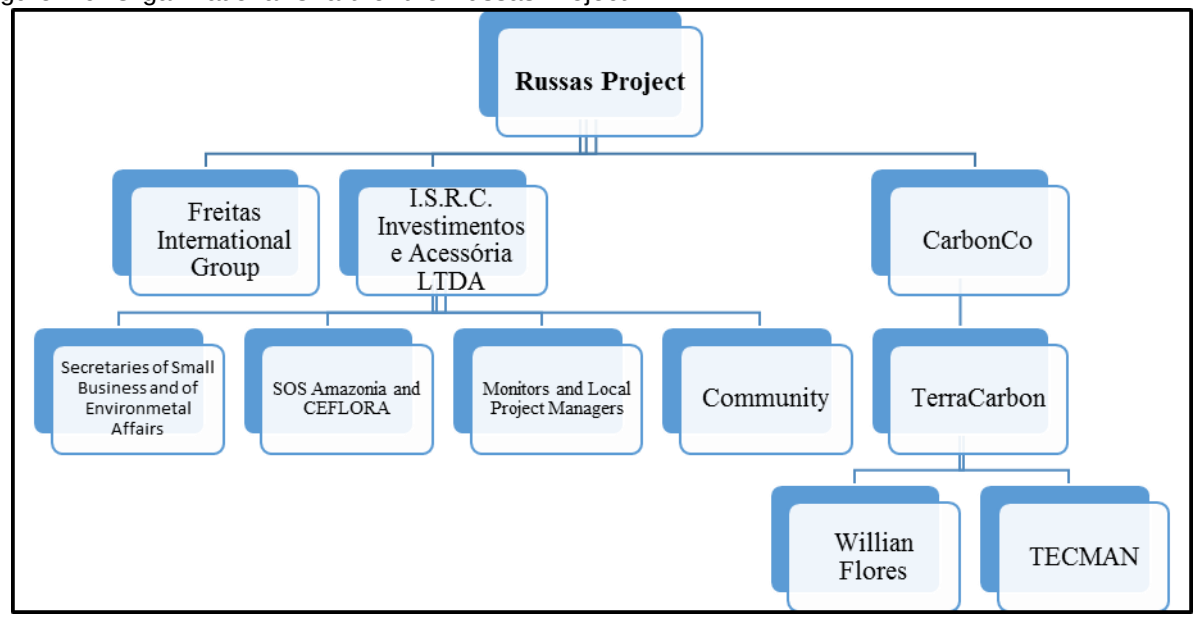


Table 1.2. List of Other Entities Involved in the Project.

Organization name	TerraCarbon
Role in the project	Co-lead project kickoff. Design and manage forest carbon inventory. Lead baseline development task. Develop project document and advise CarbonCo on all aspects of project development and monitoring.
Contact person	James Eaton
Title	Senior Manager, Forestry & Technical Services
Address	5901 N. Sheridan Rd. Peoria, Illinois 61614, USA
Telephone	+1 (434) 326-1144
Email	James.Eaton@terracarbon.com

Organization name	TECMAN
Role in the project	Lead and supervise collection of field data during the course of the forest carbon inventory.
Contact person	Igor Agapejev de Andrade
Title	Co-owner
Address	Rua Copacabana, nº 148, Sala 204, Conjunto Village Maciel, CEP 69.914-380 Rio Branco, Acre, Brasil
Telephone	+55 (68) 3227-5273
Email	IgorAgapejev@gmail.com

Organization name	N/A
Role in the project	Assist with review of the project baseline and data acquisition.
Contact person	Antonio Willian Flores de Melo
Title	Independent consultant
Address	Universidade Federal do Acre, Centro de Ciências Biológicas e da Natureza, Distrito Industrial, CEP 69.915-900, Rio Branco, Acre, Brasil
Telephone	+55 (68) 3901-2611
Email	WillianFlores@gmail.com

Organization name	N/A
Role in the project	Assist with the wildlife camera study
Contact person	André Botelho
Title	Independent consultant
Address	Instituto Federal de Educação, Ciência e Tecnologia do Acre Ecologia e Conservação de Mamíferos PPBio/CENBAM - Núcleo Regional, Acre
Telephone	+55 68 9 9282 4595
Email	botelho.alm@gmail.com

Key Technical Skills and Staff

The key technical skills required to successfully implement the Russas Project, include:

- Stakeholder identification and community engagement
- Biodiversity assessment and monitoring
- Carbon stock measurement and monitoring
- Regional deforestation and land-use modelling
- Project management
- Local knowledge and fluency in Portuguese
- Carbon finance

The Project's management team and advisors have both the expertise and prior experience with implementing forest carbon projects. For detailed staff biographies, please see the Russas Project's validated CCBS PDD, section G4. Management Capacity and Best Practices, subsection 2. Key Technical Skills and Staff.

1.5 Project Start Date (G3)

The Russas Project has a project start date of March 17, 2011. The former local project manager, Marmude Dene de Carvalho, was hired on this date and forest monitoring began. This is also the date Ilderlei Souza Rodrigues Cordeiro spoke with the community at length about REDD+, forest conservation, community benefits and the community signed an "ata" which is a public meeting MOU. After receiving the communities' formal acceptance of the Project, Ilderlei then signed the Tri-Party Agreement with Carbon Securities and CarbonCo on October 31, 2011.

1.6 Project Crediting Period (G3)

The initial Project Implementation Report (PIR) covers the monitoring and reporting period from March 17, 2011 to December 31, 2013. This second PIR covers the monitoring and reporting period from January 1, 2014 to December 31, 2016.

Project Lifetime and GHG Accounting Period

The GHG Accounting Period – otherwise known as the Project Crediting Period – also began on March 17, 2011. The Tri-Party Agreement between CarbonCo, Carbon Securities and Ilderlei Souza Rodrigues Cordeiro stipulates a 60-year Project Lifetime, followed by two renewable terms of 25-years each. Thus, the Project Lifetime is 60 years but the Project Proponents may decide in the future to extend the Project Lifetime to 110 years.

The initial Project Crediting Period – otherwise known as the GHG Accounting Period - will be for 30 years which started on March 17, 2011 and ends on March 16, 2041. The initial baseline period started on March 17, 2011 and is set to continue through March 16, 2021. This Project Crediting Period is also in conformance with the Verified Carbon Standard.

Implementation Schedule

The approximate implementation schedule for the Russas Project, with key accomplishments between March 11, 2011 and December 31, 2016, is as follows:[3]

Pre- and Post-Validation: Years 1 and 2 (2012-2013)

- Signing of Tri-Party Agreement between Project Proponents
    - The Russas Project's Tri-Party Agreement was signed in October 2011.
- Stakeholder Consultations and Community Visits
    - Stakeholder consultations and community visits occurred through March 2011 to December 2013, with the Project Proponents visiting the Russas Project together in June 2012, March-April 2013, June 2013 and August 2013. The Project Proponents continued to visit the Russas Project with visits in May 2014, August 2014, and May 2017. Ilderlei visited the Russas and Valparaiso Projects in January 2014, July 2014, and March 2016. Ilderlei also visited the Projects in 2015, but Ilderlei is unsure of the exact months. Furthermore, SOS Amazonia was hired by Ilderlei to provide training and orientation to the local communities, including about REDD+, from 2011 to 2017.
    - Extensive stakeholder consultations throughout 2011 to 2016, included but were not limited to:
        - CarbonCo spoke with Natalie Unterstell, the then-focal point for REDD+ at Brazil's Federal Ministry of Environment (February 2012);
        - Ilderlei spoke to Fernando Lima, the then-President of Instituto de Meio Ambiente do Acre (IMAC, "Environmental Institute of Acre" in English) (November 2012);
        - Project Proponents presented the Russas and Valparaiso Projects to the President of the Cruzeiro do Sul Municipal Legislature, the Secretary of Environmental Affairs for the Cruzeiro do Sul municipality, along with staff members of the Secretary of Agriculture for the Cruzeiro do Sul (March 2013);
        - Brian McFarland of CarbonCo presented at the Forests as Capital Conference hosted by the Yale School of Forestry & Environmental Studies' Chapter of the International Society of Tropical Foresters (January 2014);
        - Carbon Securities met with Rodrigo Fernandes das Neves, the State Prosecutor, to discuss the Acre REDD+ projects including the Russas and Valparaiso Projects (May 2014);
        - Brian McFarland of CarbonCo presented at Ecosystem Marketplace's State of the Voluntary Carbon Market and gave an overview of CarbonCo's work in Acre, Brazil (June 2014);

[3] Please see the appendix for a revised "catch up plan" for the Project.

- Luiz Henrique Medeiros Borges, a biologist and colleague of Andre Botelho, provided training to the Project Proponents and the local communities at the Russas and Valparaiso Projects on proper techniques for wildlife cameras and biodiversity monitoring (August 2014);

- Brian McFarland presented at the US-China Business and Cultural Exchange Center and gave an overview of forest carbon projects and particularly CarbonCo's work in Acre, Brazil (January 2015); .

- Brian McFarland presented "A Global Perspective on the Voluntary Carbon Markets" in Thessaloniki, Greece which included a discussion on REDD+ (June 2015);

- Andre Botelho presented a poster entitled, "Composition and Relative Abundance of Medium and Large Mammals in REDD+ areas in Acre" (September – October 2015);

- CarbonCo and Carbon Securities met several stakeholders in Brazil including the Climate Change Institute of Acre, the Amazon Fund, USAID, and the Ministry of Environment. Such meetings included a presentation of our Acre REDD+ Projects (February – March 2016);

- Brian McFarland presented to two classes at Cornell University on "Global Carbon Markets and Developing Forest Conservation Projects" which included highlighting CarbonCo's projects in Acre (November 2016)

- Forest Carbon Inventory

  - TECMAN was contracted by CarbonCo in January 2013 for the forest carbon inventory, TECMAN participated in a web-based training from TerraCarbon in January 2013, and then TECMAN conducted the forest carbon inventory from February to March 2013. TECMAN was later contracted by CarbonCo in April 2014, participated in a classroom and field-based training from TerraCarbon in May 2014, and then TECMAN conducted the forest carbon inventory at another CarbonCo Project from May to July 2014.

- Land-use and Deforestation Modeling

  - Professor Flores was contracted by CarbonCo in April 2013 and assisted with the review of the Russas Project's modelling from approximately March to July 2013. Professor Flores was also contracted by CarbonCo in 2014, 2015, 2016 and 2017 to assist with data acquisition.

- Project Design Documents Written

  - The Russas Project's Climate, Community and Biodiversity Standard (CCBS) Project Design Document and Verified Carbon Standard (VCS) Project Description (both English and Portuguese versions) were written between November 2012 and July

2013. The initial and second Project Implementation Reports were written between March 2014 and June 2017, with revisions made in August 2017 to February 2018 .

- Hire Project Manager

    - Marmude Dene de Carvalho ("Marmude") was hired by Ilderlei in March 2011 as the Russas Project's local project manager and to informally patrol for deforestation. Sadly, Marmude passed away on September 2, 2014. Prior to Marmude's passing, two volunteer local project coordinators (Maria de Fátima Dene de Carvalho and Nágila Deni Sarah) joined the Project in February 2014. After Marmude's passing, Fátima and Nágila stepped in to help out until a new local project manager, Willyan Deni Sarah, was contracted in May 2017. Fatima and Willian are both based at the Project, while Nagila is based in Cruzeiro do Sul.

- Initiate Patrols of Deforestation

    - Marmude began the patrols of deforestation in March 2011 and such patrols continued throughout most of 2014, until sadly, Marmude passed away on September 2, 2014. Maria de Fátima Dene de Carvalho Silva and Willian Deni Sarah informally patrol for deforestation. Starting in 2017, Willian will formally record his patrols of deforestation.

- Initiate Training and Agricultural Extension Courses for Communities

    - Communities throughout the Russas Project Zone were surveyed on their most desired agricultural extension courses from March to April 2013. The five agricultural training courses on the production of soursop (i.e., also known as graviola), passion fruit, banana, maize, and cassava took place in July 2013 to 101 community members. The communities are still using some of the knowledge obtained during the agricultural extension courses which were taught in July 2013. For example, some communities have started to plant corn and bananas (i.e., when they previously did not plant corn or bananas), while others have expanded their banana plantations.

    - Ilderlei also hired SOS Amazonia which visited the communities on behalf of the Project Proponents at least 14 times throughout 2015 and 2016, with another 12 visits in 2017. Such visits included agricultural trainings and follow up visits on these activities taught by SOS Amazonia including, but not limited to: banana production and management; agroforestry workshops; organic horticulture courses; and small animal (e.g., chickens) breeding courses.

    - Additional agricultural courses are planned for 2017 and 2018. For example, there are other agricultural techniques (e.g., planting pineapples and cocoa) that is being discussed with SOS Amazonia. Ilderlei Cordeiro, the manager of the Valparaiso Project and owner of the Russas Project, has already paid in advance for these agricultural courses and SOS Amazonia will engage the communities during these visits to bridge the understanding gap between receiving free agricultural extension courses, to improving crop yields with less deforestation, to the funding generated

from forest conservation activities that help pay for the courses. Likewise, SOS Amazonia already added a “REDD+ teachings” package.

- Biodiversity and Community Impact Monitoring Plans Developed

    - The Russas Project’s biodiversity and community impact monitoring plans were developed between March 2011 and July 2013, the Participatory Rural Assessment (PRA) and the Basic Necessity Survey (BNS) which were used to develop the community impact monitoring plan were administered in March and April 2013, and both monitoring plans were publicly posted in July 2013. The second PRA was administered in May 2014 and the third PRA was administered in March 2017, while the second BNS was administered in May 2017. Motion-sensitive wildlife camera traps, which are part of the biodiversity monitoring plan, were installed from August 2014 to July 2015.

- Project Validated to CCBS and VCS Standards

    - The validation site visit of the Russas Project took place in August 2013 and the Project was successfully validated to the CCBS and VCS Standards in March and May 2014. The initial VCS-CCBS verification was achieved in December 2014.

- Establish Initial Headquarters

    - An initial headquarters was established in early 2011 at the house of Marmude to provide a location to host visitors and to support local communities. This headquarters has been maintained and expanded since early 2011 to provide ongoing benefits. This includes the installation of additional sleeping quarters for visitors, along with the installation of a toilet and shower.

Post-Validation: Years 3 to 5 (2014-2016)

- Establish New Headquarters

    - Ilderlei and Marmude began to discuss the site location and approximate costs of establishing a new headquarters. As of April 2017, Marmude’s house remains the Project’s headquarters and due to the unfortunately passing of Marmude, his house will remain the permanent headquarters.

- Help Communities Obtain Land Tenure

    - Ilderlei began to discuss with the communities the process of them receiving official land tenure. Ilderlei spoke with ITERACRE and the Project Proponents also received a letter of support from ITERACRE. This activity was a bit delayed and was initiated in 2017 and 2018. In 2017 and as of November 2017, the Rural Workers Union (STR-Cruzeiro do Sul) met the local communities in June 2017 about the Brazilian Revised Forest Code and titling of communities, Ilderlei met with the President and Vice President of STR-Cruzeiro do Sul in September 2017 to discuss how to address the communities concerns regarding the size and shape of their titles, and Ilderlei

contracted a professional technician to work on the CAR for both the Russas and Valparaiso Projects, along with CARs for the local communities.

- Saymo Justiniano da Silva, a trained professional in rural CARs, was hired on July 1, 2017 and intended to complete all the CAR measurements by December 1, 2017. Saymo has gone door-to-door to explain all aspects of land demarcation including discussion around the shape and size of the plots, discussion about the CCIR and CAR, discussion of land tenure laws and about what communities are able to do with their titles, and a brief discussion about REDD+ projects. Saymo will revisit the communities in May 2018 to make sure the communities are still aware of the titling process and land tenure laws.

- Create Association to Process Açaí and Manioc Flour

  - Ilderlei discussed importance of manioc flour and the availability of acai with the local communities. In addition, the Project Proponents looked into the approximate costs to help process acai and manioc flour and the Project Proponents also looked at a model of processing acai in Cruzeiro do Sul. In 2017, Ilderlei will purchase manioc flour kits and will help promote associations where they currently do not exist. It is important to note that one of the courses taught in July 2013 was on cassava (i.e.., otherwise known as manioc).

- Improve Health Center and Dental Clinic

  - In 2013, as Mr. Sebastião Melo de Carvalho was completing his nursing program and expressed his desire to provide health services in the Valparaiso River Basin. Sebastião spoke of the need to implement a program of oral prevention in the Russas and Valparaiso Projects by donating toothbrushes and toothpaste to the schools. Ilderlei realized the importance of these initiatives and talked to local families about incorporating this into the Project design. Between July 20 and 24, 2014, Sebastião coordinated the action and taught basic healthcare information that was attended by 400 people, including many children and young adults, and distributed dental kits to dozens of children. Furthermore, Ilderlei and Sebastião distributed mosquito nets throughout the Russas-Valparaiso Projects to help combat malaria in the Juruá River Basin. Sebastião completed his Bachelor of Nursing degree program and will be helping in the future with the Project. Throughout 2014 to 2017, Ilderlei helped facilitate visits by the municipal health boat (e.g., provide gas and food; sometimes supplementary income to workers) to the Russas and Valparaiso Projects. In addition, in 2016, Ilderlei began renovating the onsite health clinic and then in 2017, Ilderlei began building toilets throughout the communities to promote health and clean water, and the onsite health clinic renovations were completed.

Post-Validation: Years 5 to 10 (2017-2022)

- Profit Sharing of Carbon Credits

- Although a long-term activity, the Russas Project was designed and implemented from March 2011 to December 2013 which are very important steps to eventually having a verified REDD+ project with issued carbon offset credits. Ilderlei Cordeiro will share a small portion of the carbon finance with the communities in 2017.

- Reassessment of Land-use and Deforestation Modeling Baseline
  - This is a long-term activity.

1.7 Sustainable Development

Brazil has participated in the development of the 17 Sustainable Development Goals (SDGs).[4] The following are the 17 SDGs and how the Russas Project is working towards helping to meet these voluntary SDGs:

- 1. No poverty
  - The Project is working to increase the communities' access to basic necessities and alleviate poverty.
- 2. Zero hunger
  - While the communities have access to crops, fish, and food from the forests, the Project is working to help improve the communities' agricultural techniques, while both increasing and diversifying incomes.
- 3. Good health and well-being
  - The Project has already distributed dental kits, facilitated the visits by doctors, and will completed the onsite health clinic in 2017.
- 4. Quality education
  - Ilderlei has helped improve the local school, such as facilitating the delivery of new books and repairing the school's flooring.
- 5. Gender equality
  - The Projects are working to include more women in the project activities and the Russas Project has both Fátima and Nágila as volunteer, local coordinators.
- 6. Clean water and sanitation
  - Ilderlei is building toilets throughout the Project to, in part, promote clean water and sanitation. Sebastião also taught children proper handwashing techniques. In the future, the Project may explore rainwater catch basins as a method for collecting clean drinking water.
- 7. Affordable and clean energy

[4] Itamaraty. "Sustainable Development Goals (SDGs)." http://www.itamaraty.gov.br/en/politica-externa/desenvolvimento-sustentavel-e-meio-ambiente/6298-sustainable-development-goals-sdgs

- As part of the Projects, Ilderlei is providing affordable and clean energy, including the purchase and installation of solar photovoltaic panels.

- 8. Decent work and economic growth
    - The Project has hired local project managers and local community members have been hired to assist with biodiversity studies, community studies, the forest carbon inventory, and to help visitors as guides and cooks.
- 9. Industry, innovation and infrastructure
    - In the future, the Project will help develop the açaí infrastructure. In the meantime, Ilderlei is purchasing manioc flour kits and will help promote community associations where none exist.
- 10. Reduced inequalities
    - The Project is seeking to reduce inequalities by providing, amongst many things, free agricultural courses, local employment opportunities, energy access, manioc flour kits, and land titles.
- 11. Sustainable cities and communities
    - The Project is promoting sustainable communities through providing land titles, agricultural extension courses, and health care services. These activities, in conjunction with other activities, will help reduce deforestation and improve the life quality of local communities which in turn, may reduce the pressure to migrate to neighboring cities such as Cruzeiro do Sul.
- 12. Responsible consumption and production
    - As an avoided deforestation project, the Russas Project is promoting responsible production of local crops.
- 13. Climate action
    - One of the main goals of the Project is to reduce deforestation and the associated GHG emissions.
- 14. Life below water
    - The Project is promoting sustainable fishing by monitoring for outside, commercial fishermen.
- 15. Life on land
    - One of the main goals of the Project is to reduce deforestation and to conserve the rich biodiversity of the forests.
- 16. Peace, justice and strong institutions

- The Project promotes peace, justice and strong institutions through the prohibition of illegal activities such as child exploitation, bribery, and corruption. In addition, the Project works with a wide-range of stakeholders and institutions.

- 17. Partnerships for the goals
  - The Project is the result of strong international and domestic partnerships.

2 IMPLEMENTATION OF DESIGN

See section 2.3 below for detailed information of the Project's activities during the monitoring period of January 1, 2014 to December 31, 2016. During this monitoring period, there were no significant events that negatively impact the Project's GHG emission reductions. Similarly, there were no changes in the Project Proponents or other entities. With respect to the monitoring and management of leakage and non-permanence risk factors, see the Project's non-permanence risk report and sections 4 and 5 for an assessment of leakage.

2.1 Sectoral Scope and Project Type

Project Scope 14: Agriculture, Forest and other Land Use (AFOLU)

Project Category: Reduction Emission from Deforestation and Degradation (REDD)

Type of Activity: Avoided Unplanned Deforestation (AUDD)

This project is registered under the Verified Carbon Standard (VCS) as a Reducing Emissions from Deforestation and Degradation (REDD) project and has been developed in compliance with the Verified Carbon Standard[5], Version 3.3 and VCS AFOLU Requirements[6]. The project reduces emissions from unplanned frontier deforestation.

2.2 Grouped Project

The Russas Project is not a grouped project and therefore this section of the monitoring report is not applicable.

2.3 Description of the Project Activity (G3)

The following section will further describe each major climate, community and biodiversity project activity since March 2011 and especially between January 1, 2014 and December 31, 2016 and how it is relevant to achieving the overarching climate, community and biodiversity objectives.

[5] VCS. 2012 VCS Standard. Version 3.3, 04 October 2012. Verified Carbon Standard, Washington, D.C.
[6] VCS. 2012 Agriculture, Forestry and Other Land Use (AFOLU) Requirements. Version 3.3, 04 October 2012. Verified Carbon Standard, Washington, D.C.

Major Climate Objective

To achieve the major climate objective of mitigating deforestation and the subsequent release of GHG emissions, the Project Proponents undertook a forest carbon inventory, developed a regional land-use and deforestation model, and are addressing the underlying deforestation drivers to mitigate the release of GHGs with a plan for ongoing monitoring.

Forest Carbon Inventory

A forest carbon inventory was an important project activity to undertake because it is difficult to manage an objective that is not measured. The forest carbon inventory generated a scientifically robust and statistically accurate representation of the carbon stocks at the Russas Project.

The forest carbon inventory was conducted by the renowned local forestry company TECMAN and was overseen by both CarbonCo and the international experts at TerraCarbon. TECMAN was contracted by CarbonCo in January 2013, participated in a web-based training from TerraCarbon in January 2013, and then TECMAN conducted the Russas Project's forest carbon inventory from February to March 2013. In 2014, TECMAN was contracted by CarbonCo to conduct another forest carbon inventory at a different CarbonCo REDD+ project in Acre.

TECMAN is an example of a local hire; TECMAN received a transfer of technical knowledge and know-how from TerraCarbon and TECMAN received certificates of completion to demonstrate their knowledge of conducting a forest carbon inventory.

For a more detailed discussion, please see the validated VCS Project Description's Appendix B entitled, Forest Carbon Inventory Standard Operating Procedures.

Regional Land-use and Deforestation Modeling

Similar to the need for a measurement of carbon stocks, there was a need to develop a regional land-use and deforestation model to determine a performance baseline for the Project Proponents. Such models now allow the Project Proponents to predict where (i.e., location), when, from what (i.e., drivers and agents), and how much deforestation is expected, along with where to assist with leakage mitigation and primarily where to monitor.

The Russas Project's regional land-use and deforestation modeling was conducted by TerraCarbon and reviewed by Professor Antonio Flores from the Federal University of Acre.

Professor Flores was contracted by CarbonCo in April 2013 and assisted with the review of the Russas Project's modeling from approximately March to July 2013. Professor Flores was also contracted by CarbonCo in February 2014, March 2015, March 2016 and February 2017 to assist with data acquisition and to provide an expert opinion.

Professor Flores is another example of a local hire; Professor Flores received a transfer of technical knowledge and know-how from TerraCarbon.

For a more detailed discussion, please see the validated VCS Project Description section 2 Application of Methodology and section 3 Quantification of GHG Emission Reductions and Removals.

Address Underlying Deforestation Drivers to Mitigate Release of GHGs

While understanding the Russas Project's carbon stocks and deforestation scenario, the Project Proponents began to address the underlying deforestation drivers to mitigate the release of GHGs (See Social Projects and Programs within this section).

Addressing the underlying deforestation drivers - for example, providing agricultural extension trainings – is relevant to achieving the climate objective of reducing net GHG reductions by reducing the communities' dependence on forest resources through intensification of agricultural and livestock practices, by providing alternative income, along with providing education about the effects of deforestation and benefits of protecting forest resources.

Develop Climate Monitoring Plan and Monitor Deforestation

The Project Proponents are constantly monitoring deforestation by boat as well as from the State of Acre's satellite imagery (See Social Projects and Programs within this section). This climate monitoring plan was devised between March 17, 2011 and December 31, 2013.

The climate monitoring plan and constant monitoring of deforestation is assisting the Project Proponents with achieving the climate objective. Thus, the climate monitoring plan and monitoring of deforestation result in net GHG emission reductions because such activities provide an early detection of deforestation, while enabling the Project Proponents to identify the specific drivers and agents of deforestation and to implement the appropriate actions to mitigate such deforestation and subsequent release of GHG emissions.

Major Community Objective

To generate sustainable economic opportunities and to implement local social projects for communities living in and around the Russas Project, the Project Proponents undertook, or began to plan for, the following project activities: Project Awareness, Meet Community, and Discuss Project; Design Social Projects and Programs for Community; Implement Social Projects and Programs for Community; Develop Community Monitoring Plan and Monitor Community Impacts.

Project Awareness, Meet Community and Discuss Project

The Project Proponents visited the Russas Project together and met with the local communities in June 2012, March-April 2013, June 2013, August 2013, May 2014, August 2014, and May 2017. Ilderlei Cordeiro also visited the communities in January 2014, July 2014, and March 2016. Ilderlei visited the Projects throughout 2015, but is unable to recall the exact months he visited. Ilderlei also hired SOS Amazonia which visited the communities on behalf of the Project Proponents at least 14 times throughout 2015 and 2016, with another 12 visits in 2017. Such visits included trainings and follow up visits on activities taught by SOS Amazonia including, but not limited to: banana production and management; preservation of turtles; agroforestry workshops; women's health and gender quality; organic horticulture courses; and small animal (e.g., chickens) breeding courses.

The communities are an essential component of the Russas Project and likewise, it has been absolutely necessary to openly and frequently discuss the Project with the communities.

Through meeting with the communities, the Project Proponents have been able to gain the communities' insights about project design and to better incorporate the communities into the Project. As a result, the community objective of generating sustainable economic opportunities and implementing social projects and programs will be best achieved with active, on-going participation and input from the local communities.

Throughout 2011 - 2016, the Russas Project was discussed in greater detail with the communities to ensure the communities were aware of the Russas Project, were able to contribute to the Project design, able to openly express desired outcomes and concerns, understood the third-party grievance procedure, and were able to voluntarily give free, prior and informed consent.

Community Meetings at the Russas Project (Photo Credit: Ilderlei Cordeiro)

Community members who wanted to join the Russas Project signed an "ata" on March 17, 2011. As of December 2013, the majority of community members residing within the Russas Project have either signed the "ata" or verbally agreed to join the project, with the first community members signing an initial "ata" on March 17, 2011, the Project Start Date. In addition, community members joining the Project were given a sign of recognition.

Russas Project Sign (Photo Credit: Brian McFarland)

Design and Implementation of Social Projects and Programs for Community

Social projects and programs for the local communities, which not only generate sustainable economic opportunities, will also result in: less pressure on the local forests; a reduction in deforestation; mitigation of greenhouse gas emissions; and the preservation of biodiversity.

Over the Project Lifetime, I.S.R.C. would like to further design and implement the following project activities, while some of these activities have already been implemented:

- Contract Project Manager
- Initiate Patrols of Deforestation by Boat
- Initiate Training and Agricultural Extension Courses for Communities
- Create Association to Process Açaí and Manioc Flour
- Help Communities Obtain Land Tenure
- Profit-Sharing of Carbon Credits
- Establish a Headquarters
- Improve Health Center and Dental Clinic

Contract Project Manager

Marmude Dene de Carvalho (“Marmude”) was contracted by Ilderlei in March 2011 as the Russas Project’s local project manager and to patrol for deforestation.

As the local project manager, Marmude worked as a partner in the Project, facilitating communication and transparency in community decisions. Marmude lived onsite and was able to visit the neighboring communities with relative ease. Furthermore, Marmude was responsible for ensuring social projects were implemented, assisted with the community and biodiversity monitoring plans, collaborated on the deforestation monitoring, and regularly communicated directly with I.S.R.C.

Local Project Manager and Patrollers (Photo Credit: Brian McFarland)

Project uniforms for both the Russas and Valparaiso Projects were purchased in July 2013. Also in July 2013, Marmude coordinated the placement of Russas and Valparaiso Project signs throughout the Project Zone.

Sadly, Marmude passed away on September 2, 2014. Prior to Marmude's passing, two volunteer local project coordinators (Maria de Fátima Dene de Carvalho and Nágila Deni Sarah) joined the Project in February 2014. After Marmude's passing, Fátima and Nágila stepped in to help out until a new local project manager, Willyan Deni Sarah, was contracted in May 2017. Fátima and Willyan are both based at the Project, while Nágila is based in Cruzeiro do Sul.

Initiate Patrols of Deforestation

Marmude was hired by Ilderlei in March 2011 to also patrol for deforestation. Informal monitoring of deforestation via boat began in March 2011 and takes place on a monthly basis along the Valparaiso and Jurua Rivers. Starting in 2017, Willyan Deni Sarah will officially monitor for deforestation and document each monitoring episode.

If and when deforestation is identified, I.S.R.C. will immediately document and transfer this information to Carbon Securities and CarbonCo. Collectively, CarbonCo and I.S.R.C. will discuss the appropriate actions to undertake to counteract any reported deforestation.

The monitors will write down observations in a notebook, document the community meetings, input this data into the monitoring template, and upload the document onto a shared DropBox account among the Project Proponents. The monitoring template includes:

- Name of Monitor
- Date of Monitor
- Communities Visited
- Meeting Notes with Community
- Grievances and Concerns of Community
- Location and Date of Deforestation
- Responsible Actor for Deforestation
- Observations Pertaining to Deforestation
- Biodiversity Observed
- Other Notes Related to the Project

The monitoring of deforestation helps the Project Proponents achieve both the climate and community objective. Thus, monitoring results in net GHG emission reductions because such activities provide an early detection of deforestation, while enabling the Project Proponents to identify the specific drivers and agents of deforestation and to implement the appropriate actions to mitigate such deforestation and the subsequent release of GHG emissions. Furthermore, the reduction in deforestation will provide diversified and alternative incomes to local communities via sharing of carbon credit revenue, and enables I.S.R.C. to implement a variety of social projects and programs (i.e., for example, to renovate the local health clinic, distribute mosquito nets, and hire SOS Amazonia for agricultural courses).

Initiate Training and Agricultural Extension Courses for Communities

The communities in and around the Russas Project were surveyed in March to May, 2013 to better understand which agricultural extension training courses would be of the most interest. A total of 33 courses, ranging from rotational pasture management to organic coconuts, were offered. The following are the results, which the top ten courses highlighted in yellow:

Overall Rank Order of Agricultural Training Courses for Russas-Valparaiso Projects (March and May 2013)			
	*Total of 54 Communities Surveyed (46 Inside Projects and 8 Inside Projects' Leakage Belt)		
	*Courses Highlighted in Yellow are the Courses with Overall Top-10 Interest		
	NOME DO CURSO (Name of Course)	Quero este (I Want This)	Total Percentage (Overall)
1	Brigada de Incêndio Florestal - Formação e Treinamento de... (Forest Fire Brigade - Education and Training...)	54	100.00%
2	Educação Ambiental Infantil (Children's Environmental Education)	54	100.00%
3	Mandioca - Cultivo de Mandioca (Cassava - Cultivation of Cassava)	52	96.30%
4	Floresta - Reposição Florestal (Forestry - Forestry Replacement)	52	96.30%
5	Peixes - Processamento Artesanal de Peixes (Fish - Artisanal Processing of Fish)	52	96.30%
6	Graviola - Produção de Graviola (Soursop - Production of Soursop)	51	94.44%
7	Milho - Produção em Pequenas Propriedades (Corn - Production on Small Areas)	51	94.44%
8	Sítio - Como Tornar sua Colônia Lucrativa (Site - How to Make Your Community Profitable)	51	94.44%
9	Banana - Produção de Bananas - Do Plantio a Pós-Venda (Banana - Production of Bananas - From Planting to After Sales)	49	90.74%
10	Frutas - Produção Comercial em Pequenas Áreas (Fruits - Commercial Production in Small Areas)	49	90.74%
11	Horta Caseira - Implantação e Cultivo (Household Garden - Deployment and Cultivation)	48	88.89%
12	Farmácia Viva - Utilização de Plantas Medicinais (Living Pharmacy - Use of Medicinal Plants)	47	87.04%
13	Nascentes - Recuperação e Conservação de Nascentes (Headwaters - Headwaters Conservation and Recovery)	47	87.04%
14	Galinha Caipira - Como Produzir Galinha e Frango Caipira (Redneck Chicken - How to Produce Chicken and Chicken Caipira	46	85.19%
15	Plantas Medicinais - Cultivo Orgânico de Plantas Medicinais (Medicinal Plants - Cultivating Organic Medicinal Plants)	45	83.33%
16	Banana - Receitas com Bananas (Bananas - Recipes with Bananas)	45	83.33%
17	Limão - Produção de Limão Taiti (Production of Limes)	42	77.78%
18	Apiário - Planejamento e Implantação de Apiário (criação de abelhas) (Apiary - Apiary Planning and Implementation (Beekeeping))	41	75.93%
19	Coco - Produção Orgânica de Coco (Coconut - Organic Production of Coconut)	39	72.22%
20	Rapadura, Melado e Açucar Mascavo - Como Produzir... (Brown Sugar and Molasses - How to Produce...)	39	72.22%
21	Manga - Produção de Manga (Mango - Production of Mangoes)	35	64.81%
22	Pimenta do Reino - Produção e Processamento (Pepper - Production and Processing)	35	64.81%
23	Suinos - Criação Orgânica de Suínos (Swine - Creation of Organic Pigs)	30	55.56%
24	Pimenta - Produção e Processamento de Pimenta (malagueta, etc.) (Pepper - Pepper Production and Processing (chili, etc.))	21	38.89%
25	Peixes - Técnicas de Processamento de Peixes (Fish - Fish Processing Techniques)	9	16.67%
26	Mandioca - Como Produzir Polvilho Azedo, Fécula, Farinha e Raspa (Cassava - How to Produce Sour, Starch, Flour and Zest)	8	14.81%
27	Floresta - Restauração Florestal (Forestry - Forestry Restoration)	7	12.96%
28	Pinhão Manso - Como Cultivar Pinhão Manso (biodiesel) (Jatropha - How To Grow Jatropha (biodiesel))	4	7.41%
29	Curso Produção de Palmito de Açaí (Production of Palmito of Açaí)	4	7.41%
30	Produção de Embutidos (Production of Embedded)	4	7.41%
31	Pastejo Rotacionado (Rotational Cattle Pastures)	3	5.56%
32	Produção de Defumados (Smoked / Cured Production)	3	5.56%
33	Serpentes - Criação de Serpentes (Snakes - Creation of Snakes (for venom))	0	0.00%

I.S.R.C. did, and will continue to, facilitate the teaching of these top-ten courses. I.S.R.C. engaged the State of Acre's CEFLORA (Centro de Formação e Tecnologia da Floresta or the Center for Training and Forest Technology), the Secretary of Small Business, the Secretary of Environmental Affairs for the Municipality of Cruzeiro do Sul, and local consultants to assist with onsite trainings to the communities in and near the Russas Project.

In July 2013, five courses were taught to the families living in the Russas Project and the Valparaiso Project along with families living in the leakage belt. A total of 27 people participated from the Russas Project, 34 people participated from the Valparaiso Project, and 40 people from the leakage belts participated. These five courses were the production of soursop (i.e., also known as graviola), passion fruit, banana, maize, and cassava. The courses also incorporated lessons on the control of pests and diseases through agro-ecological practices, the production of seedlings, and the use of traditional seeds. The courses were taught by the consultant Adair Pereira Duarte who is an environmental manager and specialist in agro-ecology.

Agricultural Extension Training Courses (Photo Credit: Ilderlei Cordeiro)

The communities are still using some of the knowledge obtained during the agricultural extension courses which were taught in July 2013. For example, some communities have started to plant corn and bananas (i.e., when they previously did not plant corn or bananas), while others have expanded their banana plantations.

Ilderlei then hired SOS Amazonia which visited the communities on behalf of the Project Proponents at least 14 times throughout 2015 and 2016, with another 12 visits in 2017. Such visits included agricultural trainings and follow up visits on these activities taught by SOS Amazonia including, but not limited to: banana production and management; agroforestry workshops; organic horticulture courses; and small animal (e.g., chickens) breeding courses.

Additional agricultural courses are planned for 2017 and 2018. For example, there are other agricultural techniques (e.g., planting pineapples and cocoa) that is being discussed with SOS Amazonia. Ilderlei Cordeiro, the manager of the Valparaiso Project and owner of the Russas Project, has already paid in advance for these agricultural courses and SOS Amazonia will engage the communities during these visits to bridge the understanding gap between receiving free agricultural extension courses, to improving crop yields with less deforestation, to the funding generated from forest conservation activities that help pay for the courses. Likewise, SOS Amazonia already added a "REDD+ teachings" package.

Agricultural extension trainings assist the Project Proponents achieve both the climate and community objectives of the Russas Project. These activities result in both net GHG emission reductions by reducing the communities' dependence on forest resources through intensifying agriculture and livestock, while also providing the communities with alternative incomes.

Create Association to Process Açaí and Manioc Flour

I.S.R.C. will create an association to give support to the communities' manioc houses based off local research of the individual manioc houses' needs. For example, the association could provide financial support if a manic house's motor breaks down, the association could assist improving production by mechanization of the land, and by increasing market access. The association will also do a one-time update to modernize the communities' manioc houses.

With respect to açaí, a local processing plant will be built to industrialize the açaí berries grown inside the Russas Project. This industrialization process will involve purchasing the açaí berries from local communities, transporting the raw berries to the local processing plant, process the açaí berries into açaí juice, and then transport the açaí juice to Cruzeiro do Sul for final sale to end consumers.

Açaí Processing Equipment (Photo Credit: Brian McFarland)

From March 2011 to December 2013, several initial steps were taken to eventually create this association to assist with the processing of acai and manioc flour. In March 2011, during the very early stages of designing the Project, many communities spoke of the large amount of acai which can be found in the region and that income from selling manioc flour was very important but more support was needed. In 2012, I.S.R.C. agreed to make the necessary investments to create an association to assist with the processing of acai and manioc flour when there is eventually revenue from the sale of carbon offset credits. From 2012 to 2013, the Project Proponents looked into the approximate costs to help process acai and manioc flour and the Project Proponents also looked at a model of processing acai in Cruzeiro do Sul. Furthermore, the Basic Necessity Surveys (BNSs) and the Participatory Rural Assessment (PRAs), which were conducted in March and April 2013, further confirmed the importance of acai and manioc flour.

One of the courses taught in July 2013 was about cassava (i.e., otherwise known as manioc). Such knowledge gained from the July 2013 course carried over into subsequent years and in 2017, Ilderlei will purchase several manioc flour kits for the local communities.

Help Communities Obtain Land Tenure

Community members that have been living on the land and who made the land productive (e.g., by growing agriculture or raising animals) for ten years have the right to be titled to land. I.S.R.C. will voluntarily recognize whatever area is currently deforested and under productive use by each family and up to the recommended size that a family in the State of Acre needs for a sustainable livelihood according to State and Federal laws. All communities, whether they join the Russas Project or not, will be titled the land they have put under productive use.

Between March 2011 and December 2013, Ilderlei spoke to the local families about the local families receiving land title. In addition, Ilderlei spoke with the director of ITERACRE, which is the State of Acre's Institute of Land, about land regulations of the residents. ITERACRE offered their services to be partners and the Project Proponents received a letter of support from ITERACRE for the Russas Project.

From 2014 to 2016, the Project Proponents gained insights into the titling process from another CarbonCo REDD+ Project in Acre. In 2017, Ilderlei will complete the Cadastro Ambiental Rural (CAR) registration process and begin work on granting title to the local communities. As of November 2017, the Rural Workers Union (STR-Cruzeiro do Sul) met the local communities in June 2017 about the Brazilian Revised Forest Code and titling of communities, Ilderlei met with the President and Vice President of STR-Cruzeiro do Sul in September 2017 to discuss how to address the communities concerns regarding the size and shape of their titles, and Ilderlei contracted a professional technician to work on the CAR for both the Russas and Valparaiso Projects, along with CARs for the local communities.

Saymo Justiniano da Silva, a trained professional in rural CARs, was hired on July 1, 2017 and intended to complete all the CAR measurements by December 1, 2017. Saymo has gone door-to-door to explain all aspects of land demarcation including discussion around the shape and size of the plots, discussion about the CCIR and CAR, discussion of land tenure laws and about what communities are able to do with their titles, and a brief discussion about REDD+ projects. Saymo will revisit the communities in May 2018 to make sure the communities are still aware of the titling process and land tenure laws.

It is important to note that the landowner may only be able to grant final, official land titles to the local communities upon obtaining a Certificado de Cadastro de Imóvel Rural (CCIR).

Helping communities obtain land tenure will assist the Project Proponents with facilitating the communities' sustainable economic opportunities. This formal recognition of the community's land tenure and the ability of communities to access credit (i.e., due to their property collateral) will reduce GHG emissions as communities will have greater responsibility and ownership over their land.

Profit-Sharing of Carbon Credits

Carbon revenue will be primarily used by I.S.R.C. to develop social projects and programs. Within the first five years, the community will start to receive from I.S.R.C. a small share of the payments for ecosystem services (i.e., carbon revenue) as a result of their assistance in achieving the social and environmental goals of the Russas Project. This revenue will be shared with the communities each time I.S.R.C. receives payment for its share of the verified emission reductions.

Although sharing carbon revenue with the local communities is a longer term activity, the Project Proponents – particularly I.S.R.C. – discussed with the communities that they would be eligible for a share of the carbon revenue in the future. In addition, the Project was designed and implemented throughout March 2011 to December 2016 which are necessary actions to eventually having a verified REDD+ project with issued carbon offset credits.

In 2017, Ilderlei Cordeiro will share a small portion of the carbon finance with the communities.

Carbon revenue primarily enables I.S.R.C. to implement social projects and programs, while the small portion of revenue shared with the communities will contribute both to slightly increased and diversified income for communities.

Establish a Headquarters

The Russas Project's initial headquarters is Marmude Dene de Carvalho's former house.

Marmude Dene de Carvalho's House (Photo Credit: Brian McFarland)

The initial plan was for I.S.R.C. to build a dedicated headquarters near Marmude's house at the beginning of the Valparaiso River. However, since Marmude's passing, Marmude's house has become the official headquarters and is voluntarily maintained by the volunteer Fátima. The headquarters provides: a place for visitors to sleep and eat; a small auditorium for presentations, community meetings and teaching courses; storage; a communication base with phone (in the future); and be located near the açaí processing plant (in the future).

