Bull Run Overseas Ltd. Forest Carbon Project Phase I: Project Design Document

January 24, 2012

Executive Summary

The Bull Run Overseas property ("Project") encompasses 4,650 ha of tropical pine forests, grasslands, and mature humid broadleaf forest in the Cayo District of Belize, Central America. The 30-year project plan, from 2009 to 2038, produces climate benefits by avoiding emissions from deforestation. Biodiversity benefits are produced by virtue of habitat protection. Community benefits are produced by providing educational opportunities to the children of BRO staff and providing several types of support to the general community in the area.

Of the total 4,650 ha property, 666.3 ha (the project area) are slated for conversion to agricultural uses in the absence of carbon financing. The baseline scenario for the tropical hardwood component is conversion to coffee.

Climate, Community, and Biodiversity Standard Gold Level is achieved by virtue of the significant biodiversity resources conserved on the property including habitat for 15 IUCN listed species and most notably IUCN-Endangered Baird's tapir (*Tapirus bairdii*).

Forest Carbon Offsets LLC (FCO) is the Project developer. The Conservation Management Institute (CMI) at Virginia Tech is the Project technical lead. Independent third party validation has been performed by Environmental Services Incorporated . The Project follows the carbon accounting principles of conservatism, accuracy, completeness, transparency, consistency, and relevance. Validation under a carbon accounting standard such as the Verified Carbon Standard is planned. After this further step is successfully achieved, registration of voluntary emission reduction credits will be conducted with Markit Environmental Registry.

Cover photo: Bull Run Overseas (2010)

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Facts

Title of the Proposed Project	Bull Run Overseas Ltd. Forest Carbon Project (BRO)
Country	Belize
Nearest City	San Ignacio
Precise Coordinates	Latitude $17^0$04'00.00" N and Longitude $88^0$47'00.00" W
Technical Lead	Virginia Polytechnic Institute and State University, Conservation Management Institute (CMI) (http://www.cmiweb.org/)
Auditor	Environmental Services Incorporated (http://www.esicarbon.com/)
Project Owner	Bull Run Overseas Limited (BRO) George and Melina Headley (headley@pobox.com)
Project Developer	Forest Carbon Offsets LLC (FCO) (http://www.forestcarbonoffsets.net/)
Project Contact Person	Keister Evans (info@forestcarbonoffsets.net)
Title	CEO
Address	600 Cameron St., Alexandria, Virginia 22314, USA
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Acronyms

BAPPA	Belize Association of Private Protected Areas
BZE-LC	Belize National List of Critical Species, least concern
BZE-NT	Belize National List of Critical Species, near threatened
BZE-VU	Belize National List of Critical Species, vulnerable
BRO	Bull Run Overseas
CCBA	Climate, Community, Biodiversity Standards Alliance
CMI	Conservation Management Institute, Virginia Tech
DBH	Diameter at breast height
FCO	Forest Carbon Offsets, LLC
IUCN	International Union for the Conservation of Nature, one or more levels of concern
IUCN-DD	International Union for the Conservation of Nature, data deficient
IUCN-EN	International Union for the Conservation of Nature, endangered
IUCN-LC	International Union for the Conservation of Nature, least concern
IUCN-NT	International Union for the Conservation of Nature, near threatened
IUCN-VU	International Union for the Conservation of Nature, vulnerable
mtCO2e	metric ton CO_2 equivalent
PDD	project design document
UNFCCC	United Nations Framework Convention on Climate Change
VCS	Verified Carbon Standard

General Section

Gen	Clim	Comm	Bio
G1.	**Required**		

G1 Original Conditions in the Project Area

G1.1 Project Area Location and Physical Parameters

The Bull Run Overseas Ltd. Forest Carbon property boundary encompasses 4,650 ha of which 666.3 ha (the "Project") are available for conversion to agricultural uses in the absence of finance from carbon finance. The Project area is located at Latitude 17°04'00.00" N and Longitude 88°47'00.00" W in the Cayo District, Belize 23.5 km east-southeast of San Ignacio, Belize (Figure 1).

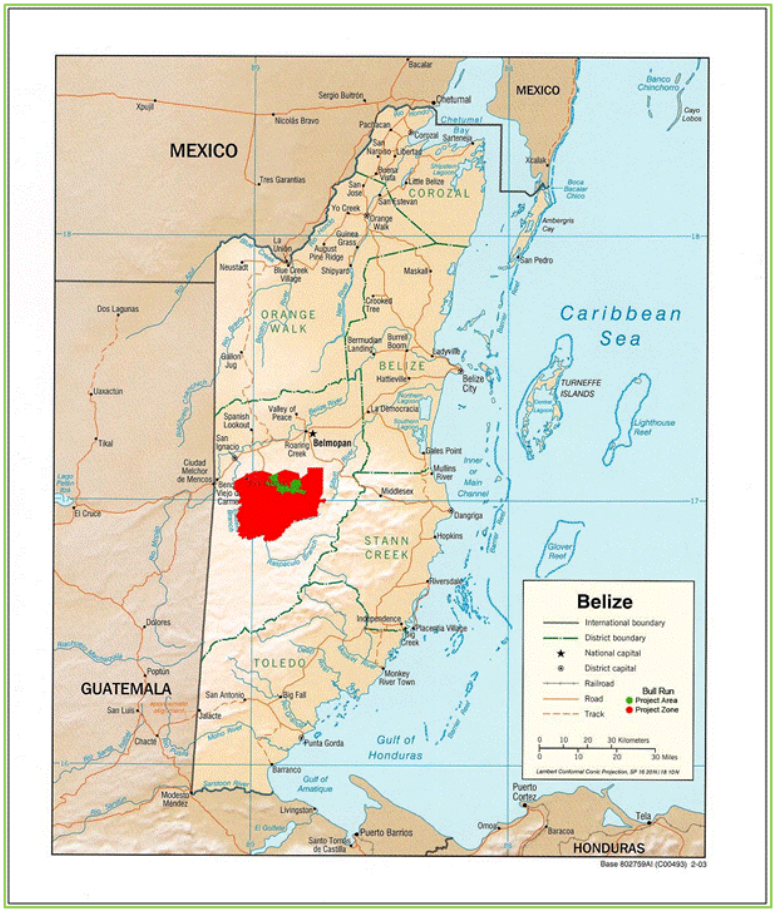


Figure 1: Location of Bull Run Overseas (Green) and Project zone (Red) in the Cayo District of Belize

The Project area lies within the Mountain Pine Ridge ecotype. Much of the following information was gleaned from Ennion (1995) unless otherwise cited. The Mountain Pine Ridge is

comprised of a granite plateau and adjacent metasedimentary terrain ranging from 400 m to 800 m elevation above mean sea level (Kellman & Meave 1997). Limestone capped hills remain in some areas, but the majority of the limestone mantel has eroded.

Temperatures throughout Belize vary across different districts with mean annual temperatures ranging from 27°C along the coast to 21°C in the hills (Belize National Meteorological Service 2010). The Mountain Pine Ridge has an average maximum of 25°C and an average minimum of 17.7°C (Belize National Meteorological Service 2010). January is on average the coldest month, while May is the warmest with minimum of temperatures of 5.5°C and 15°C respectively.

Soils are generally coarse textured and infertile ultisols (red clay soils) derived from granitic and metasedimentary material (Kellman & Miyanishi 1982). The soils tend to be acidic, contain few nutrients for plants, and usually have bedrock within a meter of the surface (Baillie et al 1993). The soils in the Project area are primarily in two suites: the Stopper suite and the Ossary suite. The Stopper suite is derived from granite and tends to be acidic and highly leached, contains few nutrients and susceptible to erosion (Baillie et al 1993). In the Project area, pinol is the main subsuite of the Stopper suite. The pinol subsuite is dominated by *Pinus caribaea*, is low in soil nutrients, and is commonly found on lower terrain. The Ossary suite, in contrast, is derived from metasedimentary parent material, and is the most common soil type in the Maya Mountains. Like the Stopper suite, the Ossary suite is acidic and low in available nutrients (Baillie et al 1993). This suite has three subsuites in the Project area: the cooma, chiquibul, and baldy. The cooma subsuite usually supports *Pinus oocarpa*, and when disturbed can be invaded by less desirable species including tiger bush (*Dicranopteris pectinata*) and dumb cane (*Tripsacum latifolium*). The chiquibul subsuite is often intermixed with cooma soils, but is comparatively shallower and less well developed than the cooma subsuite. The chiquibul subsuite is often downhill from cooma and has similar vegetation types. The baldy subsuite is much rockier than the cooma and chinquibul subsuites, very leached and acidic. These soils are usually dominated by grasses and small occasional *Pinus caribaea*. Of these four subsuites, the pinol and the cooma subsuites are the most common in the Project area.

G1.2 Types and Condition of Vegetation within the Project Area

Project Area Basic Ecotypes

There are several classification systems that can be used to map the vegetative communities within the Project area. The most useful is the basic ecotype classification described in the Biodiversity and Environmental Resource Data System of Belize (Meerman & Clabaugh 2010), which identifies five distinct basic ecotypes within the Project area (Figure).

Submontane Broadleaved Moist Forest

The submontane broadleaved moist forest type occupies lower elevations with richer soils than pine dominated classes and soils are well drained reddish brown or gray sandy clays with stones, overlying quartzite. Average annual rainfall is less than 2500 mm. This class occupies elevations of 500 m to 1000 m and commonly contains the tree species *Castilla elastica, Chrysophyllum*

cainito, Dendropanax arboreus, Dialium guianense, Euterpe precatoria, Ficus sp., Guarea spp., Licania platypus, Nectandra sp., Attalea cohune, Podocarpus guatemalensis, Protium schippii, Pterocarpus rohrii, Quararibea sp., Pourouma aspera, Rheedia sp., Schizolobium parahybum, Simarouba glauca, Stemmadenia donnell-smithii, Swietenia macrophylla, Terminalia amazonia, Virola brachycarpa, Vismia ferruginea, Vochysia hondurensis, Xylopia frutescens, and Zanthoxylum sp., with *Astrocaryum mexicanum* and *Melastomes* in the understory.

Lowland Broadleaved Moist Forest

The lowland broadleaved moist forest type is found at elevations lower than 500 m and contains tree species including: *Attalea cohune, Bactris sp., Calophyllum brasiliense, Castilla elastica, Clidemia sp., Combretum farinosum, Dendropanax arboreus, Desmoncus orthacanthos, Dialium guianense, Dicranopteris sp., Euterpe precatoria, Ficus sp., Geonoma sp., Guarea spp., Heliconia vaginalis, Hirtella racemosa, Inga sp., Licania platypus, Licania hypoleuca, Miconia spp., Mimosa pigra, Mimosa watsoni, Mouriri myrtilloides, Nectandra sp., Ochroma lagopus, Passiflora ambigua, Podocarpus guatemalensis, Pourouma aspera, Protium schippii, Psychotria poeppigiana, Pterocarpus rohrii, Quararibea sp., Rheedia sp., Schefflera morototoni, Schizolobium parahybum, Scleria bracteata, Simarouba glauca, Sloanea tuerckheimii, Souroubea sp., Spondias mornbin, Stemmadenia donnell-smithii, Swietenia macrophylla, Symphonia globulifera, Terminalia amazonia, Tococca sp., Trichospermum grewiifolium., Virola koschnyi, Vismia ferruginea, Vochysia hondurensis, Xylopia frutescens* and *Zanthoxylum sp*., with *Astrocaryum mexicanum* and *Melastomes* in the understory.

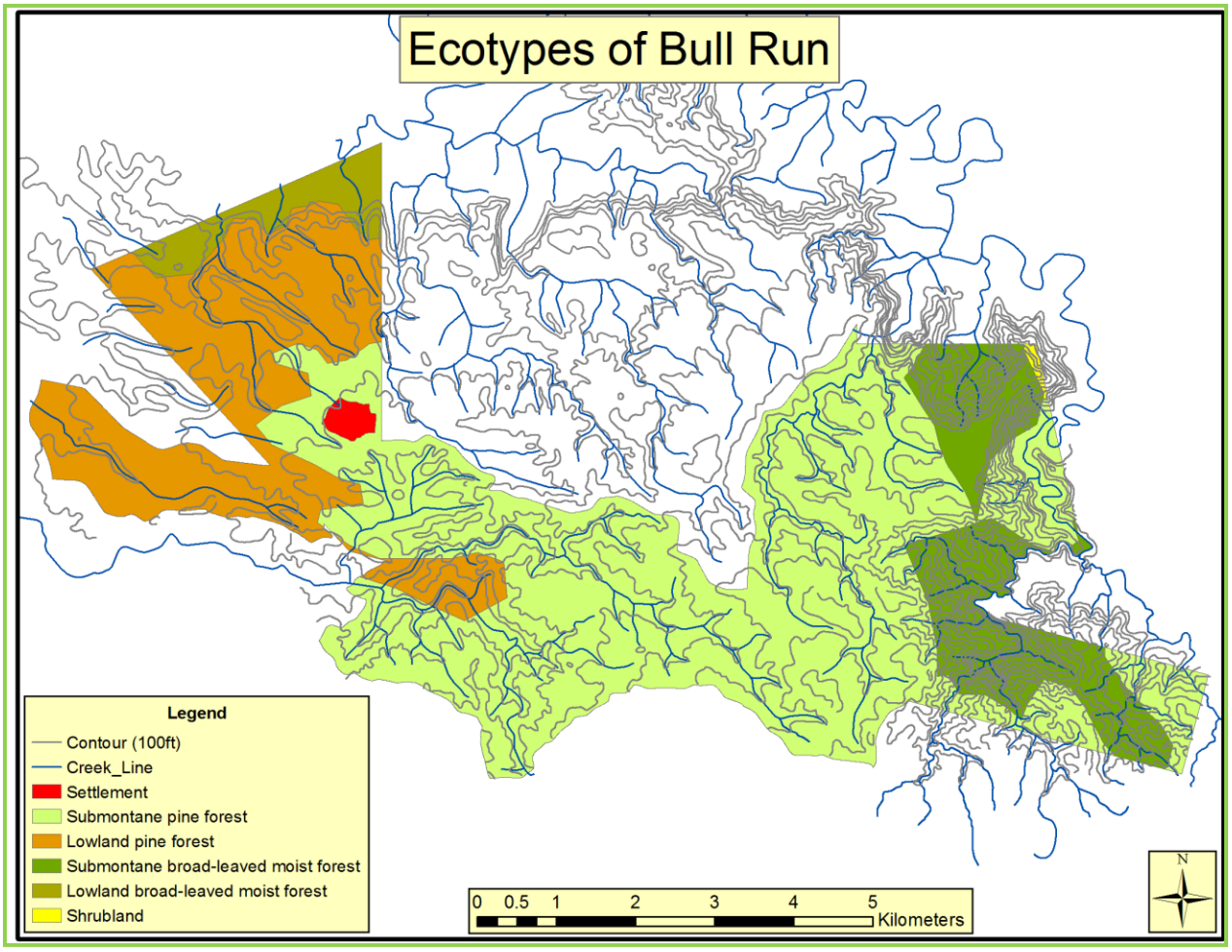


Figure 2: Regional ecotypes found in the Project area

Project Area: Management Compartments

The accuracy of current regional vegetation maps and classification systems were not sufficient to use as the basis for management decisions or carbon stock calculations. As a result, the Project area was partitioned into management compartments based upon vegetation, soils and the growth potential of the site for pine (Figure 3). The growth potential is primarily a function of the soils, with the pinol subsuite having the lowest growth potential and the cooma subsuite the highest growth potential.

