ILTF/NICC & SIG - Keweenaw Bay Indian Community
Forest Carbon Project,
Greenhouse Gas Plan, Version 1.1
February 28, 2022

ACR Project ID #637

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A. PROJECT OVERVIEW

A1. PROJECT TITLE

The project title is "ILTF/NICC & SIG Keweenaw Bay Indian Community Forest Carbon Project" (Keweenaw Bay Indian Community Forest Carbon Project).

A2. PROJECT TYPE

This project is to be registered under the American Carbon Registry Standard (ACR 2020, Version 7.0) as an Improved Forest Management (IFM) project. It has been developed in compliance with the ACR Project Standard, Version 7.0 (December 2020) and follows the approved ACR Improved Forest Management Methodology Version 1.3 (April 2018).

This project will be implemented as a Programmatic Development Approach (PDA) in compliance with American Carbon Registry Aggregation and Programmatic Development Approach Project Guidance, Version 1.0, to allow new Sites can be added after the initial Validation of an Aggregated Project.

A3. PROOF OF PROJECT ELIGIBILITY

Eligibility for this Improved Forest Management project has been determined with reference to the ACR Standard Version 7.0 (December 2020) and the Improved Forest Management Methodology for Quantifying GHG Removals and Emission Reductions through Increased Forest Carbon Sequestration on Non-Federal U.S. Forestlands, Version 1.3.

The Keweenaw Bay Indian Community Forest Carbon Project meets all relevant eligibility requirements as described in Table A3.1 below.

Table A3.1 Project eligibility requirements.

Eligibility Requirements	Proof of Eligibility	GHG Plan Reference
Ownership Type	Tribal ownership	Section G1 - Proof of Title s
Project proponent has third-party certification or no commercial timber harvesting	Third-party certification (BIA management plan)	Section A5.1 - Background Information
Project area meets the definition of 'forestland condition' as per USFS FIA program definition.	Per the ACR Standard (Version 7.0), the project meets the definition of forestland through a minimum of 10% forest cover (or equivalent stocking) by live trees of any size.	Section A4 - Location
Project Start Date	The project start date of February 13, 2019 coincides with the MOU date for the initial feasibility of the project	Section H1 - Start Date

Eligibility Requirements	Proof of Eligibility	GHG Plan Reference
	between Indian Land Tenure Foundation (ILTF) and KBIC, provided separately for verification purposes. This complies with Start Date requirements of the ACR Standard Version 7.0, that any project listed subsequent to January 1, 2021, must follow all requirements of and be validated against the ACR Standard v7.0.	
Project Term	The Project Proponent commits to maintain the carbon project scenario stocking levels on the project area at least for the required Project Term of 40 years.	Section H2 – Project Timeline
Crediting Period	In compliance with ACR Standard Version 7.0 (December 2020) and the Improved Forest Management Methodology for Quantifying GHG Removals and Emission Reductions through Increased Forest Carbon Sequestration on Non-Federal U.S. Forestlands, Version 1.3, the crediting period for the project is 20 years	Section H2 - Project Timeline
Real	GHG removals are quantified based on inventory of the standing stock in the project area at the time of verification.	See also Section D. Monitoring Plan and Section E. Quantification
Land Title	For all areas included in the project, long term land titles have been issued and ownership is thus clear, unique, and uncontested.	See also Appendix A: Ownership Docs
Direct Emissions/Offset Title	GHG emission reductions generated by the project activity are generated from forest carbon sources and sinks over which Indian Land Tenure Foundation (herein referred to as ILTF) has ownership rights. Keweenaw Bay Indian Community (KBIC) holds offset title to all lands in the project area (see Section G. Ownership and Title) and all GHG emissions from the project are from forest carbon sources and sinks where KBIC has signed an agreement with ILTF. ILTF holds all rights to carbon credits/offsets produced through management of forests in the project area (attestation provided separately for verification purposes).	Section G2. Chain of Custody
Additionality	Additionality for the project has been shown through a regulatory surplus test, a common practice test, and an implementation barrier test.	Section C. Additionality
Permanent	The long-term setup, risk analysis, and buffer establishment assure permanence of the project benefits	Section B8. Permanence
Net of Leakage	Possible leakage effects due to activity shifts are quantified and deducted from the GHG benefits.	Section E3. Leakage
Independently Validated and Verified	In accordance with ACR standard and methodology, the project benefits have been validated and verified independently by Ruby Canyon Environmental (RCE).	
Community and Environmental Impacts	Impacts on community and environment were analyzed in accordance with the ACR Standard Version 7.0, and net positive impacts were confirmed.	Section F. Community & Environmental Impacts

A4. LOCATION

A GIS geodatabase of the project area, "KBIC_DevelopmentData_20210611.gdb" was provided separately for verification. This geodatabase gives unique identification and delineation of the specific extent of the project. Figures on the following pages provide additional details.

Figure A4-1. Vicinity map that shows project location, including latitude/longitude coordinates.