At the beginning of the project design in early 2011, Ilderlei asked Marmude for permission to allow Marmude's house to serve as a provisional and unofficial headquarters. The role of this unofficial headquarters is to host visitors and to support residents such as hosting community meetings. From 2011 – 2013, Ilderlei spoke with Marmude about site identification for the eventual creation of a new, official headquarters and they also began to estimate the costs (i.e., approximately R$40,000) to establish the new headquarters. In June 2013, an addition was added to Marmude's house to better support the residents of the projects as well as to better receive visitors. In 2014, a shower and toilet were installed at the project headquarters. Furthermore, the headquarters was maintained throughout 2014, 2015, and 2016.

Building an office contributes to the community objective because the office will serve as a centralized headquarters and will facilitate I.S.R.C.'s social projects and programs.

Improve Health Center and Dental Clinic

I.S.R.C. is in the process of improving the local health center in order to provide residents and their families with preventive and curative medicine, including dental. I.S.R.C. has also facilitated the increased frequency of visits by doctors from Cruzeiro do Sul. Usually the doctors only stay for one or

two days, but I.S.R.C. will pay the doctors to stay longer and visit more families throughout the Project Zone.

Local Health Center at Russas and Valparaiso Projects (Photo Credit: Brian McFarland)

There were a few activities undertaken from March 2011 to December 2013. In 2013, Mr. Sebastião Melo de Carvalho was completing his Bachelor of Nursing program and expressed his desire to provide health services in the Valparaiso River Basin. Sebastião spoke of the need to implement a program of oral prevention in the Russas and Valparaiso Projects by donating toothbrushes and toothpaste to the schools. Ilderlei realized the importance of these initiatives and talked to local families about incorporating this into the Project design.

Between July 20 and 24, 2014, Sebastião coordinated the action and taught basic healthcare information that was attended by 400 people, including many children and young adults, and distributed dozens of dental kits to children. Furthermore, Ilderlei and Sebastião distributed mosquito nets throughout the Russas-Valparaiso Projects to help combat malaria in the Juruá River Basin. Sebastião completed his Bachelor of Nursing degree program and will be helping in the future with the Project.

Ilderlei is now installing 14 restrooms with the plan to build more of these restrooms throughout the Projects. In addition, Ilderlei began rennovations in 2016 of the local health center (renovations were completed in 2017) and Ilderlei would like to hire Sebastião, who has since completed his nursing degree, to work at the Russas and Valparaiso Projects.

The health center and dental clinic is also relevant to the community objective because this is another main social project that I.S.R.C. would like to facilitate. The clinics will ultimately improve health, life quality, and increase life expectancies which will result in more productive community members.

Develop Community Monitoring Plan and Monitor Community Impacts

The community monitoring plan essentially helps the Project Proponents better understand if the social projects and programs for the communities were able to generate sustainable economic opportunities and overall positive outputs, outcomes and impacts. The initial and full community impact monitoring plans were designed between March 17, 2011 and December 31, 2013 and the community monitoring plans were made publicly available in July 2013.

The Participatory Rural Assessment (PRA) and the Basic Necessity Survey (BNS), which were used to develop the community impact monitoring plan, were administered in March and April 2013. The second PRA was administered in May 2014 and the third PRA was administered in March 2017, while the second BNS was administered in May 2017.

Major Biodiversity Objective

To preserve the Project's rich biodiversity, the Project Proponents will continue to generate sustainable economic opportunities for the local communities and implement local social projects with the goal of addressing the underlying causes of deforestation and reducing the release of GHGs. In addition, the Project Proponents rapidly assessed biodiversity on the Project and developed a biodiversity monitoring plan.

Rapidly Assess Biodiversity on Project

A rapid assessment of the Project Zone's biodiversity was conducted in March and April 2013. This included background research along with meeting local organizations such as S.O.S. Amazônia and the Secretariat of Environmental Affairs for the Municipality of Cruzeiro do Sul about biodiversity in the Juruá and Valparaiso River Basin. This rapid assessment of biodiversity contributes to the objective of preserving the Project's rich biodiversity by providing an understanding of what flora and fauna potentially exist within the Project Zone.

Develop Biodiversity Monitoring Plan and Monitor Biodiversity Impacts

The biodiversity monitoring plan essentially helps the Project Proponents better understand if the climate and community objectives are aligned with preserving the Project's rich biodiversity.

The initial and full biodiversity monitoring plans were designed between March 17, 2011 and December 31, 2013 and the biodiversity monitoring plans were made publicly available in July 2013.

Wildlife cameras were deployed to the Purus Project, which is another REDD+ project in the State of Acre, Brazil being implemented by CarbonCo and Carbon Securities, and this provided many lessons learned for CarbonCo and Carbon Securities. This includes identifying local partners, proper placement of wildlife cameras, the quality of photographs to be expected, and the type of preventative maintenance to be conducted. These wildlife cameras were then deployed to the Russas-Valparaiso Projects from August 2014 to July 2015. Andre Botelho and Kidney Cunha da Aires were contracted to assist with the installation of the wildlife cameras and to analyze the images. Andre's classmate Luiz Henrique Medeiros Borges also assisted with the installation. Andre presented a poster in September and October 2015 entitled, "Composition and Relative Abundance of Medium and Large Mammals in REDD+ areas in Acre"

at the 8th Brazilian Congress of Mammalogy, held in João Pessoa (the capital city of Paraíba). Andre then completed his final report for the Russas-Valparaiso Projects wildlife camera study with his final analysis in December 2015. Furthermore, the Project Proponents have reviewed satellite imagery from 2011 to 2016 to monitor forest cover change.

2.4 Management of Risks to Project Benefits (G3)

Between March 2011 and December 2013, the Project Proponents conducted an extensive risk analysis and identified potential natural, anthropogenic and project risks to the climate, community and biodiversity benefits of the Russas Project. The overall risks associated with the Russas Project are considered low and justify a low Verified Carbon Standard buffer reserve established for any verified emission reductions which are issued.

Natural Risks

Although no natural risks are known to have significantly impacted the Russas Project between March 2011 and December 2016, the following are some potential natural risks that could impact the Russas Project:

- Seedling, sapling and tree survival
- Drought and flooding
- Severe weather
- Forest fire
- Disease, invasive species, and/or pest infestations

Due to the fact that the Russas Project is primarily a conservation project, there is limited risk of seedling, sapling and tree survival because reforestation is not the major climate objective. While there will be some reforestation activities, the carbon sequestration of these activities will not be counted towards the generation of verified emission reductions.

With respect to drought and flooding, the Juruá River Basin is a wetland ecosystem where the native habitat thrives under periodically flooded conditions. Drought does not have a direct effect on existing forest carbon stocks, but instead can increase the severity of forest fires and hence is covered below in the section on fire risk. Being a tropical climate, the Russas Project is not prone to snowstorms and there are no volcanoes in the general vicinity. Furthermore, the State of Acre historically has not experienced hurricanes, monsoons, or tornadoes with only minimal effects from past earthquakes in Peru and Chile.[7]

Another risk to the Russas Project is a forest fire. Forest fire historically has not been a problem in the Project Area. Most of the Project Area is un-fragmented forest, with few areas of bordering pasture/non-

[7] Center for Weather Prediction and Climate Studies, “Home,” Available: http://www1.cptec.inpe.br/
National Observatory, “Seismic Data,” mhttp://www.on.br/conteudo/modelo.php?endereco=servicos/servicos.html

forest. Most forest fires that occur in the region are anthropogenic, and thus sources of fire outbreaks in the Project Area are limited.

Incidence of fire in the Amazon has increased with recent severe droughts of 1998, 2005 and 2010. While drought conditions facilitate forest fire, fire still requires sufficient fuel loads (typically produced from previous disturbance) and an ignition source, both of which can reasonably be assumed to be less (and by extension, fire incidence should be less) in the large, intact block of forest at the Project (and maintained through project-funded protection activities) than in the surrounding land use matrix. Aragao and Shimbukuro (2010) show that the state of Acre, which has large blocks of intact forest, has no observed increase in fire incidence from 1998 to 2006, as compared with more developed and impacted areas of the Eastern and Central Amazon (e.g. Para, Mato Grosso, Rondonia and Maranhao).[8] Consequently, the rates of fire incidence referenced in the Project's VCS risk report (Cochrane and Laurance 2002), based on data from Para state, should be considered overestimates of expected incidence in Acre, and therefore conservative.

Aragao and Shimbukuro (2010) further observe that "fire-free land-management can substantially reduce fire incidence by as much as 69%." The state of Acre, as part of its State System of Incentives for Environmental Services (SISA), has instituted state-wide fire control and monitoring activities since 2010, and should be expected to show results similar to those areas of fire-free land-management witnessed (between 1998 and 2006) by Aragao and Shimbukuro. The Project Area should be expected to benefit in terms of reduced fire risk from decreased fire incidence and proximal ignition sources in the surrounding land use matrix.

Furthermore in a study[9] of fires in the Amazon, Cochrane and Laurance documented a relationship between fire incidence and distance from forest edge, with decreasing fire return intervals with increasing distance from edge. They also found that effects of forest fires depend on the extent and condition of fuel sources. In general, drought conditions need to be present prior to the initiation of rainforest fires. While initial fires can have a significant effect on the smaller diameter (<40 cm dbh) trees, it is only with subsequent burns, that significant losses (mortality of up to 40% of trees) of forest biomass can be expected[10]. Despite fire induced tree mortality, tree mortality itself is unlikely to result in the loss of substantial biomass due to incomplete combustion of live aboveground biomass. Biomass is merely transferred from the live biomass to dead biomass pool, which is also accounted for in this project.

Further as fire is unlikely to affect the whole Project Area, the significance of any single fire event is likely to be minor and result in less than 25% loss in carbon stocks in the Project Area.

The Cochrane and Laurance study[11] mentioned above, calculated a fire return intervals in another part of the Amazon as 10 to 15 years. While the agents of deforestation (and fire) are similar between region of the study (Para) and the project region (Acre), deforestation rates and likely incidences of fire are greater

[8] Luiz E. O. C. Aragão and Yosio E. Shimabukuro, "The Incidence of Fire in Amazonian Forests with Implications for REDD." *Science* 328, 1275 (2010); DOI: 10.1126/science.1186925

[9] Cochrane M.A.& Laurance W.F., 2002. Fire as a large-scale edge effect in Amazonian forests, Journal Of Tropical Ecology, 18:311-325.

[10] Cochrane M.A., Alencar A., Schulze M.D., Souza C.M., Nepstad D.C., Lefebvre P. & Davidson E.A., 1999. Positive feedbacks in the fire dynamic of closed canopy tropical forests, Science, 284(5421):1832-1835.
Cochrane M.A.& Schulze M.D., 1999. Fire as a recurrent event in tropical forests of the eastern Amazon: Effects on forest structure, biomass, and species composition, Biotropica, 31(1):2-16.

[11] Cochrane M.A.& Laurance W.F., 2002. Fire as a large-scale edge effect in Amazonian forests, Journal of Tropical Ecology, 18:311-325.

in Para. This fire return interval therefore is likely to represent a conservative estimate of the fire return interval in the project region with the actual interval likely being longer than 15 years.

It is also important to note that the State of Acre has some of the highest precipitation levels in the world with annual rainfall ranges from 1,600 – 2,750 millimeters (i.e., approximately 63 – 108 inches).[12]

With regard to disease, invasive species and insect infestation, Brazil's Department of the Environment has approved a permanent technical committee known as the National Biodiversity Commission (CONABIO) which carefully monitors these developments.[13] The Project Proponents are aware that the Global Invasive Species Database, which is managed by the Invasive Species Specialist Group of the International Union for Conservation of Nature's Species Survival Commission, has identified 62 natural forest species which are either native to Brazil and act as an invasive species elsewhere or are native species elsewhere and are considered invasive species within Brazil.[14] Furthermore, three species native to Brazil (i.e., and which are considered invasive species elsewhere) are on the Global Invasive Species Database's 100 of the World's Worst Invasive Alien Species List.[15] The Project Proponents will carefully monitor any invasive species known to exist in Acre and will not extract any known species from the Project that are considered native species but which are invasive species elsewhere. For more information on the risk of invasive species, please see the VCS Non-Permanence Risk Assessment.

Anthropogenic Risks

Although no anthropogenic risks are known to have significantly impacted the Russas Project between March 2011 and December 2013, the following are some potential anthropogenic risks that could impact the Russas Project:

- Illegal logging
- Illegal hunting of endangered fauna
- Illegal collection of endangered flora (i.e., biopiracy)
- Human-induced fires
- Expansion of Lua Clara Ramal into Project Area

The Project Proponents will regularly monitor the climate, community and biodiversity objectives of the Project and thus, will be able to identify early on if there are illegal logging or hunting activities taking place.

To mitigate the risk of the Lua Clara Ramal, which is located to the Northeast of the Russas Project, expanding into the Project Area and increasing deforestation, Ilderlei Cordeiro has frequently engaged the communities living at the end of the Ramal. This includes designing the Project in consultation with

[12] State Government of Acre Portal, "Geographic Data,"
[13] National Biodiversity Commission, "Technical Committee," Available: http://www.mma.gov.br/sitio/index.php?ido=conteudo.monta&idEstrutura=15&idConteudo=7474&idMenu=368
[14] Global Invasive Species Database, "Alien Species," Available: http://www.issg.org/database/species/search.asp?sts=sss&st=sss&fr=1&sn=&rn=brazil&hci=1&ei=-1&lang=EN&Image1.x=30&Image1.y=10
[15] Global Invasive Species Database, "100 of the World's Worst Invasive Alien Species List," Available: http://www.issg.org/database/species/search.asp?st=100ss&fr=1&str=&lang=EN

these communities, offering agricultural extension training courses, and keeping the communities informed about the Project. In addition, the Project Proponents will continue to monitor deforestation within the leakage belt and will continue to engage the communities throughout the Project Lifetime.

Project Risks

Although no project risks are known to have significantly impacted the Russas Project between March 2011 and December 2016, the following are a few of the potential future project risks identified by the Project Proponents:

- A fixed plot of land per family is given, but an increasing family population results in less land per capita.
- As incomes increase, the use of illicit drugs, alcoholism and violence might increase.
- "An influx of relatively large cash sums in areas with weak governance or where local organizations lack appropriate systems runs the risks of mismanagement, corruption, and 'elite capture'."[16]
- "Increased land speculation or in-migration, thus creating conditions for increased competition and social conflict within and between communities."[17]
- State of Acre's CEFLORA (Centro de Formação e Tecnologia da Floresta or Center for Training and Forest Technology), the Secretary of Environmental Affairs for the Municipality of Cruzeiro do Sul and/or local consultants might not be effective at providing agricultural extension to communities.
- If many communities throughout the Project Area start producing the same crop, the price might fall due to supply-demand mismatch; similarly, the price of carbon could fall.
- The adjacent Valparaiso Project might fail which would reduce the payments to Ilderlei who would be unable to develop social projects and programs for both Projects.
- The institutions IBAMA (Instituto Brasileiro do Meio Ambiente e dos Recursos Naturais Renováveis), IMAC (Instituto de Meio Ambiente do Acre) and/or the police department are unable to stop deforestation if their services are requested.

To address these aforementioned risks, the Project Proponents met in June 2013 to develop mitigation plans. These risks were periodically reviewed in 2014, 2015 and 2016.

As previously discussed, community members that have been living on the land and who made the land productive (e.g., by growing agriculture or raising animals) for ten years, have the right to be titled.

[16] Richards, M. 2011. Social and Biodiversity Impact Assessment (SBIA) Manual for REDD+ Projects: Part 2 – Social Impact Assessment Toolbox. Climate, Community & Biodiversity Alliance and Forest Trends with Rainforest Alliance and Fauna & Flora International. Washington, DC. Page 6.
[17] Richards, M. 2011. Social and Biodiversity Impact Assessment (SBIA) Manual for REDD+ Projects: Part 2 – Social Impact Assessment Toolbox. Climate, Community & Biodiversity Alliance and Forest Trends with Rainforest Alliance and Fauna & Flora International. Washington, DC. Page 6.

I.S.R.C. will voluntarily recognize whatever area is currently deforested and under productive use by each family.

In addition, the parcel granted to the community will be combined with improved agricultural techniques. Furthermore, job creation should allow for less dependency on the land.

The communities are religious and regularly attend church. The church educates the communities about the social problems surrounding illicit drugs, alcoholism and family violence. If worse comes to worse, there are federal and civil police who will take care of illicit drug use and violence.

To minimize the chances of corruption and 'elite capture,' I.S.R.C. has a few policies in place. First, the Project Proponents will encourage community-wide participation and will try to always include all the communities. For example, everyone will be given an equal opportunity to attend agricultural classes and all benefits (e.g., access to health clinic and access to manioc flour house) will be offered to everyone. Second, the Project will specifically target poorer communities to further reduce the chances of elite capture. Third, the Basic Necessities Survey (BNS) will be regularly administered (with the initial BNS administered in March and April 2013) to enable the rapid detection of elite capture by monitoring the distribution of assets, inequality and poverty. Lastly, if increased inequality is identified and attributed to the Project, the Project Proponents will conduct a root cause analysis to determine the underlying cause and using adaptive management, the Project Proponents will modify the Project accordingly. Thus as an overall principle, the Russas Project will not allow corruption or elite capture.

Agricultural training courses will be offered to surrounding communities as one method to counteract potential in-migration and the initial five courses, which were offered to families in the leakage belt, were already taught in July 2013. Some of the Project's benefits (for example, access to health clinic) will be offered to surrounding communities. Ultimately, the Russas Project is privately-owned land and in-migration will not be allowed. The deforestation monitoring plan will ensure the rapid identification and resolution of in-migration. The census conducted by Ilderlei has documented everyone currently living in the Russas Project and the titling of land to the communities will incentivize the communities to not allow in-migration.

State of Acre's CEFLORA (Centro de Formação e Tecnologia da Floresta or Center for Training and Forest Technology), the Secretary of Environmental Affairs for the Municipality of Cruzeiro do Sul and local consultants are experts at providing agricultural extension trainings and thus, the risk of their efforts failing is minimal.

The overall crop production among communities is relatively small and should not create a downward pressure on prices of a given crop throughout the Project Zone. Diversity of crop production should act as an insurance mechanism against the price drop of a given crop. If carbon prices fall, the Project Proponents will seek alternative sources of funding to continue the Project and compliment the then-reduced funding from carbon finance.

The adjacent Valparaiso Project might fail which would reduce the payments to Ilderlei who would be unable to develop social projects and programs for both Projects. The Project Proponents, particularly Carbon Securities and CarbonCo, have experience implementing REDD+ projects in Acre, Brazil and the local communities at both the Russas and Valparaiso Projects are excited to participate which makes project failure less likely.

With respect to the institutions IBAMA, IMAC, and the police department being unable to stop deforestation if their services are requested, Ilderlei has already spoken with these institutions, the municipality of Cruzeiro do Sul and the State of Acre support REDD+ projects, and the institutions' missions are in part to stop deforestation.

For a more extensive identification of risks and mitigation strategies (i.e., measures to address these climate, community and biodiversity risks), please see the VCS Non-Permanence Risk Assessment.

Describe Measures to Maintain and Enhance the Benefits beyond the Project Lifetime

There are a variety of measures, both in place and planned, to ensure the Russas Project's climate, community and biodiversity benefits are maintained and enhanced beyond the Project Lifetime. This includes:

- The Tri-Party Agreement's Longevity
- Creation of I.S.R.C. Investimentos e Acessória LTDA
- Social Projects
- Education and Outreach
- Legalization of Community Land Tenure

Tri-Party Agreement's Longevity

As described in section G3. Project Design and Goals, subsection 4. Project Timeframe, the Tri-Party Agreement between CarbonCo, Carbon Securities and Ilderlei Souza Rodrigues Cordeiro stipulates a minimum 60-year Project Lifetime, followed by two renewable terms of 25-years each. Within these contractual time periods, the initial Project Crediting Period will be for 30-years which started on March 17, 2011 and ends on March 16, 2041. While the Russas Project's Project Lifetime is 60-years, the Project Proponents are committed to maintaining forest cover within the Russas Project beyond both the Project Crediting Period and the initial Project Lifetime.

Both the Tri-Party Agreement and the Project Design Documents (PDDs) will be filed at the Brazilian Registry Office to ensure the Russas Project remains with the property even if the property is sold. Furthermore, the Project and its PDDs (both VCS and CCBS) will be registered with the State of Acre's Climate Change Institute (IMC).

Creation of I.S.R.C. Investimentos e Acessória LTDA

Ilderlei Souza Rodrigues Cordeiro created the legal entity I.S.R.C. Investimentos e Acessória LTDA ("I.S.R.C.") to specifically ensure the Russas Project is managed beyond his lifetime.

Social Projects

The social projects were designed – such as agricultural trainings and granting land titles - to provide long-lasting climate, community and biodiversity benefits beyond the Project Lifetime.

Education and Outreach

There are a variety of education and outreach activities which will both maintain and enhance the climate, community and biodiversity benefits beyond the Project Lifetime. In addition, it is the Project Proponents' hope that such benefits will not only extend temporally (i.e., beyond the Project Lifetime), but also in a spatial manner (i.e., beyond Project Zone, across State of Acre, across the country of Brazil and internationally). Such education and outreach activities which took place between March 2011 and December 2016 include, but are not limited to the following:

- Working with local contractors (further knowledge on how to develop elements of REDD+ projects);
- Landowner spreading the word beyond the Project to other landowners;
- Informing the State of Acre how REDD+ projects on privately-owned lands can work alongside the State of Acre's work;
- Carbonfund.org educating donors and the general public on the importance of supporting forest conservation projects;
- Ilderlei Cordeiro speaking to a wide-range of stakeholders about REDD+ projects;
- Brian McFarland's numerous presentations (Yale University, State of Forest Carbon Markets, US-China Council, Cornell University, etc.);
- Ilderlei hired SOS Amazonia which visited the communities on behalf of the Project Proponents at least 14 times throughout 2015 and 2016, with another 12 visits in 2017. Such visits included agricultural trainings and follow up visits on these activities taught by SOS Amazonia including, but not limited to: banana production and management; agroforestry workshops; organic horticulture courses; and small animal (e.g., chickens) breeding courses; and
- Wildlife cameras and education.

For a more comprehensive list of the Project's education and outreach activities, please see section 2.8, entitled Stakeholders.

Legalization of Community Land Tenure

The legalization of the community land tenure will continue in perpetuity.

2.5 Measures to Maintain High Conservation Values (G3)

The precautionary principal – as defined in the Preamble to the Convention on Biological Diversity – is "that where there is a threat of significant reduction or loss of biological diversity, lack of full scientific certainty should not be used as a reason for postponing measures to avoid or minimize such a threat."[18]

The Russas Project has several qualifying attributes of High Conservation Values (HCVs) and this includes possibly threatened species, threatened or rare ecosystems, critical ecosystem services, and a direct importance to the local communities living within the Project.

The Russas Project, with a primary objective of mitigating deforestation, will at the very least maintain – if not enhance – these high conservation value attributes. Specific measures to ensure the maintenance or enhancement of HCV attributes include the integration of HCVs into the Russas Project, along with training programs and monitoring plans which incorporate HCVs.[19] For example, the Russas Project Proponents have:

- Integrated HCVs into the Russas Project's main objectives. This includes preserving the Project's biodiversity and mitigating deforestation despite limited understanding of the Project's threatened and rare species, along with potential endemic species.
- Planned on eventually training the communities to assist with monitoring biodiversity with wildlife camera traps. In addition, the Project Proponents will focus additional conservation measures in areas where threatened and/or endemic species are identified.
- Monitored deforestation and community impacts and began to undertake actions to mitigate deforestation of the Project's threatened and rare ecosystems.

By maintaining forest cover and mitigating deforestation, this will facilitate water cycling, filtration and storage along with oxygen production. In addition, maintaining forest cover will maintain habitat for biodiversity and promote wildlife activities such as pollination.

2.6 Project Financing (G3 & G4)

Carbonfund.org Foundation has funded 70+ carbon reduction and tree-planting projects including the co-development and co-financing of several forest carbon projects. Thus, Carbonfund.org's wholly-owned subsidiary CarbonCo is well aware of the financial mechanisms required for successful project implementation and it is important to note that CarbonCo financed the Purus Project, which is the first-ever REDD+ project in Acre, Brazil to achieve dual VCS-CCB validation and verification.

A detailed pro forma for the Project's initial 30-year crediting period was developed and is periodically revised. Furthermore, Carbonfund.org's Internal Revenue Service (IRS) Form 990 – which demonstrates the organization's financial health - is publicly available.

[18] Convention on Biological Diversity, "Preamble," Available: http://www.cbd.int/convention/articles/?a=cbd-00
[19] HCV Resource Network, "Part 3: Identifying and managing High Conservation Values Forests, a guide for forest managers," Available: http://www.hcvnetwork.org/resources/global-hcv-toolkits/hcvf-toolkit-part-3.pdf

The primary source of financing for the Russas Project will come from Carbonfund.org's existing unrestricted funding, potential in-kind donations and grants, along with the sale of verified carbon units (VCUs).

Document the Financial Health of the Implementing Organization(s)

Carbonfund.org provided financial resources to its wholly-owned subsidiary CarbonCo to implement REDD+ projects and particularly the Russas Project.

Carbonfund.org's independently audited IRS Form 990s are publicly available and document Carbonfund.org's financial health. To learn more, see GuideStar.

CarbonCo successfully financed the Purus Project and is thus, well-aware of the financial resources required for the Russas Project. Furthermore, contractual agreements outlining the financial arrangement between the Project Proponents, along with detailed pro formas, were provided to the independent auditors of the Project.

2.7 Employment Opportunities and Worker Safety (G4)

The Project Proponents hire locally as much as possible. This includes CarbonCo hiring TECMAN, Professor Willian Flores, the biologists Andre Botelho and Luiz Henrique Medeiros Borges, and the biologist assistant Kidney da Cunha Aires who all reside in Rio Branco. Ilderlei Cordeiro hired local monitors, local project managers and coordinators, and the nurse Sebastião Melo de Carvalho from the community, and also hired a consultant and SOS Amazonia (based in Rio Branco) to assist with the agricultural extension training courses. These positions are filled by engaging the Project Proponents' network and engaging stakeholders to identify the most qualified firms and/or individuals. Although these firms and/or individuals are selected based off merit, substantial orientation and training was provided.

The Russas Project Proponents provided orientation and training for the Project's employees and community members. Between March 2011 and December 2016, orientation and trainings included:

- Ilderlei met with the local communities for over five years to provide orientation to the Russas Project and conservation activities.
- CarbonCo, Carbon Securities and TerraCarbon had a kick-off meeting and orientation in August 2011 with TECMAN and Professor Flores prior to initiating the forest carbon inventory and regional deforestation modelling.
- TerraCarbon provided both classroom and field training, along with a standard operating procedure (i.e., in Portuguese and English) for TECMAN's forest carbon inventory and provided an online, refresher training for TECMAN in January 2013.
- Five agricultural extension training courses (soursop, passion fruit, banana, maize, and cassava) took place in July 2013 with more planned in 2017.Ilderlei provide informal training to Marmude about how to monitor for deforestation, monitor for fire, and how to monitor for illegal logging and fishing. Additional training and orientation is given on a monthly basis to the new project manager Willyan, along with the volunteer local project coordinators Fátima and Nágila. Ilderlei's support included passing on knowledge Marmude had to Fatima, Nagila

and Willyan, thus maintaining, building on and expanding local capacity. It is important to note that Fatima, Nagila and Willian are a part of the community as Fatima lives at the communities, while both Nagila and Willyan were raised at the communities. The trainings they have received and knowledge they have gained, formally and informally, is local capacity for the communities. They also, as community members, readily share their knowledge with their neighbors.

- Willyan, the new local project manager, received specialized training on REDD+ from the State of Acre's Climate Change Institute.

- Assistance from Luiz Henrique Medeiros Borges to train the Project Proponents and local communities on proper techniques for wildlife cameras and biodiversity monitoring.

- Training for Sebastião as a nurse (i.e., he received training for his Bachelor of Nursing program and then Sebastião provided training to local communities for dental kits).

- Project Proponents have provided orientation to stakeholders, particularly through Brian McFarland's presentations.

- SOS Amazonia has provided lots of training and orientation to the local communities, including about REDD+, from 2011 to 2017. For instance, SOS Amazonia visited the communities on behalf of the Project Proponents at least 14 times throughout 2015 and 2016, with another 12 visits in 2017. Such visits included agricultural trainings and follow up visits on these activities taught by SOS Amazonia including, but not limited to: banana production and management; agroforestry workshops; organic horticulture courses; and small animal (e.g., chickens) breeding courses.

Furthermore, I.S.R.C. will assist with training new workers when there is staff turnover.

Community Involvement

The Russas Project Proponents recognize the communities are a central element to the Russas Project's success and to achieve the Project's objective, the communities will be given an equal opportunity to fill all employment positions.

Between March 2011 and December 2016, the communities were involved in the Russas Project by:

- Acting as guides;

- Providing lodging, food and transportation services;

- Hired as local project manager, local project coordinators, and to monitor for deforestation;

- Choosing the particular crops and techniques they would like to learn more about;

- Discussing the Project design, benefits of the project, how they would like to participate;

- Retrieval of biodiversity monitoring data.

As the Russas Project proceeds, the communities will eventually be considered for a variety of roles and employment opportunities such as:

- Additional local, on-the-ground monitors for deforestation;
- Participation in cooperative agricultural projects;
- Working internal jobs at the Project site (for example: working at the açaí processing plant, maintain the Project's headquarters, and to provide transportation services);
- Nurse for health and dental clinic.

These positions are advertised in advance via radio announcements and by going door-to-door. Under-represented groups, such as women and young adults, will be given a fair chance to participate in any employment positions. Radio announcements will be targeted to all families living throughout the Project Zone and door-to-door visits will ensure all family members (i.e., both men and women, as well as young adults) are aware of the positions.

Comprehensively Assess Situations and Occupations that Pose Substantial Risk to Worker Safety

Between March 2011 and December 2013, the Russas Project Proponents comprehensively assessed the situations and particular occupations that could pose risks to worker safety. The Project Proponents will continue to inform workers of such risks, explain how to minimize such risks, and the Project Proponents will use best work practices. For instance, Nágila, Fátima, and Willyan were specifically informed about these risks via an occupational risks and hazards document prepared by CarbonCo. This said, the Project Proponents periodically review these risks and update as necessary.

The main potential risks to workers identified by the Project Proponents include:

- Drowning;
- Heat Exhaustion and Dehydration;
- Getting lost in Remote Forest;
- Venomous Snake Bites;
- Tropical Diseases.

<u>Drowning</u>

It is important to note, that all boats travel relatively slow on the Valparaiso and Juruá Rivers, many participants know how to swim, and life preservers are always onboard in case a boat does happen to capsize.

Heat Exhaustion and Dehydration

Workers and Project Proponents are familiar with tropical rainforests (for example, high levels of humidity and tropical temperatures) and prepare for each trip with sufficient food and water.

Getting Lost

Global positioning systems (GPS) are used during trips into the deep forest to minimize the risk of getting lost. Local guides from the community and the Russas Project Landowner's familiarity with the area also helps to minimize the chances of getting lost.

Venomous Snake Bites

The most substantial risk to workers, particularly TECMAN's employees during the forest carbon inventory, was the potential encounter with venomous snake bites. Snake bites are relatively common in South America[20] and specifically within the State of Acre.[21] The snake species of greatest concern are the fer-de-lance (*Bothrops atrox*) and the South American bushmaster (*Lachesis muta*).[22] To mitigate such risk, all TECMAN's employees were equipped with and required to wear protective snake chaps. There are also many poisonous spiders and scorpions in tropical rainforests.

TECMAN's Employees with Snake Chaps (Photo Credit: Brian McFarland)

Worker safety is of the highest importance. For TECMAN's forest carbon inventory work, there was a discussion of safety procedures and TECMAN has a safety manual entitled, Procedimentos de Segurança em Campo (Field Safety Procedures).

[20] J.-P. Chippaux. "Reviews/Analyses," Available: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2305789/pdf/bullwho00388-0084.pdf
[21] Pierini SV et al., "High incidence of bites and stings by snakes and other animals among rubber tappers and Amazonian Indians of the Juruá Valley, Acre State, Brazil,"
[22] Fabiano Waldez and Richard C. Vogt, "Ecological and epidemiological aspects of snakebites in riverside communities of the lower Juruá River, Amazonas, Brazil," Available: http://piagacu.org.br/?attachment_id=416

Tropical Diseases

There are many tropical diseases in Acre, Brazil such as malaria, yellow fever and chagas disease. The Project Proponents are encouraged to get yellow fever vaccinations, malaria pills are available, and mosquito nets are frequently used. In addition, Ilderlei and Sebastião Melo de Carvalho helped distribute mosquito nets throughout the Project Zone, which should assist with malaria prevention.

2.8 Stakeholders (G3)

Between March 2011 and December 2013, the Project Proponents conducted an extensive stakeholder identification and stakeholder engagement or involvement process. For a comprehensive list of the Russas Project's stakeholders, please refer to Appendix A, Stakeholder Identification of the validated CCBS PDD.

Stakeholders were primarily analyzed based off their influence and importance and then categorized according to: Project Proponents, Community and Primary Stakeholders; Secondary Stakeholders; and Other Stakeholders.

These following stakeholders, considered primary and secondary stakeholders, were involved in project design to optimize climate, community and biodiversity benefits while ensuring the Russas Project was properly aligned with the State of Acre. Consultations with all stakeholders, but especially these following stakeholders, shall continue throughout the Project Lifetime:

- I.S.R.C. Investimentos e Acessória LTDA, specifically Ilderlei Souza Rodrigues Cordeiro
- Communities living within the Russas Project
- Carbonfund.org Foundation, Inc. and CarbonCo, LLC
- Freitas Group International LLC and Carbon Securities
- TerraCarbon
- TECMAN LTDA
- Professor Antonio Willian Flores de Melo of UFAC
- Landowner and Communities living around the Russas Project, particularly the Valparaiso Project
- State of Acre, particularly the:
    - Climate Change Institute of Acre (IMC)
    - State of Acre's CEFLORA (Centro de Formação e Tecnologia da Floresta or the Center for Training and Forest Technology)
    - The Secretary of Small Business

- The Secretary of Environmental Affairs for the Municipality of Cruzeiro do Sul

- State of California
  - California Air Resources Board (ARB)
  - REDD Offset Working Group (ROW)
  - Governors' Climate and Forest Task Force
- Environmental Services, Inc. (ESI), the Project's former auditor
- IMAFLORA, the Project's newest auditor
- Verified Carbon Standard Association
- Climate, Community and Biodiversity Alliance
- Rural Worker's Union (STR in Portuguese) of Cruzeiro do Sul
- SOS Amazonia

It is important to note that the Project Proponents used socially and culturally appropriate methods for stakeholder consultations and these stakeholder consultations were inclusive of gender, inter-generations, and language. High conservation values were also respected, along with local customs and values. In addition, meetings often took place at the most convenient locations (for example, at the communities instead of in Rio Branco) for stakeholders.

A brief summary of project meetings and stakeholder comments have been provided below which took place during the monitoring and reporting periods from March 17, 2011 to December 31, 2016.

March 9-18, 2011 - CarbonCo, Carbon Securities and TerraCarbon traveled to Acre, Brazil to better understand how to implement REDD+ projects in Acre, Brazil. A few key milestones included:

- CarbonCo, Carbon Securities and TerraCarbon held initial meetings with PESACRE (Grupo de Pesquisa e Extensão em Sistemas Agroflorestais do Acre), IPAM (Instituto de Pesquisa Ambiental da Amazônia), FUNTAC (Fundacao de Tecnologia do Estado do Acre), and SISA (System of Incentives for Environmental Services) to gain an understanding of the agents and drivers of deforestation in Acre state, how forest biomass stocks vary across the state, and local REDD+ and forest conservation initiatives;
- Carbon Securities and TerraCarbon met with Acre State Officials, including Monica Julissa De Los Rios de Leal and Eufran Amaral, on Friday, March 18th.
- The Purus Project's design, which would later influence how the Russas Project was designed, was revised based off this initial site visit in March 2011. For example, the Project Proponents: began to design the Project around the identified drivers and agents of deforestation (i.e., selection of appropriate VCS methodology); chose the source of satellite

imagery (i.e., FUNTAC/Climate Change Institute); and began a close relationship with the State of Acre.

March 17, 2011 – Ilderlei Souza Rodrigues Cordeiro met with the Russas Project's local communities to discuss the Project and an "ata" was signed, which supports the Project State Date. The community members in attendance were: Alfredo Miranda de Carvalho, Antônio Josias dos Santos de Lima, Francisco Teixeira dos Santos, João Rodrigues dos Santos, José Vagner Ferreira da Silva, Francisco Alailton Alves de Menezes, Glauber Vieira do Nascimento, Rui Henrique Alves, Francisco de Assis Henrique Barbosa, Francisco Meireles, Rocildo da Silva, Francisco Rodrigues de Menezes, Milton Ferreira da Silva and Raimundo Nonato Almeida de Oliveira.

August 9-18, 2011 - CarbonCo, Carbon Securities, and TerraCarbon visited Rio Branco. A few key milestones included:

- TerraCarbon led a classroom forest carbon inventory training for TECMAN field crew for the Purus Project. TECMAN would later be hired for the Russas Project.

- CarbonCo, Carbon Securities, TerraCarbon, and TECMAN met with Acre State officials, including Monica Julissa De Los Rios de Leal and Lucio Flavio, on Wednesday, August 3rd to discuss how to best design the forest carbon inventory to align with the State of Acre's goals and future forest inventory plans. The Project's forest carbon inventory design (for example, the size of each plot and the plot design) was revised based off the State of Acre and TECMAN's input;

    - CarbonCo, Carbon Securities, and TerraCarbon visited the Purus Project from Thursday, August 4th through Monday, August 8th. TerraCarbon trained TECMAN field crew members in forest inventory practices and standard operating procedures, which would later be used during the Russas Project's forest carbon inventory.

- CarbonCo, Carbon Securities, and TerraCarbon met with Willian Flores to discuss the VCS methodology, VM0007 the REDD Methodology Modules, applicable to modeling regional deforestation. Willian Flores would later be used for the Russas Project.

- CarbonCo, Carbon Securities, TerraCarbon, and Willian Flores met with Acre State officials, including Monica Julissa De Los Rios de Leal, Eufran Amaral and Lucio Flavio on Tuesday, August 9th to discuss how to best develop the project-level baseline; how private projects will nest with a forthcoming state level baseline; and the type of GIS data available from the State of Acre.

October 31, 2011 - Tri-Party Agreement was executed by CarbonCo, Carbon Securities, and Ilderlei Souza Rodrigues Cordeiro.

November 21, 2011 – CarbonCo spoke with Shaina Brown, Project Director at the Green Technology Leadership Group and Tony Brunello, the REDD Offset Working (ROW) Group's facilitator to better understand the developments in the State of California and how they relate to the State of Acre.

November to December 2011 - Ilderlei Souza Rodrigues Cordeiro informally met with the local community to discuss the Russas Project and informally met local officials (including the mayor) in Cruzeiro do Sul.

December 2011 - CarbonCo and Carbon Securities first met Ilderlei Souza Rodrigues Cordeiro during a presentation to landowners in Acre, Brazil about REDD+ projects. Ilderlei Souza Rodrigues Cordeiro began talking with Normando Sales who was working with CarbonCo and Carbon Securities on the Purus Project.

February 6, 2012 – Brian McFarland spoke to Dan Bisaccio, Director of Science Education at Brown University, to better understand wildlife camera traps and biodiversity monitoring plans. The biodiversity monitoring plan - particularly the specific types of cameras, duration of the biodiversity plan, and the number of cameras to be used – was revised.

February 10, 2012 – CarbonCo spoke with Natalie Unterstell, the focal point for REDD+ at Brazil's Federal Ministry of Environment. Discussions were based around:

- The role of Brazil's Federal Government in the REDD+ context; Progress of the Amazon Fund; How States, particularly Acre, might nest into National Government; How Brazil's domestic cap-and-trade market is shaping up; Market mechanisms and REDD+ as potentially eligible offset; Where to go for REDD+ information on Federal government updates and how to inform Government of our Project.

March 2012 - Ilderlei Souza Rodrigues Cordeiro met again with the local community to more formally present and discuss the Project. The local community expressed the desire to work with açaí, which was later incorporated into the agriculture surveys. The area's biodiversity was also discussed and this is when the idea to reintroduce the Amazonian manatee was raised. The community explained the Amazonian manatee used to exist in the Valparaiso River, but now there are none.

March to April 2012 – Ilderlei Souza Rodrigues Cordeiro informally contacted José Augusto Rocha, the Secretary of Environment for the city of Guajará, about the idea of reintroducing the Amazonian manatee to the Valparaiso River.

May 2012 – Ilderlei Souza Rodrigues Cordeiro spoke to Professor Paulo Bernarde from the Federal University of Acre in Cruzeiro do Sul. Professor Bernarde is the coordinator of environmental courses at the University. The discussion focused on biodiversity of the Project and the Professor expressed interest in cataloguing species on the Project.

June 2012 – CarbonCo met with André Luis Botelho de Moura, a former graduate student of Dr. Armando Muniz Calouro, to begin refining a full biodiversity plan for the Purus Project. Such discussions included: the proper locations of cameras; a short, Standard Operating Procedures (SOPs) guidance document to be developed that will be used as a training manual for the communities; the communities need to be trained on the proper placement and preventative maintenance of such cameras, and the cameras need to be setup in the field; periodic movement of cameras to different strata; assistance for one year to periodically identify species. This full biodiversity monitoring plan will be adapted for the Russas Project.

June 20-22, 2012 – CarbonCo, Carbon Securities and TerraCarbon traveled to the Russas and Valparaiso Projects to conduct a preliminary assessment of the projects, to observe the local drivers and agents of deforestation, and to informally meet with several local communities. CarbonCo, Carbon Securities, TerraCarbon and Ilderlei Souza Rodrigues Cordeiro also spoke with Professor Paulo Bernarde about potentially cataloging species at the Russas and Valparaiso Projects and reviewed Professor Bernarde's book on the snakes of Acre.

August 2012 – Ilderlei Souza Rodrigues Cordeiro entered into a more formal agreement with Marmude Dene de Carvalho, who lives on the Russas Project and will be the local project manager. Marmude started more formal monitoring for deforestation. Every month Marmude travels up and down the Valparaiso River and talks with the local community. In addition, Marmude meets Ilderlei in Cruzeiro do Sul once per month to discuss the results of his monitoring.

November 2012 – Ilderlei Souza Rodrigues Cordeiro spoke to Fernando Lima, the President of Instituto de Meio Ambiente do Acre (IMAC, "Environmental Institute of Acre" in English) to discuss the Project and requested a letter of approval. The discussion focused on how IMAC can help control deforestation in the Project.

November 29, 2012 – CarbonCo informed Mónica Julissa De Los Rios de Leal of the Climate Change Institute about the development of the Russas Project.

End of December 2012 – Ilderlei Souza Rodrigues Cordeiro contacted the former president of IBAMA, Hamilton Casara, to discuss the Project. Hamilton informed Ilderlei to feel free to contact him for any relevant studies.

January 2013 – Ilderlei Souza Rodrigues Cordeiro met with some of the community members in Cruzeiro do Sul. The community was stopping deforestation and wanted to know how they would benefit from the project. Ultimately, the community needs to eat and cannot see their incomes or food production decrease. Ilderlei explained the Project is underway, but there is a lot of work to be done, and assured the community they would receive benefits.

January 11, 2013 – TECMAN was contracted to undertake the forest carbon inventory at the Russas Project. Shortly thereafter, TerraCarbon and CarbonCo provided an online, refresher training for TECMAN's upcoming forest carbon inventory at the Russas and Valparaiso Projects.

