KRUGER TO CANYONS (K2C) RANGELAND RESTORATION PROJECT

Document Prepared by Conservation South Africa in collaboration with Unique land use GmbH

Contact Information: Leon Theron, Forrest House, Ground Floor, Belmont Office Park, Belmont Road, Rondebosch, Cape Town, 7700, South Africa, Mobile: +27 82 459 8070, ltheron@conservation.org

Project Title	KRUGER TO CANYONS RANGELAND RESTORATION PROJECT
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Project Location	South Africa
Project Proponent(s)	Conservation South Africa Forrest House, Ground Floor, Belmont Office Park, Belmont Road, Rondebosch, 7700, South Africa +2721 100 3950 ltheron@conservation.org
Prepared By	Conservation South Africa & unique land use GmbH
Validation/Verification Body	SCS Global Services 2000 Powell Street, Ste. 600 Emeryville CA 94608 USA www.SCSglobalServices.com
GHG Accounting/ Crediting Period	08 August 2018 – 07 August 2048; 30-year lifetime
Monitoring Period of this Report	08-08-2018 to 07-08-2022
History of CCB Status	N/A
Gold Level Criteria	The K2C project seeks to achieve all climate, community, and biodiversity Gold Level criteria. **Exceptional climate benefits** The project contributes to the climate resilience / adaptation of rural households by restoring nature's capacity to retain soil, provide fodder for livestock, replenish aquifers, store water, and reduce impacts of droughts and fires.

	Biodiversity benefits This project zone falls within the Kruger 2 Canyons area which is recognized by UNESCO as a Biosphere reserve. The project zone also contains around 350 individuals of the African Wild dog species which is classified by IUCN as an endangered species. **Exceptional community benefits** The project is community-led. Participating communities have management rights to land in the project area and rights to claim that their activities will cause the project's benefits. The role of project proponent will also be handed over to community structures once these are fully put in place. The project creates jobs for unemployed youth who are one of most vulnerable community groups.

Table of Contents

The page numbers of the table of contents below shall be updated upon completion of the report.

1) SUMMARY OF PROJECT BENEFITS

This section highlights some of this project's important benefits. Section 1.1 (Unique Project Benefits) should be aligned with a project's causal model and is specific to this project. Section 1.2 (Standardized Benefit Metrics) is the same quantifiable information for all CCB projects. This section does not replace the development of a project-specific causal model or the monitoring and reporting of all associated project-specific impacts (positive and negative) in Sections 2-5 of this document.

1.1 Unique Project Benefits

Outcome or Impact	Achievements during the Monitoring Period	Section Reference	Achievements during the Project Lifetime
1) Restoration and rehabilitation of degraded rangelands to buffer against drought & soil erosion	Increase in above ground biomass and perennial grass species	3.3.1	Increase in above ground biomass and perennial grass species
2) Improved livestock & human health	Data not available	4.1.1	Data not available

1.2 Standardized Benefit Metrics

Category	Metric	Achievements during Monitoring Period	Section Reference	Achievements during the Project Lifetime
GHG emission reductions & removals	Net estimated emission removals in the project area, measured against the without-project scenario	55,576	3.2.4	55,576
	Net estimated emission reductions in the project area, measured against the without-project scenario	-754	3.2.4	-754
Forest[1] cover	For REDD[2] projects: Number of hectares of reduced forest loss in the project area measured against the without-project scenario	Not applicable	n.a.	Not applicable
	For ARR[3] projects: Number of hectares of forest cover increased in the project area measured against the without-project scenario	Not applicable	n.a.	Not applicable
Improved land management	Number of hectares of existing production forest land in which IFM[4] practices have occurred as a result of the project's activities, measured against the without-project scenario	Not applicable	n.a.	Not applicable
	Number of hectares of non-forest land in which improved land management has occurred as a result of the project's activities, measured against the without-project scenario	6,432	2.1.1	6,432
Training	Total number of community members who have improved skills and/or knowledge resulting from training provided as part of project activities	3,695	4.3.1	3,695
	Number of female community members who have improved skills and/or knowledge resulting from	519 (from data available during 2020 and 2021.	4.3.1	519

[1] Land with woody vegetation that meets an internationally accepted definition (e.g., UNFCCC, FAO or IPCC) of what constitutes a forest, which includes threshold parameters, such as minimum forest area, tree height and level of crown cover, and may include mature, secondary, degraded and wetland forests (*VCS Program Definitions*)

[2] Reduced emissions from deforestation and forest degradation (REDD) - Activities that reduce GHG emissions by slowing or stopping conversion of forests to non-forest land and/or reduce the degradation of forest land where forest biomass is lost (*VCS Program Definitions*)

[3] Afforestation, reforestation and revegetation (ARR) - Activities that increase carbon stocks in woody biomass (and in some cases soils) by establishing, increasing and/or restoring vegetative cover through the planting, sowing and/or human-assisted natural regeneration of woody vegetation (*VCS Program Definitions*)

[4] Improved forest management (IFM) - Activities that change forest management practices and increase carbon stock on forest lands managed for wood products such as saw timber, pulpwood and fuelwood (*VCS Program Definitions*)

Category	Metric	Achievements during Monitoring Period	Section Reference	Achievements during the Project Lifetime
	training provided as part of project activities of project activities	Data not available for 2019).		
Employment	Total number of people employed in of project activities,[5] expressed as number of full-time employees[6]	32	4.3.1	32
	Number of women employed in project activities, expressed as number of full-time employees	20	4.3.1	20
Livelihoods	Total number of people with improved livelihoods[7] or income generated as a result of project activities	354 farmers beneficiaries and 373 youth through employment programs such as internships or through Yes for Youth	4.3.1	727
	Number of women with improved livelihoods or income generated as a result of project activities	186 (from data that was made available)	4.4.3	186
Health	Total number of people for whom health services were improved as a result of project activities, measured against the without-project scenario	Not applicable	n.a.	Not applicable
	Number of women for whom health services were improved as a result of project activities, measured against the without-project scenario	Not applicable	4.3.1	Not applicable
Education	Total number of people for whom access to, or quality of, education was improved as a result of project activities, measured against the without-project scenario	3,542 learners at schools have access to high-speed internet and 350 learners through the scouting environmental education program	4.4.2	3,892

[5] Employed in project activities means people directly working on project activities in return for compensation (financial or otherwise), including employees, contracted workers, sub-contracted workers and community members that are paid to carry out project-related work.
[6] Full time equivalency is calculated as the total number of hours worked (by full-time, part-time, temporary and/or seasonal staff) divided by the average number of hours worked in full-time jobs within the country, region or economic territory (adapted from UN System of National Accounts (1993) paragraphs 17.14[15.102];[17.28])
[7] Livelihoods are the capabilities, assets (including material and social resources) and activities required for a means of living (Krantz, Lasse, 2001. *The Sustainable Livelihood Approach to Poverty Reduction*. SIDA). Livelihood benefits may include benefits reported in the Employment metrics of this table.

Category	Metric	Achievements during Monitoring Period	Section Reference	Achievements during the Project Lifetime
	Number of women and girls for whom access to, or quality of, education was improved as a result of project activities, measured against the without-project scenario	Data not available	4.4.2	Data not available
Water	Total number of people who experienced increased water quality and/or improved access to drinking water as a result of project activities, measured against the without-project scenario	Not applicable	n.a.	Not applicable
	Number of women who experienced increased water quality and/or improved access to drinking water as a result of project activities, measured against the without-project scenario	Not applicable	n.a.	Not applicable
Well-being	Total number of community members whose well-being[8] was improved as a result of project activities	7,996 (includes community members who have been employed, received training, signed conservation agreements, and receive internet in school)	4.1.3	7,996
	Number of women whose well-being was improved as a result of project activities	Data not available	4.4.2	Data not available
Biodiversity conservation	Change in the number of hectares significantly better managed by the project for biodiversity conservation,[9] measured against the without-project scenario	6,432	5.1.2	6,432

[8] Well-being is people's experience of the quality of their lives. Well-being benefits may include benefits reported in other metrics of this table (e.g. Training, Employment, Health, Education, Water, etc.), but could also include other benefits such as empowerment of community groups, strengthened legal rights to resources, conservation of access to areas of cultural significance, etc.

[9] Biodiversity conservation in this context means areas where specific management measures are being implemented as a part of project activities with an objective of enhancing biodiversity conservation.

Category	Metric	Achievements during Monitoring Period	Section Reference	Achievements during the Project Lifetime
	Number of globally Critically Endangered or Endangered species[10] benefiting from reduced threats as a result of project activities,[11] measured against the without-project scenario	350	5.4.1	350

[10] Per IUCN's Red List of Threatened Species
[11] In the absence of direct population or occupancy measures, measurement of reduced threats may be used as evidence of benefit

2 GENERAL

2.1 Project Description

2.1.1 Implementation Description

In the first project instance, conservation agreements (CAs) have been signed with four Farmers' Cooperatives (grazing associations) representing 348 livestock farmers in 4 villages within the Mnisi tribal area. Grazing calendars have been collaboratively developed and the introduction of planned rotational grazing with rest camps successfully implemented in rangelands of the Farmers' Cooperatives (Grazing associations) under CAs. The pilot sites cover an area of 6,432 ha in total. Fourteen camps in the four villages were used for grazing and rotational resting was applied according to the grazing plans that were developed.

Community engagement and negotiations are underway to design new CAs in planned expansion sites (Figure 1). The project expansion is planned according to the implementation schedule in section 2.2.1. Throughout the project area, compliance monitoring is done in grazing areas through patrols by Yes4Youth herders and Eco-trainers. Within project instances that are well fenced, (Dixie and Utah) weekly fence patrols are done to monitor the integrity of the fence.

Project activities targeted at community impact such as capacity development, establishment of ICT centers in schools and communities for the provision of internet access, and further restoration activities including brush packing and the clearing of alien/invasive plant species have also been undertaken during this monitoring period.

The main challenge to the implementation schedule during this monitoring period was the lockdown and isolation measures due to the Covid-19 outbreak. This prevented several planned stakeholder engagement events, learning exchanges and monitoring surveys from taking place.

The total net GHG emission reductions or removals generated in this monitoring period is 54,819 tCO_2e.

2.1.2 Project Category and Activity Type

The project falls under sectoral scope 14: Agriculture, Forestry and Other Land Use (AFOLU) of the VERRA's VCS Program.
It is an Improved Grassland Management (IGM) project under VM0032, which includes practices that manipulate number and type of domestic livestock grazing animals and/or grouping, timing and season of grazing in ways that sequester soil carbon and/or reduce methane emissions. Altering fire frequency and/or intensity in ways that increase carbon inputs to soil is also an included activity.
This is a grouped project as per the VCS Standard version 4.4, i.e., "projects structured to allow the expansion of a project activity subsequent to project validation".