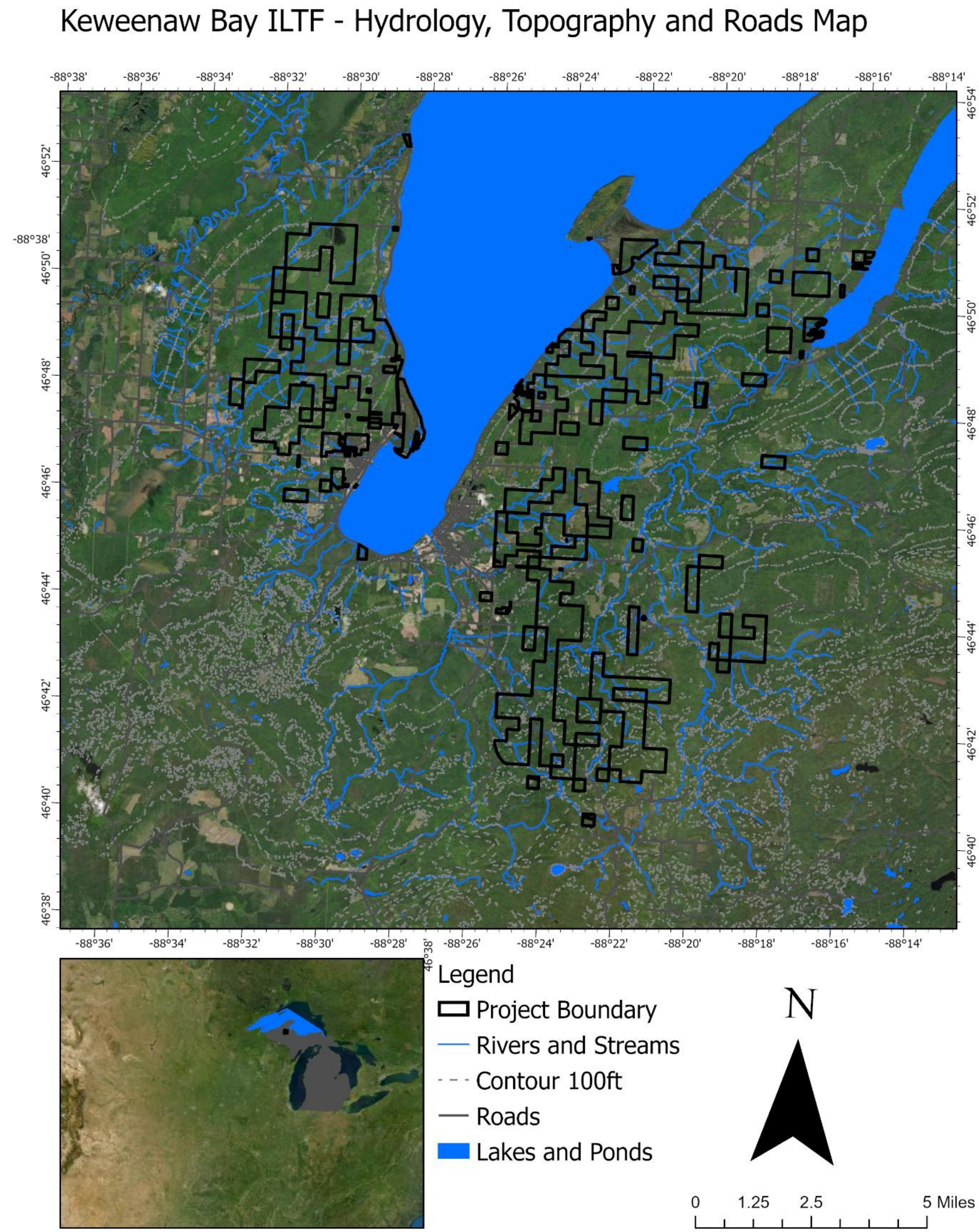

Figure A4-2. Hydrology, topography, and roads relative project area

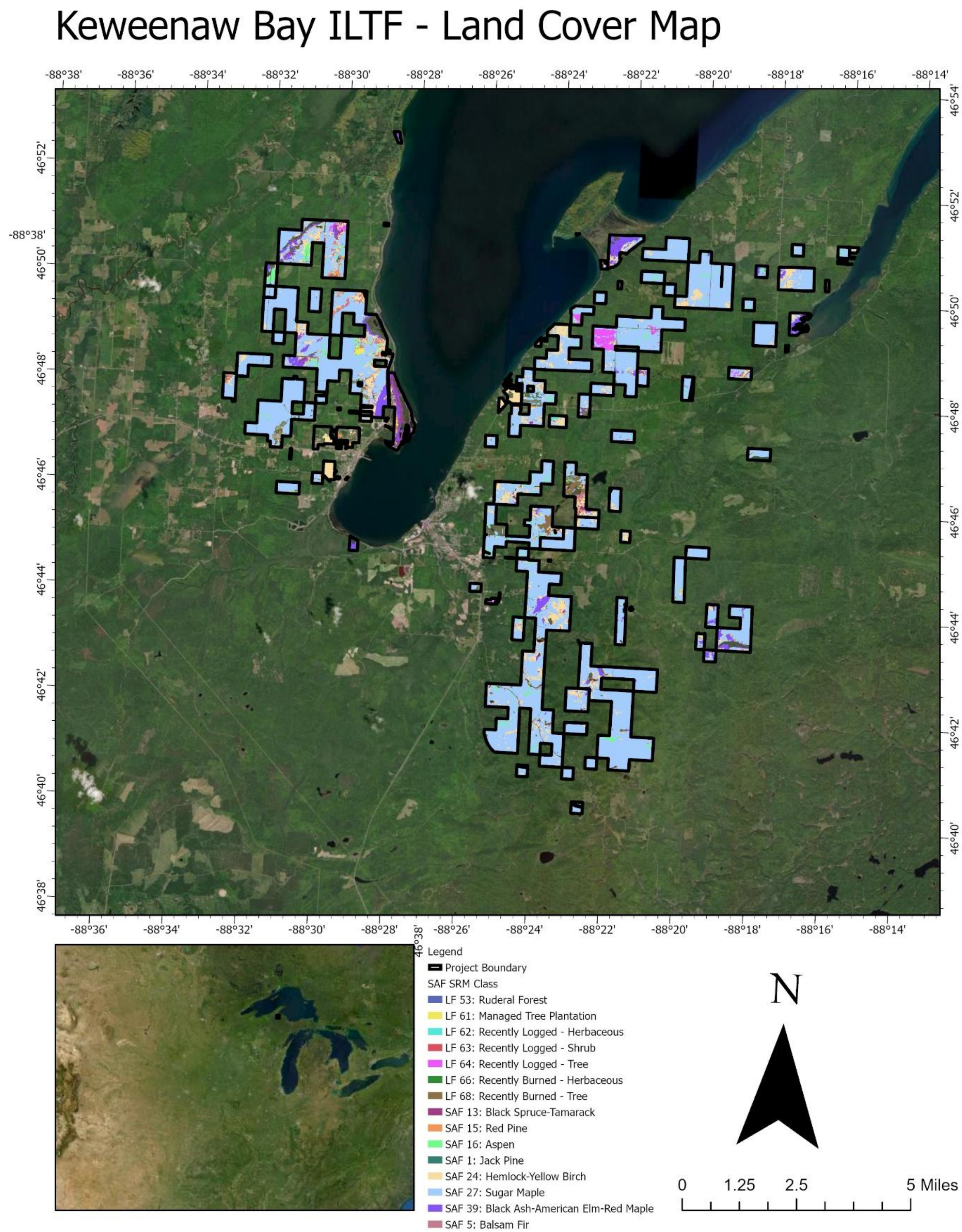

Figure A4-3. Land cover type relative project area

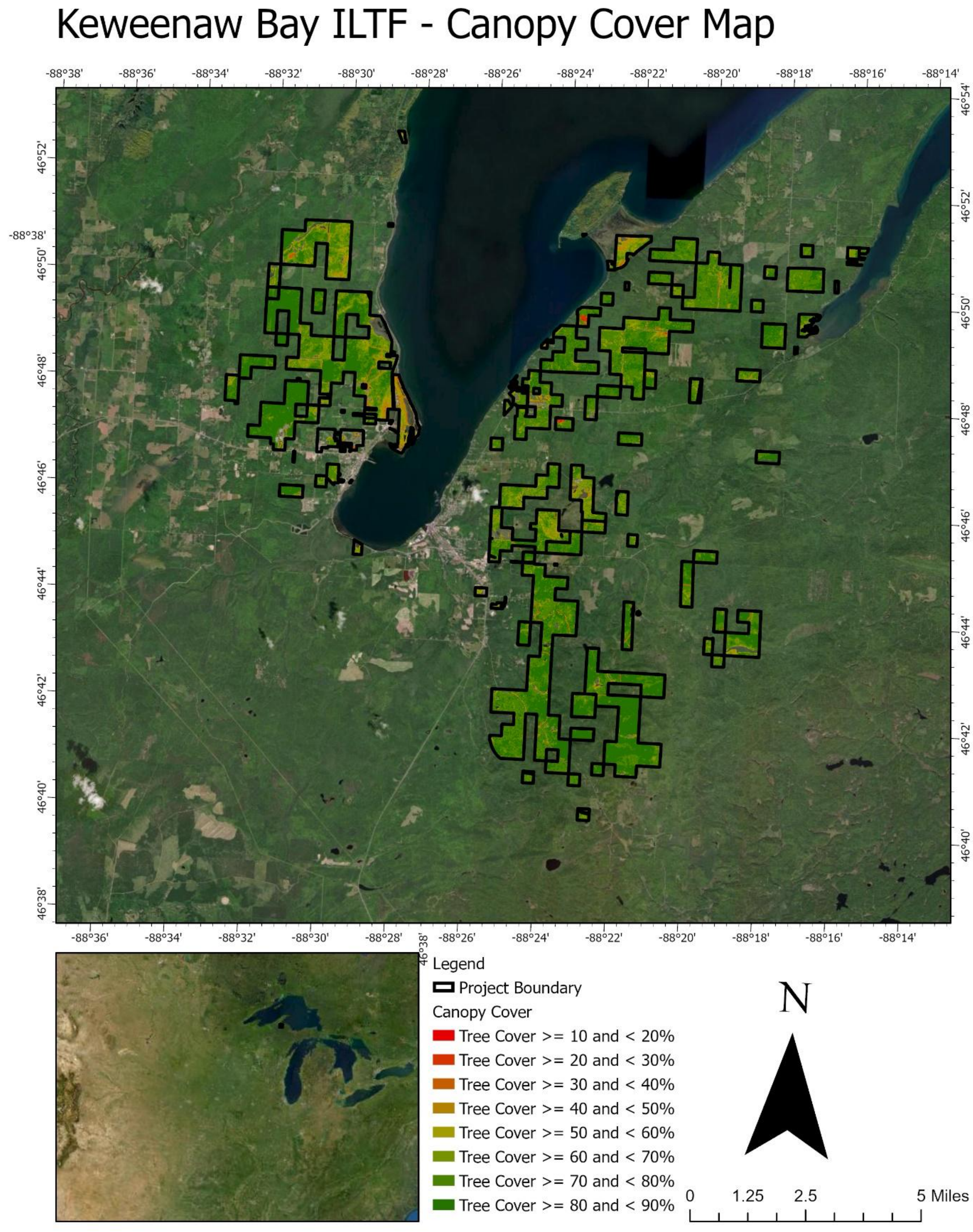

Figure A4-4. Canopy cover map

A5. BRIEF SUMMARY OF PROJECT

A5.1 Background Information

The Keweenaw Bay Indian Community Forest Carbon Project area is located on 15,356 acres of upland forests in the Upper Peninsula of Michigan. By committing to maintain forest CO2 stocks above the regional baseline, the project will provide significant climate benefits through carbon sequestration.

The Keweenaw Bay Indian Community was established under the 1936 Treaty with the United States Government. It is one of the four original member tribes in Michigan that founded the Inter-Tribal Council of Michigan, Inc. Their constitution, by-laws and corporate charter were adopted on November 7, 1836 pursuant to the terms of the 1934 Indian Reorganization Act.

The Keweenaw Bay Indian Community Forest Carbon Project is situated within 18,811 acres of tribal land, of which approximately 16,500 acres is forested. The forest stands within this project consist of northern hardwoods (a mix of sugar maple, basswood, and yellow birch), aspen, lowland mix, hemlock and hemlock hardwoods, and pine. There is currently commercial timber management within the project area.

A5.2 Description of Project Activities

The project activity is Improved Forest Management, with KBIC's forest management practices representing a significant improvement in the carbon storage and conservation value than higher return, more aggressive management regimes of maximum BIA sustained yield production in the region, which are characterized by shorter, even-aged rotations. Management decisions of the forest focus on sustainable, natural forest growth, control of invasive species, and diversification of age classes. There is currently single-tree selection and shelterwood timber harvesting within the project.

The project ensures long-term sustainable management of the forests, which could otherwise undergo significant commercial timber harvesting.

A5.3 Project Purpose and Objectives

By committing to maintain forest CO2 stocks above the regional baseline level, the project will provide significant climate benefits through carbon sequestration. The aim of this project is also to ensure long-term continuance of all environmental benefits provided by the conservation of this forestland.

A6. PROJECT ACTION

A.6.1 Description of prior physical conditions

<u>Climactic Zone</u>

The project is located in the Upper Peninsula of Michigan, which falls within zone 4b (mean annual extreme minimum temperatures between -25 to -20 F) and 5a (mean annual extreme minimum temperatures between -20 to -15 F) (USDA-ARS Plant Hardiness Zones, 2012).

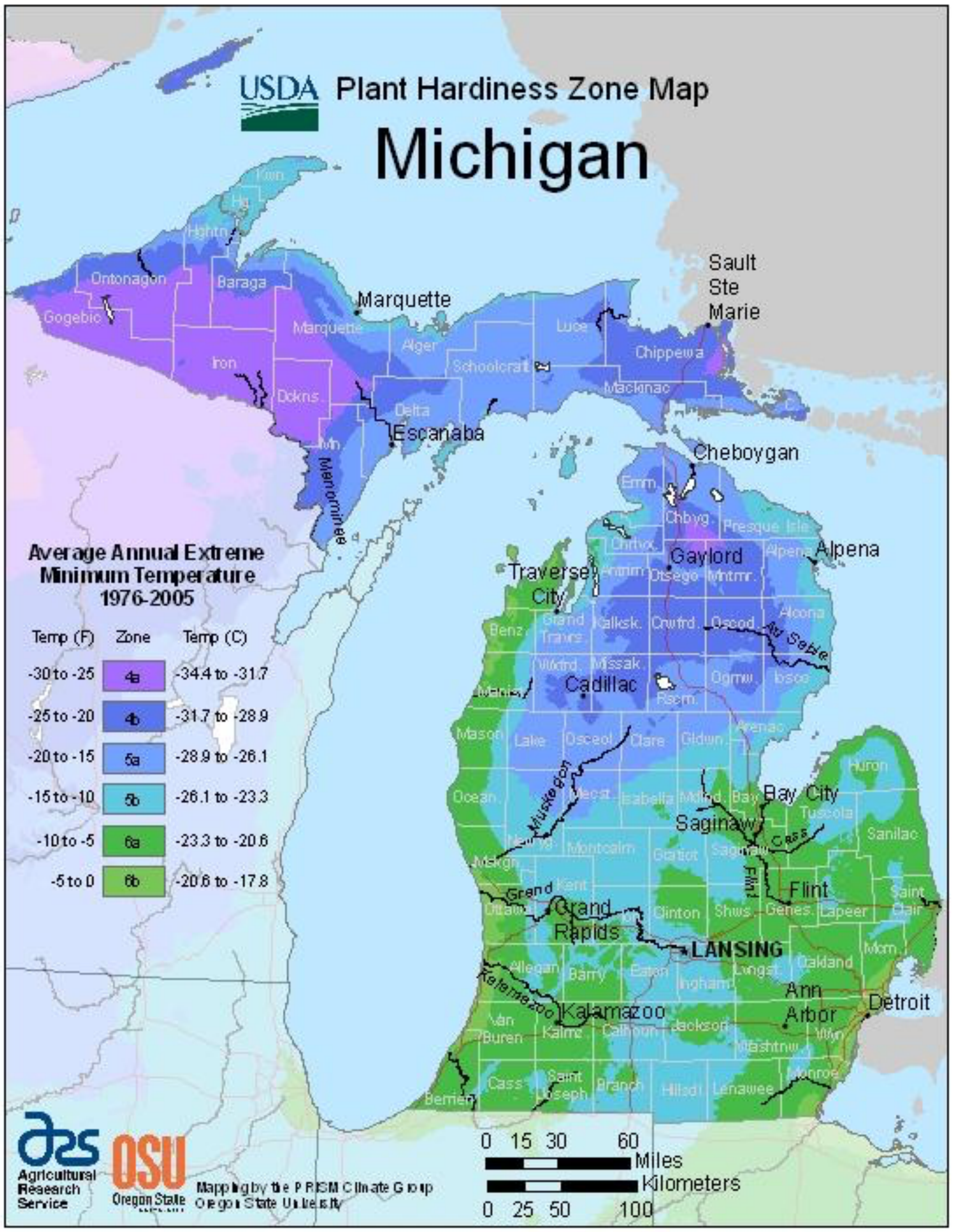

Figure A6.1. USDA plant hardiness (https://planthardiness.ars.usda.gov/PHZMWeb/)

Ecosystem/Vegetation

Vegetation Communities: Using 2016 USGS LANDFIRE layers SAF vegetation types were identified in the project area: SAF 27: Sugar Maple, SAF 24: Hemlock-Yellow Birch, SAF 39: Black Ash-American Elm-Red Maple, SAF 16 Aspen, SAF 5: Balsam Fir, SAF 15: Red Pine. See file PC364_KB01_GIS_Acres_Plots_ 20210930.xlsb for details.