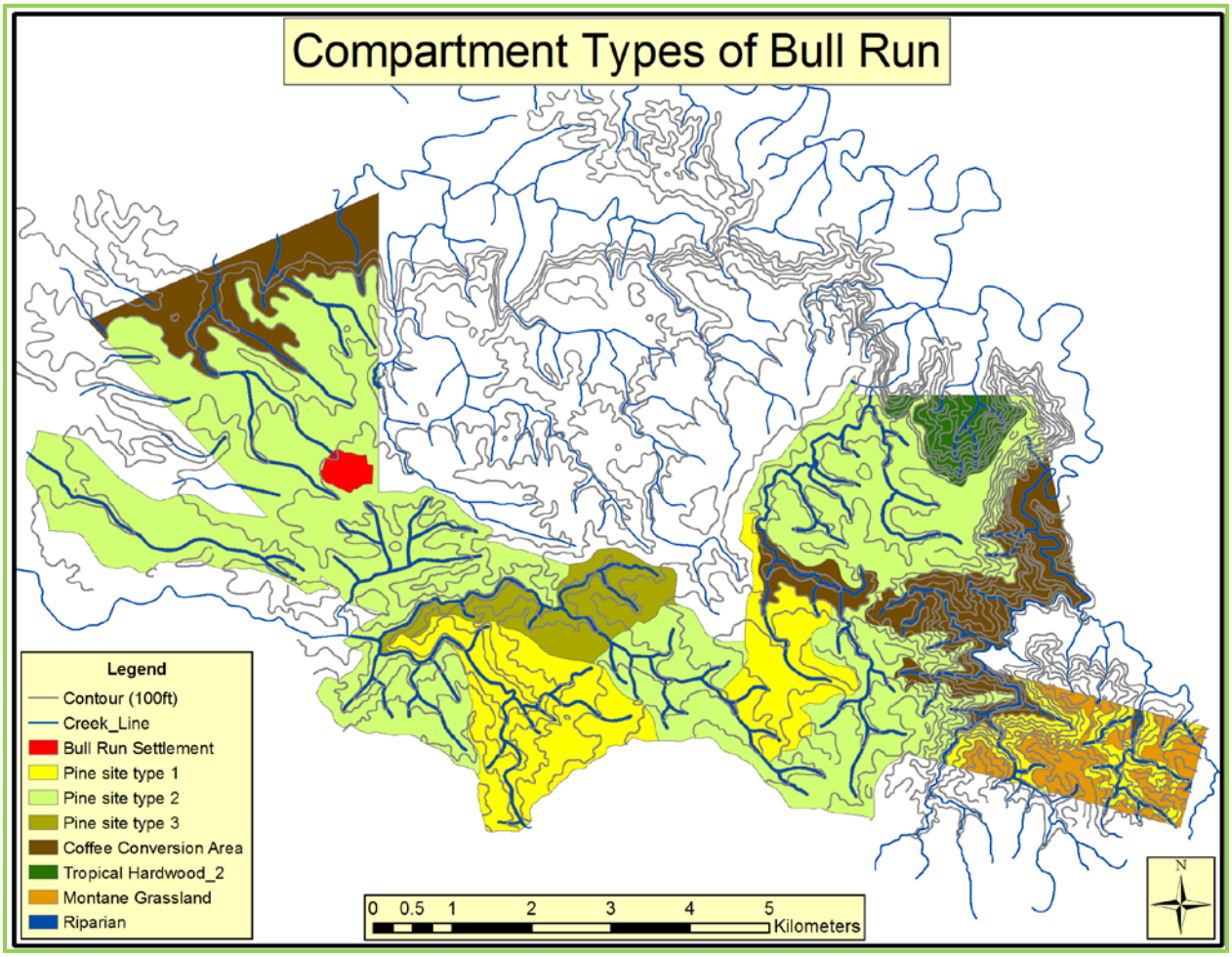


Figure 3: Project property project management compartments delineated based upon vegetation, soils and the growth potential of the site for pine. Project is limited to hardwood component of Coffee Conversion Area.

Table 1: Project management compartments, description and hectares of each compartment type

Compartment name	Description	Hectares
Bull Run settlement	Housing, storage buildings, garages, office, gardens and orchards.	25
Montane grassland	High elevation grassland maintained by fire. Ecotype: shrubland.	161
Pine site type 1	Poor quality sites for pine growth. Ecotype: submontane pine.	720
Pine site type 2	Moderate quality sites for pine growth. Ecotypes: submontane pine and lowland pine.	2,442
Pine site type 3	High quality sites for pine growth. Ecotype: submontane pine.	205
Tropical hardwood	Hardwood forests.	700

	Ecotypes: submontane broadleaved moist forest and lowland broadleaved moist forest.	
Riparian	One-chain buffer surrounding perennial streams.	397
Total		4,650

G1.3 Project Boundaries of the Project Area and the Project Zone

The 666.3 ha Project area is the area slated for conversion and consists of a large portion of the broadleaf area of the property and a smaller portion of pine areas of the property. The project zone landowners include Hidden Valley Inn; Belize Forestry Department, Ministry of Natural Resources including Thousand-Foot Falls National Park, Elijio Panti National Park, Mountain Pine Ridge Forest Reserve, Government of Belize Crown Lands; the Privassion Enclave; Pine Lumber Company (concession holder); Five Sisters Lodge; Pine Ridge Lodge; and Blancaneaux Lodge. The 66,645 ha Project zone encompasses the entire Mountain Pine Ridge ecosystem in Belize and surrounding areas to and is bordered to the south and west by the Macal River (Figure 4).

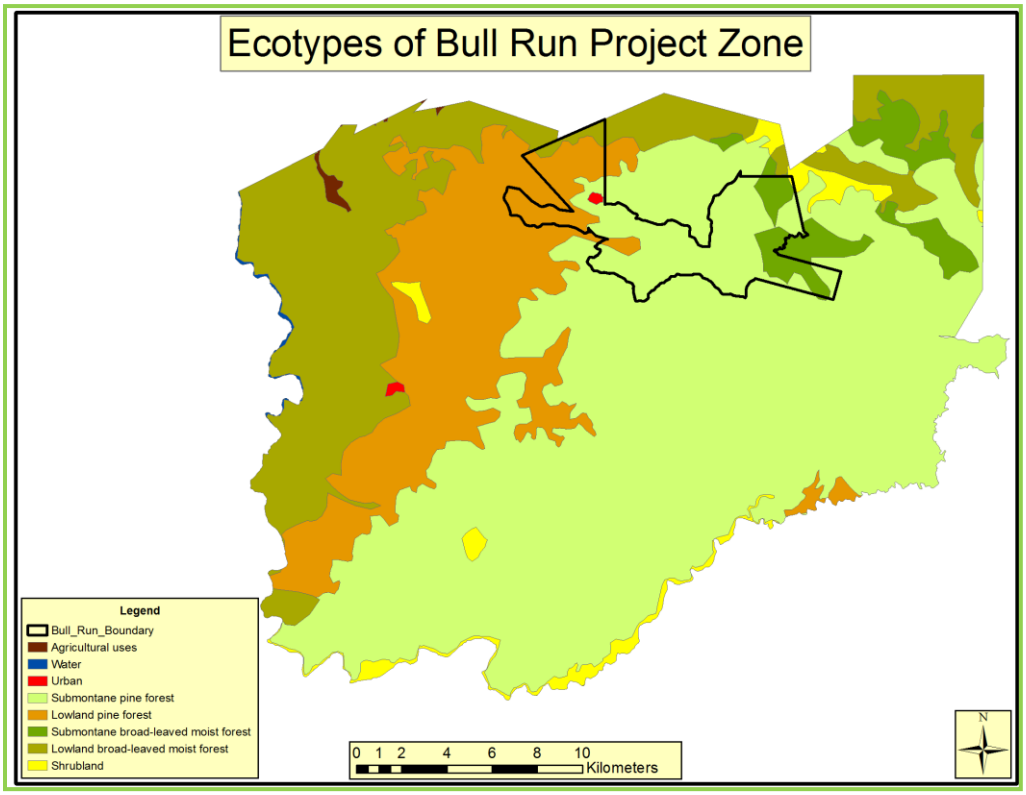


Figure 4: Location of the Project area and Project zone with the general ecotypes of the region

G1.4 Carbon Stocks within the Project Area

The approach to measuring carbon stocks in the Project area is based upon the *Sourcebook for Land Use, Land-Use Change and Forestry Projects* (Pearson et al 2005). These methods comply with the Intergovernmental Panel on Climate Change's 2006 Guidelines for National GHG Inventories for Agriculture, Forestry and Other Land Use.

Carbon Pools

The carbon pools selected for measurements were the above ground tree > 5 cm DBH and below-ground biomass. Aboveground non-tree biomass (lianas and palms), down or standing dead wood, and leaf litter were not measured, which resulted in a conservative estimation of carbon stocks.

Table 2: Selected Carbon Pools and Sources of Greenhouse Gas Emissions

Carbon pools		**Included / excluded**	**Justification / explanation of choice**
Above ground biomass		Included	A major component of project.
Below ground biomass		Included	A major component of project.
Dead-wood		Excluded	Excluded to be conservative and make the monitoring cost-effective.
Harvested wood products		Excluded	The standard practice in Belize for conversion of forest to agricultural lands is to remove valuable timber species and then bulldoze and burn the remaining trees. This pool was analyzed for significance and found to be de minimis.
Litter		Excluded	Excluded to be conservative and make the monitoring cost-effective.
Soil organic carbon		Excluded	Excluded to be conservative and make the monitoring cost-effective.
Sources	**Gas**	**Included / excluded**	**Justification / explanation**
Biomass burning	CO_2	Excluded	CO_2 emissions are accounted for by biomass changes in the above ground and below ground biomass pools.
	CH_4	Excluded	Analyzed and found to be de minimis.
	N_2O	Excluded	Analyzed and found to be de minimis.
Combustion of fossil fuels	CO_2	Excluded	Conservatively omitted from the baseline and project scenarios.
	CH_4	Excluded	Conservatively omitted from the baseline and project scenarios.
	N_2O	Excluded	Conservatively omitted from the baseline and project scenarios.
Use of fertilizers	CO_2	Excluded	Conservatively omitted from the baseline and project scenarios.
	CH_4	Excluded	Conservatively omitted from the baseline and project scenarios.
	N_2O	Included.	The baseline scenario of coffee agriculture would utilize chemical fertilizer.

Current carbon stocks in the above ground and below ground pools on project site were determined to be 90,986 tons C.

Field Measurements

Using a GIS of the compartments, 18 plots were randomly allocated (Figure 5a and 5b).

The methods for measuring the carbon pools at BRO were based on the *Sourcebook for Land Use, Land-Use Change and Forestry Projects* (Pearson et al 2005). Because destructive sampling was not practical to measure above ground carbon stocks, published allometric equations were used to determine aboveground biomass based upon the DBH of hardwood trees and pine trees. The following forest inventory techniques were used to collect the appropriate field data (Pearson et al 2005).

Every tree tallied was marked with a metal identification tag and given a unique identification number for future monitoring. Raw data were entered into a spreadsheet for data analysis and carbon calculations.

Carbon Stock Calculations

The moist hardwood equation in Pearson et. al. (2005) was used because mean annual rainfall is below 4000 mm at the Project area. Because no peer reviewed allometric equations relating DBH to above ground biomass were available for Caribbean pine and Honduran pine, allometric equations for temperate pine from the eastern United States were used as a surrogate (Brown and Schroeder 1999). For below-ground biomass, the regression equation from Pearson et al (2005) was used.

Table 3: Allometric equations used for calculating biomass.

