



**New Acre  
Project**

Delivered by  **ALUS**

**ALUS Year 2 Progress Report to**

# **Bruce Power**

with the cooperation of the Nuclear Innovation Institute

Powering Grey-Bruce Farmers for Climate Action

April 2024

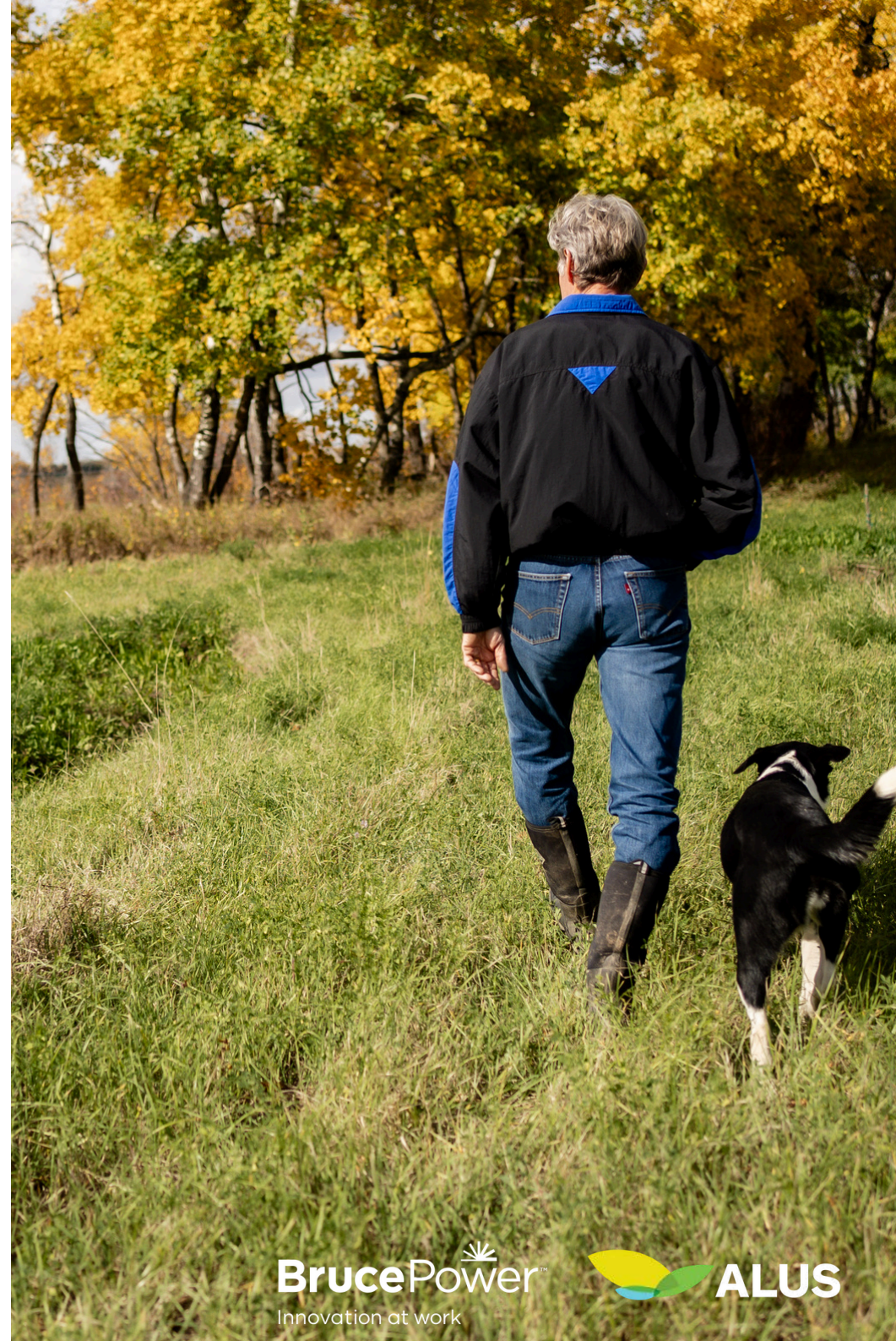
**BrucePower**<sup>™</sup>

Innovation at work



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# EXECUTIVE SUMMARY

ALUS envisions a future where all farmers and ranchers produce ecosystem services from nature-based solutions alongside food and fibre to help solve the crises of biodiversity loss and climate change. Through its turn-key farmer-led, community-delivered program, ALUS supports more than 360 community leaders across 39 ALUS communities in helping over 1,700 farmers and ranchers build and actively manage 52,000+ acres of nature-based projects. These projects, like wetlands, grasslands and tree and shrub plantings, help capture carbon, keep lakes, rivers and streams clean, provide food and shelter for wildlife, and better prepare communities for extreme weather events like flood and drought.

ALUS also helps governments, businesses and organizations invest in new acres of nature created on agricultural land to generate positive environmental, economic and social outcomes in the communities where they operate—one acre at a time.

In 2022, Bruce Power and the Nuclear Innovation Institute (NII) partnered with ALUS to invest \$910,500, over three years to support ALUS Grey-Bruce farmer participants in creating and managing 600 acres of nature-based projects in Grey and Bruce Counties within the Saugeen Ojibway Nation.

These projects enhance biodiversity, capture carbon and improve watershed health. This partnership stemmed from a workshop led by Bruce Power in 2021. ALUS was then invited to submit a proposal to Bruce Power's Carbon Offset Coalition and its \$1M Carbon Offset Accelerator Fund, resulting in this investment.

To date, Bruce Power and NII's investment has supported over 40 ALUS participants in delivering 400 project acres in Grey and Bruce Counties, meeting the target of 200 acres delivered annually.

In 2022, the Bruce Power/NII Leadership Group was established to collaborate with ALUS on a carbon quantification and credit issuance pathway to address the gap in Canada of a methodology and process for generating carbon credits that is aligned with farming and the needs of individual landholders. The group continues to provide valuable guidance on the development of carbon quantification methods using emerging technologies to support the delivery of carbon credits. This year, ALUS published the first draft of ALUS' Ecosystem Service Quantification and CO<sub>2</sub> Credit Issuance Methodology. A process to validate this methodology by American National Standards Institute, an accredited body is underway.