February 2013 – Ilderlei Souza Rodrigues Cordeiro received feedback from José Augusto Rocha about the Amazonian manatee reintroduction. José contacted Associação Amigos do Peixe-Boi (Friends of the Manatee Association) in the State of Amazonas. José introduced Ilderlei to Diogo Alexandre de Souza, a biologist at the Association. Ilderlei registered with the Association, provided his area for reintroduction of the Amazonian manatee, and was sent pictures.

February 2013 – Ilderlei contacted Miguel Scarcello from S.O.S Amazônia. S.O.S Amazônia wanted to reintroduce turtles ("quelonios" in Portuguese). S.O.S Amazônia also has courses they want to teach to the local communities at the Russas Project about forest preservation.

February 2013 – Throughout February 2013, Ilderlei Souza Rodrigues Cordeiro held several short calls with organizations such as Instituto Nacional de Colonização e Reforma Agrária (INCRA), Instituto de

Terra do Acre (ITERACRE), Secretary of Tourism for the State of Acre, Secretary of Agriculture, and Secretary of Commerce to explain the Project and ask for a letter of support.

Approximately February 8, 2013 – Ilderlei Souza Rodrigues Cordeiro met with the State of Acre Congressional Assembly, presented the project, and received a letter of support. Ilderlei also met Eufran Amaral, Mónica Julissa De Los Rios de Leal and Pavel Jezek from the Climate Change Institute (IMC) of Acre in Rio Branco. Ilderlei discussed the Project, received a letter of support, and also received the necessary paperwork to register the Project with IMC. The main suggestion was to register with IMC. In addition, IMC would like the completed Project Design Document and any supporting documentation to be filed with the IMC.

March 2013 – The Russas Project filed the registration paperwork with the IMC. Ilderlei contacted Sarney Filho, the Federal Minister of Environment Affairs, along with the President of the Commission of Environmental Affairs of the Federal Congress and President Jerônimo Goergen of the Amazon Commission of the House of Representatives, to inform them of the Project.

March 27, 2013 – Carbon Securities, with CarbonCo, Ilderlei Souza Rodrigues Cordeiro, Manoel Batista Lopes (landowner of the Valparaiso Project), Roberto Catão (Advisor to the Valparaiso Project) and Normando Sales (landowner of the Purus Project) in attendance, presented the Russas and Valparaiso Projects to the President of the Cruzeiro do Sul Municipal Legislature, the Secretary of Environmental Affairs for the Cruzeiro do Sul municipality, along with staff members of the Secretary of Agriculture for the Cruzeiro do Sul. The presentation gave an overview of the Project Proponents, the objectives of the Projects, the reason for Carbon Securities and CarbonCo's visit to Cruzeiro do Sul, the basic timeline of the Projects, how the Projects are implemented and the main activities to be implemented, the legal basis for the Projects, and concluded with a question and answer session. The Project Proponents learned that the municipality has a fund for agricultural courses devoted to local families.

Meeting at Legislature for Municipality of Cruzeiro do Sul

March 29, 2013 - CarbonCo and Carbon Securities met with Ilderlei Souza Rodrigues Cordeiro in Cruzeiro do Sul, Acre, Brazil to discuss elements of the VCS Project Description and the CCBS Project Design Document.

March 30 - April 1, 2013 – CarbonCo, Carbon Securities, Ilderlei Souza Rodrigues Cordeiro, and Sebastião Tome de Melo Junior (son-in-law of Manoel Batista Lopes) visited the Russas-Valparaiso communities, further discussed the Projects, and administered the Household Survey and Participatory Rural Assessment (PRA), Basic Necessity Survey (BNS), and the Agricultural Surveys. The community members in attendance included, but were not limited to: Benjamin Dene de Carvalho, Bertoldo Dene de Carvalho, Marmude Dene de Carvalho, Edilson Guerra de Oliveira, Rosildo da Silva, Francisco Meireles, Rui Henrique Alves, Francisco de Assis Henrique Barbosa, Alfredo Miranda de Carvalho, Glauber Vieira do Nascimento, Francisco Teixeira dos Santos, Milton Ferreira da Silva, Antônio Josias dos Santos de Lima, Maria Socorro Valente de Carvalho, José Luís da Silva, Gilson do Carmo da Silva, Francisco Rodrigues de Menezes, José Vagner Ferreira da Silva, Raimundo Nonato Almeida de Oliveira, Francisco Alailton Alves de Menezes and João Rodrigues dos Santos.

April 2, 2013 - CarbonCo, Carbon Securities, and Ilderlei Souza Rodrigues Cordeiro met again with Maria Francisca R. Nascimento, the Secretary of Environmental Affairs for the Municipality of Cruzeiro do Sul to further discuss the Valparaiso and Jurua River Basins' biodiversity as part of the Projects' rapid assessment of biodiversity.

April 4, 2013 - CarbonCo, Carbon Securities, and Ilderlei Souza Rodrigues Cordeiro met Edgar de Deus, the State Secretary of Environmental Affairs to introduce the Project Proponents and explained the Purus, Valparaiso and Russas Projects.

April 5, 2013 - CarbonCo, Carbon Securities, and Ilderlei Souza Rodrigues Cordeiro met Miguel Scarcello, the Secretary General from S.O.S. Amazônia to: introduce the Project Proponents, explain the Projects and particularly the biodiversity aspects, explained the role of the Verified Carbon Standard and the Climate, Community and Biodiversity Standards.

April 5, 2013 - CarbonCo, Carbon Securities, and Ilderlei Souza Rodrigues Cordeiro met again with Eufran Amaral from the Climate Change Institute to give an update on all the Projects and an update on the work of the Climate Change Institute.

April 5, 2013 - Professor Antonio Willian Flores de Melo was contracted to assist with deforestation baseline and land-use modeling.

April 30, 2013 – CarbonCo held another call with Natalie Unterstell of Brazil's Ministry of Environment to update her that the Purus Project became the first dual VCS-CCB validated REDD+ Project in Acre and that Russas and Valparaiso Projects were undergoing VCS-CCB validation later in 2013.

May 11-15, 2013 - Ilderlei Souza Rodrigues Cordeiro visited the Russas-Valparaiso Projects to administer additional Household Survey and Participatory Rural Assessment (PRA), Basic Necessity Survey (BNS), and the Agricultural Surveys. The community members in attendance included, but were not limited to: Antônio Josias dos Santos de Lima, José Manoel Nobre de Oliveira, Raimundo Manoel de Oliveira, Francisco Manoel Nóbrega de Lima, Antônio Manoel de Oliveira, Raimundo Antônio Silva de Oliveira, Manoel Leite de Almeida (Galdino), Maria Antônia Ferreira da Silva, Maria Márcia da Mota Gomes, Francisco Ferreira dos Santos (Eulo), Francisco Gomes Oliveira de Souza, Francisco Alailton Alves de Menezes, Elison, Francisco Santos de Nazaré, Janderson Nascimento de Oliveira, Raimundo Nonato Almeida de Oliveira, Paulo Alves de Menezes, Raimundo Nascimento de Oliveira, Raimundo Nobre de Oliveira, José Vagner Ferreira da Silva, Cleiciane Alves de Menezes, Francisco Rodrigues de Menezes, Francisco Alves de Menezes, Samara Nascimento de Oliveira, Daiana Alves de Menezes, Rui

Alves de Meireles, Francisco Meireles, Glauber Vieira do Nascimento, Maria José Alves Meireles, Rosildo da Silva, Antônio Ferreira de Almeida (Casimiro), Marmude Dene de Carvalho, Maria de Fátima Dene de Carvalho Silva, Benjamin Dene de Carvalho, Marcelo Alves de Carvalho, and Sebastião Melo de Carvalho.

May 21, 2013 - Ilderlei Souza Rodrigues Cordeiro met the Vice President of Brazil, Michel Temer, to discuss the Russas-Valparaiso Project and asking for the support of the Federal Government.

June – December 2013 – From June to December 2013, Ilderlei continued to meet with numerous stakeholders to discuss the Russas-Valparaiso Projects. Ilderlei also promoted the public comment period to stakeholders. Such stakeholder meetings included the Mayor of Mazinho Santiago, municipal councilors Romário Tavares, Iria Matos, Jota Marronzinho, Altemar and Elenildo, along with the municipal environmental secretary Francisca and representatives of municipal agriculture department.

July 2013 - Five agricultural extension courses were taught to the families living in the Russas Project and the Valparaiso Project along with families living in the leakage belt. A total of 27 people participated from the Russas Project, 34 people participated from the Valparaiso Project, and 40 people from the leakage belts participated. These five courses were the production of soursop (i.e., also known as graviola), passion fruit, banana, maize, and cassava. The courses also incorporated lessons on the control of pests and diseases through agro-ecological practices, the production of seedlings, and the use of traditional seeds. The courses were taught by the consultant Adair Pereira Duarte who is an environmental manager and specialist in agro-ecology.

January 31, 2014 – Brian McFarland of CarbonCo presented at the Forests as Capital Conference hosted by the Yale School of Forestry & Environmental Studies' Chapter of the International Society of Tropical Foresters. Brian's presentation gave an introduction to CarbonCo, described CarbonCo's Acre REDD+ Projects, and discussed REDD+ and other conservation financing instruments.

May 8, 2014 – CarbonCo, Carbon Securities and TerraCarbon met with the Climate Change Institute to give an update on all Acre REDD+ projects, including the Russas and Valparaiso Projects, and received updates on the latest developments at the Climate Change Institute. More specifically, this meeting was with Monica Julissa De Los Rios de Leal and Magaly Medeiros, the new director of the Climate Change Institute.

May 19, 2014 – Carbon Securities met with Rodrigo Fernandes das Neves, the State Prosecutor, to discuss the Acre REDD+ Projects including the Russas and Valparaiso Projects, and to get an update on the state-level baseline.

May 20-21, 2014 – CarbonCo and Carbon Securities met Maron Greenleaf to introduce the Project Proponents, give an overview of all Acre REDD+ projects underway, and discussed Maron Greenleaf's anthropological research in Acre for her PhD at Stanford University.

June 24, 2014 – Brian McFarland of CarbonCo presented at Ecosystem Marketplace's State of the Voluntary Carbon Market and gave an overview of CarbonCo's work in Acre, Brazil.

July 2014 - Between July 20 and 24, 2014, Sebastião Melo de Carvalho coordinated the action and taught basic healthcare information that was attended by 400 people, including many children and young

adults, and distributed dental kits. Furthermore, Ilderlei and Sebastião distributed mosquito nets throughout the Russas-Valparaiso Projects to help combat malaria in the Juruá River Basin.

August 2014 - Luiz Henrique Medeiros Borges, a biologist and colleague of Andre Botelho, provided training to the Project Proponents and the local communities at the Russas and Valparaiso Projects on proper techniques for wildlife cameras and biodiversity monitoring. These wildlife cameras were then deployed to the Russas-Valparaiso Projects from August 2014 to July 2015. Andre Botelho and Kidney Cunha da Aires were contracted to assist with the installation of the wildlife cameras and to analyze the images.

September 3, 2014 - CarbonCo and TerraCarbon held a call with the VCSA to give an update on the Acre REDD+ Projects and discussed the future developments necessary to best position the Acre REDD+ Projects for their potential inclusion in a California compliance carbon market.

January 30, 2015 - Brian McFarland of CarbonCo presented at the US-China Business and Cultural Exchange Center and gave an overview of forest carbon projects and particularly CarbonCo's work in Acre, Brazil.

June 23, 2015 - Brian McFarland of CarbonCo presented "A Global Perspective on the Voluntary Carbon Markets" in Thessaloniki, Greece which included a case study on the Purus Project.

July 20-21, 2015 - SOS Amazonia taught a small animal breeding course to communities living along the Juruá River in the area known as "Foz do Valparaiso."

August 29, 2015 - Brian McFarland of CarbonCo presented "Investing in the Voluntary Carbon Markets and Developing Forest Carbon Projects" for the Sustainability & Investing course at the University of Maryland's Robert H. Smith School of Business.

September 28 – October 2, 2015 – Andre Botelho presented a poster entitled, "Composition and Relative Abundance of Medium and Large Mammals in REDD+ areas in Acre" at the 8th Brazilian Congress of Mammalogy, held in João Pessoa the capital city of Paraíba.

December 5-12, 2015 - CarbonCo and Carbon Securities attended COP21 in Paris, France.

February 23 - March 3, 2016 – CarbonCo and Carbon Securities met several stakeholders in Brazil including the Climate Change Institute of Acre, the Amazon Fund, USAID, and the Ministry of Environment. Such meetings included a presentation of our Acre REDD+ Projects and a discussion on recent developments in Acre and/or Brazil with respect to REDD+.

March 10-11, 2016 – SOS Amazonia taught another small animal breeding course to communities living along the Valparaiso River in the area known as "Três Bocas."

March 16-17, 2016 – SOS Amazonia taught an organic horticultural course to communities living along the Valparaiso River in the area known as "Tartaruga."

March 23-24, 2016 – SOS Amazonia taught another organic horticultural course to communities living in the area known as "Comunidade Foz do Valparaíso."

April 1, 2016 – SOS Amazonia taught a course on reusing vegetable oils to communities living along the Valparaiso River in the area known as “Terra Firme do Cima.”

April 15-16, 2016 – SOS Amazonia taught a third organic horticultural course to communities living in the area known as “Três Bocas.”

April 20-21, 2016 – SOS Amazonia taught another course on reusing vegetable oils to communities living in the area known as “Tartaruga.”

April 23-24, 2016 – SOS Amazonia taught a third course on reusing vegetable oils to communities living in the area known as “Foz do Rio Valparaiso.”

May 5-6, 2016 – SOS Amazonia taught a fourth course on organic horticulture to communities living in the area known as “Terra Firme de Cima.”

September 20, 2016 – SOS Amazonia provided a thematic meeting on environmental education with an emphasis on the management of turtles to the communities living in the area known as “Comunidade Foz do Valparaíso.”

September 21-22, 2016 – SOS Amazonia taught a course about sustainable pastures / clearings to the communities living in the area “Foz do Rio Valparaiso.”

November 17, 2016 – Brian McFarland presented to two classes at Cornell University on “Global Carbon Markets and Developing Forest Conservation Projects” which included highlighting CarbonCo’s projects in Acre.

December 29-31, 2016 – SOS made announcements to communities living along the Valparaiso River in the area known as “Três Bocas” about agroforestry trainings to take place later in 2017.

January 4, 2017 – SOS Amazonia held a thematic meeting about domestic violence, women’s health, gender equality and racism at the communities living in the area known as “Foz do Rio Valparaiso.”

January 5, 2017 – SOS Amazonia held another thematic meeting as “Foz do Rio Valparaiso.” This thematic meeting was about environmental education with an emphasis on solid waste and the separation of garbage.

February 20-23, 2017 - SOS Amazonia held another thematic meeting about domestic violence, women’s health, gender equality and racism at the communities living along the Valparaiso River and particularly in the areas known as “Terra Firme de Cima” and “Tartaruga.”

April 17 - 22, 2017 - CarbonCo attends Navigating the American Carbon World and receive training through the various workshops and breakout sessions. CarbonCo also provides orientation to numerous stakeholders about CarbonCo’s Acre REDD+ Projects, including California’s Air Resources Board.

May 1, 2017 - SOS Amazonia provided a training on the organic creation, production and management of bees for the communities living in the area known as “Três Bocas.”

May 2 – 12, 2017 - CarbonCo and Carbon Securities visit the Russas and Valparaiso Projects to discuss project updates and to conduct the second Basic Necessity Survey and the Participatory Rural Assessments. CarbonCo and Carbon Securities also administered an Outside Stakeholders Survey. CarbonCo and Carbon Securities meet Nagila deni Sarah, the volunteer project coordinator, for the first time in person and provide orientation to Carbon Securities, CarbonCo and the overall carbon markets.

May 3-5, 2017 – SOS Amazonia provided a second training on the organic creation, production and management of bees for the communities living in the area known as "Tartaruga."

May 6, 2017 – SOS Amazonia provided agroforestry trainings to communities living in "Tartaruga."

May 10, 2017 - Brian McFarland presented via Skype to Cornell University on "Global Carbon Markets and Developing Forest Conservation Projects" which included highlighting CarbonCo's projects in Acre.

July 5 – 22, 2017 - Carbon Securities and CarbonCo visit the Russas, Valparaiso and Purus Projects. Carbon Securities and CarbonCo meet Michelle Matos (Manoel Lopes' Power of Attorney) and Genildo da Silva Macedo (newly hired local project manager for the Valparaiso Project) for the first time in person and provide orientation to Carbon Securities, CarbonCo and the overall carbon markets.

July 7-9, 2017 - SOS Amazonia provided agroforestry trainings to communities living in "Foz do Valparaiso."

July 17-19, 2017 – SOS Amazonia provided agroforestry trainings to communities living in "Três Bocas."

October 19, 2017 - Brian McFarland presented to the New England Aquarium in Boston, Massachusetts on "Global Carbon Markets and Developing Forest Carbon Offset Conservation Projects" which included highlighting CarbonCo's projects in Acre.

November 15, 2017 - Brian McFarland's book, Conservation of Tropical Rainforests: A Review of Financial and Strategic Solutions, is published by Springer / Palgrave Macmillan. The book provides orientation to conservation finance and specifically forest carbon offset projects, along with a case study on the Purus Project.

CarbonCo, Carbon Securities, and I.S.R.C. held biweekly meetings during the development phase of the project. Post-validation, CarbonCo, Carbon Securities and I.S.R.C. hold periodic check-in calls and will hold calls more regularly if necessary.

Historically, Ilderlei Souza Rodrigues Cordeiro visited the Russas Project approximately 1-3 times per year to help implement the Project including showing project staff, contractors, and visitors the Project Area, meet with and engage the surrounding communities, and to further establish a local project base.

CarbonCo, Carbon Securities, and Ilderlei Souza Rodrigues Cordeiro are committed to meet in person at least once per year at the Russas Project with the local community to discuss project activities, project management, and meet with the local community to get their feedback, ideas, and provide a platform for discussion. This collective site visit was done in 2012, 2013 and 2014. Due to a shortage of funding, this did not take place in 2015 and 2016, but restarted in 2017. This yearly visit also includes meetings with other stakeholders such as: the Climate Change Institute (IMC); IMAC (Institute of Environmental Affairs

for Acre); the State Secretary of Environmental Affairs for the Municipality of Cruzeiro do Sul; and the Mayor of Cruzeiro do Sul.

The Project Proponents will continue communication throughout the Project Lifetime with the goal of monitoring the success of Project activities in achieving the climate, community and biodiversity objectives. As the Project unfolds, the Project Proponents will practice adaptive management techniques to constantly assess the Project's ongoing successes and shortcomings.

Adaptive management is necessary for the Russas Project in part because many aspects of REDD+ are still unfolding and being decided. This said, as country-specific indicators of the REDD+ Social and Environmental Standards are developed by the State of Acre, the Russas Project shall attempt to further harmonize its biodiversity and community monitoring plans.

Describe Methods to Publicize CCBA Public Comment Period and to Facilitate Submission of Comments

A variety of communication methods were utilized to publicize the CCBA Public Comment Period to stakeholders of the Russas Project, including the local communities. In addition, the Project Proponents played an active role in distributing the Russas Project's CCBS Project Design Documents. Such specific steps include:

- First and foremost, the CCBS Project Documents (i.e., PDDs, Full Monitoring Reports, Project Description, etc.) were made available in both English and Portuguese. This allowed for a wider-range of stakeholder participation including local communities and government officials in Acre, Brazil.

- Secondly, the Project Documents were communicated to community members in an appropriate manner to overcome the fact that some community members might be illiterate. For example, Marmude Dene de Carvalho visited the communities during the first CCBA Public Comment Period to explain the Project's Public Comment Period and solicit their comments. A copy of the Portuguese CCBS PDD was also left at the Russas Project. Going forward, Fatima and/or Willyan will now visit the communities to explain the Public Comment Period.

- The CCBS Project Design Documents were publicly posted for a minimum of 30 days on the CCBA website and comments were solicited. The CCBS PDD 30-day Public Comment Period officially ran from July 18th to August 17th, 2013. The CCBS PIR Public Comment Period for the Russas Project's verification officially ran from July 14th to August 13th, 2014. The third Public Comment Period officially ran from June 6 to July 6, 2017.

- CarbonCo's parent company Carbonfund.org Foundation, Inc. publicized the Project Documents on its website and solicited comments on the Project via a newsletter announcement to Carbonfund.org's 20,000+ members. Carbonfund.org's newsletter for the CCBS PDD Public Comment Period announcement was sent on July 22nd, 2013 and the announcement for the CCBS PIR Public Comment Period was sent on July 21, 2014. In addition, the CCBA announced the Russas Project's Public Comment Period via the

International Institute for Sustainable Development listserv on July 15, 2014. Carbonfund.org also announced the third Public Comment Period via its newsletter on June 30, 2017.

- Furthermore, the Project Design Documents were sent on July 24th, 2013 to a variety of specific stakeholders including Acre State Government officials, TECMAN and Professor Flores to ensure accuracy of statements and encouraged their submission of comments to the CCBS.

During the 2013 and 2014 CCBS Public Comment Period, Marmude Dene de Carvalho visited as many communities as possible living within the Project Zone. To facilitate comments from the communities, Marmude Dene de Carvalho individually met with each community and offered to transcribe their comments. Nagila and Willyan did the same in June 2017 for the third Public Comment Period.

With respect to other stakeholders, I.S.R.C. announced the Public Comment Period and the offering of agricultural courses on the Rádio Juruá FM and Rádio Verdes Florestas from July 19th to July 23rd, 2013 and then again on August 15th, 2013. These radio stations are widely listened to throughout the State of Acre, including the municipalities of Cruzeiro do Sul and Porto Walter. Such an announcement informed listeners about the Russas Project and about the CCBS, encouraged listeners to review the CCBS PDD, and asked for comments to be submitted. In addition, the Public Comment Period and offering of agricultural courses was also announced in the "Journal Tribune Juruá" on July 25, 2013, see here. Ilderlei also made radio announcements on three radio stations, along with a television announcement, in June 2017 for the third Public Comment Period

Formalize Clear Process for Handling Unresolved Conflicts and Grievances

Between March 2011 and December 2013, the Project's grievances procedure was designed and communicated to local communities. In 2014, the Project's grievances procedure was again communicated to the local communities and the grievances procedure was included in the Summary Documents that were distributed throughout the Project Zone. Furthermore, Ilderlei Cordeiro and Pedro Freitas' cell phone numbers were left at the headquarters for anyone to contact the Project Proponents.

Essentially, if conflicts or grievances are unable to be resolved by the Project Proponents (particularly I.S.R.C.), the State of Acre's Climate Change Institute – acting as a third party to prevent any conflict of interest - will hear, respond to, and help resolve all reasonable grievances with the Russas Project through an impartial and accessible process.

More specifically, the State of Acre's Climate Change Institute has hired an Ombudsman and any stakeholder is free to contact or visit the Climate Change Institute with any unresolved conflicts or grievances. Below is the physical address, phone numbers, fax numbers and email address:

Instituto de Mudanças Climáticas e Regulação de Serviços Ambientais

(Climate Change Institute)

Address: Rua Floriano Peixoto, nº 460, Primeiro Andar, Centro, Acre, Brazil

Telephone: +55 (68) 3223-1933 / +55 (68) 3223 9962 / +55 (68) 3223 1903

Fax: +55 (68) 3223 9962 Email Address: gabinete.imc@ac.gov.br

The Climate Change Institute's process for hearing, responding to, and resolving reasonable grievances is as follows:

- Receiving: Any person may visit or contact the Climate Change Institute. Any person who makes contact with the Ombudsman over the internet will receive a notification of receipt by email.

- Verification and Acceptance: The Ombudsman will decide whether a complaint is considered reasonable and whether the complaint should be accepted by the Climate Change Institute.

- Referral to Internal Areas: When deciding to accept a demand, the Ombudsman records the compliant and informs the person raising the complaint of the protocol number and the deadline for a response. If the demand is accepted, the demand will be internally referred to the appropriate specialist. If the demand is rejected, the Ombudsman will inform the person of the reason for the rejection.

- Monitoring: The Ombudsman will monitor the protocol and will monitor the internal areas responsible for collecting the answers to the compliant.

- Resolution: When the settlement is decided, the Ombudsman will make contact with the person who raised the complaint and the Ombudsman will close the protocol. All complaints received by the Ombudsman are usually answered within five working days and the person can call to know the progress of their protocol.

Each month the Ombudsman shall prepare a report and forward it to Board and President of the Climate Change Institute. In this report, the Ombudsman will: summarize actions taken to address complaints; quantify complaints and provide graphics to compare number of complaints against previous months; report amount of open and closed protocols; and provide relevant suggestions for process improvements and final considerations of the Ombudsman.

Furthermore, all conflicts or grievances will be addressed within a reasonable timeframe, the resolutions will be documented, and this process has been publicized to all stakeholders and especially to the local communities.

There were a few specific processes developed in order to address particular conflicts that may arise at the Russas Project.

Upon learning of any significant deforestation within the Project Area, the Project Manager shall:

- 1. Contact the agent of deforestation to explain that deforestation is not part of the Project.

- 2. If the deforestation continues, the Project Manager will immediately notify the fact to Ilderlei Souza Rodrigues Cordeiro.

- 3. Ilderlei Souza Rodrigues Cordeiro will contact the police department, IMAC, IBAMA, and other institutions to assist if necessary.

Upon learning of any fire within the Project Area, the Project Manager would take the following steps:

- 1. The Project Manager will immediately notify the fact to Ilderlei.
- 2. If the fire results in a large-scale fire started by a community member, Ilderlei will contact the State of Acre government and the fire department in Cruzeiro do Sul to assist with putting out the fire and to take actions against the community member.

Upon learning of any in-migration of Project Area, the Project Manager should adopt the following procedures:

- 1. Contact the in-migrant to explain the property is a forest conservation project and in-migration is not allowed.
- 2. If the in-migrant is established, the Project Manager will immediately notify the fact to Ilderlei and Ilderlei will contact the police department.
- 3. The police department would remove the in-migrant.

Upon learning of the occurrence of illegal logging or poaching in the Russas Project, the Project Manager should adopt the following procedures:

- 1. The Project Manager will immediately notify the fact to Ilderlei and Ilderlei will contact the police department and IMAC.
- 2. The police department and IMAC will investigate.

Project Transparency

The Russas Project seeks to promote the highest level of transparency, while protecting proprietary information and respecting intellectual property rights. To achieve this goal, these actions took place between March 2011 and December 2016 to promote the Project's transparency:

- The Russas Project was independently validated and verified by Environmental Services, Inc. to the CCBS and VCS, two leading certification standards.
- The CCBS PDD and CCBS PIR were publicly posted for 30 days.
- Carbonfund.org and CarbonCo LLC's financial statements were annually audited by an independent, certified public accountant.
- The Project Proponents presented the Project to a wide-range of officials, including but not limited to: the President of the Cruzeiro do Sul Municipal Legislature, the Secretary of Environmental Affairs for the Cruzeiro do Sul municipality, staff members of the Secretary of Agriculture for the Cruzeiro do Sul, the Climate Change Institute of the State of Acre, IMAC, the Federal Minister of Environment Affairs, the President of the Commission of Environmental Affairs of the Federal Congress and President of the Amazon Commission of the House of Representatives.

- Brian McFarland of CarbonCo has presented at various events including: 2014 Panel for the State of the Voluntary Carbon Markets, to two classes at Cornell University, and during a climate change workshop in Toronto, Ontario.

- The Project was publicly displayed on Ecosystem Marketplace's Forest Carbon Portal and the VCS Project Database.

- The Project is registered with the Markit Environmental Registry.

Below are pictures of a few stakeholder meetings:

Stakeholder Meetings (Photo Credit: Normando Sales and Ilderlei Cordeiro)

There was also a participatory process of drafting the Tri-Party Agreement, outlining the overall roles and responsibilities of the Project Proponents, clarity about funding, and appropriate risk sharing of costs and benefits. Furthermore, the transparency of benefit sharing will be enhanced through verification and VCS-registry distribution of VERs.

2.9 Deviations

2.9.1 Methodology Deviations

The following deviations to the methodology are applied.

Trees in the Cecropia genus will not be included as part of the forest inventory. This has been proposed as a deviation as it stands in conflict with the CP-AB requirement that "all the trees above some minimum DBH in the sample plots" be measured.

While sampling lying dead wood using the line intersect method:

- Two 92-meter transect lines were used rather than two 50-meter transect lines;
- The sampling lines did not bisect each sample plot, but rather ran from one plot center to the next; and
- The sampling lines were oriented to the north and east, and no randomization in the bearing of the first line was employed.

Rather than using a root to shoot ratio to estimate belowground biomass as per the CP-AB module, belowground biomass was estimated using an allometric equation developed by Cairns et al.[23]

The forest inventory has deviated from the criteria for selection (i.e., the equation is based on a datasets comprising at least 30 trees, with an r2 that is ≥ 0.8) and validation of the allometric equation related to palm biomass, however the equation used is likely to result in a conservative estimate of palm biomass for the following reasons:

-Volume is calculated as the volume a parabaloid rather than the volume of a cylinder;

-Only stem biomass is estimated, thus conservatively excluding other aboveground biomass; and

- A conservative measure of basal diameter (i.e., dbh) was used.

Dead wood collected for density determination was opportunistically sampled from within the project area. The forest inventory collected a total of 13, 17, 13 samples for the sound, intermediate, and rotten classes, respectively. While the minimum number of samples, twenty, as stated in the CP-D module of the methodology was not collected for each class, the sample was still sufficient for a robust estimate of the mean as indicated by the low coefficient of variations for each of the classes (i.e., less than 20% for each class).

The similarities of the project boundaries were assessed using population density rather than settlement density. This methodological deviation is warranted due to obvious inconsistencies in the available data on the location of settlements within the state. Use of population density data still meets the intent of the methodology as both population and settlement density reflect the relative density of resident populations (and level of pressures associated with those population).

[23] Cairns, M. A., S. Brown, E. H. Helmer, and G. A. Baumgardner. 1997. Root biomass allocation in the world's upland forests. Oecologia 111, 1-11.

The parameter TOTFOR has not been "limited to forest areas within 5km of roads and rivers suitable for conversion to agriculture / livestock" as mentioned in the methodology. As the resulting TOTFOR value is greater, the AVFOR value is also greater. The PROPLB parameter is therefore smaller thus resulting in more leakage outside the leakage belt and hence a conservative estimate. This deviation results in conservative accounting of leakage outside the leakage belt.

The parameter COLB has not been “limited to areas demonstrated to be suitable for agriculture or livestock ranching” as mentioned in the methodology. COLB has conservatively been set to the largest forest aboveground tree carbon stock rather than the area-weighted average aboveground tree carbon stock. This deviation results in conservative accounting of leakage outside the leakage belt.

The AVFOR parameter used in leakage estimation will be stratified using information and data derived from official (government) publications, peer-reviewed published sources, or other verifiable sources. Stratification is not limited to the delineation of different strata where contiguous areas of at least 100 ha differ in stocks by ≥20%.

Parameter $U_{P,SS,i,pool\#}$ will be monitored at least once every 10 years, on re-measurement of forest carbon stocks. While module X-UNC requires that monitoring of this parameter occur every $\leq$ 5 years, this requirement is inconsistent with the VM0007 pools modules, which specify that stock estimates (from which uncertainty is calculated) are assumed valid for 10 years. Therefore, a deviation to module X-UNC is applied to permit parameter $U_{P,SS,i,pool\#}$ to be monitored every $\leq$ 10 years, putting it into alignment with modules CP-AB and CP-D.

2.9.2 Project Description Deviations

Rather than initially assessing the significance of illegal logging using temporary sample plots covering 1% of the potential degradation area (*ADegW,i*) as proposed in the project document and monitoring module of the VM0007 methodology; information gathered during the course of the participatory appraisals including amounts of fuelwood, charcoal, and timber collected by communities members will be used along with conservative assumptions to assess whether emissions due to degradation are significant using the T-SIG tool, and plot level monitoring of degradation is warranted. This deviation may be used for the first and each subsequent monitoring period. This deviation was added during the course of the first verification event. This deviation was included as it was our understanding that we could use T-SIG to determine the significance of any with project emission. Further, this deviation was warranted due to the significant amount of work necessary to monitoring degradation using temporary plots and the likely insignificant amount of emissions resulting from degradation. The section on "Monitoring Illegal Degradation" in the monitoring plan has been updated to reflect this deviation.

Rather than monitoring Cpost using modules CP-AB and CP-D as described in the MON modules, C(post) can conservatively be assumed to be zero in the with project case, not only for natural disturbance (CP,Dist,q,i , as stated in Section 5.2.3 of the M-MON module) but also for deforestation (CP,post,u,i). This deviation is conservative because subtracting zero from the baseline stocks, leads to the conclusion that ΔCpools,Def,u,i,t is equal to C(BSL,i), which leads to the maximum emission in the with project case, which is conservative. This deviation may be used for the first and each subsequent monitoring period.

3 LEGAL STATUS

3.1 Compliance with Laws, Statues, Property Rights and Other Regulatory Frameworks (G4 & G5)

Between March 2011 and December 2013, the Project Proponents identified all relevant laws and discussed the laws impacts on the Russas Project. For example, the Russas Project meets, or exceeds, all applicable laws and regulations covering worker rights in Brazil and the Project Proponents informed all workers about their rights.

The following is a list of Brazil's relevant laws and regulations covering worker's rights:

- The Brazilian Constitution, Chapter II-Social Rights, Articles 7- 11[24]

In addition to the Constitution, there are two additional decrees related to Brazilian labor laws.

- Consolidação das Leis do Trabalho (CLT): DECRETO-LEI N.º 5.452, DE 1º DE MAIO DE 1943 (Consolidate of Working Laws).[25]

- Estatui normas reguladoras do trabalho rural: LEI Nº 5.889, DE 8 DE JUNHO DE 1973 (Establishes Regular Norms for Rural Workers).[26]

Compliance with Law

Agreements between the Project Proponents as well as Agreements between CarbonCo and its contractors stipulate firms to abide by labor laws (for example, wages above Brazil's federal minimum wage) and an assurance that all Brazilian employment taxes and insurance are paid.

In addition, CarbonCo has an employee handbook to ensure proper guidelines are followed by its employees. I.S.R.C. has an explanatory letter on labor rights that was presented to all of their employees to ensure workers are informed about their rights.

CarbonCo underwent a financial audit by an independent accountant to ensure all taxes, including employment, social and corporate, are paid. Furthermore, I.S.R.C. has provided "Receita Federal" which certifies that all taxes (including employee and business) and insurance (including social) are paid.

The Project Proponents will forever continue to work with the well-being of the communities in mind. This shall differ from historical employment arrangements where there were indentured servant arrangements at extractive reserves. In contrast, the communities will be offered meaningful employment, have the ability to directly shape the Project, and an ability to express any and all grievances.

[24] Massachusetts Institute of Technology, "Brazilian Constitution," Available: http://web.mit.edu/12.000/www/m2006/teams/willr3/const.htm
[25] Presidency of the Republic, "DECRETO-LEI N.º 5.452, DE 1º DE MAIO DE 1943, Available: http://www.planalto.gov.br/ccivil_03/decreto-lei/Del5452.htm
[26] Presidency of the Republic. "LEI Nº 5.889, DE 8 DE JUNHO DE 1973," Available: http://www.planalto.gov.br/ccivil_03/leis/L5889.htm

List of all Relevant International, National and Local Laws, Regulation, Treaties and Agreements

The following is a list of all the international, national and state-level laws and regulatory frameworks identified by the Project Proponents between March 2011 and December 2016 which are relevant to the Russas Project.

International Laws and Regulatory Frameworks

Brazil is a party to numerous international conventions and treaties such as the:

- Convention on Biological Diversity
- United Nations Framework Convention on Climate Change
- Convention on International Trade in Endangered Species of Wild Fauna and Flora
- International Tropical Timber Organization (i.e., Brazil is a Producing Member)
- Ramsar Convention on Wetlands
- Universal Declaration of Human Rights
- United Nations Declaration on the Rights of Indigenous Peoples
- Convention on the Elimination of All Forms of Discrimination Against Women
- International Labor Organization Convention

There was also a Memorandum of Understanding (MOU) signed on March 3, 2010 between Brazil and the United States of America on "cooperation regarding climate change."[27]

Furthermore, there was an international MOU between California (United States), Chiapas (Mexico) and Acre (Brazil) signed on November 16, 2010.[28]

The State of Acre is also an active member in the Governors' Climate and Forest Task Force.[29]

National Laws and Regulatory Frameworks

The Russas Project will continue to abide by Brazilian national laws and especially the Brazilian Constitution. This includes Chapter 6 of the Brazilian Constitution which specifically discusses environmental issues in Article 225.[30]

[27] The Government of Brazil and the Government of the United States of America, "Memorandum of Understanding Between the Government of the Federative Republic of Brazil and the Government of the United States of America on Cooperation Regarding Climate Change," http://www.brazilcouncil.org/sites/default/files/MOUonCooperationRegardingClimateChange-Mar032010.pdf

[28] The State of Acre, the State of Chiapas, and the State of California, "Memorandum of Understanding on Environmental Cooperation between the State of Acre of the Federative Republic of Brazil, the State of Chiapas of the United Mexican States, and the State of California of the United States of America," http://www.gcftaskforce.org/documents/MOU_Acre_California_and_Chiapas.pdf

[29] Governors' Climate and Forest Task Force, "About GCF," http://www.gcftaskforce.org/about.php

Compliance with Law

Although the Russas Project is privately-owned and Paragraph 1 of Article 225 specifically states "it is incumbent upon the Government," the Project Proponents will nevertheless seek to preserve the Project's ecosystems, preserve the diversity of fauna and flora, and promote environmental education. This preservation can be documented via satellite imagery, firsthand observations, and via the Project's biodiversity monitoring plan, while the local schools within the Russas Project will incorporate environmental education.

The Brazilian Forest Code is of particular importance to the Russas Project. This includes:

- The original Brazil Forest Code entitled, Law No. 4771, September 15, 1965.[31]
- Revision of Brazil Forest Code under Law No. 7803, July 18, 1989.[32]
- Provisional Measure entitled 2166-67, August 24, 2001.[33]
- Revision of Brazil Forest Code under Law No. 12.651 of May 25, 2012.[34]

Title of Law

Law Number 4771 of September 15, 1965, entitled "Establishing the new Forest Code."

Summary of Law

Law Number 4771 of September 15, 1965 was the original Brazil Forest Code. A few major provisions of the Forest Code were the establishment of permanent preservation areas (APP), establishment of legal reserves of 50% on properties in the Legal Amazon, and designation of Acre State (among others) as within the Legal Amazon territory.[35] Many of these provisions have been revised since 1965.

Compliance with Law

The Russas Project, as can be documented via satellite imagery or firsthand observations, has respected the Project's permanent preservation areas and legal reserves.

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[30] Georgetown University, "1988 Constitution, with 1996 reforms in English," Available: http://pdba.georgetown.edu/Constitutions/Brazil/english96.html#mozTocId920049
[31] Presidency of the Republic, "Law No. 4771, September 15, 1965," Available: http://www.planalto.gov.br/ccivil_03/Leis/L4771.htm
[32] Presidency of the Republic, "Law No. 7803, July 18, 1989," Available: http://www.planalto.gov.br/ccivil_03/leis/L7803.htm
[33] Presidency of the Republic, "Provisional Measure 2166-67, August 24, 2001," Available: https://www.planalto.gov.br/ccivil_03/MPV/2166-67.htm
[34] Presidency of the Republic, Civil House Cabinet Subcommittee for Legal Affairs, "Law No. 12,651, OF 25 MAY 2012," Available: http://www.planalto.gov.br/ccivil_03/_Ato2011-2014/2012/Lei/L12651.htm
[35] Presidency of the Republic, "Law No. 4771, September 15, 1965," Available: http://www.planalto.gov.br/ccivil_03/Leis/L4771.htm

Title of Law

Law Number 7803 of July 18, 1989 entitled, “Change the wording of Law No. 4771 of September 15, 1965, and repealing Laws Nos. 6535 of June 15, 1978, and 7511 of 7 July 1986.”

Summary of Law

Law Number 7803 was the first significant amendment to the original 1965 Forest Code. For example, the permanent preserve areas were reclassified. The Law also stipulated that “the exploitation of forests and succeeding formations, both public domain and private domain, will depend on approval from the Brazilian Institute of Environment and Renewable Natural Resources - IBAMA, and the adoption of techniques of driving, exploitation, reforestation and management compatible with the varied ecosystems that form the tree cover.[36]

Compliance with Law

The Russas Project will continue to abide by the new guidance on permanent preserve areas such as to not clear forests on steep slopes or within one hundred meters proximity to rivers. Any such clearing that has taken place in the past, will be reforested.

Title of Law

The Provisional Measure Number 2166-67 of August 24, 2001 entitled, “Changes the arts.[1, 4,] 14, 16 and 44, and adds provisions to Law [No.] 4771 of September 15, 1965, establishing the Forest Code and amending art. 10 of Law [No.] 9393 of December 19, 1996, which provides for the Property Tax Territorial Rural - ITR, and other measures.”

Summary of Law

The Provisional Measure Number 2166-67 of August 24, 2001 was one of the latest revisions to the original 1965 Forest Code and to the amendments of Law Number 7803. The most relevant change to the Russas Project was the revision of the legal reserve requirement in the Legal Amazon (i.e., including the State of Acre) from 50% to 80% which shall be conserved.[37]

Compliance with Law

As mentioned previously, the Russas Project - as can be documented via remote sensing or firsthand observations - has respected both the Project’s permanent preservation areas and the recently revised legal reserve requirement.

[36] Presidency of the Republic, “Law No. 7803, July 18, 1989,” Available: http://www.planalto.gov.br/ccivil_03/leis/L7803.htm
[37] Presidency of the Republic, “Provisional Measure 2166-67, August 24, 2001,” Available: https://www.planalto.gov.br/ccivil_03/MPV/2166-67.htm

Title of Law

Law Number 12.651 of May 25, 2012, which is the latest Brazilian Forest Code.[38]

Summary of Law

The latest Brazilian Forest Code, "Provides for the protection of native vegetation; amends Laws Nos. 6938 of August 31, 1981, 9,393, of December 19, 1996, and 11,428 of December 22, 2006, repealing the Laws No. 4771, 15 September 1965 and 7754, of April 14, 1989, and Provisional Measure No. 2.166-67, of August 24, 2001, and other provisions."

Other key provisions of the Brazilian Forest Code include:

> "CHAPTER I: GENERAL PROVISIONS
>
> The Article 1-A. This Act lays down general rules on the protection of vegetation, Permanent Preservation Areas and Legal Reserves, forest exploitation, the supply of forest raw materials, control the origin of forest products and the prevention and control of forest fires, and provides economic and financial instruments for the achievement of its objectives
>
> II - reaffirming the importance of the strategic role of farming and the role of forests and other forms of native vegetation in sustainability, economic growth, improving the quality of life of the population and the country's presence in the domestic and international food and bioenergy; (Included by Law No. 12,727, 2012).
>
> VI - the creation and mobilization of economic incentives to encourage the preservation and restoration of native vegetation and to promote the development of sustainable productive activities.
>
> Article 3 For the purposes of this Act, the following definitions apply:
>
> I - Amazon: the states of Acre, Pará, Amazonas, Roraima, Rondônia, Mato Grosso and Amapá and the regions north of latitude 13 ° S, the states of Goiás and Tocantins, and west of 44 ° W , State of Maranhão;
>
> II - Permanent Preservation Area - APP: protected area, or not covered by native vegetation, with the environmental function of preserving water resources, landscape, geological stability, biodiversity, facilitate gene flow of fauna and flora, soil protection and ensure the well-being of human populations;
>
> III - Legal Reserve area located within a rural property or ownership, demarcated according to art. 12, with the function of ensuring a sustainable economic use of natural resources of rural property, assist the conservation and rehabilitation of ecological processes and to promote the conservation of biodiversity, as well as shelter and protection of wildlife and native flora;

[38] Presidency of the Republic, Civil House Cabinet Subcommittee for Legal Affairs, "Law No. 12,651, OF 25 MAY 2012," Available: http://www.planalto.gov.br/ccivil_03/_Ato2011-2014/2012/Lei/L12651.htm

VI - alternative land use: replacement of native vegetation and succeeding formations other ground covers such as agricultural activities, industrial, power generation and transmission of energy, mining and transport, urban settlements or other forms of human occupation;

CHAPTER II: AREAS OF PERMANENT PRESERVATION

Section I: Delimitation of Areas of Permanent Preservation

III - the licensing is done by the competent environmental authority;

IV - the property is registered in the Rural Environmental Registry - CAR.