Classification	Species group	Equation	Maximum DBH or height
Moist hardwood	Tropical hardwood	Biomass = $\exp(-2.289 + 2.649 \times \ln DBH - 0.021 \times \ln DBH^2)$	148 cm
Pine	Caribbean and Honduran pine	Biomass = $0.887 + ((10486 \times DBH^{2.84}) / (DBH^{2.84} + 376907))$	56.1 cm

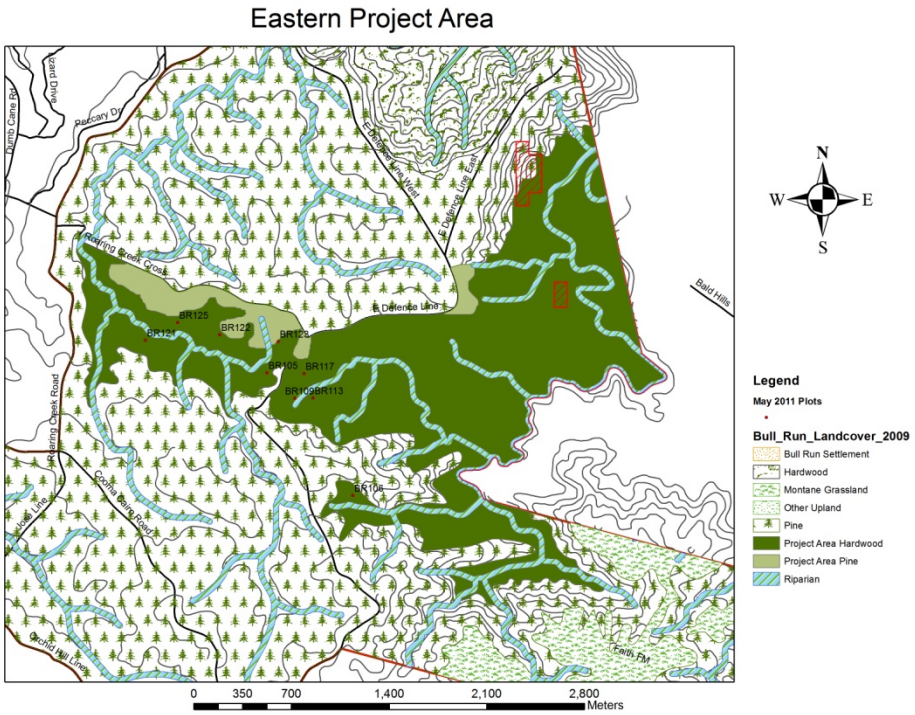


Figure 5a: Graphic presentation of the distribution of plots sampled in the Eastern portion of the Project area in 2011.

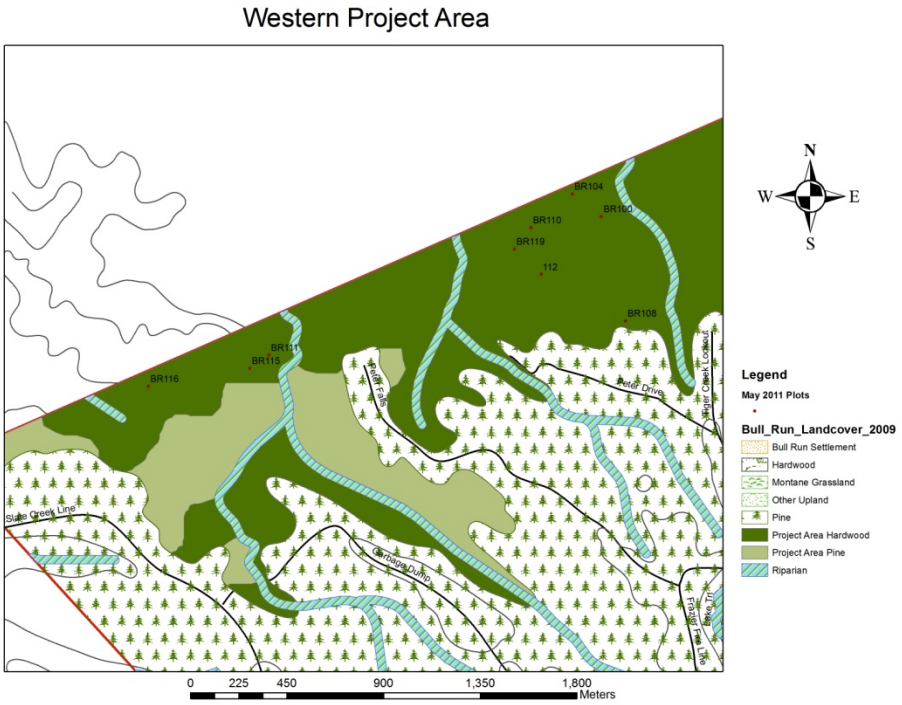


Figure 5b: Graphic presentation of the distribution of plots sampled in the Northwestern portion of the Project area in 2011.

Since the area slated for conversion to coffee is a combination of relatively pure hardwood stands and transitional stands that include some pines and other species associated with a pine savannah, the inventory was stratified. The pure hardwood stands comprise 483 ha of the conversion area while another 177 ha of pine transition zone is included. Due to the high variability of the transition zone, that area is conservatively excluded from the climate benefit claims of the project.

G1.5 Communities Located in the Project Zone

The Mountain Pine Ridge is sparsely populated and the majority of BRO staff are from San Antonio Village and villages nearby San Antonio Village none of which are in the Project zone. BRO staff commute once each fortnight by company provided transportation up to 2.5 hours each way to get to BRO from their homes. No official population statistics are available for the Mountain Pine Ridge or San Antonio Village specifically. For reference, Table 4 displays population estimates for the Cayo District, the largest district in Belize.

There are a few unincorporated settlements and communities of people associated with local lodges and government facilities in the Project Zone, as identified and included as stakeholders. The Project zone has part-time habitants in its Project zone at Hidden Valley Inn; Belize Forestry Department Ministry of Natural Resources including Thousand-Foot Falls National Park, Douglas Da Silva Forest Station and headquarters, private residences within the Privassion Enclave; Five Sisters Lodge; Pine Ridge Lodge; and Blancaneaux Lodge. Given the nature of their activities in the Mountain Pine Ridge and the nature of the Bull Run Project, the involvement and concern by these communities in the project are minimal.

Based on direct observations of workers in the project zone, the workers in the area are a typical mix of Belizeans of Mayan or Hispanic decent working for the basic wage guaranteed in Belize according to the Belize minimum wage laws. They don't live in the project zone, but are transported by their employer as needed. Jobs at the lodges are widely considered to be very desirable. A wide variety of age groups work in the area. Women are hired at the lodges but not to the same extent as men.

A stakeholder analysis was performed. This analysis follows the procedural steps found in the "Community Development Toolkit" methodology at http://www.icmm.com/page/629/community-development-toolkit-c.

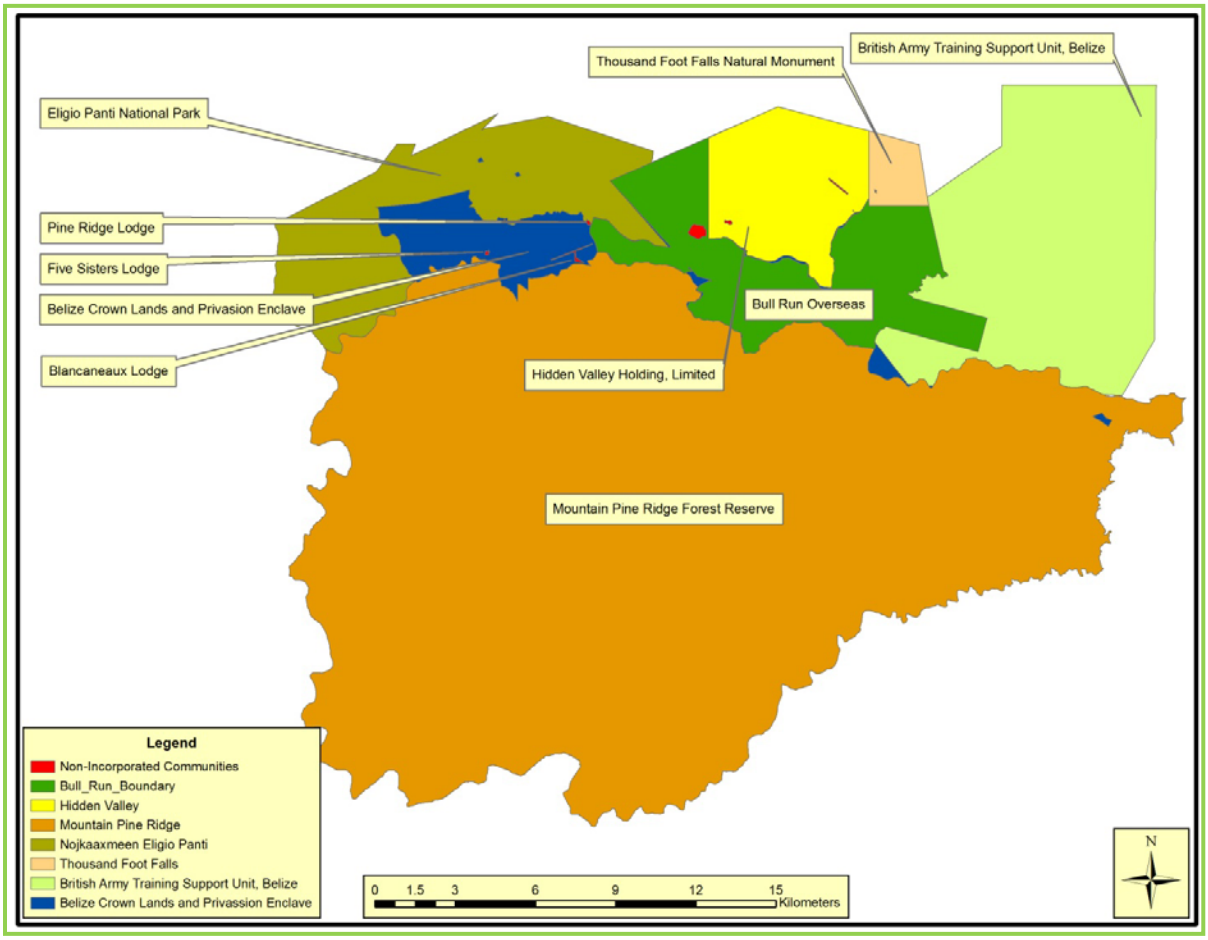


Figure 6: Unincorporated settlements within the Project zone

Table 4: Cayo District and Project zone 2009 midyear population estimates

	Male	Female	Total
Cayo District	40,200	40,600	80,800
Cayo Urban	24,000	25,100	49,200
San Ignacio and Santa Elena	9,700	10,200	19,900
Benque Viejo del Carmen	4,500	4,700	9,300
Belmopan	9,800	10,100	20,000
Cayo Rural	16,200	15,400	31,600
San Antonio	(no data available)	(no data available)	(no data available)
Mountain Pine Ridge	(no data available)	(no data available)	(no data available)

G1.6 Current Land Use and Land Tenure in the Project Zone

The Project does not encroach upon community property. The property is privately held and no approvals are required from the Government of Belize or the local communities. There is no historical context of communities living in the Mountain Pine Ridge (Morehart, Lentz & Prufer 2005). There are no ongoing property disputes with the Project property (Maya Atlas 1997). The property containing Thousand-Foot Falls National Park was originally owned by BRO. In 2000, Thousand-Foot Falls National Park was transferred by BRO to the Government of Belize. BRO Project title and registry are shown in Table 5.

Table 5: Project land title and registry information

Owner	Title	Parcel	Area (ac)	Area (ha)
East Point Farms	Grant Fiat 904 of 2000	1	139.8	56.6
Pine Tree Farms	Grant Fiat 905 of 2000	2	1,863.9	754.6
Pine Tree Farms	Grant Fiat 906 of 2000	3	759.6	307.5
MPR Farms	Transfer Certificate of Title Volume 54 Folio 147	4	2,250.8	911.3
Pine Tree Farms	Transfer Certificate of Title Volume 54 Folio 148	6	1,930.1	781.4
East Point Farms	Transfer Certificate of Title Volume 54 Folio 149	7	4,477.5	1,812.8
Total				4,624.2[1]

Within the 66,645 ha project zone, the majority is public land (the Mountain Pine Ridge Forest Reserve, 1000' Foot Falls National Park, and Elijio Panti National Park. The national parks are set aside for conservation purposes and tourism. Visitation to 1000' Foot Falls National Park is light but regular. Elijio Panti National Park has limited access and no data is available on visitation. The Mountain Pine Ridge (MPR) receives some visitation for tourism particularly to visit some of the rivers in the area. There is some low level timber extraction ongoing. The private properties are typically held for recreational or tourism associated with lodges. One larger lodge, Hidden Valley, is engaged in timber extraction.

G1.7 Current Biodiversity within the Project Zone

The Mountain Pine Ridge is an ecosystem that plays a crucial role in protecting native biodiversity for a wide range of Belizean fauna, and has been identified as a high priority in the Belize protected areas plan (Meerman and Wilson 2005). The Mountain Pine Ridge ecosystem provides habitat for large predators such as the jaguar, puma, and ocelot along with a diverse array of prey species (Davis, Kelly & Stauffer 2010). The Mountain Pine Ridge also provides suitable habitat for the IUCN-EN Baird's tapir, along with many more species of concern.

[1] Note that totals for parcels affected by the project are correct. Total Area of property doesn't match survey due to historic discrepancies in Minister's fiats.

The current threats to the biodiversity in the Project area and Project zone in the "without-Project" scenario are:

- Lack of protection from illegal hunting.

Hunting associated with the illegal collection of xate (*Chamaedorea spp.*) particularly for large animals and collection of parrots has been identified as a conservation concern in Belize (Young 2008, Bridgewater 2011, and UNDP 2010) and specifically in the area of the project site (Bridgewater et. al. 2006). Observations of evidence of incursions by illegal collectors indicates a threat from illegal hunting at the project site.

- Loss of broadleaf forest habitat.

The primary threat facing the biodiversity of the site in the baseline scenario would be the removal of habitat. The baseline scenario would convert the habitat from a primary forest to a coffee plantation. None of the at risk species identified for the property can complete their life cycles in a coffee plantation due to a change in habitat and disturbance by the coffee workers (IUCN 2012).

An initial biodiversity study was conducted in the Project area (Means 1997) which summarized biodiversity at BRO and Hidden Valley, concentrating on threatened, charismatic, and indicator taxa to provide key biological information for conservation management. The Project area provides habitat for at least 15 species listed on the IUCN Red List and the Belize National List of Critical Species (BZE). The study summarized all species known to occur in the Project area based on previous publications and personal observation. The assessment summarized common plants, invertebrates (especially butterflies), amphibians, reptiles, mammals, and birds. The lists of plants, mammals, and birds are specific to BRO. The reptile and the amphibian lists are based on literature addressing the entire Mountain Pine Ridge.