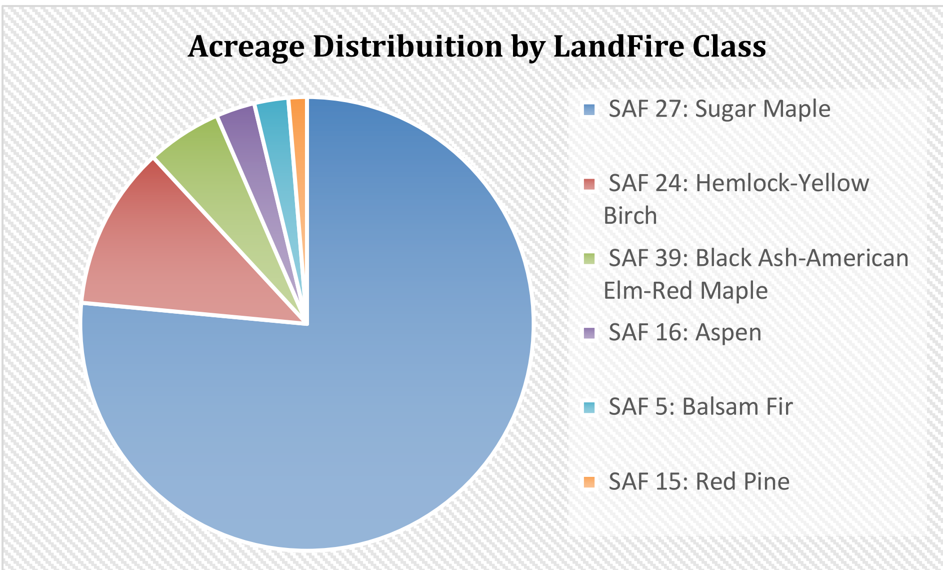

Figure A6.2: Acreage Distribution by LandFire Class

Land Use

Since the establishment of the L'Anse Indian Reservation in 1854, the forest has undergone many changes. Timber cutting in the area was intense following the Civil War in the mid 1860's. By 1910, the pine, northern white cedar and most of the hardwoods was cut. Destructive fire followed on much of the cleared land in the area. Since the early 1900's, fire suppression has been practiced to protect human settlements and interests. This practice has promoted the prevalence of northern hardwood and hemlock mesic forests. These events during the turn of the century and into the 1930's helped shape the forests of the Reservation today. KBIC members have historically used and continue to use the forests for timber, wildlife habitat, firewood, and gathering. KBIC's management style for their preserves promotes low-impact recreation use and habitat restoration. The project area is managed for a variety of resource uses including cultural resources, wetlands, fisheries, wildlife, recreation and forestry.

A.6.2 Description of project technologies, products, services and expected level of activity

There is planned commercial timber harvesting. Forests are managed in the project area using a mix of uneven-aged silviculture and shelterwood harvest to improve the health and vigor of the forest and associated ecosystems. This includes maintaining diverse wildlife habitat, maintaining or increasing biodiversity, maintaining and increasing culturally important species such as paper birch, white cedar, sugar maple and blueberries. This management activity will increase carbon stocking by creating healthy, resilient, multi-aged stands.

A.6.3 Project Action

By committing to maintain forest CO2 stocks above the baseline level, the project will provide climate benefits through carbon sequestration. Commercial timber harvesting will provide supply of timber products but be conducted using management techniques to improve carbon stocking. Management practices within the project area will encourage healthy multi-age stands by allowing for mature trees to achieve larger sizes, encouraging vigorous growth of younger cohorts, and establishing regeneration native seedlings. The Keweenaw Bay Indian Community Carbon Project will achieve GHG removals by sequestering more CO2 than the baseline scenario.

A7. EX ANTE OFFSET PROJECTION

Total projected GHG removal is 2,066,293 mtCO_2e (without risk buffer deductions) over the first crediting period of 20 years (including GHG removal from long-term wood products). Table A7.1 lists the estimates of net GHG emissions reductions achieved, and the Project's increase in CO_2; both metrics are for the end of the listed year. Figure A7.1 shows the GHG differences between the baseline scenario and the Project's conservative/management scenario (in metric tonnes of CO_2).

Table A7.1. Estimate of net ERTs and gross additional CO2, by Year.

Project Year	Year	ERTs	Estimates of GHG emission reductions (mtCO2e)
1	2019	167,641	332,621
2	2020	200,637	730,710
3	2021	57,748	845,291
4	2022	108,270	1,060,113
5	2023	131,732	1,321,486
6	2024	22,879	1,366,883
7	2025	25,651	1,417,780
8	2026	22,902	1,463,221
9	2027	24,113	1,511,065
10	2028	31,338	1,573,244
11	2029	24,849	1,622,549
12	2030	24,849	1,671,854
13	2031	24,849	1,721,159

14	2032	24,849	1,770,464
15	2033	24,849	1,819,769
16	2034	24,849	1,869,073
17	2035	24,849	1,918,378
18	2036	24,849	1,967,683
19	2037	24,849	2,016,988
20	2038	24,849	2,066,293

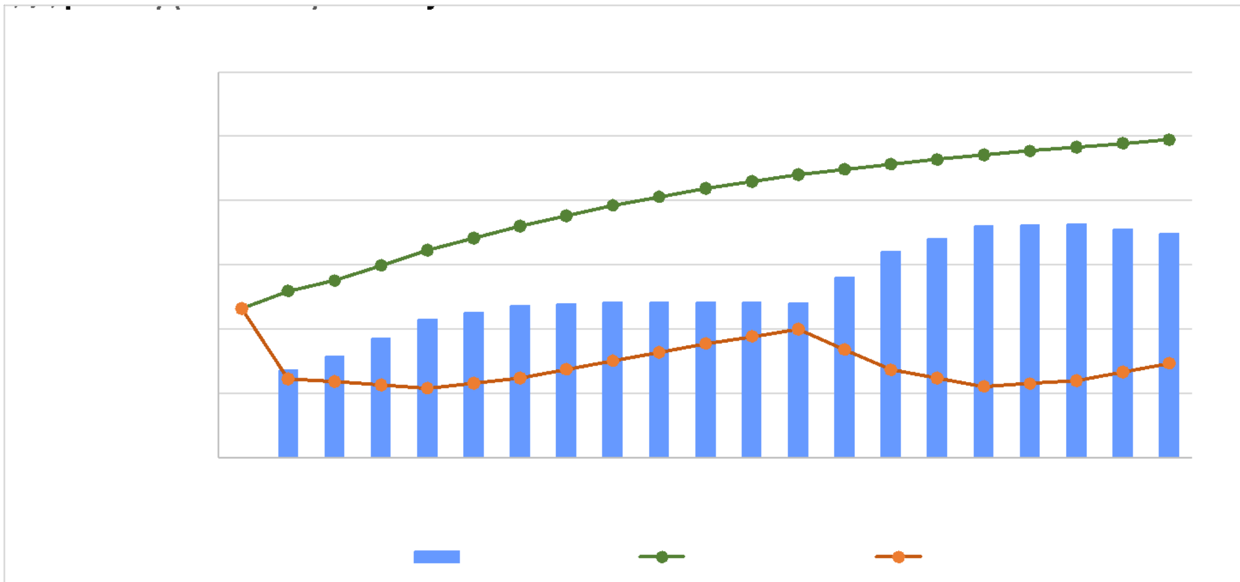

Figure A7.1. – Graph showing the CO_2 relationship between the Baseline scenario (with an objective to maximize net present value), versus the Project's conservation management scenario (with an objective to conserve CO_2), and the difference (in metric tonnes) therein (from 2024 to 2119).

A8. PARTIES

The project was implemented by ILTF and Spatial Informatics Group, LLC, a carbon offsets project developer and technical modeler. Project verification was completed by Ruby Canyon Environmental and the forest carbon inventory was conducted by Green Timber Consulting Foresters, Inc.

Table A8.1. Project Parties and Responsibilities

Project Party	Point of Contact	Role/Responsibility	Contact Information
Indian Land Tenure Foundation /	Bryan Van Stippen, NICC Program Director	Project Proponent – financing and implementation of long-term project management	Indian Land Tenure Foundation 151 County Road B2E Little Canada, Minnesota 55117 Phone: 651-789-1744

Project Party	Point of Contact	Role/Responsibility	Contact Information
National Indian Carbon Coalition			
Spatial Informatics Group, LLC	Tim Kramer Carbon Domain Manager	Offset Developer, coordination of project implementation, modeling,	Spatial Informatics Group, LLC. 2529 Yolanda Ct. Pleasanton, CA 94566 Phone: (802) 999-6986
Ruby Canyon Environmental	Zack Eyler	Initial Verifier	Ruby Canyon Environmental 743 Horizon Ct. #385 Grand Junction, CO 81506 Phone: 970-241-9298 x 15
Green Timber Consulting Foresters, Inc.	Justin Miller Forester	Contractor Forest Inventory	Green Timber Consulting Foresters, Inc. 11511 US-41, Pelkie, MI 49958 Phone: 906-353-8584

A9. PROGRAMMATIC DEVELOPMENT APPROACH – GENERAL REQUIREMENTS

Keweenaw Bay Indian Community Forest Carbon Project will employ the programmatic development approach (PDA) outlined in ACR's Aggregation and Programmatic Development Approach Guidance for Improved Forest Management (Version 1.0)

A9.1 PDA Eligibility Criteria

New sites must meet all eligibility criteria for IFM projects outlined in ACR methodology (Version 7.0) and must not have been enrolled in another carbon project. ILTF will lead the recruitment and screening of new sites. Priority sites will have similar forest characteristics, productivity, carbon stocking, soil types, ownership class, and legal and management constraints of the initial project. However, sites that are sufficiently different from the initial project characteristics may be grouped into cohorts of similar properties and added to the project with a cohort-level inventory and baseline.

PDA Geographic Scope

Additional sites to be enrolled in the project will be within three adjacent ecosystem provinces of the Keweenaw Bay Indian Community Forest Carbon Project.

PDA Temporal Scope

All sites will have a start date for February 13, 2019. Additional sites will have a site-specific implementation date and will be enrolled within the project by February 12, 2024; 5 years from start date. All sites within cohorts will be on the same validation and verification schedule.

A9.2 PDA GHG Assessment Boundary

All sites enrolled in the project will have the same GHG sources and sinks. Reference section B4 for details.

A9.3 PDA Baseline Scenario

The ACR Aggregation and Programmatic Development Approach Guidance for IFM (Version 1.0) allows baseline quantification at either the cohort or PDA level.

If the cohort level baseline quantification is used, each cohort implements its own stand-alone inventory for project and baseline stock quantification. Baseline modeling of subsequent cohorts will consider relevant legal and management constraints of each site and use the appropriate NPV discount rates, according to ownership class. Cohort-level inventories and baselines will weight carbon stocks and statistical confidence according to the proportional stocking of each respective cohort and report the respective values at a PDA-level. The cohort specific baseline model will be updated if a site within the distinct cohort discontinues participation or upon crediting period renewal.

If a PDA level baseline is used, there is a single baseline for the project. The baseline will be remodeled and revalidated each time a site is added (or exits) from the project.

The Project Design Document will include detailed methodology on inventory and baseline approach for each additional site.

A9.4 PDA Monitoring Reporting and Verification Schedules

All sites will have a start date for February 13, 2019. Additional sites will be enrolled within the project by February 12, 2024, 5 years from start date.

All sites within each cohort will have the same quantification approach and be on the same validation and verification schedule. Monitoring of additional sites will follow procedures for the initial project area outlined in section D2.

The Project Design Document will include detailed schedules for reporting and verification for each additional site.

A9.5 PDA Roles and Responsibilities

ILTF is responsible for recruiting and screening new sites for potential enrollment in the project. Roles and responsibilities of initial project are outlined in section A8. Roles and responsibilities for additional sites will be included in the Project Design Document.

A9.6 Procedures to avoid double counting

To avoid double counting, ILTF will screen potential sites for prior application and participation in a carbon project. No sites will be added to the project that has been or will be registered on ACR as part of another project.

The Project Design Document will include details on how each new site is screened to avoid double counting.

A9.7 Site-level QA/QC

The process for record and documentation control for new sites will be made available to the VVB at the time of Validation. The QAQC process for the initial project area is detailed in Section D2.

The Project Design Document will include details on how site-level QAQC for additional sites.

B. METHODOLOGY

B1. APPROVED METHODOLOGY

The methodology used for the Keweenaw Bay Indian Community Forest Carbon Project is the American Carbon Registry - Improved Forest Management Methodology for Quantifying GHG Removals and Emission Reductions through Increased Forest Carbon Sequestration on Non-Federal U.S. Forestlands, Version 1.3. (April 2018).