2.1.3 Project Proponent(s)

Organization name	Conservation South Africa
Contact person	Julia Levin
Title	Vice President, Africa, South Africa
Address	Forrest House, Ground Floor, Belmont Office Park, Belmont Road, Rondebosch, 7700, South Africa
Telephone	+2721 100 3950
Email	jlevin@conservation.org

2.1.4 Other Entities Involved in the Project

Organization name	Meat Naturally Pty Partner
Contact person	Nomusa Mashile
Title	K2C Meat Naturally Incentives Manager
Address	K2C Nodal Office, Zandspruit Bush and Aero Estate, R527 road, Hoedspruit
Telephone	072 470 0650
Email	nmmashile@conservation.org

Organization name	Kruger to Canyons Biosphere Reserve Partner
Contact person	Marie-Tinka Uys
Title	Executive Coordinator & Chief Operating Officer
Address	K2C Biosphere Nodal Centre, Zandspruit Bush & Aero Estate, R527, Hoedspruit, Limpopo, South Africa
Telephone	015 817 1838
Email	info@kruger2canyons.org

Organization name	Ahititirheleni Farmers' Cooperative (Dixie Community)
Contact person	Farmers Organization Chairperson
Title	Justice Ntimane
Address	Chairperson
Telephone	Dixie Trust, Stand Number 20067, Hluvukani, 1363
Email	0714380147
	Justicentimane26@gmail.com

Organization name	Mokgapeng Farmers' Cooperative (Welverdiend A)
Contact person	Farmers organization Chairperson
Title	Lion Thete
Address	Chairperson of the Cooperative
Telephone	P.O.Box 39; Hluvukani; 1363
Email	0723342867
	N/A

Organization name	Welverdiend B Farmers' Cooperative
Contact person	Farmers Organization Chairperson
Title	Johnson Mlambo
Address	Chairperson
Telephone	Welverdiend B, Stand Number 27, Hluvukani, 1363
Email	0762327049
	N/A

Organization name	Nhlanganani Farmers' Cooperative (Utah)
Contact person	Farmers Organization chairperson
Title	Lucas Ubisi
Address	Chairperson
Telephone	Utah Stand number 10133; Hluvukani, 1363
Email	0728762821
	Lucasubisi67@gmail.com

Organization name	Mnisi Traditional Authority
Contact person	Lawrence Ndubane
Title	Secretary
Address	Thulamahashe Rd, Khokhovela, 1367
Telephone	+27 829657949
Email	ndubane10@gmail.com

Organization name	Amashangana Traditional Authority
Contact person	Masocha Khoza
Title	Senior Admin
Address	Newforest Bushbuckridge
Telephone	+27 022736996
Email	amashanganatraditionalcoucil@gmail.com

Organization name	Unique land use GmbH (PD writing and technical support)
Contact person	Benjamin Schwarz
Title	Senior consultant

Address	Schnewlinstr. 10, 79098 Freiburg, Germany
Telephone	+49 761 208534-29
Email	benjamin.schwarz@unique-landuse.de

Organization name	Conservation International
Contact person	Chris Zink
Title	Vice President Carbon Finance
Address	2011 Crystal Drive, Suite 600 Arlington, VA 22202
Telephone	+1 703 341 2400
Email	czink@conservation.org

2.1.5 Project Start Date (G1.9)

The project start date was 8 August 2018 with the signing of conservation agreements between Conservation South Africa and implementation of grazing plans with the initial grazing associations (Ahitiriheleni and Nhlanganani cooperatives).

2.1.6 Project Crediting Period (G1.9)

The project crediting period is 30 years from the start date: from 8 August 2018 to 7 August 2048. This is the project lifetime.

2.1.7 Project Location

The grouped project is located within the Kruger to Canyons (K2C) Biosphere within the Limpopo and Mpumalanga provinces of South Africa (Figure 1). Geodetic coordinates are provided below and is available separately as a KML file. Sites that will be included into the project by 2030 stretch over Mpumalanga and Limpopo Province in the Ehlanzeni, Thaba Chewu and Maruleng Municipalities. The first activity instance which is the subject of this monitoring period comprises of Dixie (Phungwe), Utah and Welverdiend communal grazing camps (orange and yellow polygons) totaling 6,432 ha. Areas proposed for immediate expansion are outlined in white, and subsequent expansion areas to the west are outlined in green, blue, and pink. Sites that will be included into the project by 2030 stretch over Mpumalanga and Limpopo Province in the Ehlanzeni, Thaba Chewu and Maruleng District Municipalities and Bushbuckridge Local Municipality. Geodetic coordinates are provided below and are available separately as a KML file.

Coordinates	Welverdiend:	24°35'7.33"S 31°19'22.39"E
	Dixie:	24°42'13.07"S 31°28'31.40"E
	Utah:	24°42'56.82"S 31°26'10.73"E

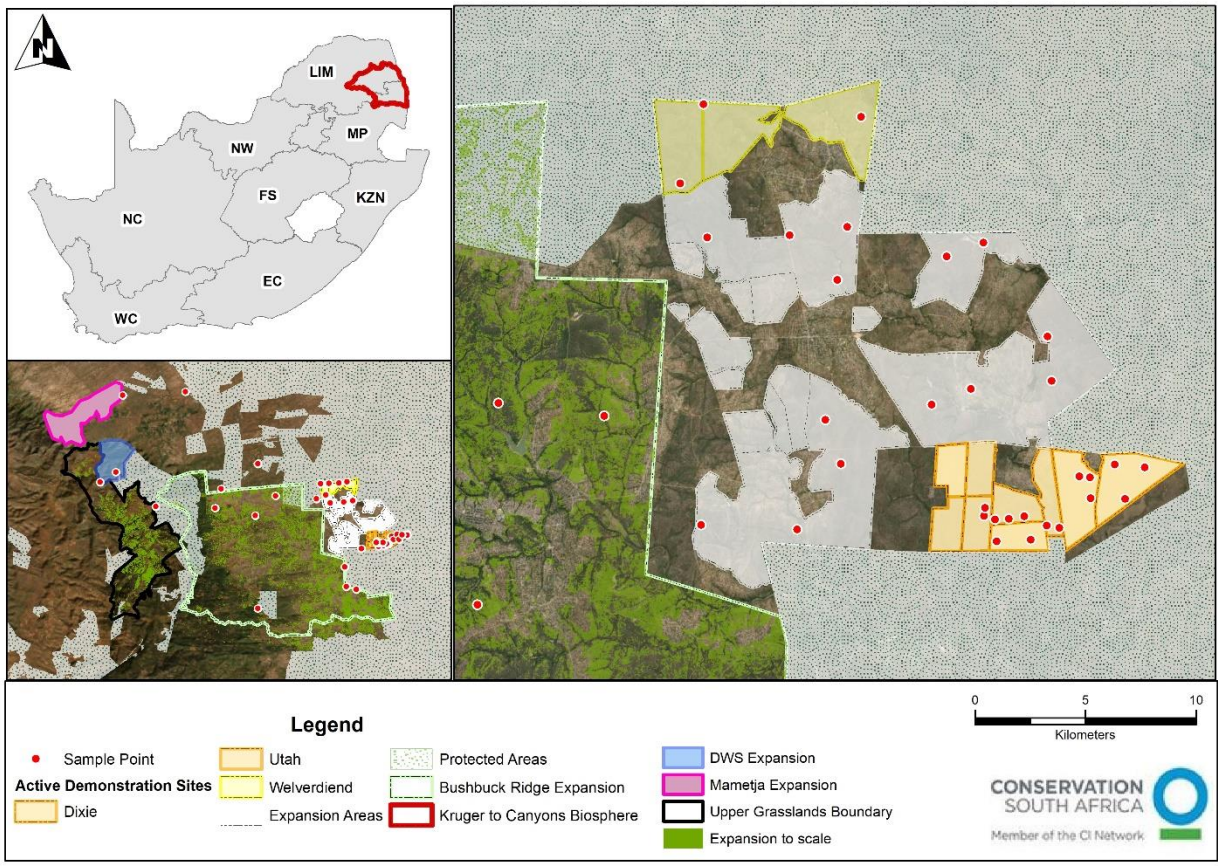


Figure 1: Project location in the Kruger to Canyons (K2C) Biosphere within the Limpopo (LIM) and Mpumalanga (MP) provinces of South Africa. The base maps are satellite imagery.

2.1.8 Title and Reference of Methodology

Methodology:

- The methodology used in this project is the VCS VM0032 Methodology for the Adoption of Sustainable Grasslands through Adjustment of Fire and Grazing, v1.0.

Tools:

- CDM A/R methodological tool Calculation of the number of sample plots for measurements within A/R CDM project activities
- VMD0016 Methods for stratification of the project area (X-STR), VMD0016, v1.2
- VT0001 Tool for the Demonstration and Assessment of Additionality in VCS AFOLU Project Activities, version v3.0
- VMD0040 Leakage from Displacement of Grazing Activities VMD0040, v1.0
- VCS AFOLU Non-Permanence Risk Tool, v4.0

2.1.9 Other Programs (G5.9)

The project will only be registered under the VCS 4.4 and CCBA 3.0 Standards. It will not pursue other forms of environmental credit. The VCS is the only standard that allows carbon credits under agricultural land management to adjust grazing. Project credits are also ineligible under existing Emissions Trading programs.

2.1.10 Sustainable Development

The project contributes to underprivileged farming communities' resilience to climate change by restoring nature's capacity to retain soil, provide fodder for livestock, replenish aquifers, store water, and reduce impacts of floods and fires. From South Africa's National Development Plan 2030[12], the project specifically addresses 2 of 13 stated action areas:

- Economy and Employment
- Environmental sustainability and resilience

The project also aligns with the objectives of the South African National Adaptation Plan[13] which are to:

- Build climate resilience and adaptive capacity to respond to climate change risk and vulnerability.
- Promote the integration of climate change adaptation response into development objectives, policy, planning and implementation.
- Improve understanding of climate change impacts and capacity to respond to these impacts.
- Ensure resources and Systems are in place to enable implementation of climate change responses.

The project measures its contribution to Sustainable Development through indicators linked to the SDGs, particularly in outcomes 6 (Clean Water and Sanitation), 13 (Climate Action) and 15 (Life on land).

Table 1: Sustainable Development Goals of the K2C Rangeland Restoration Project

SUSTAINABLE DEVELOPMENT GOAL	SUB-TARGET	INDICATORS	RELATED PROJECT ACTIVITIES	SECTION REFERENCE
	**SDG 6.3 Improve water quality (6.3.2 - ambient water quality)** **SDG 6.4 Increase water-use efficiency and ensure sustainable withdrawals and supply to reduce water scarcity** **SDG 6.6 Protect and restore water-**	Rangeland rehabilitation: spring repair Ecosystem health: critical habitat condition	WASH education through the CSA Veld Sanitation Guide.	4.4.6 (no quantitative data monitored)

[12] https://www.gov.za/sites/default/files/gcis_document/201409/ndp-2030-our-future-make-it-workr.pdf
[13] https://unfccc.int/sites/default/files/resource/South-Africa_NAP.pdf

SUSTAINABLE DEVELOPMENT GOAL	SUB-TARGET	INDICATORS	RELATED PROJECT ACTIVITIES	SECTION REFERENCE
	related ecosystems			
	**SDG 13 Combat climate change**	Soil carbon stocks	Rangeland rehabilitation: Planned grazing	3.2
		Net ecosystem exchange. Net CO_2	Rangeland rehabilitation: Planned grazing SNAPGRAZE (modelled)	3.2
	SDG 13b Combat climate change via education of the youth, women, and marginalized communities	Number of youth (16-24 yrs) trained formally (accredited), and informally (mentored, workplace learning, internship, primary health care session).	All activities	4.3
		Number of people (>24yrs) trained formally (accredited), informally (mentored, workplace learning, internship, primary health care session).	All activities	4.3
		Number of influential actors (officials, traditional leaders, etc.) trained	All activities	4.4.6 (no quantitative data monitored)
		Number of organisations trained	All activities	4.4.6 (no quantitative data monitored)
	**SDG15A. Increase financial resources to conserve & sustainably use biodiversity and ecosystems**	Number of direct beneficiaries in landscape	All activities	4.3
		Number of jobs created	All Activities	4.3
		Value of stock sales at auctions.	Rangeland rehabilitation: Meat Naturally	4.1.1 (no quantitative data monitored)
		Number of households supported from stock sales and GED	Rangeland rehabilitation: Meat Naturally	4.1.1