# HIGHLIGHTS

## Tracking Progress

Here's what we've accomplished together in 2022 and 2023:

### Year 1

- Provided outreach and guidance to Partnership Advisory Committee (PAC) to review farmer-led project proposals
- Supported 20 farmers to establish 200 acres of nature-based projects
- Developed an ArcGIS map to estimate the theoretical maximum annual SOC stock gain potential for every Canadian census subdivision
- Identified suitable tools to estimate initial carbon reductions from tree and grassland projects and developed methods to apply these tools to ALUS Projects
- Developed a baseline classification scheme to track prior and historical land use information
- Launched remote sensing technology pilots to quantify the above-ground biomass carbon stocks in trees

### Year 2

- Refined guidance for PACs on project types that are suitable for carbon credit issuance for Year 3
- Supported 22 farmers to establish an additional 200 acres of nature-based projects
- Incorporated a dynamic baseline approach using control plots from sites outside the project boundaries
- Published the first draft of the peer reviewed ALUS Ecosystem Service Quantification and CO<sub>2</sub> Credit Issuance Methodology
- Refined Year 1 carbon estimates based on new Methodology (v 1.0)
- Initiated process to validate Methodology with ANSI-accredited body and register carbon credits on CSA GHG CleanProjects® Registry

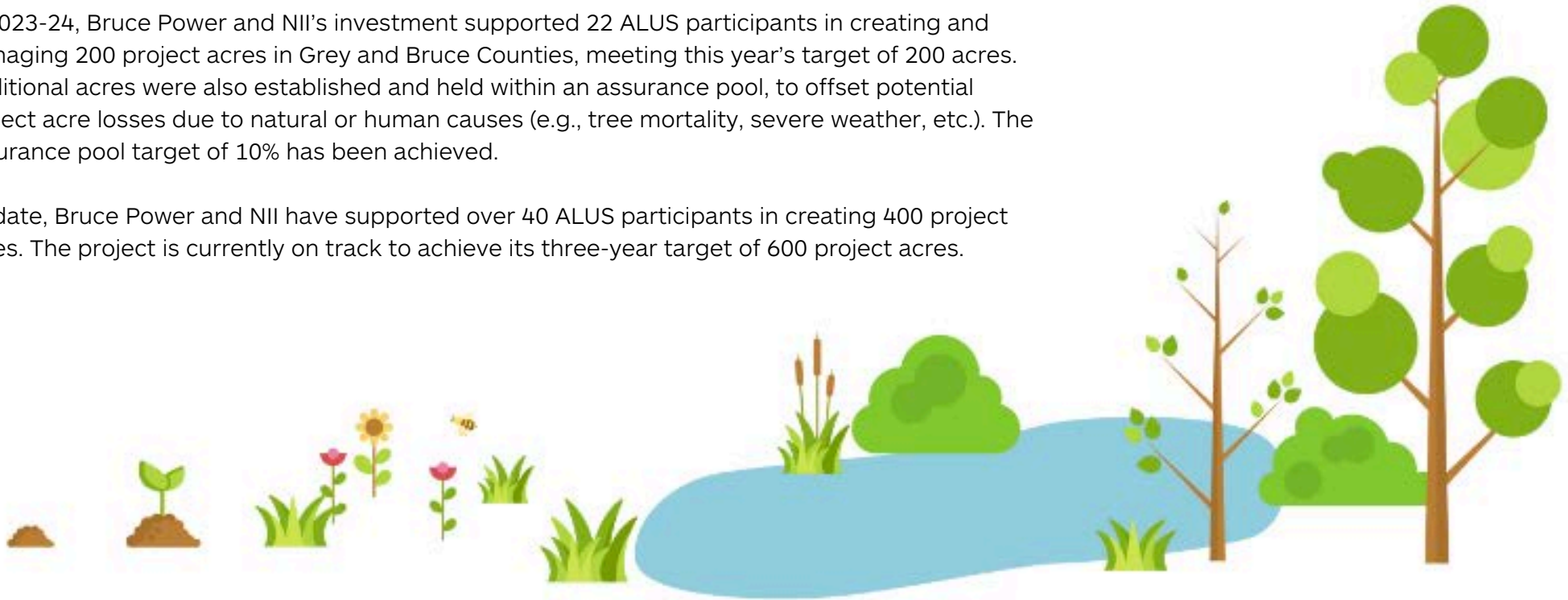


# PROGRESS REPORT

## Year Two

In 2023-24, Bruce Power and NII's investment supported 22 ALUS participants in creating and managing 200 project acres in Grey and Bruce Counties, meeting this year's target of 200 acres. Additional acres were also established and held within an assurance pool, to offset potential project acre losses due to natural or human causes (e.g., tree mortality, severe weather, etc.). The assurance pool target of 10% has been achieved.

To date, Bruce Power and NII have supported over 40 ALUS participants in creating 400 project acres. The project is currently on track to achieve its three-year target of 600 project acres.



**400 ACRES**

**600 ACRES**

**PROGRESS TO DATE**

**GOAL BY 2024**



# Local Nature-based Projects Funded in 2023

The ALUS program is delivered at the community level by government, NGO, agricultural and local leaders through Partnership Advisory Committees (PACs). At least 50% of PAC members across all ALUS communities are local farmers. Embedding decision-making authority and autonomy in local PACs ensures that nature-based projects are designed to respond to local environmental challenges and meet the needs of each community, while helping to reduce the effects of climate change and reverse biodiversity loss.