B2. METHODOLOGY JUSTIFICATION

All applicability criteria of the selected methodology are fulfilled by the Keweenaw Bay Forest Carbon Project:

1. *This methodology is applicable only on non-federally owned forestland within the United States.*
   - Lands that are included in this project are not federally owned forestland.

2. *The methodology applies to lands that can be legally harvested by entities owning or controlling timber rights on forestland.*
   - KBIC controls the timber rights on the forestland and can legally harvest (Appendix I2. Land Owner and Contracts).

3. *Private or non-governmental organization ownerships subject to commercial timber harvesting at the project Start Date in the with-project scenario must be certified by FSC, SFI, or ATFS or become certified within one year of the project Start Date. If there are no ongoing harvests at the project Start Date, but harvests occur later in the project life cycle, the project area must become certified before any commercial timber harvesting can occur.*
   - The project area's management plan is certified by the Bureau of Indian Affairs (BIA).

4. *All Tribal lands in the United States, except those lands that are managed or administered by the Bureau of Indian Affairs, are eligible under this methodology, provided that they meet ACR requirements for Tribal lands*
   - Keweenaw Bay Indian Community Forest Carbon Project is on tribal lands.

5. *Public non-federal ownerships currently subject to commercial timber harvesting in the with-project scenario must:*
   - be certified by FSC, SFI, or ATFS or become certified within one year of the project Start Date; or
   - have its forest management plan sanctioned by a unit of elected government officials within a state, or a state agency, or a federal agency

    - *Please note that any such forest management plans must be updated at minimum every 10 years*
  - If there are no ongoing harvests on a public non-federal ownership at the project Start Date, but harvests occur later in the project life cycle, the project area must become certified by FSC, SFI, or ATFS, or develop a sanctioned management plan before any commercial timber harvesting can occur
  - Not Applicable – Keweenaw Bay Indian Community Forest Carbon Project is not on public lands.

6. *Use of non-native species is prohibited where adequately stocked native stands were converted for forestry or other land uses after 1997*
   - There is no use of non-native species where adequately stocked native stands were converted for forestry or other land uses after 1997.

7. *Draining or flooding of wetlands is prohibited*
   - No draining or flooding of wetlands will occur after the project start date.

8. *Project proponent must demonstrate its ownership or control of timber rights at the project start date.*
   - See attached Deeds (Appendix A: Ownership Docs)

9. *The project must demonstrate an increase in on-site stocking levels above the baseline condition by the end of the Crediting Period.*
   - Stocking levels increase well above the baseline conditions for the duration of the project and by the end of the Crediting Period (see Section E1. Baseline).

B3. PROJECT BOUNDARIES

The physical project boundaries include 15,356 acres of forestland, shown in the maps and in the geodatabase "KBIC_DevelopmentData_20210611.gdb."

See Section H2. Project Timeline for the temporal boundaries of the project.

B4. IDENTIFICATION OF GHG SOURCES AND SINKS

The following tables (Table B4.1, Table B4.2, and Table B4.3) provides a summary of GHG sources and sinks, GHG gases, and potential leakage sources within the project boundary.

Table B4.1. List of GHG sinks within the project boundary and the rationale of whether they were considered in the project analysis.

Carbon Pool/Sink	Included/ Optional/ Excluded	Justification/Explanation
Above-ground biomass carbon	Included	Major carbon pool subjected to the project activity.
Below-ground biomass carbon	Included	Major carbon pool subjected to the project activity.
Standing dead wood	Included	Major carbon pool in unmanaged stands subjected to the project activity. Project Proponents may elect to include the pool in managed stands. Where included, the pool must be estimated in both the baseline and with project cases. For this Project, standing dead wood will be included in all stands.
Lying dead wood	Excluded	Project proponents may elect to include the pool. Where included, the pool must be estimated in both the baseline and with project cases. For this Project, lying dead wood will not be included.
Harvested wood product	Included	Major carbon pool subjected to the project activity
Forest floor litter	Excluded	Changes in the litter pool are considered de minimis as a result of project implementation.
Soil organic carbon	Excluded	Changes in the litter pool are considered de minimis as a result of project implementation.

Table B4.2. GHG gases considered in the project analysis.

Gas	Source	Included / Excluded	Justification / Explanation
CO_2	Burning of biomass	Excluded	Carbon stock decreases due to burning are accounted as a carbon stock change.
CH_4	Burning of biomass	Excluded	Non-CO_2 gas emitted from biomass burning.
N_2O	Burning of biomass	Excluded	Potential emissions are negligible.

Table B4.3. Potential sources of leakage.

Potential Source of Leakage		Included/ Optional/ Excluded	Justification / Explanation
Activity-shifting	Timber Harvesting	Included	Project Proponent must demonstrate no activity-shifting leakage beyond the *de minimis* threshold will occur because of project implementation.
	Crops	Excluded	Forestland eligible for this methodology does not produce agricultural crops that could cause activity shifting.
	Livestock	Excluded	Forestland eligible for this methodology does not include grazing activities, thus there are no leakage impacts.

Potential Source of Leakage		Included/ Optional/ Excluded	Justification / Explanation
Market Effects	Timber	Included	Reductions in project outputs due to project activity may be compensated by other entities in the marketplace. Those emissions are included/considered in the quantification of project benefits.

B5. BASELINE

The Baseline Scenario represents harvest levels that maximize the net present value (NPV) at a 5% discount rate (for Tribal Land) subject to KBIC's existing harvest constraints, which limits harvest regimes to be more conservative than typical practices in the project region on privately owned lands.

Baseline silviculture includes clearcutting only Rxs as allowed under the Michigan State Forest Practice Laws. No harvesting occurs on plots in riparian buffers. Derivation and justification for the baseline is detailed in Section E. Quantification.

B6. PROJECT SCENARIO

The project scenario consists of land management with low levels of commercial timber harvests. See Section A6, Project Action for details.

B7. REDUCTIONS AND ENHANCED REMOVALS

The project reduces greenhouse gas emissions through natural forest growth and stand improvement using prescribed fire treatments. These management activities will maintain and increase carbon stocks compared to the baseline scenario.

B8. PERMANENCE

Project Proponents must conduct their risk assessment using the ACR Tool for Risk Analysis and Buffer Determination. All Project types must claim a value from risk categories: A) Financial, B) Project Management, and C) Social/Policy. Additional risk values that must be selected by project type include:

Forestry Projects claim one value from each:

D. Conservation Easement (if applicable)
E. Fire
F. Disease/pest
G. Levee failure/water table changes (required only if forested wetlands comprise more than 60% of project area).
H. Other natural disaster risk scores.

1) Financial Risk

Buffer account contribution associated with financial risk come from the risk that the organization overseeing, or financing project implementation will be unable to continue due to financial failure. Keweenaw Bay Forest Carbon Project is on tribal lands and has a buffer value of 3%.

- Financial Risk 3% (Tribal Lands)

2) Project Management Risk

Project management failure is the risk related to the ability of the project management team to effectively manage the project throughout its lifetime. Keweenaw Bay Forest Carbon Project is on tribal lands and has a buffer value of 3%.

- Project Management Risk 3% (Tribal Lands)

3) Social and Political Risk

Social risk is related to changing social, political or legal landscapes that could affect the project. The project location is in the United States and supports the selection of the 2% default value.

- Social Risk 2% (default)

4) Conservation Easement

The project does not have a conservation easement(s) that requires the protection of carbon stocks for the life of the project, which supports the selection of the 0% default value.

- Conservation Easement 0% (default)

5) Fire Risk

A wildfire risks can be reduced using certain techniques including reducing surface fuel loads, removing ladder fuels, adding fuel breaks, and reducing stand density.

- Fire Risk 2%

Risk assessment supported by the Wildfire Hazard Potential (WHP) map; a publicly available map provided by the USFS:

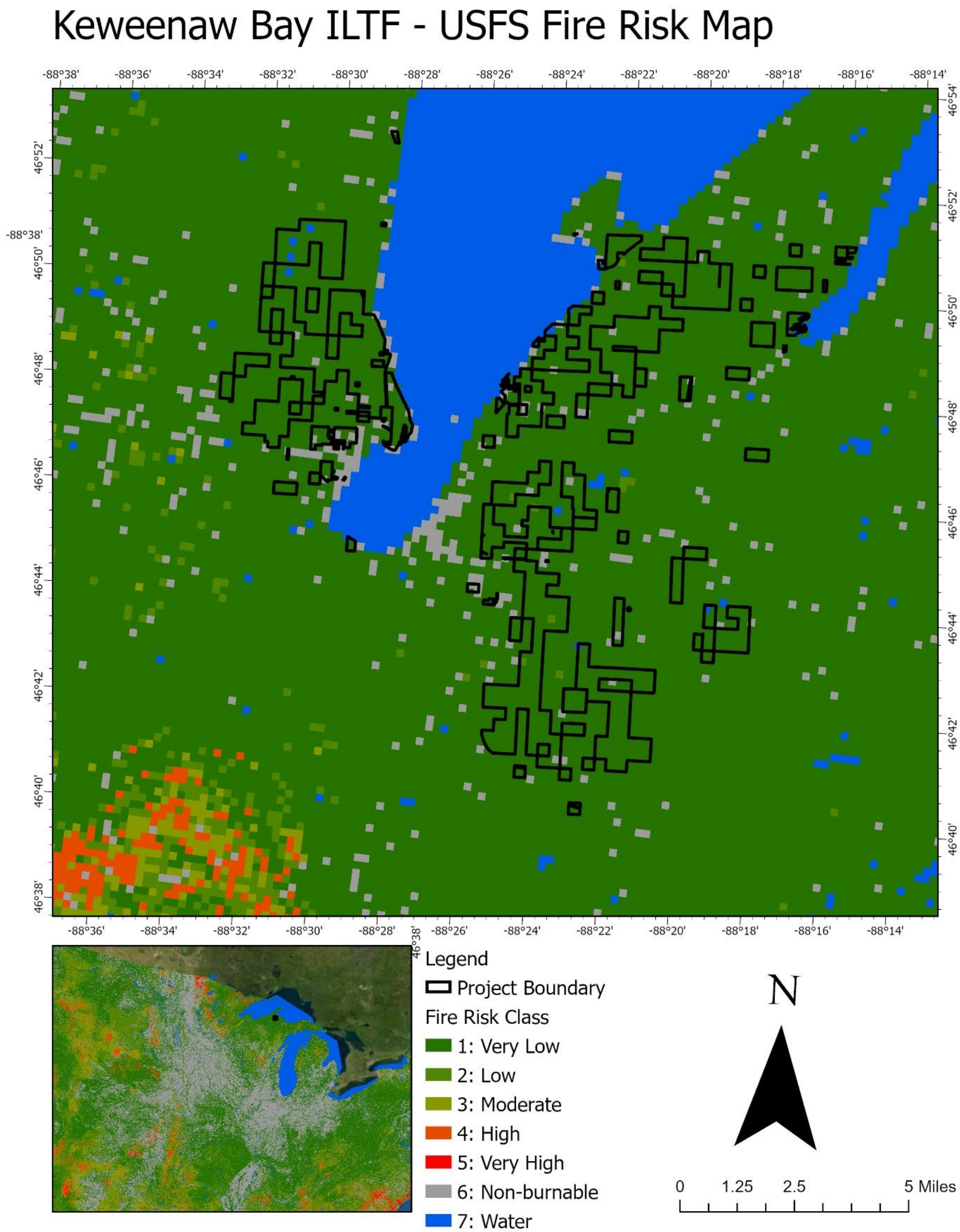

Figure B8.1. USFS Fire Risk

6) Disease and Pest Risk

Disease and pests can pose a significant risk to the permanence of the GHG emission reductions and GHG removal enhancements. Keweenaw Bay Indian Community Forest Carbon Project has not experienced any epidemic diseases or infestations.