SUSTAINABLE DEVELOPMENT GOAL	SUB-TARGET	INDICATORS	RELATED PROJECT ACTIVITIES	SECTION REFERENCE
		Meat Naturally Pty turnover (Rands)	Rangeland rehabilitation: Meat Naturally	4.3
	SDG15.1 Conservation, restoration & sustainable use of terrestrial and inland freshwater systems	Number of Conservation Agreements - individuals and entities	Rangeland rehabilitation: Planned grazing	4.3
		Area covered by Conservation Agreements (hectares)	Rangeland rehabilitation: Planned grazing	2.1.1
		Compliant Conservation Agreements	Rangeland rehabilitation: Planned grazing	2.1.1
		Area of indigenous woody plant encroachment reduced (hectares)	Rangeland rehabilitation: Planned grazing	(no quantitative data monitored)
		Grazing plans in place	Rangeland rehabilitation: Planned grazing	2.1.1
		Number of rest days in grazing plan	Rangeland rehabilitation: Planned grazing	3.1
		Total camps area (hectares)	Rangeland rehabilitation: Planned grazing	3.1
		Productivity/greenness of rangelands (NDVI)	Rangeland rehabilitation: Planned grazing	3.1
		Change in % basal cover of herbaceous layer	Rangeland rehabilitation: Planned grazing	5.3
		Plant biodiversity and composition. Shannon Wiener index / species list	Rangeland rehabilitation: Planned grazing	5.3
		Area of wetlands protected by planned exclusion of livestock (hectares)	Rangeland rehabilitation: Planned grazing	(no quantitative data monitored)
	SDG15.3 Combat desertification, restore	Number of gabions, micro-catchments	Rangeland rehabilitation: Erosion control activity	3.3.1

SUSTAINABLE DEVELOPMENT GOAL	SUB-TARGET	INDICATORS	RELATED PROJECT ACTIVITIES	SECTION REFERENCE
	degraded land and soil			
	SDG15.8 Prevent and reduce invasive alien species	Hectares of Alien vegetation infestation	Rangeland rehabilitation	5.3
		Hectares of Alien vegetation cleared to maintenance level	Rangeland rehabilitation	5.3

2.2 Project Implementation Status

2.2.1 Implementation Schedule (G1.9)

Date	Milestone(s) in the project's development and implementation
April 2015	Baseline vegetation surveys undertaken
March 2017	Socio-Economic Survey baseline done in pilot sites
April 2017	Feasibility study assessing states of rangelands: • Veld Condition Assessment (G Wolfaard); • Conservation Stewards Programme Feasibility Assessment (Conservation South Africa) and • Vulnerability Assessment (S Holness)
October 2017	Stakeholder mapping & skills audit done. Inception meetings held & engagement on CSP commenced.
February 2018	Design & negotiation workshops started.
May 2018	Capacity building for CSA project staff, CSA Eco-rangers & Eco-trainers, K2C Env monitors, herd monitors to assist with the implementation of Rangeland Management Plans, monitoring. Community trainings to strengthen capacities for improved rangeland management
	Meat Naturally trial slaughters successfully conducted to demonstrate benefits to farmers.
August 2018	CAs successfully negotiated & signed with farmer cooperatives
	Grazing calendars collaboratively developed & implementation introduced in the rangelands.
October 2018	Infrastructure for monitoring gully erosion and water infiltration installed in grazing areas, baseline recorded
August 2019	First annual review of benefit packages provided to Farmers Organisations upon verified compliance to Farmers Organisations.
March 2021	Baseline soil sampling survey done in pilot sites as well as 10-year expansion sites.
2022-2023	SNAP graze model calibrated / validated for project area
2023-24	Project validation, First verification and credit issuance
Yearly	Monitoring of Climate, Community and Biodiversity indicators
2024	Mnisi 3-year expansion areas of 12,500 ha
2025	Bapedi Dinkwanyane (DWS) expansion of 11,800 ha
2028	Bushbuck Ridge Expansion of 51,000 ha

Every 5 years from 2023 onwards	Verification of Monitoring Report by external auditors

2.2.2 Methodology Deviations

Limited data were collected for baseline carbon stocks at the project start in 2018 due to logistical constraints; while project activities had already commenced by that time in the first project instances, the full implementation of this complex and far-reaching project was still in its infancy. Thus, most baseline carbon stock measurements have only been collected since 2021, three years after the project start date. However, this is not thought to affect the accuracy or conservativeness of estimated GHG benefits for several reasons.

First, the three-year delay is unlikely to have a significant effect on estimated GHG benefits, since changes in SOC stock between two distinct land use types happen gradually, in a time frame of about 20 years (Lal 2004).

Second, baseline carbon stock sampling included the first project instances as well as areas within the K2C biosphere/project region outside of the first project instances. Samples collected starting in 2021 within the first project instance may overestimate baseline carbon stocks, since project activities would have already produced increases in carbon stocks; based on these data, the change between baseline and project SOC stocks could appear to be lower than if the samples had been collected in 2018, reducing estimated emissions removals and increasing the conservativeness of estimated GHG benefits. However, even this impact may have been insignificant due to the aforementioned delay in SOC stock changes after a land use change occurs.

Third, the rest of the K2C biosphere/project region (outside of the first project influence) is unlikely to have experienced significant changes to baseline carbon stocks between 2018 and 2021, since grazing practices remained similar to those of the baseline scenario. In addition, these areas have long been used as grazing lands, even before the land area has been assigned to the Tribal Authorities, with the land use of unmanaged grazing having persisted for more than 30 years. Thus, due to the continuity of the land use, any changes to SOC stock would be minor. Based on the findings of Lal (2004), the baseline SOC stock equilibrium should have been reached for at least a decade prior to the collection of baseline soil samples, and the three-year delay in data collection would have had a minor impact.

Cattle numbers for the baseline scenario are well recorded in a yearly count by the State Vet as of 2015. To estimate the harmonic mean of the cattle numbers in each category, this dataset has been used. Though it does not cover the required 10 years baseline period, it is the most accurate dataset and therefore can better represent baseline conditions than any other means proposed in the methodology. Animal numbers are likely to have declined in recent years due to degradation of grasslands. Thus, by not accounting for the full 10-year period, the baseline estimate of methane emissions of cattle is rather underestimating. Therefore, this methodology deviation is considered conservative. Cattle numbers are counted at the end of January each year by the State Veterinary Services. The years of 2015 to 2018 represent the baseline.

2.2.3 Minor Changes to Project Description (*Rules* 3.5.6)

Not applicable.

2.2.4 Project Description Deviations (*Rules* 3.5.7 – 3.5.10)

Not applicable.

2.2.5 Grouped Projects

This project is a grouped project. The first project activity instance, which is the subject of this first verification, includes 6,432 ha as outlined in section 2.1.1. This is the first project validation / verification

event and no new instances have been included which differ from those identified in the project description document (PD).

1) New Project Areas and Communities (G1.13)

Not applicable. This is the first VCS and CCB validation. Therefore, the project areas and communities included are the same as identified in the project description.

2) Removed Project Areas and Communities (G1.13)

Not applicable. This is the first VCS and CCB validation. Therefore, the project areas and communities included are the same as identified in the project description.

3) Eligibility Criteria for Grouped Projects (G1.14)

Not applicable. This is the first VCS and CCB validation. Therefore, the project areas and communities included are the same as identified in the project description.

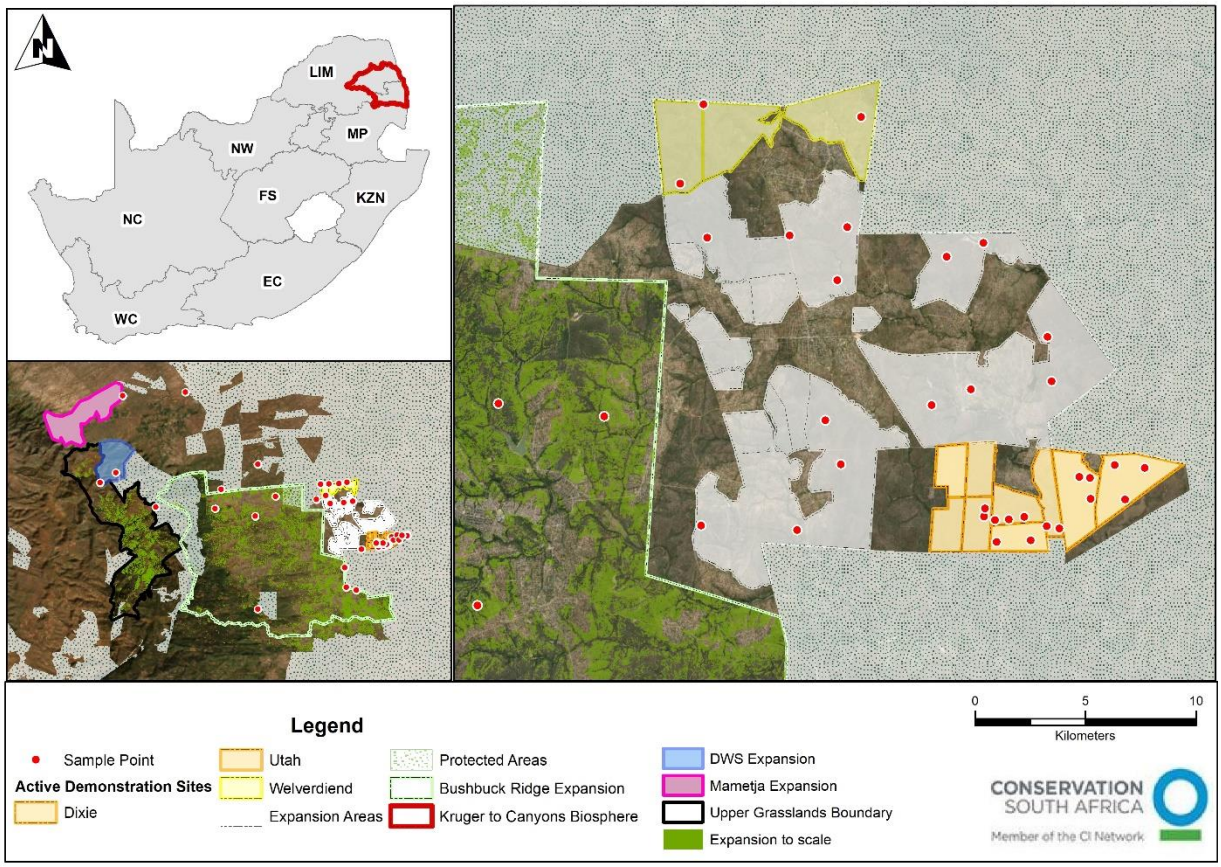
4) Scalability Limits for Grouped Projects (G1.15)

Not applicable. This is the first VCS and CCB validation. Therefore, the project areas and communities included are the same as identified in the project description.

5) Risk Mitigation for Grouped Projects (G1.15)

Not applicable. This is the first VCS and CCB validation. Therefore, the project areas and communities included are the same as identified in the project description.

6) Project Zone Map (G1.13)



7) Changes to Management (G4.1)

Not applicable. No new entities have joined the project.

2.2.6 Risks to the Project (G1.10)

The risks as well as their mitigation strategy is presented in the table below. In addition to the risks identified in the project description, some additional risks were identified during the project implementation. The main risk is a lack of changed grazing intensity or herd structure, which may arise due to e.g., unfavorable climate, inadequate stakeholder engagement, or traditional tendencies to keep older male animals.

Table 2: Project Risks and mitigation measures taken.