**39**

acres of wetlands and riparian buffers



**46**

acres of modified agricultural practices



**108**

acres of trees and shrubs

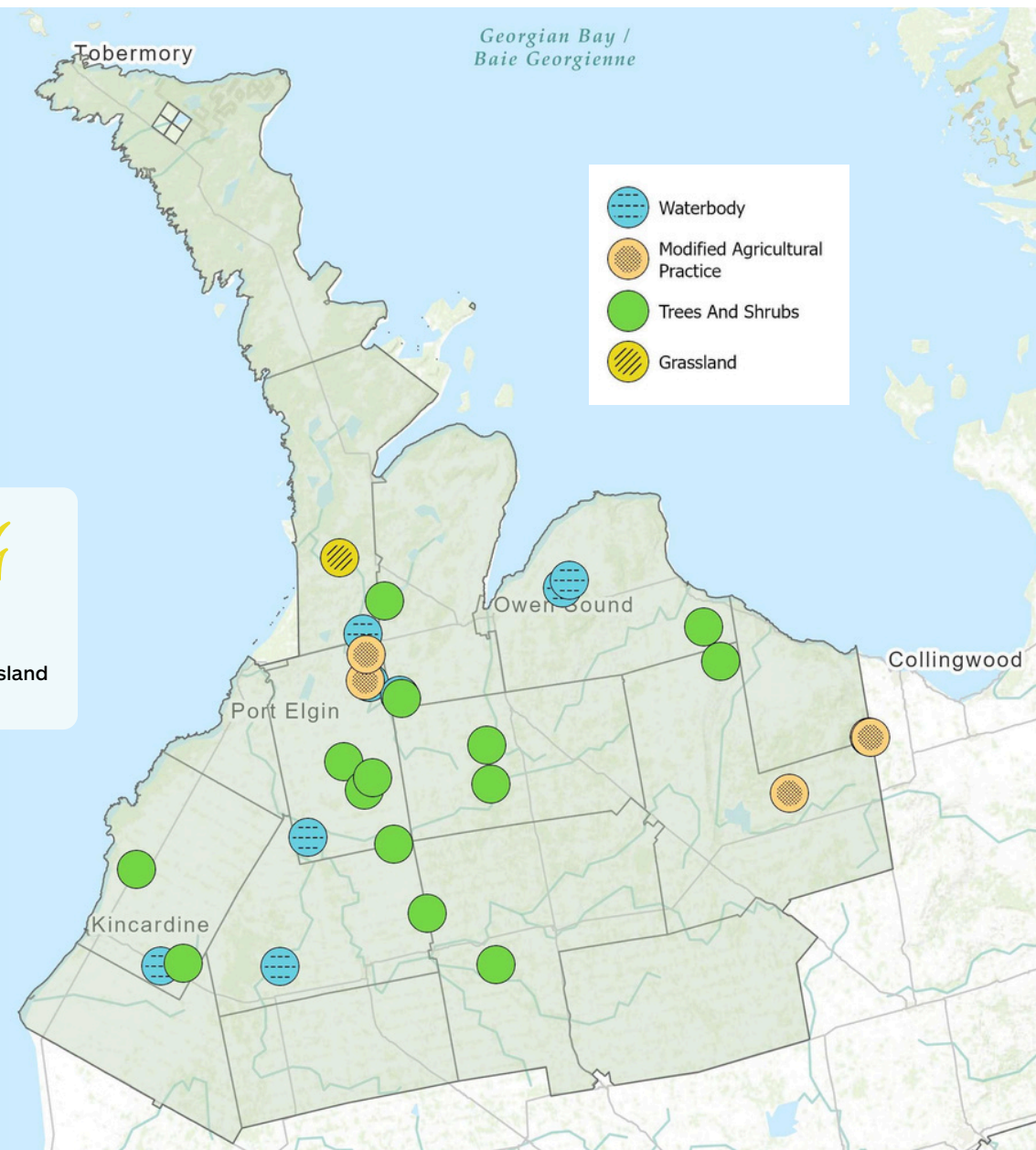


**7**

acres of grassland

Twenty-two farmers participating in ALUS Grey-Bruce completed the above PAC-approved projects with support from Bruce Power and NII.

ALUS Grey-Bruce operates within the traditional territories of the Saugeen Ojibway Nation, (Chippewas of Nawash Unceded First Nation and Chippewas of Saugeen First Nation).





# Social and Environmental Impact

The 200 acres of nature-based projects created by ALUS Grey-Bruce farmers in 2023 deliver a suite of ecosystem services and community benefits that improve the overall health of Grey and Bruce Counties.

- Climate Resilience: Adding new acres of nature to the landscape reduces the effects of severe weather, like wind, flood and drought. Trees provide a cooling effect to counter extreme heat and act as a windbreak to reduce blowing snow and soil erosion.
- Community and Stewardship: ALUS communities foster peer-to-peer learning, knowledge transfer, awareness of local environmental issues and encourage environmental stewardship within the agricultural community.
- Water Quality: Wetlands, grasslands and trees and shrubs help to improve water quality and quantity through filtration and run-off reduction. Plants also help with water absorption to support groundwater recharge.
- Erosion and Nutrient Reduction: Plant roots hold soils in place and slow wind to reduce erosion. They also filter and absorb water to minimize nutrient runoff into local waterways and Lake Huron.
- Biodiversity: Natural areas foster diverse plant life and provide food and shelter for wildlife, like beneficial insects, birds, bats and soil microorganisms.
- Species at Risk: New and restored grasslands protect Species at Risk, such as the Monarch butterfly. Modifying agricultural practices, such as delaying the hay cut until after July 15, can help protect grassland birds like the Bobolink and Eastern Meadowlark.

***Loss of habitat is the leading cause of biodiversity loss in the world. New Acre sponsors are helping to build habitats back.***

**– Katherine Balpataky,  
Senior Director of Corporate Partnerships**

## **SPECIES AT RISK**

**ALUS funders help support local partnerships to create special habitats to protect Species at Risk, including those in Grey and Bruce Counties.**

### **EXAMPLE 1**



**Milkweed is added to tallgrass prairie planting to help Monarch butterflies**

### **EXAMPLE 2**



**Delayed haying enable young Bobolink and other grassland birds to fledge their nests**

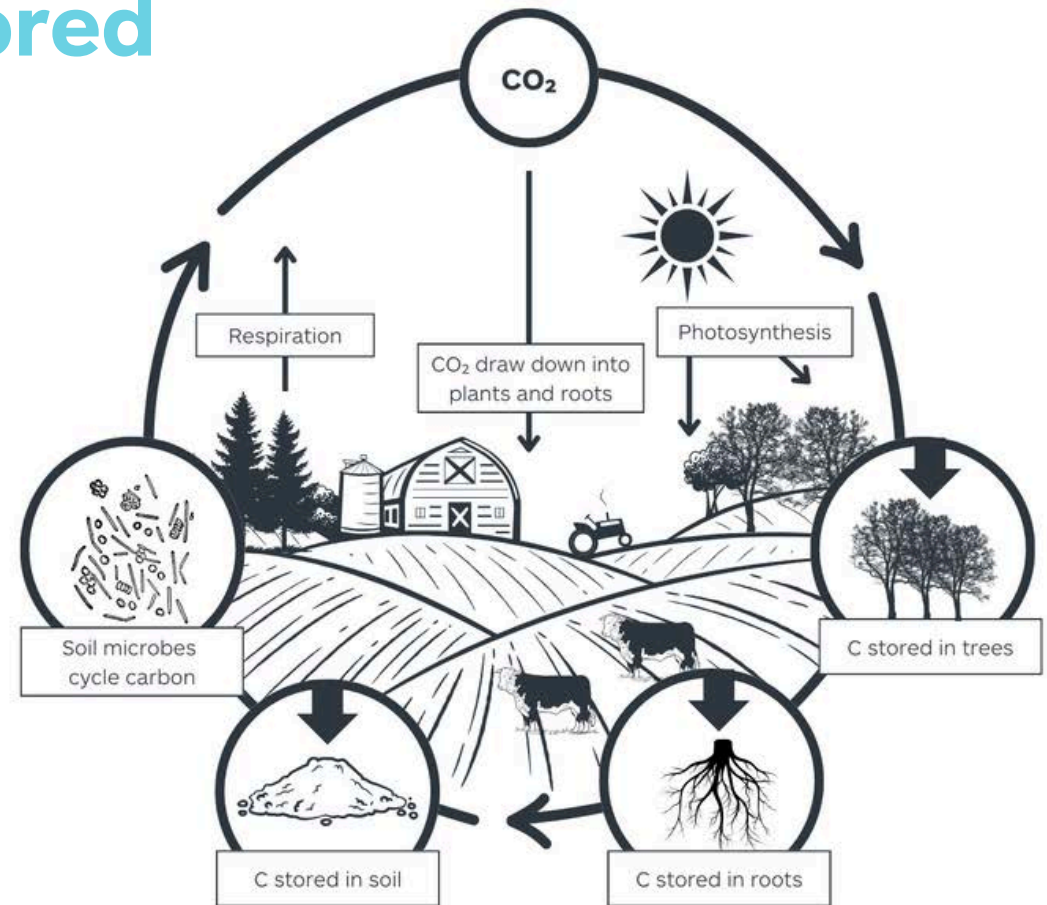


## Carbon Captured and Stored

Native trees, shrubs and grasslands capture carbon from the atmosphere and store it in the soil and in above and below-ground biomass (plant stems, leaves and root systems). Local farmers have the land, skills and knowledge to establish nature-based projects on marginal or uneconomic parcels of land or to adopt modified agricultural practices that can increase the amount of carbon captured and stored on agricultural lands.

