Assessment Report:
Forest Carbon Project Potential – Small Forestland Owners
(BC South Coast)

Prepared for:
Four forest landowners – details removed for their privacy

With support from:

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Contents

Executive Summary

The owners of four privately managed forest lands are evaluating the carbon crediting potential of their properties. The properties approximately 500 ha and are located near Vancouver Island and the adjacent Gulf Islands, in British Columbia, Canada. The proposed project area(s) within these properties are composed dominantly of Douglas-fir stands, with lesser components or hemlock, arbutus, Garry oak, and western red cedar. To provide insight on the carbon crediting potential of the properties, these participating members, supported by the BC Conservation Foundation retained Zimmfor Management Services Ltd. (Zimmfor) to:

1. Complete a timber assessment (qualitative) on their properties to determine the merchantable standing timber available,
2. Describe the process and requirements to join an existing carbon crediting project (specifically the BigCoast Forest Climate Initiative implemented by Mosaic Forest Management Corp.),
3. Provide an estimate of the carbon credit potential of the properties, and
4. Propose a carbon project implementation plan.

Zimmfor has provided an overview of VERRA's Verified Carbon Standard and the VM0012 methodology used to implement Mosaic's BigCoast Forest Climate Initiative (BigCoast). Additionally, an overview of the eligibility requirements for new project activity instances has been included.

Due to the relative small size of the properties (and volume of merchantable timber) it is only feasible for the landowners to join an existing carbon project as a new project activity instance (PAI). In the case of BigCoast Forest Climate Initiative (BigCoast), this would require alterations to the existing project document and monitoring report.

Zimmfor has provided an overview of VERRA's Verified Carbon Standard and the VM0012 methodology used to implement BigCoast. Additionally, an overview of the eligibility requirements for new project activity instances has been included.

Field surveys of the properties determined the volume of standing merchantable timber eligible for a 40year carbon project (numbers removed for landowner privacy).

The properties would generate Verified Carbon Units (VCUs) over a 40-year project period. A proposed implementation plan has been provided if the properties are able to join the BigCoast project.

The ability to generate credits will be limited to historical practices (modelled as a sustained harvest rate with a 75-year rotation, as opposed to Common Practice).

Based on the assumptions noted within the assessment, the net present value of this project is estimated in the attached proforma.

1 Introduction

A group of interested forest landowners, supported by the Coastal Douglas-fir Conservation Partnership (CDFCP), retained Zimmfor Management Services (Zimmfor) to assess the forest carbon crediting potential for member owned forested lands (referred to as the properties from this point forward). These lands are located on or near Vancouver Island and approximately 500 ha. Each of the four properties is spatially distinct, with two being located on southeastern Vancouver Island, one located on Salt Spring Island, and one located on Texada Island. Forests within these lands are within the Coastal Douglass Fir Moist Maritime (CDFmm) and Coastal Western Hemlock Eastern Very Dry Maritime (CWHxm1) biogeoclimatic zones.

Overstory tree species in these biogeoclimatic units are dominated by Douglas-fir, Western redcedar, and grand fir. Western hemlock is common within CWHxm1 sites, along with big leaf maple and arbutus in the CDFmm. The volume of current (2024) merchantable timber for all the properties was determined, but has been removed from this report to maintain landowner privacy.

The Group has retained Zimmfor Management Services Ltd. (Zimmfor) to assess the carbon crediting potential of the properties. This assessment required validation of the current standing forest inventory to determine the potential to join Mosaic's BigCoast Forest Climate Initiative (BigCoast) carbon offset project. Additionally, the assessment provides:

1. An overview of the voluntary carbon crediting standard administered by VERRA, titled the Verified Carbon Standard (VCS),
2. A review of VCS methodologies and a recommendation for the most appropriate methodology to be implemented on the properties,
3. Projections of carbon credits and revenue potentials from project scenarios, and
4. A proposed carbon credit implementation plan for the most appropriate carbon crediting methodology

A map of the properties is included in the Appendices.

2 Forest Carbon

Several carbon crediting standards generate carbon credits which are applicable to the voluntary carbon offset market. These standards vary in their applicability, offering preferences for locations, target industries, and methodologies available. VERRA's VCS[1] offers methodologies which are globally applicable and target a variety of topics and project types. Voluntary carbon offset projects in Canada benefit from the versatility of the VCS and the methodologies offered.

2.1 VERRA – Verified Carbon Standard

VERRA's – VCS creates sellable carbon credits through the formation of emission reductions generated from altered project management. The carbon credits generated are termed Verified

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[1] https://verra.org/programs/verified-carbon-standard/

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Carbon Units (VCUs). VCS methodologies are appliable to several industries including forestry, mining, agriculture, and transportation. Methodologies under the VCS program have become the world's largest generator of carbon offset credits. The wide applicability and versatility of carbon credits generated under the VCS program is ideal for private managed forest lands in Canada.