- Disease or Insect Outbreak 4% (default)

7) Levee Failure and Water Table Changes

The project does not occur in a forested wetland, therefore a 0% buffer value.

- Levee Failure and Water Table Changes 0%

8) Other Natural Disaster Events

- Other Natural Disaster Events (Default) 2% (default)

Calculated Risk Score

Section 1 (A + B + C + D) + Section 2 (E + F + G + H) = Total Risk score %

Section 1 (3% + 3% + 2% + 0%) + Section 2 (2% + 4% + 0% +2%) = 8% + 8% = 16%

Buffer Pool Contribution

(Total Risk score %) * (Net0[1] ERTs generated for reporting period) = Buffer pool contribution in ERTs at time of issuance.

Over the first reporting period period, 16% X 438,425 = 70,149 credits of buffer pool contribution

1) Net ERTs is the total less leakage and uncertainty
2) Total buffer pool is the summation of rounded annual values

Table B8.1 Emission Reserve Tons (ERTs) and Buffer Credits by Vintage for Reporting Period 1

	2019	2020	2021	Total
Total ERTs	162,511	184,787	91,128	438,425
Buffer Contribution	26,002	29,566	14,581	70,149
Net ERTs	**136,509**	**155,220**	**76,547**	**368,276**
Net Removals	*27,559*	*31,333*	*15,452*	*74,340*
Net Reductions	*108,953*	*123,888*	*61,095*	*293,936*

C. ADDITIONALITY

C1. REGULATORY SURPLUS TEST

Relevant laws, regulations, statutes, legal rulings, and other regulatory frameworks that could affect the project activity includes:

National Laws, Regulations and Policies

- Clean Water Act
- Endangered Species Act
- The Logger's Guide to the New OSHA Logging Safety Standards, 1995
- The US Army Corps of Engineers may require a permit for stream crossings, with exemptions for certain crossings where Best Management Practices are followed

State and Local Laws and Programs

- Michigan Department of Natural Resources: Forestry Best Management Practices for Soil and Water Quality
- Michigan Commercial Forest Act

International Agreements

- Paris Agreement, sign by US in 2016. President Trump withdrew US from agreement in June 2017. President Biden rejoined in January 2021.
- Kyoto Protocol, 1997 (signed, not ratified).
- United Nations Framework Convention on Climate Change, 1992.
- United Nations Convention on Biological Diversity, 1992 (signed, not ratified)
- Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), 1973
- UNESCO World Heritage Convention, 1972

None of the above or any other existing law, regulation, statute, legal ruling, or other regulatory framework in effect as of the start date in 2019 effectively require the proposed forest carbon project activity and its associated GHG emissions reductions/removal enhancements. Consequently, the project passes the Regulatory Surplus test.

C2. COMMON PRACTICE TEST

The geographic region includes Michigan. Wood products including sawtimber and pulpwood are distributed to mills throughout this region. The forest type for this project is similar to other ITLF forestland ownership due to the size of the property and its status as BIA. If the Keweenaw Bay Indian Community Forest Carbon Project was not implemented, the forest management could more closely

resemble that of maximum sustained yield production. Instead, the project will exceed the common practice as described in Section A6. Project Action.

C3. IMPLEMENTATION BARRIERS TEST

- ***Financial***
- *Technological*
- *Institutional*

Financial Test – *Does the project face capital constraints that carbon revenues can potentially address; or is carbon funding reasonably expected to incentivize the project's implementation; or are carbon revenues a key element to maintaining the project action's ongoing economic viability after its implementation?* **YES**

Carbon funding is reasonably expected to incentivize the project's implementation. The implementation of the carbon project represents an opportunity cost to lost revenue associated with the potential timber harvesting that could legally and feasibly occur on the property in the lifetime of the carbon project. A financial feasibility assessment is provided separately for verification demonstrating the financial barrier carbon funding overcomes in project implementation.

The net present values are summarized below.

Table C3.1 NPV components by scenario, over first 2 decades.

Scenario	NPV
The net present value of the baseline scenario, over the crediting period, is	$19,528,000
This is in contrast to the project scenario NPV, for timber harvest only, of	$0
The carbon revenues add another	$7,343,000
The total 20-year project NPV is	$7,343,000

C4. PERFORMANCE STANDARD TEST

The Keweenaw Bay Indian Community Forest Carbon Project uses the three-pronged approach; therefore, this step is not required.

D. MONITORING PLAN

D1. MONITORED DATA AND PARAMETERS

The following data/parameters will be monitored and reported:

Data or Parameter Monitored	Area
Unit of Measurement	Acres
Description	Area of IFM Project
Data Source	GIS data derived from GPS coordinates and remotely sensed data
Measurement Methodology	Area is calculated using GIS area calculation tool. Information is reported in monitoring reports. Total project area shall remain fixed through crediting period.
Monitoring Frequency	Every 5 years, following with inventory update
Value applied	15,356 acres
Reporting Procedure	Handheld GPS unit, GIS software
QA/QC Procedure	Meta data is kept current and uncorrupted
Purpose of Data	Calculation of project emissions
Calculation method	Calculated in ArcGIS
Notes	-

Data or Parameter Monitored	Time (T) between monitoring events
Unit of Measurement	Year(s)
Description	Number of years between monitoring ($T = t_2 – t_1$); used for calculation of project emissions
Data Source	Monitoring reports
Measurement Methodology	Number of years between monitoring ($T = t_2 – t_1$)
Monitoring Frequency	Annually
Value applied	Calendar
Reporting Procedure	Included in monitoring report
QA/QC Procedure	All calculations double checked for accuracy prior to submission for verification
Purpose of Data	Calculation of project emissions
Calculation method	Subtraction
Notes	-

Data or Parameter Monitored	Tree Height (H)
Unit of Measurement	Feet
Description	Height of tree within inventory plot (measured from tree base to treetop).
Data Source	Field measurements
Measurement Methodology	Measured with clinometer or hypsometer

Monitoring Frequency	Every 5 years after the first inventory
Value applied	
Reporting Procedure	Handheld GPS unit or cruise tally sheet
QA/QC Procedure	Equipment will be maintained in excellent condition. All heights will be double checked for reasonableness prior to submission for verification
Purpose of Data	Calculations of project emissions
Calculation method	N/A
Notes	-

Data or Parameter Monitored	Diameter at breast height of tree (DBH)
Unit of Measurement	Inches (to 1/10th of an inch)
Description	Tree diameter measure 4.5 feet above ground
Data Source	Field measurement
Measurement Methodology	Measured with loggers Tape, calipers, or Biltmore stick
Monitoring Frequency	Every 5 years after the first inventory
Reporting Procedure	Handheld GPS unit or cruise tally sheet
QA/QC Procedure	Equipment will be maintained in excellent condition. All diameters will be double checked for reasonableness prior to submission for verification
Purpose of Data	Calculations of project emissions
Calculation method	N/A
Notes	-

Data or Parameter Monitored	Decay class
Unit of Measurement	Decay class category
Description	Qualitative degree of decomposition
Data Source	Forest Inventory
Measurement Methodology	Qualitative assessment of dead tree into 1 of 4 decay classes based on class descriptions
Data Uncertainty	None
Monitoring Frequency	Every 5 years after the first inventory
Value applied	
Reporting Procedure	Handheld GPS unit or cruise tally sheet
QA/QC Procedure	Equipment will be maintained in excellent condition. All decay classes will be double checked for reasonableness prior to submission for verification
Purpose of Data	Calculations of project emissions
Notes	-

Data or Parameter Monitored	Tree Live or Dead Status
Unit of Measurement	Tree life status
Description	Record the live or dead status of trees in inventory plots
Data Source	Forest Inventory
Measurement Methodology	Measured per the Carbon Plot Methodology
Data Uncertainty	None
Monitoring Frequency	Every 5 years after the first inventory
Value applied	
Reporting Procedure	Handheld GPS unit or cruise tally sheet

QA/QC Procedure	Equipment will be maintained in excellent condition. All tree life statuses will be double checked for reasonableness prior to submission for verification
Notes	-

Data or Parameter Monitored	Defect
Unit of Measurement	%
Description	Qualitative percent of missing biomass
Data Source	Forest Inventory
Measurement Methodology	Tree defect is qualitatively assessed for missing biomass in the bole from 1 ft stump to total height. Missing volume from broken tops below 4" DOB is not included.
Data Uncertainty	None
Monitoring Frequency	Every 5 years after the first inventory
Value applied	Tree-specific
Reporting Procedure	Handheld GPS unit or cruise tally sheet
QA/QC Procedure	Equipment will be maintained in excellent condition. All tree defects will be double checked for reasonableness prior to submission for verification.
Notes	-

Data or Parameter Monitored	Species Composition
Unit of Measurement	%
Description	Spp. composition as a percentage of basal area
Data Source	Forest Inventory
Measurement Methodology	Derived from basal area calculations from inventory data.
Data Uncertainty	None
Monitoring Frequency	Every 5 years after the first inventory
Value applied	
Reporting Procedure	
QA/QC Procedure	Species identification is confirmed at verification.
Purpose of Data	Calculation of project emissions
Calculation method:	Basal Area = 0.005454 * DBH2
Notes	-

Data or Parameter Monitored	Harvested Wood Products
Unit of Measurement	Metric tonnes CO_2
Description	Carbon remaining in stored wood products 40 years after harvest for the project in year t.
Data Source	Harvest slips and reports
Measurement Methodology	Log Scale based on log length and DIB
Data Uncertainty	None
Monitoring Frequency	Annual data summed for the monitoring period, applied as average annual for the monitoring period
Value applied	
Reporting Procedure	Data summarized in monitoring reports
QA/QC Procedure	Compare to post harvest cruises
Notes	-

Data or Parameter Monitored	Forest Carbon
Unit of Measurement	Metric tonnes of CO_2
Description	Carbon stores in above and below ground live trees at the beginning of the year t.
Data Source	Forest Inventory
Measurement Methodology	Measured per the Carbon Plot Methodology
Data Uncertainty	To be calculated in FVS as the mean +/- 90% confidence interval
Monitoring Frequency	Summarized every 5 years after the first inventory
Reporting Procedure	
QA/QC Procedure	Consistent with carbon plot methodology - The inventory will use a random sample design and re-measure the same permanent plots, which targeted a precision level of +/- 10% of the mean live tree biomass with 90% confidence.
Notes	-

D2. MONITORING PLAN

Each year, the Project Proponent shall submit a signed Attestation that:

- Confirms the continuance of project activities;
- Confirms that ownership remains clear and uncontested;
- Discloses any negative environmental or community impacts or claims of negative environmental and community impacts, and documents plans to mitigate any reported negative environmental or community impacts;
- Addresses any significant change in external conditions that would affect the quality or environmental integrity of the project.

The following material outlines the monitoring plan to be followed during the decade following the initial project validation and verification.

General Monitoring Method

Prior to validation/initial verification, a representative sample of 217 fixed radius permanent inventory plots were established across the project area. All permanent plots will be re-inventoried at least twice over the following decade to calibrate forest growth models and improve carbon sequestration projections. See file PC364_KB00_GTCF_KBIC_Carbon_TreeList_20210420.xlsx.

The well-monumented and maintained plot design will give forest managers the opportunity to consistently track the growth and development of specific trees over an extended timeline and allows for improved ease of plot location during field work and site verifications. All plots will be re-measured in a manner consistent with the Inventory Methodology, provided separately for verification.

In addition to the full inventory update of the entire property that will be conducted on all plots every 5 years, inventories of select portions of the Project Area will be updated periodically in response to natural disturbance or significant forest management activities. Following natural disturbance events, affected project stands will be assessed for damage by forestry staff. If damage is significant, the affected areas will be re-inventoried and project scenario models will be adjusted to reflect onsite carbon stocks.

In years in which forest plots are not re-inventoried, carbon stocks will be estimated and monitored through forest growth and yield modeling.