ALUS carbon estimates measure incremental carbon sequestration and retention that is realized through the establishment and maintenance of ALUS nature-based projects. The 200 project acres delivered in 2023 have sequestered a preliminary estimate of **172 TCO<sub>2</sub>e per year\***. This is equivalent to **860 TCO<sub>2</sub>e** when projected over the five-year land management agreement held by each ALUS participant. These estimates are discounted and conservative, in alignment with ALUS' Ecosystem Service Quantification and CO<sub>2</sub> Credit Issuance Methodology.

*\*This preliminary estimate reflects ALUS' assessment of the carbon associated with 2023 projects that are admissible under the first draft methodology.*





## COMMUNITY ENGAGEMENT & PARTNERSHIPS

# Fostering Community Connections in Grey- Bruce Counties

The ALUS program is developed and delivered at the community level and is designed to integrate alongside existing conservation programs to foster partnerships and maximize outcomes. This model puts people at the centre of ALUS' work and is key to ALUS' success.

In addition to producing new acres of nature-based projects, Bruce Power and NII's investment fosters meaningful engagement and local outreach activities that facilitate peer-to-peer learning, knowledge sharing, partnerships and pride in stewardship among ALUS Grey-Bruce farmers. In 2023, Bruce Power and NII supported ALUS Grey-Bruce's participation in eight events, engaging over 400 people. To date, ALUS Grey-Bruce has participated in more than 20 local events that have engaged more than 1,300 people with the support of this investment.

Collaboration amplifies impact and community partnerships create robust support networks for establishing local nature-based projects. Bruce Power and NII's investment enables ALUS Grey-Bruce to foster and maintain partnerships with more than 20 organizations, including Stewardship Grey Bruce, Ducks Unlimited Canada, and Bruce Peninsula Biosphere Association.



# Carbon Workplan Collaboration with the Bruce Power/NII Leadership Group

Bruce Power and the NII continue to support ALUS in advancing its workplan to deliver carbon quantification and credit issuance for pre-identified nature-based projects. The Bruce Power/NII Leadership Group and ALUS have met several times this year to discuss progress with the Ecosystem Service Quantification and CO<sub>2</sub> Credit Issuance Methodology, gain feedback on technical considerations and to advance credit issuance decisions.

ALUS values Bruce Power and NII's industry perspectives and expertise. In May 2023 and 2024, NII's Chad Richards, Director, Policy & Partnerships, participated in ALUS' National Strategic Focus Meetings in Toronto. As well, in September, ALUS and NII collaborated on a submission to the Offsets and Emissions Trading Section – Environment & Climate Change Canada regarding the draft [Improved Forest Management on Private Land Federal Offset Protocol](#).

Refer to **Appendix A** for a detailed update on the ALUS Carbon Quantification Workplan.

Year-two meetings achieved the following:

- Sep 2023: Developed steps for third-party credit issuance.
- Oct 2023: Shared initial results from Albo Climate technology pilot.
- Nov 2023: Discussed credit validation and verification options.
- Nov 2023 (ALUS only): Discussed workplan achievements and prioritized next steps to advance quantification efforts (ALUS quantification team in-person meeting, Paris, ON).
- Jan 2024: Provided a general progress update.
- Jan 2024: Refined ALUS' approach to estimating biodiversity benefits; revisited technology pilot results; discussed progress status.
- Mar 2024: Assessed trade-offs in carbon claims (if projects are registered ahead of enhanced quantification results).
- Apr 2024: Reviewed draft of the Ecosystem Service Quantification and CO<sub>2</sub> Credit Issuance Methodology.



# Advancing Technology through Partnerships

Technology is critical to developing credible, cost-effective and scalable ways of valuing nature and the vital ecosystem services it provides people and communities. With support from Bruce Power, NII and Sustainable Development Technology Canada, ALUS launched a technology pilot with Albo Climate in 2022 to map and measure carbon in tree and shrub and grassland projects using remote sensing and machine learning models.

In year two of this partnership, ALUS collected tree measurements on project sites to train and calibrate Albo Climate's model further. To better support satellite imagery processing of ALUS projects, which are often smaller areas with different planting patterns, ages and densities, Albo Climate developed a novel tree detection mask to identify tree pixels more precisely. An artificial intelligence algorithm was applied to the mapped areas to estimate above ground carbon stock.

Ground sampling will continue into next year to recalibrate the models, focusing on increasing both the number of sites sampled and the number of samples taken per site to refine the accuracy of carbon estimates. ALUS has also developed sampling stratification plans to improve the consistency of data collection across different tree planting classifications, to support the need for higher quality field data.

In 2023, the pilot was expanded to include measurement of above-ground carbon stock across a subset of natural grassland acres in Ontario and Alberta. Results from this phase of the study will determine soil organic carbon stock changes realized through establishment and ongoing maintenance of natural grassland and managed pastureland.



# COMMUNICATION AND RECOGNITION

## Summary

In 2023, Bruce Power and NII's investment was announced in a press release alongside the publication of the Year 1 Progress Report. Bruce Power has also been featured in corresponding social media posts and is recognized as a supporter on the ALUS.ca website.

### RECOGNITION

Bruce Power's logo is featured on the ALUS Supporters web page. It is also featured on the new New Acre Nature Investments web page, along with a quote from Danielle LaCroix, Bruce Power's Senior Director, Environment, Sustainability & Net Zero.

#### Trusted by businesses and organizations across North America



**TD READY COMMITMENT**

"Nature is one of the most powerful tools we have to help communities become more resilient to the impacts of climate change. By using what already exists in nature we can help preserve the health of the environment, while also generating positive social and economic benefits"

**Nicole Vadori**  
Vice President, Head of Environment, TD Bank

**BrucePower**  
Innovation at work

"At Bruce Power, our environmental and social principles are core to the work we do and the partnerships we form. Investing in community-led, farmer-delivered nature-based projects has already shown tremendous success and we're looking forward to continued progress and innovation in the years ahead"

**Danielle LaCroix**  
Senior Director - Environment, Sustainability & Net Zero, Bruce Power

**TC Energy**

"New Acre provides an innovative opportunity to invest in building local climate resilience through farmer-delivered environmental projects in the areas where we operate."

**Sharon Tomkins**  
Vice President, Sustainability & Social Impact, TC Energy

#### Trusted by businesses and organizations across North America

**Results you can see and trust**

Managed by ALUS' local community partners and the people who know their land best, projects funded by New Acre™ Nature Investments deliver credible and reliable acre-based outcomes you can trust.