VERRA is an approved Offset Project Registry for the California Cap-and-Trade program, allowing VERRA to facilitate the development of projects and listing of carbon credits on the California Air Resource Board (ARB) compliance offset market. Additionally, the International Civil Aviation Organization (ICAO) and the Carbon Offsetting and Reductions Scheme for International Aviation (CORSIA) have made carbon offsets from VCS projects (specifically VM0012) applicable for use toward CORSIA offsetting requirements.

The VCS now requires that projects demonstrate contributions to sustainable development goals, as defined and tracked by the United Nations Sustainable Development Goals (SDGs). The project proponent must demonstrate that the project contributes to at least three SDGs.

2.1.1 VERRA – Sustainable Development Verified Impact Standard (SD VISta)

The United Nations "2030 Agenda for Sustainable Development" contains 17 Sustainable Development Goals [2] which are used to measure, guide, assess, etc. progress towards meeting Agenda objectives.

Many organizations have chosen to publicly support this Agenda by participating in the UN Global Compact [3] and make efforts to achieve some or all of the 17 SDGs by implementing projects or undertaking activities that relate to the indicators associated with the SDGs.

Implementation of a forest carbon project via the VERRA administered VCS will result in the issuance of VCUs. Under the recently updated VCS standard, this project will be required to demonstrate that it contributes to at least three SDGs; additionally, it is assumed that end-users of the VCUs will also be seeking to illustrate how they [positively] contribute to the SDGs (and therefore will give preference to VCS projects that can verify the SDG contributions).

VERRA has a complementary process called the Sustainable Development Verified Impact Standard (SD VISta) that is designed as the framework for assessing and reporting on the sustainable development benefits of the activities related to a project. Implementing a SD VISta carbon project will have the ability to apply an "SD VISta label" to the VCUs generated/issued from the carbon project.

Zimmfor has identified that this project may be eligible for the SD VISta program in combination with the VCS standard to generate SD VISta claims and VCU labels. Therefore, our recommendation is that the PFLA and property owners consider assessing (i.e., "certifying") any resulting forest carbon project against the SD VISta standard at the same time the VCS validation/verification process is occurring.

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[2] For a full list of SDGs and information on the 2030 Agenda for Sustainable Development, see the United Nations website: https://sdgs.un.org/2030agenda.
[3] What is the UN Global Compact | UN Global Compact

3 Verified Carbon Standard (VCS)

VERRA offers several carbon credit methodologies for a variety of forest areas and management practices. The VCS program allows certified projects to convert greenhouse gas emission reductions and removals to tradeable carbon credits. As of 2023, over 1,600 VCS registered projects have been created, resulting in the issuance of over 1.2 billion verified carbon credits.

Each VCU represents 1 [metric] tonne of carbon dioxide equivalent emission reduction.

VERRA has created 14 forestry specific methodologies, with each targeting a specific management scenario and/or forest ecosystem type. Additional requirements, such as third-party certification may further limit the applicability of forestry VCS methodologies.

The minimum project period for all VCS forestry projects is 40-years. Project proponents will be responsible for providing evidence of free prior and informed consent of stakeholders within the project area, including a method for addressing and recording any grievances which may arise.[4] Additionally, the project must show how it respects human rights and equity, including human rights, respect for indigenous rights and cultural heritage.

In a situation where the Group was to establish a stand-alone project (i.e., no linkage to BigCoast), five methodologies would be suitable for the properties:

a) VM0003 – Methodology for Improved Forest Management Through Extension of Rotation Age (IFM ERA),
b) VM0010 – Methodology for Improved Forest Management: Conversion from Logged to Protected Forest,
c) VM0012 – Improved Forest Management in Temperate and Boreal Forests (LtPF),
d) VM0034 – Canadian Forest Carbon Offset Methodology, and
e) VM0045 – Improved Forest Management Using Dynamic Matched Baselines from National Forest Inventories.

The VM0003 – Methodology quantifies greenhouse gas (GHG) emission reductions and removals generated by increasing forest carbon stocks through the extension of stand rotation age prior to timber harvesting. This methodology allows for the continuation of commercial timber harvest on the properties, diversifying revenue streams to include both timber harvest and carbon credits. This methodology requires stands to be certified by the Forest Stewardship Council (FSC) by the start of the project crediting period. The methodology is applicable worldwide and is not specific to certain ecological zones. Carbon credits generated using the VM0003 methodology are only applicable to the voluntary crediting market.