CHAPTER IV: AREA LEGAL RESERVE

Section I: Delimitation of the Legal Reserve Area

Article 12. All property must maintain rural area with native vegetation cover, as a legal reserve, without prejudice to the application of the rules on the Permanent Preservation Areas, subject to the following minimum percentages in relation to the area of the property, except as specified in art. 68 of this Act: (Amended by Law No. 12,727, 2012).

I - located in the Amazon:

a) 80% (eighty percent), in the property situated in forest area;

b) 35% (thirty five percent), in the property situated in cerrado;

c) 20% (twenty percent), in the property situated in the area of general fields;

II - located in other regions of the country: 20% (twenty percent).

CHAPTER V: THE SUPPRESSION OF VEGETATION FOR ALTERNATIVE USE OF SOIL

Article 26. The removal of native vegetation to alternative land use, both public domain and private domain, depend on the registration of the property in CAR, mentioned in art. 29, and the prior authorization of the competent state agency Sisnama."

Compliance with Law

The Russas Project is in compliance with the latest Brazil Forest Code. Acre is still considered an Amazonian State and thus, the Project must maintain 80% of forest cover as a legal reserve. This can be demonstrated via firsthand observations and review of satellite imagery. Furthermore, the Russas Project is also in the process of being geo-referenced and is in the process of registering with CAR, which as of August 2017, is not required until the end of December 2017 and there is a chance this deadline for CAR registration will be further extended.

In addition to the Forest Code, Brazil's National Environmental Policy is also relevant to the Russas Project.[39]

Title of Law

Law Number 6.938 of August 31, 1981 entitled, "Provides for the National Environmental Policy, its aims and mechanisms for the formulation and implementation, and other measures."

Summary of Law

Law Number 4771 of August 21, 1981 is based off Brazil's constitution and established Brazil's National Environmental Policy. Essentially, the "National Policy on the Environment is aimed at the preservation, improvement and restoration of environmental quality conducive to life, to ensure, in the country, conditions for the socio-economic development, the interests of national security and protecting the dignity of life human." Agencies were also established to carry out the National Environmental Policy.[40]

Compliance with Law

The Russas Project has identified, consulted and shall continue to work with the relevant agencies responsible for environmental protection, particularly with respect to REDD+ projects. Furthermore, the Russas Project will seek to conserve soil and water resources, protect rare and threatened ecosystems, and promote the recovery of degraded areas and encourage environmental education.

Another important national Brazilian law that is relevant to the Russas Project is the National Climate Change Policy (NCCP).[41]

Compliance with Law

A key component of Brazil's National Climate Change Policy is the voluntary reduction in greenhouse gas emissions. The Russas Project is in compliance with this voluntary target because the Russas Project is a Reducing Emissions from Deforestation and Degradation (REDD+) project. Furthermore, this compliance will be demonstrated via periodic verifications of the Russas Project.

Related to the National Climate Change Policy, is a recent Brazilian federal decree addressing REDD+.

Title of Law

The title of the Decree 8.576, of 26 November 2015, is "Establishing the National Commission for the Reduction of Greenhouse Gas Emissions from Deforestation and Forest Degradation, Conservation of Forest Carbon Stocks, Sustainable Management of Forests and Increase Forest Carbon Stocks - REDD+."Summary of Law

[39] Presidency of the Republic, "Law No. 6.938, August 31, 1981," Available: http://www.planalto.gov.br/ccivil_03/leis/L6938.htm
[40] Presidency of the Republic, "Law No. 6.938, August 31, 1981," Available: http://www.planalto.gov.br/ccivil_03/leis/L6938.htm
[41] World Bank, "State and Trends of the Carbon Market 2010," Available: http://siteresources.worldbank.org/INTCARBONFINANCE/Resources/StateAndTrend_LowRes.pdf.

The Brazilian Federal Decree 8.576/2015 establishes "the National Commission for REDD+" which "creates a committee responsible for coordinating, monitoring, and implementing the National Strategy for REDD+." See here for the complete Federal Decree 8.576/2015: http://pesquisa.in.gov.br/imprensa/jsp/visualiza/index.jsp?data=27/11/2015&jornal=1&pagina=1&totalArquivos=232

Compliance with Law

The Project Proponents have spoken numerous times to the State of Acre's Climate Change Institute and Brazil's Federal Ministry of the Environment and neither entity informed the Project Proponents of any restrictions placed on their private, voluntary REDD+ projects – particularly the Russas Project - as a result of Federal Decree 8.576/2015. The Project Proponents will continue to follow and report on this Decree as it applies to the Project.

State Laws and Regulatory Frameworks

The Project Proponents of the Russas Project will continue to abide by Acre's state laws and regulatory frameworks. The two most relevant laws are Acre's State Forestry Law (Bill Number 1.426 of December 27, 2001) and Bill Number 2.308 of October 22, 2010 entitled, The State System of Incentive for Environmental Services (SISA).

SISA was "created, with the aim of promoting the maintenance and expansion of supply of the following ecosystem products and services:

> I - sequestration, conservation and maintenance of carbon stock, increase in carbon stock and decrease in carbon flow;
>
> II - conservation of natural scenic beauty;
>
> III - socio-biodiversity conservation;
>
> IV - conservation of waters and water services;
>
> V - climate regulation;
>
> VI - increase in the value placed on culture and on traditional ecosystem knowledge;
>
> VII - soil conservation and improvement."[42]

Compliance with Law

As a tropical forest ecosystem services project, otherwise known as REDD+, the Russas Project shall continue to conserve the forests' carbon stock, while also conserving the natural scenic beauty, biodiversity, water and soil resources, along with working alongside the local communities. Such

[42] State of Acre, "Unofficial Translation, State of Acre, Bill No. 2.308 of October 22, 2010," Available: http://www.gcftaskforce.org/documents/Unofficial%20English%20Translation%20of%20Acre%20State%20Law%20on%20Environmental%20Services.pdf

compliance can be demonstrated via remote sensing, firsthand observations, and via the periodic verifications of the Project.

Related to SISA is a Normative Instruction that was released by the Climate Change Institute (IMC) to provide guidance for how special projects should register with the State of Acre.

Title of Law

IMC's Normative Instruction nº 01, of 19 October 2015. – "Regulating the item IV of the art. 7 of Law No. 2308 of 22 October 2010, disciplining the admission procedure of special projects and linked within the Environmental Services incentive program – Carbon (ISA-Carbon), State System of Incentives for Environmental Services-SISA."

Summary of Law

The Normative Instruction outlines how special projects shall register with the State of Acre including the review of the methodology, review of project documents, fees required to be paid to the State of Acre, etc.

Compliance with Law

The Project Proponents are working closely with the State of Acre's Climate Change Institute and their SISA-Carbono Program. As of December 31, 2016, the Russas Project was not incorporated into the State of Acre's jurisdictional program and thus, the Project was not yet officially participating in any GHG Program. To prevent double-counting, this voluntary private REDD+ project is using the Markit Environmental Registry to issue and trade verified carbon units (VCUs). If in the future the Russas Project is nested into the State of Acre's SISA-Carbono Program, then the Project will follow the guidance of the VCSA and/or the State of Acre.

The Project Proponents have done the following to conform to the State of Acre's SISA legislation and more specifically, the IMC Normative Instruction #1 of October 19, 2015:

- 1. Original signed, notarized copy in English and Portuguese of "Formulário de Cadastro de Desenvolvedores" (Developers Registration Form) was submitted to the IMC.
- 2. Physical copy of Project Proponents' (CarbonCo and Carbon Securities) Good Standing.
- 3. Physical copy of Representative's Brazilian visa and/or passport. This was done for Brian McFarland of CarbonCo and Pedro Freitas of Carbon Securities.
- 4. There was also a "Term Assignment of Use of Information" form signed between CarbonCo and the Climate Change Institute (IMC) that allowed access to the classified satellite imagery.
- 5. The landowners submitted their landownership documentation to the IMC.
- 6. The VCS Methodology VM007, which was used by the Russas Project, was translated into Portuguese and submitted to the IMC for review on April 1, 2016.

- 7. The IMC will then receive electronic copies of our VCS and CCBS Project Documents (i.e., VCS PDs and Monitoring Reports; CCBS PDDs and PIRs).

Going forward and where required, the Project Proponents will continue to follow the IMC Normative Instruction; this includes submitting updated documents in 2017 of the Developers Registration Form, the certificates of Good Standing, copies of passports/visas and a large print out of the property map.

Acre's State Forestry Law (Bill Number 1.426 of December 27, 2001) essentially, "provides for the preservation and conservation of State forests, establishing the State System of Natural Areas, creates the State Forest Fund and other measures."[43] The Law also established the institutional responsibility for the management of State Forests, defines forests, and outlines the administrative penalties for non-compliance.

Compliance with Law

The Russas Project is on private property and thus, this law is not relevant. Nevertheless, the Project Proponents shall continue contributing to the sustainable use of forest resources, preserve biodiversity, and also "promote ecotourism, recreation, forestry research and education."[44]

There are several additional Acre State laws such as:

- Law nº 1.117/1994, which establishes the Environmental Policy in the State of Acre;
- Law 1.904/2007, which establishes the Ecological and Economic Zoning (EEZ) map of the State of Acre;
- Decree nº 3.416/2008, which regulates the second stage of the EEZ map of the State of Acre;
- Law nº 2693 de 17/01/2013, which amends law nº 1.904/2007, and "creates the State Program of Productive Family Unity Certification of the state of Acre;"
- State of Acre's Plan to Prevent and Control Deforestation (PPCD/AC); and
- Normative ordinance Nº 004/2013, which authorizes the use of fires for family farming

The Project Proponents are also in compliance with these laws as outlined below.

Title of Law

Law nº 1.117/1994 is entitled, "The Foundation of the State's Environmental Policy."

[43] The Governor of the State of Acre, "Acre Forestry Law, December, 27, 2001," Available: http://webserver.mp.ac.gov.br/?dl_id=800
[44] The Governor of the State of Acre, "Acre Forestry Law, December, 27, 20 01," Available: http://webserver.mp.ac.gov.br/?dl_id=800

Summary of Law

This law establishes the Environmental Policy in the State of Acre and describes "its implementation and monitoring, establishing basic objectives, guidelines and standards for the protection, conservation and preservation of the environment and environmental resources, as a quality of life of the population."[45]

Compliance with Law

As a validated and verified REDD+ project, the Russas Project is seeking to conserve the environment and its natural resources which are foundations of Acre's Environmental Policy.

Title of Law

Three laws/decrees that relate to Acre' ecological and economic zoning are law 1.904/2007, entitled "Establishes the Ecological - Economic Zoning of the State of Acre – ZEE," decree nº 3.416/2008, and law nº 2693 of 17/01/2013, entitled "amends laws nos. 1.904, dated June 5, 2007, which 'Establishes the Ecological and Economic Zoning of the State of Acre – ZEE,' and 2.025, dated October 20, 2008, which 'Creates the State Program for Certification of Family Production Units of the State of Acre,' and provides other measures."[46]

Summary of Law

Law 1.904/2007 initially established the ecological and economic zoning (EEZ) map of the State of Acre. The State Decree nº 3.416/2008 regulates the second stage of the EEZ map for the State of Acre.[47] Law nº 2693 of 17/01/2013, amends laws nº 1.904/2007, which "Imposes the Ecological - Economic Zoning map of the state of Acre – ZEE," and "Creates the State Program of Productive Family Unity Certification of the state of Acre." [48]

Compliance with Law

The Russas Project is in the process of registering with the CAR and is conserving the property's Legal Reserve, along with Areas of Permanent Preservation. In addition, the landowner is not a part of the State Program of Productive Family Unity Certification and thus, this aspect is not applicable.

Title of Law

PPCD/AC of 2010 is entitled, "The Plan to Prevent and Control Deforestation of Acre."[49]

Summary of Law

PPCD/AC of 2010 consists of three parts: spatial planning and land tenure; productive chains and sustainable practices; and monitoring and control.

[45] LegisWeb. "Lei nº 1.117 de 26/01/1994," Available: https://www.legisweb.com.br/legislacao/?id=116194
[46] LegisWeb. "Lei Nº 2693 DE 17/01/2013," Available: https://www.legisweb.com.br/legislacao/?id=250191
[47] Official Diary of the State of Acre. "October 22, 2009." Available: http://www.diario.ac.gov.br/edicoes/DO10157_22102009.pdf. Page 7.
[48] LegisWeb. "Lei Nº 2693 DE 17/01/2013," Available: https://www.legisweb.com.br/legislacao/?id=250191
[49] State of Acre Government. "Plano Estadual de Prevenção e Controle do Desmatamento do Acre." Available: https://www.scribd.com/document/154380731/PPCD-AC-2010

Compliance with Law

The Russas Project is in the process of being geo-referenced and in the process of being registered with CAR. In addition, the Project seeks to provide titles to local communities. The Project is also developing productive and sustainable supply chains via agricultural extension trainings. In the future, Ilderlei will provide manioc processing kits to local communities and help to establish açaí processing. As part of a validated and verified REDD+ project, the Project will annually monitor for climate, community and biodiversity impacts.

Title of Law

IMAC issued normative ordinance entitled, "nº 004/2013."

Summary of Law

IMAC's normative ordinance entitled, "nº 004/2013," authorizes small-scale fires for family farming.

Compliance with Law

The landowner of the Russas Project does not use fire and nor is the property an INCRA settlement. The landowner does allow the communities to use small-scale fires to clear land for subsistence agriculture. This said, the agricultural extension courses and ongoing trainings will discuss alternatives to the use of fire.[50,51]

Approval from the Appropriate Authorities

Between March 2011 and December 2013, the Russas Project received approval from Ilderlei Souza Rodrigues Cordeiro who privately owns the Russas Project property and the Project Proponents also received approval from the local communities. Such approvals are evidenced by the Tri-Party Agreement between the Project Proponents, along with the "ata" signed by the local communities.

The Project Proponents were in active communication with the State of Acre between March 2011 and December 2013. The Project Proponents also received letters of support from numerous institutions including:

- The President of the Legislature for the Municipality of Cruzeiro do Sul;
- The State Secretary of Environmental Affairs for the Municipality of Cruzeiro do Sul; and
- The Mayor of Cruzeiro do Sul.

[50] Globo. "Autorização de queimadas controladas podem ser solicitadas," Available: http://g1.globo.com/ac/acre/noticia/2013/05/autorizacao-de-queimadas-controladas-podem-ser-solicitadas.html
[51] State of Acre Government. "Imac começa a emitir autorização para queimadas controladas," Available: http://www.agencia.ac.gov.br/imac-comeca-a-emitir-autorizacao-para-queimadas-controladas/

3.2 Evidence of Project Ownership (G5)

The Project Proponents have clear, uncontested title to both the property rights and the carbon rights. A review of the Landowner and the Russas Project property was conducted between March 2011 and December 2013 to ensure full title validity and accuracy. A copy of the property rights documentation is provided in the project database including the:

- Certidao de Inteiro Teor (or certification of full rights), and
- Georeferenced property delineation.

This documentation satisfies the VCS Standard as rights of use "arising by virtue of a statutory, property or contractual right."[52]

Carbon Securities and CarbonCo conducted an initial search for any pending cases, lawsuits, or other problems associated with the Landowner, their CPF numbers (i.e., Cadastro de Pessoas Físicas which is equivalent to a social security number in the US), their property, or their company's CNPJ (Cadastro Nacional da Pessoa Jurídica, which is equivalent to the EIN or Employer Identification Number in the US). Federal tax issues and liens associated with the Landowner and the project property, were assessed using the CPF, CNPJ and Imóvel Rural (NIRF) using the Secretariat of the Federal Reserve of Brazil website.[53]

INCRA, or Instituto Nacional de Colonização e Reforma Agrária, is a Brazilian Federal Institute and their website states what types of certifications are required to document appropriate landownership and who can ask for such certifications.

Finally, Carbon Securities and CarbonCo visited the IBAMA, or Instituto Brasileiro do Meio Ambiente e dos Recursos Naturais Renováveis, website[54] to ensure IBAMA has not blocked landownership titles due to noncompliance with environmental laws and regulation associated with a particular property. State and municipality level documentation[55] further demonstrated authentic land ownership. These local authorities in Acre are able to provide up to a 100-year history of landownership for the properties.

In October and November 2017, the Project Proponents reviewed the necessity of obtaining the Certificado de Cadastro de Imóvel Rural (CCIR) and the Cadastro Ambiental Rural (CAR). The Project is in the process of obtaining both the CCIR and CAR, but as of November 2017, neither document were required to demonstrate landownership.

With respect to private ownership of carbon rights in Brazil, a Presidential Decree on July 7, 1999 by the Brazilian Government established the Inter-ministerial Commission on Global Climate Change as the

[52] VCS. 2012 VCS Standard. Version 3.2, 01 February 2012. Verified Carbon Standard, Washington, DC.
[53] http://www.receita.fazenda.gov.br/grupo2/certidoes.htm
[54] IBAMA, "Certidão Negativa de Débito," Available: http://www.ibama.gov.br/sicafiext/sistema.php
[55] Ministry of Justice of Brazil, "Cadastro de Cartório do Brasil," Available: http://portal.mj.gov.br/CartorioInterConsulta/consulta.do?action=prepararConsulta&uf=AC

Designated National Authority for approval of projects under the UNFCCC Kyoto Protocol's Clean Development Mechanism (CDM).[56]

José D.G. Miguez, Executive Secretary of the Brazilian Interministerial Commission on Global Climate Change, presented on March 18, 2003 at the Organisation for Economic Co-operation and Development (OECD) Global Forum on Sustainable Development: Emissions Trading Concerted Action on Tradeable Emissions Permits (CATEP) Country Forum. Within in presentation, Mr. Miguez specifically indicated the private sectors ability "to design, develop and implement CDM project activities" in Brazil.[57] This said, there are currently numerous private sector CDM and voluntary carbon market projects in Brazil including projects within the Agricultural, Forestry and Other Land-use (AFOLU) sector.

The Tri-Party Agreement documents the transfer of some portion of these carbon rights from Ilderlei Souza Rodrigues Cordeiro to CarbonCo and Carbon Securities.

3.3 Emissions Trading Programs and Other Binding Limits (CL1)

This section is not applicable because Brazil does not have an emissions trading program and REDD+ projects are currently not eligible for any compliance market. In contrast, the Russas Project was validated to the VCS and CCBS and shall be regularly verified to both the VCS and CCBS. The issuance of Verified Carbon Units (VCUs) onto the VCS-approved Markit Environmental Registry helps to ensure the avoidance of GHG emissions being double counted.

3.4 Participation under Other GHG Programs (CL1)

The Russas Project has been registered under the Climate, Community and Biodiversity Alliance Standard (CCBS). The Russas Project has not been registered, nor is seeking registration, under any other GHG programs.

3.5 Other Forms of Environmental Credit (CL1)

This section is not applicable because the Russas Project is not generating any other forms of environmental credits such as biodiversity offsets, watershed protection payments, or renewable energy certificates (RECs).

3.6 Projects Rejected by Other GHG Programs (CL1)

This section is not applicable because the Russas Project has not been rejected by any other GHG program.

3.7 Respect for Rights and No Involuntary Relocation (G5)

The Russas Project does not require the involuntary relocation of people nor important activities related to the communities' livelihoods and culture. See section 7.3 for an explanation of the Free, Prior and Informed Consent (FPIC) process.

[56] Ministry of Science, Technology and Innovation, "Designated National Authority (Interministerial Commission on Global Climate Change)," Available: http://www.mct.gov.br/index.php/content/view/14666.html
[57] José D.G. Miguez, "CDM in Brazil," Available: www.oecd.org/dataoecd/9/6/2790262.pdf

3.8 Illegal Activities and Project Benefits (G5)

Between March 2011 and December 2013, the Project Proponents identified the following illegal activities that could affect the Project's climate, community and biodiversity benefits.

- Hunting, fishing or collecting endangered flora and fauna;
- Illegal logging; and
- Cultivation, transportation or distribution of illegal drugs.

While conducting deforestation monitoring along with community and biodiversity impact monitoring, the Project Proponents also kept their eyes open for illegal activities.

Ultimately, illegal activities of any kind will not be allowed in the Russas Project and the appropriate authorities will be contacted.

4 APPLICATION OF METHODOLOGY

4.1 Title and Reference of Methodology

The Russas Project is utilizing the Avoided Deforestation Partners' VCS REDD Methodology, entitled, "VM0007: REDD Methodology Modules (REDD-MF)." The only eligible activity as part of this project is avoiding unplanned deforestation, hence only modules related to unplanned deforestation are required. This project is eligible as an avoiding unplanned deforestation project because the forest land is expected to be converted to non-forest land in the baseline case and the land is not legally authorized and documented to be converted to non-forest or a managed tree plantation. The specific modules applied to the Russas Project are listed below.

REDD-MF, REDD Methodology Framework Version 1.4

Carbon Pool Modules:

CP-AB, "VMD0001 Estimation of carbon stocks in the above- and belowground biomass in live tree and non-tree pools," Version 1.0

CP-D, "VMD0002 Estimation of carbon stocks in the dead-wood pool," Version 1.0

Baseline Modules:

BL-UP, "VMD0007 Estimation of baseline carbon stock changes and greenhouse gas emissions from unplanned deforestation," Version 3.2

Leakage Modules:

LK-ASU, "VMD0010 Estimation of emissions from activity shifting for avoided unplanned deforestation," Version 1.0

Monitoring Module:

M-MON, "VMD0015 Methods for monitoring of greenhouse gas emissions and removals," Version 2.1,

Miscellaneous Modules:

X –STR, “VMD0016 Methods for stratification of the project area,” Version 1.0

X-UNC, “VMD0017 Estimation of uncertainty for REDD project activities,” Version 2.0

Tools:

T-SIG, CDM tool “Tool for testing significance of GHG emissions in A/R CDM project activities,” Version 1.0

T-ADD, “VT0001 Tool for the Demonstration and Assessment of Additionality in VCS Agriculture, Forestry and Other Land Use (AFOLU) Project Activities,” Version 3.0

T-BAR, “Tool for AFOLU non-permanence risk analysis and buffer determination,” Version 3.2

Use of modules, REDD-MF, M-MON, T-ADD, T-BAR, X-UNC, and X–STR, is always mandatory when using the VM0007 methodology. Further use of modules, BL-UP and LK-ASU, is mandatory in the case of projects focusing on unplanned deforestation. Use of the module T-SIG determines whether GHG emissions by sources and/or decreases in carbon pools are insignificant. Finally, CP-AB is mandatory in all cases and while CP-D is optional, as the dead wood pool is greater in the project scenario than the baseline scenario, it has been included.

4.2 Project Boundary (G1)

4.2.1 Sources of GHG Emissions Associated with the Baseline, Project and Leakage

GHG emission sources included in the project boundary are listed in Table 4.1. Justifications are provided when excluded from the project boundaries.

Table 4.1. GHG Emission Sources Included in the Project Boundary.

Source	Gas	Included	Justification/ Explanation
Biomass burning	CO_2	No	CO_2 emissions are already considered in carbon stock changes.
	CH_4	Yes	While CH_4 and N_2O emissions are conservatively excluded in the baseline, they are included in the with project case where fires occur
	N_2O	Yes	
Fossil Fuel Combustion	CO_2	No	Emissions from fossil fuel combustion in the baseline and project case are minimal. As per methodology module E-FCC “Fossil fuel combustion in all situations is an optional emission source.”
	CH_4	No	Emissions are small and

	N_2O	No	negligible.
Use of fertilizers	CO_2	No	Excluded. No increase in fertilizer use is contemplated in the project case as part of leakage mitigation or any other activity.
	CH_4	No	
	N_2O	No	Excluded. No increase in fertilizer use is contemplated in the project case as part of leakage mitigation or any other activity.

4.2.2 Carbon Stock Associated with the Baseline, Project and Leakage

This project will include the following carbon pools (see Table 4.2).

Table 4.2. Carbon Pools Included in the Project Boundary.

Carbon pools	**Included / Excluded**	**Justification / Explanation of Choice**
Aboveground	Included	Mandatory to include. Tree biomass only is included, which is the most significant pool. Non-tree woody biomass (e.g. shrubs) is less in the baseline (pasture and cropland) than the project case (forest) and is conservatively excluded.
Belowground	Included	Included and treated together with aboveground biomass for completeness to include whole tree (aboveground and belowground) biomass.
Dead Wood	Included	This pool was included as it can represent a significant component of forest biomass.
Harvested Wood Products	Excluded	Excluded as no commercial harvesting for wood products[58] takes place in the baseline (as part of the forest conversion process) or with project scenarios.
Litter	Excluded	Conservatively omitted, as allowed by methodology.
Soil Organic Carbon	Excluded	Conservatively omitted, as allowed by methodology.

1. As noted in the table above, this project will consider three pools of carbon and the applicable modules include: CP-AB “VMD0001 Estimation of carbon stocks in the above- and belowground biomass in live tree and non-tree pools” and CP-D, “VMD0002 Estimation of carbon stocks in the dead-wood pool”.

[58] The results of the community surveys indicated 0 of 16 communities responded yes to the question, “Do you sell timber?”

4.3 Baseline Scenario (G2)

The VCS "Tool for the Demonstration and Assessment of Additionality in VCS Agriculture, Forestry and Other Land Use (AFOLU) Project Activities" is applied to identify the baseline scenario of the project.

As the outcome of sub-step 1a of the tool, the following alternative land use scenarios were identified.

1. Continuation of pre-project land use with unabated threat of illegal deforestation.
2. Project activity on the land within the project boundary performed without being registered as a VCS AFOLU project.

As the outcome of Sub-step 1b, all land use scenarios identified above are in compliance with applicable legal and regulatory requirements, except #1, which represents illegal deforestation not undertaken by the landowners or project proponents. These scenarios are discussed and justified below.

4.3.1 Continuation of the Pre-Project Land Use with Unabated Threat of Illegal Deforestation

While the pre-project land use for the project area was moist tropical forest, this land use is unlikely to continue in the future given land use change patterns and deforestation pressures in the area. Considering the deforestation on other parts of the Russas property (i.e., those areas outside the project area) and in the region in general, portions of the project area are increasingly likely to be deforested and converted to pasture and cropland by small scale farmers.

There are approximately 20 small scale and subsistence farming communities living on the project property. These farming communities are the agents of deforestation. These communities clear a portion of forest for land to engage in small scale farming and ranching for their livelihoods. Forest is generally cleared over a period of months. The process most often starts in May/June at the beginning of the dry season with the cutting of small trees and vines by machete. Next, the farmer uses their own chainsaw or hires someone with a chainsaw to cut the larger trees down. The farmer then waits for the dead vegetation to dry for a period of time ranging from two weeks to several months. A portion of the farmers, then use fire to clear the land. Finally crops are planted or the land is converted to pasture. In cases where fire is not used, the land is planted or grazed without full clearing. In addition to clearing land, the agents of deforestation also rely on the forest surrounding their homesteads for fuelwood to make charcoal, for hunting and gathering, and on occasion for timber.

As the agent of deforestation is small scale farmers, rather than the landowners themselves, this deforestation is unplanned. This deforestation is technically illegal as these agents of deforestation do not have the permission to convert forest land to pasture or cropland; however, this deforestation is rarely prosecuted by authorities. The most likely baseline scenario is continued conversion of moist tropical forest to pasture and cropland by small scale farmers.

Noncompliance with private properties laws is widespread and laws are systematically not enforced in Acre State. Numerous inquiries have been made to relevant state and local authorities to obtain data on levels of enforcement (or e.g., percentage of illegal land invasions resolved) of private property laws. To our knowledge no institutions currently track these cases in a systematic fashion. The State of Acre in general has insufficient levels of government enforcement of property rights sufficient to prevent or remove illegal land invasions and stop deforestation in accessible areas. This is supported by a letter[59]

[59] A copy of this letter is contained in the project database.

dated 11 October 2012 from, the President of the Acre Lawyers Association, Dr. Florindo Poersch where he states:

> In my professional opinion, illegal deforestation in the State of Acre…[is] rarely controlled and/or prevented by institutions of environmental control, due to lack of technical personnel and staff of the State Acre to perform this control…
>
> Furthermore, the right to property in rural areas, in the case of invasion is difficult to apply in the State of Acre, due to lack of the judiciary's structure to escalate these demands quickly, and promptly remove invaders.

The likelihood of this scenario is further substantiated on the basis of analysis of historic deforestation and drivers, elaborated below.

4.3.2 Project Activity on the Land within the Project Boundary Performed without being Registered as the VCS AFOLU Project

The landowner maintains the property as primary tropical rainforest.

Effective forest conservation in the project area would be unlikely under any non carbon market-related scenario. The landowner does not have sufficient finances to protect the area and incentivize communities to participate in forest conservation, which is reflected by the 220 ha of deforestation that has occurred on the property prior to the project start since the landowner had acquired the property, and the increasing pressures as described above. Further there is no legal requirements to undertake activities similar to the project activity. Likewise, there are no observed similar activities in the geographical region on private lands.

To develop a defensible and well-documented baseline projection with respect to the 'without-project' reference scenario, the Russas Project utilized the Avoided Deforestation Partners' VCS REDD Methodology, entitled, "VM0007: REDD Methodology Modules (REDD-MF), v1.3." Ultimately, the most likely 'without project' scenario for the Russas Project is the continuation of unplanned, frontier deforestation as opposed to planned deforestation by the Landowner or the Landowner providing project activities in the absence of a validated and verified REDD+ project.

According to the Food and Agriculture Organization of the United Nations, Brazil had the largest area of forest loss over the years 2000 to 2010:

Top 5 Forest Cover Annual Change Rates: 2000-2010 (Hectares and Acres)[60]

	Country	Annual Change Rate 2000-2010 (Hectares)	Annual Change Rate 2000-2010 (Acres)
1	Brazil	-2,642,000	-6,525,740
2	Australia	-562,000	-1,388,140

[60] Food and Agriculture Organization of the United Nations, "State of the World's Forests 2011, Annex, Table 2: Forest area and area change," Available: http://www.fao.org/docrep/013/i2000e/i2000e05.pdf.

3	Indonesia	-498,000	-1,230,060
4	Nigeria	-410,000	-1,012,700
5	Tanzania	-403,000	-995,410

More specifically, the following are the annual deforestation rates for the state of Acre, along with the nearby Brazilian states of Amazonas and Rondônia:

Annual Rates of Deforestation (Square Kilometers per Year)[61]

States	2006	2007	2008	2009	2010
Acre	521	545	256	495	203
Amazonas	1,673	1,306	1,115	1,535	917
Rondônia	2,820	2,316	1,835	1,025	346

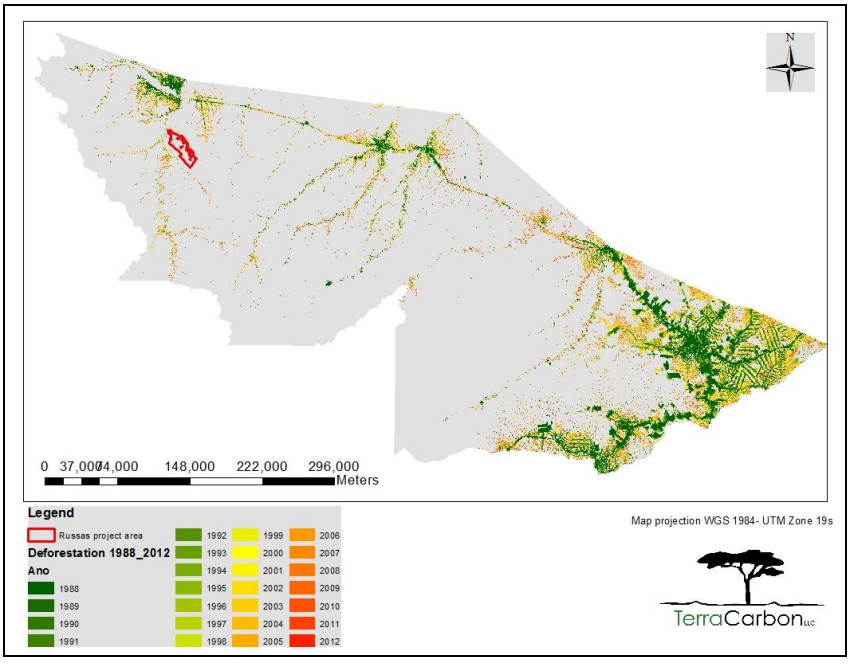


Figure 4.0: Map of Deforestation in Acre State
(Credit: TerraCarbon and Data from State of Acre's Climate Change Institute)

[61] Imazon.org, "Deforestation and forest degradation in the Amazon Biome," Available: http://www.imazon.org.br/publications/other-publications/deforestation-and-forest-degradation-in-the-amazon-biome-1

For a more detailed explanation of the regional land use and deforestation patterns in the 'without project scenario,' please see section 2.4 Baseline Scenario of the validated VCS Project Description.

Carbon Stock Exchanges without Project

For the estimated carbon stock changes associated with the 'without project' reference scenario and specifically the estimation of carbon stocks and the specific carbon pools included in the forest carbon inventory, please see the validated VCS Project Description. A discussion of the net change in the emissions of non-CO_2 GHG emissions is also included. In addition, the validated VCS Project Description will also include an analysis of the relevant drivers and rates of deforestation and justification of the approaches, assumptions, and data used to perform this carbon stock analysis.

Local Communities without Project

The local communities obtain a variety of benefits from the Russas and there are numerous social projects being planned as result of payments for ecosystem services. The 'without project' scenario would be the continued unplanned, frontier deforestation activities of subsistence agriculture and cattle pastures by the local communities. The communities undoubtedly receive benefits from these activities such as locally-produced food and income generation through the sale of their crops and cattle to Cruzeiro do Sul.

However in the 'without project' scenario the communities, without a secure and legal title to land, are marginalized and vulnerable. Thus, the communities could legally be removed from the Russas Project and the communities would either need to relocate to a new patch of forest (i.e., most likely alongside the Juruá River or Valparaiso River) or move to a city such as Cruzeiro do Sul or possibly Porto Walter.

Water and Soil

If the Landowner, instead of undertaking a forest conservation project, allowed unplanned deforestation to continue from communities, there would be significant impacts on the local water cycle and soil quality – both of which would have negative impacts on the community. Such impacts include, but are not limited to:

- Less trees to store water, resulting in potential localized flooding;
- Without water absorption by trees, pools of water left behind in open pastures could increase mosquito population and insect-borne diseases such as yellow fever and malaria;
- Increased water runoff, due to less roots, could increase topsoil runoff and contribute to the further erosion of river banks;
- Increased runoff could damage local fishing grounds (i.e., soil settles on eggs, disrupts photosynthesis process of water plants and algae which are sources of fish food);
- Additional debris from clear-cut could be swept into the river causing increased challenges of boat transportation; and

- Less agriculturally productive soils due to the loss of nutrients embedded in the tropical rainforest ecosystem along with the loss of soil microbes.

Other Locally Important Ecosystem Services

In addition to an impact on water and soil, other locally important ecosystem services that could be impacted without the Russas Project include a loss of wildlife habitat. This wildlife habitat loss, which would also reduce the availability of game for the local community, will be discussed in greater detail in the next section.

Biodiversity without Project

There is a high-level of biodiversity in and around the Russas Project. If unplanned deforestation by the communities was allowed to continue, there would be reduced availability of habitat, a fragmented landscape, and potentially more threatened species.

Habitat Availability

If the Landowner allowed for the continuation of unplanned, frontier deforestation, the resulting open cattle pastures and cropland would provide a poor habitat for the region's biodiversity except for domesticated animals and wild species that exist in transitional forests and open grasslands. Thus, forest dependent species and especially flora would have less available habitat.

Landscape Connectivity

If the 'without project," unplanned frontier deforestation scenario continued, there would be a negative impact on landscape connectivity due to increased pressure on surrounding intact forests of the Russas Project.

Threatened Species

There several threatened fauna species, and likely several threatened flora species, in the Project Area. If the Russas Project were converted to cattle pasture and crop land via unplanned frontier deforestation, these particular threatened species would likely disappear from the Russas Project due to a reduction in habitat. These threatened species could move to a higher level of extinction risk according to the International Union for Conservation of Nature (IUCN). In addition, species currently considered to be at a low level of risk could move into a threatened category if the additional deforestation pressures were placed on the surrounding landscape.

4.4 Additionality (G2)

The VCS "Tool for the Demonstration and Assessment of Additionality in VCS Agriculture, Forestry and Other Land Use (AFOLU) Project Activities" is applied to demonstrate additionality for the Russas Project.

4.4.1 Simple Cost Analysis

As the project activity generates no financial or economic benefits to the Project Proponents other than VCS related income through the project activity, a simple cost analysis is justified.

The project activity produces no revenue, as the project area will be managed for conservation purposes, rather than for commercial timber production, livestock, or crop production. Costs associated with implementing project activities, project development, and VCS project validation are significant. Additionally, while the project will incur ongoing costs (related to management and implementation of project activities including forest patrols, social programs, and payments for environmental services), it will not generate future financial benefits other than VCU related income. The Project Proponents thus generate no financial benefits, and therefore the outcome of a simple cost comparison shows significant project expenditure with no financial return in the absence of VCS-related income, thus making this REDD project impractical in the absence of carbon finance.

4.4.2 Common Practice

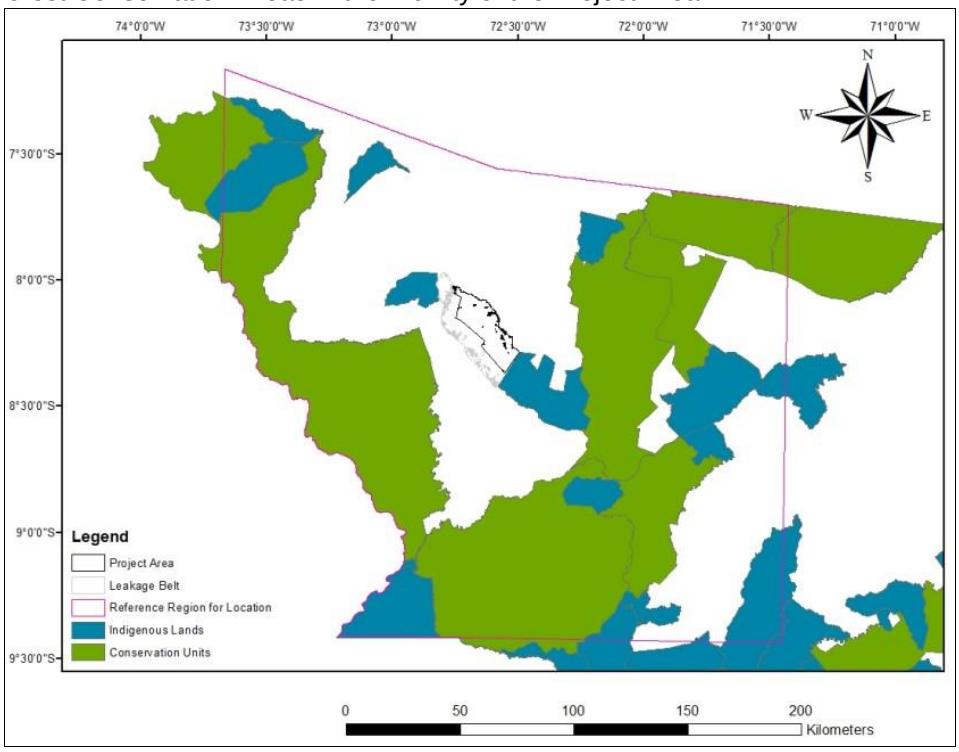
Conservation of privately owned forest land in Acre state is generally limited to designated areas of permanent protection (APP). One requirement of the Brazilian Forest Code is for landowners to maintain 80% of privately owned property as an APP. Regardless of this designation or the property owner's intentions to comply with the law, the APP areas continue to be subject to pressure from illegal deforestation.

It is possible to implement certain social and environmental programs without carbon financing, such as government assistance with agricultural extension. However, these measures on their own are not sufficient to incentivize small scale farmers in the area or new settlers to stop deforestation in and around the project area. It is only through the implementation of significant social and environmental programs, as well as implementation of forest protection measures, that illegal deforestation can be reduced or prevented in the project area.

Publicly-funded forest conservation efforts on government lands exist. Other forest conservation efforts within Acre state include a series of national, state, and local conservation areas, and indigenous reserves (see Figure 4.1, below). However, to our knowledge, there are no privately funded projects on private lands with the aim of stopping unplanned deforestation in Acre state without the aid of carbon finance.

While the conservation areas and indigenous reserves have had some successes at maintaining forest cover, the essential distinction between these lands and the project area is that the project area is privately owned and does not have access to government resources to deter unplanned deforestation pressures on its land.

Figure 4.1. Forest Conservation Areas in the Vicinity of the Project Area.



4.4.3 Results of the Additionality Analysis

As demonstrated above, the project activity, without revenue from carbon credits, is unlikely to occur and is not a common practice in the region. The project is therefore additional.

The predominant land-use among medium-to-large landowners along the BR-364 and BR-317 highways and the Ramal 3 road is the conversion of primary forests to cattle pastures. The pressure on the Russas Project is increasing with each passing year as BR-364 and Ramal 3 are paved and this paving allows for year-round transportation, which increases property values and market access for landowners' cattle.

Ilderlei Souza Rodrigues Cordeiro ("Ilderlei") started the negotiation to purchase the Russas Project property in 2003 from the Radisi Group and the purchase deal closed in 2004. Historically, the Radisi Group was using the land for rubber tapping since 1940. Ilderlei initially purchased the Russas Project property for wood management and also for cattle ranching on 20% of the property.

In 2004, Ilderlei become Vice-Mayor of Cruzeiro do Sul and his plans for the Russas Project were temporarily put on hold. Ilderlei was Vice-Mayor until December 2006 and then from January 2007 to 2010, Ilderlei was a Federal Congressman representing the State of Acre in Brasilia. During this time, Ilderlei had a local community manager living at the Russas Project.

Ilderlei moved back to Cruzeiro do Sul in 2011 and began looking into projects for his property, when he eventually spoke to Normando Sales from the Purus Project and began to learn about REDD+ projects.

Without a payment for ecosystem services forest conservation project, Ilderlei would continue to pay taxes on his property without generating any economic returns unless planned forest conversion took

place. If forest conversion took place, the Russas Project's biodiversity would surely be reduced and the communities' might be forced to relocate.

Even if planned forest conversion by the Ilderlei did not take place, there would still be increasing pressure on the Russas Project's forests via unplanned, frontier deforestation from the community and neighboring landowners. This is the most likely 'without-project' scenario. Thus, the communities within the Project Area would continue unsustainable subsistence agriculture, while surrounding communities encroached on the Project Area and in-migration continued.

Another possible, but unlikely, 'without project' land-use scenario would be for the Landowner to provide project activities to the communities without developing and registering the Project as a validated and verified REDD+ Project. The lack of economic returns in the 'without project' scenario would result in Ilderlei's inability to provide a range of social projects (e.g., establish health clinic) for the communities along with an inability to research the Russas Project's biodiversity. This is because there are significant financial and institutional resources required to develop a validated and verified REDD+ project.

Furthermore without a REDD+ project, the communities would not receive agricultural extension trainings (i.e., which shall assist with increasing and diversifying incomes) nor a share of the Project's carbon offset revenue.

For a more detailed discussion of the Russas Project's additionality, please also see the validated VCS Project Description here.