**START THE CONVERSATION**

**Katherine Balpataky**  
Senior Director of Corporate Partnerships

#### Corporate Sponsors



# COMMUNICATION AND RECOGNITION



## In the Media - First Annual Progress Report

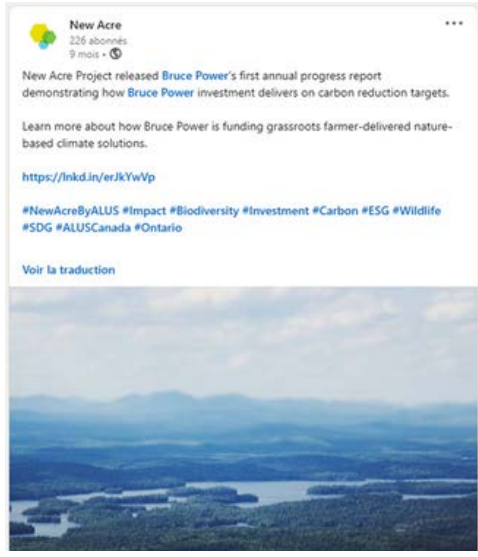
On June 22, 2023, ALUS released Bruce Power's first Annual Progress Report highlighting the positive environmental and social impact Bruce Power's investment achieved in year one. The report was announced through a press release on 3BL Media, a US-based media distribution platform covering ESG-related news and content. It performed extremely well on the platform with 41,059 impressions, compared to a benchmark of 2,973. The press release was distributed across 48 media websites for a total reach of 45M users, with Yahoo Finance reaching 43.7M users.

The announcement was also mentioned 77 times on social media, including on New Acre LinkedIn and Twitter accounts.

*“Bruce Power is a tremendous supporter of Grey-Bruce farmers creating grasslands, forests and wetlands to capture and store carbon,” says Katherine Balpataky, Senior Director of Corporate Partnerships at ALUS. “As the first nuclear operator in North America to announce a net-zero commitment and a development partner of ALUS’ carbon quantification and credit issuance plan, Bruce Power is using their technical expertise and leadership to help drive the low carbon economy for Ontario and all Canadians.”*

**– Katherine Balpataky,**  
Senior Director of Corporate Partnerships

Quote from the press release published on June 22, 2023.





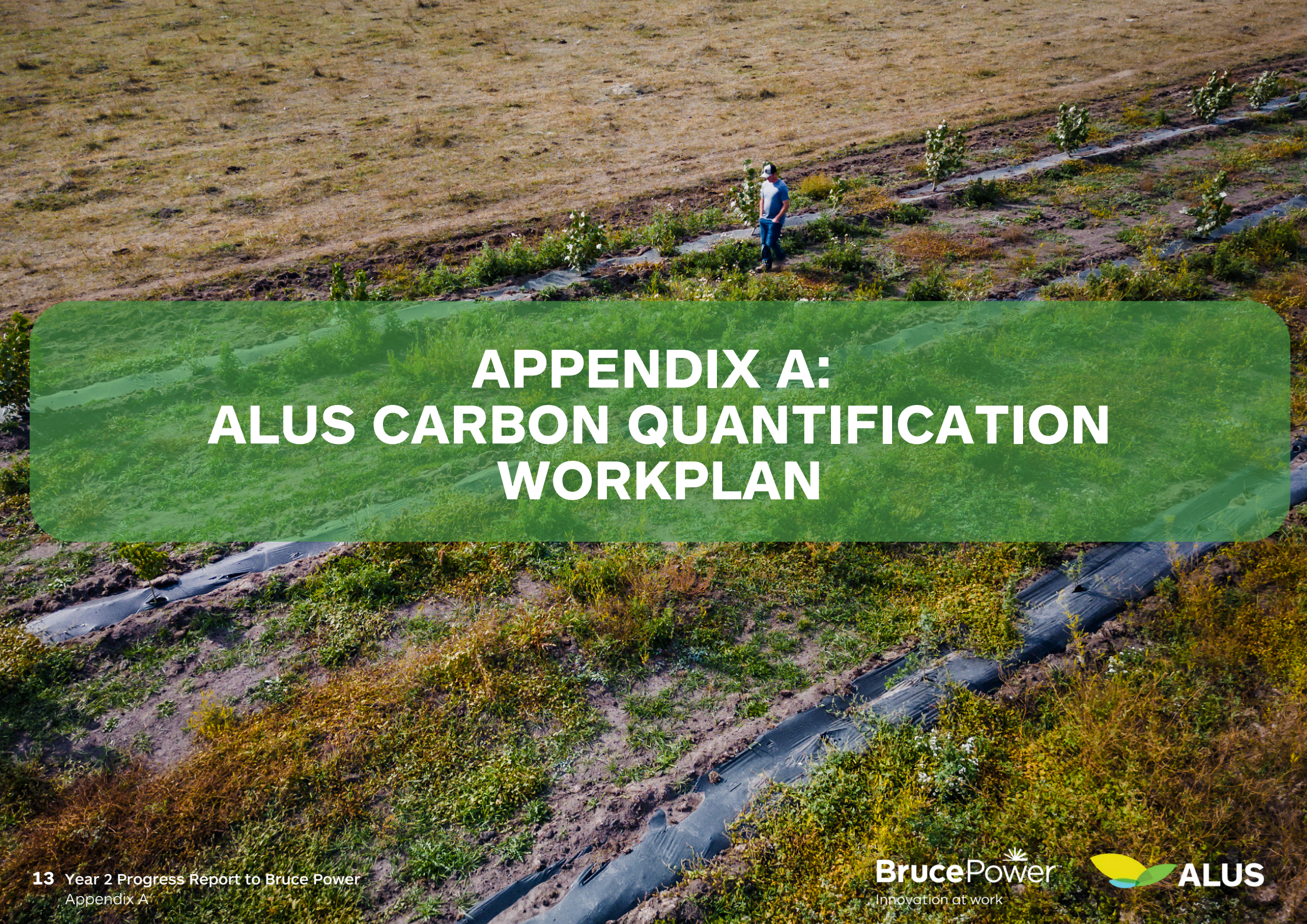
## NEXT STEPS

# Looking Ahead

This year (2024-2025) marks the final year of Bruce Power and NII's three-year ALUS collaboration. To meet the investment objectives of Bruce Power and NII, ALUS will focus its efforts in the following areas:

- Providing ongoing support for the management of projects created as part of this initiative until 2028 and beyond to maintain optimal ecosystem services
- Establishing 200 acres (+ 10% Carbon Loss Risk Assurance Pool) of PAC-approved nature-based projects
- Delivering verified carbon estimates and ALUS CO<sub>2</sub> credits for Year 1 projects under the New Acre Tonne brand in Q4
- Working to expand the scope of carbon sequestration that is included in ALUS' methodology (e.g. below-ground biomass for trees, above-ground biomass for grasslands, wetlands) to capture the full extent of benefits generated by established projects
- Collaborating with researchers and advancing technology pilots to ground truth geospatial monitoring data from ALUS nature-based projects
- Refining the Ecosystem Service Quantification and CO<sub>2</sub> Credit Issuance Methodology based on feedback from external reviewers and submitting the methodology for American National Standards Institute accredited third party validation
- Supporting ALUS Grey-Bruce in their local outreach efforts
- Sharing the recent video [Bruce Power partnership with the ALUS New Acre Project](#), produced by Bruce Power