This assessment resulted in the documentation of 37 mammal, 109 bird, and approximately 60 plant species in the Project area. Of the 37 mammals, the IUCN lists seven of the mammals as near-threatened or threatened, vulnerable and endangered. Among them are the IUCN-EN Baird's tapir. Seven of the bird species are listed on the Belize National List of Critical Species, and the IUCN includes six on the Red List. Two species of threatened plant species are listed by the IUCN and are known to occur in the Project area, with one species documented at BRO. One IUCN listed amphibian, the Maya mountains frog, has been documented in the Mountain Pine Ridge but not in the Project area.

Table 6 outlines the species of special concern in the Project zone documented by Dr. Kelly's Jaguar Project, The Peregrine Fund, and Conservation Management Institute. All species listed on the Belize National List of Critical Species, and the IUCN Red List are included. IUCN species of Least Concern are included only if listed by the Belize National List of Critical Species. All species listed in Table 6 documented by BRO, its associated researchers, staff and consultants onsite.

Table 6: IUCN red list species documented in the Project area

Common name	Scientific name	IUCN	BZE	With-Project	Without-Project	Observed on site
Mammals						
Baird's tapir	*Tapirus bairdii*	EN	VU	No change.	Illegal hunting. Habitat loss.	The Jaguar Project (Dr. Kelly) and audit team
Southern river otter	*Lutra longicaudis*	DD	VU	No change.	Habitat loss in riparian areas.	The Jaguar Project (Dr. Kelly)
Jaguar	*Panthera onca*	NT	NT	No change.	Loss of prey species due to illegal hunting. Habitat loss.	The Jaguar Project (Dr. Kelly)
Margay	*Leopardus wiedii*	NT	VU	No change.	Loss of prey species due to illegal hunting. Loss of riparian habitat.	The Jaguar Project (Dr. Kelly)
White-lipped peccary	*Tayassu pecari*	NT	VU	No change.	Habitat loss in riparian areas. Illegal hunting.	The Jaguar Project (Dr. Kelly)
Ocelot	*Leopardus pardalis*	LC	VU	No change.	Loss of prey species due to illegal hunting. Loss of riparian habitat.	The Jaguar Project (Dr. Kelly)
Puma	*Puma concolor*	LC	NT	No change.	Loss of prey species due to illegal hunting. Habitat loss. .	The Jaguar Project (Dr. Kelly)
Giant anteater	*Myrmecophaga tridactyla*	VU		No change.	Illegal hunting. Habitat loss.	The Jaguar Project (Dr. Kelly)
Birds						
Great curassow	*Crax rubra*	VU	VU	No change.	Habitat loss.	The Jaguar Project (Dr. Kelly)
Ocellated turkey	*Meleagris ocellata*	NT	VU	No change.	Habitat loss.	The Jaguar Project (Dr. Kelly)
Orange-breasted falcon	*Falco deiroleucus*	LC	VU	No change.	Habitat loss.	The Peregrine Fund
Stygian Owl	*Asio stygius*	LC	VU	No change.	Habitat loss.	The Belize Raptor

						Research Institute
Crested guan	*Penelope purpurascens*	LC	VU	No change.	Habitat loss.	The Jaguar Project (Dr. Kelly)
Plants						
Mahogany	*Swietenia macrophylla*	VU	VU	No change.	Habitat loss and direct mortality from land clearing.	BRO
Tecunumanii pine	*Pinus tecunumanii*	VU		No change.	Habitat loss and direct mortality from land clearing.	BRO

A system of key biodiversity areas (KBA) was identified in Meerman (2007). The project site is identified as part of the Maya Mountains KBA. Ecosystems of the project site are best described in Meerman and Sabido (2001). The two ecosystem types found on the project site are submontane broadleaf forest and submontane pine forest. Biotic types are typically classified as *Tropical evergreen seasonal mixed needle and broadleaf submontane forest* and *Tropical evergreen seasonal broadleaf submontane forest: Virola-Terminalia variant* or *Tropical evergreen seasonal broadleaf submontane forest: Simarouba -Terminalia variant.*

G1.8 High Conservation Values within the Project Zone

An assessment and evaluation of High Conservation Values with the Project zone and Project area is shown in Table .

Table 7: High Conservation Values within the Project area and Project zone

High Conservation Values	Project Description
8.1. Globally, regionally or nationally significant concentrations of biodiversity values; a. Protected areas b. Threatened species c. Endemic species d. Areas that support significant concentrations of a species during any time in their lifecycle	A. Protected areas in the Project zone include Thousand-Foot Falls National Park, and Elijio Panti National Park. B. 15 IUCN listed species are documented to occur on the site. C. Project zone includes Key Biodiversity Areas (Meerman 2007).
8.2. Globally, regionally or nationally significant large landscape-level areas where viable populations of most if not all naturally occurring species exist in natural patterns of distribution and abundance;	Project site resides within the Mesoamerican Biological Corridor (WRI 2003). Project site within Conservation International Biodiversity Hotspot (Brooks et al 2002).
8.3. Threatened or rare ecosystems;	The Mountain Pine Ridge is an ecosystem of "exceptional importance" (Meerman & Wilson 2005).
8.4. Areas that provide critical ecosystem services.	None noted.
8.5. Areas that are fundamental for meeting the basic needs of local communities.	None noted.

8.6. Areas that are critical for the traditional cultural identity of communities.	None noted.

This Project addresses multiple High Conservation Values in the form of threatened species (8.1.b), protected areas (8.1.a), and globally and regionally significant large landscape-level areas where viable populations of most if not all naturally occurring species exist in natural patterns of distribution and abundance (8.2). The threatened species are listed in Table 6.

The Project helps comprise the Mesoamerican Biological Corridor (8.2), and is a part of a Conservation International Biodiversity Hotspot. The Mesoamerican Biological Corridor spans across eight countries from the southern Mexico to northern Panama. Currently about 13% of the land area in the Mesoamerican Biological Corridor is under some sort of conservation. The Project incorporates protection of the globally rare Mountain Pine Ridge ecosystem. The Belize National Protected Areas System Plan (Meerman & Wilson 2005) states the Maya Mountains–Mountain Pine Ridge massif is one of three areas of "exceptional importance" in Belize. In 1944, the Mountain Pine Ridge Forest Reserve was established, setting aside roughly 43,000 ha of this unique ecosystem.

G2 Baseline Projections

G2.1 Baseline Land Use

Per instructions from the methodology, the following analysis is conducted to determine alternative baseline scenarios according to the procedure presented in "VT0001 Tool for the Demonstration and Assessment of Additionality in VCS Agriculture, Forestry and Other Land Use (AFOLU) Project Activities"

This tool is applicable because a) the proposed project activities will not violate any Belizean law, and b) the use of this tool results in identification of the most plausible baseline scenario of the several possible baseline scenarios identified below.

Step 1: Identification of alternative land use scenarios to the AFOLU project activity.
Some of the alternative land uses are more likely and pose a much larger deforestation threat than others. The following is a "ranking" of the most likely alternative land uses. Each alternative is considered legal in Belize.

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

1. Conversion to Agriculture

The most likely alternative land use scenario is the conversion to agriculture, and it is the most pervasive driver for deforestation and land use change in the region. The conversion of forestland in Belize to agriculture is both a national and regional trend. The FAO (2001) estimated that by 1989 about 217,241 hectares, or about 10%, of the national land area had been

converted from forest to agricultural land. Furthermore, by the first half of the 1990's 25,000 hectares of forested land were being lost yearly due to conversion to agricultural land (FAO 2001). Conversion of forest land for cattle and citrus is occurring in Belize near the project area and forest cover declined by an average of 6,479 acres/year from 1980 to 2010 in the Cayo District (Cherrington et.al. 2010) almost exclusively from agricultural development. Suitability of soils for conversion to agriculture, particularly coffee, was evaluated on site by planting and harvesting coffee over many years in small plots. This is a planned deforestation project and the plan calls for coffee conversion. Conversion of land for agriculture is considered legal. A land clearing permit is required for clearings of over 300 acres. An environmental impact analysis (EIA) is required. Based on analysis of EIA database for Belize, the EIA process is not a barrier for the project .

2. Purchase of the Land to Operate an Ecotourism Lodge

One alternative land use would be the conversion of the property for ecotourism. This strategy is employed by several lodges in the area already. A portion of the property was purchased for that very purpose many years ago, which now supports Hidden Valley Inn. To pursue this alternative would require finding a buyer with the resources to both purchase the property, protect the property, and build competitive facilities in an area that already has several tourist lodges.

3. Purchase of the Land as a Conservation Area

There are privately owned protected areas in the area and throughout Belize. Most landowners that own these properties are members of the Belize Association of Private Protected Areas (BAPPA). Landowners purchase properties for conservation for a variety of reasons. Some establish nonprofit companies to hold the property and some simply hold onto the property out of a desire to protect the biodiversity or other values of the site. There is no inherent financial income stream from owning a private protected area while there are several required expenses. The initial purchase price, annual taxes, maintenance, and protection from trespass are all expenses that can run into the millions of dollars. Landowners that pursue this strategy are required to be relatively wealthy or have outside sponsors or pursue a strategy of income generation that is consistent with conservation such as ecotourism. Purchasing land for conservation purposes is legal.

4. Continuation of the preproject land use

The project area has been in forest as far as the historical record goes back. The baseline plan calls for clearing that forest to generate income from coffee due to sustain the property owner and staff. Current income from the project area is zero. Property taxes are still a required expense, therefore continuation of the preproject land use is unsustainable.

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

This alternative land use is essentially continuation of the preproject land use with the added expenses of patrols and monitoring. Income from the project area is zero, while expenses for this scenario include property taxes, patrols, and monitoring. Therefore conducting the project without registration as a VCS AFOLU project is also unsustainable.

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

All the alternatives presented are legal and permissible under Belizean law. Clearing of land over 300 acres is legal and permissible but requires an environmental impact statement and a permit.

Step 2. Investment Analysis

Sub-step 2a. Determine appropriate analysis method

Since the project generates no financial or economic benefits other than VCS related income, simple cost analysis is selected.

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

Costs have been documented for the project and audited to demonstrate no financial benefits other than VCS related income. Proceed to step 4.

Step 4. Common Practice Analysis

Multiple private properties are listed as private protected areas in Belize through the Belize Association of Private Protected Areas. The essential distinction between the project and other lands managed as private protected areas is that the other lands are able, at least in some cases, to support the annual costs of management through outside means e.g. ecotourism, private funds, or outside donors/nongovernmental organizations. Those sources of income are not available to this landowner and therefore the project activity is additional.

G2.2 Additionality

The property owner has a conversion plan that has been evaluated and a pilot project conducted to convert land to coffee. The equipment and manpower required for clearing the land is on site. Of the 666.3 ha slated for conversion to coffee, 567.3 ha are classified as broadleaf forest and included in the calculations for avoided emissions from conversion. The remaining 99 ha of pine forest are conservatively excluded from the claim due to high uncertainty about the aboveground and below ground biomass present.

Conversion of the forest includes harvesting merchantable trees, bulldozing, piling, and burning the remaining vegetation, and planting the site to coffee. Management of the coffee includes annual application of fertilizer.

No part of the project area is currently restricted from development due to government regulation or other legal requirement.

G2.3 Carbon Stock Changes

The coffee conversion plan calls for conversion of 666.3 ha of hardwood and transition hardwood/pine all of which is available for land conversion according to Belize law after conducting an appropriate environmental impact assessment. Conversion to agriculture is the most likely alternative land use scenario for 567.3 ha of the tropical hardwood component. The coffee conversion plan also calls for conversion of an additional 99 ha of transition zone lands although the emissions from the transition zone land conversion is conservatively omitted for the purpose of this analysis. This part of the property was selected based on workability, soils, and proximity to existing infrastructure.

Planting of coffee will require land clearing that also will include carbon emissions. In Belize, land clearing involves using bulldozers and chains to clear the land followed by burning of the biomass. Changes in biomass account for the CO2 emissions from biomass burning. Total non-CO2 emissions from biomass burning are estimated at slightly above 11,000 mtCO2e. Total fertilizer emissions are expected to be in excess of 32,000 mtCO2e for the life of the project.

The available literature on steady state C stocks for coffee bushes varies widely depending upon geographic location. Belize has one small commercial grower thus there are no published data on C stocks for coffee bushes within Belize. Polzot (2004) found that the carbon stock of open grown (without-Project scenario) coffee bushes in Costa Rica ranged from 1.4 to 3.5 t C ha^{-1}. Thus, FCO uses a conservative figure of 5 t C ha^{-1} to calculate the without-Project C stocks for

the coffee bushes. In addition the plan calls for leaving 10-12 trees for shade on each acre.

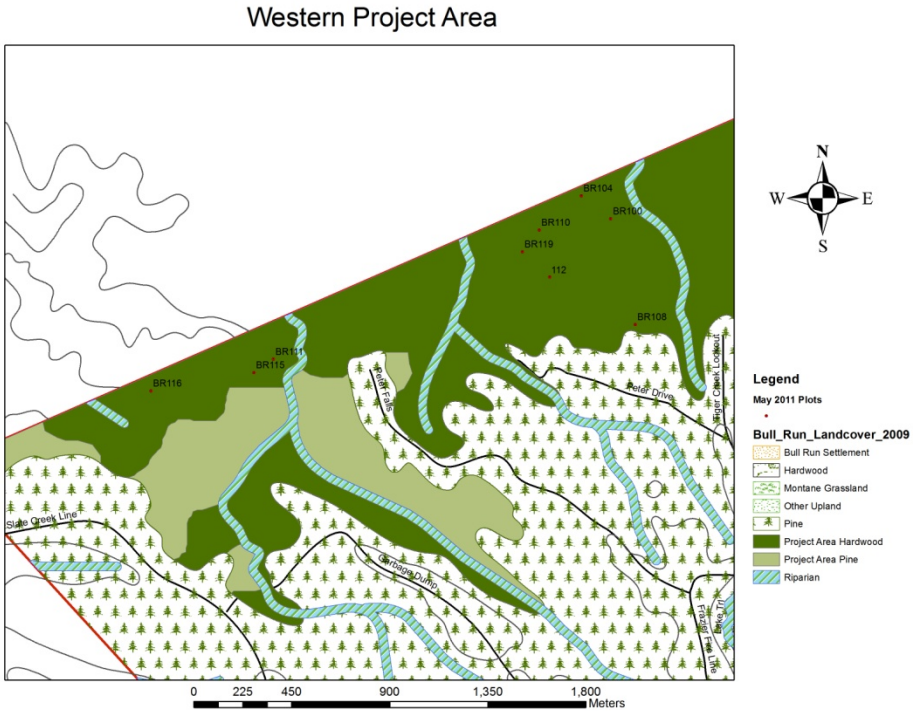


Figure 7a. Location of forest sample plots at BRO Northwestern Plots and Project Area (dark green).