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[4] Free, Prior and Informed Consent (FPIC) is defined as a safeguard to protect the rights of indigenous peoples and local communities, particularly relating to decision-making processes that affect their lands, territories, and resources. To satisfy the meaning of FPIC, the agreement of the affected community must be obtained (1) without coercion, (2) before any irreversible action is taken, and (3) after the community is provided accurate and culturally appropriate information about the nature, scope, and potential impacts of the proposed project. (Source VCS Program Definitions v4.5). The VCS Project Description & Monitoring Report v4.4 template uses a table to describe the outcome of FPIC process as part of stakeholder consultation process at validation and during the monitoring period.

The VM0010 - Methodology for Improved Forest Management: Conversion from Logged to Protected Forest converts forests designated for operational timber harvest to conservation forests. The methodology is applicable worldwide and requires that the project area is managed for timber harvest prior to project implementation and that the intent to harvest can be demonstrated through approved forest management plans. The project area must not include managed wetland or peatland areas. The project scenario cannot include any form of commercial timber harvest within the project area. This methodology does not include the belowground tree biomass carbon pool, which potentially results in fewer carbon credits compared to the VM0003 and VM0012 methodologies.

VERRA's VM0012 – Improved Forest Management in Temperate and Boreal Forests (LtPF) (v1.2) methodology is applicable worldwide, generates credits applicable to both the voluntary and regulatory markets, and does not require additional forest certification as a prerequisite. Commercial timber harvesting is not permitted under the methodology however, low levels of timber harvest to maintain or enhance forest health is permitted. The VM0012 methodology maximizes the amount of carbon credits which can be generated from the property due to the significant harvest deferral.

The VM0034 Canadian Forest Carbon Offset Methodology is applicable to a variety of Canadian only project activities that occur on private or Crown lands. The methodology was designed to quantify carbon offsets that occur through reduced forestry operations, improved forest management, reforestation projects, maintained or increased stores of carbon in wood products, or avoided forest land clearing activities. This methodology applies to the following VCS project categories:

- Afforestation, Reforestation and Revegetation (ARR),
- Improved Forest Management – Reduced Impact Logging (IFM-RIL),
- Improved Forest Management – Logged to Protect Forests (IFM-LtPF)
- Improved Forest Management – Extended Rotation Age (IFM-ERA)
- Improved Forest Management – Low to High Productivity (IFM-LtHP)
- Reduced Emissions from Deforestation and Degradation – Avoided Planned Deforestation (REDD-APD)

Project activities implemented with the Group's forest lands would classify as IFM-LtPF. VCUs are calculated based on the difference in emissions from all historic activities occurring in a project area (baseline), compared to the reduction or absence of all harvest activities.

The VM0034 methodology offers two methods of determining carbon stocks. The first is based on forest inventory measurements and processing through calculations listed in the methodology. This method is suitable for smaller projects with more homogeneous forest stands. The second method utilizes existing forest inventory and modelling programs capable of projecting carbon stocks coupled with sampling within the project area to verify model projections. Initial model projections of carbon stocks must be adjusted to match actual forest conditions following stand monitoring. The project proponent must demonstrate that the selected model and sampling techniques are appropriate to the provincial forest ecosystem and is consistent with IPCC standards. Models suggested by the methodology include CBM-CFS3 and FORECAST. The methodology provides information on accounting for uncertainty when using either of the two methods.

The VM0034 methodology offers flexibility during project implementation due to the selection of carbon pools, method of carbon storage calculation and monitoring, leakage determination, and determination of carbon stored in harvested wood products. Although greater flexibility may result in a tailored project scenario, this flexibility may also be detrimental during project implementation and auditing. Additionally, the VM0034 methodology is specific to Canada and the credits produced via the methodology are not eligible under the CORSIA program which would hinder sales of carbon credits on the global voluntary offset market.

VM0045 methodology is applicable to several project types classified as Improved Forest Management. The methodology requires the use of national or sub-national forest inventory databases to represent baseline scenario data. Project activities must maintain forest stands and include an intervention which is expected to achieve improved net carbon emission outcomes relative to business-as-usual practices.

Implementation of the VM0045 methodology is catered to projects located within the United States. The methodology requires extensive data from the national/sub-national forest inventory program. Net GHG emission reductions and removals require significant data on carbon stocks from a variety of pools, all of which are sourced from regionally appropriate data. This data reliance may act as a restriction to project implementation, depending on the geographical location and distribution of project instances.

The VM0045 methodology is very new (introduced October 2022; updated March 12, 2024), and no projects have been verified to this standard. This may pose challenges during project auditing and sale of carbon credits.

Credits produced via this methodology or not eligible under the CORSIA program and therefore would potentially hinder sales.

It is acknowledged that multiple methodologies can be included within a single project, but due to complexities in implementing and administering, this was deemed not feasible and assumed to not be of interest

Due to the size, carbon crediting potential of the properties, and the economic barriers associated with project implementation, the most economically feasible option to develop carbon credits through the deferral of timber harvest is to join an existing carbon offset project. Mosaic's BigCoast project was implemented under the VCS – VM0012 methodology. This project was developed as a grouped project, allowing for the addition of project activity instances (PAI) throughout the life of the project. The most feasible option to gain carbon credits from the properties is to join the BigCoast project as a new PAI.