5 MONITORING DATA AND PARAMETERS

5.1 Description of the Monitoring Plan (CL3, CM3 & B3)

This monitoring plan has been developed in close conjunction with module VMD0015 of the REDD Methodological Module, "Methods for monitoring of greenhouse gas emissions and removals (M-MON)." This section focuses on establishing procedures for monitoring deforestation, illegal degradation, natural disturbance, and project emissions ex-post in the project area and leakage belt. Further, procedures for updating the forest carbon stocks and revising the baseline are also provided below.

For accounting purposes, the project conservatively assumes stable stocks and no biomass monitoring is conducted in areas undergoing carbon stock enhancement, as permitted in the methodology monitoring module VMD0015, hence $\Delta C_{P,Enh,i,t}$ is set to 0.

Further as no commercial harvest of timber (including FSC selective logging) occurs in the baseline or with project case, the degradation due to harvest of timber will not be monitored, thus parameter $\Delta C_{P,SelLog,i,t}$ is set to 0. As such, parameters related to calculating emissions from commercial timber harvest, including ADECKS,I,t; AROAD,i,t; CAB_tree_dest, i; CBB_tree_dest, i; CS/U,lg; CB,lg; Lsk; VEXT,z,i,t; VEXT,j,z,i,t; and WSKID, are not included in the project.

None of the project area has been or will be registered under another carbon trading scheme during the VCS project lifetime, other than CCBA. Further, the property is under the private ownership of I.S.R.C., a project proponent, and registration under the CDM or under any other carbon trading scheme is not

feasible without their consent. A separate section on quality assurance/quality control and data archiving procedures covers all monitoring tasks.

Organizations responsible for monitoring are listed below in Table 5.1. These organizations are responsible for implementing all aspects of a particular monitoring task, as described in the monitoring sub-sections below.

Monitoring Deforestation and Natural Disturbance

Forest cover change due to deforestation and natural disturbance is monitored through periodic assessment of classified satellite imagery, see below, covering the project area. Emissions ($\Delta C_{P,Def,i,t}$ and $\Delta C_{P,DistPA,i,t}$ for deforestation and natural disturbance, respectively) are estimated by the multiplying areas $A_{DefPA,u,i,t}$ and $A_{DistPA,q,i,t}$,, for deforestation and natural disturbance, respectively, by average forest carbon stock per unit area. Note that $A_{DistPA,q,i,t}$,, is limited to the area where credits have been issued and is identified as the overlap between the delineated area of the disturbance and the summed area of unplanned deforestation in the project area to the year in which the disturbance occurred. Stock estimates from the initial field inventory completed in 2013, are valid for 10 years (per VM0007). Table 5.1 shows the data and parameters monitored.

Table 5.1 Data and Parameters for Monitoring Deforestation and Natural Disturbance.

Parameter	Description	Units	Source/ Justification of Choice of Data or Description of Measurement Methods
$\Delta C_{P,Def,i,t}$	Net carbon stock change as a result of deforestation in the project case in the project area in stratum i at time t	t CO_2e	Calculated
$\Delta C_{P,DistPA,i,t}$	Net carbon stock change as a result of natural disturbance in the project case in the project area in stratum i at time t	t CO_2e	Calculated
$A_{DefPA,u,i,t}$	Area of recorded deforestation in the project area stratum i converted to land use u at time t	Ha	Monitored for each verification event
$A_{DistPA,q,i,t}$	Area impacted by natural disturbance in post-natural disturbance stratum q in stratum i, at time t	Ha	Monitored for each verification event

$C_{BSL,i}$	Carbon stock in all pools in the baseline case in stratum i	t CO_2e ha^{-1}	Estimated from the forest carbon inventory
ARRL,forest,t	Remaining area of forest in RRL at time t	Ha	Updated prior to each verification event

Changes in forest cover ($A_{DefPA,u,i,t}$ and $A_{DistPA,q,i,t}$) will be monitored using data provided by the State of Acre. UCEGEO, the Central Unit of GIS and Remote Sensing within the Climate Change Institute (ICM) in Acre, produces an annual dataset on the extent and spatial location of all deforestation within the state using Landsat images. This dataset extends back to 1988. The definition of forest used in the classified dataset is in broad agreement with the Brazilian definition of a forest[62] as set by the Clean Development Mechanism Designated National Authority.

The UCGEO classification methodology includes atmospheric and geometric correction and uses a supervised classification approach. Landsat images with cloud cover covering less than 10% of a scene were downloaded and corrected for any atmospheric problems (using Carlotto HAZE algorithm) and geometric correction (using images Geocover 2000). Georeferencing was conducted with the nearest neighbor method, using a minimum of 20 points, and had an error (RMS) of less than 1 pixel. The image processing phase includes image segmentation (into statistically homogeneous areas) using the blue, green, and red Landsat bands. Then representative samples (training sites) of Forest, Non-Forest Water, Cloud and Cloud Shadow are selected using expert knowledge that are distributed throughout the image and represent the variability within each class. A supervised classification[63] approach was used with the Support Vector Machine (SVM) classification algorithm. All processing was implemented in ENVI + IDL 4.6 except georeferencing which was carried out using ERDAS IMAGINE 9.

Deforestation and natural disturbance may be distinguished using ancillary data which may include but is not limited to high resolution imagery, digital elevation models (to identify steep areas prone to landslides), information from local land managers, etc. For this monitoring period no ancillary data was required and all information on deforestation was acquired from the UCGEO classification. In the case, where this dataset ceases to be available, or if newer and/or higher quality data becomes available, ex-post deforestation will be determined by classification of remotely sensed imagery and land use change detection procedures.

The project area (and leakage belt boundary), as set in the PD, will serve as the initial “forest cover benchmark map” against which changes in forest cover will be assessed over the interval of the first monitoring period; the entire project area has been demonstrated to meet the forest definition at the beginning of the crediting period. For subsequent monitoring periods, change in forest cover will be

[62] The Clean Development Mechanism Designated National Authority in Brazil has set the forest definition as:
1. Minimum tree crown cover of 30 per cent;
2. Minimum land area of 1 hectare; and
3. Potential to reach a minimum tree height of 5 meters at maturity
See http://cdm.unfccc.int/DNA/ARDNA.html?CID=30, accessed March 5, 2012.
[63] There is no overlap between the accuracy assessment points and the data used for classification.

assessed against the preceding classified forest cover map marking the beginning of the monitoring interval. Thus, the forest benchmark map is updated at each monitoring event.

The area of remaining forest in the RRL (ARRL,forest,t) is derived by subtracting by the nonforested area within the RRL, as found in the forest benchmark map (updated at each monitoring event), from the total area of the RRL.

Monitoring Illegal Degradation

Emissions due to illegal logging will be tracked by conducting surveys in the surrounding areas every two years. Locations surveyed will include:

- Families residing on the Russas property adjacent to the project area; and
- Nearby ranches and rural properties, along the Jurua and Valparaiso Rivers and secondary roads approaching the project area.

Surveys will produce information on wood consumers (fuel wood and wood for construction and charcoal production) in the surroundings areas, as well as general indications on the areas where wood is sourced from and maximum depth of penetration of harvest activities from access points. In the event that any potential of illegal logging occurring in the project area is detected from the surveys (i.e. ≥ 10% of those interviewed/surveyed believe that degradation may be occurring within the project boundary), then an estimation of emissions associated with illegal logging will be produced from the survey data and the T-SIG tool applied. The information collected in the PRAs will be used to calculate logging emissions in conjunction with conservative assumptions/estimates including that all wood collected was live, use of a regional charcoal recovery rate, and use of a logging damage factor from the methodology.

In the event that the initial assessment indicated that illegal logging is occurring and significant in the area; the potential degradation area within the project area ($A_{DegW,i}$) will be delineated based on survey results, incorporating general area information and depth of penetration. Degradation monitoring plots will be allocated to achieve a 3% sample of this area. Rectangular plots 10 meters by 1 kilometer (1 ha area) will be randomly or systematically allocated in the area, sufficient to produce a 3% sample of the area, and any recently-cut stumps or other indications of illegal harvest will be noted and recorded. Diameter at breast height, or diameter at height of cut, whichever is lower, of cut stumps will be measured. Biomass will be estimated from measured diameters (conservatively assuming that diameters of stumps cut below breast height are equivalent to diameter at breast height) applying the allometric equations of Brown (1997) and otherwise maintain consistency with analytical procedures applied in the original forest inventory report. Emissions due to illegal logging ($\Delta C_{P,DegW,i,t}$) are estimated by multiplying area ($A_{DegW,i}$) by average biomass carbon of trees cut and removed per unit area ($C_{DegW,i,t}/AP_i$).

The 3% sample will be carried out once every 5 years where initial surveys continue to indicate possibility of illegal logging in the project area to produce an estimate of emissions resulting from illegal logging ($\Delta C_{P,DegW,i}$). Estimates of emissions will be annualized (to produce estimates in t CO_2e per year) by dividing the emission for the monitoring interval by the number of years in the interval.

Table 5.3. Data and Parameters for Monitoring Illegal Degradation.

Parameter	Description	Units	Source/ Justification of Choice of Data or Description of Measurement Methods
$A_{DegW,i,t}$	Area potentially impacted by degradation processes in stratum i	Ha	Delineated based on survey results indicating general area of project potentially accessed and typical depth of penetration of illegal harvest activities from points of access
$C_{DegW,i,t}$	Biomass carbon of trees cut and removed through degradation process from plots measured in stratum i at time t	t CO_2e	Estimated from diameter measurements of cut stumps in sample plots
AP_i	Total area of degradation sample plots in stratum i	Ha	Calculated as 3% of $A_{DegW,i,t}$
$\Delta C_{P,DegW,i,t}$	Net carbon stock changes as a result of degradation in stratum i in the project area at time t	t CO_2e	Calculated

Monitoring Project Emissions

With project emissions are calculated as the sum of emission from fossil fuel combustion (EFC,i,t) + non-CO_2 emissions due to biomass burning (EBiomassBurn,i,t) + direct N_2O emissions as a result of nitrogen application (N2Odirect-N,i,t.). As stipulated in the methodology, fossil fuel combustion in all situations is an optional emission source. Further, no nitrogen is applied on alternative land uses in the with project case and hence project emissions therefore equal EBiomassBurn and are calculated using the VMD0013, "Estimation of greenhouse gas emissions from biomass burning (E-BB)" of the AD Partners modular REDD Methodology.
Non-CO_2 emissions from biomass burning in the project case include emissions from burning associated with deforestation and burning associate with natural disturbance, i.e. forest fire. It will be conservatively assumed that the total area burnt during the deforestation process is equal to the area deforested, ADefPA,u,i,t. Thus, the area used when calculating E-BB is equal to Aburn,i,t. (area burnt) = Aburn,q,i,t. (area burnt in natural disturbance) + ADefPA,u,i,t (area burnt via deforestation in project ex post).

Also, it is conservatively assumed that burning is a part of the forest conversion process in all incidents of deforestation taking place in the leakage belt. Thus, for deforested strata in the leakage belt, parameter $A_{burn,i,t}$ (Area burnt for stratum *i* at time *t*; ha) will be set equal to monitored parameter $A_{DefLB,i,t}$ (Area of

recorded deforestation in the leakage belt at time t; ha). The T-SIG tool can then be applied, and if parameter $E_{BiomassBurn,t}$ (Greenhouse emissions due to biomass burning as part of deforestation activities in stratum *i* in year *t*) is determined to be insignificant, $E_{BiomassBurn,t}$, can be assumed equal to zero.

Table 5.4. Data and Parameters for Monitoring Emissions from Biomass Burning.

Parameter	**Description**	**Units**	**Source/ Justification of Choice of Data or Description of Measurement Methods**
E BiomassBurn,t	Greenhouse emissions due to biomass burning as part of deforestation activities in stratum i in year t	tCO_2e of each GHG (CH_4, N_2O)	Calculated
Aburn,i,t	Area burnt for stratum i at time t	Ha	Monitored for each verification event
Bi,t	Average aboveground biomass stock before burning stratum i, time t	tonnes d. m. ha-1	Conservatively assumed to be the carbon stock in all pools in the baseline case (CBSL,i).
COMF i	Combustion factor for stratum i; dimensionless	dimensionless	0.45 for primary open tropical forest. Derived from Table 2.6 of IPCC, 2006.
Gg,i	Emission factor for stratum i for gas g	kg t-1 dry matter burnt	GCH_4 = 6.8 g kg-1 and GN_2O = 0.2 g kg-1. Derived from Table 2.5 of IPCC, 2006.
GWPg	Global warming potential for gas g	t CO_2/t gas g	Default values from IPCC SAR: CH_4 = 21; N_2O = 310).

Monitoring Leakage

Leakage by local agents of deforestation is quantified in the leakage belt. The area deforested in the leakage belt (ADefLB,i,t) is estimated in the same manner as the area deforested in the with project case ($A_{DefPA,u,i,t}$) using the procedures outlined above in the monitoring deforestation section. Aburn,i,t is assumed to be equal to ADefLB,i,t unless monitoring and on the ground observations demonstrate otherwise. Activity shifting leakage within the leakage belt (ΔCLK-ASU-LB) is then calculated as the with

project emissions in the leakage belt (ΔCP,LB) minus the baseline emissions in the leakage belt (ΔCBSL,LK,unplanned).

Table 5.5 Data and Parameters for Monitoring Activity Shifting Leakage.

Parameter	Description	Units	Source/ Justification of Choice of Data or Description of Measurement Methods
ΔCP,LB	Net greenhouse gas emissions within the leakage belt in the project case	t CO_2e	Calculated
ADefLB,i,t	Area of recorded deforestation in the leakage belt at time t	ha	Monitored for each verification event
$\Delta C_{P,Def,i,t}$	Net carbon stock change as a result of deforestation in the project case in the project area in stratum i at time t	t CO_2e	Calculated

Immigrant leakage is calculated using a series of equations found in the LK-ASU module. Most of the data for calculating immigrant leakage has been derived for the ex-ante estimates (including ΔCBSL,LK,unplanned; AVFOR; TOTFOR; PROTFOR; MANFOR; PROPLB; LBFOR; COLB; CLB; PROPCS; and ABSL,PA,unplanned,t) or gathered in the course of monitoring activity shifting leakage within the leakage belt and deforestation in the project area (including ADefPA; ADefLB,i,t; and ΔCP,LB).

The monitoring parameters MANFOR, PROTFOR, TOTFOR will be sourced from official data, peer reviewed publications or other verifiable sources, such as the Brazil Global Forest Resources Assessment Report published by the FAO and these monitoring parameters will be updated on review of current literature at least every 5 years. Demonstration that managed and protected forests will be protected against deforestation will further be demonstrated, as stipulated in the LK-ASU module.

Monitoring immigrant leakage will therefore consist of implementing surveys in communities living within 2 kilometers of the boundaries of the leakage belt and project area to determine what proportion of the agents of deforestation have been resident in and around the leakage belt and project area for ≥ 5 years (PROPRES) and the proportion of area deforested by population that has migrated into the area in the last 5 years (PROPIMM). As it is extremely sensitive to ask explicit questions regarding responsibility for deforestation, “the proportion of area deforested by population that has migrated into the area in the last 5 years” is assumed to be equal to the percentage of recent immigrants among local population with potential access to the project area (i.e. without directly asking if they are deforestation agents). Similarly, the “proportion of baseline deforestation caused by population that has been resident for ≥5 years” is assumed to be equal to the percentage of the local population residing in the area longer than 5 years with potential access to the project area.

Table 5.6 Data and Parameters for Monitoring Immigrant Leakage.

Parameter	Description	Units	Source/ Justification of Choice of Data or Description of Measurement Methods
PROPIMM	Proportion of area deforested by immigrant agents in the leakage belt and project area	proportion	Monitored prior to each verification event and at least every 5 years
PROPRES	Proportion of baseline deforestation caused by population that has been resident for ≥5 years	proportion	Monitored prior to each verification event and at least every 5 years
TOTFOR	Total available national forest area	ha	Monitored prior to each verification event and at least every 5 years
PROTFOR	Total area of fully protected forests nationally	ha	Monitored prior to each verification event and at least every 5 years
MANFOR	Total area of forests under active management nationally	ha	Monitored prior to each verification event and at least every 5 years

Updating Forest Carbon Stocks Estimates

Forest carbon stock estimates will be derived from field measurements less than or equal to 10 years old. Aboveground and belowground live tree and dead wood stocks will be re-assessed on or before 2023. For each stratum, where the re-measured estimate is within the 90% confidence interval of the t=0 estimate, the t=0 stock estimate takes precedence and is re-employed, and where the re-measured estimate is outside (i.e. greater than or less than) the 90% confidence interval of the t=0 estimate, the new stock estimate takes precedence and is used for the subsequent period.

Sample plots will be randomly located in areas within the Russas Project and measured following standard operating procedures located in Appendix B. Biomass will be estimated applying the following allometric equations and otherwise maintain consistency with analytical procedures applied in the original inventory (“Forest biomass carbon inventory for the Russas and Valparaiso Properties, Acre State, Brazil,” 2013). For live trees, biomass is calculated as a function of diameter at breast height (DBH; in cm)

using the predictive model developed by Brown[64] for tropical moist forest stands. Application of the "moist" equation reflects the annual precipitation for the inventoried area, 2200mm.

aboveground biomass (kg) = ((42.69-12.8*(DBH)+1.242*(DBH)^2)) Equation 5.1

For palms, height and dbh (a conservative estimate of basal diameter) measurements are used to estimate the aboveground volume of a paraboloid and then mean (species level) Amazonian palm specific gravity of 0.31 g/cm3 estimated by Baker et al (2004) will be applied. The estimate of biomass for palms is therefore to be limited to the main trunk (bole) of the palm. Thus, for palms

aboveground biomass (Mg) = 0.5*Π*(basal diameter(cm)/200)^2*height(m)*0.31 Equation 5.2

Root biomass density is estimated at the cluster sample level applying the equation developed by Cairns et al.[65] , where

Root Biomass Density (t/ha) = EXP (-1.085 + 0.925 LN(aboveground biomass density)) Equation 5.3

The volume of lying dead wood per unit area is estimated using the equation (Warren and Olsen[66]) as modified by Van Wagner[67] separately for each dead wood density class:

$$V_{LDW} = \frac{\pi^2 * \left(\sum_{n=1}^{N} D_n^{\,2} \right)}{8 * L}$$ Equation 5.4

where:

V_{LDW} Volume of lying dead wood per unit area; $m^3\ ha^{-1}$

D_n Diameter of piece n of dead wood along the transect; cm

N Total number of wood pieces intersecting the transect; dimensionless

L Length of the transect; m

Length of each transect was corrected for slope. The volumes per unit area of each dead wood density class are then multiplied by their respective densities to convert to a mass per unit area.

Biomass of standing dead wood is estimated using the allometric equation for live trees in the decomposition class 1. In decomposition class 2, the estimate of biomass was limited to the main trunk (bole) of the tree, in which case the biomass was calculated converting volume to biomass using dead wood density classes. Volume was estimated as the volume of a cone, as specified in the VM0007 module, "Estimation of carbon stocks in the dead wood pool".

[64]Brown, S., 1997. Estimating biomass and biomass change of tropical forests: A primer. FAO Forestry Paper: vii, 55 p.
[65] Cairns, M. A., S. Brown, E. H. Helmer, and G. A. Baumgardner. 1997. Root biomass allocation in the world's upland forests. Oecologia 111, 1-11.
[66] Warren, W.G. and Olsen, P.F. (1964) A line intersect technique for assessing logging waste. Forest Science 10: 267-276.
[67] Van Wagner, C.E. (1968). The line intersect method in forest fuel sampling. Forest Science 14: 20-26.

Density of dead wood is determined through sampling and laboratory analysis. Discs are collected in the field and decomposition class and green volume determined as per standard protocols (see Appendix B for more details). The resulting dry weight is recorded and used to calculate dead wood density as oven-dry weight (g) / green volume (cm^3) for each sample.

Dry mass is converted to carbon using the default carbon fraction of 0.47 t C/t d.m. (as recommended by IPCC[68] Guidelines for National Greenhouse Gas Inventories).

Revision of the Baseline

The baseline as outlined in the Project Description is valid for 10 years, through March 16, 2021. The baseline will be revised every 10 years from the project start date.

Data collection procedures in regards to revision of the baseline will include participatory rural appraisals, interviews and collaboration with the Acre State government, UCEGEO, the GIS department within the Climate Change Institute, and municipal officials. In the case, where the Acre State government no longer produces the annual dataset on the extent and spatial location of all deforestation within the state, deforestation maps will be prepared by classifying remotely sensed imagery. Other datasets used to substantiate aspects of the baseline with be from official government sources, peer reviewed publications, or other reputable sources.

Quality Assurance/Quality Control and Data Archiving Procedures

Monitoring Deforestation, Natural Disturbance, and Leakage

To ensure consistency and quality results, spatial analysts carrying out the imagery processing, interpretation, and change detection procedures will strictly adhere to best practices and good practice guidelines, when using the alternative method for quantifying deforestation. All data sources and analytical procedures will be documented and archived (detailed under data archiving below).

Accuracy of the classification, for both the baseline and monitoring, will be assessed by comparing the classification with ground-truth points or samples of high resolution imagery. Any data collected from ground-truth points will be recorded (including GPS coordinates, identified land-use class, and supporting photographic evidence) and archived. Any sample points of high resolution imagery used to assess classification accuracy will also be archived. Samples used to assess classification accuracy should be well-distributed throughout the project area (as far as is possible considering availability of high resolution imagery and/or logistics of acquiring ground-truth data), with a minimum sampling intensity of 50 points each for the forest and non-forest classes.

The classification will only be used in the forest cover change detection step if the overall classification accuracy, calculated as the total number of correct samples / the total number of samples, is equal to or exceeds 90%.

[68] IPCC 2006 Guidelines for National Greenhouse Gas Inventories. Chapter 4 AFOLU (Agriculture, Forestry and Other Land-use).

All data sources and processing, classification and change detection procedures will be documented and stored in a dedicated long-term electronic archive.

Information related to monitoring deforestation maintained in the archive will include:

- Forest / non-forest maps;
- Documentation of software type and procedures applied (including all pre-processing steps and corrections, spectral bands used in final classifications (the blue, green, and red Landsat bands), and classification methodologies and algorithms applied), if applicable; and
- Data used in accuracy assessment - ground-truth points (including GPS coordinates, identified land-use class, and supporting photographic evidence) and/or sample points of high resolution imagery.

Forest Carbon Stocks and Degradation

The following steps will be taken to control for errors in field sampling and data analysis:

1. Trained field crews will carry out all field data collection and adhere to standard operating procedures. Pilot sample plots shall be measured before the initiation of formal measurements to appraise field crews and identify and correct any errors in field measurements. Field crew leaders will be responsible for ensuring that field protocols are followed to ensure accurate and consistent measurements. To ensure accurate measurements, the height of diameter at breast height (1.3 m) will be periodically re-assessed by personnel during the course of the inventory.
2. An opportunistic sample of plots will be re-measured to identify and correct any field measurement issues which arise during implementation of the monitoring plan and to assess measurement errors. Re-measurement for this purpose will be done by different field personnel.
3. Field measurement data will be recorded on standard field data sheets and entered into an excel database for data management and quality control. Potential errors in data entry (anomalous values) will be verified or corrected consulting the original data sheets or personnel involved in measurement. Original data sheets will be permanently archived in a dedicated long-term electronic archive. The electronic database will also archive GIS coverages detailing forest and strata boundaries and plot locations.

Quality control procedures for sampling degradation will include steps 1 and step 3, above.

Quality control procedures related to monitoring leakage include conducting a review of the current literature at least every 5 years to source information on the area of the monitoring parameters MANFOR, PROTFOR, and TOTFOR. Further, participatory rural appraisals used to assess the length of time people have been living in the project area and leakage belt will be implemented by personnel with experience conducting community surveys in rural Brazil.

Personnel involved in the revising of the baseline will have detailed knowledge in regards to spatial modeling and land use change and deep familiarity with REDD methodologies. Remote sensing data used will include officially published dataset, or classified imagery, which meets accuracy assessment requirements as laid out in the methodology.

All measurement and monitoring equipment requiring calibration will be calibrated according to the equipment's specifications and/or relevant national or international standards.

Data Archiving

Data archived will be maintained through at least two years beyond the end of the project crediting period. All project records are secure and retrievable. This includes project documents saved on the desktop of CarbonCo's Project Director and stored in the Director's file cabinets (based in Silver Spring, Maryland). An identical version of the project documents are remotely saved on an external hard drive and in the cloud via DropBox. Furthermore, many project documents (e.g., VCS Project Description, Monitoring Reports, CCBS Project Design Document, Project Implementation Reports, Validation and Verification Reports, etc.) are publicly available and stored on both the Standards' website and on the Markit Environmental Registry. Given the extended time frame and the pace of production of updated versions of software and new hardware for storing data, electronic files will be updated periodically or converted to a format accessible to future software applications, as needed.

Organization, Responsibilities, and Monitoring Frequency

For all aspects of project monitoring, Russas Project staff will ensure that data collection, processing, analysis, management and archiving are conducted in accordance with the monitoring plan.

Table 5.7. Type of Monitoring and Party Responsible for Monitoring.

Variables to be monitored	Responsible	Frequency
Monitoring deforestation and natural disturbance	I.S.R.C.	Prior to each verification
Monitoring illegal degradation	I.S.R.C.	Every two years
Monitoring project emissions	CarbonCo	Prior to each verification
Activity shifting immigrant leakage assessment	I.S.R.C.	Prior to each verification event and at least every 5 years.
Updating forest carbon stocks estimates	CarbonCo	At least every 10 years.
Revision of the baseline	CarbonCo	At least every 10 years.

Climate Impact Monitoring

Between March 2011 and December 2013, the Russas Project Proponents developed a climate impact monitoring plan which identified the types of measurements, sampling method, and frequency of measurements.

Initial Monitoring Plan

The Russas Project has a complete and detailed climate impact monitoring plan which accounts for leakage and the required carbon pools.

Full Monitoring Plan

For the Russas Project's full climate impact monitoring plan, which also addressed the initial monitoring plan requirements, please see the validated VCS Project Description section 4 Monitoring. This full climate impact monitoring plan, and its ongoing monitoring results, were made publicly available on the internet and were also made available to the communities and the Russas Project's other stakeholders.

Community Impact Monitoring

Between March 2011 and December 2013, the Project Proponents designed an initial community impact monitoring plan and a full community impact monitoring plan. The Project Proponents disseminated this full community impact monitoring plan and the results of the monitoring plan specifically to the local communities and other stakeholders, along with making the plan and results publicly available via the internet to the general public.

Initial Community Monitoring Plan

The initial community monitoring plan involved regular communication between Ilderlei Souza Rodrigues Cordeiro and the communities. With respect to outside stakeholders, the initial monitoring plan involved informal conversations with outside stakeholders and reviewing the Brazilian Census' socio-economic variables for the municipalities of Cruzeiro do Sul and Porto Walter.

From these conversations and based off Carbon Securities and CarbonCo's experience at the Purus Project, it was determined that a Basic Necessity Survey (BNS), Participatory Rural Assessment (PRA) and the Theory of Change would be the three best tools to monitor community net benefits and the communities' High Conservation Values. The BNS and PRA shall be administered every two years, with the initial surveys conducted from March to May 2013. The specific variables to be annually monitored are the indicators of the Theory of Change (activities, outputs, outcomes, and impacts), while the access to Basic Necessities, along with the value of owned assets, value of owned assets per capita, poverty score and poverty index, inequality of owned assets and inequality of owned assets per capita will be monitored every two years. Please see the full monitoring plan below for additional details.

Initial High Conservation Values Plan

The PRA and BNS were designed to measure the communities' high conservation values (HCVs) and the Project Proponents will continue to monitor these HCVs.

The PRA inquired about HCVs such as the communities' hunting, fishing, building materials, and the collection of medicinal plants. As an example of the PRA's ability to monitor HCVs, it was discovered via community meetings and the initial PRA that local fishing stocks in the Valparaiso River were being depleted because commercial fishermen from outside the Project Zone were entering into the Project Zone to fish. This situation will be monitored and the Project signs now specify no commercial fishing is allowed.

The BNS will also be regularly administered and will identify trends in the overall availability of basic needs and HCVs including access to housing, health clinic, food, and clean drinking water. This said, the specific HCVs related to hydrological services that provide benefits to the local communities are the provision of fish, using the rivers as a mode of transportation, and as a source of clean drinking water. Thus, the BNS will track the access to clean drinking water, transportation (i.e., access to boat or canoe), and the PRA inquired about fishing.

Full Monitoring Plan

The Russas Project's full community monitoring plan is to monitor the indicators derived from the PRA, BNS and Theory of Change's outputs, outcomes and community impacts. The frequency of monitoring and reporting to ensure that these indicators are directly linked to the Russas Project's major community objectives and are leading to the anticipated net positive impacts will take place every two years for the PRA and BNS and annually for the Theory of Change.

The Project's community impact monitoring baseline was established from March to April 2013, when the PRA and BNS were conducted by the Project Proponents with the local communities. Due to a lack of financial resources, the follow up PRA and BNS were conducted in March 2017 and May 2017.

The specific indicators of the Theory of Change which will be monitored and reported on are as follows:

Indicators of Activities

- Signed Tri-Party Agreement between Project Proponents
    - The Russas Project's Tri-Party Agreement was signed in October 2011.
- Completion of Forest Carbon Inventory
    - The forest carbon inventory was completed in March 2013.
- Completion of Regional Deforestation and Land-Use Modeling
    - The regional deforestation and land-use modelling was completed in July 2013.
- Completion of VCS Project Description and CCBS Project Design Document
    - The final draft versions of the VCS Project Description and CCBS Project Design Document were completed in July 2013. The final versions of these Project Documents were successfully validated in March and May 2014.
- Completion of the Agricultural Survey, Basic Necessities Survey and Participatory Rural Appraisal
    - The Agricultural Survey, Basic Necessities Survey and the Participatory Rural Appraisal were completed in April 2013. A follow up PRA was completed in March 2017 and a follow up BNS was completed in May 2017.

Indicators of Outputs

- Validation Statements for VCS Project Description and CCBS Project Design Document
    - The validation statements for the VCS Project Description and the CCBS Project Design Document were received in March and May 2014.
- Spreadsheet with Top-10 Agricultural Courses Identified
    - The spreadsheet identifying the top-10 agricultural courses was completed in April 2013.
- Agricultural Extension Trainings / Courses Conducted

    - The first five agricultural courses were taught in July 2013. Ilderlei hired SOS Amazonia which visited the communities on behalf of the Project Proponents at least 14 times throughout 2015 and 2016, with another 12 visits in 2017. Such visits included agricultural trainings and follow up visits on these activities taught by SOS Amazonia including, but not limited to: banana production and management; agroforestry workshops; organic horticulture courses; and small animal (e.g., chickens) breeding courses.
- Spreadsheet Compiling Data on Basic Necessities including: What are Considered Basic Necessities; Total Value of Owned Assets and Total Value of Owned Assets per Capita; Price of Assets; Poverty Score and Poverty Index
    - The spreadsheet compiling date on the basic necessities was completed in April 2013. A follow up spreadsheet was completed in 2017.
- Summary Statistics on: Income/Asset Inequality; Most Disadvantaged Communities; Most Under-Owned Assets; Most Desired Basic Necessities
    - Summary statistics were calculated in April 2013. Follow up statistics were calculated in 2017.
- Participatory Rural Appraisal Surveys and Spreadsheet Compiling Data on: Land-Use; Patterns of Deforestation and Yearly Cycle of Deforestation; Why and Where Deforestation Occurs; Deforestation from Residents vs. Recent Migrants
    - The Participatory Rural Appraisal Surveys were completed in April 2013 and the spreadsheet compiling this data was completed in April 2013.

<u>Indicators of Outcomes</u>

- Value of Carbon Finance Generated
    - Carbon finance was generated in 2016 and 2017.
- Communities Gain New Knowledge, Practices and Skills About Sustainable Agricultural
    - Initial five agricultural courses taught in July 2013. In addition, SOS Amazonia visited the communities on behalf of the Project Proponents at least 14 times throughout 2015 and 2016, with another 12 visits in 2017. Such visits included agricultural trainings and follow up visits on these activities taught by SOS Amazonia including, but not limited to: banana production and management; agroforestry workshops; organic horticulture courses; and small animal (e.g., chickens) breeding courses.
- Prioritization and Implementation Plan for Social Projects and Programs to Reduce Deforestation and Improve Community Benefits
    - Social projects – such as hiring local staff, focusing on health (e.g., distribution of mosquito nets and dental kits, facilitating doctor visits, and renovating the local health clinic), and teaching agricultural courses – were prioritized and implemented between March 2011 and December 2016.
- Baseline for Monitoring Community Benefits
    - Baseline established in May 2013.
- Formulation of Plan to Mitigate Leakage
    - Leakage plan formulated in May 2013.
- Formulation of Plan to Monitor Deforestation
    - Deforestation monitoring plan formulated in May 2013.

Indicators of Impacts

- Community Income Diversified
    - Ongoing, with local staff hired and initial agricultural courses taught in July 2013 and SOS Amazonia trainings throughout 2015 to 2017.
- Increased Income Generation
    - Ongoing, with local staff hired and initial agricultural courses taught in July 2013 and SOS Amazonia trainings throughout 2015 to 2017.
- Reduced Deforestation
    - Achieved between March 2011 and December 2016.
- Intensified Agricultural Practices
    - Ongoing, with initial agricultural courses taught in July 2013 and SOS Amazonia trainings throughout 2015 to 2017.
- Diversified Crops
    - Ongoing, with initial agricultural courses taught in July 2013 and SOS Amazonia trainings throughout 2015 to 2017.
- Increasing Communities' Owned Assets and Owned Assets per Capita
    - Ongoing, next Basic Necessity Survey (BNS) was administered in 2017.
- Improved Poverty Figures and Poverty Scores
    - Ongoing, next BNS was administered in 2017.
- Increased Access to Basic Necessities
    - Ongoing, next BNS was administered in 2017.
- Improvement in Health and Dental Clinic
    - Mosquito nets were distributed and a local nurse taught healthcare to 400 community members and distributed dental kits in July 2014. In 2017, 14 restrooms are being constructed and the onsite health clinic is now completed.

The specific variables that will be monitored and reported approximately every two years with the BNS and PRA are as follows:

- Communities' Access to Basic Necessities;
- Value of Owned Assets;
- Value of Owned Assets per Capita;
- Poverty Score;
- Poverty Index;
- Inequality of Owned Assets; and
- Inequality of Owned Assets per Capita.

This community monitoring plan is ultimately designed to ensure equitable benefits distribution. To this end, the plan shall:

- Document receipt of benefits;
- Ensure attention is paid to gender and generational distribution of benefits;
- Adaptive management to address shortcomings associated with improper distribution of benefits;
- Monitoring plan will be shared with stakeholders; and
- Avoid elite capture.

Although very limited leakage is predicted outside of the Project Zone due to the project activities of the Russas Project, the other stakeholders who might be negatively impacted due to the Russas Project are the communities and landowners living adjacent to the Project Zone and within the municipalities of Cruzeiro do Sul and Porto Walter.

To quantify and document changes in the social and economic well-being of these outside stakeholders which result from the project activities, the Project Proponents will first review the Brazilian Census every four years to document the socio-economic variables in the municipalities of Cruzeiro do Sul and Porto Walter. These specific socio-economic variables to be monitored include:

- Total employed personnel
- Resident population
- Gross Domestic Product (GDP) per capita at current prices
- Value of average nominal monthly income of permanent private households with household income, by status of the housing unit – Rural
- Value of average nominal monthly income of permanent private households with household income, by status of the housing unit – Urban
- Resident population – literate
- Enrollment - Elementary school
- Enrollment - High school
- Number of Health institutions
- Percentage of Permanent private housing units, by existence of piped water and type of water supply - With water supply
- Percentage of Permanent private housing units - with energy supply[69]

The Project Proponents will then interview the outside stakeholders adjacent to the Project Zone approximately every four years to quantify their socio-economic variables (i.e., the same socio-economic variables described above). Next, the Project Proponents will conduct a statistical analysis to determine whether the outside stakeholders' socio-economic variables are significantly worse off than the residents throughout the municipality of Cruzeiro do Sul due to the project activities of the Russas Project. The most recent Brazilian census took place in 2010 and will be used to establish a baseline of these socio-economic variables for outside stakeholders living in the municipality of Cruzeiro do Sul. The outside stakeholder survey was conducted in May 2017.

The BNS and PRA will be administered approximately every two years and the Russas Project will be fully discussed with each family prior to re-administering the BNS and PRA. This includes a discussion of the Project's benefits (i.e., particularly the HCVs) and implemented activities, along with the communities' costs and risks to participation.

The BNS was originally administered in March-April 2013 and illustrated what the local communities view as basic necessities. Each time the BNS is re-administered, the local communities will be re-asked which items are considered basic necessities and this will allow the Project Proponents to monitor whether what are locally considered basic necessities remain constant or change over time.

[69] IBGE, "Click here to get information about municipalities at Cities@," Available: http://www.ibge.gov.br/estadosat/perfil.php?sigla=ac#

Biodiversity Impact Monitoring

The Project Proponents have an initial biodiversity monitoring plan and a full biodiversity impact monitoring plan. The Project Proponents disseminated this full biodiversity impact monitoring plan and the results of the monitoring plan specifically to the local communities and other stakeholders, along with making the plan and results publicly available via the internet to the general public.

Initial Biodiversity Monitoring Plan

The Project Proponents initial plan is to monitor forest loss (i.e., habitat availability) in the Project Area and Project Zone on a regular basis using the State of Acre's remote sensing data.

Initial High Conservation Values Plan

The Project Proponents recognize the particular importance of the Project's high conservation values and will assess the effectiveness of the Project's conservation activities vis-à-vis the Project's high conservation values.

The measures to maintain or enhance the significant concentrations of biodiversity – particularly threatened species, endemic species and threatened ecosystems - within the Russas Project are the various deforestation mitigation activities (e.g., agricultural extension training, deforestation monitoring, etc.) being undertaken.

The initial plan to assess the effectiveness of these various deforestation mitigation activities included:

- Review satellite imagery for deforestation to ensure effective conservation of forest cover (i.e., a threatened or rare ecosystem).
- Incorporate analysis of the population and distribution of threatened and endemic species identified with wildlife camera traps into full biodiversity monitoring plan.
- Review ongoing Participatory Rural Assessments and Basic Necessity Surveys to ensure effectiveness of maintaining or enhancing community HCVs.

Additional mechanisms to ensure effective maintenance or enhancement of HCVs will be developed utilizing adaptive management and stakeholder consultation. For example, if small-sized, threatened or endangered species such as amphibians, reptiles, or insects are identified in the Project Area (i.e., an example of an HCV), then the Project Proponents will incorporate the monitoring of these species, if necessary, into the full biodiversity impact monitoring plan.

Full Monitoring Plan

The Project Proponents' full monitoring plan will continue with monitoring forest cover and habitat availability, along with monitoring the diversity, distribution, and populations of medium-to-large mammals with wildlife camera traps. Furthermore, a Theory of Change shall be used to link the Projects activities to outputs and outcomes, and to the overall biodiversity impacts.

Monitoring forest cover and using wildlife cameras will be sufficient to monitor all wildlife species of interest – particularly medium-to-large mammals – throughout the Project Zone's rainforests. This was demonstrated via local studies conducted near the Project Zone indicating the type of biodiversity likely present, along with CarbonCo and Carbon Securities' successful use of wildlife cameras at the Purus Project (another REDD+ project near Manoel Urbano, Acre) from June 2013 to March 2014 which has identified numerous mammals such as:

- Black agouti (Dasyprocta fuliginosa)
- Collared Peccary (Pecari tajacu)
- Giant Anteater (Myrmecophaga tridactyla)
- Jaguar (Panthera onca)
- Lowland tapir (Tapirus terrestris)
- Ocelot (Leopardus pardalis)
- Paca (Cuniculus paca)
- Puma (Puma concolor)
- Short-Eared Dog (Atelocynus microtis)
- Squirrel Monkey (Saimiri sciureus)

From March 2011 to December 2013, the basic process of developing the biodiversity monitoring plan was:

- 1. Conduct background research

- 2. Identify local partners and community members to assist with monitoring plan

Background research included: Reviewing the wildlife camera trap techniques deployed by other REDD project developers;[70] How to position cameras, sampling designs, and field crews;[71,72] Technical elements of mammalian diversity and populations using wildlife camera traps,[73,74] along with reviewing wildlife camera trap models.[75]

Brian McFarland also spoke to Dan Bisaccio, a Lecturer in Education and Director of Science Education at Brown University on February 6, 2012 who has frequently used wildlife camera traps in a variety of tropical ecosystems.

Within one year of project validation, the Project Proponents shall:

[70] Waldon, Jeff, Bruce W. Miller and Carolyn M. Miller, "A model biodiversity monitoring protocol for REDD projects," September 2011, Tropical Conservation Science Vol. 4(3):254-260.
[71] Grant Harris et. al, "Automatic Storage and Analysis of Camera Trap Data," Available: http://dx.doi.org/10.1890/0012-9623-91.3.352
[72] TEAM Network. 2011. Terrestrial Vertebrate Protocol Implementation Manual, v. 3.1. Tropical Ecology, Assessment and Monitoring Network, Center for Applied Biodiversity Science, Conservation International, Arlington, VA, USA.
[73] C. Carbone et. al, "The use of photographic rates to estimate densities of tigers and other cryptic animals," Available: nationalzoo.si.edu/.../024ebe33-5a96-49f6-9080-33bbdb0c92c0.pdf
[74] Tim O'Brien, "Wildlife Picture Index: Implementation Manual Version 1.0," Available: static.zsl.org/files/wcs-wpno39-wildlifepictureindex-928.pdf
[75] TrailCamPro, "Trail Camera Selection Guide," Available: http://www.trailcampro.com/trailcameraselectionguide.aspx

- Review vegetation maps of the Russas Project to identify general areas within the Project to set up wildlife camera traps (Achieved in 2013).

- Consult local communities and André Luis Botelho de Moura to identify the specific locations to set up wildlife camera traps (Achieved in 2013).

- Purchase and placement of wildlife cameras throughout the Project Area, rotating the cameras to different vegetation strata as necessary (Cameras originally purchased for Purus Project in May 2013 and were used for the Russas-Valparaiso Projects from August 2014 to July 2015).

- Train community on wildlife cameras such as preventative maintenance, periodic movement of cameras between different locations, along with regular retrieval and replacement of camera memory and batteries (Achieved in August 2014).

- Photographic images will be then be organized, identified and analyzed by specialists (Conducted throughout 2014 and 2015).

- Disseminate the full biodiversity impact monitoring plan and the results of the monitoring plan specifically to the local communities and other stakeholders, along with making the plan and results publicly available to the general public (Conducted from 2013 to 2016).

Adaptive management will be incorporated into the biodiversity monitoring plan in order to allow for a change in the camera locations and camera models based off results.

Activities

The main activities were identified above.

Outputs

The main outputs of the biodiversity monitoring plan will be photographs from the wildlife camera traps and deforestation monitoring reports to document forest cover and habitat availability. In addition, an analysis of the population and distribution of threatened and endemic species will be conducted.


Bushnell
Camera04 68°F20°C
09-01-2014 08:40:12


Bushnell
Camera01 68°F20°C
09-07-2014 06:38:57


Bushnell
Camera06 77°F25°C
12-02-2014 12:24:17


Bushnell
Camera08 75°F23°C
08-23-2014 15:24:10


Bushnell
Camera 07 64°F17°C
08-24-2014 04:02:32


Bushnell
Camera04 75°F23°C
10-18-2014 09:35:35

Outcomes

The outcomes based off the outputs will be an analysis of medium-to-large mammal populations and a better understanding of their distribution throughout the Russas Project.