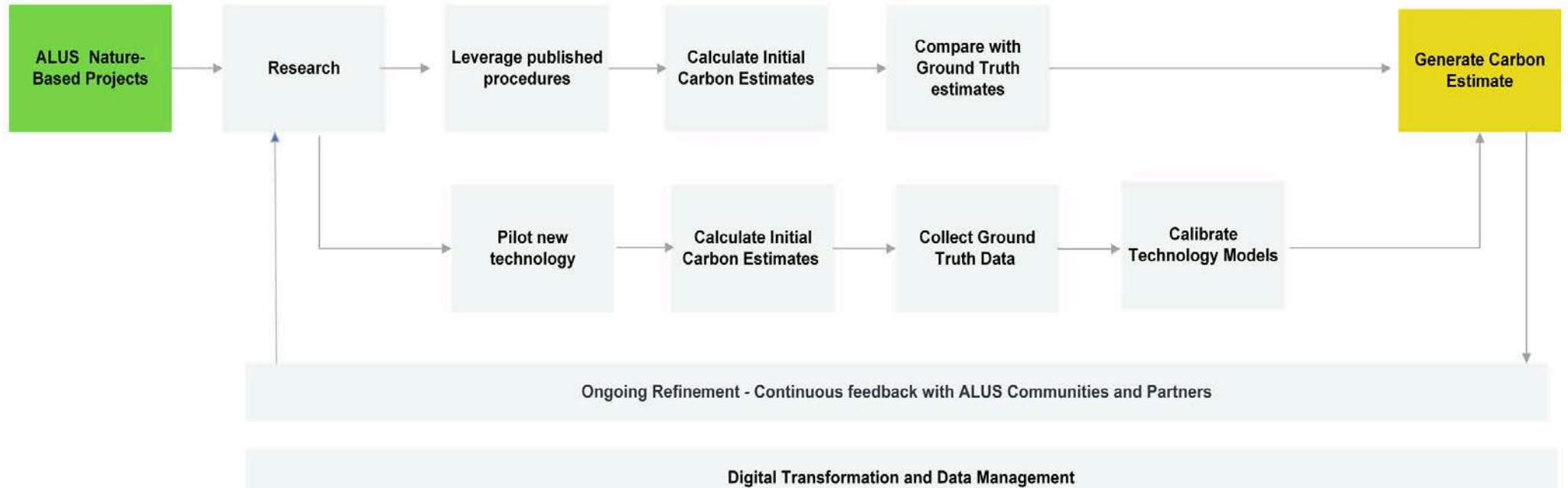




# APPENDIX A: ALUS CARBON QUANTIFICATION WORKPLAN



## ALUS CARBON QUANTIFICATION WORKPLAN



The ALUS Carbon Quantification Workplan was updated in 2023 to reflect ongoing refinement and continuous program improvements. These changes highlight the importance of ongoing feedback and communication with ALUS communities and partners. ALUS communities are committed to piloting and testing new technologies and processes for monitoring, estimating, reporting, and verifying ecosystem service outcomes. Ongoing refinement ensures that data inputs and outputs adhere to quality assurance standards. This includes alignment between the needs of ALUS participants, communities, funders, and ALUS' overarching quantification goals and objectives.



## ALUS CARBON METHODOLOGY

*Objective: Develop a methodology, with expert review, that outlines how carbon sequestration values are estimated, monitored, reported and verified, and how verified carbon credit claims are converted into New Acre Tonne (NAT) issuance.*

In 2023, ALUS developed a methodology that outlines how carbon sequestration values are estimated, monitored, reported and verified, and how verified carbon credit claims are converted into New Acre Tonnes (NATs), ALUS' uniquely branded carbon credit.

The Ecosystem Service Quantification and CO<sub>2</sub> Credit Issuance Methodology received expert review and outlines procedures and tools for estimating annual and projected rates of carbon sequestration and retention for tree planting and grassland establishment projects across the ALUS community network. Planting trees helps to build above-ground biomass. ALUS has used equations from scientific literature to determine high-level carbon estimates in above-ground biomass carbon stocks in early year tree planting projects where trees are difficult to detect with satellite imagery.

Natural grasslands and managed pasturelands similarly capture and store CO<sub>2</sub> from the atmosphere, converting it into above-ground biomass carbon (AGBC) and durable below-ground soil organic carbon (SOC). To estimate incremental SOC sequestration in grassland and pasturelands, ALUS used the [COMET-Planner evaluation tool](#) developed by the USDA/NRCS.

COMET-Planner relies on county-level soil and ecoregion data specific to the U.S. and provides generalized estimates of the potential net greenhouse gas impacts that could result from the implementation of select conservation practices. To adapt the tool for the Canadian soil/ecoregion context, ALUS established selection criteria that matched ALUS communities to U.S. counties with shared/complementary ecoregions.

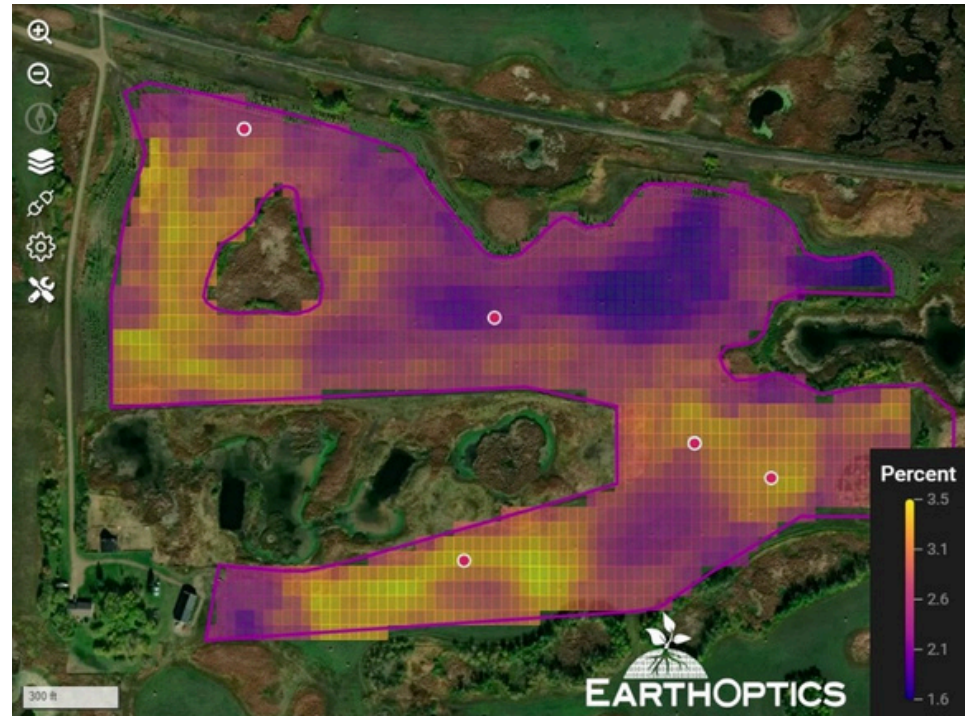


## ADVANCING TECHNOLOGY SOLUTIONS WITH GROUND TRUTH DATA

*Objective: Developing cost effective, scalable approaches to precisely quantify carbon outcomes from representative sample plots across the ALUS network.*

### *EarthOptics*

ALUS partnered with soil data measurement and mapping company, EarthOptics, to leverage on-field sensor technologies to map field-scale carbon concentrations. On-field sensors augmented by machine learning, were used to measure carbon content from baseline soil core samples. More than 60 adaptive multi-paddock grazing projects, representing over 2,800 acres of managed pasturelands in the ALUS community network, were sampled and mapped as part of this pilot.