4 VM0012 – Improved Forest Management (IFM) in Temperate and Boreal Forest (LtPF)

The VM0012 methodology emphasizes improved forest management, with the goal of converting "logged to protected forests" within temperate and boreal ecological zones. The project area must occur on privately owned lands or where the project proponent can demonstrate legal right to manage resources. The project area cannot include managed peatlands as per the VM0012 methodology eligibility requirements.

Verified Carbon Units are generated from reduced and avoided emissions from timber harvest in the project scenario compared to the baseline scenario (business as usual). Suitable project areas include those which protect logged or degraded forests from further logging or protect forests from future logging. The methodology offers flexibility to landowners and forest managers by allowing them to specify harvest reduction areas on their lands, while continuing regular harvesting in non-project areas. The minimum project period under the VM0012 methodology is 40-years to satisfy the requirements of the Agriculture, Forestry and Other Land Uses (AFOLU) Non-Permanence Risk Tool[5]. This 40-year project period cannot be aggregated among properties. Projects which choose to aggregate properties are termed Grouped Projects, in which each instance of the methodology or project activity must fulfill its own set of eligibility requirements[6].

The VM0012 methodology accounts for carbon stored in above and below ground tree biomass, deadwood, carbon stored in harvested wood products, and avoided emissions from the combustion of fossil fuels by vehicles used in timber harvest and log transport. Determining the carbon stored in these pools is achieved by following calculations outlined in the VM0012 methodology and use of regionally applicable carbon modeling programs.

4.1 Project Eligibility Requirements

To be eligible for VM0012 project implementation, the Project Proponent and project area must satisfy the following eligibility requirements:

1. The project must meet the most recent approved criteria for VCS Improved Forest Management – Logged to Protected Forest,
2. Project area must be within the Temperate and Boreal Domain Global Ecological Zones,
3. Projects must be owned by the Project Proponent, or the Project Proponent must have the legal rights to resources within the project area,
4. Average annual illegal, unplanned, and fuelwood removals are less than 5% of the total annual harvest levels at the start of the project,
5. Project areas do not encompass managed peatland forests,
6. The total percentage of wetlands within the project area is not expected to change as part of project activities,
7. Projects demonstrate that there will be no activity shifting leakage to other lands owned or managed by Project Proponents outside the project boundary at the beginning of the project, and

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[5] To pass the AFOLU Non-Permanence Risk Tool assessment, the project crediting period must be a minimum of 40 years. Refer to the AFOLU Non-Permanence Risk Tool v4.2 guideline for additional information.

[6] Further information is provided in the VCS Standard v4.5.

8. Projects do not include non-*de minimis* application of organic or inorganic fertilizer in the project scenario.

4.2 Data Requirements

Development of a VCS VM0012 project requires extensive background information to be used in both scenario development and model projections. This information can be placed into two categories:

1. Forest management data, and
2. Forest inventory data.

Forest Management Data

Data from forest management plans describes how forest enterprises and landowners are currently using the forest. This includes the following:

- Total area – the total forested and non-forested area where the forest enterprise can operate.

- Forested area – the area which is forested and available for harvest (excludes non-forested areas such as waterbodies, roads, grass lands, buffer areas, areas of historical value, inoperable areas, etc.).

- A description of land use, describing present and future use of the forest. This will identify any planned infrastructure development or land use changes (e.g., reforestation and permanent deforestation areas).

- GIS data which shows the total area, forested area, and identifies prominent landscape features such as roads, water bodies, and inoperable areas.

- Volume (m^3) of timber projected to be harvested annually within the project area.

- Harvested wood products – description of use for harvested timber, including percentage utilization being converted to lumber and pulp related products.

Additional information regarding previous volume harvested and previous planned timber harvest may be requested to gain carbon credits from previous harvest deferrals. Based on information communicated from the owners of the properties, it is believed the information above is available.

Forest Inventory

Forest inventory data describes the current state of the forest and provides vital information to model the projected forest conditions. Data required for carbon sequestration modeling includes:

- Description of species cover and species associations within forested areas.

- Timber volume per hectare (m^3/ha).

- Average mean annual increment (m^3/ha/yr) for forested areas.

- Growth curves – (m³/yr) for each stand cover type within forested areas. Forest cover types can be single species or mixed species associations and are based on the dominant overstory species in the stand.

- Forest stand data – including species, height (m), diameter at breast height (DBH) (cm), Site index (SI), stand number/ID, and any other relevant information used by the forest enterprise. This information often includes characteristics for primary, secondary, tertiary, and understory species.