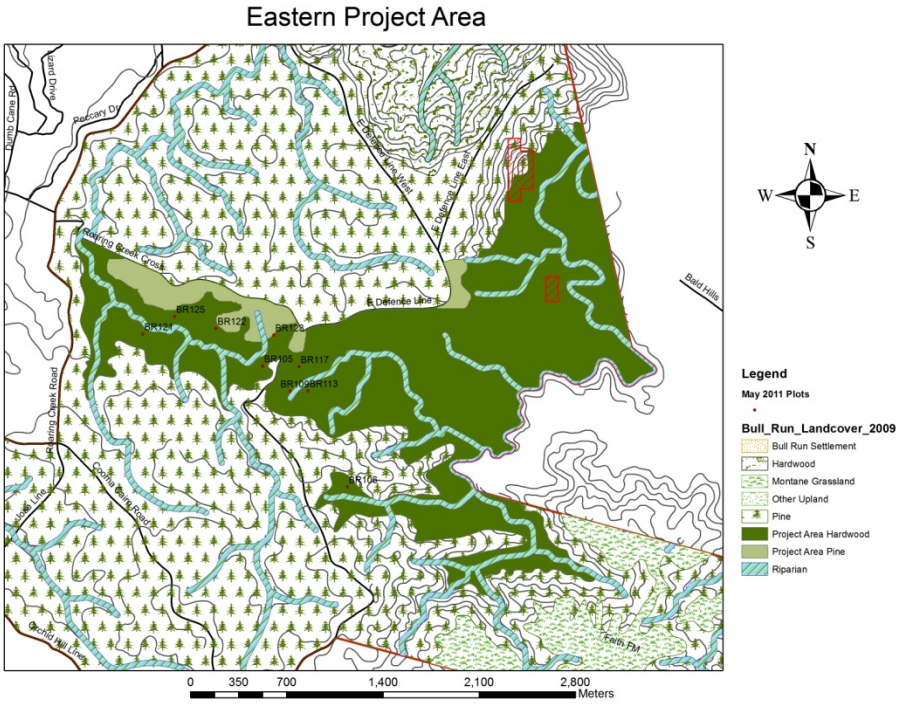


Figure 7b. Location of forest sample plots at BRO Eastern Plots and Project Area (dark green).

Based on the inventory, an additional 12 tons of aboveground and belowground biomass were allocated to the coffee conversion area that was withdrawn from the hardwood component of the property.

Common practice when land clearing is to sell commercially valuable trees from the cleared land. After analyzing the inventory in the area planned for deforestation, potentially valuable trees were defined as trees over 25 cm DBH and either identified as a commercial species or not identified to species. FCO determined that the total tons biomass/ha attributable to these potentially commercial trees will result in less than 3,000 mtCO2e sequestered in long term wood products for the life of the project. This pool is considered de minimis and excluded from the rest of the analysis.

Forest growth is conservatively omitted from the analysis because the tropical hardwood component of the property is presumed to be at steady state.

G2.4 Baseline Communities

The community, current BRO staff and neighbors as described in G1.5, would be adversely affected in multiple ways in the baseline scenario. In the baseline scenario, BRO would clear the tropical hardwood component of the property for conversion to agriculture. BRO would lease the land to multiple small-holders assisting with agricultural inputs and logistics and taking rent in the form of raw coffee. This process would generate multiple, low wage, low skill jobs on the project site. The result would be many newcomers to the community, an increase in traffic and demand for services. While this action would generate enough funding to maintain the current BRO staff, it would not justify training the staff as envisioned in the project scenario.

The community comprised of the lodges and other neighbors would be negatively impacted because of the higher number of people in the area. Increased incidences of trespass, trash, human caused fires, etc… would be a likely result as is commonly experienced throughout Belize. The biggest negative impact would be to water quality. Commercial coffee agriculture requires large inputs of fertilizer and pesticides. Erosion from land clearing would increase further impacting downstream water quality. The project site is at the top of the watershed that serves a large part of the population of Belize. Negative impacts to water quality will affect the majority of the population of Belize as well as negatively impacting the coral reef system in the near shore area of Belize.

G2.5 Baseline Biodiversity

Biodiversity loss will be substantial in the tropical hardwood compartment in the without-Project scenario. Impacts of the baseline on each of the species with IUCN or Belize rarity status is listed in Table 6 based on information found in the IUCN Redlist database (IUCN 2012). Clearing the tropical hardwood compartment will result in significant landscape level fragmentation and habitat loss. Each of the species listed is either associated directly with mature broadleaf forest, or is directly dependent on prey species that are associated with broadleaf forest (IUCN 2012). None of the species listed in Table 6 have known habitat associations with coffee plantations.

Gen	Clim	Comm	Bio
G3.	**Required**		

G3. Project Design and Goals

G3.1 Major Climate, Community and Biodiversity Objectives

The goal of the Project is to develop BRO as a carbon sink while maintaining the biodiversity values of the BRO property and providing training and educational opportunities for the community. The climate objective is to avoid emissions from land clearing and avoided fertilizer use. The community objective is to maintain water quality and provide improved training and educational opportunities. The biodiversity objective is to conserve habitat for IUCN species of concern.

G3.2 Major Project Activities

Over the next two decades, the primary major project activities (Table 8) are to protect the broadleaf component of the property.

Table 8: Project management

Activity	Climate benefits	Community benefits	Biodiversity benefits
Maintain habitat for native, forest-based flora and fauna including IUCN listed species.	Sequester carbon.	Maintain existence values for high profile species.	Protect habitat.
Maintain large live trees, snags, and coarse woody debris in broadleaf forest.	Sequester carbon.	Maintain existence values for high profile species.	Protect habitat.
Monitor forest composition, structure, and yield.	To insure permanence.	Provide livelihoods for communities.	Protect habitat.
Place restrictive legal covenant on the BRO property to ensure permanence.	To insure permanence.	Provide livelihoods for communities.	Protect habitat.
Train staff		Develop human capital and provide capabilities for future employment.	
Provide education benefits		Provide additional education and opportunities for children of staff.	

Sequestering carbon will achieve the climate goals of the project. A successful and financially stable BRO will provide employment for protection of the property. Financial stability insures activities necessary to maintain and protect the property are sustainable. A substantial monitoring program will be undertaken by BRO according to CM3.1 within twelve months of validation against the Standards.

G3.3 Location of Project Activities

Project activities will occur over the entire project area. Patrols will occur routinely throughout the project area. Carbon monitoring will occur at fixed plots. Off -site leakage has been analyzed utilizing the methodology REDD Methodological Module "Estimation of emissions from activity shifting for avoided planned deforestation" – LK-ASP Version –April 2010 and determined to be zero ex ante. By the methodology, leakage can only occur as a result of the actions of the agent of deforestation, BRO, so BRO activities (deforestation, fertilizer use, and biomass burning) will be monitored on properties BRO owns or controls.

G3.4 Time-frame and Project Accounting

The timeframe of the CCBA Project extends from 2009 through 2038 (Table 9). While the Project began in 2003, due to the lack of available financing for the carbon Project, the crediting period will begin in 2009 and will run through 2038. The final verification will take place the year after the Project ends in 2038. This Project will be validated using the CCBA protocol Climate, Community, and Biodiversity Project Design Standards Second Edition. Plans also include a validation against an appropriate methodology for carbon accounting approved by the Verified Carbon Standard.

Table 9: BRO Project timeline

Milestone	2003	2009	2010	2012	2038
Project started					
Crediting period begins					
Survey work conducted					
CCBA Project validation					
VCS Project validation					
Deed restriction					
Project ends					

Note that in addition, verification audits will take place at least every five years throughout the life of the project.

G3.5 Project Risks and Mitigation Measures

Risks to the Project from instability in the Government or a change in leadership at BRO are considered minimal. In any case, BRO has agreed to a restrictive covenant for the life of the Project to ensure permanence.

To the best of FCO's knowledge no oil or mineral resources occur on the Project site and exploration for mineral resources is not occurring nor is it expected to occur. If oil or gas is discovered on the site, it may belong to the Government of Belize. Similar sites in Belize where oil extraction is taking place have minimal above ground disturbance. Section 26 paragraph 6 of the National Petroleum Act states:

> (6) Subject to this Act, where, in the course of conducting petroleum operations pursuant to a contract, the rights of the owner or lawful occupier of any land are disturbed or damage to any crops, trees, buildings, stock, works or other property thereon is caused, the contractor is liable to pay the owner or lawful occupier fair and reasonable compensation in respect of the disturbance or damage according to the respective rights or interests of the owner or lawful occupier concerned. The amount of compensation payable shall be determined by agreement between the parties or if the parties are unable to reach agreement or the agreed compensation is not paid, the matter may be treated in accordance with the Arbitration Act.

Based on this, the contractor for the Government extracting the oil may be responsible for compensating the owner of the credits for any reversals suffered as a result of the oil extraction process.

The greatest risk to the Project is reversals due to illegal timber extraction. Given the low population levels and remoteness of the site, this risk is considered to be low.

The Mountain Pine Ridge exhibits low risk from hurricanes (Konrad 1996).

Fire is a risk generally and the pine savannahs are a fire maintained ecosystem. The broadleaf forest slated for conversion is fire resistant (Meerman and Sabido 2001) and the fact that it still exists with the history of wildfire in the area is self-evident testament to the resiliency of the system to resist fire damage. The project proponents have a fire crew and equipment on hand to fight wildfires. A fire tower has been built to detect wildfires.

G3.6 Maintenance of High Conservation Values

The primary strategy for maintaining High Conservation Values is protection through patrolling and managing the property for existing high quality habitats with no reduction in forest cover. Patrols will prevent illegal hunting by preventing incursions from xate hunters. Maintaining habitat will prevent the loss of HCVs by maintaining the landscape components necessary for each species to complete its life cycle. No enhancement of HCVs is required or anticipated.

G3.7 Measures Taken to Enhance Climate, Community, Biodiversity Benefits

BRO intends for this Project to be a focal point for forest protection in the Mountain Pine Ridge region and ecosystem demonstrating how carbon sequestration, biodiversity, and community benefits can be achieved concurrently. Because of the Project's profile within Belize it is expected that the Project will act as a catalyst for other projects regionally. Discussions with the Belize Association of Private Protected Areas (BAPPA) have already resulted in contacts regarding additional conservation projects throughout Belize.

Specifically,

1. the project proponents will make a presentation to BAPPA to explain the process so other projects can be catalyzed;
2. the stakeholders will become more educated about the benefits of the project; and
3. capacity built in human and physical capital will remain after the end of the project making the continuation of the project highly likely.

G3.8 Stakeholder Involvement

Stakeholders were identified using the procedural steps found in the "Community Development Toolkit" methodology at http://www.icmm.com/page/629/community-development-toolkit-c. Stakeholder meetings were held at the Bull Run compound on January 24, 2011 and at a local lodge on January 25, 2011.

BRO has actively engaged local stakeholders in soliciting comments on the design of the CCB Project with various onsite consultations. Local stakeholders are primarily BRO staff. BRO staff will be actively engaged in Project activities including permanent sample plot measurements, setting up remote large mammal camera traps, conducting forest patrols, and engaging in other knowledge transfer activities. Stakeholder involvement has been solicited formally and informally over a period of time so as to inform stakeholders about the BRO Project and to receive their feedback. Post CCB validation, BRO will provide an annual update in written form to all stakeholders describing Project status as a method to continue communication and consultation between stakeholders and Project managers. Furthermore, BRO will continue and improve upon its current enacted policy to proactively seek stakeholder consultation whenever possible through regular meetings and a survey of attitudes regarding the project.

Project zone stakeholder groups are:

- BRO owners and staff.
- Hidden Valley Inn owners and staff.
- Belize Forestry Department Ministry of Natural Resources including Thousand-Foot Falls National Park, Elijio Panti National Park, Mountain Pine Ridge Forest Reserve, Government of Belize Crown Lands and Privassion Enclave.

- Pine Lumber Company.
- British Army.
- The Peregrine Fund.
- Dr. Marcella Kelly's Jaguar Project.
- Five Sisters Lodge owners and staff.
- Pine Ridge Lodge owners and staff.
- Blancaneaux Lodge owners and staff.
- UNFCCC Belize Focal Point and Designated National Authority.

Figure 8a: Stakeholder meeting Bull Run farm complex, January 24, 2011.

Figure 8b: Stakeholder meeting Blancaneaux Lodge, January 25, 2011.

G3.9 Publicization of Public Comment Period

BRO publicized its CCBA Project for public comment through the following avenues:

- Direct email and phone contact with Hidden Valley Inn owners and staff, Belize Forestry Department Ministry of Natural Resources, Pine Lumber Company, British Army, The Peregrine Fund, Dr. Marcella Kelly's Jaguar Project, Five Sisters Lodge owner and staff, Pine Ridge Lodge owners and staff, Blancaneaux Lodge owners and staff, and UNFCCC Belize Focal Point and Designated National Authority.
- The PDD was made available on the CCBA webpage and open to public comments (http://www.climate-standards.org/projects/index.html) beginning January 2011.
- Public information meetings held 1/24/2011 and 1/25/2011 for stakeholders.
- Periodic BRO staff meetings describing the Project.

G3.10 Conflict Resolution Tools

BAPPA has agreed to serve as an independent 3rd party in country to receive and document grievances related to the CCB Project. BAPPA will serve as a mediator keeping all parties informed of the status of grievances and their resolution. A record of grievances and their resolution will be a part of the monitoring process for future verifications. Stakeholder grievances related to employment will be handled according to Belizean law through the Belize Labor Department. Non-employee stakeholders need to be informed that they should contact BAPPA. Each community member and stakeholder will be informed in writing of the grievance procedure and the contact person at BAPPA.