In addition to inventory sampling, management staff will consistently monitor the general health and condition of the forest throughout the course of normal forest management activities (e.g., road maintenance, ecological studies, boundary marking), reducing the risk of reversal by disease, pest invasion, and unauthorized timber removal.

Spatial Informatics Group, LLC (SIG) will oversee initial project reporting, modeling, and monitoring activities on behalf of the landowner. The landowner will be responsible for “on the ground” forest management activities on the project area, and a contractor will conduct inventory measurements and data collection. After forest inventory data collection, the forestry contractor will report results to SIG for processing and updating of modeling projections. After processing is complete SIG will house all data and submit the necessary documentation for compliance with ACR standards. SIG will ultimately store project data for at least fifteen years after the conclusion of the project.

Data Processing and Storage

Manually and electronically filed data are stored and archived. Backup copies of all electronically stored data are maintained in a separate data center with scheduled archiving to assure data protection. Future revisions to project documents after initial verification and registration will be clearly identified by saving them as separate files and including the date of revision in any modified documents. All data will be stored on Dropbox or similar online cloud storage service and kept by SIG for a minimum of 15 years after the conclusion of the project.

QA/QC Field Procedures

Field Procedures

At the end of each field day, individual foresters back up their data recorders. The senior forester then looks for irregularities in the data and asks the field crew to confirm the data or remeasure any plots that cannot be reconciled. The senior forester then adds all the data to a master spread sheet.

At least 5% of the plots are checked by a different forester than cruised the plot, specifically by someone senior to the field crew. This involves full plot measurement to identify any problems with determining in/out trees, species calls, defect measurements, DBH measurements, and height measurements. Any

errors noted during the check cruise are used to update the master spread sheet file. Any consistent height, species, DBH, or defect errors are resolved by talking with the foresters and removing crew members as needed.

Desk Procedures

The following QA/QC approach was designed to ensure that field data, once inputted, was appropriately managed and maintained, and that subsequent calculations using that data to determine onsite carbon stocks and associated ERT issuance were correctly implemented.

A three-stage QA/QC process with a defined review group for the project was established, engaging both personnel intimately familiar with all project files and documentation, as well as independent reviewers who are able to bring fresh eyes to key outputs.

Independent Forester Review: Initial data checks are conducted prior to modeling as a part of the SIG QA/QC process. Once the inventory data is sent to SIG by the contracted inventory crew, SIG runs a series of data checks to look for abnormalities in the data including outlier searches for height/DBH/species, histograms looking for normal or expected distributions of data, and null or missing data entries. Additional data checks include looking for duplicate information within plots, and duplicate information across plots. Information searches include both text, values, and total carbon stocks per plots. Any missing plot data found during these checks results in SIG requesting clarification or additional field measurements from the inventory contractor. The project implementation team (SIG) has a team of foresters with intimate knowledge of the files, models and documents. The development of quantitative components, such as Access databases, FVS model runs and Excel workbooks, are led by one of these foresters. Each of these sources have queries to sum basic biometrics, which facilitate verification (i.e., the sum of tree diameters must be the same in each data component).

Technical Review: Once quantitative outputs are finalized, exported from Access/FVS to Excel, and are ready to be transferred into the GHG Plan and other project documents, an independent manager reviews these outputs. This individual performs data checks by tracing key outputs back from final ERT calculations though the chain of Excel documents to the underlying Access/FVS database.

Senior Management Review: Once outputs have been transferred from Excel to the GHG Plan and other project documents, a senior manager reviews these documents for consistency with other GHG plans, and also reviews text, grammar and formatting for presentation and accuracy.

E. QUANTIFICATION

E1. BASELINE

Inventory Development Overview

The carbon inventory of the project area (15,356 acres) was conducted in December 2020. The inventory employed a sample of 217 fixed-radius circular plots installed in a random distribution across the project area. The nested plots consist of a 1/24th acre plot recording trees ≥ 5" and a 1/300th acre plot recording trees ≥ 1" and <5" DBH.

Baseline Stratification

The project area was not stratified because the project area is relatively homogenous and the standard error on live CO2 is low at only 6.75%. Specifically, about 75% of the project area is dominated by sugar and red maple, and about 75% of the project area has >= 70% to 90% canopy cover. The other 25% in each case is a mix of species and canopies.

Growth Model Overview

Field measurement protocols are documented in "KBIC Carbon inventory manual_ 2022_02_10_Final.pdf."

Total aboveground biomass carbon was estimated from inventory data applying species group-specific allometric equations sourced from Jenkins et al 2003. Root biomass was then estimated from total aboveground biomass using component ratios from Jenkins et al 2003, to produce total live tree biomass. Total live tree biomass was converted from pounds to metric tons, multiplied by 0.5 to estimate carbon fraction, then multiplied by 3.664 to calculate CO2 equivalent.

Carbon in standing dead wood included deductions for decay class that were recorded in the field. Decay classes were recorded according to the ACR standard using the methodology-defined class (see Table E1.2). See the Section "ERT Calculation Overview" for further details on how carbon estimates are calculated for aboveground dead carbon.

Table E1.2 ACR decay classes

Decay Class	Description
Decay Class 1	Tree with branches and twigs that resembles a live tree (except for leaves)
Decay Class 2	Tree with no twigs but with persistent small and large branches.
Decay Class 3	Tree with large branches only.
Decay Class 4	Bole only, no branches.

Growth and Yield Simulation

For growth and yield projections, we used the US Forest Service Forest Vegetation Simulator (FVS) Lake States (LS) variant. FVS-LS was calibrated to the project area using site index value and species, and using plot aspect and slope, plus the projects National Forest location code. Site Index was calculated from tree cores taken in the field, one site tree per plot. The available outputs following processing tree cores included tree species, DBH, Height, Pith Date (calendar year), and DBH Age (years). From these outputs, Site Index was calculated using species-specific Carmean site index curve (1989) equations. See file PC364_KB02_SiteIndexforPlots_20210930.xlsx.

Initial carbon stock estimates for the project start date were back-modeled via FVS-LS with the approach outlined below. See file PC364_KB05_Degrowth_20210513.xlsx for details.

1. Inventory tree data were entered into FVS-LS and grown for 5 years with no management (with "NoTriple" keyworded to track individual trees and permit cross-referencing to raw inventory dataset).
2. For each live tree (ascribed a unique identifier), annual diameter (and height) growth was derived assuming linear growth during the 5-year projection interval (i.e. for DBH, annual growth calculated as DBH at end of 5-year interval minus DBH at beginning of 5-year interval, reported in the FVS Tree list output, divided by 5).
3. For each live tree, diameter and height data from the plot measurement date were degrown referencing the percentage of annual basal growth observed by Winget & Kozlowski (1965). Trees per acre were held constant over the degrow period.
4. Initial carbon stocks were recalculated using the degrown data. No harvests or significant disturbances took place during the intervening period. Diameter of standing dead trees were assumed to be constant through the period.

Table E1.4 Project start values for above and belowground (live and dead) tree biomass

Live CO2e Statistics (AG+BG) February 13th, 2019			
Strata	Average of Live CO2e	Std. Dev of Live CO2e	Plots
Average/Acre	143.6	86.8	217
Dead CO2e Statistics (AG Only) February 13th, 2019			
Strata	Average of Dead CO2e	Std. Dev of Dead CO2e	Plots
Average/Acre	4.33	9.7	217

Estimated total stock in live and dead trees at the project start date, de-grown from the inventory data, is 2,271,497 tonnes CO2e (= 147.9t CO2/ac * 15,356 acres). See the details in file PC364_KB06_ProjStart_PlotAvgs_20210930.xlsx.

Baseline Harvest Schedule Scenario Overview

The Baseline Scenario represents a non-governmental harvest regime designed to maximize the 100-year Net Present Value (NPV) at a 5% discount rate, subject to operational considerations in the region. Only volume from merchantable species count toward costs and revenues. The acres to cut of each prescription by plot was determined using a linear programming model, which found the combination of prescriptions that maximizes the NPV over 100 years.

1. The only regeneration harvest modeled was clearcutting.
   a. Clearcuts were modeled starting in 2019, and then in one-year intervals for the 1st decade, and then at the midpoint of each latter decade.
   b. A minimum harvest of at least 4,500 board feet/acre could be harvested if the stand was growing less than the 5% discount rate.
   c. The subsequent rotation age was modeled at 60 years.

The common practice in this area regarding post clearcut regeneration is to rely on natural regeneration, without any site prep. The post clearcut species composition is based on the existing site specie's shade tolerance. Stands with a shade tolerant major species (based on the site tree), will have lower seedling survivability due to the lack of shade in a clearcut. See file PC364_KB07_RxInputs_20210410.xlsx for details.

Table E1.6 Post clearcut seedling establishment with shade tolerance distribution

Common Name	Wood Type	Tolerance	RegnTotal	RegnTol	RegnMod	RegnInTol
balsam fir	Softwood	Tolerant	699	0.5	0.25	0.25
tamarack	Softwood	Intolerant	1,366	0.25	0.25	0.5
white spruce	Softwood	Moderate	1,059	0.25	0.5	0.25
black spruce	Softwood	Tolerant	699	0.5	0.25	0.25
eastern white pine	Softwood	Moderate	1,059	0.25	0.5	0.25
northern white-cedar	Softwood	Tolerant	699	0.5	0.25	0.25
red maple	Hardwood	Tolerant	912	0.5	0.25	0.25
sugar maple	Hardwood	Tolerant	608	0.5	0.25	0.25
paper birch	Hardwood	Intolerant	1,188	0.25	0.25	0.5
white ash	Hardwood	Intolerant	1,188	0.25	0.25	0.5
black ash	Hardwood	Intolerant	1,188	0.25	0.25	0.5
bigtooth aspen	Hardwood	Intolerant	1,188	0.25	0.25	0.5
quaking aspen	Hardwood	Intolerant	1,188	0.25	0.25	0.5
northern red oak	Hardwood	Moderate	921	0.25	0.5	0.25
American basswood	Hardwood	Tolerant	608	0.5	0.25	0.25

Volume yields were output for 100-year projections from FVS-LS.

The net present value of the harvests was computed using stumpage rates published by **2021 Michigan DNR**. These per MBF rates are by species. The file PC364_KB11_Stumpage_20210930.xlsx has the stumpage rates. The final stumpage value is decreased by $5/MBF for road maintenance.

Cost Assumptions

There is no site prep or planting costs in the modeling.

Fixed cost estimates for the property were not included as they do not affect harvest decisions in the NPV optimization, which are volume based. Ultimately, the financial analysis shows all harvest entries have positive net revenues, therefore the baseline harvest activities are financially viable over a 100-year term using the cost and stumpage estimates cited above.

Optimal Harvest Scheduling

The objective function maximized the net present value of the stumpage revenues less road maintenance costs, at a 5% discount rate, subject to a maximum of 30 MMBF/year, and a minimum of 2.4 MMBF/year (about 2/3 of current allowable cut). The minimum was included to provide a continuous and sustained level of forest products and revenues.

Project Harvest Schedule Scenario Overview

The project model has no harvesting.

Carbon Calculation Overview

The harvest schedule reports the two CO2 pools used in the uncertainty calculations:

1) Live Stocks: includes above and below ground live stocks
2) Dead Stocks: includes only above ground dead stocks

ERT Calculation Overview

The ERTs were computed based on the equations and coefficients provided in the ACR Document Improved Forest Management Methodology for Quantifying GHG Removals and Emission Reductions through Increased Forest Carbon Sequestration on Non-Federal U.S. Forestlands; April 2018.

The mill efficiencies are from the Regional Mill Efficiency Database and are broken down by species group (hardwood vs. softwood) and wood product (pulp vs. sawlog). However, since FVS provides no estimates of carbon by species or wood product, we determined species and product estimates from the ACR wood product classes for the project's Assessment Area. (From tab CO2Stats in file PC364_KB06_ProjStart_PlotAvgs_20210930.xlsx).