RISK EVENT / ISSUE	DESCRIPTION	POTENTIAL MITIGATION STRATEGY	OCCURRENCE/ MITIGATION DURING MONITORING PERIOD
Non-compliance of communal farmers with agreed restoration activities	Compliance of farmers depends on short-term (2-yr) conservation agreements (CAs), which in turn depend	Non-compliance means no benefits (auctions, etc). The well-established social enterprise (Meat Naturally Pty,	Cases of farmers under conservation agreement that did not comply to the grazing plan and resting of camps were resolved by herd monitors and Yes herders who are able to identify the cattle from

RISK EVENT / ISSUE	DESCRIPTION	POTENTIAL MITIGATION STRATEGY	OCCURRENCE/ MITIGATION DURING MONITORING PERIOD
(planned grazing, management of herd characteristics)	on incentives (auctions, fodder, training, etc) and farmer willingness	MNP) provides a sustainable market mechanism that has proved to encourage good compliance with CAs. Extend conservation agreement renewable period to 5 years.	their brandmarks and ear tags. Isolated cases of broken fences and open gates at grazing camps are mostly due to wood harvesting from outside parties. This has been discussed at farmer meetings and resolved collectively as a team to do the necessary repairs and fund the process. We are working towards a realistic solution for the community and the rangelands to control the challenge of uncontrolled wood harvesting in some of the planned grazing camps
Land ownership and Land rights	Land ownership is a complex issue in communal systems, meaning the land is state owned and without an individual ownership title deed but is rather under the custodianship of the Tribal Authorities and recognised under the Communal Land Rights Act 11 (2004) and the Interim Protection of Informal Land Rights Act (IPILRA) of 1996. The use of the land is decided through the Tribal Authority and local municipal government through consultation with communities and community structures. Therefore, change in land use from communal rangeland to any other land use is possible but unlikely.	Livestock ownership is part of cultural practices. Therefore, the need for communal land to graze livestock is entrenched and not easily lost. Small portions of the areas may change in land use but not in totality.	N/A

RISK EVENT / ISSUE	DESCRIPTION	POTENTIAL MITIGATION STRATEGY	OCCURRENCE/ MITIGATION DURING MONITORING PERIOD
Climate change impacts are evident in the area and predicted to increase through longer dry seasons and increased temperatures.	Longer dry seasons and increased temperatures are stressors for livestock production in communal rangelands. Here, people rely heavily on rainfall and surface water for livestock as well as good grass production. Over-utilization during growing seasons can result in increased risk during the dry periods.	Planned grazing should account for extreme climatic predictions to ensure that risk is mitigated. An incentive for better quality animals ahead of higher quantity of animals should be incorporated from the beginning to reduce over utilization	N/A
Foot and Mouth Disease	The areas adjacent to the Greater Kruger fall within the Foot and Mouth Vaccination zone. This is monitored by state vet services, and, if foot and mouth disease is detected in the area, it can slow the progress of certain activities	Work by CSA in FMD areas to find alternative market options and policy work with the OIE around FMD regulations are already underway and are well supported.	Due to stringent Foot and Mouth Disease (FMD) regulations, Meat Naturally Pty has had difficulty in maintaining a strong presence in the landscape, this has affected the project's ability to ensure long term access to the red meat market for Farmer Cooperatives under conservation agreements. Meat Naturally Pty and CSA currently exploring alternative ways in which to help Farmers access the red meat market
Discrimination	Women and youth experience discrimination in the distribution of benefits because they do not own large herds of cattle.	All CSA employees are familiarised with CSA's non-discrimination policies and follow the principles of these policies during all stakeholder engagements. In addition, CSA employees promote gender equality according to the gender plan.	N/A
Land Use Change	There is pressure from urban areas, and some areas might be needed for urbanisation and expansion.	Support and work with local authorities such as Traditional Councils and Municipalities to mitigate land use change impacts on	The project team had to address fall outs in the community brought about due to opportunities presented to two communities (Dixie and Utah Villages) in the form of construction of a lodge that would be built on a significant

RISK EVENT / ISSUE	DESCRIPTION	POTENTIAL MITIGATION STRATEGY	OCCURRENCE/ MITIGATION DURING MONITORING PERIOD
		important ecosystems, such as the rangelands.	portion of their grazing land, and on which planned grazing was being implemented. The team was invited to attend meetings in which the proposed project was outlined and were asked to partake in the public participation process of the proposed project by the Farmer Cooperatives committees.
Capacities for monitoring / implementation e.g., Eco-rangers & Herd Monitors	A shortage of staff to fill critical roles could stall project implementation and monitoring activities.	Work with partnerships to promote sustainable employment streams, such as the Yes for Youth employment scheme	CSA was unable to provide full scale support to Farmers Organisations through Eco-rangers from June 2018 as contract with Department of Environmental Affairs not been renewed due to internal audits process within the department. Stewards in Utah proposing imposition of penalties on CSA for unavailability of Eco-rangers as per the terms stipulated in the conservation agreement, despite CSA efforts to fill gap left by Ecoranger absence. Three Eco-rangers in Dixie village were employed on a short-term basis. Kruger 2 Canyons Biosphere Herd monitors were employed to fill the role of Eco-rangers though their numbers were significantly low, and their contracts came to an end in March 2019 and this left a gap in the project's compliance monitoring process.
Theft / damage of project or monitoring infrastructure	Theft / damage of project or monitoring infrastructure could interrupt project implementation schedule.	Additional security measures to be in place and ensure regular check in on monitoring equipment.	Remeasurement of gully profiles in Welverdiend A & B, Dixie & Utah could not be completed as some infrastructure was removed or tampered with.
Provision of benefits	Challenges with delivering benefits to compliant farmers as per conservation agreements can lead to loss of farmer willingness to participate	Source additional suppliers as needed to ensure benefits are delivered.	Challenges of fodder provision were encountered in 2019 due to lack of total volume of locally produced fodder. Open and honest communication with Farmer Cooperatives when/if unable to deliver benefits as agreed ensured that the farmers still trust in CSA and are willing to continue with the process despite challenges.

Other unpredicted issues which occurred during the monitoring period are described below. These are isolated events and not included in the risk register since they are not anticipated to reoccur:

- Covid-19 related disruptions due to COVID protocols caused limitations of people gatherings and affected the following project activities: Starting planned grazing and restoration in 4 new sites (Clare A, Clare B, Share and Eglington) in the K2C region was delayed in March 2021 preventing negotiations to get new conservation agreements signed. A follow up Socio-economic survey was postponed in Welverdiend A and Welverdiend B and learning exchanges between Cooperatives in Mnisi were also postponed due to the Covid-19 measures.
- The sudden passing of key members in Mnisi Traditional Authority slowed down engagement processes in proposed expansion sites as well as re-negotiation process in 4 pilot sites. Re-establishment of leadership structures is currently underway, and the CSA team remains well informed on progress.

2.2.7 Benefit Permanence (G1.11)

Over the project lifetime, the project intends to hand-over as much of the project management away from CSA to the communities. This is on track to being achieved through building up institutional capacities and setting up a community-led organizational structure that can distribute the profits transparently and continue the function of delivering the benefits derived from conservation activities long beyond the lifespan of this project.

There has been a strong focus on strengthening institutional capacity and communal decision-making structures in the project area. This took the form of formal trainings, as well as informal interactions through attendance at weekly grazing association meetings. Provision of governance training to some members of the Farmers Cooperatives under CAs helped strengthen leadership structures, improve communication between members, and increased interest of members in the cooperatives. This was seen through consistent attendance of weekly farmers meeting, payment of membership fees by members and signing of CAs. Agency was built up in the Farmer cooperative's leadership to take responsibility of certain processes such as ensuring compliance to CAs by all cooperative members.

It is also expected that witnessing higher income through better prices and more productive cattle with access to more palatable grass from sustainable grasslands, should motivate farmers to continue this more lucrative way of managing rangelands. Already, there is an observed willingness to continue implementation of planned grazing. Planned grazing has been established through CAs as a viable strategy to ensure that grazing areas are in a good condition as well as ensuring availability of grass for longer periods. With guidance from the leadership of each cooperative, planned grazing can continue outside of conservation agreements. This is further supported by the willingness of farmers in villages in Mnisi who have expressed interest in learning about and implementing planned grazing without the promise of incentives; what is needed however is some engagement, training, and support by CSA project team at the beginning stages.

2.3 Stakeholder Engagement

2.3.1 Stakeholder Access to Project Documents (G3.1)

The different stakeholder groups will be able to access the complete documents and monitoring reports of the project. Hard copies will be left with the traditional authorities, in the communities and in schools/youth centers where CSA provides internet access. The project monitoring report will also be published on the Verra website and made available to the wider public for a public commenting period. CI will share this link as well with other project stakeholders for their information and input.

2.3.2 Dissemination of Summary Project Documents (G3.1)

As mentioned above, project description documentation and monitoring reports will be shared as hard copies with the traditional authorities, in the communities and in schools/youth centers where CSA provides internet access. A translated summary is planned to be provided with this documentation. In addition, Eco-rangers and/or CSA staff will present and discuss summaries of the documents in the

livestock committees as well as in the events of the Scouts. These presentations will take the form of focused feedback sessions on specific issues of particular interest to stakeholder groups such as soil, grazing quality etc.

2.3.3 Informational Meetings with Stakeholders (G3.1)

Traditional Authorities were consulted first before approaching the communities since they are the statutory custodians of the land. At the project inception phase, CSA Environmental Monitors working on a particular village approach the village Induna (local chief) to introduce the project and seek approval to work in the Village. Once approval is obtained from the Induna, CSA then facilitates community meetings to explain the intended project and engage members of the community, partners, CDF, businesspeople, land users, government employees, youth, women, and all influencers. After this is done, the venue and all other necessary resources are then organized to facilitate the Skills Audits and visioning workshops. During visioning workshops, the communities voice their challenges and needs, their skills, and resources, as well as their connections with other organizations. CSA then presents itself, checks for which challenges they can provide help and then explains how they will deliver this help through conservation agreements. This process is described in CSA's field guide serving as the SOP on outreach. After the engagement team presents the conservation agreement idea (including costs, benefits, and risks, if any) and verifies that the stewards understand the intent, the representatives are given as much time as they need to communicate with their constituency and discuss the desirability of designing an agreement with CSA. CSA confirms that the decision made reflects the sentiment of the wider resource user group, for example through randomly selected focus groups or informal individual interviews (with representatives from a variety of social groups). The objective of this step is to ensure that the resource users understand and consent to the proposition of proceeding to the next step, namely designing a conservation agreement. So far, design and negotiation workshops were successfully facilitated with four Farmers Cooperatives in Mnisi area, two in Welverdiend and one each in Utah and Dixie. During the project implementation, dissemination of information is channeled through the weekly Farmers' Cooperative meetings. Constant feedback is also received through this platform to enable adaptive management.

2.3.4 Community Costs, Risks, and Benefits (G3.2)

During the engagement phase, CSA presents the conservation agreement concept to the resource users (stewards) to introduce the idea and explore whether they are interested in working together toward an agreement. During the process, it is ensured to involve all relevant groups within a community (women and men, youth as well as the elderly, different resource-user groups, marginalized sub-groups, etc.) This phase also sets the stage for design and negotiation of the agreement, by presenting what an agreement is and how it works, verifying understanding of the concept, and seeking a mutual decision to proceed with design of specific agreement terms. Since conservation agreements are voluntary, CSA emphasizes that this is a choice and ensures that stewards understand the concept. Once communities show interest in working towards a conservation agreement, negotiation workshops ensue whereby the conservation actions and benefits are designed together with the communities. During negotiation workshops the costs and benefits are explained to farmers by experienced facilitators following the CSP Field Guide SOP. All exchanges take place in the local languages of potential stewards', while observing cultural norms and expectations to ensure transparency and a shared understanding.

2.3.5 Information to Stakeholder on Verification Process (G3.3)

When the project was initiated, it did not envision to be developed into a carbon project according to the Verified Carbon Standards (VCS). However, since the inception of these standards in the project scope, livestock farmers that are part of the conservation agreements, have been made aware of what it means to align the grazing project with a VCS methodology. CSA took a tiered approach in disseminating communications regarding this process.