BAPPA's office will do the following:

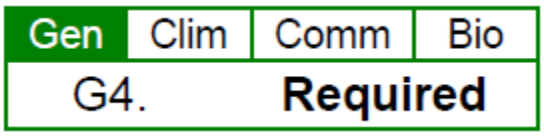
- A BAPPA representative meets with the landowner annually to review the project plan.
- A BAPPA representative attends an annual stakeholder meeting for the project.
- BAPPA is available by phone or email throughout the year to independently field complaints.
- BAPPA queries appropriate government offices once per year to get a report on any biodiversity or labor violations that might have occurred.
- BAPPA writes a report for the landowner annually on their findings. That report will go to the landowner and the project developer and become a part of the verification process for the project.
- If there is a dispute that requires more detailed involvement by BAPPA, the landowner will contract with BAPPA as needed/available for further help in resolving the dispute.

The BAPPA representative will resolve disputes by collecting and documenting the complaint and whatever information about the situation that can be independently determined. The BAPPA representative will determine if the complaint is reasonable and if so, determine a likely strategy for addressing the complaint. The complaint and the proposed strategy will be presented to

BRO. BRO will address the complaint or propose a different strategy for addressing the complaint within 30 days.

G3.11 Project Financial Support

Primary expenses are to pay for patrols, and pay for biodiversity, carbon sequestration, and community monitoring expenses. A complete financial plan was made available to the auditor during the validation audit.



G4 Management Capacity and Best Practices

G4.1 Project Proponents

BRO is the Project proponent. BRO has entered into an agency agreement with FCO to develop the strategy, implementation, and monitoring of the carbon credits generated by this Project. FCO has hired CMI to collect initial data, develop the monitoring protocol and conduct the baseline study for the monitoring program. Supporting documents are available by contacting FCO. Decisions on implementation of the Project activities are the responsibility of the BRO board.

G4.2 Technical and Management Expertise

The key technical skills to implement the Project are:

- The business skills required to successfully manage a large and complex operation,
- The managerial skills to manage the property effectively,
- The diplomatic skills to successfully interact with the local communities, and
- The technical skills to conduct monitoring on a periodic basis.

The leadership team at BRO has over twenty years of experience working in Belize and has significant skills in managing the property. The property has been owned and managed by BRO for over fifty years.

Forest Carbon Offsets, LLC managerial experience is considerable with current biographies available at www.forestcarbonoffsets.net.

Conservation Management Institute (CMI) serves as technical support for Project design and monitoring. CMI is a research center within the College of Natural Resources at Virginia Tech in Blacksburg, VA. CMI has extensive experience in monitoring protocol development and

implementation for natural resources throughout North America with additional experience in Belize, Dominican Republic, Peru, and Nepal.

G4.3 Capacity Building

The training plan calls for the following types and frequencies of training.

Training Type	Topics Covered	Personnel	Frequency
Rangers and patrols	First aid, navigation, vehicle operation.	Four individuals	Initial training as staff are employed and periodic refreshers as needed or for recertification of first aid training.
Heavy equipment operations and maintenance	Safe operation. Situational effectiveness of equipment. Techniques for road and trail building and maintenance. Equipment maintenance.	Two individuals	Initial training as staff are employed and periodic refreshers as needed.
Assisting forest carbon data and biodiversity data collection	Data collection. Use of GPS for navigation to plots. Maintaining plot markings. Camera trap use and maintenance.	Two individuals	Initial training as staff are employed and periodic refreshers before data collection events.
Personnel management	Personnel time accounting. Conflict resolution.	One individual.	Initial training as staff are employed and periodic refreshers as needed.
Maintenance	Engine repair. Welding.	One individual	Initial training as staff are employed and periodic refreshers as needed particularly when new equipment is acquired.
Cook	Nutrition and hygiene.	One individual	Initial training as staff are employed and periodic refreshers as needed.
Paramedic	First response. Evacuation procedures.	Two individuals.	Initial training as staff are employed and periodic refreshers as needed or for recertification of first aid training.

Figure 9: Forest monitoring crew comprised of CMI and BRO staff (August 2010)

All staff are local and are representative of the general population in the area consisting of Belizeans of Mayan and Hispanic heritage. One staff member is Belizean of European heritage.

Staff retention has not been a problem in the past at BRO. Jobs at BRO are considered to be better than average and the managers are well-regarded in the community. Some staff turnover is inevitable over such a long time period however, and when there is staff turnover, measures will be taken not to lose local capacity and skills by providing training to new staff.

G4.4 Community Employment Opportunities

The Project employs individuals from the local communities patrolling and monitoring the Project area. Employment opportunities will be advertised. Employment at BRO will follow Belize labor law and codes. Women and underrepresented minorities will be encouraged to apply for the positions. Staff will be chosen based on capacity to meet the needs of BRO so that BRO can perform its business mission.

G4.5 Employment Laws

BRO will follow all applicable labor laws under Belize Labour Act Chapter 297, Labour Act 297S – Subsidiary Act, and Belize International Labour Organization Conventions Act Chapter 304:01 Revised Edition 2003. BRO is obliged, under Belizean laws to follow appropriate safe

labor practices toward the prevention of injuries in the workplace. Additionally BRO will comply with all other applicable local, district, and national workplace standards. Belize has the following relevant labor laws:

- International Labour Organization Conventions Act,
- Labour Act,
- Labour (Subsidiary Laws),
- Protection Against Sexual Harassment Act,
- Protection Against Sexual Harassment Commencement Act Order,
- Public Safety Act,
- Trade Unions Act,
- Trade Unions Regulations,
- Trade Unions and Employers Organizations (Registration, Status and Recognition) Act, and
- Trade Unions and Employers Organizations (Registration, Status and Recognition) Act (Commencement) Order.

Staff are made aware of their legal rights when they sign a contract to work for BRO. Currently, BRO staff are paid at an appropriate rate and in a timely manner according to Belize labor standards. All staff are paid using automatic wire transfers to their bank accounts. If staff do not have a bank account, BRO will assist them with obtaining a bank account.

G4.6 Employee Safety

All local, district, and national workplace standards will be met at the moment of hiring of each staff member. Local regulations and safety concerns will be discussed with each staff with an emphasis on guaranteeing workplace safety according to Belizean law. All employees have received HIV/AIDS training. Leadership staff has First Aid training. There are two trained emergency medical technicians (EMT) on staff. BRO is also in the process of getting all necessary equipment for full EMT capabilities plus arranging ambulance contract. Safety information is available in Table 10 10.

Table 10: Staff safety

Hazard	Safety strategy and equipment
Snake bite	Staff emergency medical technician. Helicopter evacuation. First aid training. Adequate boots. Radios. Minimum two person crews.
Poachers	Radios. Minimum two person crews.
Fire	Staff emergency medical technician. First aid kit. Radios.

	Gloves. Eye protection.
Vehicle accidents	Staff emergency medical technician. Helicopter evacuation. First aid training. Radios.
Machete cuts	First aid training. First aid kit. Radios. Minimum two person crews. Eye protection. Adequate boots. Gloves.
Chainsaw cuts	Staff emergency medical technician. Helicopter evacuation. First aid training. First aid kit. Radios. Minimum two person crews. Eye and ear protection. Adequate boots. Chaps and gloves (optional).
Lightning strike	Develop procedures for avoiding lightning strikes. Radio.

G4.7 Financial Health of the Implementing Organizations

Forest Carbon Offsets LLC (FCO) is a United States registered private limited liability company and, as such, is governed by the corporation laws of the United States which ensure that, at all times, the company remain financially solvent and able to meet its liabilities. FCO is owned by independent shareholders of good standing and has a Board of Directors. It is sufficiently capitalized to ensure completion of the Project. More information about FCO is available on the FCO web site at http://forestcarbonoffsets.net. Carbon financing received after contractual obligations will fund BRO to pay for the management and monitoring activities. BRO's management and financial plan was made available to the auditors during the site visit to BRO.

Gen	Clim	Comm	Bio
G5.	**Required**		

G5 Legal Status and Property Rights

G5.1 Local Laws and Regulations

The Project team conducted an exhaustive law review for the PDD:

- Belize Private Forests (Conservation) Act, Chapter 217, Revised Edition 2000.
    - This is a revised edition of the law, prepared by the Law Revision Commissioner under the authority of the Law Revision Act, Chapter 3 of the Laws of Belize, Revised Edition 1980 - 1990.
- Forests Act, Chapter 213, Revised Edition 2003.
    - This is a revised edition of the Subsidiary Laws, prepared by the Law Revision Commissioner under the authority of the Law Revision Act, Chapter 3 of the Substantive Laws of Belize, Revised Edition 2000.
- Forest Fire Protection Act, Chapter 212, Revised Edition 2000.
    - Allows the Chief Forest Officer to declare a "fire protection plan". No such plan has been implemented for the project site.
- Water and Sewage Act, Chapter 222.
    - Defines riparian protection as "that the flow of the stream does not fall below the minimum quantity necessary to secure the interest of public health and the protection of the rights of riparian and other land-owners." (p. 46)
- Water Industry Act, Chapter 222.
    - Allows the establishment of rural water supply areas and the administration of those areas.
- Belize Agricultural Health Authority Act, Chapter 211.
    - Establishes Board and authority.
    - Addresses agricultural plant and animal health issues.
- Fisheries Act, Chapter 210.
    - Establishes board and authority.
    - Addresses fisheries regulations, licensing, and penalties.
- Timber Industry Act, Chapter 341.
    - Establishes power of Chief Forest Officer
    - Regulates timber exports
    - Establishes rules for timber royalties.
- Land Utilization Act, Chapter 188.
    - The Minister may, for the better utilization of land, make regulations-
        - to demarcate areas, water catchment areas or watersheds and prohibiting the clearing of any vegetation within those areas;
        - to provide for such other measures as may be required to prevent soil erosion;

    - restricting the construction of buildings within stipulated distances from the middle line of any road or street;
    - to demarcate specific areas as special development areas and to stipulate the type of development that will be permitted within those areas;
    - for the clearing of any forest or the felling of any trees; and
    - to provide for all such other things as may be necessary for the better carrying out of the provisions of this Part of the Act.
- Environmental Impact Assessment (Amendment) Regulations 2007.

Presumably all lands cleared over 300 acres in Belize are subject to the Environmental Impact Assessment (Amendment) Regulations 2007 law. Belize common practice is to ignore the law in its entirety, or common practice is to provide a waiver from the law since there are no published reports of EIAs being conducted for agricultural land clearing in and there are no published reports of EIAs being declined in Belize.

Regardless, this law has clearly not been a barrier to clearing land for other activities as evidenced by the extensive land clearing that has gone on in the country since 2007. Given the monumental effort Belize is undergoing to support agriculture (http://www.agriculture.gov.bz/PDF/Policy_Document.pdf) and the national policy supporting the expansion of agriculture (http://www.embassyofbelize.org/belize-profile/economy.html) including technical, financial, and international development assistance, it is unlikely at best that any restriction would be placed on land clearing for agriculture if an EIA or study were required. If an EIA or environmental study were required it would be conducted and approved, given that no EIAs have been publicly declined. For example, the Balam Jungle Estates EIA approved by the Government of Belize on October 26, 2007 would clear 25,784 acres *and* commercially log another 44,345 acres, for a total of 70,129 acres of cleared and impacted tropical moist forest.

From this analysis, it is clear that the tropical hardwood component of the BRO property could easily be converted legally to an agricultural plantation after performing the necessary Environmental Impact Assessment in accordance to generally accepted best practices in Belize. The only caveat is that there should be a one-chain riparian buffer on either side of permanent streams (personal communication with the Ministry of Natural Resources and Environment, Belize). There are no property disputes within the Project area.

G5.2 Documentation of Legal Approval

FCO warrants that all actions and documentation for the Project establishment as a carbon sequestration Project have and will be met. Private legal documents have been shared with the auditor upon the auditor's request. Deeds have been reviewed and read by the auditor. The property is privately held and no approvals are required from the Government of Belize or the local communities other than compliance with the Environmental Impact Assessment (Amendment) Regulations 2007 discussed in section G5.1.

G5.3 Free, Prior, and Informed Consent

BRO owns the property fee simple. Fee simple ownership in Belize represents absolute ownership of real property. A title certification has been conducted and the titles and titles' certifications have been made available to the auditor. The Project does not encroach upon private property, community property, or government property. According to the Maya Atlas: The Struggle to Preserve Maya Land in Southern Belize (Maya Atlas 1997), the property has not been associated with any Maya communal land claims. There is no historical context of communities living in the Mountain Pine Ridge (Morehart, Lentz & Prufer 2005).

G5.4 Involuntary Relocations

FCO has verified by direct observation that the Project site does not have human inhabitants besides farm laborers, management, owners, and their families. Moreover, FCO has observed that the Project does not involve the relocation or inward migration of any people. If immigration were to occur, the Project's monitoring teams will work with all stakeholders using appropriate tools to engage towards a resolution.

G5.5 Illegal Activities

Project will include regular patrols to address illegal hunting, timber poaching, or wood gathering. No evidence of these activities was detected during site visits.

G5.6 Carbon Rights

FCO has a legally binding agreement with the landowner which transfers management of the environmental service rights of the property. The agreement also sets out the obligations and responsibilities placed on the landowners for the duration of the Project. BRO follows all applicable environmental laws including the Belize Environmental Protection Act Chapter 328, Revised Edition 2000. Belize ratified the Kyoto Protocol September 26, 2003. BRO title proof is available if requested from the Department of Land and Surveys, Market Square, Belmopan, Belize (Table 5: Project land title and registry information).

Climate Section

CL1 Net Positive Climate Impacts

CL1.1 Net Change in Carbon Stocks

The net change in carbon stocks in the with-Project scenario before reductions for uncertainty or a risk buffer is conservatively estimated at 369,472 mtCO2e (Table 11) over the life of the Project. This project is designed for validation under the Verified Carbon Standard Version 3.1, AFOLU Requirements Version 3.0 and utilizing methodology VM0007 REDD Methodology Modules (http://www.v-c-s.org/methodology_rmm.html). In particular the following methodology modules were used for this project:

- REDD-MF
- M-MON
- T-ADD
- T-BAR
- X-UNC
- X-STR
- BL-PL
- LK-ASP
- CP-AB
- T-SIG
- E-BB
- A/R Methodological tool "Estimation of direct nitrous oxide emission from nitrogen fertilization" (Version 01).