Table E1.9 Total Live CO2 Stocks

Strata	CO2/ Acre	Std. Dev.	Plots	Std. Error	Acres	Total CO2	Acres * Error (millions)
Average/Acre	143.6	86.8	217	5.9	15,356	2,204,971	8183

Table E1.10 Calculation of Aboveground Dead CO2 Stocks

Strata	CO2/ Acre	Std. Dev.	Plots	Std. Error	Acres	Total CO2	Acres * Error (millions)
Average/Acre	4.33	9.70	217	0.66	15,356	66,526	102.3

The inventories were projected in FVS-LS for the 100-year scenario. Projections past the 1st decade were annualized using linear interpolation. Direct biomass carbon estimates for live trees were output via FVS FFE carbon reports, using Jenkins et al 2003 biomass predictions in metric tons of carbon per acre, matching the calculations applied to the forest inventory measurements. Carbon in dead stocks based on Jenkin's biomass was computed external to FVS using the snag detail table.

Defect deductions were applied to both live and dead trees at the plot level, using the following methodology:

- Calculate total cubic feet (CF) for each tree record: (trees/acre)*(CF/tree) = CF/ac
- Apply cruise defect to each tree
- Calculate live defect for each plot from a CF-weighted average of live trees
- Calculate dead defect for each plot from a CF-weighted average of dead trees, plus the ACR wood density deductions.
- See file PC364_KB03_FVS_AvgDefect_20210930.xlsx for details

Table E1.11 Snag description for project area

ACR Decay Class	Density Deduction
1 - Tree with branches and twigs that resembles a live tree	97%
2 - Tree with no twigs but with persistent small and large branches	95%
3 - Tree with large branches only	90%
4 - Bole only, no branches	80%

Harvested wood products

Step 1: Long-term storage in wood products was calculated from FVS projections of merchantable carbon removed. The wood products are based on the percentages for the supersection in table E1.8.

Step 2: Estimate net wood product tonnes by applying mill efficiency values referenced from the ARB 2015 forest protocol "Regional Mill Efficiency Data.xls", for the North Central Lake States region specified in Table E1-12.

Table E1.12 Mill efficiency values

Wood Product Group	Mill Efficiency
SW SAW	63.0%
SW PULP	51.4%
HW SAW	58.5%
HW PULP	68.5%

Steps 3 and 4: Transformed carbon was summed across the hardwood/softwood/pulp/sawtimber categories and then distributed among a range of end wood product classes. Distributions of end wood product classes reference ARB 2015 forest protocol values derived from the supersection (Table E.1.13).

Table E1.13 Wood Product Category Percentages for supersection: Laurentian Mixed Forest Southern Superior

Softwood Lumber	Hardwood Lumber	Plywood	OSB	Panels	Misc.	Paper	Softwood Pulp	Hardwood Pulp
15.73%	46.09%	0.51%	25.64%	8.54%	3.50%	0.00%	9.71%	28.47%

Wood product amounts retained in storage for 100 years in in-use wood products and landfills were then calculated referencing end wood product class-specific 100-year average storage factors provided in the methodology.

Table E1.14 100 Year storage factors

Wood Product Class	In-Use	Landfills
Softwood Lumber	0.234	0.405
Hardwood Lumber	0.064	0.49
Softwood Plywood	0.245	0.4
Oriented Strandboard	0.349	0.347
Non-Structural Panels	0.138	0.454
Misc. Products	0.003	0.518
Paper	0.000	0.151

Step 5: Carbon in long-term storage was then summed across in-use wood products and landfills and across modeled baseline strata to produce annual total t CO2 stored in in-use wood products and landfills after 100 years from wood harvested in a given year. Emissions due to burning logging slash are conservatively assumed in the baseline to be zero. Thus, parameter BSBSL equals zero and the outcome of equation 4 of the methodology, parameter GHGBSL, equals zero.

Baseline Harvest Mix

Table E1.15 presents the baseline mix of harvest practices that maximizes the net present value of 100-year cash flows. The maximum NPV under the baseline over 20 years is $19,528,000.

Table E1.15 Baseline prescription acreage.

Rx Theme	Grand Total
Clearcuts only	13,446
Let grow, no harvest	1,910
Total	**15,356**

E2. PROJECT SCENARIO

The actual project scenario is measured through future inventories over the course of the project lifetime. However, we produce an ex-ante projection of the project scenario assuming the landowner will not conduct any harvesting.

E3. LEAKAGE

Quantification of leakage is limited to market leakage, as no activity-shifting leakage is allowed by the methodology beyond de minimis levels. All entity owned lands that conduct commercial timber harvestings are managed under the Forest Stewardship Plan for the Keweenaw Bay Indian Community, a Bureau of Indian Affairs approved forest management plan, therefore there is no activity-shifting leakage.

Market leakage was determined by quantifying the merchantable carbon removed in both the baseline and with-project cases. Carbon in long-term storage in in-use wood products and landfills, calculated above, was used to assess relative amounts of “total wood products produced” in the two scenarios. Light timber harvest is projected to take place in the with-project scenario. The decrease in wood production relative to the baseline was calculated and the applicable market leakage discount factor was determined.

Table E3.1 Calculation of leakage factors for baseline:

Period	Total harvested wood products stored for 100 years under the	Total harvested wood products stored for 100 years under the	Decrease in Wood Products as Percentage of Baseline Stocks (%)	Applicable Leakage Factor

	Baseline Scenario (tCO_2e)	Project Scenario (tCO_2e)		
2019-2038	727,541	0	100.0%	40.0%

E4. UNCERTAINTY

Per the methodology, *"The 90% statistical confidence interval (CI) of sampling can be no more than ±10% of the mean estimated amount of the combined carbon stock across all strata. If the Project Proponent cannot meet the targeted ±10% of the mean at 90% confidence, then the reportable amount shall be the lower bound of the 90% confidence interval.*"

Parameter $e_{BSL,TREE}$ (6.75%) is derived below from the 2019 starting inventory data.

Table E4.1. Live tree statistics from 2019 inventory

Parameter	Project
Mean tCO_2/acre	143.6
Variance (C)	7,530
Standard Deviation (C)	86.8
Coefficient of Variation (%)	0.604
Standard Error (in C)	**6.75%**
90% Confidence Interval (C)	9.690
n	217
Acres	15,356
Mean (acres)	70.8

Parameter $e_{BSL,DEAD}$ (25.01%) is derived below from the 2019 Dead inventory data.

Table E4.2. Dead tree statistics from 2019 inventory

Parameter	Project
Mean tCO_2/acre	4.3
Variance (C)	94
Standard Deviation (C)	9.7
Coefficient of Variation (%)	2.240
Standard Error (in C)	**25.01%**
90% Confidence Interval (C)	1.083
n	217
Acres	15,356
Mean (acres)	70.8

See tab [CO2 Stats] in file PC364_KB06_ProjStart_PlotAvgs_20210513.xlsx

Overall uncertainty in the baseline is calculated using equation 10 of the methodology:

$UNC_{BSL} = \sqrt{((C_{BSL,TREE} * e_{BSL,TREE})^2 + (C_{BSL,DEAD} * e_{BSL,DEAD})^2 + (C_{BSL,HWP} * e_{BSL,TREE})^2 + (GHG_{BSL} * e_{BSL,TREE})^2)} / (C_{BSL,TREE} + C_{BSL,DEAD} + C_{BSL,HWP} + GHG_{BSL})$

where $C_{BSL,TREE}$ is the live tree carbon stock at the start date, $C_{BSL,DEAD}$ is the dead wood carbon stock at the start date and $C_{BSL,HWP}$ is the twenty-year average stock of carbon in long term storage in wood products. Emissions due to burning logging slash are conservatively assumed in the baseline to be zero, thus parameter GHG_{BSL} equals zero.

Table E4.3. Model Uncertainty

Scenario	Total Uncertainty
Baseline	6.49%
Project	6.60%
Total Uncertainty	5.33%

E5. REDUCTIONS AND REMOVAL ENHANCEMENTS

Methodology calculations and estimates of net reductions and removals enhancements are detailed in the tables below. Note that (2019) refers to starting stocks at the February 13, 2019 project start date; the first Reporting Period is February 13, 2019 to June 30, 2021.

Table E5.1 Project ERT Calculations, First Decade

ITLF KBIC Project Final ERT Calculations, First Decade										2/7/2022	
Period Start Date	2/13/2019	2/13/2020	6/30/2021	2/13/2022	2/13/2023	2/13/2024	2/13/2025	2/13/2026	2/13/2027	2/13/2028	2/13/2029
Reporting Period	0	1	1	2	3	4	5	6	7	8	9
RP Days			**137.8%**	**62.2%**							
Project Yr	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
BASELINE											
AG+BG LIVE TREE	*2,204,971*	*1,894,302*	*1,539,232*	*1,415,871*	*1,222,416*	*1,092,074*	*1,005,169*	*1,003,254*	*1,005,951*	*1,012,329*	*1,017,003*
AG DEAD TREE	*66,526*	*76,367*	*62,549*	*59,763*	*54,640*	*53,621*	*44,511*	*40,286*	*34,500*	*30,302*	*38,195*
HWPs		36,377	50,131	22,624	36,377	36,377	36,377	36,377	36,377	36,377	36,377
C BSL	2,271,497	2,007,046	1,651,912	1,498,257	1,313,434	1,182,072	1,086,057	1,079,917	1,076,828	1,079,008	1,091,575
ΔC BSL, tree, t		(310,669)	(355,070)	(123,361)	(193,455)	(130,342)	(86,905)	(1,915)	2,697	6,378	4,673
ΔC BSL, dead, t		9,842	(13,818)	(2,786)	(5,122)	(1,019)	(9,110)	(4,224)	(5,787)	(4,198)	7,893
$\bar{c}$ BSL, HWP		36,377	36,377	36,377	36,377	36,377	36,377	36,377	36,377	36,377	36,377
C BSL, AVE		1,220,984	1,220,984	1,220,984	1,220,984	1,220,984	1,220,984	1,220,984	1,220,984	1,220,984	1,220,984
Year T	2,271,497	2,007,046	1,651,912	1,498,257	1,313,434	1,220,984	1,220,984	1,220,984	1,220,984	1,220,984	1,220,984
ΔC BSL, t		(264,450)	(318,757)	(103,524)	(162,200)	(201,581)	-	-	-	-	-
PROJECT											
AG+BG LIVE TREE	*2,204,971*	*2,273,118*	*2,349,382*	*2,328,742*	*2,383,578*	*2,440,766*	*2,490,450*	*2,541,239*	*2,592,156*	*2,645,143*	*2,699,242*
AG DEAD TREE	*66,526*	*66,526*	*66,526*	*98,222*	*96,007*	*98,612*	*94,324*	*94,432*	*88,958*	*83,814*	*91,894*
HWPs		24	3,068	-	-	-	-	-	-	-	-
C Proj	2,271,497	2,339,667	2,418,975	2,426,964	2,479,586	2,539,378	2,584,774	2,635,672	2,681,113	2,728,957	2,791,136
ΔC Proj, tree, t		68,146	76,264	(20,640)	54,837	57,187	49,685	50,789	50,916	52,988	54,098
ΔC Proj, dead, t		-	-	31,696	(2,215)	2,605	(4,288)	108	(5,475)	(5,144)	8,081
ΔC Proj, t		68,170	79,332	11,057	52,622	59,792	45,397	50,897	45,442	47,844	62,179
Total Uncertainty		5.3%	5.4%	5.9%	5.2%	5.2%	6.6%	6.6%	6.6%	6.6%	6.6%
C ACR (gross),t		332,621	398,089	114,581	214,822	261,373	45,397	50,897	45,442	47,844	62,179
C ACR (deduct),t		164,980	197,453	56,832	106,552	129,641	22,518	25,246	22,540	23,730	30,842
Net ERTs Issued, t		167,641	200,637	57,748	108,270	131,732	22,879	25,651	22,902	24,113	31,338
Total Tradeable Balance		167,641	368,277	426,026	534,296	666,028	688,907	714,558	737,460	761,573	792,911