Sourcing Data

Data requirements (listed above) should be readily available to the property as the VM0012 methodology is based on reducing timber harvest in areas under active and planned forest management. Prior to validation/ verification (i.e., certification) of the project, the Project Proponent is responsible for outsourcing any data which is outstanding. A statement must be made justifying the use of externally sourced data, describing its applicability to the project area. Descriptions of harvested wood products and mill efficiency can be extracted from regionally applicable, peer reviewed sources.

Much of the above data requirements have been determined based on Mosaic's existing BigCoast project and can be used for carbon credit determination on the properties.

4.3 Monitoring Requirements

In a VM0012 project, the Project Proponent will be responsible for developing a monitoring protocol which collects additional data on the status of the project area and forest conditions. This data will be used to adjust the project following disturbances and verify model projections.

4.3.1 Spatial Monitoring

The Project Proponent will monitor spatial changes to the project area annually. Landscape changes (anthropogenically or naturally caused) which are greater than 4 ha will require the Project Proponent to reassess or further stratify the project area. Ground verification will be required when reportable spatial changes are identified. Crews will identify the disturbance area and trace its outline with GPS units to update the inventory data as needed.

4.3.2 Stand Monitoring

Monitoring plots must be established to verify the carbon content of stands. The VM0012 methodology identifies suitable tools to determine the number of plots required based on the variability of forest conditions. At a minimum, each analysis unit/ strata created for project modeling requires one sample plot. Field crews must collect data to determine the carbon contained within live trees and standing and lying dead organic matter. Measured carbon values will be compared against modeled values within the same stand and age type. Comparisons will be used to calculate the uncertainty value used within the VM0012 methodology. Uncertainty values must be calculated at each verification period.

4.4 Additionality

Carbon credit generation and project scenario development are dependent on the principle of additionality. Additionality is achieved when the planned activity (project scenario) results in emission reductions or removals that are greater than the current (baseline) management scenario. The project activity must not have occurred in the absence of incentives created by

carbon markets. Additionality is used as an indicator that the new management regime creates a net environmental benefit and reduction in GHG emissions, allowing it to be used to offset emissions.

The VM0012 methodology uses an additionality assessment tool published by VERRA to certify that the proposed project follows additionality requirements. The tool assesses land use options for the area and requires the Project Proponent to compare project opportunity (carbon project) costs to current revenue generated from the baseline management scenario (commercial harvesting).

In the context of BC forestry operations, property owners will achieve additionality by reducing the total harvest volume for a period of 40-years. Low levels of timber harvest[7] can still occur within the project area if it can be proven that it contributes to forest health and carbon sequestration and does not exceed 20% of the harvesting volume projected in the baseline scenario over an equivalent 10-year period.

4.5 Modeling Carbon Stocks

Several requirements are identified in the VERRA VM0012 methodology for selecting an appropriate carbon sequestration model. Model input fields and specific data requirements will vary depending on the selected model. Project technicians must ensure that the model is applicable to the project area and provide justifications for any alterations made. The accuracy of model projections is a function of the provided forest inventory data and the applicability of the model to the project environment. Model projections can be verified by collecting actual data from a particular forest stand. Comparisons of carbon storage between projected values and calculated field values of that stand type and age class will be made to assess model accuracy.

Effective modeling requires accurate input data. In the case of carbon budget modeling, obtaining accurate initial forest inventory data and accurate growth curves will significantly influence projections of carbon stock. Emphasis should be placed on ensuring this information is as accurate as possible.

The Carbon Budget Model of the Canadian Forest Sector (CBM-CFS3) is ideal for use in modeling forest carbon stocks in British Columbia and has been used for modeling the BigCoast project. Carbon stock modeling within the properties will be achieved using the same method as implemented in the BigCoast project.

4.5.1 Harvested Wood Products

Harvested wood products (HWP) are pulp and lumber products created from timber harvested within the project area. Reductions (typically) from HWPs account for carbon stored and lost in

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[7] Within the VM0012 methodology, project scenarios may undertake low levels of management activities for forest maintenance, ecological enhancement, and/or risk mitigation (for example, pest management, salvage, etc.). These activities must meet the following requirements: 1. All net GHG emissions from project activities must be modeled and accounted for in the project scenario in the same manner as the baseline scenario. 2. Project activities cannot remove > 20% of the harvesting volume projected in the baseline scenario over an equivalent 10-year period. 3. Project proponents must be able to demonstrate that activities: (a). have a conservation benefit and are consistent with principles of managing for biodiversity, ecosystem function, and carbon retention. (b). are related to restoration, ecological management, or emissions risk reduction.

wood during product manufacturing and decay. Carbon storage and release from HWP are accounted for in both the baseline and project scenarios if relevant.