Given that the tropical hardwood component has reached climax and is in stasis, there is no significant carbon stock change in the with-Project scenario during the Project lifetime of the tropical hardwood component.

The transition zone component of the coffee conversion area is conservatively excluded due to highly variable data resulting from insect damage and fire history. Transition zones are by definition highly variable and difficult to describe.

Baseline Emissions

In order to estimate GHG loss und the baseline scenario the following variables are required:

1. area of forest available for conversion,
2. baseline carbon stocks,

3. deforestation/conversion rates,
4. carbon stocks in agro-ecosystems,
5. fate of commercial timber and long-lived wood products,
6. losses of biomass attributable to fuel-wood collection,
7. avoided emissions from fertilizer use,
8. avoided emissions from biomass burning, and
9. avoided emissions from transportation fuel use.

1. Area of forest available for conversion

Of the total area of the property, 666.3 ha are slated for conversion to coffee. Of that 666.3 ha, 567.3 ha are currently in broadleaf forest and the balance, 99 ha are in pine forest. In the baseline, all 666.3 ha are converted to coffee. After analyzing the inventory from the pine component, the project proponents determined that the recent history of that part of the forest introduced a high degree of variability resulting from insect and fire effects. Therefore, to reduce the uncertainty of the pool claims and insure a conservative estimate for the claimed avoided emissions of the project, the pine component aboveground and belowground biomass has been excluded from the project claims. A 1-chain buffer around perennial streams is excluded to comply with directives from the Belize Forest Department.

2. Biomass Baseline Carbon Stocks

Baseline biomass carbon stocks consisted of above ground biomass and below ground biomass of the broadleaf component of the coffee conversion area. The mean carbon pool in 2011 was based on field measurements conducted in 2011 and independently verified. The moist forest allometric equation for biomass prediction published in Pearson et. al. (2005) was used to predict above ground biomass. A factor of 50% was used to convert biomass to carbon. A pantropic equation was chosen because higher priority equations were unavailable or unsuitable for the forest on the project area. Accuracy of the equation was validated using the procedure described in module CP-AB "Estimation of carbon stocks in the above- and belowground biomass in live tree and non-tree pools".

Below ground biomass was estimated based on above ground biomass using the equation found in Pearson et al (2005).

An uncertainty level of 14.36% was calculated using module "Estimation of uncertainty for REDD project activities (X-UNC)" and a reduction in climate benefit claims was made in that amount.

Aboveground and belowground biomass attributed to non-tree biomass (palms and lianas) and soil carbon were conservatively excluded.

3. Rate of Deforestation and Agricultural Conversion

Based on the plan for deforestation developed by the landowner, the rate of conversion is 50%/year. This rate was determined to be feasible and in line with common practice.

4. Carbon stocks in agro-ecosystems

The available literature on steady state C stocks for coffee bushes varies widely depending upon geographic location. Belize has one small commercial grower thus there are no published data on C stocks for coffee bushes within Belize. Polzot (2004) found that the carbon stock of open grown (without-Project scenario) coffee bushes in Costa Rica ranged from 1.4 to 3.5 t C ha-1. Thus, FCO uses a conservative figure of 5 t C ha-1 to calculate the without-Project C stocks for the coffee bushes. In addition the plan calls for leaving 10-12 trees for shade on each acre. Based on the inventory, an additional 12 tons of aboveground and belowground biomass were allocated to the coffee conversion area that was withdrawn from the hardwood component of the property.

5. Fate of Forest Resources Lost to Agricultural Conversion (Long-lived Wood Products)

The standard practice in Belize for conversion of forest to agricultural lands is to remove valuable timber species and then bulldoze and burn the remaining trees. An analysis was conducted using module CP-W "Estimation of carbon stocks in the long-term wood products pool" based on the inventory data and found that the available timber for a long-lived wood products pool was de minimis.

6. Loss of biomass attributable to fuel-wood collection

No fuel wood collection was occurring prior to the project and presumably none would occur in the baseline scenario.

7. Avoided emissions from fertilizer use

Avoided emissions from fertilizer use for the baseline was calculated using CDM A/R Methodological tool "Estimation of direct nitrous oxide emission from nitrogen fertilization" (Version 01). In the baseline scenario, fertilizer would be applied at the rate of 1,200 pounds of 13-13-21 and 1,200 pounds of 20-6-12 per acre per annum, based on experience of the pilot coffee project.

8. Avoided emissions from biomass burning

In the baseline scenario, land clearing would include piling and burning of biomass on the site. An analysis of emissions from biomass burning was conducted to determine CH4 and N2O using module "Estimation of greenhouse gas emissions from biomass burning (E-BB)". Avoided emissions from CO2 release are omitted because they are accounted for by biomass changes in

the above ground and below ground biomass pools. Avoided emissions attributable to CH4 and N2O are included.

9. Avoided emissions from transportation fuel use

Emissions from transportation fuel use are conservatively omitted in both the baseline and project scenarios.

Project Emissions

GHG emissions and/or removals for the project are described for the same pools and variables as the baseline scenario with the addition of activity shifting leakage which only applies to the project scenario.

1. Area of forest available for conversion

Same as baseline.

2. Baseline carbon stocks

Same as baseline.

3. Deforestation/conversion rates

No reductions or removals are planned for the life of the project.

4. Carbon stocks in agro-ecosystems

N/A, no conversion is allowed in the project.

5. Fate of commercial timber and long-lived wood products

No reductions or removals are planned for the life of the project.

6. Losses of biomass attributable to fuel-wood collection

No reductions or removals are planned for the life of the project.

7. Avoided emissions from fertilizer use

No fertilization is anticipated as a project activity.

8. Avoided emissions from biomass burning

N/A, no conversion is allowed in the project. In the event of ex-post fires occurring, the REDD Methodological Module: Estimation of greenhouse gas emissions from biomass burning (E-BB) Sectoral Scope 14 will be applied.

9. Avoided emissions from transportation fuel use

Emissions from transportation fuel use are conservatively omitted in both the baseline and project scenarios.

Table 11: Total with-Project mtCO2e sequestered by year.

Year	Project Emissions		Baseline Emissions				Total Avoided Emissions	Total Less Uncer-tainty Deduction	Risk Buffer (23%)	Total After Risk Buffer Removal
	Bio-mass Change	Total Project Emis-sions	Bio-mass Change	Biomass Burning	Ferti-lizer Use	Total Baseline Emissions				
2009	0	0	162,690	5,769	552	169,011	169,011	158,221	38,746	119,475
2010	0	0	162,690	5,769	1,104	169,562	169,562	158,737	38,746	119,992
2011	0	0	0	0	1,104	1,104	1,104	1,033	0	1,033
2012	0	0	0	0	1,104	1,104	1,104	1,033	0	1,033
2013	0	0	0	0	1,104	1,104	1,104	1,033	0	1,033
2014	0	0	0	0	1,104	1,104	1,104	1,033	0	1,033
2015	0	0	0	0	1,104	1,104	1,104	1,033	0	1,033
2016	0	0	0	0	1,104	1,104	1,104	1,033	0	1,033
2017	0	0	0	0	1,104	1,104	1,104	1,033	0	1,033
2018	0	0	0	0	1,104	1,104	1,104	1,033	0	1,033
2019	0	0	0	0	1,104	1,104	1,104	1,033	0	1,033
2020	0	0	0	0	1,104	1,104	1,104	1,033	0	1,033
2021	0	0	0	0	1,104	1,104	1,104	1,033	0	1,033
2022	0	0	0	0	1,104	1,104	1,104	1,033	0	1,033
2023	0	0	0	0	1,104	1,104	1,104	1,033	0	1,033
2024	0	0	0	0	1,104	1,104	1,104	1,033	0	1,033
2025	0	0	0	0	1,104	1,104	1,104	1,033	0	1,033
2026	0	0	0	0	1,104	1,104	1,104	1,033	0	1,033
2027	0	0	0	0	1,104	1,104	1,104	1,033	0	1,033
2038	0	0	0	0	1,104	1,104	1,104	1,033	0	1,033
2029	0	0	0	0	1,104	1,104	1,104	1,033	0	1,033
2030	0	0	0	0	1,104	1,104	1,104	1,033	0	1,033
2031	0	0	0	0	1,104	1,104	1,104	1,033	0	1,033
2032	0	0	0	0	1,104	1,104	1,104	1,033	0	1,033
2033	0	0	0	0	1,104	1,104	1,104	1,033	0	1,033
2034	0	0	0	0	1,104	1,104	1,104	1,033	0	1,033
2035	0	0	0	0	1,104	1,104	1,104	1,033	0	1,033
2036	0	0	0	0	1,104	1,104	1,104	1,033	0	1,033
2037	0	0	0	0	1,104	1,104	1,104	1,033	0	1,033
2038	0	0	0	0	1,104	1,104	1,104	1,033	0	1,033
Total	0	0	325,379	11,539	32,555	369,472	369,472	345,885	77,491	268,394

CL1.2 Net Change in Non-CO_2 Gases

Fertilizer use avoided is in excess of 32k mtCO2e in avoided emissions (Table 11). This figure is based on non-CO2 nitrogen emissions and is calculated using the UNFCCC A/R Methodological tool "Estimation of direct nitrous oxide emission from nitrogen fertilization". The application rate and type of fertilizer was determined from the coffee conversion plan (Headley 2009).

Non-CO2 gases from biomass burning were estimated using the methodological tool VMD0013 Version 1.0 REDD Methodological Module: Estimation of greenhouse gas emissions from biomass burning (E-BB). An estimate of 11,539 mtCO2e was determined for biomass burning in the baseline scenario.

CL1.3 Other GHG Emissions from Project Activities

Emissions from equipment use are considered de minimis and excluded from both the project and baseline scenarios.

CL1.4 Positive Net Climate Impact

According to Sections CL1.1 and CL1.2 the contribution of the Project toward climate change mitigation by GHG emission reduction is evident by virtue of avoiding emissions from land clearing and avoided emissions attributable to fertilizer use.

CL1.5 Avoid Double-Counting

All of the Project's emission reductions will be registered and held by an independent third-party registry, Markit Environmental Registry, to guarantee avoidance of double counting.

CL2. Offsite Climate Impacts

CL2.1 Types of Leakage

Leakage was determined using module "Estimation of emissions from activity shifting for avoided planned deforestation (LK-ASP)". The deforestation agent was determined to be the current landowner.

Step 1 Option 1.2 (option 1.1 is infeasible): Determine the baseline rate of forest clearance for the deforestation agent: Total area deforested by the deforestation agent over the previous 5 years is zero. WoPR is set to 666 ha.

Step 2: Estimate new projection of forest clearance by the baseline agent of deforestation with project implementation if no leakage occurring: NewR is equal to zero.

Step 3: Monitor all areas deforested by baseline agent of deforestation through the year in which planned deforestation was forecast to occur: All areas owned by the landowner in Belize are monitored for deforestation. Result is zero hectares.

Step 4: Monitor greenhouse gas emissions outside the project boundary by baseline agent of deforestation: Fertilizer use and biomass burning will be monitored on all lands owned by the landowner in Belize.

Monitoring of the landowner's property will occur as indicated in LK-ASP and M-MON using a combination of remote sensing and ground observations.

Two areas of leakage for non-CO2 gases are required for monitoring, use of nitrogen fertilizer and biomass burning. The landowner conducts prescribed fire outside the project area to reduce biomass loss from wildfires. Prescribed burning has minimal year-by-year impact on emissions, and the benefits of prescribed fire to prevent catastrophic fire and subsequent loss of biomass are well documented. Records will be kept of nitrogen fertilizer use to prove that fertilizer use has not increased as a result of the project.

CL2.2 Mitigation of Negative Offsite Impacts

There are no foreseen direct negative offsite climate impacts as a result of the project. Since this project is on private land and leakage would presumably also occur on private land, there are no opportunities for leakage mitigation.

CL2.3 Unmitigated Negative Offsite Climate Impacts

No leakage deduction was applied (see CL 2.1).

CL2.4 Unmitigated Negative Offsite Non-CO_2 Climate Impacts

As described above, the Project has no unmitigated direct negative offsite non-CO2 climate impacts. The leakage calculation includes non-CO2 gas emissions from likely fertilizer use on lands where leakage might take place.

CL3. Climate Impact Monitoring

CL3.1 Carbon Pool Selection and Monitoring

In Table 1 three pools are included, aboveground biomass, belowground biomass, and fertilizer. All the excluded pools are conservative omissions allowed by the methodology with the exception of long-lived wood products which was analyzed and found to be de minimis. All included pools are monitored. The goal of the climate monitoring for BRO is to insure that estimates of carbon stocks and GHG emissions are accurate and updated. The three pools included in the project calculations and in the monitoring plan are aboveground biomass, belowground biomass (calculated as a function of aboveground biomass) and fertilizer use.

There are two objectives for the climate monitoring plan at BRO:

Objective 1: Monitor Biomass

Each permanent plot will be revisited and measured no less frequently than every five years. All of the tagged trees will be re-assessed and the DBH and height measured. Species of each tree will be determined if possible. The resultant data will be used to recalculate above ground carbon stocks. The below ground biomass will be calculated using accepted regression equations based upon the updated above ground biomass data.

Objective 2: Monitor Activity Shifting Leakage

Activity shifting leakage associated deforestation, fertilizer use, and biomass burning will be monitored in conjunction with climate, community and biodiversity metrics monitoring. Potential emissions from wildfire and fuelwood collection will be monitored as well, although the ex ante assumption is that no additional emissions will be released from those pools.

Soil carbon, non-tree above ground biomass, dead and downed material, and transportation fuel use are conservatively omitted from the analysis and will not be monitored.

A full project plan will be developed to meet these objectives within 6 months of project approval and made public on the CCB web site.