The first step was to draft communication materials describing what carbon is, how the methodology speaks to the grazing activities, and how carbon markets work. This training material will be made available to the validator. Once the material was created it was important that the CSA team understood what this entailed and undertook a train-the-trainer approach. This approach rolled out a series of training

sessions that were facilitated to the Eco-trainers, Eco-rangers, Yes 4 Youth supervisors and Yes 4 Youth participants. These sessions included a practical session in-field that spoke to how herbaceous cover supports soil organic sequestration. The train-the-trainer approach enables large scale knowledge sharing within local communities.

The second stage of communication and information dissemination was focused on the Farmers Cooperatives (grazing associations). This was done through two communication methods. The first method focused on presentations that were presented at the weekly Farmers' Cooperative meetings, where a presentation was given on the prepared materials. Discussions were also held with printed materials (some farmers do not have good vision, and the printed material made it possible for them to see the presentation). Throughout these engagements, the communications were translated and facilitated in Tsonga, a local language.

The second approach was done through video screening sessions. A video was played that explained the carbon project and was translated on-site to facilitate discussion and understanding. Key questions were captured during these engagement sessions to provide feedback to communities if there were any uncertainties. These screening sessions were also open to all community members to attend.

CSA promotes open and informed communication between all its stakeholders. It is extremely important that conversations regarding the carbon project are continuous and that Eco-trainers continue to facilitate carbon-related discussions with grazing organizations in a way that they can understand. All engagement materials can be made available upon request.

2.3.6 Site Visit Information and Opportunities to Communicate with Auditor (G3.3)

As soon as auditing events are scheduled, stakeholders are informed via communication by the Eco-rangers in the weekly meetings of farmers on the date and planned timing of the site visit. CSA will organize the meetings between the auditor and stakeholders and moderate introductions. At the discretion of the auditor, CSA staff shall leave the meeting for enough time so that stakeholders are not influenced by the presence of the project proponent. For a closing of the discussion, CSA staff stays on site and can be called back to the meeting as necessary.

2.3.7 Stakeholder Consultation (G3.4)

As described in sections 2.3.3, 2.3.4, the first step in the conservation agreement approach involved visioning workshops where the communities voice their challenges and needs. Afterwards, CSA presents the concept of conservation agreements, and resource users consent to further processes. Negotiation workshops commence, where conservation agreements are designed. In conservation agreements, farmer associations agree to certain conservation actions in exchange for incentives/benefits. These conservation actions make up the inputs for grazing plans, which are drafted together with Eco-trainers in a subsequent step. All farmers are present when grazing plans are made, and they jointly take the decision to participate during the planning session. Throughout the whole approach, stakeholders are directly involved in the project activity design and in selecting benefits which are most suited to their needs. (See Supporting Documents "Stakeholder Consultation" and "Conservation Agreements"). Furthermore, it is planned that stakeholders will become the owners of this project over time. CSA is acting as the initial Project Proponent and leading project development until such time as the cooperatives register a community-owned entity.

2.3.8 Continued Consultation and Adaptive Management (G3.4)

The management and steering of the project are influenced by the continuous feedback obtained by the Herd monitors and Eco-rangers who work directly with the farmers (see section 4.3.1) as well as by other CSA staff involved e.g., in pro-nature business development supporting other community members (oftentimes women) with compliance and business-related questions. Feedback is also collected through project monitoring structures e.g., weekly farmer meetings and bi-annual household surveys. For future upscaling of the project in terms of area or quality, feedback from stakeholders is encouraged and considered in the management plan as much as possible. Continued stakeholder consultation according to the processes described in sections 2.3.3, 2.3.4, and 2.3.7 is expected as project expansion continues.

2.3.9 Stakeholder Consultation Channels (G3.5)

Stakeholder engagement and participatory processes through which the project organizes information sharing and consultations are described at length in the above sections of chapter 2.3. In addition, this project has placed a strong focus on strengthening institutional capacity and decision making of the participating farmer communities. Attendance in weekly grazing association meetings has increased since the project started. Meetings are organized and chaired independently of CSA, minutes taken by a nominated member, and CSA is requested to report back on issues where necessary.

2.3.10 Stakeholder Participation in Decision-Making and Implementation (G3.6)

Respecting customary decision-making mechanisms within communities ensures that CAs are adapted to local realities. However, it is important to also remember that some customary decision-making mechanisms do not allow for disadvantaged or marginalized groups to be heard. It is necessary to find culturally appropriate ways to ensure those voices are part of decision-making. Various socioeconomic and cultural dimensions shape social groups, such as ethnicity or race, poverty level, gender, age, field of work or religion, among others. This is considered by the engagement team. As an example, when CSA commenced with the engagement of Farmers Organizations to introduce and discuss CSP and conservation agreements, there was limited inclusion, especially of youth and women. This was largely on account of prevailing cultural norms and taboos in the area. These norms and taboos often meant that women and young people did not speak during workshops or meetings and therefore their inputs on the process were not included. Through introduction of FPIC the team highlighted the importance of everyone's participation in the process and this prompted the leadership to start encouraging everyone to speak in meetings, although this was a slow process overtime participation of women and youth improved as the chairperson (in Utah village) would use the techniques such as saying "for the next 10 minutes we only want inputs from the women", this allowed some of the more outspoken men to give others a chance to speak, until it became a norm over time. Creation of informal communication platforms also played a useful role. For example, during breaks women or silent participants in the meeting are asked bilaterally for their inputs and if they are happy with where the discussion is going. Also, house visits by female environmental monitors allowed the team to capture the inputs of women and youth members.
Throughout the implementation stage participation of these two groups, especially in Utah and Dixie villages has improved to the point where women lead key processes such as facilitation of learning exchanges and being representatives at meetings with the department of agriculture and recently were they successfully engaged the MTPA on compensation packages for farmers who lost livestock due to lions breaking out of the Manyeleti Nature Reserve which is next to the communities.
Since participation in conservation agreements is voluntary, CSA works to ensure that community members who are not willing to participate in project activities are not stigmatized or forced to participate via the imposition of other community members. Communal livestock farmers are sensitized about the voluntary nature of the agreement and educated on conflict management within the project.

2.3.11 Anti-Discrimination Assurance (G3.7)

The project is committed to the fair treatment and equal opportunity for all stakeholders, community members and employees. This is ensured through CSA's code of ethics as well as policies towards Harassment and Workplace violence and Gender Policies which are strictly complied to. These policies are available under the attached 'CSA internal policies and processes' folder.
Neither the project, nor any agent of the project, has been found to violate these policies or to discriminate against any person for any reason, including – but not limited to – gender, religion, nationality, tribe, or sexual identity.

2.3.12 Grievances (G3.8)

Records of grievances are available in the attached Excel 'Grievance Tracker_Form'. For additional information on the project's Grievance Mechanism, refer to 'Grievance Overview.ppt' provided in the Supporting Documents as well as the description in the Project Design Document.

2.3.13 Worker Training (G3.9)

The following training is provided to field staff implementing project activities:

- Workplace Ethics Training
- Conservation Stewardship Program field guide training
- Project team trained on carbon, carbon credits and financing.
- Veld and Sanitation Training (for Environmental Monitors, Eco-trainers and project staff)
- Training in facilitation skills, difficult conversation & conflict resolution.
- Financial Literacy (Yes4Youth, Eco-trainers, Environmental Monitors & project staff).
- Gender Based Violence Training (Yes4Youth, Eco-trainers, Environmental Monitors & project staff).
- Alien Invasive Plants Removal Training
- Waste Management Training through Operation Basis
- Rangeland management and restoration learning exchanges.

Almost all staff in the project area are either directly or indirectly connected to livestock herding, grazing management, and livestock marketing as either they or their families own or have owned cattle. So, the skills learnt in these trainings cater to locally useful skills and knowledge. So far, the project shows little staff turnover, partly also since local job opportunities are rare. Potential gaps in the staff of e.g., Eco-rangers can be filled through learning exchanges hosted by senior team members.

2.3.14 Community Employment Opportunities (G3.10)

The Yes 4 Youth program forms the basis of local job creation through the project. Yes 4 Youth is a government-led program to offer job experience to one of the most vulnerable groups in South Africa society: unskilled, lowly educated, unemployed youth. The project offers 10 vacancies per supervisor each year per community. The community and livestock herders decide who will get these vacancies depending on who they find trustworthy and fit for the job. The best of these Yes 4 Youth are offered the possibility to become Eco-rangers after their contract ends (1 year). Eco-rangers are the mentors of the Yes 4 Youth. Individual Eco-rangers qualify for further training to become Eco-trainers. Current Eco-trainers eventually move up to fill Monitoring and Evaluation positions. Eco-rangers are also selected from local communities and are employed on an annual basis, the selection of Eco-rangers is done through community consultation. As the project expands throughout the landscape it envisions having an Eco-ranger present in each community.
Livestock herding is culturally male dominated. Recognizing this and to also provide opportunities for women in the project, vacancies in other parts of the project, such as finances/operations, livestock marketing, pro-nature business development, and more are specifically reserved for women.

2.3.15 Relevant Laws and Regulations Related to Worker's Rights (G3.11)

List all relevant laws and regulations covering worker's rights in the host country and provide assurance that the project has met or exceeded each. Where relevant, demonstrate how compliance was achieved and describe activities and/or processes implemented to inform workers about their rights.

The following laws and regulations contain provisions with regards to labour rights in South Africa:

1. Basic Conditions of Employment Act (BCEA): This act sets out the minimum standards for working conditions, including working hours, leave, payment, and termination of employment.
2. Labour Relations Act (LRA): This act regulates the relationship between employers and employees and provides for collective bargaining, dispute resolution, and protection of employees' rights.
3. Employment Equity Act (EEA): This act promotes equal opportunities and fair treatment in employment, prohibits unfair discrimination, and requires affirmative action measures to redress imbalances in the workplace.

4. Compensation for Occupational Injuries and Diseases Act (COIDA): This act provides for compensation for employees who suffer injuries or contract diseases arising from their work.
5. Occupational Health and Safety Act (OHSA): This act sets out the health and safety standards for workplaces and imposes duties on employers to provide safe working conditions.
6. Skills Development Act (SDA): This act promotes skills development and training for employees and provides for the establishment of Sector Education and Training Authorities (SETAs).
7. National Minimum Wage Act (NMWA): This act provides for a national minimum wage that employers must pay their employees, as well as for exemptions and enforcement measures.
8. Unemployment Insurance Act (UIA): This act provides for the payment of unemployment insurance benefits to employees who become unemployed or are unable to work due to illness or maternity leave.
9. Skills Development Levies Act (SDLA): This act requires employers to contribute a percentage of their payroll to the National Skills Fund, which is used to fund training and development initiatives.
10. Employment Services Act (ESA): This act provides for the establishment of public employment services and the registration of private employment agencies.

Key elements of these labour laws are embodied in the employment contracts of workers, according to National and Provincial legislation, governed by The Department of Employment and Labour. These Departments ensure the implementation of the country's and province's labour laws, regulations and policies and protect labour rights. The core mandate of the Department of Employment and Labour is to regulate the South African Labour Market for sustainable economic development through appropriate legislation and regulations, inspection, compliance monitoring and enforcement, protection of human rights, provision of employment services, promotion of equity, social and income protection, and social dialogue.
South Africa joined the ILO (International Labour Organisation) in 1994. The country has ratified 28 ILO Conventions. Of these, 25 are already in force in the country. The project proponents being a socially responsible organization will ensure that any relevant international conventions or government laws and regulations (provincial and national) are fully followed. All staff employed by the project are compensated above the national minimum wage and adhere to regulations on working hours. The project provides skill development training for employees. The measures taken to ensure Occupational Health and Safety are described in section 2.3.16 below.