Reductions are made to account for utilization loss within the harvest area, which include removals for carbon lost during bucking and raw log processing. Processed logs are transported to mills, which have additional manufacturing loss factors applied to them. Tree utilization values and milling reduction values can be sourced from peer reviewed papers or from industry partners with reputable experience. Carbon contained in harvested wood products shall be separated into the following categories:

1) Short lived wood products – HWP and wood waste which decay within 3 years,

2) Medium lived wood products – HWP and wood waste which are retired between 3 and 100 years,

3) Long lived wood products – HWP and wood waste which are considered permanent, lasting 100 years or more.

Reductions for carbon stored and released from HWP are only applicable if harvesting occurs in the project scenario. If the Project Proponent does not conduct any harvesting in the project period, then no reductions will be made to carbon sequestration calculations which affect VCUs generated. Thinning and stand tending are included in harvested wood products calculations.

4.6 VCU Reductions

VERRA carbon credit projections require Project Proponents to account for various reduction factors, including project non-permanence risks, market leakage, and project uncertainty. These values act as reductions to calculated VCUs in the project scenario. Verra has published tools to assist in the calculation of these values after formal project modeling. Providing reduction estimates for each category prior to project initiation is challenging due to the amount of input information required in calculations.

Risk: Non-permanence

Non-permanence refers to a risk rating that is applied to the project. The risk rating is calculated by assessing risk factors outlined in the AFOLU Non-Permanence Risk Tool. Risk factors are composed of three categories: internal, external, and natural risks (including natural disturbances), with additional sub-categories for project management, financial viability, and community engagement. The calculated risk factor based on the above criteria defines a percentage of VCUs which shall be added to the AFOLU buffer pool. The minimum Non-permanence reduction applied to any project under version 4.2 of the Non-permanence Risk Tool is 12%. The BigCoast project's risk rating is 19%, which would be deducted from the VCU's generated by the properties as well.

Risk: Leakage

Project leakage accounts for any increase in GHG emissions which occur outside of the project boundary, but within the same country and are attributed to project activities. All leakage occurring due to the project must be assessed and accounted for in GHG calculations. Positive leakage (increased GHG emissions) will be deducted from the total VCUs calculated.

Leakage can be caused by two sources: activity shifting leakage, and market leakage. Activity shifting leakage occurs when the Project Proponent increases timber harvest elsewhere within lands they own (within the same country) to compensate for reductions within the project area. Market shift leakage happens when the availability of commodities is affected by project implementation, causing increased demand and greater production elsewhere.

No activity shifting leakage is permitted following project implementation. The VM0012 methodology provides guidance on calculating the market leakage reduction. The market leakage reduction factor for the BigCoast project is 10% which will be applied to the properties.

Risk: Uncertainty

Uncertainty reductions account for uncertainties associated with forest inventory, carbon stocks, biomass growth rates, modeling error, and other various expansion factors and coefficients. Uncertainty values can be mitigated by using peer-reviewed scientific data and methodologies, and high-quality forest inventory sampling procedures. Project uncertainty is a function of model error and inventory error. Uncertainty factors are assigned based on the project error:

Table 1: Uncertainty calculation tool

Estimated Project Error (E$_p$)	Uncertainty factor
0 – 10%	1.5%
>10%	1.5% + E$_p$ – 10%

The uncertainty reduction factor applied to VCU projections is 1.5%. The BigCoast project has a 1.5% uncertainty factor reduction.

4.7 Grouped Project Requirements

The properties are eligible to be added to the BigCoast carbon project as a new project activity instance (PAI). Additional project activity instances can be added to an existing project after the initial validation has occurred. The new activity instance must adhere to the eligibility requirements specified in the VCS Standard (v4.5):

1. Meet the applicability conditions set out in the methodology applied to the project (eligibility requirements).
2. Use the technologies or measures specified in the project description.
3. Apply the technologies or measures in the same manner as specified in the project description.
4. Are subject to the baseline scenario determined in the project description for the specified project activity and geographic area[8], and
5. Have characteristics with respect to additionality that are consistent with the initial instances for the specified project activity and geographic area.

New PAI(s) wishing to join an existing project must satisfy the eligibility requirements of the methodology the project was registered with. In the case of the BigCoast project, additional project activity instances must meet the VM0012 methodology eligibility requirements (as described in Section 4.1).

Additionally, the VCS Standard (v4.5) requires that the new project activity instance shall:

1. Occur within one of the designated geographic areas specified in the project description (as noted in the BigCoast joint project description document and monitoring report).
2. Conform with at least one complete set of eligibility criteria for the inclusion of new project activity instances.
3. Be included in the monitoring report (BigCoast joint project description document and monitoring report) with sufficient technical, financial, geographic and other relevant information to demonstrate conformance with the applicable set of eligibility criteria and enable evidence gathering by the validation/verification body.
4. Be included in an updated project description, with updated project location information which shall be validated at the time of verification against the applicable set of eligibility criteria.