Table E5.2 Project ERT Calculations, Second Decade

ITLF KBIC Final ERT Calculations, Second Decade									2/7/2022	
Period Start Date	2/13/2030	2/13/2031	2/13/2032	2/13/2033	2/13/2034	2/13/2035	2/13/2036	2/13/2037	2/13/2038	2/13/2039
ACR Acct Yr	10	11	12	13	14	15	16	17	18	19
Project Yr	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039
BASELINE										
LIVE TREE	1,023,873	1,030,744	1,037,614	1,044,484	*1,051,355*	1,058,225	1,065,096	1,071,966	1,078,837	*1,085,707*
DEAD TREE	39,285	40,375	41,465	42,555	*43,645*	44,735	45,825	46,915	48,005	*49,095*
HWPs	36,377	36,377	36,377	36,377	36,377	36,377	36,377	36,377	36,377	36,377
C BSL	1,099,536	1,107,496	1,115,456	1,123,417	1,131,377	1,139,337	1,147,298	1,155,258	1,163,218	1,171,179
ΔC BSL, tree, t	6,870	6,870	6,870	6,870	6,870	6,870	6,870	6,870	6,870	6,870
ΔC BSL, dead, t	1,090	1,090	1,090	1,090	1,090	1,090	1,090	1,090	1,090	1,090
c̄ BSL, HWP	36,377	36,377	36,377	36,377	36,377	36,377	36,377	36,377	36,377	36,377
C BSL, AVE	1,220,984	1,220,984	1,220,984	1,220,984	1,220,984	1,220,984	1,220,984	1,220,984	1,220,984	1,220,984
Year T	1,220,984	1,220,984	1,220,984	1,220,984	1,220,984	1,220,984	1,220,984	1,220,984	1,220,984	1,220,984
ΔC BSL, t	-	-	-	-	-	-	-	-	-	-
PROJECT										
LIVE TREE	2,745,073	2,790,903	2,836,734	2,882,565	*2,928,396*	2,974,227	3,020,058	3,065,889	3,111,720	*3,157,551*
DEAD TREE	95,368	98,842	102,316	105,790	*109,264*	112,738	116,212	119,686	123,160	*126,634*
HWPs	-	-	-	-	-	-	-	-	-	-
C Proj	2,840,441	2,889,746	2,939,051	2,988,355	3,037,660	3,086,965	3,136,270	3,185,575	3,234,880	3,284,185
ΔC Proj, tree, t	45,831	45,831	45,831	45,831	45,831	45,831	45,831	45,831	45,831	45,831
ΔC Proj, dead, t	3,474	3,474	3,474	3,474	3,474	3,474	3,474	3,474	3,474	3,474
ΔC Proj, t	49,305	49,305	49,305	49,305	49,305	49,305	49,305	49,305	49,305	49,305
Total Uncertainty	6.6%	6.6%	6.6%	6.6%	6.6%	6.6%	6.6%	6.6%	6.6%	6.6%
C ACR (gross),t	49,305	49,305	49,305	49,305	49,305	49,305	49,305	49,305	49,305	49,305
C ACR (deduct),t	24,456	24,456	24,456	24,456	24,456	24,456	24,456	24,456	24,456	24,456
Net ERTs Issued, t	24,849	24,849	24,849	24,849	24,849	24,849	24,849	24,849	24,849	24,849
Total Tradeable Balance	817,759	842,608	867,457	892,306	917,155	942,004	966,853	991,702	1,016,551	1,041,400

E6. EX-ANTE ESTIMATION METHODS

Live tree carbon stocks in the project scenario were projected *ex ante* in FVS for the period 2019 to 2039. Projections were annualized using linear interpolation. Direct biomass carbon estimates for live trees were output via FVS Jenkins carbon reports. Projections were made assuming no timber harvests and sustainable conservation forest management activities take place during the period.

Carbon Dioxide projections per acre for the project scenario are summarized in the table below, including live tree, standing dead wood and harvested wood products carbon. The project scenario's crediting period is from 2019 to 2038. The inventory was completed in December 2020.

Table E6.1 Ex-ante CO2 estimation over time

Year	Live tCO2/Ac	Dead tCO2/Ac	HWP tCO2/Ac
2019	143.59	4.33	
2020	148.03	4.33	0.00
2021	152.99	4.33	0.20
2022	151.65	6.40	0.00
2023	155.22	6.25	0.00
2024	158.94	6.42	0.00
2025	162.18	6.14	0.00
2026	165.49	6.15	0.00
2027	168.80	5.79	0.00
2028	172.25	5.46	0.00
2029	175.77	5.98	0.00
2030	178.76	6.21	0.00
2031	181.74	6.44	0.00
2032	184.73	6.66	0.00
2033	187.71	6.89	0.00
2034	190.70	7.12	0.00
2035	193.68	7.34	0.00
2036	196.67	7.57	0.00
2037	199.65	7.79	0.00
2038	202.63	8.02	0.00

F. ENVIRONMENTAL & COMMUNITY IMPACTS

F1. NET POSITIVE IMPACTS

Community and Environmental Assessment

1. See Section A5. Brief Summary of Project and Section A4. Location.
2. See Section C1. Regulatory Surplus Test.
3. No formal stakeholder consultation was conducted in advance of the project, nor was any required because Keweenaw Bay Indian Community Forest Carbon Project is on tribal lands. If Project Proponent is contacted by any persons regarding the project, Project Proponent will provide references to the publicly available documentation for the project

The project will generate significant environmental benefits including carbon sequestration, habitat protection for wildlife, trees, and plant species, water quality protection, and reduced soil erosion.

There are no perceived negative environmental effects of implementing the project activities maintaining forests and sustainable forest management (Table F1.1). However, ongoing evaluation of forest management practices is addressed in Section D2. Monitoring Plan, and results will be used to identify potential unforeseen future negative direct, indirect and cumulative impacts.

Environmental Factors	**Potential Risk or Impact of Forest Management**	**Change in Risk by Project Activities (Increase, Decrease, No Change)**	
		Maintaining forests	Sustainable forest management
Climate change mitigation	Forest conversion	Decrease	No Change
	Carbon emissions	Decrease	Decrease
Climate change adaptation biodiversity	Habitat fragmentation	Decrease	Decrease
	Introduction of invasive species	Decrease	Decrease

	Habitat degradation or loss Habitat fragmentation	Decrease	Decrease
Air quality	Emissions for logging and trucking equipment	Decrease	Decrease
	C02 emissions	Decrease	Decrease
Water quality	Non-point source pollution	Decrease	Decrease
Soil quality	Soil erosion	Decrease	Decrease
Protection, conservation, or restoration of natural habitats such as forests, grasslands, and wetlands	Habitat fragmentation	Decrease	Decrease
	Habitat degradation	Decrease	Decrease
	Disturbance of hydrological processes	Decrease	Decrease

Table F1.2 An overview of how the project contributes (positive, negative, or N/A) to the United Nation's Sustainable Development Goals

Sustainable Development Goal	Project Impact (+, -, or N/A)	Rationale
GOAL 1: No Poverty	N/A	
GOAL 2: Zero Hunger	N/A	
GOAL 3: Good Health and Well-being	N/A	
GOAL 4: Quality Education	N/A	
GOAL 5: Gender Equality	N/A	
GOAL 6: Clean Water and Sanitation	+	By maintaining forests and ensuring sustainable forest management the project reduces erosion and non-point source water pollution.
GOAL 7: Affordable and Clean Energy	N/A	

GOAL 8: Decent Work and Economic Growth	+	By maintaining forest, habitats, and recreational opportunities the project contributes to tourism, an important resource to the local economy.
GOAL 9: Industry, Innovation and Infrastructure	+	The project provides a new revenue stream for forest land owners.
GOAL 10: Reduced Inequality	N/A	
GOAL 11: Sustainable Cities and Communities	+	By maintaining forests and ensuring sustainable forest management the project sustains the character and economic viability of local communities.
GOAL 12: Responsible Consumption and Production	N/A	
GOAL 13: Climate Action	+	By maintaining forest and ensuring sustainable forest management the project increases sequestration of carbon.
GOAL 14: Life Below Water	N/A	
GOAL 15: Life on Land	+	By maintaining forest and ensuring sustainable forest management the project protects habitat benefits both within the project area and the larger landscape.
GOAL 16: Peace and Justice Strong Institutions	N/A	
GOAL 17: Partnerships to achieve the Goal	N/A	

F2. STAKEHOLDER COMMENTS

N/A KBIC is a federally recognized tribe, and adhered to their internally agreed upon practices of project consultation and notification on associated decision making. NICC will provide references to the publicly available documentation for the project.

G. OWNERSHIP AND TITLE

G1. PROOF OF TITLE

Ownership of forestlands

GHG emission reductions generated by the project activity are generated from forest carbon sources and sinks over which ILTF has ownership rights. KBIC holds offset title to all lands in the project area (see Section G. Ownership and Title) and all GHG emissions from the project are from forest carbon sources and sinks where KBIC has signed an agreement with ILTF. ILTF holds all rights to carbon credits/offsets produced through management of forests in the project area (attestation provided separately for verification purposes).

The deeds for lands within the project boundary were provided for review by the project developer and included in the project file. Agreements between NICC and KBIC specifying GHG emission reduction ownership rights have also been provided.

Emission reduction rights

Emissions reductions rights are owned by the Project Proponent.

G2. CHAIN OF CUSTODY

No sales or purchasing of offsets was conducted prior to project registration.

G3. PRIOR APPLICATION

The Keweenaw Bay Forest Carbon Project has not been listed or registered previously.

H. PROJECT TIMELINE

H1. START DATE

Project start date is February 13, 2019, which is the date of the contractual signing MOU between the Project Proponent and the Offset Developer to assess project feasibility. This start date is appropriate and consistent with the ACR Standard Version 7.0

H2. PROJECT TIMELINE

The table below provides the timeline for Keweenaw Bay Indian Community Forest Carbon Project.

Project Activity	Date	Source/Notes
Project Start Date (Initiation of forest carbon inventory).	February 13, 2019	MOU signing
Frequency of monitoring, reporting and verification		Every 5 years after the first verification
Length of First Crediting period	Through February 12, 2039	20 years
Expected project longevity	Minimum Project Term of at least 40 Years	40 years

ADDENDUM: PROJECT DESIGN DOCUMENT

1. Initial Cohort

Total of 15,356 acres enrolled February 13, 2019.

1.1 Geographic Boundary

Reference section A4 of the Initial Greenhouse Gas Plan for details on the unique geographical boundaries of the initial cohort, including maps and spatial files.

1.2 Project Activities

Reference section *A5.2 Description of Project Activities* of the Initial Greenhouse Gas Plan for details on project activities carried out on the initial cohort site.

1.3 Landowners

Reference section A8 *Project Parties* of the Initial Greenhouse Gas Plan for the name and contact details of the landowner and operator of the initial cohort site.

1.4 Implementation Date

For the initial cohort, the site-specific implementation date is February 13, 2019 and is the same as the project's start date. The implementation date is not prior to the project's Start Date.

1.5 Eligibility Criteria

Reference section A3 *Proof of Project Eligibility* of the Initial Greenhouse Gas Plan for information on how the initial cohort site fulfills the eligibility criteria of the ACR Standard and chosen methodology.

Reference section C *Additionality* of the Initial Greenhouse Gas Plan for a demonstration of additionality as specified in the GHG Project Plan.

1.6 Calculations of Baseline and Emission Reductions

Reference section E *Quantification* of the Initial Greenhouse Gas Plan for information on calculations of baseline emissions and estimated net emission reductions or removal enhancements.

1.7 Confirmation of Implementation Date

Reference section H1 *Start Date* of the Initial Greenhouse Gas Plan for confirmation and evidence of the initial cohort's enrollment date.