2.3.16 Occupational Safety Assessment (G3.12)

CSA as an affiliate to Conservation International (CI) is working in increasingly complex environments that pose a range of safety and security risks to our people, assets, operations, and reputation. Conservation International believes that managing these safety and security risks is essential in not only ensuring that our critical assets are protected, but also to guarantee we can continue to empower societies to care for nature, our global biodiversity, and for the well-being of humanity. Conservation International will take every reasonable measure to ensure that safety and security risks are minimized.

The following risks to the health and safety of workers were identified through the project's CI safety and security analysis process. None of the identified risks occurred during this monitoring period. The CI Safety Screening risk assessment provides further details on the security plan for CSA (Conservational International South Africa Safety Security Plan V2). All workers are fully informed about workplace risks and safe practices to mitigate those risks. These include training in conflict resolution, safe working practices, as well as the enforcement of requirements for safe handling of equipment and other materials. All CSA employees are contracted under a medical aid scheme that prescribes the minimum requirements for medical cover to ensure that each employee has access to an accepted standard of medical treatment.

Project activity	Risk	Mitigation
Office Security	Office fire Break-in / Theft Injury while at office	• Each office has their keys held by the respective focal point, with spare keys held by the landscape director. • An annual fire drill should be held. A fire drill is effective if it results in the rapid evacuation of all people from the office and to the pre-arranged rendezvous point outside of the building. • Fire-fighting equipment is available. • The office first aid kit is stored in the kitchen cupboard in the boardroom and contains basic supplies to treat a patient during an emergency. • If you are in the office at the time of the break in, attempt to leave the office and contact the police when safe to do so, do not confront intruder

Travel Security	Vehicle Accident	• Conservation South Africa relies currently relies on CI owned vehicles and utilizes CI staff who have a valid driver's license for driving.
		• All CI staff who are authorized to drive for work duties must have their local driving license on file.
		• Cars must only carry the number of passengers as legally authorized by the vehicle and insurance. No passengers should ride in the back of pickups.
		• Conservation South Africa hired vehicles must have the following equipment (depending on whether or not the travel is rural or urban).
		  ○ Safety belts (Urban and Rural)
		  ○ Spare tire and tools (U/R)
		  ○ First aid kit (often provided by CI) (R)
		  ○ Adequate fuel for the journey (U/R)
		  ○ Hazard signs to mark the vehicle in the event of a break down (U/R0
		  ○ Communications equipment – if travel is beyond mobile network for extended periods, then consider satellite communications devices. (R)
		  ○ Water and basic emergency food supplies (R)
		  ○ Emergency blankets and mosquito nets (R)
		• No road travel between towns will occur during the hours of darkness, except in exceptional circumstances (such as medical emergency) authorized by the CEO of Conservation South Africa or Operations Director.

Ranger Patrolling and Confrontations	- Injury on duty resulting from restoration activities. - Conflict from livestock theft - Increase illegal poaching and rangelands become unsafe for herders	• Eco-rangers, must be deployed in locations with mobile coverage and have contact numbers for the relevant local police and local community leaders. • Prior to deployment, Eco-rangers/ Restoration workers are given level 1 and 2 first aid training as well as Health and Safety training. • Evacuation plans for each field site are required and monthly health and safety meetings with teams will help to highlight concerns and complications. Typically, the type of issues being reported include people not wearing PPE, drunken workers, community conflicts, etc. • Ensure all restoration workers are fully equipment with the correct PPE prior to any restoration work may commence. • Whenever rangers observe livestock thieves or people suspected of planning these activities they must alert the police and local community livestock committee, which will mobilize members of the community to confront the thieves. The Eco-rangers should not directly engage with the thieves who should be considered as being armed and dangerous. • Collaboration with SANParks and authorities. • Introduction of alternative, sustainable livelihoods to discourage poaching activities. • Do not engage directly with any suspected illegal poachers.
Wildlife Attacks	- Domestic or rabid dog - Lions - Elephants - Hippos - Buffalos - Crocodiles - Snakes	• When budgeting for Eco-rangers working in high-risk areas the programs should budget to have the individuals vaccinated against rabies. • Don’t make direct eye contact but shout at the animal look threatening and confident. • Keep a safe distance from the wildlife and do not engage it and walk away from it and report sighting to team members • Stay in the vehicle if you suspect wildlife in close proximity. • Should you be bitten follow the emergency response guidelines and contact emergency services.

Health	- Malaria
	- Typhoid
		• Take malaria precautions such as wearing long sleeves, insect repellent, and using mosquito nets.
		• Avoid Typhoid using the following precautions;
		  ○ Drink bottled water (preferably carbonated)
		  ○ If bottled water cannot be sourced, ensure water is heated on a rolling boil for at least one minute before consuming or is form a clean source.
		  ○ Ensure fresh fruit and vegetables are cleaned in clean water.

2.4 Management Capacity

2.4.1 Required Technical Skills (G4.2)

CSA, being the project proponent, will lead the implementation of proposed project activities in collaboration with the local communities and other partner organizations when deemed appropriate and useful. This includes those partners listed in Section 2.1.4 but also includes a range of other collaborators. CSA has the required human resources with expertise in ecosystem restoration, stakeholder engagement, training facilitation, wildlife conservation as well as the management capacity to implement large-scale conservation and carbon projects.

Through the herding for health program, CSA's Eco-trainers who are trained in regenerative land management will support the communities of livestock farmers with the development of grazing plans and in building up sufficient local capacities for sustainable rangeland management via selected herders and Eco-rangers. Eco-trainers also receive accredited training at the SA college for Tourism Herding Academy.

The social enterprise Meat Naturally Pty Ltd brings experience and expertise in livestock management and livestock markets. They will be responsible for providing a suite of livestock management benefits (vaccination, planned grazing equipment, and herder training) to the participating farmers as part of the Conservation Agreement Approach.

Consulting organization Unique land use GmbH guides in preparation of this document and the application of the methodology to the project area. Unique land use GmbH brings 20 years of experience in developing nature-based climate solutions around the world. Capabilities for carbon monitoring will be built up among CSA Eco-trainers as well as setting up project monitoring and reporting systems.

Monitoring of biodiversity benefits is being conducted by Sustineri Ecological Consulting (Pty) Ltd with technical expertise in Ecological Science. The specialist team is led by Graeme Wolfaard who is a Professional Natural Scientist in Ecological Science (SACNASP No. 117179), and an active partner of International Conservation Services CC. Graeme has experience undertaking veld condition assessments, terrestrial ecological assessments for EIAs and developing management plans for game reserves and communal rangelands.

2.4.2 Management Team Experience (G4.2)

The project management team comprises individuals who have significant experiences in AFOLU projects development. Additionally, Conservation International has been involved in numerous carbon projects from inception, design, implementation to validation and several verification rounds. Hence, they have developed the capacity to design this AFOLU project, account for climate mitigation impacts, and report and participate in validation and verification under the VCS program.

Key Staff in the Kruger to Canyons Landscape:

Michael Grover
Michael Grover holds an BSc Honor in GIS and Spatial Mapping and as the landscape director has been the driving force of the Kruger to Canyons Landscape since its implementation in 2016. He works closely with the field teams in all aspects of operations, from financial management to conservation agreement facilitations. Michael has extensive experience in ecology with a strong focus on landscape and business management.

Hardie van Tonder
Hardie is the Rangeland Restoration Manager, he holds a BS Honours in Wildlife Management and has also attended the land management course for executives at the Herding Academy, South Africa. He has 9 years' experience working as a wildlife manager and a facilitator.

Lerato Mogane
Lerato holds a BSc. Geography and Environmental Sciences. She started her career working under a Learnership program run by the South African Wildlife College and Thaba-Chweu Municipality from 2013 to 2015 focusing on environmental education and waste management. From there she joined the Association of Water and Rural Development (AWARD) as a project officer under the RESILIM-O program. In 2018 Lerato joined CSA as a Stewardship Coordinator in the K2C landscape and has been the key facilitator for conservation agreements.

Natasha Reynolds
Natasha Reynolds has been working in the Kruger to Canyons project since 2020 as a Monitoring and Evaluation Co-ordinator. She holds a BA Honours degree in in Environmental Management and has been working in the environmental field for the past 8 years, some of her key roles include project management, Environmental Impact Assessment and Environmental compliance.

Moses Mathabela
Moses has a number of certificates to support his role as community liaison officer namely Diploma in Youth Development University of South Africa; Senior Teachers Diploma; Conflict management in community. He has been working as the community liaison officer for CSA since prior to that he has worked for Sabi Sands on the Pfunanani Enterprise Development as Community Liaison Officer, other experience includes working with women and youth on medical awareness programmes.

Agnes Rapau
Agnes holds numerous certificates including: Advanced Diploma in computer literacy; Assessor Moderator (Oxbridge Academy); Small Business enrichment Programme (UJ); Mentoring programme as a Mentor (Reach Africa); Project Management (IQ Academy); Tourism and Hospitality Management(IQ Academy). She worked at Small Enterprise Foundation (SEF) as a branch Manager from 1996-2008, thereafter she worked as the regional manager at Women Development Business until 2013. She gained business development experience working with Hand in hand as Enterprise Development Manager until 2014. In 2015 she joined Pfunanani Enterprise Development Project (Buffelshoek Trust) as an Enterprise Development Manager and then Joined CSA in March 2017 as Enterprise Development Coordinator and is currently coordinating the development of Green Businesses for the Kruger to Canyons landscape. She is also a lead facilitator for establishing governance structures and formal business registration with communities.

Nomusa Mashile
Nomusa holds a BSc Agric (Animal Science) and MSc Agric (Animal Production &Ecology). She did her internship at Agricultural Research Council under Animal Production (2011-2012). Worked at Red Farms AgriPark (2014-2017) as the deputy director for Specialized Animal Production. Thereafter she worked for Meat Naturally Pty (2017-2023) as the Farmer Outreach and Mobile Abattoir Project Coordinator. Currently she is working for Conservation South Africa as the Stewardship Incentive Manager.

Stanley Mathebula
Stanley is one of the senior Eco-trainers working on the Kruger to Canyons project. He initially started working in the landscape under the Herding for Health programme, which dates to 2016. Since then, he has been promoted to the monitoring officer and has received formal training on Herd Management form the Herding Academy South Africa. He has extensive experience with indigenous knowledge of pastoralism and working with communities on grazing plans as well as monitoring rangelands.

National supporting staff:

Leon-Jacques Theron
Leon is the Carbon Project Development Director for Conservation International, he holds a MSc in Zoology, and his work focuses on carbon accounting in the land use sector and ensuring that projects comply with ISO standards and pass third party verification. He has led the verification of VCS and CCB projects.

Heidi-Jane Hawkins
Heidi is a research fellow at Conservation International (CI), a research associate at the University of Cape Town, and led the action research portfolio at CI in South Africa between 2015 and 2022. Her doctoral and postdoctoral work explored nutrient and water relations including in specialized roots and root symbioses.

Perushan Rajah
Perushan Rajah has been with CSA for over 4 years, he holds a PhD in Environmental Sciences (Remote sensing) and leads the Conservation Impact Portfolio for the country program. He has a strong background in spatial science and earth observation which is critical to the way CSA measures, tracks, and reports on conservation Impact.

2.4.3 Project Management Partnerships/Team Development (G4.2)

CSA has been using CI's Conservation Stewards Program (CSP) conservation agreements framework to make conservation a viable choice for local resource users since 2009. The CSP operates through an existing governance platform, the K2C Biosphere, a public benefit organization that includes the partners CSA, South African National Biodiversity Institute, South African National Parks, National Research Foundation, BirdLife South Africa, government, industry, and others. The K2C employs a network of community based environmental monitors including herd monitors in partnership with CSA, rhino monitors and the world-renowned Black Mamba all ladies anti-poaching team. Other relevant project management partnerships are detailed in Sections 2.4.1.