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[8] This has been clarified with VERRA. Additional project activity instances can use a different project baseline and additionality assessment provided certain conditions are met. This is described further in Section 4 of this document.

5. Have evidence of project ownership held by the project proponent from the respective start date of each project activity instance. In this case, individual owners of the properties would be added as an additional project proponent.
6. Have a start date that is the same or later than the grouped project start date.
7. Be eligible for crediting from the start date of the project activity instance through to the end of the project crediting period.
8. Only eligible for crediting from the start of the verification period in which they were added to the grouped project.
9. Not be or have been enrolled in another VCS project, and
10. Adhere to the clustering and capacity limit requirements for multiple project activity instances.

Lastly, the BigCoast project identifies eligibility criteria for new project activity instances, although this criterion contains overlap from the VCS Standard and VM0012 methodology. The criteria created by the BigCoast project is subject to change and can be modified to better suit the inclusion of new project activity instances. This would require the submission of a project document deviation which redefines the geographic region and additionality assessment of the project, an updated set of project activity instance eligibility criteria, and the submission of a new project document that notes the changes made. Inclusion of additional PAI(s) to the BigCoast project must adhere to the following:

1. The PAI must meet the applicability conditions defined in the most recent version of the VCS methodology VM0012 – Improved Forest Management in Temperate and Boreal Forests (LtPF), or conditions specified in the applicable methodology selected.
2. The new PAI must utilize all technologies or measures used in the BigCoast joint project description document and monitoring report and must satisfy conditions of the selected methodology. Any novel technologies utilized shall be clearly identified and defined.
3. Technologies or measures shall be applied in a similar fashion as outlined in the BigCoast project description document.
4. The PAI(s) will utilize the same baseline scenario as described in Section 6 or a baseline scenario appropriate to the specified methodology for the geographic area defined in Section 4.
5. The PAI(s) will have characteristics with respect to additionality that are consistent with the initial instance of the project and geographic area. Such characteristics include financial and technical parameters or barriers.
6. Additional activity instance(s) must also satisfy inclusion requirements as outlined in the most current version of the VCS Standard.
7. The PAI(s) must use the GHG information systems and controls (or equivalent) in use by the Project Proponent, Project Developer and/or the Implementation Partner.

5 BigCoast Forest Climate Initiative

Mosaic's BigCoast Forest Climate Initiative (BigCoast)[9] is a voluntary forest carbon offset project registered under the VCS using the VM0012 – Improved Forest Management (IFM) in Temperate and Boreal Forests (LtPF), v1.2 methodology. The BigCoast project generates greenhouse gas (GHG) emissions reductions and removals through the voluntary deferral of harvestable timber volume. The BigCoast project was designed as a grouped project, allowing Mosaic to add additional project activity instances to the carbon project for future carbon credit generation. Additional PAIs must be within a similar geographical area as the existing project (coastal British Columbia). The current project area defers timber harvest on approximately 44,000 ha of privately owned forest lands located throughout Vancouver Island, Cortes Island, and Haida Gwaii.

5.1 Baseline Scenario

The baseline scenario of the BigCoast project follows Mosaic's historical timber harvest activities. Timber harvest practices (i.e., harvest rates) are based on Woodstock models which account for site productivity, harvest systems, market demands, etc. Mosaic generates Woodstock Net Present Value models to project timber harvest activities.

5.2 SD VISta

The BigCoast project has been verified to VERRA's Sustainable Development Verified Impact Standard (SD VISta). SD VISta is a complementary process designed as the framework for assessing and reporting on the sustainable development benefits of the activities related to a project. Implementing a SD VISta carbon project allows for the application of an "SD VISta label" to the verified carbon units (VCUs) generated/issued from the carbon project. The additional label identifies that the project has positive, measurable contributions to the United Nations "2030 Agenda for Sustainable Development" Sustainable Development Goals[10].

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[9] https://www.bigcoastforest.com/
[10] THE 17 GOALS | Sustainable Development (un.org)

6 Status of the Properties

Zimmfor conducted site visits to the properties in the fall and winter of 2023/ 2024. The objective of the site visits was to determine the suitability of the property to join the existing BigCoast project, to conduct and/ or audit existing inventory data, assess operability, harvest opportunities, and estimate the merchantable timber volume on the individual properties.

6.1 Timber Harvest Potential

The total area of the properties is approximately 500 ha, with approximately 340 ha being identified as merchantable forest. Analysis of the cruise data and ground truthing of the tabular spatial data indicate that the volume of merchantable timber. This volume was determined by:

1. Ground identifying and removing stands due operational constraints,
2. Removing any polygons which do not meet a minimum merchantability threshold of $150 m^3$/ha of standing timber volume,
3. Reducing the merchantable timber volume in riparian areas and fisheries sensitive zones, as per industry standard, and
4. Growing the current standing inventory to account for future harvest opportunities in pre-merch stands.