More specifically, according to the biologist Andre Botelho, From August 2014 to July 2015, images were retrieved from a sampling effort of 1,644 trap nights. During this time, 483 vertebrates were recorded. There were 95 birds and 388 were medium to large mammals. They recorded 16 different species of mammals across six orders. Among the taxa recorded, the most abundant species were the paca (*Cuniculus paca*), red deer (*Mazama americana*) and the agouti (*Dasyprocta fuliginosa*), totaling 77.8% of all mammals recorded. There was also the record of three endangered species: the short-eared dog (*Atelocynus microtis*), jaguarundi (*Puma yagouaroundi*) and the giant armadillo (*Priodontes maximus*). Of the species with more than ten independent records, six showed a diurnal activity pattern and predominantly nocturnal pattern.

Impacts

The ultimate impact will be the preservation of biodiversity and particularly, the preservation of the Project's high conservation values such as threatened species.

The Russas Project shall monitor biodiversity impacts both spatially throughout the Russas Project as well as temporally over the Russas Project Lifetime. The goal is to conduct a biodiversity monitoring project every four years.

5.2 Data and Parameters Available at Validation (CL3)

Data and parameters calculated during the course of project development include those listed in this section.

Data Unit / Parameter:	$\Delta C_{BSL,PA,unplanned}$
Data unit:	t CO_2-e
Description:	Net CO_2 emissions in the baseline from unplanned deforestation in the project area
Source of data:	Derived in Section 3.1 of PD
Value applied:	

Year	ΔCBSL,PA,unplanned
2012	34,205
2013	190,685
2014	243,544
2015	233,773
2016	248,221
2017	217,214
2018	246,296
2019	251,397
2020	233,279

	2021 | 265,663
Justification of choice of data or description of measurement methods and procedures applied:	Derived and justified in Section 3 of VCS Project Description (PD) in which baseline is set
Purpose of the data:	Calculation of baseline emissions
Comment:	None

Data Unit / Parameter:	$\Delta C_{BSL,LK,unplanned}$
Data unit:	t CO_2-e
Description:	Net CO_2 emissions in the baseline from unplanned deforestation in the leakage belt
Source of data:	Derived in Section 3.1 and 3.2 of PD
Value applied:	Year | ΔCBSL,LK,unplanned 2012 | 35,152 2013 | 237,009 2014 | 380,426 2015 | 344,023 2016 | 337,645 2017 | 317,929 2018 | 342,140 2019 | 344,183 2020 | 314,928 2021 | 366,684
Justification of choice of data or description of measurement methods and procedures applied:	Derived and justified in Section 3 of PD in which baseline is set
Purpose of the data	Calculation of baseline emissions Calculation of leakage
Comment	None

Data Unit / Parameter:	*CF*
Data unit:	t C t^{-1} d.m.
Description:	Carbon fraction of biomass
Source of data:	IPCC 2006GL
Value applied:	0.47
Justification of choice of data or description of measurement methods and procedures	Global default

applied:	
Purpose of the data	Calculation of baseline emissions
Comment	None

Data Unit / Parameter:	C_{OLB}
Data unit:	t CO_2-e ha^{-1}
Description:	Area-weighted average aboveground tree carbon stock for forests available for unplanned deforestation outside the Leakage Belt
Source of data:	Derived from source data found in FAO. 2009. Global Forest Resources Assessment 2010, Brazil Country Report. Forestry Department, Food and Agriculture Organization of the United Nations, Rome.
Value applied:	458 t CO_2-e ha^{-1}
Justification of choice of data or description of measurement methods and procedures applied:	Derived above in Section 3.3 of the PD
Purpose of the data	Calculation of leakage
Comment	None

Data Unit / Parameter:	$C_{P,LB}$
Data unit:	t CO_2-e ha^{-1}
Description:	Area weighted average aboveground tree carbon stock for forests available for unplanned deforestation inside the Leakage Belt
Source of data:	Stock estimates of strata represented in the project area were derived from measurements from the forest carbon inventory of the project area, in addition to data from Salimon et al. for one unsampled forest strata. Salimon et al. 2011. Estimating state-wide biomass carbon stocks for a REDD plan in Acre, Brazil. Forest Ecology and Management 262: 555-560.

Value applied:	415 t CO_2e ha-1
Justification of choice of data or description of measurement methods and procedures applied:	Derived above in Section 3 of the Project Description
Purpose of the data	Calculation of leakage
Comment	None

Data Unit / Parameter:	ABSL,PA,unplanned,i,t
Data unit:	Ha
Description:	Projected area of unplanned baseline deforestation in the project area in stratum i at time t
Source of data:	Derived in Section 3.1 of PD
Value applied:	

Year	Aunplanned, i,t, FAB + FAP (ha)	AAunplanned,i,t, FAP (ha)	AAunplanned,i,t, FAP-alluvial (ha)	AAunplanned,i,t, FAP + FAB + FD or FAP + FD + FAB (ha)	AAunplanned,i,t, FAP + FD or FD + FAP (ha)
2012	2.2	16.3	4	0	94.3
2013	46.9	153.9	88.6	0.5	342.4
2014	48.1	245	158.8	1.4	330.3
2015	38.2	242.4	159.1	6.4	281.3
2016	35.3	248.5	161.5	3.7	309
2017	30.8	211.3	137.2	2.8	253
2018	27.7	241.9	127	2.7	313.7
2019	31.7	230.1	138.4	3.6	309.2
2020	35.9	212.7	97.3	3.4	281
2021	35.8	255.8	118.3	2.1	306.4

Justification of choice of data or description of measurement methods and procedures applied:	Derived and justified in Section 3 of PD in which baseline is set
Purpose of the data	Calculation of baseline emissions
Comment	None

Data Unit / Parameter:	COMF i
Data unit:	dimensionless
Description:	Combustion factor for stratum i
Source of data:	Derived from Table 2.6 of IPCC, 2006.
Value applied:	0.45
Justification of choice of data or description of measurement methods and procedures applied:	Value is for primary open tropical forest.
Purpose of the data	Calculation of baseline emissions Calculation of project emissions
Comment	None

Data Unit / Parameter:	Gg,i
Data unit:	kg t-1 dry matter burnt
Description:	Emission factor for stratum i for gas g
Source of data:	Derived from Table 2.5 of IPCC, 2006.
Value applied:	G,N20 (kg/t d.m. burnt): 0.2 G,CH4 (kg/t d.m. burnt): 6.8
Justification of choice of data or description of measurement methods and procedures applied:	Default parameter from IPCC
Purpose of the data	Calculation of baseline emissions Calculation of project emissions
Comment	None

Data Unit / Parameter:	GWPg
Data unit:	t CO_2/t gas g
Description:	Global warming potential for gas g
Source of data:	Default values from IPCC SAR
Value applied:	GWP,N20 (t CO2/t gas g): 310 GWP,CH4 (t CO2/t gas g): 21

Justification of choice of data or description of measurement methods and procedures applied:	Default parameter from IPCC
Purpose of the data	Calculation of baseline emissions Calculation of project emissions
Comment	None

5.3 Data and Parameters Monitored (CL3, CM3 & B3)

Details on data and parameters monitored are provided below. Note that for climate:

Data Unit / Parameter:	$\Delta C_{P,Def,i,t}$
Data unit:	t CO_2-e
Description:	Net carbon stock change as a result of deforestation in the project case in the project area in stratum *i* at time *t*
Source of data:	Calculated
Description of measurement methods and procedures to be applied:	As this parameter was calculated rather than measured, no measurements methods are noted.
Frequency of monitoring/recording:	Every ≤ 5 years
Value applied:	Year: ΔCP,DefPA,i,t (t CO2-e) 2014: 32,306 2015: 824 2016: 9,290
Monitoring equipment:	None
QA/QC procedures to be applied:	Neither QA/QC procedures nor calibration are relevant for this calculated parameter.
Purpose of the data	Calculation of project emissions
Calculation method:	Equation 3, VMD0015
Comment	None

Data Unit / Parameter:	$\Delta C_{P,DefLB,i,t}$
Data unit:	t CO_2-e
Description:	Net carbon stock change as a result of deforestation in the project case in the leakage belt in stratum *i* at time *t*

Source of data:	Calculated
Description of measurement methods and procedures to be applied:	Net carbon stock change as a result of deforestation in the project case in the leakage belt in stratum *i* at time *t*
Frequency of monitoring/recording:	Every ≤ 5 years
Value applied:	Year: ΔCP,LB (t CO2-e) 2014: 72,196 2015: 8,780 2016: 15,635
Monitoring equipment:	None.
QA/QC procedures to be applied:	Neither QA/QC procedures nor calibration are relevant for this calculated parameter.
Purpose of the data	Calculation of leakage
Calculation method:	Equation 4, VMD0015
Comment	None

Data Unit / Parameter:	$\Delta C_{P,DistPA,i,t}$
Data unit:	t CO_2-e
Description:	Net carbon stock change as a result of natural disturbance in the project case in the project area in stratum *i* at time *t*
Source of data:	Calculated
Description of measurement methods and procedures to be applied:	As this parameter was calculated rather than measured, no measurements methods are noted.
Frequency of monitoring/recording:	Every ≤ 5 years
Value applied:	Year: ΔCP,DistPA,i,t (t CO2-e) 2014: 0 2015: 0 2016: 0
QA/QC procedures to be applied:	Neither QA/QC procedures nor calibration are relevant for this calculated parameter.
Purpose of the data	Calculation of project emissions
Calculation method:	Equation 20, VMD0015
Comment	None

Data Unit / Parameter:	$A_{DefPA,u,i,t}$
Data unit:	Ha
Description:	Area of recorded deforestation in the project area stratum *i* converted to land use *u* at time *t*
Source of data:	Monitored at each monitoring/verification event through the use of classified satellite imagery
Description of measurement methods and procedures to be applied:	Detailed procedures are provided below under monitoring plan description.
Frequency of monitoring/recording:	Every ≤ 5 years
Value applied:	

Year	FAB + FAP (ha)	FAP (ha)	FAP-alluvial (ha)	FAP + FAB + FD or FAP + FD + FAB (ha)	FAP + FD or FD + FAP (ha)
2014	1.8	28.6	14.7	0.1	33.1
2015	0	1.8	0	0	0
2016	0	10.6	4	0	7.6

Monitoring equipment:	*ArcGIS*
QA/QC procedures to be applied:	Detailed procedures provided below under monitoring plan description
Purpose of the data	Calculation of project emissions
Calculation method:	Not relevant
Comment	None

Data Unit / Parameter:	$A_{DefLB,u,i,t}$
Data unit:	Ha
Description:	Area of recorded deforestation in the leakage belt stratum *i* converted to land use *u* at time *t*
Source of data:	Monitored at each monitoring/verification event through the use of classified satellite imagery
Description of measurement methods	Detailed procedures provided below under monitoring plan description.

<table>
<tr><td>and procedures to be applied:</td><td></td></tr>
<tr><td>Frequency of monitoring/recording:</td><td>Every ≤ 5 years</td></tr>
<tr><td>Value applied:</td><td>
<table>
<tr><th>Year</th><th>FAB + FAP (ha)</th><th>FAP (ha)</th><th>FAP-alluvial (ha)</th><th>FAB - Aluvial (ha)</th><th>FAP + FD or FD + FAP (ha)</th></tr>
<tr><td>2014</td><td>23.5</td><td>7.8</td><td>38.4</td><td>4.4</td><td>100.4</td></tr>
<tr><td>2015</td><td>2.5</td><td>0.0</td><td>2.4</td><td>0.0</td><td>16.4</td></tr>
<tr><td>2016</td><td>1.4</td><td>0.1</td><td>6.1</td><td>0.0</td><td>30.9</td></tr>
</table>
</td></tr>
<tr><td>Monitoring equipment:</td><td>ArcGIS</td></tr>
<tr><td>QA/QC procedures to be applied:</td><td>Detailed procedures provided below under monitoring plan description</td></tr>
<tr><td>Purpose of the data</td><td>Calculation of leakage</td></tr>
<tr><td>Calculation method:</td><td>Not relevant</td></tr>
<tr><td>Comment</td><td>None</td></tr>
</table>

Data Unit / Parameter:	$A_{DistPA,q,i,t}$
Data unit:	ha
Description:	Area impacted by natural disturbance in post-natural disturbance stratum *q* in stratum *i,* at time *t*
Source of data:	Monitored at each monitoring/verification event through the use of classified satellite imagery and land managers observations
Description of measurement methods and procedures to be applied:	Detailed procedures provided below under monitoring plan description.
Frequency of monitoring/recording:	Every ≤ 5 years
Value applied:	Year: $A_{DistPA,q,i,t}$ (t CO2-e) 2014: 0 2015: 0 2016: 0
Monitoring equipment:	None
QA/QC procedures to be applied:	Detailed procedures provided below under monitoring plan description
Purpose of the data	Calculation of project emissions
Calculation method:	Not relevant
Comment	None

Data Unit / Parameter:	$C_{BSL,i}$
Data unit:	t CO_2-e ha^{-1}
Description:	Carbon stock in all pools in the baseline case in stratum *i*
Source of data:	Estimated from forest carbon inventory.
Description of measurement methods and procedures to be applied:	Detailed procedures provided below under monitoring plan description
Frequency of monitoring/recording:	Every ≤ 10 years.
Value applied:	Strata: CBSL,i (t CO2-e ha-1) FAB + FAP: 441.9 FAP: 458.1

	FAP - Aluvial	370.5
	FAP + FAB + FD or FAP + FD + FAB	482.1
	FAP + FD or FD + FAP	389.5
	FAB - Aluvial	424.4
Monitoring equipment:	*dbh tape, measuring tape, GPS, clinometer*	
QA/QC procedures to be applied:	Detailed procedures provided below under monitoring plan description	
Purpose of the data	Calculation of baseline emissions Calculation of project emissions Calculation of leakage	
Calculation method:	Use equations as stated in the forest inventory, including allometric equations as found in Brown (1997), a volumetric based palm equation, Cairns et al. (1997), Van Wagner (1968)	
Comment	None	

Data Unit / Parameter:	$\Delta C_{pools,Def,u,i,t}$
Data unit:	t CO2-e ha-1
Description:	Carbon stock in all pools in post-deforestation land use u in stratum i
Source of data:	Calculated.
Description of measurement methods and procedures to be applied:	None.
Frequency of monitoring/recording:	Every < 10 years.
Value applied:	Stratum specific values calculated as $C_{BSL,I}$-Cpost
Monitoring equipment:	None.
QA/QC procedures to be applied:	Detailed procedures provided below under monitoring plan description
Purpose of the data	Calculation of baseline emissions

	Calculation of project emissions Calculation of leakage
Calculation method:	Stratum specific values calculated as $C_{BSL,I}$-Cpost
Comment	None

Data Unit / Parameter:	$A_{DegW,i,t}$
Data unit:	ha
Description:	Area potentially impacted by degradation processes in stratum i
Source of data:	Delineated based on survey results indicating general area of project potentially accessed and typical depth of penetration of illegal harvest activities from points of access
Description of measurement methods and procedures to be applied:	Detailed procedures provided below under monitoring plan description.
Frequency of monitoring/recording:	Repeated each time the PRA indicates a potential for degradation. PRA conducted every < 2 years
Value applied:	0
Monitoring equipment:	None.
QA/QC procedures to be applied:	Detailed procedures provided below under monitoring plan description.
Purpose of the data	Calculation of project emissions
Calculation method:	Not relevant
Comment	None

Data Unit / Parameter:	$C_{DegW,i,t}$
Data unit:	t CO_2-e
Description:	Biomass carbon of trees cut and removed through degradation process from plots measured in stratum *i* at time *t*
Source of data:	Estimated from diameter measurements of cut stumps in sample plots
Description of measurement methods and procedures to be applied:	Detailed procedures provided below under monitoring plan description.

Frequency of monitoring/recording:	Every ≤ 5 years where surveys and limited sampling continue to indicate possibility of illegal logging in the project area
Value applied:	0
Monitoring equipment:	None.
QA/QC procedures to be applied:	Detailed procedures provided below under monitoring plan description.
Purpose of the data	Calculation of project emissions
Calculation method:	Equation 8, VMD0015
Comment	None

Data Unit / Parameter:	AP_i
Data unit:	ha
Description:	Total area of degradation sample plots in stratum *i*
Source of data:	Calculated as 3% of $A_{DegW,i,t}$
Description of measurement methods and procedures to be applied:	Detailed procedures provided below under monitoring plan description.
Frequency of monitoring/recording:	Every ≤ 5 years where surveys and limited sampling continue to indicate possibility of illegal logging in the project area
Value applied:	0
Monitoring equipment:	ArcGIS
QA/QC procedures to be applied:	Detailed procedures provided below under monitoring plan description.
Purpose of the data	Calculation of project emissions
Calculation method:	Not relevant
Comment	Not used in this monitoring period

Data Unit / Parameter:	$\Delta C_{P,DegW,i,t}$
Data unit:	t CO_2-e
Description:	Net carbon stock changes as a result of degradation in stratum *i* in the project area at time *t*
Source of data:	Calculated

Description of measurement methods and procedures to be applied:	As this parameter was calculated rather than measured, no measurements methods are note
Frequency of monitoring/recording:	Every ≤ 5 years where surveys and limited sampling continue to indicate possibility of illegal logging in the project area
Value applied:	<table><tr><th>Year</th><th>ΔCP,Deg,i,t (t CO2-e)</th></tr><tr><td>2014</td><td>0</td></tr><tr><td>2015</td><td>0</td></tr><tr><td>2016</td><td>0</td></tr></table>
Monitoring equipment:	None
QA/QC procedures to be applied:	Neither QA/QC procedures nor calibration are relevant for this calculated parameter.
Purpose of the data	Calculation of project emissions
Calculation method:	Equation 8, VMD0015
Comment	None

Data Unit / Parameter:	$PROP_{IMM}$
Data unit:	Proportion
Description:	Estimated proportion of baseline deforestation caused by immigrating population
Source of data:	Calculated based on results of survey of communities in the area around the project.
Description of measurement methods and procedures to be applied:	Detailed procedures provided below under monitoring plan description.
Frequency of monitoring/recording:	Every ≤ 5 years
Value applied:	0.05556
Monitoring equipment:	None
QA/QC procedures to be applied:	Detailed procedures provided below under monitoring plan description
Purpose of the data	Calculation of leakage
Calculation method:	Not relevant
Comment	See March-May 2017 Degradation Survey

Data Unit / Parameter:	$PROP_{RES}$
Data unit:	Proportion

Description:	Estimated proportion of baseline deforestation caused by population that has been resident for ≥5 years
Source of data:	Calculated based on results of survey of communities in the area around the project.
Description of measurement methods and procedures to be applied:	Detailed procedures provided below under monitoring plan description.
Frequency of monitoring/recording:	Every ≤ 5 years
Value applied:	0.94444
Monitoring equipment:	None
QA/QC procedures to be applied:	Detailed procedures provided below under monitoring plan description
Purpose of the data	Calculation of leakage
Calculation method:	Not relevant
Comment	See March-May 2017 Degradation Survey

Data Unit / Parameter:	*TOTFOR*
Data unit:	ha
Description:	Total available national forest area
Source of data:	Official data, peer reviewed publications, remotely sensed imagery (coarse scale imagery is appropriate) or cadastral maps and other verifiable sources
Description of measurement methods and procedures to be applied:	*Not applicable*
Frequency of monitoring/recording:	Prior to each verification event and at least every 5 years.
Value applied:	533,073,000
Monitoring equipment:	None
QA/QC procedures to be applied:	Detailed procedures provided below.
Purpose of the data	Calculation of leakage
Calculation method:	Not relevant
Comment	See page 3, Table 1 of the FAO published Global Forest Resources Assessment 2015.

Data Unit / Parameter:	*PROTFOR*
Data unit:	ha
Description:	Total area of fully protected forests nationally
Source of data:	Official data, peer reviewed publications and other verifiable sources
Description of measurement methods and procedures to be applied:	Not applicable
Frequency of monitoring/recording:	Prior to each verification event and at least every 5 years.
Value applied:	0
Monitoring equipment:	None
QA/QC procedures to be applied:	Detailed procedures provided below.
Purpose of the data	Calculation of leakage
Calculation method:	Not relevant
Comment	None

Data Unit / Parameter:	*MANFOR*
Data unit:	ha
Description:	Total area of forests under active management nationally
Source of data:	Official data, peer reviewed publications and other verifiable sources
Description of measurement methods and procedures to be applied:	Not applicable
Frequency of monitoring/recording:	Prior to each verification event and at least every 5 years.
Value applied:	0
Monitoring equipment:	None
QA/QC procedures to be applied:	Detailed procedures provided below.
Purpose of the data	Calculation of leakage
Calculation method:	Not relevant
Comment	None

Data Unit / Parameter:	*ARRL,forest,2016*

Data unit:	ha
Description:	Remaining area of forest in RRL at time t
Source of data:	Calculated
Description of measurement methods and procedures to be applied:	As this parameter was calculated rather than measured, no measurements methods are noted.
Frequency of monitoring/recording:	Prior to each verification event and at least every 5 years.
Value applied:	4,272,043
Monitoring equipment:	ArcGIS
QA/QC procedures to be applied:	Neither QA/QC procedures nor calibration are relevant for this calculated parameter.
Purpose of the data	Calculation of project emissions
Calculation method:	Calculated as the total area of the RRL minus all nonforested areas.
Comment	None

<table>
<tr><td>Data Unit / Parameter:</td><td>Aburn,q,i,t.</td></tr>
<tr><td>Data unit:</td><td>ha</td></tr>
<tr><td>Description:</td><td>Area burnt in post-natural disturbance stratum q in stratum i, at time t;</td></tr>
<tr><td>Source of data:</td><td>See parameter $A_{DistPA,q,i,t}$</td></tr>
<tr><td>Description of measurement methods and procedures to be applied:</td><td>Monitored as part of $A_{DistPA,q,i,t}$</td></tr>
<tr><td>Frequency of monitoring/recording:</td><td>Every $\leq$ 5 years</td></tr>
<tr><td>Value applied:</td><td>
<table>
<tr><th>Year</th><th>FAB + FAP (ha)</th><th>FAP (ha)</th><th>FAP-alluvial (ha)</th><th>FAP + FAB + FD or FAP + FD + FAB (ha)</th><th>FAP + FD or FD + FAP (ha)</th></tr>
<tr><td>2014</td><td>1.8</td><td>28.6</td><td>14.7</td><td>0.1</td><td>33.1</td></tr>
<tr><td>2015</td><td>0</td><td>1.8</td><td>0</td><td>0</td><td>0</td></tr>
<tr><td>2016</td><td>0</td><td>10.6</td><td>4</td><td>0</td><td>7.6</td></tr>
</table>
</td></tr>
<tr><td>Monitoring equipment:</td><td>None</td></tr>
<tr><td>QA/QC procedures to be applied:</td><td>Detailed procedures provided below under monitoring plan description</td></tr>
<tr><td>Purpose of the data</td><td>Calculation of project emissions</td></tr>
<tr><td>Calculation method:</td><td>Aburn,q,i,t.= = $A_{DistPA,q,i,t}$ (area burnt in natural disturbance) + ADefPA,u,i,t (area burnt via deforestation in project ex post)</td></tr>
<tr><td>Comment:</td><td>None</td></tr>
</table>

Data Unit / Parameter:	dbh
Data unit:	cm
Description:	diameter at breast height
Source of data:	Monitored during the course of each forest inventory
Description of measurement methods and procedures to be applied:	Detailed procedures provided in Appendix B of the project document
Frequency of monitoring/recording:	Every ≤ 10 years
Value applied:	See forest inventory excel sheet.
Monitoring equipment:	dbh tape, measuring tape,
QA/QC procedures to be applied:	Detailed procedures are provided below under monitoring plan description.
Purpose of the data	Calculation of baseline emissions Calculation of project emissions
Calculation method:	Not relevant
Comment	None

Data Unit / Parameter:	dbasal
Data unit:	cm
Description:	Basal diameter
Source of data:	Monitored during the course of each forest inventory
Description of measurement methods and procedures to be applied:	Detailed procedures provided in Appendix B of the project document
Frequency of monitoring/recording:	Every ≤ 10 years
Value applied:	Detailed in the Russas Project forest inventory
Monitoring equipment:	dbh tape, measuring tape,
QA/QC procedures to be applied:	Detailed procedures are provided below under monitoring plan description.
Purpose of the data	Calculation of baseline emissions Calculation of project emissions
Calculation method:	Not relevant
Comment	Dbh may be used as a conservative estimate of dbasal
Data Unit / Parameter:	H

Data unit:	m
Description:	Height of tree
Source of data:	Monitored during the course of each forest inventory
Description of measurement methods and procedures to be applied:	Detailed procedures provided in Appendix B of the project document
Frequency of monitoring/recording:	Every ≤ 10 years
Value applied:	Detailed in the Russas Project forest inventory
Monitoring equipment:	measuring tape, clinometer
QA/QC procedures to be applied:	Detailed procedures are provided below under monitoring plan description.
Purpose of the data	Calculation of baseline emissions Calculation of project emissions
Calculation method:	Not relevant
Comment	None

Data Unit / Parameter:	Dn
Data unit:	cm
Description:	Diameter of piece n of dead wood along the transect
Source of data:	Monitored during the course of each forest inventory
Description of measurement methods and procedures to be applied:	Detailed procedures provided in Appendix B of the project document
Value applied:	Detailed in the Russas Project forest inventory
Monitoring equipment:	dbh tape, measuring tape
QA/QC procedures to be applied:	Detailed procedures are provided below under monitoring plan description.
Purpose of the data	Calculation of baseline emissions Calculation of project emissions
Calculation method:	Not relevant
Comment	None

Data Unit / Parameter:	N
Data unit:	dimensionless

Description:	Total number of wood pieces intersecting the transect
Source of data:	Monitored during the course of each forest inventory
Description of measurement methods and procedures to be applied:	Detailed procedures provided in Appendix B of the project document
Frequency of monitoring/recording:	Every ≤ 10 years
Value applied:	See forest inventory excel sheet.
Value applied:	Detailed in the Russas Project forest inventory
Monitoring equipment:	None
QA/QC procedures to be applied:	Detailed procedures are provided below under monitoring plan description.
Purpose of the data	Calculation of baseline emissions Calculation of project emissions
Calculation method:	Not relevant
Comment	None

Data Unit / Parameter:	L
Data unit:	m
Description:	Length of the transect
Source of data:	Monitored during the course of each forest inventory
Description of measurement methods and procedures to be applied:	Detailed procedures provided in Appendix B of the project document
Frequency of monitoring/recording:	Every ≤ 10 years
Value applied:	184 m
Monitoring equipment:	measuring tape,
QA/QC procedures to be applied:	Detailed procedures are provided below under monitoring plan description.
Purpose of the data	Calculation of baseline emissions Calculation of project emissions
Calculation method:	Not relevant
Comment	None

Data Unit / Parameter:	Cpost

Data unit:	t CO_2-e ha^{-1}
Description:	Average carbon stocks remaining after deforestation.
Source of data:	Calculated
Description of measurement methods and procedures to be applied:	None
Frequency of monitoring/recording:	Every $\leq$ 10 years.
Value applied:	0
Monitoring equipment:	None
QA/QC procedures to be applied:	None
Purpose of the data	Calculation of project emissions Calculation of leakage
Calculation method:	None
Comment	None

<table>
<tr><td>Data Unit / Parameter:</td><td>Bi,t</td></tr>
<tr><td>Data unit:</td><td>tonnes d. m. ha-1</td></tr>
<tr><td>Description:</td><td>Average aboveground biomass stock before burning stratum i,time t</td></tr>
<tr><td>Source of data:</td><td>Calculated using forest inventory data</td></tr>
<tr><td>Description of measurement methods and procedures to be applied:</td><td>Detailed forest inventory procedures are provided in Appendix B of the project document</td></tr>
<tr><td>Frequency of monitoring/recording:</td><td>Every ≤ 10 years</td></tr>
<tr><td>Value applied:</td><td>
<table>
<tr><th>FAB + FAP Bi,t (t d.m./ha)</th><th>FAP Bi,t (t d.m./ha)</th><th>FAP-alluvial Bi,t (t d.m./ha)</th><th>FAP + FAB + FD or FAP + FD + FAB Bi,t (t d.m./ha)</th><th>FAP + FD or FD + FAP Bi,t (t d.m./ha)</th><th>FAB - Aluvial Bi,t (t d.m./ha)</th></tr>
<tr><td>211.0</td><td>217.7</td><td>176.3</td><td>229.7</td><td>185.6</td><td>202.3</td></tr>
</table>
</td></tr>
<tr><td>Monitoring equipment:</td><td>None</td></tr>
<tr><td>QA/QC procedures to be applied:</td><td>Detailed procedures are provided below under monitoring plan description.</td></tr>
<tr><td>Purpose of the data</td><td>Calculation of baseline emissions
Calculation of project emissions
Calculation of leakage</td></tr>
<tr><td>Calculation method:</td><td>Use equations as stated in the forest inventory, including allometric equations as found in Brown (1997) and a volumetric based palm equation, Van Wagner (1968)</td></tr>
<tr><td>Comment</td><td>None</td></tr>
</table>

<table>
<tr><td>Data Unit / Parameter:</td><td>EBSL SS,i, pool#</td></tr>
<tr><td>Data unit:</td><td>t CO2-e</td></tr>
<tr><td>Description:</td><td>Carbon stock or GHG sources (e.g. trees, dead wood, soil organic carbon, emission from fertilizer addition, emission from biomass burning etc.) in the baseline case</td></tr>
<tr><td>Source of data:</td><td>Calculated</td></tr>
<tr><td>Description of measurement methods and procedures to be applied:</td><td>As this parameter was calculated rather than measured, no measurements methods are noted.</td></tr>
<tr><td>Frequency of monitoring/recording:</td><td>Every ≤ 10 years.</td></tr>
<tr><td>Value applied:</td><td>
<table>
<tr><th>Parameter</th><th>Live aboveground tree biomass</th><th>Belowground biomass</th><th>Standing dead wood</th><th>Lying dead wood</th></tr>
<tr><td>EBSL,SS,FAB+FAP,pool# (tCO2e)</td><td>4,063,545</td><td>922,537</td><td>19,465</td><td>199,338</td></tr>
<tr><td>EBSL,SS,FAP,pool# (tCO2e)</td><td>5,926,339</td><td>1,343,754</td><td>81,394</td><td>75,108</td></tr>
<tr><td>EBSL,SS,FAP-A,pool# (tCO2e)</td><td>1,954,348</td><td>449,895</td><td>32,948</td><td>60,536</td></tr>
<tr><td>EBSL,SS,FAB+FAP+FD or FAP + FD + FAB ,pool# (tCO2e)</td><td>6,921,606</td><td>1,563,641</td><td>45,383</td><td>210,652</td></tr>
<tr><td>EBSL,SS, FAP + FD or FD + FAP ,pool# (tCO2e)</td><td>5,812,094</td><td>1,335,873</td><td>152,414</td><td>167,009</td></tr>
</table>
</td></tr>
<tr><td>Monitoring equipment:</td><td>None</td></tr>
<tr><td>QA/QC procedures to be applied:</td><td>Neither QA/QC procedures nor calibration are relevant for this calculated parameter.</td></tr>
</table>

Purpose of the data	Calculation of baseline emissions Calculation of project emissions
Calculation method:	See X-UNC module.

Data Unit / Parameter:	*UBSL,SS,i,pool#*
Data unit:	%
Description:	Percentage uncertainty (expressed as 95% confidence interval as a percentage of the mean where appropriate) for carbon stocks and greenhouse gas sources in the baseline case (1,2…n represent different carbon pools and/or GHG sources)
Source of data:	Calculated
Description of measurement methods and procedures to be applied:	As this parameter was calculated rather than measured, no measurements methods are noted.
Frequency of monitoring/recording:	Every ≤ 10 years.
Value applied:	

Parameter	Live aboveground tree biomass	Belowground biomass	Standing dead wood	Lying dead wood
UBSL,SS,FAB+FAP,pool# (%)	42.5%	39.7%	60.9%	76.5%
UBSL,SS,FAP,pool# (%)	18.6%	17.2%	179.7%	54.6%
UBSL,SS, FAP-A,pool# (%)	79.4%	74.0%	283.2%	221.8%
UBSL,SS,FAB+FAP+FD or FAP + FD + FAB ,pool# (%)	17.7%	16.4%	62.9%	45.9%
UBSL,SS, FAP + FD or FD + FAP ,pool# (%)	14.2%	13.2%	138.4%	37.1%

Monitoring equipment:	None
QA/QC procedures to be applied:	Neither QA/QC procedures nor calibration are relevant for this calculated parameter.
Calculation of baseline emissions	Calculation of baseline emissions
Calculation method:	See X-UNC module.

Data Unit / Parameter:	E BiomassBurn,t
Data unit:	tCO2-e
Description:	Greenhouse emissions due to biomass burning as part of deforestation activities in stratum i in year t
Source of data:	Calculated
Description of measurement methods and procedures to be applied:	As this parameter was calculated rather than measured, no measurements methods are noted.
Frequency of monitoring/recording:	Every ≤ 10 years
Value applied:	E BiomassBurn2014,PA: 1,416.9 E BiomassBurn2015,PA: 36.1 E BiomassBurn2016,PA: 407.3 E BiomassBurn2014,LB: 3,036.6 E BiomassBurn2015,LB: 369.4 E BiomassBurn2016,LB: 657.6
Monitoring equipment:	None
QA/QC procedures to be applied:	Neither QA/QC procedures nor calibration are relevant for this calculated parameter.
Purpose of the data	Calculation of project emissions Calculation of leakage
Calculation method:	Use equation 1 as found in the E-BB module of VM0007
Comment	None

Note that for community:

Data / Parameter	
Data unit	Poverty score and poverty index
Description	The poverty score is determined by the number of basic necessities owned by the community member multiplied by the weighted indicator (a fraction derived from the percentage of communities who believe the asset is a basic necessity). The poverty index is determined by dividing the poverty score by the highest possible poverty score (if the community member owned all of the basic necessities; i.e., by adding up the weighted indicators).
Source of data	Basic Necessity Survey
Description of measurement methods and procedures to be applied	See above description for how poverty score and poverty index are calculated.
Frequency of monitoring/recording	The Basic Necessity Survey will be administered approximately every two years.
Value monitored	Poverty score and poverty index are monitored for each family surveyed in the Project.
Monitoring equipment	The only equipment used is a printed template of the Basic Necessity Survey and an excel spreadsheet to compile and analyze the results.
QA/QC procedures to be applied	CarbonCo and Carbon Securities re-asked questions to ensure accurate responses. Calculations were conducted by hand and via excel sheet to ensure accurate results.
Purpose of the data	The purpose of the data was to assess the impacts (positive and negative) of the Project on the local communities.
Calculation method	The only calculation methods were basic arithmetic.
Comments	The initial Basic Necessity Survey was conducted in 2013. A follow up Basic Necessity Survey, due to a lack of financial resources, was later conducted in 2017.

Data / Parameter	
Data unit	R$
Description	The total owned assets (both on a per family and per capita basis) will be assessed.
Source of data	Basic Necessity Survey
Description of measurement	The total owned assets is determined by the number of

methods and procedures to be applied	owned assets multiplied by the community price. The total owned assets are then added up. In addition, the total owned assets per capita are determined by dividing the total owned assets by the number of family members.
Frequency of monitoring/recording	The Basic Necessity Survey will be administered approximately every two years.
Value monitored	The total owned assets are monitored for each family (on a per family and per capita basis) surveyed in the Project.
Monitoring equipment	The only equipment used is a printed template of the Basic Necessity Survey and an excel spreadsheet to compile and analyze the results.
QA/QC procedures to be applied	CarbonCo and Carbon Securities re-asked questions to ensure accurate responses. Calculations were conducted by hand and via excel sheet to ensure accurate results.
Purpose of the data	The purpose of the data was to assess the impacts (positive and negative) of the Project on the local communities.
Calculation method	The only calculation methods were basic arithmetic.
Comments	The initial Basic Necessity Survey was conducted in 2013. A follow up Basic Necessity Survey, due to a lack of financial resources, was later conducted in 2017.

Note that for biodiversity:

Data / Parameter	
Data unit	Number and species
Description	Number and species of medium-to-large mammals photographed in the Project.
Source of data	Motion-sensitive, wildlife cameras.
Description of measurement methods and procedures to be applied	Andre Botelho, a trained biologist, established the measurement methods and procedures. Cameras were placed approximately one kilometer apart and at a height of approximately one meter above the ground. The cameras were deployed to the field for one year and were regularly checked on by Kidney da Cunha Aires.
Frequency of monitoring/recording	Monitoring via motion-sensitive wildlife cameras was done on a continuously basis for one year. Going forward, the use of wildlife cameras will take place approximately once every four years.

Value monitored	Number and species of medium-to-large mammals.
Monitoring equipment	The specific type of motion-sensitive wildlife camera used at the Project was the Bushnell Trophy Cam HD Essential, with a security package.
QA/QC procedures to be applied	Kidney da Cunha Aires regularly conducted preventative maintenance on the cameras (e.g., clearing vegetation, checking batteries, and removing memory cards). Andre Botelho conducted quality assurance and quality control with respect to uploading and organizing the images, analyzing the images, coding the images, and documenting the findings via a final report.
Purpose of the data	The purpose of the data was to identity medium-to-large mammals within the Project and to establish a baseline for ongoing assessment with respect to the Project's impacts (positive and negative) on biodiversity.
Calculation method	N/A
Comments	N/A

6 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS (CLIMATE)

6.1 Baseline Emissions (G2)

Baseline emissions for the project activities are found in Table 6.1 below (derived from Section 3.1 of the VCS PD)

Table 6.1. Baseline emissions in the project area and leakage belt.

ΔCBSL,PA,unplanned	ΔCBSL,LK,unplanned
34,205	35,152
190,685	237,009
243,544	380,426
233,773	344,023
248,221	337,645
217,214	317,929
246,296	342,140
251,397	344,183
233,279	314,928
265,663	366,684

6.2 Project Emissions

Project emissions are estimated by applying module M-MON (VMD0015, Version 2.0) of Methodology VM0007.

Deforestation Data

Monitoring results reported here used classified satellite imagery produced by UCEGEO, the GIS department within the Climate Change Institute, Acre State government, which produces an annual dataset on the extent and spatial location of all deforestation within the state. Antonio Willian Flores de Melo, a professor at the Universidade Federal do Acre, has stated the Acre State deforestation data is updated annually. The deforestation layer, "Desmate_TC_1988_2016.shp", available in the project database contains polygons of all areas deforested in Acre State in 2014, 2015, 2016 (and all prior years). According to the UCGEO methodology, the imagery collected and classified by the State of Acre for each year "covers approximately the period of July from the previous year to August of year listed as the deforestation year" (pers. comm. Antonio Willian Flores de Melo). This dataset is based on classification of a series of Landsat imagery. Each image selected for classification contains less than 10% cloud cover. This is followed by processing of the images by applying the filter HAZE. This algorithm was developed by Carlotto[76] and aims to improve visibility by reducing the effect of atmospheric haze and smoke. This algorithm was applied using the software ENVI, version 4.6. This step was followed by geometric correction using base the NASA GeoCover 2000 product as the base data. ENVI + IDL, version 4.6 were used to group multispectral bands (the blue, green, and red Landsat bands), while ERDAS IMAGINE 9.1 software was used for georeferencing. The RMS error of the georeferenced product was < 1 pixel, meeting good practice standards in remote sensing. Additional details on pre-processing can be found in the UCEGEO methodology[77].

As mentioned in the monitoring plan, changes in forest cover were determined using the 2016 Acre deforestation database provided UCEGEO. Figure 6.1 shows the area of deforestation in the project area and leakage belt for this monitoring period. Figure 6.2 shows the 2016 forest benchmark map (covering both the project area and leakage belt) which was produced using the aforementioned deforestation dataset.

The deforestation in the project area and leakage belt is derived by subtracting the non-forested area at the time of the project start from the non-forested area at the end of 2016.

[76] CARLOTTO, M. J. Reducing the effects of space-varying wavelength-dependent scattering in multispectral imagery. International Journal of Remote Sensing, v. 20, n. 17, p. 3333-3344, 1999.
[77] ACRE - Governo do Estado do Acre (no prelo). REVISÃO DA DINÂMICA DO DESMATAMENTO NO ESTADO DO ACRE: ANÁLISE TEMPORAL DE 23 ANOS (PERÍODO DE 1988 A 2010). Rio Branco: (UCEGEO - FUNTAC/SEMA), 2011 .

Figure 6.1. Map of the 2014, 2015, and 2016 deforestation in the project area and leakage belt.

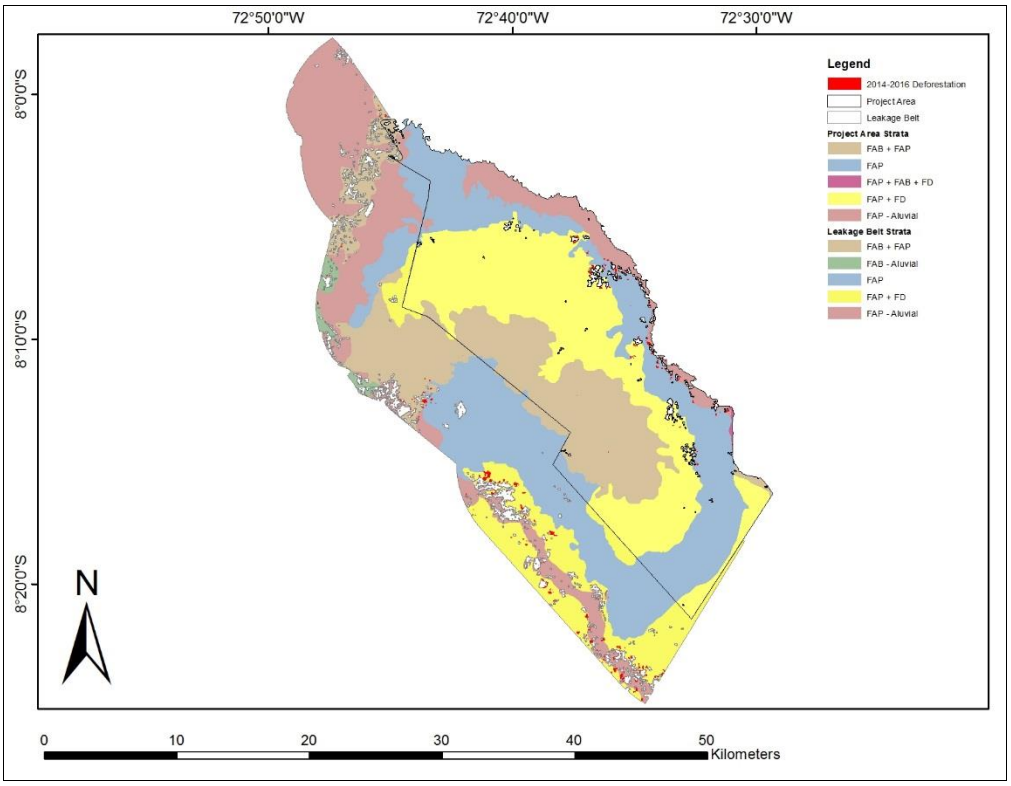
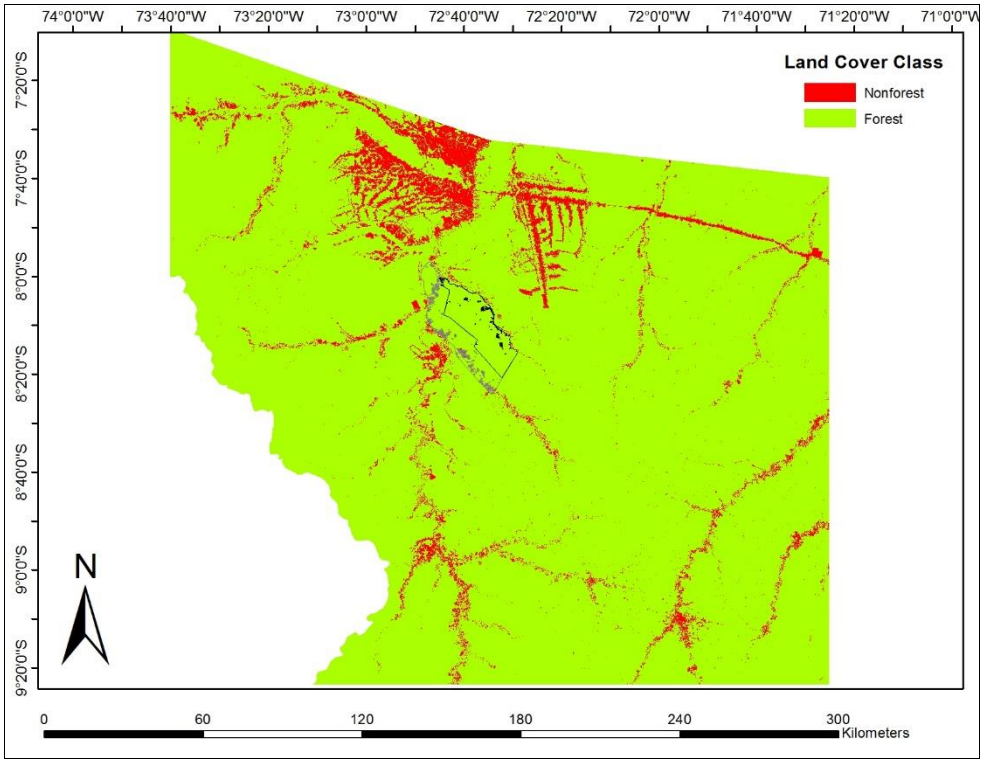


Figure 6.2. 2016 forest benchmark map for the project area and leakage belt.