## ADVANCING TECHNOLOGY SOLUTIONS WITH GROUND TRUTH DATA

### Albo Climate

ALUS continued its multi-year partnership with Albo Climate, an AI-powered carbon monitoring and mapping company, to measure and map carbon stocks in tree planting and natural grassland establishment projects created by ALUS farmers and ranchers.



The Albo Climate approach uses AI-powered satellite imagery processing with a machine learning model to accurately estimate carbon stock changes at high resolution. In year two of this partnership, satellite radar and multispectral images were analyzed with ground truth data to train and calibrate the model further. To better support satellite imagery processing of ALUS projects, which are often smaller areas with different planting patterns, ages, and densities, Albo developed a novel tree detection mask to identify tree pixels more precisely. More than 1,000 tree planting projects, representing over 2,000 acres, were mapped to a 50-centimetre resolution across five provinces. Carbon maps and per acre carbon estimates for all tree planting projects established between 2008 and 2019 were also generated.

The Albo Climate pilot was expanded in 2023 to include measurement of soil organic carbon stock for a subset of natural grassland acres in Ontario and Alberta. Ground truth soil sample cores were collected to help train the model's processing of satellite imagery at a 10-metre resolution. Because project sizes and site conditions vary, the number of sample cores required per project was assessed carefully as part of the stratification process<sup>1</sup>. The number of samples needed depends on soil types, project age, and bioclimatic conditions, among other factors. Future iterations of the model will include more specific data about grassland coverage and species for each sample area.

ALUS also developed sampling stratification plans and protocols to improve the consistency of ground truth data collection. These guidelines ensure consistency in ground truth data collection and management across project classification tiers, regions, and will also improve integration of field measurement data with models for analysis and calibration.

<sup>1</sup> With stratified sampling, a group of projects are subdivided into representative subgroups from which soil cores are obtained. For example, geographical regions can be stratified into similar regions by variables such as soil type, elevation, habitat type, etc.



## CREDIT ISSUANCE

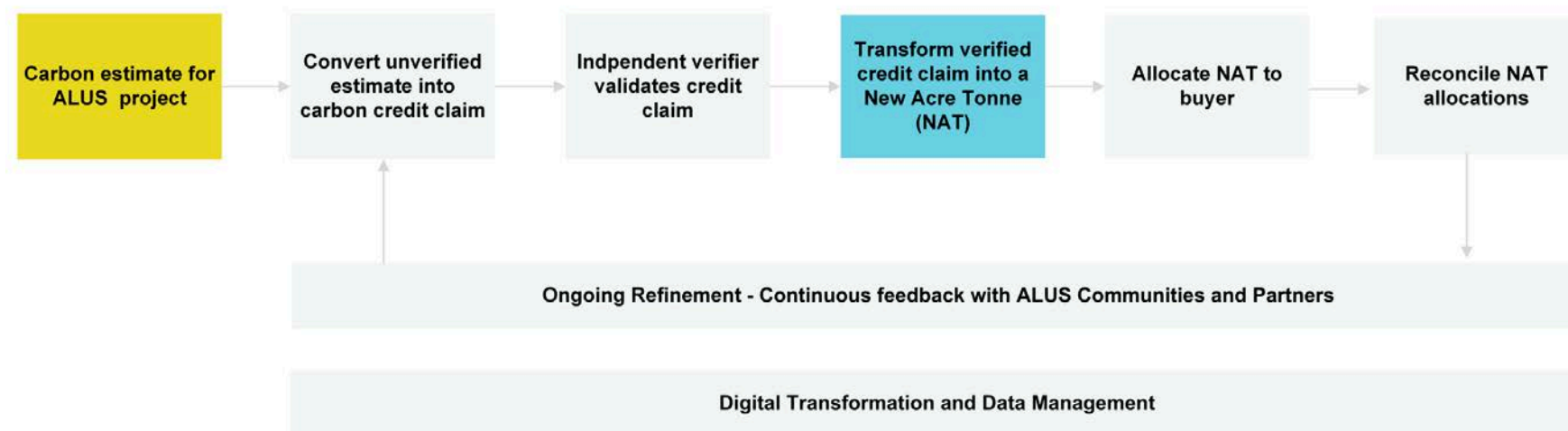
*Objective: Developing a process to convert unverified carbon credit claims into NATs issued by ALUS*

ALUS assessed the data quality, project condition and monitoring records for each delivered project to determine eligibility for certification and to verify that the projects followed the protocols outlined in the methodology and has developed a process to convert conservative CO<sub>2</sub> credit claims from these projects into initial New Acre Tonne issuance.

### New Acre™ Tonne (NAT)

A New Acre Tonne or NAT is an ALUS CO<sub>2</sub> credit denominated in tonne-years, whereby one NAT equates 1 incremental TCO<sub>2</sub>e removed from the atmosphere in a given year.<sup>2</sup> ALUS guarantees that the removed carbon dioxide equivalent will be retained in terrestrial storage for at least 10 years.

### Pathway to Credit Issuance



<sup>2</sup> TCO<sub>2</sub>e stands for tonnes (T) of heat-trapping gas in carbon dioxide (CO<sub>2</sub>) equivalents (e). Different heat-trapping gases (i.e., CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O, etc.) have different heat-trapping/warming potentials. Denominating all heat-trapping gases in CO<sub>2</sub>e enables the comparison of different investments in a single or standard global warming risk mitigation metric.

## CONTINUOUS IMPROVEMENT - INSIGHTS

*Objective: Ongoing refinement with feedback from ALUS communities, partners and technical experts to ensure that the ALUS Methodology is credible, robust and meets market needs*

ALUS leveraged its long-standing history working with farmers and ranchers across Canada by seeking feedback from local community and agricultural leaders to ensure carbon quantification and credit issuance processes are practical and drive value. ALUS also engaged experts in carbon markets and ESG disclosure to identify market demand.

Insights gathered along the way:

- Work done to date validates the hypothesis that building nature on marginal agricultural land generates carbon, water, biodiversity and landscape benefits.
- Remote sensing and machine learning are promising terrestrial carbon sequestration technologies, but they are still in development and more data is needed to improve accuracy.
- Sensor-based technologies deployed on the ground deliver accurate carbon estimates, but ALUS encountered several challenges to using these tools.
- No existing carbon registry offers a practical, affordable solution for farmer-delivered nature-based projects, especially in Canada. ALUS remains committed to building a workable solution for farmers and ranchers.



# APPENDIX B: CARBON SEQUESTRATION ESTIMATES

## APPENDIX B: CARBON SEQUESTRATION ESTIMATES

Table 1: Estimated annual and projected carbon sequestered in New Acre projects delivered in 2023.