CL3.2 Monitoring Plan

Forest Carbon Offsets LLC and their partners are committed to expanding on the above monitoring and create a full detailed monitoring plan within twelve months of validation and to make that plan available to the public. The monitoring plan will be made public on the CCBA web site, the FCO web site, and will be delivered in hardcopy form to all the stakeholders who request a copy after being informed of its availability by personal contact, email, or phone. Likewise monitoring information will be made available in the same manner as it becomes available.

Community Section

CM1 Net Positive Community Impacts

CM1.1 Community Benefits

Community benefits will accrue differently to different community segments particularly BRO staff and non-BRO staff. The following analysis follows the Social Impact and Opportunities Assessment procedure found at http://www.icmm.com/page/629/community-development-toolkit-c and developed by the International Council of Mining and Metals.

Step 1: Review social baseline study and determine areas of concern to the communities, potential impacts, as well as areas where the project might present opportunities.

After interviewing stakeholders, a list of community opportunities for the project scenario and list of concerns for the baseline scenario were developed.

Step 2: Assess potential impacts and opportunities and identify areas needing impact management programs.

No negative impacts were suggested by the stakeholders for the project scenario. Several negative impacts were suggested for the baseline scenario including the potential for conflicts between agricultural workers and stakeholders, road impacts, increased wildfire instances, etc.

Step 3: Propose measures to manage and if necessary mitigate the identified impacts and enhance opportunities.

No negative impacts of the project were suggested.

Step 4: Reassess the impacts and opportunities, taking proposed management measures into account.

Impacts of the baseline scenario would be impossible to eliminate. Opportunities suggested by the stakeholders are reflected in the project plan.

Step 5: Work with community and other other partners on participatory development plans that address community priority programs (enhancing opportunities) as well as required mitigation programs (mitigating impacts).

The community suggested the project plan components including the training, and educational benefits. Additional plans were developed by the project proponents to include having an available EMT in the area, developing a radio network for emergency communications, etc.

Step 6: Review management measures and programs

Community is very much in support of the project plan.

Table 12a: Project Scenario Impacts to Existing Community and Stakeholders

Impact Area	Positive or Negative Impact	Significance
Livelihoods - Predicted impacts - Predicted impacts after mitigation measures	Positive N/A	High N/A
Community Relations - Predicted impacts - Predicted impacts after mitigation measures	Positive N/A	Moderate N/A
Education - Predicted impacts - Predicted impacts after mitigation measures	Positive N/A	High N/A
Health - Predicted impacts - Predicted impacts after mitigation measures	Positive N/A	High N/A
Infrastructure - Predicted impacts - Predicted impacts after mitigation measures	Positive N/A	High N/A
Community Development - Predicted impacts - Predicted impacts after mitigation measures	Positive N/A	Moderate N/A

Table 12b: Baseline Scenario Impacts to Existing Community and Stakeholders

Impact Area	Positive or Negative Impact	Significance
Livelihoods - Predicted impacts - Predicted impacts after mitigation measures	No impact No impact	Low Low
Community Relations - Predicted impacts - Predicted impacts after mitigation measures	Negative Neutral	High High
Education - Predicted impacts - Predicted impacts after mitigation measures	Negative Negative	High High
Health - Predicted impacts - Predicted impacts after mitigation measures	No impact No impact	Low Low
Infrastructure - Predicted impacts - Predicted impacts after mitigation measures	Negative Negative	Medium Medium
Community Development - Predicted impacts - Predicted impacts after mitigation measures	No impact No impact	Low Low

A comparison of the project vs. baseline scenarios indicates significant net positive benefits for both the BRO staff and the other stakeholders.

Non-BRO Staff Community Benefits

The portion of the community not employed directly at BRO consists of the surrounding landowners and visitors. A large impact of the project to this part of the community is water quality protection, through avoidance of fertilizer and pesticide use. The project is at the top of the major watershed providing drinking water to a large portion of the country. The baseline scenario also includes a large influx of small leaseholders for work the coffee project. Conflicts

between the agricultural workers and visitors/surrounding landowners would be expected as is common throughout Belize. Other benefits include:

1. Communications – The project will establish radio communications for coordination of fire suppression in the area.

2. Community coalition – Bull Run is at the forefront of various community group activities. Bull Run is a key stakeholder in a Mountain Pine Ridge environmental coalition and the founding stakeholder of the Mountain Pine Ridge emergency response team.

3. Fire -- Bull Run has the only operational heavy equipment permanently located in the Mountain Pine Ridge and will contribute that equipment, company personnel, company expertise and other company assets to respond to wildfire outbreaks throughout the community.

4. Bull Run has the only trained and equipped EMTs in the Mountain Pine Ridge and will make those resources available to the wider community.

5. Emergency Medical Technician – The project will provide the only trained emergency medical technicians in the area.

6. Environment -- The project can only improve the ecology and environment of the Mountain Pine Ridge and hence positively impact all the resorts in the area and their staff, staffing levels and business economics.

7. Good neighbor -- Beyond the obvious community benefits listed above, Bull Run has a long and storied history of contributing in myriad's of small ways to the wider community. Examples include collecting roadside trash, rebuilding the forest reserve entrance gate, rides to and from town, repairing and grading public roads, and frequent roadside assistance for stuck or stranded resort guests and locals.

BRO Staff Benefits

The Project scenario proposes increasing professional skills development (see section G4.3), and a program of reimbursing long-term employees with over five years employment for the educational expenses of their minor children ($4500 paid out in FY2011). Also, provided to BRO staff free of charge are use community garden, housing, and food for staff and immediate family members. The baseline scenario would not require additional training for the staff. The

program to provide educational expense reimbursement is specifically tied to the project scenario.

In addition, the BRO conduct life skills training and facilitates all manner of life management activities (such as opening bank accounts, obtaining visas, fixing erroneous vital records, land title disputes, bank loans, to list but a few).

Figure 10: Bull Run Overseas settlement

CM1.2 Impact on High Conservation Values

No community HCVs are projected to be impacted by the project.

Gen	Clim	Comm	Bio
CM2.		**Required**	

CM2 Offsite Stakeholder Impacts

CM2.1 Potential Negative Offsite Stakeholder Impacts

The Project is not expected to have any negative offsite impacts.

CM2.2 Plans to Mitigate Potential Offsite Impacts

If any negative impact is identified, the BRO team and its community representatives will address such problems. The issue will be discussed and mitigation actions will be designed.

CM2.3 Unmitigated Offsite Impacts

No unmitigated social or economic impacts are expected from the Project.

CM3 Community Impact Monitoring

CM3.1 Community Impact Monitoring Plan

Community monitoring metrics must be directly related to the community objectives of the project.

- For community members who are BRO staff, the monitoring metrics are
  - payroll records
  - training days on the topics already identified
  - reimbursing long-term employees with over five years employment for the educational expenses of their minor children.
- For stakeholders who are not BRO staff, the monitoring metric is a satisfaction rating based on interviews with non-BRO community members conducted in connection with each verification event (no less frequently than every five years).

CM3.2 High Conservation Value Plan

No community HCVs have been identified that will be impacted by the project.

CM3.3 Community Impact Monitoring Implementation

Within twelve months of Project validation a monitoring plan will be developed and implemented according to CM3.1. The monitoring plan will be made publicly available on the internet, and results communicated to all stakeholders. The primary strategy for the community HCV monitoring plan will be periodic surveys of the property managers to determine satisfaction with the project.

Biodiversity Section

B1 Net Positive Biodiversity Impacts

B1.1 Biodiversity Impacts

The biodiversity objective for the Project is to maintain existing biodiversity and HCVs to the extent possible barring set backs from natural processes.

Table 13: Comparison of Baseline and Project Biodiversity based on IUCN Redlist (2012) for selected species found at BRO.

Common name	Scientific name	Habitat	With-Project	Without-Project
Baird's tapir	*Tapirus bairdii*	"wet tropical rainforest, riparian woodland, monsoon deciduous forest, dry deciduous forest, montane cloud forest and paramo (Matola et al. 1997, Gonzalez-Maya pers. comm.)."	Habitat exists.	Habitat loss. Illegal hunting.
Southern river otter	*Lutra longicaudis*	"Rest and den sites are found in areas with dense vegetation"…" associated with dense mature forest with thick undergrowth extending close to shore. Both the above-ground root systems of mature or fallen trees and the dense vegetation cover are important components of L. provocax habitat; absence of these key features may result in absence of otters, even if abundance of prey is not limiting (Chehebar et al. 1986)."	Habitat exists.	Habitat loss in riparian areas.
Margay	*Leopardus wiedii*	"The margay is strongly associated with forest habitat/tree cover, both evergreen and deciduous, although it has been occasionally reported outside forested areas (Nowell and Jackson 1996)."	Habitat exists.	Habitat loss. Loss of prey species due to illegal hunting.
Great curassow	*Crax rubra*	"It is restricted to undisturbed humid evergreen forest (also seasonally dry forest in some areas) and mangroves. It is primarily a lowland species but has been recorded at altitudes of up to 1,900 m in Panama."	Habitat exists.	Habitat loss. Illegal hunting.
Ocellated turkey	*Meleagris ocellata*	It occupies non-flooded mature forest, but associates with seasonally flooded habitat and open areas when breeding	Habitat exists.	Habitat loss. Illegal hunting.

With-Project Scenario

The with-Project scenario presumes that with proper protection of the site and the exceptional existing biodiversity of the site will be maintained. In addition the Project will provide funding for more protection for HCV species. Large/medium mammal surveys will provide valuable information on several IUCN species. Patrols to eliminate hunting will ensure existing populations and habitat will remain on the site. Any potential impacts to populations or habitat will be from natural causes only. The following surveys will be conducted:

- Large-medium mammals will be surveyed using remotely-triggered camera traps in conjunction with Dr. Marcella Kelly's Jaguar Project or a similarly competent researcher.
- Anecdotal observations of other species will be noted with particular emphasis on species of High Conservation value.

Justification for the use of camera traps follows Waldon, Miller, and Miller (2011).

Without-Project Scenario

The without-Project scenario presumes that the property will receive less protection for HCVs. Patrols to eliminate hunting and expectations are that significant negative impacts to hunted species and predators that rely on hunted species may result. Removal of tropical forest component will eliminate habitat for many species (IUCN 2012) and severely degrade the value of riparian corridors within the property. Travel corridors across the property will be eliminated reducing genetic interchange between surrounding protected areas.

B1.2 Impact on High Conservation Values

The with-Project scenario will maintain existing HCVs by means of regular patrols and protection of habitat. This Project addresses multiple High Conservation Values (Table 6).

B1.3 Species Used by the Project

No species are being used by this Project since it is a natural native forest. All vegetation in the Project area is natural regeneration.

B1.4 Exotic Species in the Project Area

There are no exotic species used in the Project area.

B1.5 Genetically Modified Organisms

The Project will not use any genetically modified organisms in its operations.

B2 Offsite Biodiversity Impacts

B2.1 Potential Negative Offsite Biodiversity Impacts

The Project does not anticipate any offsite negative biodiversity impacts. Offsite impacts will be positive since larger habitat and forest areas will improve the long-term viability of populations offsite through connectivity of off-site habitats on surrounding conservation lands.

B2.2 Mitigation of Potential Negative Offsite Biodiversity Impacts

If any negative impact is identified, the BRO team and the stakeholder representative will address such problems with fast and effective solutions. The issue will be discussed and mitigation actions will be designed.

B2.3 Evaluation of Potential Negative Offsite Biodiversity Impacts

The Project does not anticipate any offsite negative biodiversity impacts. Most offsite impacts will be positive since larger habitat and forest areas will improve the long-term viability of populations offsite.

B3 Biodiversity Impact Monitoring

B3.1 Biodiversity Impact Monitoring Plan

The initial plan for biodiversity metrics is described in Table 3.

Table 14: Objectives of biodiversity monitoring

Taxa	Why	Method	Analysis
Medium-large mammal assemblage.	Assessment of ecosystem health, and investigation of empty forest syndrome by human over-hunting pressures.	Sampling array of camera traps (15-20 stations minimum of 750 trap nights).	Diversity indices, species richness, species heterogeneity, species evenness, relative trap success, and population size analysis for individually identifiable species (e.g. jaguar).

Opportunistic observations of avian and mammalian IUCN listed species.	Document presence absence of additional IUCN species of concern.	Time constrained expert searches focused on target species in appropriate habitats during appropriate seasons.	Continued presence/absence documentation of species of global concern.

Monitoring will occur in conjunction with each verification event and no less frequently than every 5 years. Monitoring will occur in a scientifically representative manner for the project area. At least 15 camera trap sites will be used for monitoring. A complete list of camera trap sites will be included in the monitoring plan.

B3.2 Biodiversity Impact Monitoring Effectiveness

The primary strategy used to maintain the biodiversity HCVs is to protect the property through patrols and avoid conversion to agriculture. The monitoring metric is presence/absence of the biodiversity HCVs. Loss of an HCV species is not necessarily considered a failure of the Project if that loss is not linked to anthropomorphic factors like hunting. Maintenance of forest cover (as determined by permanent plots and satellite imagery) and the habitats within the forest is the responsibility of the Project. Monitoring of selected biodiversity HCVs utilizing the methods described in section B3.1 will be conducted and is expected to be 100% effective at determining presence/absence of those HCVs.

B3.3 Biodiversity Impact Monitoring Implementation

A full monitoring plan as described in section B3.1. Biodiversity Impact Monitoring Plan will be initiated within twelve months of validation against the Standards and to disseminate this plan and the results of monitoring. This monitoring plan will be made publicly available on the internet and shared with stakeholders for public comment. Once approved, the plan will be executed on BRO for the initial monitoring period. The same repeatable methodologies will be followed up again at least every five years by qualified trained biologists from the date of registration with the CCBA.

Gold Level

Gen	Clim	Comm	Bio	Gold
GL3. **Optional**				

GL3 Exceptional Biodiversity Benefits

GL3.1 Vulnerability or Irreplaceability

The Project site has a documented history of Baird's tapir (*Tapirus bairdii*) onsite. The Baird's tapir is listed as IUCN-EN with declining populations (Davis, Kelly & Stauffer 2010). Images for IUCN species from onsite camera traps have been reviewed by the auditors.

Figure 11: Baird's tapir (*Tapirus bairdii*) in Belize.

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