Accuracy Assessment

Accuracy of the most recent UCGEO data set (including data on deforestation through 2016) was assessed by comparing the classification with ground truth points collected using high-resolution imagery (e.g. Digital Globe). The Digital Globe satellite collects multispectral imagery at 2 meter resolution. Sample points of high resolution imagery used to assess classification accuracy were recorded and archived (with an ID number, geographic position information, identified land-use class). Samples used to assess classification accuracy were well-distributed throughout the project area (as far as is possible considering availability of high resolution imagery and/or logistics of acquiring ground truth data). Figure 6.3 below shows the distribution of these points. All verification samples gathered from high-resolution imagery are from images as close as possible to classification date.

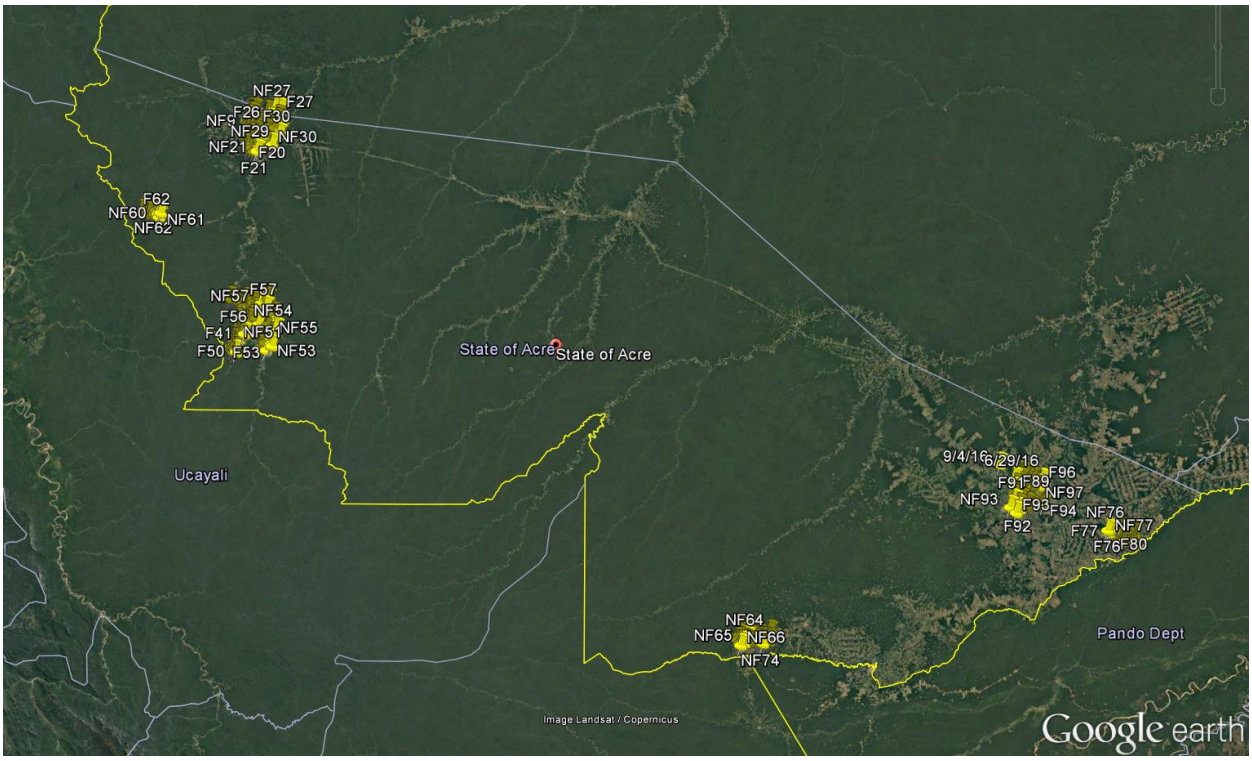
Results of the accuracy assessment are presented and analyzed in a matrix below, such that the following errors are presented:

- Classification accuracy
- Error of omission of each land-use category (forest and non-forest)
- Error of commission of each land-use category (forest and non-forest)

Land-use class as determined from ground-truth points	**Classification**		**Total**	**Accuracy (%)** ***User's accuracy (# correct/ row total)***	**Error of Commission (%)**
	Forest	**Non-forest**			
Forest (100)	97	3	100	97	3
Non-forest (100)	4	96	100	96	4
Total	101	99	200		Overall Accuracy
Accuracy (%) ***Producer's accuracy (# correct/ column total)***	96.04	96.97			96.5
Error of Omission (%)	3.96	3.03			

The classification will only be used in the forest cover change detection step if the overall classification accuracy, calculated as the total number of correct samples/ the total number of samples, is equal to or exceeds 90%. The accuracy of the 2016 classification meets this criteria with overall accuracy of 96.5%.

Figure 6.3. Distribution of accuracy assessment points across Acre state



Equation 6.1 is used to calculate ex-post project emissions, along with parameters listed in Table 6.2.

Equation 6.1. Equation for calculating the net GHG emissions within the project area under the project scenario.

$$\Delta C_P = \sum_{t=1}^{t^*} \sum_{i=1}^{M} \left(\Delta C_{P,DefPA,i,t} + \Delta C_{P,Deg,i,t} + \Delta C_{P,DistPA,i,t} + GHG_{P-E,i,t} - \Delta C_{P,Enh,i,t} \right)$$

Table 6.2. Parameters used to calculate ex-post project emissions.

Parameter	Description
ΔC_P	Net greenhouse gas emissions within the project area under the project scenario; t CO_2e
$\Delta C_{P,DefPA,i,t}$	Net carbon stock change as a result of deforestation in the project area in the project case in stratum i at time t; t CO_2e
$\Delta C_{P,Deg,i,t}$	Net carbon stock change as a result of degradation in the project area in the project case in stratum i at time t; t CO_2e
$\Delta C_{P,DistPA,i,t}$	Net carbon stock change as a result of natural disturbance in the project area in the project case in stratum i at time t; t CO_2e
$GHG_{P-E,i,t}$	Greenhouse gas emissions as a result of deforestation and degradation activities within the project area in the project case in stratum i in year t; t CO_2e

$\Delta C_{P,Enh,i,t}$	Net carbon stock change as a result of forest growth and sequestration during the project in areas projected to be deforested in the baseline in stratum i at time t; t CO_2e

Deforestation

Emissions resulting from deforestation in the with-project case (ΔCP,DefPA,i,t) are calculated as the area of deforestation (ADefPA,u,i,t) multiplied by the net change in carbon stocks. All parameters in Table 6.3 are sourced from Section 5.2 and 5.3 of this report. The area deforested was derived from the 2016 Acre deforestation dataset (see above for additional Information) combined with the original strata map. CBSL and Cpost values were those derived in the original forest inventory and the project document, respectively.

While deforestation decreased relative to the baseline case, a total of 102.3 ha were still deforested over this monitoring period. Upon discovering deforestation, the local project manager Marmude would talk to the communities about the importance of stopping deforestation in order for the implementation of social projects and programs.

Table 6.3 Net carbon stock change (t CO2-e) as a result of deforestation in the project area (ΔCP,DefPA,i,t).

Year	FAB + FAP ADefPA,u,i,t (ha)	FAB + FAP CBSL,i (t CO2-e/ha)	FAP ADefPA,u,i,t (ha)	FAP CBSL,i (t CO2-e/ha)	FAP-alluvial ADefPA,u,i,t (ha)	FAP-alluvial CBSL,i (t CO2-e/ha)	FAP + FAB + FD or FAP + FD + FAB ADefPA,u,i,t (ha)	FAP + FAB + FD or FAP + FD + FAB CBSL,i (t CO2-e/ha)	FAP + FD or FD + FAP ADefPA,u,i,t (ha)	FAP + FD or FD + FAP CBSL,i (t CO2-e/ha)	Cpost (t CO2-e ha-1)	ΔCP,DefPA,i,t (t CO2-e)
2014	1.8	441.9	28.6	458.1	14.7	370.5	0.1	482.1	33.1	389.5	0.0	32,306
2015	0.0	441.9	1.8	458.1	0.0	370.5	0.0	482.1	0.0	389.5	0.0	824
2016	0.0	441.9	10.6	458.1	4.0	370.5	0.0	482.1	7.6	389.5	0.0	9,290

Degradation

Net carbon stock change accounted as a result of degradation in the project area ($\Delta C_{P,Deg,i,t}$) are limited to emissions resulting from degradation due to illegal logging (ΔCP,DegW) as no commercial logging occurs in either the baseline or with-project case (i.e., ΔCP,SelLog,i,t is equal to zero).

While no acts of illegal logging were identified by forest monitors, degradation surveys were conducted in the project and surrounding area by CarbonCo and Carbon Securities. Surveys produced information on wood consumers (fuel wood and wood for construction and charcoal production) in the surroundings areas, as well as general indications on practices and areas where wood is sourced from.

Surveys confirmed that no sampled households collected wood for charcoal production. It was estimated that 124 solid cubic meters of fuelwood were extracted annually per household from 2014-2016 in the project area (bulk volumes reported were converted to solid volumes using a 0.65 conversion rate of solid volume of fuelwood to bulk volume, per FAO[78], p24) – this conservatively assumes that all fuelwood consumption reported was sourced from within the project area forests; see supporting survey results and analysis in "2016_RussasDegradation 2017.08.14.xlxs".

Respondents reported that they also sometimes extracted timber from forests in the project area. It was estimated that 81 solid cubic meters of timber were extracted annually per household from 2014-2016 in the project area – this conservatively assumes that all timber extraction reported was sourced from within the project area forests; see supporting survey results and analysis in "2016_RussasDegradation 2017.08.14.xlxs".

As the surveys reported above indicated that some level of logging is occurring in accessible areas within the project area, analysis proceeded to estimate emissions associated with illegal logging and apply the T-SIG tool.

Emissions from illegal logging were estimated from information collected in the survey, incorporating the following conservative assumptions:

- all wood used for fuelwood is live; and
- all reported volumes were collected from within project area.

Emissions were calculated referencing extracted solid wood volumes derived from the survey results (reported above), and applying mean live wood density of 0.62 g/cm^3 (= species level mean wood density for Amazonian forests calculated by Baker et al 2004 and subsequently validated for western Amazonia by Anderson et al 2009) and a logging damage factor (LDF) of 0.67 t C/m^3 stem volume harvested (for harvested timber), accounting for emissions associated with non-commercial portions of aboveground biomass and collateral damage, referenced VM7 module M-MON.

Estimated emissions from degradation were very small due to the low population pressures and insignificant amounts of fuelwood and timber collected. Degradation emissions over monitoring period from 2014-2016 are *de minimis,* representing less than 5% of net GHG benefits generated during the same monitoring period, and consequently are not accounted for.

[78] FAO. 2004. UNIFIED BIOENERGY TERMINOLOGY - UBET. Food and Agricultural Organization of the United Nations. Rome, Italy.

Natural Disturbance

No areas of natural disturbance were reported in the project area during the 2014-2016 period by forest monitors or local land managers, nor was evident or could be distinguished (from anthropogenic deforestation, accounted for above) with remote sensing, and therefore $A_{DistPA,q,i,t}$ is assumed to be 0. As there is no ground based evidence of natural disturbance, net carbon stock changes resulting from natural disturbance in the project area in the project case are reported to be zero (i.e., $\Delta C_{P,DistPA,i,t} = 0$).

GHG Emissions

As forest monitors reported evidence of fire on recently cleared land, N2O and CH4 emissions from biomass burning have been accounted for. Using parameters found in Section 5.2 and 5.3 emissions from biomass burning (EBB) were calculated as the product of the area burned, the aboveground carbon stocks, a combustion factor, a GHG emission factor, and the global warming potential. It was conservatively assumed that Aburn,i,t = ADefPA,u,i,t (i.e., all areas deforested in the project area were burnt).

Table 6.4. Calculation of N2O emissions resulting from burning.

Year	FAB + FAP Aburn,i,t (ha)	FAB + FAP B,i,t (t d.m./ha)	FAP Aburn,i,t (ha)	FAP B,i,t (t d.m./ha)	FAP-alluvial Aburn,i,t (ha)	FAP-alluvial B,i,t (t d.m./ha)	FAP + FAB + FD or FAP + FD + FAB Aburn,i,t (ha)	FAP + FAB + FD or FAP + FD + FAB B,i,t (t d.m./ha)	FAP + FD or FD + FAP Aburn,i,t (ha)	FAP + FD or FD + FAP B,i,t (t d.m./ha)	COMF	G,N20 (kg/t d.m. burnt)	GWP,N20 (t CO2/t gas g)	E-N2O BiomassBurn (tCO2e)
2014	1.8	211.0	28.6	217.7	14.7	176.3	0.1	229.7	33.1	185.6	0.45	0.2	310.0	428.9
2015	0.0	211.0	1.8	217.7	0.0	176.3	0.0	229.7	0.0	185.6	0.45	0.2	310.0	10.9
2016	0.0	211.0	10.6	217.7	4.0	176.3	0.0	229.7	7.6	185.6	0.45	0.2	310.0	123.3

Table 6.5. Calculation of CH4 emissions resulting from burning.

Year	FAB + FAP Aburn,i,t (ha)	FAB + FAP B,i,t (t d.m./ha)	FAP Aburn,i,t (ha)	FAP B,i,t (t d.m./ha)	FAP-alluvial Aburn,i,t (ha)	FAP-alluvial B,i,t (t d.m./ha)	FAP + FAB + FD or FAP + FD + FAB Aburn,i,t (ha)	FAP + FAB + FD or FAP + FD + FAB B,i,t (t d.m./ha)	FAP + FD or FD + FAP Aburn,i,t (ha)	FAP + FD or FD + FAP B,i,t (t d.m./ha)	COMF	G,CH4 (kg/t d.m. burnt)	GWP,CH4 (t CO2/t gas g)	E-CH4 BiomassBurn (tCO2e)
2014	1.8	211.0	28.6	217.7	14.7	176.3	0.1	229.7	33.1	185.6	0.45	6.8	21.0	988.0
2015	0.0	211.0	1.8	217.7	0.0	176.3	0.0	229.7	0.0	185.6	0.45	6.8	21.0	25.2
2016	0.0	211.0	10.6	217.7	4.0	176.3	0.0	229.7	7.6	185.6	0.45	6.8	21.0	284.0

Table 6.6. Calculation of E BiomassBurning in the project area.

Year	E-N2O BiomassBurn (tCO2e)	E-CH4 BiomassBurn (tCO2e)	E-BiomassBurn (tCO2e)	GHGP-E,i,t (t CO2-e)
2014	428.9	988.0	1,416.9	1,416.9
2015	10.9	25.2	36.1	36.1
2016	123.3	284.0	407.3	407.3

As justified in Section 6.2, total project GHG emissions (GHGP) equal emissions from biomass burning (EBB), as other potential sources are equal to zero.

Forest growth and sequestration

As stated in the project document, it is conservative to exclude forest growth and sequestration during the project, hence the parameter $\Delta C_{P,Enh,i,t}$ has been set to zero.

Net project emissions

Net emissions within the project area calculated in Table 6.7.

Table 6.7. Net project emission within the project area, ΔCP (t CO2-e).

Year	ΔCP,DefPA,i,t (t CO2-e)	ΔCP,Deg,i,t (t CO2-e)	ΔCP,DistPA,i,t (t CO2-e)	GHGP-E,i,t (t CO2-e)	ΔCP,Enh,i,t (t CO2-e)	ΔCP (t CO2-e)
2014	32,306	0	0	1,417	0	33,723
2015	824	0	0	36	0	860
2016	9,290	0	0	407	0	9,698

6.3 Leakage

Leakage emissions from displacement of unplanned deforestation are estimated in conformance with the VCS modular REDD methodology VM0007, specifically the LK-ASU module. This module provides for accounting for activity shifting leakage resulting from both local and immigrant deforestation agents.

Activity shifting from local agents in the leakage belt was tracked by monitoring deforestation and stock changes in the leakage belt. Emissions were calculated as the difference between stocks before and after deforestation, as for project emissions. Emissions due to biomass burning were also calculated as per the procedures in the E-BB module. As justified in Section 6.2, total project GHG emissions (GHGP) equal emissions from biomass burning (EBB) as other sources are equal to zero. The area deforested was derived from the 2016 Acre deforestation dataset combined with the original strata map. CBSL and Cpost values were those derived in the original forest inventory and the project document, respectively.

The net greenhouse gas emission in the project case for the leakage belt, parameter *ΔCP,LB*, is equal to the sum of stock changes dues to deforestation through 2016, equal to 96,612 t CO2e. Estimated baseline annual emissions in the leakage belt from 2014 through 2016 were 1,062,094 t CO2e. Emissions from deforestation in the leakage belt were less than the projected baseline emissions from deforestation in the leakage belt in 2014-2016 monitoring period, thus ΔCLK-ASU-LB equals 0

Table 6.8a. Calculation of E BiomassBurning in the leakage belt.

Year	E-N2O BiomassBurn (tCO2e)	E-CH4 BiomassBurn (tCO2e)	E-BiomassBurn (tCO2e)	GHGP-E,i,t (t CO2-e)
2014	919.3	2,117.3	3,036.6	3,036.6
2015	111.8	257.6	369.4	369.4
2016	199.1	458.5	657.6	657.6

Table 6.8b. Area (ha) deforested in the leakage belt (ADefLB,u,i,t) and resulting emissions ΔCP,DefLB,i,t (t CO2e).

Year	FAB + FAP ADefLB,u,i,t (ha)	FAB + FAP CBSL,i (t CO2-e/ha)	FAP ADefLB,u,i,t (ha)	FAP CBSL,i (t CO2-e/ha)	FAP-alluvial ADefLB,u,i,t (ha)	FAP-alluvial CBSL,i (t CO2-e/ha)	FAB - Aluvial (ha)	FAB - Aluvial CBSL,i (t CO2-e/ha)	FAP + FD or FD + FAP ADefLB,u,i,t (ha)	FAP + FD or FD + FAP CBSL,i (t CO2-e/ha)	Cpost (t CO2-e ha-1)	E-Biomass Burning LB (tCO2e)	ΔCP,LB (t CO2-e)	ΔCBSL,LK,unplanned (t CO2-e)	ΔCLK-ASU-LB (t CO2-e)
2014	23.5	441.9	7.8	458.1	38.4	370.5	4.4	424.4	100.4	389.5	0.0	3036.6	72,196	380,426	0
2015	2.5	441.9	0.0	458.1	2.4	370.5	0.0	424.4	16.4	389.5	0.0	369.4	8,780	344,023	0
2016	1.4	441.9	0.1	458.1	6.1	370.5	0.0	424.4	30.9	389.5	0.0	657.6	15,635	337,645	0

Activity shifting leakage outside the leakage belt was tracked by monitoring deforestation in the project area ($A_{DefPA,i,t}$) and leakage belt ($A_{DefLB,i,t}$). The area deforested by immigrants outside the Leakage Belt and project area under the project scenario (ALK-OLB) is then calculated as the difference between the total area deforested by immigrant agents in the baseline scenario in the project area (ALK-IMM,t) and the area deforested by immigrants in the project area and Leakage Belt under the project scenario (ALK-ACT-IMM,t). This area (ALK-OLB in Table 6.9) is then multiplied by the difference between stocks before and after deforestation outside the leakage belt to yield the estimate of emissions due to activity shifting immigrant leakage ΔCLK-ASU,OLB.

Table 6.9. Emissions calculations for activity shifting immigrant leakage outside the leakage belt

Year	PROPIMM	ABSL,PA,unplanned,t (ha)	ALK-IMM,t (ha)	ADefPA,i,t (ha)	ADefLB,i,t (ha)	ALK-ACT-IMM,t (ha)	ALK-OLB,t (ha)	COLB (t CO2-e ha-1)	Cpost (t CO2-e ha-1)	ΔCLK-ASU,OLB (t CO2-e)
2014	0.056	783.6	43.5	78.4	69.7	8.2	35.3	458.0	0.0	16,170
2015	0.056	727.6	40.4	1.8	4.9	0.4	40.0	458.0	0.0	18,341
2016	0.056	757.9	42.1	22.2	7.7	1.7	40.4	458.0	0.0	18,526

Total leakage (53,038 t CO2-e) is then calculated as the sum of activity shifting leakage resulting from both local and immigrant (Table 6.10). GHG emissions from leakage mitigation activities (GHGLK) equal zero as none of the mitigation activities involve biomass burning or fertilizer usage.

Table 6.10. Estimation of total leakage due to the displacement of unplanned deforestation

Year	ΔCLK-ASU-OLB (t CO2-e)	ΔCLK-ASU-LB (t CO2-e)	GHGLK,E (t CO2-e)	ΔCLK-AS,unplanned (t CO2-e)
2014	16,170	0	0	16,170
2015	18,341	0	0	18,341
2016	18,526	0	0	18,526

6.4 Net GHG Emission Reductions and Removals (CL1 & CL2)

Uncertainty in baseline carbon stock estimates, GHG emission estimates, and baseline deforestation projections were calculated applying the VM007 module X-UNC.

As stated in the methodology, “it is here assumed that there is zero uncertainty in baseline rate of deforestation or degradation where numbers are equal to a long-term average (BL-UP)”, hence uncertainty associated with the baseline deforestation projections are equal to zero.

As GHG emission sources in the baseline are conservatively assumed to be zero, uncertainty surrounding this estimate is also considered to be zero.

Uncertainty is therefore limited to the baseline carbon stock as determined by the Russas Project forest carbon inventory[79]. Overall, the inventory produced an estimate of biomass carbon stocks at the project level of 118.7 t C/ha (or 435.1 tCO2/ha) with a precision level of +/- 9.7% of the mean at the 95% confidence level.

As stated in the uncertainty module “where no ex post (re-)measurements of carbon pools or GHG sources have been made, i.e. uncertainty from these sources is already included in UncertaintyBSL,t*, cumulative project uncertainty through time t is therefore equal to uncertainty in baseline estimates.” As no ex post measurements of carbon pools or GHG sources have occurred, parameters related to calculating uncertainty in the with-project scenario, including EP,SS,i, Pool# and UP,SS,i,pool#, have not been included in the project.

As the precision surrounding estimates of forest carbon stocks, 9.7% of the mean (at the 95% confidence level) are less than precision requirements of the methodology, +/- 15% of the mean (at a 95% confidence level), no uncertainty deduction was warranted or applied.

Estimates of GHG credits eligible for issuance as VCUs were calculated in Table 6.11, below; where

Estimated GHG emission reduction credits =

[79] Forest biomass carbon inventory for the Russas and Valparaiso Properties, Acre State, Brazil,” 2013.

Baseline emissions, fixed for 10 years at validation *minus*

Project emissions *minus*

Leakage *minus*

Non-permanence Risk Buffer withholding (calculated as a percent of net change in carbon stocks prior to deduction of leakage)

Table 6.11. Estimate of Net Emission Reduction Credits. Values in this table have been rounded to the nearest whole number.

Years	Estimated baseline emissions or removals (tCO_{2e})	Estimated project emissions or removals (tCO_{2e})	Estimated leakage emissions (tCO_{2e})	Risk buffer (%)	Deductions for AFOLU pooled buffer account (tCO2e)	GHG credits eligible for issuance as VCUs (tCO_{2e})
2014	243,544	33,723	16,170	15%	31,473	162,177
2015	233,773	860	18,341	15%	34,937	179,634
2016	248,221	9,698	18,526	15%	35,778	184,219
Total						526,030

6.5 Climate Change Adaptation Benefits (GL1)

This section is not applicable to the Russas Project.

7 COMMUNITY

7.1 Net Positive Community Impacts (CM1)

The Russas Project generated net positive community impacts between March 17, 2011 and December 31, 2016 which were equitably shared and the Project will also maintain, or enhance, high conservation values important to the communities.

Use Appropriate Methodologies to Estimate the Impacts on Communities

The Project Proponents utilized stakeholder identification and consultation, along with a Participatory Rural Assessment (PRAs) and the Basic Necessities Survey (BNS) methodology to develop a Theory of Change for estimating the community impacts of the Project for the with-project scenario vis-à-vis the without-project scenario. The activities, outputs, outcomes and community impacts of the Project were monitored to ensure positive net benefits for all communities.

The general process between March 17, 2011 and December 31, 2016 of identifying community impacts was:

- Ilderlei Souza Rodrigues Cordeiro met with Community to Discuss Project;
- Rapid Community Assessment conducted by Ilderlei;
- Project Proponents met Community to Further Discuss Project;
- CarbonCo Reviewed Background Studies on Appropriate Methodologies, Particularly the Social and Biodiversity Impact Assessment (SBIA) Manual for REDD+ Projects: Part 1, 2 and 3;
- PRAs and BNS Assessment Conducted by Project Proponents;
- Casual Analysis to Develop a Theory of Change; and.
- Theory of Change Modified, as Necessary.

Participatory Rural Assessment

A Participatory Rural Assessment (PRA, also known as a Participatory Rural Appraisal) with the Russas Project communities was conducted by CarbonCo, Carbon Securities, and Ilderlei Souza Rodrigues Cordeiro from March 30 – April 1, 2013. The Project Proponents attempted to sample each community living within the Russas Project Area, along with all adjacent communities living along the Juruá River and within the Project Zone. A total of nineteen communities – sixteen communities within the Russas Project Area and three communities living alongside the Juruá River and in the Project Zone - were interviewed as part of the PRA.

The aggregated results of the PRA were as follows:

Grand Totals (Inside Russas Project and Russas Project's Leakage Belt)								
	How Many Years Lived Here?	Do You Participate in Agriculture (Yes = 1, No = 0)	Do You Participate in Cattle Ranching (Yes = 1, No = 0)	Do You Participate in Timber Extraction / Logging (Yes = 1, No = 0)	Do You Participate in Fuel Wood Collection (Yes = 1, No = 0)	Do You Participate in Charcoal Production (Yes = 1, No = 0)	Do You Sell Crops or Cattle Outside Property (Yes = 1, No = 0)	How Much Fuel Wood, on Average, Collected per Week?
Average	33.1	N/A	N/A	N/A	N/A	N/A	N/A	1.07
Total of Yes Responses	N/A	19	1	18	16	0	19	N/A
Total of No Responses	N/A	0	18	1	3	19	0	N/A
Percentage of Yes Responses	N/A	100.00%	5.26%	94.74%	84.21%	0.00%	100.00%	N/A
Percentage of No Responses	N/A	0.00%	94.74%	5.26%	15.79%	100.00%	0.00%	N/A
Number Over 5 Years	18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Percentage Over 5 Years	94.74%	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Do You Use Fuel Wood for Cooking (Yes = 1, No = 0)	Do You Have a Sustainable Fuel Wood Lot (Yes = 1, No = 0)	Do You Make Charcoal (Yes = 1, No = 0)	Do You Sell Charcoal (Yes = 1, No = 0)	Do You Sell Timber (Yes = 1, No = 0)	How Far into Forest Do You Go to Collect Construction Timber? (In Meters)	How Many Meters Away From House do You Collect Fuel Wood?	How Much Fuel Wood, on Average, Collected per Year?
Average	N/A	N/A	N/A	N/A	N/A	303.61	194.69	52.47
Total of Yes Responses	16	0	0	0	0	N/A	N/A	N/A
Total of No Responses	3	19	19	19	19	N/A	N/A	N/A
Percentage of Yes Responses	84.21%	0.00%	0.00%	0.00%	0.00%	N/A	N/A	N/A
Percentage of No Responses	15.79%	100.00%	100.00%	100.00%	100.00%	N/A	N/A	N/A
Number Over 5 Years	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Percentage Over 5 Years	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Figure 7.1: Aggregated Results of Participatory Rural Assessment (Credit: Brian McFarland)

As one can observe, all community members practice agriculture and only one person surveyed participates in cattle-ranching. It is also important to note that although no communities sell timber or charcoal outside of the community, every person surveyed from the communities sells either crops or cattle and a significant majority also collects fuel wood.

This PRA helped to establish a baseline of economic activities and land-use practices that the communities practice, along with a mechanism to assess leakage.

A follow up PRA, with a focus on degradation including fuel wood and timber usage, was conducted in March and May 2017.

Basic Necessities Survey

CarbonCo, Carbon Securities, and Ilderlei Souza Rodrigues Cordeiro also conducted a Basic Necessities Survey (BNS) from March 30 – April 1, 2013 among the nineteen communities. Essentially, a focus group was created among the Project Proponents and the community to identify the top 27 assets or services which were believed to be basic necessities or things that no one should have to live without.

Basic Necessity Survey Focus Group (Photo Credit: Ilderlei Cordeiro)

The Project Proponents then individually surveyed each of the nineteen communities and only those assets or services which at least 50% of the communities deemed a basic necessity were included in the final calculations of a poverty index and poverty score. The aggregated results of the BNS among the sixteen communities living inside the Russas Project were as follows:

Aggegated Data from Basic Necessities Survey (Communities Inside Russas Project)							
	Total Surveys: 16						
	Asset or Service	**Item**	**Are Basic Necessities? (Total Number of No Responses)**	**Are Basic Necessities? (Total Percentage of No Responses)**	**Are Basic Necessities? (Total Number of Yes Responses)**	**Are Basic Necessities? (Total Percentage of Yes Responses)**	**Weighting (Fraction)**
1	Asset	Telephone	0	0.00%	16	100.0%	1.000
2	Asset	Machete	0	0.00%	16	100.0%	1.000
3	Asset	Ax	1	6.25%	15	93.8%	0.938
4	Asset	Hoe	0	0.00%	16	100.0%	1.000
5	Asset	Planting Tool	0	0.00%	16	100.0%	1.000
6	Asset	Boat Engine / Motor	0	0.00%	16	100.0%	1.000
7	Asset	Boat or Canoe	0	0.00%	16	100.0%	1.000
8	Asset	Boots	2	12.50%	14	87.5%	0.875
9	Asset	Cooking Stove	0	0.00%	16	100.0%	1.000
10	Asset	Dishware Set	0	0.00%	16	100.0%	1.000
11	Asset	Fishing Pole and Line	0	0.00%	16	100.0%	1.000
12	Asset	Diesel Generator	0	0.00%	16	100.0%	1.000
13	Asset	Diesel	0	0.00%	16	100.0%	1.000
14	Asset	TV with Antenna	0	0.00%	16	100.0%	1.000
15	Asset	Kit for Making Manioc Flour	0	0.00%	16	100.0%	1.000
16	Asset	Hammock	1	6.25%	15	93.8%	0.938
17	Asset	Bed and Mattress	0	0.00%	16	100.0%	1.000
18	Service	Food	0	0.00%	16	100.0%	1.000
19	Asset	House	0	0.00%	16	100.0%	1.000
20	Asset	Chicken Coup	0	0.00%	16	100.0%	1.000
21	Asset	Pasture Fence	4	25.00%	12	75.0%	0.750
22	Asset	House for Pigs	2	12.50%	14	87.5%	0.875
23	Service	Sense of Security	0	0.00%	16	100.0%	1.000
24	Service	Access to Doctor and Clinic	0	0.00%	16	100.0%	1.000
25	Service	Access to Good School	1	6.25%	15	93.8%	0.938
26	Asset	Weedwacker	0	0.00%	16	100.0%	1.000
27	Asset	Freezer	1	6.25%	15	93.8%	0.938

Figure 7.2: Aggregated Results of Participatory Rural Assessment (Credit: Brian McFarland)

Rearranging the data from above, the top twenty Basic Necessities among the communities living within the Russas Project were as follows:

Aggregated Data from Basic Necessities Survey (Communities Inside Russas Project)						
Total Surveys: 16						
	Item	Are Basic Necessities? (Total Number of Yes Responses)	Are Basic Necessities? (Total Percentage of Yes Responses)	Weighting (Fraction)	Have Basic Necessities? (Total Number of Yes)	Have Basic Necessities? (Total Percentage of Yes)
1	Telephone	16	100.0%	1.000	3	18.75%
2	Machete	16	100.0%	1.000	13	81.25%
3	Hoe	16	100.0%	1.000	11	68.75%
4	Planting Tool	16	100.0%	1.000	2	12.50%
5	Boat Engine / Motor	16	100.0%	1.000	8	50.00%
6	Boat or Canoe	16	100.0%	1.000	6	37.50%
7	Cooking Stove	16	100.0%	1.000	12	75.00%
8	Dishware Set	16	100.0%	1.000	15	93.75%
9	Fishing Pole and Line	16	100.0%	1.000	6	37.50%
10	Diesel Generator	16	100.0%	1.000	5	31.25%
11	Diesel	16	100.0%	1.000	5	31.25%
12	TV with Antenna	16	100.0%	1.000	5	31.25%
13	Kit for Making Manioc Flour	16	100.0%	1.000	2	12.50%
14	Bed and Mattress	16	100.0%	1.000	12	75.00%
15	Food	16	100.0%	1.000	16	100.00%
16	House	16	100.0%	1.000	14	87.50%
17	Chicken Coup	16	100.0%	1.000	6	37.50%
18	Sense of Security	16	100.0%	1.000	15	93.75%
19	Access to Doctor and Clinic	16	100.0%	1.000	3	18.75%
20	Weedwacker	16	100.0%	1.000	1	6.25%

Figure 7.3: Top 20 Basic Necessities (Credit: Brian McFarland)

The assets or services which have a higher percentage of communities considering them a basic necessity than the number of communities actually possessing those assets or services shall be considered higher priority social projects or programs for I.S.R.C. For example, this includes the access to weedwacker, planting tool, and a kit for making manioc flour.

For analytical and comparative purposes, the summary statistics for both the communities within and adjacent to the Russas Project are as follows:

Summary Statistics for Inside Russas Project	
Highest Total Value of Owned Assets	R$ 62,746.40
Lowest Total Value of Owned Assets	R$ 1,817.00
Total Value of Owned Assets Range	R$ 60,929.40
Average Total Value of Owned Assets	R$ 35,349.15
% Above Total Value of Owned Assets Average	56.25%
% Below Total Value of Owned Assets Average	43.75%

Summary Statistics for Inside Russas Project	
Highest Total Value of Owned Assets Per Capita	R$ 14,531.00
Lowest Total Value of Owned Assets Per Capita	R$ 605.67
Total Value of Owned Assets Per Capita Range	R$ 13,925.33
Average Total Value of Owned Assets Per Capita	R$ 7,238.58
% Above Total Vale of Assets Per Capita Average	43.75%
% Below Total Value of Assets Per Capita Average	56.25%

Summary Statistics for Russas Project's Leakage Belt	
Highest Total Value of Owned Assets	R$ 50,461.00
Lowest Total Value of Owned Assets	R$ 29,615.00
Total Value of Owned Assets Range	R$ 20,846.00
Average Total Value of Owned Assets	R$ 40,369.00
% Above Total Value of Owned Assets Average	66.67%
% Below Total Value of Owned Assets Average	33.33%

Summary Statistics for Russas Project's Leakage Belt	
Highest Total Value of Owned Assets Per Capita	R$ 12,615.25
Lowest Total Value of Owned Assets Per Capita	R$ 9,871.67
Total Value of Owned Assets Per Capita Range	R$ 2,743.58
Average Total Value of Owned Assets Per Capita	R$ 10,914.89
% Above Total Value of Assets Per Capita Average	33.33%
% Below Total Value of Assets Per Capita Average	66.67%

Figure 7.4: Summary Statistics of the Basic Necessities Survey (Credit: Brian McFarland)

A follow up BNS was conducted in May 2017.

Theory of Change

The PRA and BNS helped to shape the Project Proponent's Theory of Change. As noted in the Social Impact Assessment Toolbox, in simple terms, {the Theory of Change} is a roadmap drawn up by the Project Proponents and stakeholders of how the project plans to get from Point A (project strategy and activities) to Point Z (project impacts)."[80] Likewise, the Russas Project strategies and activities will lead to outputs, followed by outcomes, and ultimately by net positive climate, community and biodiversity impacts.[81]

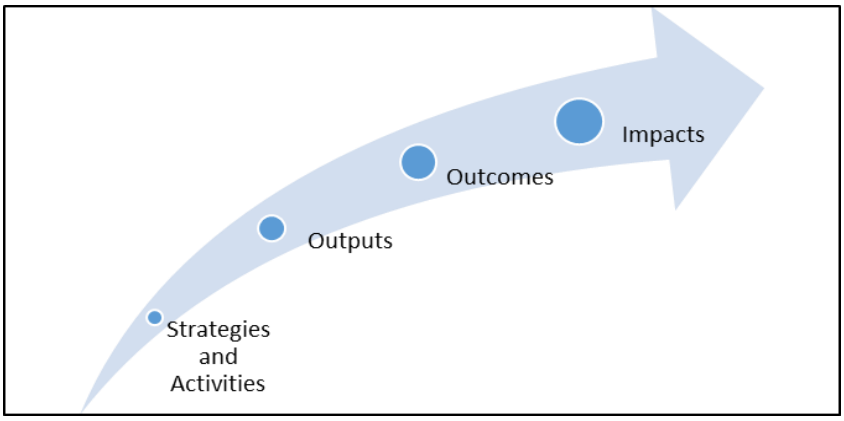


Figure 7.5: Progression from Project Strategies and Activities through Community Impacts

To clearly define activities, outputs, outcomes and impacts, the following definitions were utilized:

> Project activities are the physical or implemented activities of the projects.
>
> Project outputs are the tangible short-term results of project activities and normally take the form of products or services provided during the project lifetime and as a direct result of project funding.
>
> Project outcomes are the direct intended results stemming from the outputs. They are short- and medium term changes experienced by project stakeholders and/or by the physical environment, and are less tangible and easy to measure than outputs.

[80] Richards, M. and Panfil, S.N. 2011. Social and Biodiversity Impact Assessment (SBIA) Manual for REDD+ Projects: Part 1 – Core Guidance for Project Proponents. Climate, Community & Biodiversity Alliance, Forest Trends, Fauna & Flora International, and Rainforest Alliance. Washington, DC., Page 13.

[81] The linkages between the Russas Project's Strategies and Activities, Outputs, Outcomes, and Impacts were conceptualized with assistance from Brigitta Jozan, Independent Advisor

> Project impacts are the end results sought by the project, especially as regards net social changes. They may occur as a direct or indirect result of project outcomes.[82]

The following causal analysis was conducted to demonstrate net positive community impacts from the Russas Project.[83]

Carbon Finance

The following Theory of Change is for Carbon Finance.

[82] Sources: Based on GEF Evaluation Office and Conservation Development Centre 2009; Schreckenberg et al. 2010.

[83] Richards, M. and Panfil, S.N. 2011. Social and Biodiversity Impact Assessment (SBIA) Manual for REDD+ Projects: Part 1 – Core Guidance for Project Proponents. Climate, Community & Biodiversity Alliance, Forest Trends, Fauna & Flora International, and Rainforest Alliance. Washington, DC., Page 32.

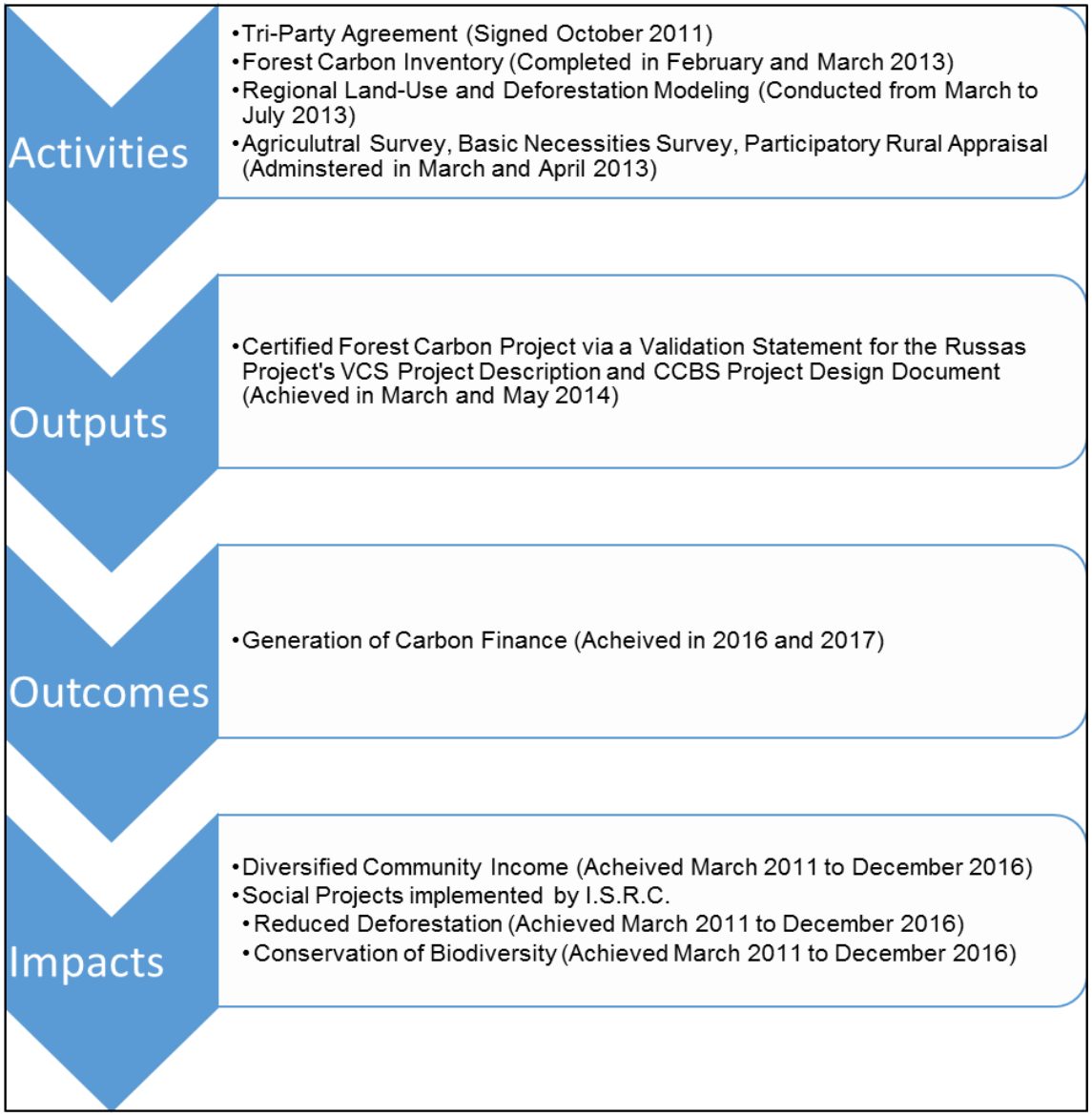


Figure 7.6: Activities, Outputs, Outcomes and Impacts of Carbon Finance

IF, THEN Statements

If the Tri-Party Agreement, forest carbon inventory, regional land-use and deforestation modeling, along with the agricultural survey, Basic Necessities Survey and Participatory Rural Appraisal activities are successfully accomplished, then the output will be a certified forest carbon project with a validation statement for the VCS and CCBS. If the validation statement is received, then carbon finance can be generated. If carbon finance is generated, then the communities will diversify incomes and I.S.R.C. will be able to implement social projects and programs. If communities diversify incomes and I.S.R.C. can implement social projects (e.g., agricultural extension trainings) and programs, then deforestation will be reduced and biodiversity will be conserved.