6.2 Carbon Credit Potential

The carbon credit potential (i.e., generated VCUs) is determined by determining two scenarios:

1. A realistic baseline scenario based on principles from Mosaic's Woodstock timber harvest model (Remsoft) that would harvest the standing merchantable timber, and
2. A carbon credit project scenario which defers the harvest of standing merchantable timber for the duration of the project period.

Carbon credits are generated from the difference in the carbon stocks (i.e., GHG reductions/ removals) between the baseline and project scenarios. The key assumption to the VCU estimate is the timber harvest rate (i.e., the baseline scenario). Due to eligibility constraints for new project activity instances, the following assumptions were made during the VCU estimations:

1. The baseline scenario must follow the BigCoast project and use historical practices,
2. The baseline scenario must be modeled using equivalent technologies as the BigCoast project (Woodstock or an equivalent timber supply model),
3. Timber harvest rates will be based on a 75-year rotation age with three-year harvest entry periods (to reflect an efficient harvest amount).

The project scenario will defer all harvesting, and therefor generates VCUs by calculating the difference in the carbon stocks between the two scenarios.

The carbon credit potential of the properties has been estimated based on the total merchantable timber harvest volume available through the entire crediting period. Utilizing a 75-year harvest rotation with three-year entry periods results in a harvest deferral of merchantable timber.

The estimate utilizes a proprietary Verified Carbon Unit (VCU) calculation tool developed by Zimmfor which accounts for the timber harvest volume, onsite conditions, and VCS reductions to determine the amount of carbon credits generated for the project.

Inclusion of the properties in the project will require an additional verification and validation for the new project activity instance. The new project activity instance will utilise a baseline scenario (historical practice) based on the history of timber harvest on the property, and a new additionality assessment. Once the project has been validated and carbon credit calculations are verified, credit issuance will follow the BigCoast project credit issuance schedule. Although BigCoast is anticipated to have annual VCU issuances (and corresponding audits), due to the size of the Groups PAI, audits and issuance were projected to occur every 3-years.

It is not recommended that the property owners pursue SD VISta certification for the proposed project lands. When seeking SD VISta certification, BigCoast was able to rely on resources/ initiatives (such as Sustainable Forestry Initiative third-party forest land certification) which Mosaic has access to or has already implemented. This includes third-party forest management certification which heavily contributes to the sustainable development goals to achieve the SD VISta certification. These certifications and additional resources required to achieve SD VISta eligibility will require significant financial resources which out weight the potential benefits of the certification. As it is anticipated that in the future Verra will enable VCUs to be issued by PAIs, the ability to have the Group not be included in the SDVISta certification will be possible.

6.2.1 Project Financial Analysis

Based on the above project scenario, a proforma was produced noting implementation costs, project revenues, etc. Additional information was provided in Appendix 1 of this report but it has been removed for landowner privacy.

6.3 Project Implementation

Should the property owners and/or the PFLA on behalf of their members and BigCoast pursue carbon crediting project implementation, project implementation would be structured as follows:

Table 2 - Project Implementation Tasks

Step	Description
1	Select the most appropriate project timber harvest scenario based on estimated projections and credit issuance objectives
2	Collaborate with any involved parties to finalize the project scenario
3	Review the list of data requirements to continue the project. Develop a plan to access the necessary data or provide justification for any substitutions as necessary
4	Review the applicability of the VM0012 methodology
5	Complete a formal test for additionality using the VCS AFOLU Tool
6	Determine the baseline scenario
7	Draft the Project Description Document + Monitoring Report to include the new project activity instance.
8	Initiate project consultation process. List with VERRA for project pipeline listing.
9	Complete the methodology steps and identify and record any methodology deviations

Step	Description
10	Quantify GHG emission reductions and removals (final)
11	Develop and implement a project monitoring plan
12	Determine project uncertainty and non-permanence following the VCS methodology
13	Finalize emission reductions and project VCU generation
14	Retain third-party validation/verification body (VVB)
15	Complete the updated Project Description Document + Monitoring Report (final)
16	Submit project to VERRA for technical review.
17	Address and concerns raised by VERRA during project review
18	Have project registered and VCUs issued
19	Sell VCUs on global marketplace. Note – option for presales at step 10.
20	Continue verification process to release VCUs for sale as necessary

7 Conclusion

The properties are suitable for a carbon crediting project based on the deferral of merchantable timber over the project period. The properties are only feasible for carbon credit generation if they are implemented as part of a grouped project as an additional project activity instance. Mosaic's BigCoast Forest Climate Initiative is the ideal project to join, as it allows for the inclusion of additional project activity instances. Further discussions with Mosaic and the BigCoast project implementation team are required to provide insight on the inclusion of the properties as an additional project activity instance. A summary of the project's net present value is described in the project proforma.