Project Type	Carbon Stock Type	Number of Acres	Number of Surviving Trees	Carbon Reduction Factor	TCO <sub>2</sub> e Sequestered in Year 2 <i>No Discount</i>	TCO <sub>2</sub> e Sequestered in Year 2 <i>-20% Discount</i>	Projected TCO <sub>2</sub> e Sequestered in Year 2 <i>-20% Discount</i>
			<i>60% Survival Rate</i>	<i>TCO<sub>2</sub>e/acre/year</i>	<i>TCO<sub>2</sub>e/year</i>	<i>TCO<sub>2</sub>e/year</i>	<i>TCO<sub>2</sub>e/five years</i>
Grasslands	Soil organic carbon (SOC)	6.92	-	0.34	2.4	1.9	9
Modified Ag	Soil organic carbon (SOC)	46.21	-	0	0	0	0
Trees and shrubs	Above-ground biomass	107.96	14,172	0.015	213	170	850
Waterbody	Soil organic carbon (SOC)	38.9	-	0	0	0	0
<b>Total</b>		<b>200</b>	<b>14,172</b>		<b>215</b>	<b>172</b>	<b>860</b>

This carbon estimate adheres to Methodology (v 1.0) and is derived from a subset of the total available carbon stocks sequestered by established nature-based projects. ALUS continues to develop methodologies to measure additional carbon stocks including soil organic carbon for tree and shrub plantings, above-ground biomass carbon stored in established grasslands, as well as any stocks from other ALUS project types. Future versions of the Methodology will incorporate technologies to improve verification and model calibration over the data reporting term to support inclusions of these additional carbon stocks.

### 1. Wetlands

There is variability in the rate of soil carbon sequestration in areas where water flows or is present. Therefore, wetland project acres are currently assigned a zero value. When ground truth data is collected, actual results are likely to prove greater than zero for some (not all) wetland recovery projects as the projects mature over time.

### 2. Modified Agricultural Practices

Projects that involve a change of current agricultural practice on acres used in production to provide an increase in ecosystem services are not eligible for carbon quantification.



# NAT ISSUANCE RISK MANAGEMENT POOLS

ALUS is committed to maintaining two NAT issuance risk management pools:

## 1. Carbon Loss Risk Assurance Pool

To manage the risk of carbon stock losses resulting from any project condition change, ALUS created an assurance pool of acres, 10% above the original 200-acre target, that will be held in Bruce Power's name for the duration of the retention period. Any carbon value linked to these acres will be allocated to the Carbon Loss Risk Assurance Pool. ALUS will draw verified credit claims from this assurance pool of project acres, convert those claims to New Acre Tonnes (NATs), and retire those NATs to cover any carbon stock losses that are found to occur during the ALUS-guaranteed 10-year carbon stock retention term.

## 2. Quantification Risk NAT Holdback

An additional 20% discount has been applied to the carbon estimates to manage the potential risk for quantification error. When ALUS converts verified credit claims into NATs, 20% of all issued NATs are set aside or "held back" to cover risk of credit claim quantification error.

If/when at the end of the 10-year data reporting term that follows NAT issuance, ALUS finds a shortfall in initial NAT issuances (i.e., more CO<sub>2</sub> was sequestered than reflected in initial NAT issuance), NATs equal to that shortfall will be released from the Quantification Risk NAT Holdback and made available to ALUS project investors or will become available for sale to the general marketplace. If it is found that initial NAT issuance exceeded the final estimate of incremental terrestrial carbon stock gain arising from the analysis of 10 years' worth of reported data, ALUS will retire NATs from the Holdback to cover any such excess NAT issuance.

If the NAT set aside for any given project acres is insufficient to cover any such initial over-issuance, ALUS will draw down credit claims sufficient to cover that gap from the Carbon Loss Risk Assurance Pool.



## APPENDIX B: CARBON SEQUESTRATION ESTIMATES

### Community Tree Data and Tree Survival Rates

Above-ground carbon stock sequestered by tree planting projects was calculated using community tree planting records (i.e., number and type of trees planted). Community tree data is multiplied by a tree survival rate. This refers to the expected/average number of surviving trees in a particular region over the project lifespan divided by the number of trees that were originally planted and is expressed as a percentage. Tree survival rates reflect regional trends across Canada and consider operation and maintenance plans developed for the practice in the local context, as well as contract requirements of the landowner as part of project maintenance.

Existing forests/woodland areas are not currently eligible for quantification. While these projects provide additional ecosystem services from new growth in the understory, they are not accounted for in the methodology. Only tree planting acres associated with newly established plantings are factored into the above estimates.

### Grassland Carbon Reduction Factors

ALUS generates initial SOC estimates using the COMET-Planner evaluation tool. CO<sub>2</sub>e reduction potentials represent the net estimates of carbon sequestration compared to baseline conditions which factor land use and historical data within a period of the last ten years.

ALUS projects within an ALUS community are spatially referenced to the boundaries of shared/complementary Level III terrestrial ecoregions<sup>3</sup> (e.g., regions with similar/complementary soil type, climate, hydrology, terrain, and land use, etc.) in U.S. counties. The corresponding TCO<sub>2</sub>e reduction factor is then selected from the subset list of matched U.S. proxies, which equates conservation practice standards (CPS) to specific ALUS project types.

<sup>3</sup> Wiken, Ed, Francisco Jiménez Nava, and Glenn Griffith. 2011. *North American Terrestrial Ecoregions—Level III*. Commission for Environmental Cooperation, Montreal, Canada.



# APPENDIX C: UPDATED CARBON ESTIMATES FOR 2022 PROJECTS



## APPENDIX C: UPDATED CARBON ESTIMATES FOR 2022 PROJECTS

Following the completion and expert review of the Ecosystem Service Quantification and CO<sub>2</sub> Credit Issuance Methodology, ALUS has revised its preliminary estimates for Year 1 projects (established in 2022) for credit issuance. These new estimates reflect the fact that the community of ALUS Grey-Bruce enrolls a class of tree and shrub project that ALUS has excluded from its methodology, as detailed below. All projects established in Year 1 underwent a quality control process to ensure that acre-estimates were aligned with satellite imagery. The results have led to an adjustment to the total carbon being considered for credit registration in 2024 (Table 2).

**Table 2: Adjusted carbon estimates for 2022 projects based on updated Methodology (v 1.0)**

<b>Project Implementation Year</b>	<b>Carbon sequestration estimate for one year reported in 2023 (TCO<sub>2</sub>e)</b>	<b>Adjusted carbon sequestration estimate for one year reported in 2024 (TCO<sub>2</sub>e)</b>
<b>2022</b>	<b>527</b>	<b>175</b>

In Grey and Bruce Counties, the local ALUS PAC has chosen to approve tree and shrub projects where exclusion fencing is implemented to prevent livestock from grazing in the understory because this kind of project offers significant opportunities in the region to enhance ecosystem services. Exclusion fencing enables the forest stand to diversify with new native plants, trees, shrubs and forbs, which deliver carbon, water infiltration and biodiversity benefits.

Although additional carbon sequestration benefits are derived from such projects, ALUS does not currently have a method in place to estimate the carbon stored in the understory growth. Many other carbon registries would permit the inclusion of the existing forest stand for credits on the basis of avoided loss (conservation), however, ALUS has chosen to uphold the strictest definitions of additionality, thus excluding this project type from its Methodology and the total carbon credited to Bruce Power.





# **ALUS Year 2 Progress Report to Bruce Power and the Nuclear Innovation Institute**

**THANK YOU FOR YOUR GENEROUS SUPPORT**