Agricultural Surveys

The following Theory of Change is for Agricultural Surveys.

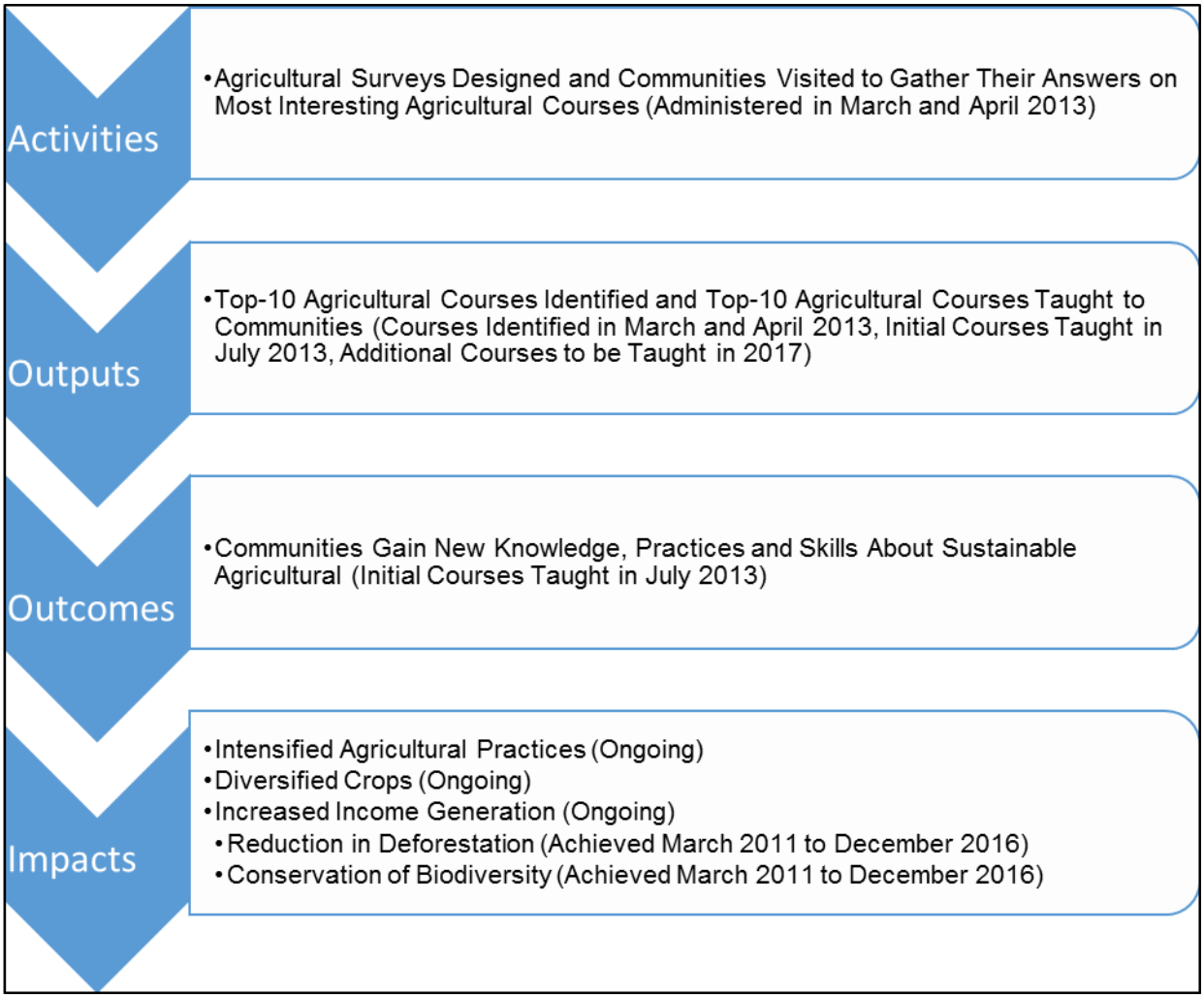


Figure 7.7: Activities, Outputs, Outcomes and Impacts of Agricultural Survey

IF, THEN Statements

If agricultural surveys are designed and communities are asked about what are the most interesting agricultural courses, then the project proponents will have identified the top-10 courses and these courses can be taught to the communities. If the most interesting courses are taught to the communities, then the communities will gain new knowledge, learn new practices and learn new skills about sustainable forms of agriculture. If the communities gain new knowledge, practices and skills, then the communities will intensify agricultural practices, diversify crops, and increase income generation. If communities intensify agricultural practices, diversify crops, and increase income generation, then deforestation will be reduced and biodiversity will be conserved.

Basic Necessities Survey

The following Theory of Change is for the Basic Necessities Survey (BNS).

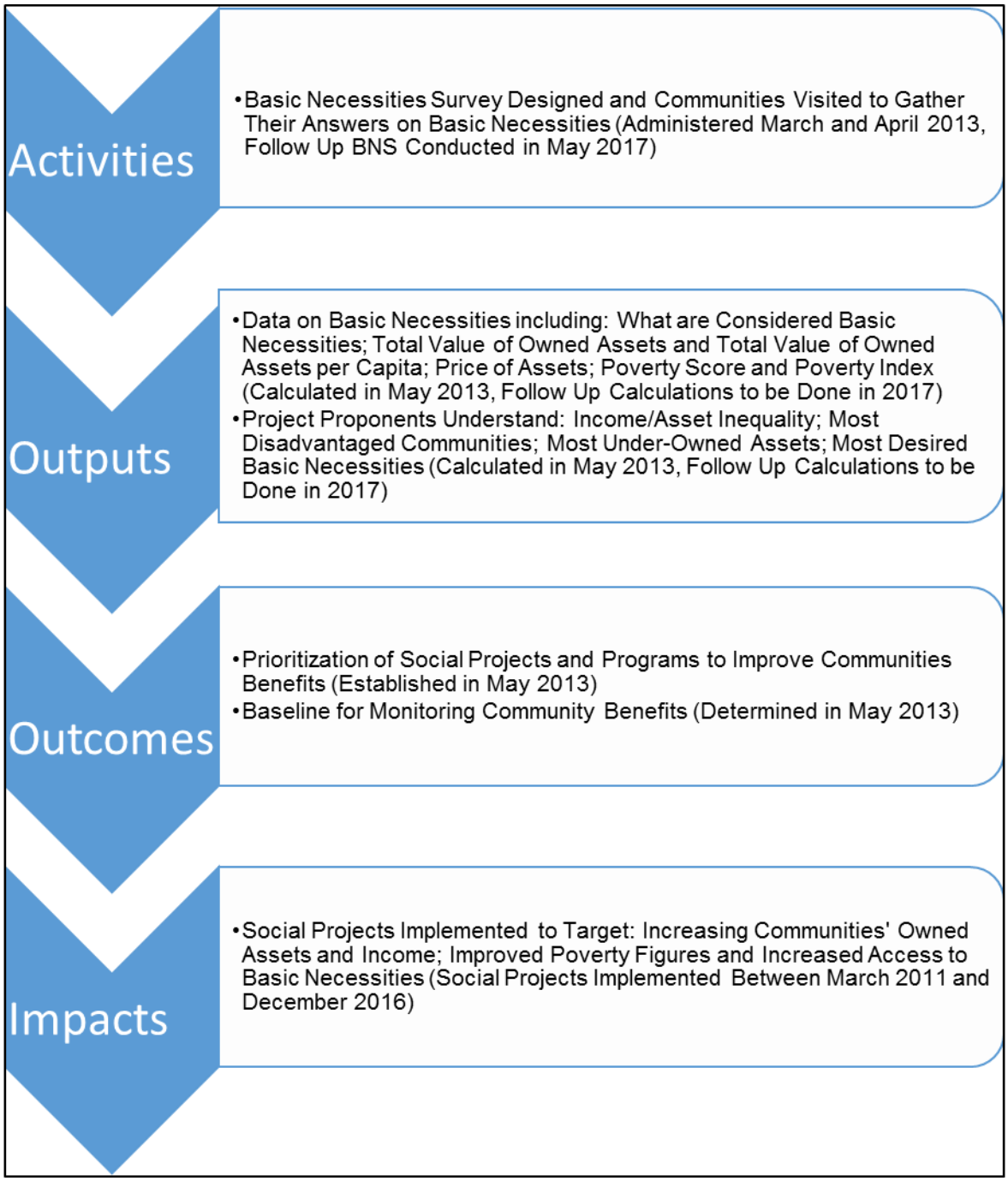


Figure 7.8: Activities, Outputs, Outcomes and Impacts of Basic Necessities Survey

IF, THEN Statements

If the BNS is designed and communities are surveyed, then the Project Proponents will have data on basic necessities, community assets and poverty which will enable the Project Proponents to understand asset inequality, which communities are most disadvantaged, along with which are the most under-owned assets and which are the most desired basic necessities. If this data is collected and understood by the Project Proponents, then social project and programs are prioritized for improving community benefits and a baseline for monitoring benefits is established. If social projects and programs are prioritized, then social projects can be implement which specifically target increasing communities owned assets and income, along with to improve poverty figures and access to basic necessities.

Participatory Rural Appraisals

The following Theory of Change is for Participatory Rural Appraisals (PRAs).

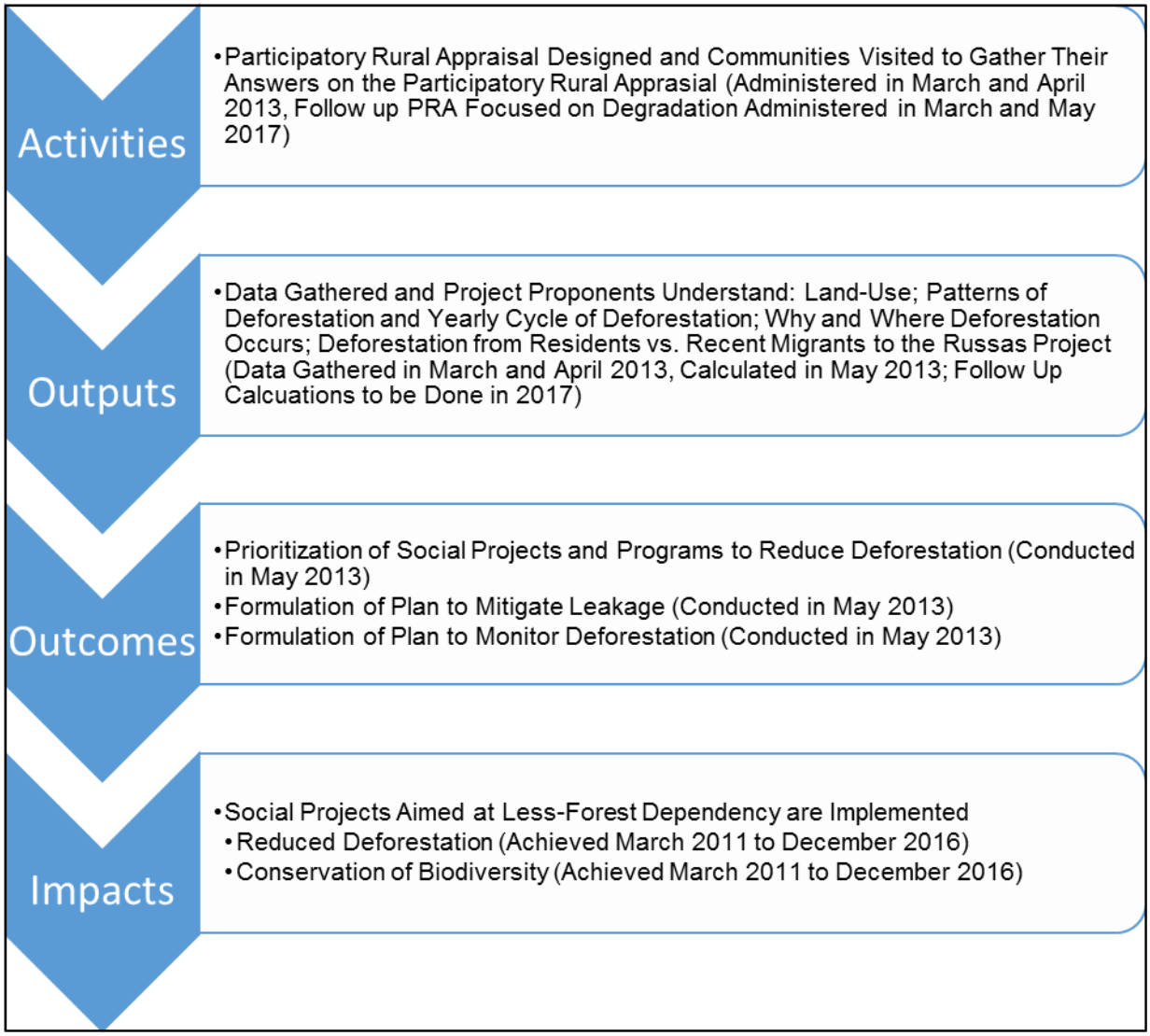


Figure 7.9: Activities, Outputs, Outcomes and Impacts of Participatory Rural Appraisal

IF, THEN Statements

IF PRAs are designed and communities are surveyed, then data will be gathered and the Project Proponents will understand: Land-Use; Patterns of Deforestation and Yearly Cycle of Deforestation; Why and Where Deforestation Occurs; Deforestation from Residents vs. Recent Migrants to the Russas Project. If this data is collected and deforestation is understood by the Project Proponents, then social projects and programs aimed at reducing deforestation can be prioritized and plans for mitigating leakage and monitoring deforestation can be formulated. If social projects and programs are prioritized, then deforestation will be reduced and biodiversity will be conserved.

Comparison of 'With Project' Scenario and 'Without Project' Scenario

A comparison between community benefits in the 'with project' scenario and in the 'without project' scenarios resulted in net positive community benefits in the 'with project' scenario from March 2011 to December 2013. As demonstrated, the estimated impacts on all communities from the Russas Project are expected to be positive throughout the Project Lifetime and such positive benefits include socio-economic well-being and benefits for ecosystem services. Such community impacts and biodiversity impacts will be regularly monitored and periodically verified by an independent firm approved by the CCBS.

The 'without project' scenario is the continuation of unplanned, frontier deforestation. While it is believed that the communities would continue to practice mainly subsistence agriculture and some cattle-ranching and receive the associated benefits from these activities, the amount of land deforested would increase. Such increased deforestation would result in negative impacts on ecosystem services. This includes increased erosion, increased flooding due to fewer trees storing water, increased GHG emissions, and less habitat area for both wildlife and for the game which communities hunt.

The Russas Project, which seeks to provide alternative economic opportunities to communities and mitigate deforestation, provided net positive socio-economic benefits for communities in the 'with project' scenario from March 2011 to December 2013 by: creating awareness about the Project and the need to preserve the forests for future generations; discussions with communities and initiation of the process to formalize land tenure of communities; providing the first five agricultural courses to 101 community members along with delivery of seeds, graviola, and passion fruit; hiring local staff and implementation of monitoring; expansion of Marmude's house to serve as the initial Project headquarters. Many of these benefits, such as the knowledge gained from agricultural extension courses, the establishment of a local headquarters, and the preservation of biologically diverse habitats, carry over into future monitoring periods. Furthermore, these activities would not have resulted in the 'without project' scenario.

Net positive socio-economic benefits for communities in the 'with project' scenario from January 2014 to December 2016 include: continuing awareness about the Project; hiring new local project manager and local project coordinators; providing health services to 400 community members, distributing dozens of dental kits for children, and distributing dozens of mosquito nets; and raising carbon finance to install 14 restrooms, renovate the onsite health clinic, distribute generators and solar panels, and distribute manioc flour kits in 2017. In addition, SOS Amazonia visited the communities on behalf of the Project Proponents at least 14 times throughout 2015 and 2016, with another 12 visits in 2017. Such visits included agricultural trainings and follow up visits on these activities taught by SOS Amazonia including, but not limited to: banana production and management; agroforestry workshops; organic horticulture courses; and small animal (e.g., chickens) breeding courses. These activities would not have resulted in the 'without project' scenario.

Impact on High Conservation Values

Communities place high conservation values on the Russas Project such as food, medicines, building materials, and traditional cultural significance.

Food

With respect to food, the community places a high conservation value especially on fishing and hunting. The Project shall not disrupt the communities' access to fishing and by maintaining the Russas Project's primary forests, the Project shall also assist with maintaining a healthy population of game.

Medicines

Being a forest conservation project, the Project shall preserve the primary forest's medicinal plants. In addition, I.S.R.C. is in the process of improving the health clinic at the Russas Project.

Building Materials

Although the Project seeks to eliminate deforestation – which might negatively impact the communities' access to building materials – the communities use relatively little timber to repair their houses. To mitigate this potential negative impact, the communities will be allowed to continue extracting timber to repair their houses and over time, the Project will promote replanting hardwood species that can be specifically used by the communities for housing.

Traditional Cultural Significance

The with-project scenario will not involuntarily relocate communities and thus, the Project shall help maintain the traditional cultural significance of the Russas Project property.

7.2 Negative Offsite Stakeholder Impacts (CM2)

The Russas Project Proponents undertook an extensive stakeholder identification and consultation, including with offsite stakeholders, from March 2011 to December 2016.

The following is a list of the adjacent communities and Landowner to the Russas Project:

- The largest adjacent property owner to the Russas Project is Manoel Batista Lopes, owner of the Valparaiso Project which is located North of the Russas Project;
- Seringal Santa Cruz, owned by Francisco Manoel de Mello (West of Russas Project);
- Seringal Floresta, owned by the company Almeida & Castro (West of Russas Project);
- Seringal Porto Peters, owned by Armando Geraldo Silva (West of Russas Project);
- Seringal Humaita, owned by the company M. Teixeira de Costa & Cia (West of Russas Project); and
- Terras Indigenas (Southeast of Russas).

Project Proponents spoke extensively with Manoel Batista Lopes as the Russas and Valparaiso Projects are being developed in unison.

Potential Negative Offsite Stakeholder Impacts

Although no negative offsite stakeholder impacts took place between March 2011 and December 2016, the Project Proponents identified the following potential negative offsite stakeholder impacts:

- Increased cost of land; for example, if forest carbon projects increase property values for future land purchases;
- Decreased value of land; for example, if Russas Project prevents adjacent properties from accessing markets;
- In-migration to areas adjacent to the Project Zone;
- If communities migrate out of the Project Zone (i.e., due to forced relocation or lack of Project success) and into primary forests adjacent to the Project Zone;
- If the Project Proponents are unable to eliminate deforestation and the community continues to expand into the forest, including forests outside the Project Zone; and
- Wealth in Project Zone creates conflict in surrounding areas due to jealousy, a rise in illicit activities, alcoholism, elite capture, etc.

Mitigation Plans

It is important to note that the communities in and near the Russas Project have good relationships and no conflicts with main stakeholders living outside the Project Zone have been identified through stakeholder consultations between March 2011 and December 2016.

Regarding the increased cost of land, the Russas Project did not have a noticeable impact on rising costs of land especially if compared to the paving of BR-364 and Ramal 3. In contrast, the Russas Project might decrease the value of surrounding land. The Russas Project is a conservation project and might prevent surrounding properties from having access to markets because the Project will not allow road construction through the property. Nevertheless, Ilderlei Souza Rodrigues Cordeiro discussed the Russas Project with adjacent landowners to offer expanding forest conservation projects beyond the boundaries of the Russas Project. Maintaining forest cover, at the expense of road construction or the establishment of large-scale cattle-ranches, has positive climate, community and biodiversity benefits.

In-migration to areas adjacent to the Project Zone could occur, but was not identified as a result of the Russas Project between March 2011 and December 2016. Acre's State System of Incentive for Environmental Services (SISA) seeks to improve rural livelihoods which should continue to reduce in-migration into the both the Project Zone and areas adjacent to the Project Zone. Furthermore, the Project Proponents monitored deforestation throughout the Project Zone and will seek to minimize deforestation within the Project Zone. Similarly, there is a possibility of out-migration from the Russas Project and into

the surrounding non-Russas Project property forests. To mitigate out-migration, the Project Proponents held numerous community meetings and seek to implement a variety of social projects and programs.

With respect to increased conflict, illicit activities, alcoholism, and elite capture, the Project Proponents will continue to monitor community benefits throughout the Project Zone. Children from surrounding communities will be allowed to attend school at the Russas Project, while surrounding communities will be allowed to visit the dental and health clinic at the Russas Project.

Net Effect of Project on Stakeholders

The Russas Project had a net positive impact from March 17, 2011 to December 31, 2016 on the well-being of stakeholders including the Project Proponents, local communities, offsite stakeholders, and the Acre State Government. This was independently verified. Furthermore, ongoing consultations will take place to assure the Project does not result in a net negative impact.

Such positive offsite stakeholder impacts include:

- Health clinic, dental clinic and school at the Russas Project will be accessible to offsite communities. Agricultural extension trainings were also be offered.
- Increased learning curve for future REDD+ projects amongst private landowners in Acre.
- Sharing of knowledge, best practices, and lessons learned with stakeholders including the State of Acre, graduate students, and industry participants.

7.3 Exceptional Community Benefits (GL2)

The Project Proponents will continue to assist all communities in and around the Russas Project, including the more vulnerable communities within the Project.

Project Zone and Socio-Economic Status

According to the United Nations Development Programme's International Human Development Index (HDI), Brazil is considered a high human development country.[84] However, it can be demonstrated that at least 50% of the population in the Project Zone are below the national poverty line. According to a World Bank study[85], the national poverty line per capita per month in Brazil is 180.14 (2005 PPP$) while the nominal median monthly income per capita of a rural, permanent private household in the municipality of Cruzeiro do Sul is R$130.75.[86]

[84] UNDP, "International Human Development Index," Available: http://hdrstats.undp.org/images/explanations/BRA.pdf
[85] Martin Ravallion et al., "Dollar a Day Revisited," Available: http://www-wds.worldbank.org/servlet/WDSContentServer/WDSP/IB/2008/09/02/000158349_20080902095754/Rendered/PDF/wps4620.pdf
[86] IBGE, "Cruzeiro do Sul," Available: http://www.ibge.gov.br/cidadesat/link.php?codigo=120020&idtema=16

Involvement of Poorest Community Members

Project Proponents did not practice selective enrollment – all community members, regardless of background, longevity on Project, size of holding, etc. were allowed to participate.

All social projects and programs (e.g., health and dental clinic, agricultural extension trainings, etc.) will continue to be offered to all communities. For example, in July 2013 the initial five agricultural courses (i.e., production of soursop, passion fruit, banana, maize, and cassava) were taught to the families living in the Russas Project and the Valparaiso Project. A total of 27 people participated from the Russas Project, 34 people participated from the Valparaiso Project, and 40 people from the leakage belts participated. Furthermore, the Project Proponents are aware of the potential for elite capture and will seek to prevent this risk.

The initial Basic Necessity Survey (BNS) allowed the Project Proponents to identify the 50% of households within the lowest category of well-being. As of June 2013, the lowest quartile included communities with:

- Owned assets less than: R$28,037.00
- Owned assets per capita less than: R$5,262.71
- Poverty score less than: 10.500
- Poverty index less than: 40.00%

The follow-up BNS, which was conducted in May 2017, revealed similar characteristics of the lower quartile. Benefit distribution will continue to be very equal. Land titling will take into account per capita, so larger families will get larger parcels of land.

Furthermore, the Project Proponents identified the particular needs of the four households within the lowest quartile of the sixteen communities surveyed via the Basic Necessity Survey. Thus, the assets and services deemed by 100% of these four households in the lowest quartile as Basic Necessities, but are the least owned among this lowest quartile, are as follows:

- Telephone (0% owned by lowest quartile)
- Planting Tool (0% owned)
- Boat or Canoe and Diesel (0% owned)
- Generator (0% owned)
- TV with Antenna (0% owned)

- Pasture Fence (0% owned)
- Weedwacker (0% owned)

The Project Proponents designed the Project in order for at least 50% of these households to benefit substantially from the Project. This includes addressing some of their particular needs (such as increasing access to transportation and focusing on agricultural extension courses) and by also seeking to increase their incomes in order for them to eventually purchase assets (such as a telephone or television) to satisfy their other needs. In addition, the Project Proponents purchased planting tools in July 2017 and several generators have been distributed throughout the communities.

The Project Proponents identified scenarios which might prevent the poorest quartile of communities to benefit substantially from the Project and this includes:

- Poorer families might live further away from the project headquarters.
- Less tools to produce agriculture.
- Might not have boat, motor or diesel to travel
- Communities might have poorer soil quality where they live.
- Poorer health and less nutrition.

<u>Poorer Families might live further away from the Project Headquarters</u>

The Project Proponents recognize that accessibility is important. Some activities – such as agricultural extension courses and building toilets – will occur throughout the communities. The location of the toilets, for instance, was prioritized based off being installed first at the poorer communities. Some activities – such as granting official land titles – will be done on a house-by-house basis. Some activities – such as renovating the headquarters and renovating the health clinic – will be done in one specific location. To ensure, for instance, the headquarters and health clinic are accessible to all, Ilderlei provides gas for their canoes, food while at staying at the headquarters and for their return canoe ride, and lodging at the headquarters (e.g., there are spare mattresses and hammocks) to anyone who needs such assistance, especially for poorer communities. Similarly, I.S.R.C will pay for the diesel, assuming these families have working boats and motors, to allow further communities to participate in the Project and attend meetings and agricultural courses.

For example, fuel was provided to communities living in the Russas and Valparaiso Projects, along with communities in the leakage belt, in July 2013 in order for families to participate in the agricultural courses and fuel was also provided in August 2013 and August 2014 in order for families to participate in a community-wide meeting with the auditors. Fuel was also provided throughout 2015 and 2016, so that poorer families could attend the visiting doctors.

Fewer Tools to Produce Agriculture

The Project gave free agricultural extension courses for the communities to learn new techniques in July 2013. The association will help with the mechanization of the land. The association will also prioritize the improvement of the poorer communities' manic flour houses. In addition, the Project Proponents purchased planting tools in July 2017 for the communities.

Might not have Boat, Motor or Diesel to Travel

The boat being purchased by the Russas Project will allow those communities without a boat to participate in the Project and specifically to participate in the commercialization and market access of their crops. This boat has not yet been purchased, but will be acquired in conjunction with the establishment of an association to assist with acai processing and the manioc flour houses.

Might Have Poorer Soil Quality Where They Live

Teaching fishing courses will allow those communities with poorer soil quality an alternative means to generate income. The agricultural courses will teach new techniques to take into account poorer soil. For example, the soil might be bad for bananas but might be good for manioc and this is something the agricultural courses will help to teach. For example, the agricultural courses taught in July 2013 focused on improvements in agricultural production through soil preparation techniques and through the use of cover crops for soil enhancement and to replace the use of fire.

Poorer Health and Less Nutrition

The agricultural courses will seek to increase the productivity and hence, improve the nutrition of local communities. The health clinic was improved and the doctor visits to the community will increase. The doctor will visit all communities including poorer communities. The doctor visits are free, which will most benefit the poorer communities who would otherwise be less able to pay for such doctor visits. Furthermore, the installation of toilets began at the poorer communities.

The Basic Necessities Survey was utilized to identify any poorer and more vulnerable households and individuals whose well-being or poverty may be negatively affected by the project. All communities have been consulted and there were no negative impacts.

Community Impact Monitoring

The Basic Necessities Survey and Poverty Index have enabled the Project Proponents to establish a baseline and in the future, to identify positive and negative impacts on all the communities including the poorest communities and more vulnerable groups within the Project, including women.

The Basic Necessities Survey is a differentiated approach because the Survey allows for the identification of the poorest communities and will enable the Project to specifically target their needs (for example, lack

of transportation to participate in the Project). Furthermore, the Survey was administered with women throughout the Project and the Project will specifically target their unique needs (for example, access to education for their children) as well.

This being said, the Project Proponents will continue to monitor community impact variables such as: value of owned assets; value of owned assets per capita; poverty score and poverty index; inequality of owned assets and inequality of owned assets per capita.

8 BIODIVERSITY

8.1 Net Positive Biodiversity Impacts (B1)

The Russas Project generated net positive biodiversity impacts while maintaining high conservation values from March 2011 to December 2016. In order to contribute to net positive biodiversity impacts, the Project shall not use invasive species nor genetically modified organisms (GMOs).

Biodiversity Impacts

The Project Proponents used the Avoided Deforestation Partners VCS REDD Methodology, entitled, "VM0007: REDD Methodology Modules (REDD-MF), v1.3." and the VCS Monitoring Plan to estimate the changes in forest cover.

In conjunction with the VCS VM0007 methodology to monitor changes in forest cover, the Project Proponents utilized the island biogeography methodology to estimate changes in biodiversity as a result of the project. The biodiversity concept of island biogeography was originally developed by Robert MacArthur and E.O. Wilson and was extrapolated to theorize that habitat area is related to species diversity and species abundance.

Island biogeography in the Brazilian Amazon was demonstrated by the "Biological Dynamics of Forest Fragments Project (BDFFP, also known as the Minimum Critical Size of Ecosystems Project) {… which concluded that} censuses of beetles, birds, and primates in 1-, 10-, and 100- hectare reserves indicate that the number of species, and in some cases population sizes, in these groups varies with the size of the reserve."[87]

The 'without project' scenario involved the continued, unplanned frontier deforestation which would result in less forest cover, less habitat availability, and most likely a reduction in both species diversity and species abundance. In contrast the 'with project' scenario, which is a tropical forest conservation project, had positive biodiversity impacts such as:

- Maintaining forest cover and reforesting degraded areas, thus expanding forest cover;
- Maintaining water cycling, filtration and storage;

[87] Richard O. Bierregaard Jr. et. al., "The Biological Dynamics of Tropical Rainforest Fragments," pages 859-866.

- Maintaining nutrient recycling and soil quality enhancement;
- Providing foodstuffs for both local communities and wildlife; and
- Providing habitat for an extraordinary diversity of flora and fauna.

In contrast, the 'with project' scenario resulted in avoided deforestation from March 2011 to December 2016. With no negative biodiversity impacts estimated as a result of the Russas Project between March 2011 and December 2016, these aforementioned positive biodiversity impacts resulted in a net positive impact on biodiversity in the 'with project' scenario throughout the Project Zone.

Impact on High Conservation Values

No high conservation values – whether with respect to communities or biodiversity – were negatively affected by the Russas Project from March 2011 to December 2016. Regarding the biodiversity high conservation values (HCVs), the Russas Project has several qualifying attributes and this includes possibly threatened species, threatened or rare ecosystems, and critical ecosystem services.

To demonstrate that such HCVs were not negatively affected by the Project, one can observe via satellite imagery or firsthand observations that the Russas Project's tropical rainforest (i.e. a threatened or rare ecosystem), and its associated ecosystem services, were maintained as intact forest cover. In addition, the Russas Project developed a full biodiversity monitoring plan which shall monitor medium-to-large mammals including any threatened species. This monitoring plan was made publicly available in July 2013.

In addition, the Project's Participatory Rural Assessment and Basic Necessities Survey were designed to measure the communities' high conservation values and the Project Proponents will continue to monitor these HCVs to ensure they are not negatively affected by the Russas Project.

Identify All Species to be used by the Project

There were no known invasive species used in the Project between March 2011 and December 2016, because the Russas Project is mainly a payment for ecosystem services forest conservation project. A few communities plant locally sourced seeds of hardwood species for eventual use as timber. These specific species include:

- Angelim (Hymenolobium sp)
- Cedro-rosa, Cedrella odorata and Cerejeira (Amburana acreana)
- Garapeira (Apuleia molaris /Apuleia leiocarpa)
- Itauba (Mezilaurus itaúba)

- Jacareúba (Calophyllum brasiliense)
- Mulateiro (Calicophyllun spruceanun)

It is also important to note that the carbon sequestration associated with these reforestation activities were not included in the GHG quantifications.

Furthermore, the potential spread of invasive species did not increase as a result of the Russas Project and the Project Proponents will continue to monitor for signs of invasive species.

Possible Adverse Effects of Non-Native Species

N/A – There will only be locally-appropriate, native species used in the Russas Project.

Non-Use of GMOs

The Project Proponents guarantee that no genetically-modified organisms (GMOs) will be used in the Russas Project to generate GHG emissions reductions or removals and no GMOs were used between March 2011 and December 2016.

8.2 Negative Offsite Biodiversity Impacts (B2)

Due to the fact that the Russas Project is a payment for ecosystem services forest conservation project, there is unlikely to be any negative offsite biodiversity impacts that the Project is likely to cause. The major negative offsite biodiversity impacts would be a result of leakage. For example, this activity shifting leakage could include deforestation agents such as the communities and/or deforestation drivers such as cattle-ranching and road construction shifting from within the Project Zone to outside the Project Zone.[88] This activity shifting leakage would result in an increase in deforestation, increase in GHG emissions, reduction of habitat availability and more forest fragmentation – all of which would have a negative impact on offsite biodiversity. The Project Proponents are committed to monitoring deforestation within the Project Zone and there are activities planned to reduce leakage effects.

Mitigation Plans

Although negative offsite biodiversity impacts are unlikely, the Russas Project has leakage mitigation plans to minimize the likelihood of communities moving from within the Project Zone to outside the Project Zone which would result in negative offsite biodiversity impacts. In addition, the Project Proponents shall practice adaptive management and will collectively address any additional negative offsite biodiversity impacts that are later identified.

> As previously mentioned, there were a variety of activity-shifting leakage mitigation activities designed between March 2011 and December 2016. This includes:

[88] Pitman, N. 2011. Social and Biodiversity Impact Assessment Manual for REDD+ Projects: Part 3 – Biodiversity Impact Assessment Toolbox. Forest Trends, Climate, Community & Biodiversity Alliance, Rainforest Alliance and Fauna & Flora International. Washington, DC., Page 9

- Discussing the Project with adjacent landowners to potentially expand the forest conservation efforts (which already resulted in the inclusion of the Valparaiso Project);

- Alignment with the State of Acre's Payment for Ecosystem Services Scheme; and

- Monitoring the leakage belt and offering social projects and programs to communities throughout the Project Zone.

The State of Acre's Payment for Ecosystem Services Scheme (known as Sistema de Incentivo a Serviços Ambientais or "SISA" in Portuguese) is relevant to the mitigation of leakage; particularly the leakage attributed to communities moving from outside the Project Zone to within the Project Zone. This is because the SISA is focusing on improving rural livelihoods through a Certification Program of Rural Production Units which shall "provide for the gradual abandonment of burning; priority access to labor-saving technologies; access to incentives and financing; and inclusion in sustainable production chains to encourage the production and protection of environmental services."[89] Thus by improving rural livelihoods, communities will have less incentive to migrate, which shall reduce deforestation in the leakage belt while maintaining forest cover and habitat availability.

From March 2011 to December 2016, to mitigate the leakage attributed to communities moving from within the Project Zone to outside the Project Zone, the Project Proponents consulted communities throughout the Project Zone and extended project activities (such as agricultural extension training courses) to communities throughout the Project Zone and not just to those living within the Russas Project property. Furthermore, the largest adjacent property – the Valparaiso Project – was developed as a forest conservation project as well which will increase habitat connectivity and minimize the likelihood of activity-shifting leakage.

Net Effect of Project on Biodiversity

The overall effect of the Russas Project on both offsite and onsite (i.e., within the Russas Project Zone and outside the Project Zone) biodiversity between March 2011 and December 2016 was overwhelmingly positive. The mitigation of deforestation and preservation of forest cover had a significantly positive effect on biodiversity. Thus, the overall effect of the Russas Project on biodiversity was overwhelmingly positive because much more forest cover was preserved as opposed to deforested as a result of the project activities.

8.3 Exceptional Biodiversity Benefits (GL3)

This section is not applicable to the Russas Project.

[89] Environmental Defense Fund, "Ready for REDD: Acre's State Programs for Sustainable Development and Deforestation Control," Page 8.

Appendix A: Catch Up Plan for Russas Project

As of December 31, 2016, the following activities – according to the previously validated Project Implementation Schedule – were not completed:

A. More regular stakeholder engagement and community consultations;

B. Hire project manager;

C. Continue patrols of deforestation;

D. Help communities obtain land tenure;

E. Create association to process açaí and manioc flour;

F. Improve health clinic and dental clinic;

In 2017, many of these activities were conducted. For instance, Willyan Dene Sarah was officially hired by Ilderlei Cordeiro as the official, local project manager and Manoel Lopes hired Genildo da Silva Macedo for assistance. Willyan continued to patrol for deforestation and Willyan also provided assistance to Saymo Justiniano da Silva, a local technician who was hired in 2017 to undertake the necessary measurements for the Cadastro Ambiental Rural (CAR) and to engage the communities about the land titling process. In addition, both Projects worked in 2017 towards receiving the Certificado de Cadastro de Imóvel Rural (CCIR). Furthermore, the local health clinic has now been completed near the headquarters of the Russas and Valparaiso Project.

Despite, these activities in 2017, the following catch up plan is hereby agreed to by the Project Proponents:

December 1, 2017: Carbon Securities, CarbonCo and both Ilderlei Cordeiro and Manoel Lopes hold conference call to develop a plan for the remainder of the year until December 2018. This includes focusing on all the activities that were planned to be undertaken in the past such as:

- Update on the CCIR and CAR progress for both Projects;
- Start taking notes during monthly meetings held with Nagila, Fatima, Willyan, and Ilderlei. Also Manoel and Genildo will be invited to these future monthly meetings;
- Receive official monitoring templates completed by Willyan and discuss the need for such deforestation patrols to take place beyond the banks of the Valparaiso River;
- Discuss progress on resolving border overlap at Valparaiso Project;
- Map out the additional agricultural extension trainings to be provided;
- Map out more frequent trips in 2018 by the Project Proponents;
- Profit sharing with communities (to be completed by end of 2017);
- Improve communications with local communities (i.e., particularly to receive their comments and concerns, and specifically to address their concerns about land tenure). This includes revisiting the Projects' grievance procedures; and
- Create association to process açaí and manioc flour.

December 8, 2017: Hold Conference Call with Saymo Justiniano da Silva to discuss how the CAR process went with the communities, discuss the current situation, and discuss next steps. More specifically, the Project Proponents will ask:

- Were all community CARs completed?
- Were the CARs completed for both the Russas and Valparaiso Projects?
- How many communities, in total, were visited? How were these communities distributed between the Russas and Valparaiso Projects?
- How many communities still have concerns about land demarcation and titling process? What were these specific concerns and which specific communities, or families, expressed the concerns? What is the best way to resolve these community concerns?
- Who would Saymo recommend as a third party entity (e.g., SOS Amazonia, STR-Cruzeiro do Sul, INTERACRE, INCRA, IMAC, Saymo, etc.) to engage the communities about their land demarcation and titling concerns?
- How is the best way to resolve the overlapping title claim for Valparaiso Project?

December 15, 2017: Project Proponents hold conference call with the Purus Project, which is another VCS-CCB REDD+ Project in Acre, Brazil that has already granted official land titles to a few local communities. More specifically, the Project Proponents would like to know:

- Who would the Purus Project recommend as a third party entity (e.g., SOS Amazonia, STR-Cruzeiro do Sul, the State of Acre's Climate Change Institute, etc.) to engage the communities about their land demarcation and titling concerns?
- How was the Purus Project able to receive waivers on behalf of the communities so the communities did not have to follow all parameters (e.g., being located too close to the river banks) of the Revised Forest Code?
- What are the Purus Project landowners' lessons learned from the titling process?

Prior to December 31, 2017: Ilderlei Cordeiro and Manoel Lopes to provide necessary equipment for communities to create association to process acaii and manioc flour. Ilderlei and Manoel shall also provide a revenue share of the carbon finance with the local communities.

January 2, 2018: Initiation of biweekly calls with Project Proponents. These calls were initially held every two weeks during the validation stage, but were reduced to approximately once per month post-verification. The Project Proponents will restart more regular conference calls as of January 2018.

January 2018: The Project Proponents shall determine the most appropriate entity (e.g., SOS Amazonia, STR-Cruzeiro do Sul, the State of Acre's Climate Change Institute, the Secretary of Environmental Affairs for the Municipality of Cruzeiro do Sul) and hire the entity to visit the Project sites on a regular basis in order to explain the Project. The Project Proponents will also determine, in conjunction with the selected third party, the appropriate frequency in engaging with and gathering community comments. Project Proponents to continue holding biweekly calls. Furthermore, CarbonCo will map out specific dates for all 2018 trips to Brazil, develop a budget for 2018, and begin working on Requests for Proposals (RFPs) for the various service providers (e.g., technical firms, auditors, etc.).

February 2018: Project Proponents to hold biweekly calls. Project Proponents to confirm availability in May 2018 for in-person meeting in Cruzeiro do Sul and to visit the Projects. CarbonCo will review proposals for service providers (e.g., technical firms, auditors, etc.) and upon deciding on service providers, CarbonCo shall initiate the contracting process. The selected third party from January 2018, shall visit the communities at the Russas and Valparaiso Projects. More specifically, this meeting shall:

- Include a reintroduction of the Project, its stated goals, objectives, project activities, benefits and risks, and grievance procedure. The grievance procedure will be modified, in conjunction with the communities' input, to better facilitate communication.
- Detailed discussion of the land titling process and land tenure law. This includes discussion of the Revised Forest Code, how the code applies to rural properties, rural taxes (if any), and what types of waivers (e.g., rural taxes, communities' close proximity to the river banks, etc.) may be granted.

March 2018: Project Proponents to hold biweekly calls. CarbonCo shall receive the 2017 deforestation data layer and begin working on the Monitoring and Implementation Reports for both the Russas and Valparaiso Projects.

April 2018: Project Proponents to hold biweekly calls. The Project Proponents shall confirm all meeting logistics for May, including the attendance list, meeting location, training agenda, etc.

May 2018: The Project Proponents will all meet in person, in Cruzeiro do Sul, to assess progress. The Project Proponents will also meet with SOS Amazonia and the Secretary of Environmental Affairs for the Municipality of Cruzeiro do Sul in Cruzeiro do Sul, along with at the Project Headquarters to discuss environmental education, tropical deforestation, climate change, and how forest conservation projects can benefit local communities. The Project Proponents will also invite Saymo Justiniano da Silva to visit the Projects during this time to reassess whether the communities are still aware of the titling process and about land tenure laws. Project Proponents to also confirm availability for next in-person meeting in July.

June 2018: Project Proponents to hold biweekly calls. The Project Proponents shall aim to complete the Monitoring and Implementation Reports, and the Summary Documents (in Both English and Portuguese), by the end of June 2018.

July 2018: The Project Proponents will all meet in person, again, in Cruzeiro do Sul, to assess progress. The Project Proponents will discuss the upcoming auditor visit, the Public Comment Period and specifically which third party entity can visit the communities for the Public Comment Period. The Project Proponents will also assess the previous effective of the past Public Comment Periods and discuss if alternative methods are more appropriate.

September, October or November 2018: September, October, or November – depending on the rainy season – are the proposed next dates for verification of the monitoring, reporting and verification period of January 1, 2017 to December 31, 2017, with assessment of 2018 activities. Project Proponents will continue holding biweekly calls. For the 30-day Public Comment Period, the Project Proponents will hire an independent, third party entity (e.g., SOS Amazonia, STR-Cruzeiro do Sul, etc.) to visit the communities and inform about the Public Comment Period.

December 2018: Project Proponents to hold biweekly calls. The last of these biweekly calls during the month of December will include a lessons learned section to discuss how progress was made throughout 2018, when compared to 2017, and when compared to 2014-2016.