2.4.4 Financial Health of Implementing Organization(s) (G4.3)

The project proponent CSA is a member of the Conservation International network, a non-profit environmental organization with a presence in 29 countries. CI and CSA receive revenue from a diversified, well-balanced portfolio of donors, including individuals, corporations, foundations, government, and multi-lateral agencies. In general, this support is evenly distributed between contribution and grant and contract revenue. The broad diversification of funding sources affords CSA the flexibility to support annual operating needs, meet unforeseen short-term needs, and the resources to implement complex, longer-term programs at scale. In addition, CI is fortunate to receive consistent, ongoing support from a highly engaged Board of Directors as does CSA.
CSA's audited financial statements are published in an annual report on their official website[14] . Further details if needed can be made available to the validator.

2.4.5 Avoidance of Corruption and Other Unethical Behavior (G4.3)

Necessary steps have been taken to avoid corruption and other unethical behavior within the project. These steps among others include:

[14] 2018-19 report here.

1. Annual declaration of conflict of interests by the project team per CI's requirements.
2. Mandatory attendance of training on ethics, power dynamics and harassment done annually by project team.
3. Use of FPIC in engagement of project beneficiaries and partners to ensure inclusivity, fairness, and transparency.
4. Safeguards and Gender Mainstreaming Plan completed by project team to explore and address any potential challenges in implementation.
5. CSA project team and project beneficiaries made aware of CI Ethics hotline for reporting of corrupt practices and unethical behaviour.
6. Compliance to Employment Equity Act 55 of 1998
7. Compliance CI Procurement Policy when sourcing services

CSA is committed to the highest standards in integrity ethics from their staff, directors, vendors and grantees and CI provides regular training to staff, including CSA, and partners on these policies, ensures awareness of, understanding of and compliance with these policies. Above-mentioned policy documents are provided as supporting documents to the validator in the folder 'CSA Policies and Processes'.

2.4.6 Commercially Sensitive Information (*Rules* 3.5.13 – 3.5.14)

There is no commercially sensitive information that has been excluded.

2.5 Legal Status and Property Rights

2.5.1 Recognition of Property Rights (G5.1)

The project proponent has signed Conservation Agreements with the grazing associations who have the grazing rights designated by the Traditional Authorities to implement rangeland restoration activities following an FPIC process described in the following section. All property rights are fully supported and respected, and no property rights are transferred or infringed upon by the implementation of rangeland restoration and associated activities of this project.

2.5.2 Free, Prior and Informed Consent (G5.2)

Any conservation agreement initiative involves a thorough community engagement process and a participatory design and negotiation stage that together must embody the principle of Free, Prior and Informed Consent (FPIC)[15].
Engagement of Tribal Authorities was first done to introduce CSA and give a detailed overview on the organization and projects as well as to seek permission and endorsement to engage livestock farmers' cooperatives, who are one of several groups using the rangeland. Tribal Authorities provide the organization with a letter to indicate consent. Afterwards, community engagement is commenced by hosting a 'visioning' workshop in which the organization seeks to understand the community's challenges and determine if they can be addressed through any of the proposed projects. FPIC is obtained verbally during the engagement and negotiation stage of conservation agreements. Attendance registers are signed during these engagements to record all parties present.
The Conservation Agreements themselves include declarations that indicate CSA's recognition of project beneficiaries' rights as land users and thus does not implement any activities without their consent (see consolidated conservation agreement). Project activities are only limited to designated grazing areas, and grazing plans are designed and implemented with the input of conservation agreement signatories. Consent letters, attendance registers and Conservation agreements are provided as supporting documents under the folders "Grazing Plans" and Conservation Agreements".

2.5.3 Property Right Protection (G5.3)

Project activities are limited to designated grazing areas in project sites and do not involve any removal or relocation of property. The Interim Protection of Informal Land Rights Act (IPILRA) of 1996 regulates the

[15] CI's FPIC Guidelines here

question of whether the activities or arrangement between the parties is either a (i)“disposal” or (ii) a “deprivation” of the community’s right “to” or right “in” land. If an activity or arrangement amounts to such disposal or deprivation, then implementation of the activity would require formal consent from the community. In relation to disposal, IPLRA defines an informal right to land as including “the use of, occupation of, or access to land” and a disposal of the land or a right in the land would, therefore, be a disposal of such rights. In the present instance, the community is not disposing of its rights to use, occupy or access the land but is entering into Conservation Agreements (effectively, land management agreements) pertaining to rangeland practices on the land. The CAs themselves emphasize the voluntary nature of the agreement which in no way infringes on the rights of members regarding the use of land. Moreover, project activities are implemented directly by the land users. Consent to undertake project activities are requested from the tribal authority and Farmers Cooperatives (grazing associations) during conservation agreements negotiation.

2.5.4 Identification of Illegal Activity (G5.4)

Illegal activities which may occur in the project area with a direct impact on the project activities that threaten the ecosystem of the rangelands include sand mining, wood harvesting, and illegal dumping of waste. Eco-trainers and environmental monitors which are supported by the project are mandated to capture and report on any of the abovementioned activities. In the instance of these illegal activities, the monitors would highlight areas where these activities have taken place and report the occurrences to the local leader of the community (Induna). The report is then raised through traditional structures. These structures are based on indigenous conflict resolution methods, whereby community members are gathered to discuss the issues, and resolve the matters at hand through confronting identified offenders. In the signed legal Benefit Sharing Agreement between CSA and Traditional Authority, the TA commit in section 6 to supporting CSA to “ensure that the Land is not used in any way which would negatively impact on the operation of the Project and/or the generation of Carbon Credits.”
Furthermore, the data that is gathered from the monitors form part of the Kruger to Canyons Monitoring Schema. This provides supporting evidence of illegal activities present in the landscape and enables supporting conditions for enforcement under the National Environmental Management Act 107 of 1998.

Within a larger context the Kruger National Park is faced with widespread corruption linked to criminal syndicates associated with illegal poaching. Unfortunately, corruption at this scale cannot be mitigated through intervention of the project activities and requires a national approach to be addressed. This is thus beyond the sphere of influence of this project.

2.5.5 Ongoing Disputes (G5.5)

The project has implemented activities to resolve any potential disputes over land through continued stakeholder engagement which establishes a communication channel between different communities. It is part of the job of an Eco-ranger to mediate between communities. Below are some of the disputes which have been identified and/or resolved:

- An ongoing three – year long court dispute exists in Dixie, where some farmers want to lease 700ha of communal land to a tourism operation. This is currently being appealed and outcomes remain uncertain. However, the risk of disrupting the project is minimal as the area in question constitutes only one percent of the total project area.
- The project team had to address fall outs in the community brought about due to opportunities presented to two communities (Dixie and Utah Villages) in the form of construction of a lodge that would be built on a significant portion of their grazing land, and on which planned grazing was being implemented. The team was invited to attend meetings in which the proposed project was outlined and were asked to partake in the public participation process of the proposed project by the Farmer Cooperative committees. The Background Information Document to this proposed development can be made available to the validator.
- Finally, through the mediation of Eco-rangers, the communities of Utah and Dixie were able to resolve an ongoing quarrel on the use rights of a certain grazing camp. This grazing camp is now open to both communities and a resolution was achieved. Documented evidence is provided in the ‘Grievance Tracker Form.xlsx’.

2.5.6 National and Local Laws (G5.6)

The project activity involving livestock grazing in communal lands is a legal activity. Communal rangelands are recognized under the Communal Land Rights Act 11 (2004). The customary land tenure system in South Africa is currently governed by the Interim Protection of Informal Land Rights Act 31 of 1996 (IPILRA). Relevant labour laws are discussed in section 2.3.16. In summary, below is a list of laws that are applicable to the project. All laws are strictly adhered to.

Law / Regulatory Framework	Summary description	Project Compliance to it
National Environmental Management Act (No. 107 of 1998)	This Act serves as the primary framework for environmental management and protection in the country. It established principles for environmental management which include sustainable development, intergenerational equity, integration of environmental considerations into decision-making, and the polluter pays principle. The Act establishes the South African National Biodiversity Institute (SANBI) and the South African National Parks (SANParks) as statutory bodies responsible for biodiversity conservation and protected areas management, respectively. NEMA requires that certain activities likely to have a significant impact on the environment undergo an environmental impact assessment. NEMA provides for the establishment and management of protected areas, including national parks, nature reserves, and protected ecosystems	The improved grazing and rangeland restoration activities of the project support the resilience of protected areas and their buffer zones. The project works together with SANParks and other authorities to achieve sustainable management of the rangeland ecosystem in the project area.
National Environmental Management: Biodiversity Act (No. 10 of 2004)	NEMBA establishes mechanisms for the protection of ecosystems, species, and genetic diversity, including the regulation of invasive species and the establishment of protected areas. It also emphasizes the importance of public participation, cooperation with other sectors, and the integration of biodiversity considerations into decision-making processes.	The project includes biodiversity considerations into its design process and contributes to net-positive biodiversity impacts.
National Water Act (No. 36 of 1998)	The Act establishes a framework for integrated water resource management, emphasizing the equitable allocation and efficient utilization of water. It promotes the participation of stakeholders, including communities and water users, in decision-making processes. The NWA also establishes a system of water resource classification, licensing, and monitoring to ensure the sustainable development and protection of water resources. It addresses issues such as water pollution, water conservation, and water infrastructure development.	The projects rangeland restoration activities contribute towards the policy's key target of conserving natural water resources.

National Veld and Forest Fire Act (No. 101 of 1998)	This legislation is aimed at preventing and managing veld and forest fires. The Act establishes measures for fire management, including fire prevention, suppression, and control. It promotes the development of fire protection associations and encourages cooperation between landowners, government authorities, and communities in fire management efforts. The NVFFA empowers designated officers to enforce fire safety regulations and issue permits for controlled burning. It also outlines penalties for non-compliance and provides a framework for the investigation of fire incidents.	The project excludes the use of fire/burning as a management strategy.
Communal Land Rights Act (No. 11 of 2004)	The Act aims to address historical injustices by providing legal recognition to customary land tenure systems and promoting equitable access to and ownership of communal land. It establishes mechanisms for the registration and administration of communal land rights, ensuring communities have secure tenure and control over their land. The CLRA also emphasizes the participation and decision-making rights of community members in land-related matters and encourages sustainable land management practices.	The project acknowledges communal land rights and integrates traditional structures for land management and decision-making processes
Animal Protection Act (No. 71 of 1962)	The Act sets out various provisions to prevent cruelty and ensure the well-being of animals. It prohibits acts of cruelty towards animals, including unnecessary suffering, abandonment, and neglect. The APA also regulates the transportation, sale, and slaughter of animals, ensuring that these activities are conducted in a humane and ethical manner. It empowers inspectors to enforce animal welfare standards and take legal action against offenders.	The project supports improved livestock management practices and educates communities about wildlife conservation with the aim to reduce threats to endangered wildlife
Carbon Tax Act (No. 15 of 2019)	The Act imposes a tax on the carbon dioxide equivalent emissions produced by certain activities and sectors, including fossil fuel combustion, industrial processes, and waste management. The tax is designed to incentivize businesses and industries to reduce their carbon emissions and transition towards cleaner and more sustainable practices. The revenue generated from the carbon tax is utilized to support government initiatives aimed at mitigating climate change impacts and promoting the transition to a low-carbon economy.	N/A
Upgrading of Land Tenure Rights Act (ULTRA; No. 112 of 1991)	The Act seeks to address historical injustices and promote land reform by granting certain rights and protections to occupiers of land. ULTRA establishes mechanisms for the	

	upgrading of land tenure rights, including the conversion of insecure rights into formal ownership or leasehold arrangements. It provides for the establishment of Land Rights Boards to oversee the process of upgrading and resolve disputes related to land tenure.	
Basic conditions of Employment Act (BCEA; No. 75 of 1997)	The Act sets out minimum standards for working hours, leave entitlements, remuneration, and other essential employment conditions. It ensures that employees are protected from unfair labor practices and discrimination. The BCEA establishes regulations for issues such as overtime, night work, annual leave, sick leave, maternity leave, and termination of employment. It also guarantees employees' rights to fair labor practices, including the right to form and join trade unions and engage in collective bargaining.	All staff employed by the project are compensated above the national minimum wage and adhere to regulations on working hours.
Labour Relations Act (LRA; No. 24 of 1956)	LRA sets out provisions for collective bargaining, dispute resolution, and the rights of workers to organize and engage in protected industrial action. It establishes mechanisms for the registration and regulation of trade unions and employer organizations. The LRA prohibits unfair labor practices, such as unfair dismissals and discrimination in the workplace. It also provides for the establishment of the Commission for Conciliation, Mediation, and Arbitration (CCMA) as a central institution for dispute resolution.	The project incorporates fair labour practices and does not restrict participation of workers in trade unions.
Employment Equity Act (No. 55 of 1998)	This legislation seeks to address historical disadvantages and promote diversity and inclusion. It requires designated employers to implement affirmative action measures to ensure equitable representation of designated groups, such as Black people, women, and people with disabilities, at all levels of employment. The EEA prohibits unfair discrimination in employment practices, including recruitment, promotion, and remuneration, based on factors such as race, gender, and disability. The Act also establishes mechanisms for monitoring and reporting on employment equity progress. The Employment Equity Act plays a vital role in fostering a more inclusive and equitable workforce in South Africa, promoting equal opportunities, and addressing systemic discrimination.	The project is committed to the fair treatment and equal opportunity for all community members and employees. This is ensured through CSA's code of ethics as well as policies towards Harassment and Workplace violence and Gender Policies which are strictly complied to. These policies are available under the attached 'CSA internal policies and processes' folder.
Occupational Health and Safety Act (No. 85 of 1993)	The Act sets out comprehensive regulations and standards to protect employees from work-related hazards and promote a safe working environment. It places	The measures taken to ensure Occupational Health and Safety are described in section 2.3.16 below.

	responsibilities on employers to provide a safe workplace, conduct risk assessments, implement safety measures, and provide training and protective equipment to employees. The OHSA also establishes mechanisms for employee participation, such as health and safety committees, to ensure collaboration and communication on health and safety matters.	
Local Government Municipal Systems Act (No. 32 of 2000)	This Act aims to establish a framework for efficient, transparent, and accountable local governance. It sets out provisions for the establishment and functioning of municipalities, including their organizational structures, financial management, and service delivery obligations. The MSA promotes public participation in decision-making processes and emphasizes the importance of community involvement in local government affairs. It also outlines mechanisms for the oversight and intervention by national and provincial government in cases of non-compliance or dysfunctional municipalities.	
Interim Protection of Informal Land Rights Act (No. 31 of 1996)	The Act recognizes and provides temporary legal protection to those who have occupied and used land without formal ownership rights. It seeks to prevent forced evictions and provides a legal framework for negotiation, mediation, and resolution of disputes related to informal land rights. The IPILRA establishes the Interim Protection of Informal Land Rights Board to oversee and adjudicate matters concerning informal land rights. This Act plays a crucial role in safeguarding the rights and interests of individuals and communities who have historically occupied land informally, providing them with temporary legal protection and promoting land tenure security.	The project recognizes and respects informal rights and does not deprive or dispose any party of rights to use, occupy or access the land
Local Government: Municipal Finance Management Act (No. 56 of 2003)	Act No. 56 of 2003 is a legislation that governs the financial management and accountability of local government municipalities. The Act aims to ensure prudent and transparent financial practices, promote sound financial governance, and enhance service delivery at the local level. It sets out regulations for budgeting, procurement, financial reporting, and auditing within municipalities. The MFMA establishes financial management standards and requirements for municipalities, including the preparation and approval of annual budgets, the management of revenue and expenditure, and the prevention of	

	financial mismanagement and irregularities. The Act also establishes mechanisms for oversight and intervention by national and provincial government in cases of financial distress or mismanagement within municipalities.	

3 CLIMATE

3.1 Monitoring GHG Emission Reductions and Removals

3.1.1 Data and Parameters Available at Validation

Project Design

Per the VCS VM0032 methodology, the following data and parameters will be presented at validation:

(1) Maps of the project area, indicating all land parcels included in the project, as indicated in accompanying shape files with vector coordinates of project and stratum boundaries.

(2) Maps, with accompanying georeferenced shape files, of the locations of the permanent sampling stations overlaid on a map of project strata.

(3) Results of analysis to determine the number of sampling units and their allocation among strata.

(4) Results of cluster analysis to determine project strata.

(5) Table of all project strata, their description, and area, PA_m

(6) Legal statements of the usage rights of conservancy members to graze livestock and benefit from carbon sales, and governmental permissions for conducting the project.

(7) Justification of planned rotational grazing practices.

(8) Justification of methane as the major emission source and methane and soil carbon as the major sink for carbon dioxide in the project.

Data / Parameter	$PA_{m,g}$
Data unit	ha
Description	Project area in stratum *m*
Source of data	Measured in project area
Value applied	Total project area of first instances is 6,432 ha.
Justification of choice of data or description of measurement methods and procedures applied	This is only the project area of the first project instances Utah, Dixie, and Welverdiend, which all are in the “lowveld stratum”. New project instances will join the project over time, so no final value can yet be fixed here. It is estimated to be ca. 80,300 ha. Area data will come from shape files in a GIS.

Purpose of data	Calculation of project and baseline emissions Computation of project soil carbon removals
Comments	

Data Unit / Parameter	GWP_{CH4}
Data unit	$tCO_2e/t\ CH_4$
Description	Global-warming potential (GWP) for CH_4
Source of data	100-year GWP_{CH4} without climate change feedback obtained from the IPCC 5th Assessment Report
Value applied	28
Justification of choice of data or description of measurement methods and procedures applied	Recent and common value, not substantially different than value of IPCC 6th Assessment report (27.2)
Purpose of data	Calculation of baseline emissions Calculation of project emissions
Comment	

Baseline Methane Emissions

Data / Parameter	$W_{c,t}$	
Data unit	kg	
Description	Average body weight for animals of category *c* in year *t*	
Source of data	Estimated from measurements in project area combined with expert estimates	
Value applied	**Cattle classes**	**Average weights based on IPCC 2006 (Table 10 A2) (kg)**
	Bulls	400
	Oxen (castrated bulls)	400
	Cows	350
	Tollies (young bulls)	240
	Heifers (pre-reproductive females)	240
	Male calves	100
	Female calves	100

Justification of choice of data or description of measurement methods and procedures applied	Necessary to estimate emission factor for grazing animals using allometric equations. Measurements must be taken in accordance with the procedures described in Section 9.1.2 of the VM0032 Methodology.
Purpose of data	Calculation of baseline emissions Calculation of project emissions
Comments	

Data / Parameter	$N_{c,i}$
Data unit	Number
Description	Baseline number of animals of category *c* in census *i*
Source of data	Measured in project area by State Veterinary Services
Value applied	See Table 5 and calculation sheet "Project methane emissions calculation and uncertainty"
Justification of choice of data or description of measurement methods and procedures applied	The number of animals in each census *i* are measured to calculate the harmonic mean of the multiple counts *i* of *n* censuses of animals in category *c*. The methodology requires at least four measurements within the baseline period, with at least two during the period 5-10 years prior to the project start. However, data were not available for the entirety of the required 10-year baseline period, and, therefore, a methodological deviation was taken. Cattle numbers of the baseline are well recorded in a yearly count by State Veterinary Services as of 2015. To estimate the harmonic mean of the cattle numbers in each category *c*, a dataset was used that covered each year in the period 2015-2018. Though it does not cover the entire 10-year baseline period, this is the most accurate dataset available, and, therefore better represents baseline conditions than any other means proposed in the methodology. Animal numbers are likely to have declined in recent years due to degradation of grasslands. Thus, by not accounting the full 10-year period, the baseline estimate of methane emissions of cattle is rather underestimating. Cattle numbers are counted at the end of January each year by the State Veterinary Services. The years 2015 to 2018 represent the baseline. Measurements must be taken in accordance with the procedures described in Section 9.1.2. of the VM0032 Methodology.
Purpose of data	Calculation of baseline emissions
Comments	This document provides in Table 5 historical estimates for number of grazing animals, BN_c, for each year in which counts or estimates are available. The breed is national and homogenous. Sex and age plus the respective live body weights (W_c) of each category, with 95% CI and uncertainties are provided. The project description also provides a data table showing calculations of methane emissions based on the equations in

	VM0032 for each animal category for each year the data are available. The table includes calculated total emissions for that year and a cell containing the harmonic mean of total annual calculated methane emissions. This is the baseline BEM. The harmonic mean appropriately and conservatively weights the average methane emissions towards the lower values of a time series of measurements. The table also shows the uncertainty in daily methane emissions and the harmonic mean and its uncertainty.

Parameters for Baseline Calculation of Emissions from Burning of Biomass

The project does not plan to increase fire intensity. Therefore, the data/parameters within VM0032 for monitoring burning of biomass are not applicable.

Parameters for Calculation of Baseline SOC

Data / Parameter	$DEPTH_{m,j,0}$
Data unit	cm
Description	Soil core depth at station *j* in stratum *m* at time *t = 0* (ie, at the start of the project or since the last verification)
Source of data	Measured in project area
Value applied	20
Justification of choice of data or description of measurement methods and procedures applied	At each sampling station *j*, according to standard methods, soil is taken from four (4) soil cores to a depth that reflects depth to the general hardpan and until deeper auger measurements were not possible. The four sub-sample cores were well-mixed into a single composite sample for analysis.
Purpose of data	Calculation of baseline emissions
Comments	

Data / Parameter	$SOC\%_{j,m,0}$
Data unit	Dimensionless proportion expressed as a percent
Description	Proportion soil organic carbon at station *j* in stratum *m* at time *t = 0* (i.e., at the start of the project or since the last verification)
Source of data	Measured in project area

Value applied	Shown for each station
Justification of choice of data or description of measurement methods and procedures applied	The baseline for the measured offset approach is based on increasing SOC. Tracked at the level of $j = 1$ to z_m individual sampling stations in each stratum because offset will be based on demonstrating changes in SOC at individual stations and then summing increments. At each sampling station j, according to standard methods, measurements as above were applied. Organic carbon concentrations were measured in an appropriate academic laboratory that used either chemical combustion or the Walkley-Black method.
Purpose of data	Calculation of baseline emissions
Comments	

Data / Parameter	$BULK_{m,j,0}$
Data unit	g/cm^3
Description	Bulk density at station j in stratum m at time $t = 0$ (i.e., at the start of the project or since the last verification)
Source of data	Measured in project area
Justification of choice of data or description of measurement methods and procedures applied	At each sampling station j, according to standard methods, soil was taken from at least 4 soil cores to the depth that reflects the depth to hardpans. A volumetric ring with known volumes of soil was used. Cores were sieved to remove rocks, pebbles, and coarse fragments. The remainder was dried (5 days at 45°C or equivalent) and weighed to determine bulk density.
Purpose of data	Calculation of baseline emissions
Comments	

Parameters for Soil Carbon Models

Data / Parameter	MAP_m
Data unit	mm/yr
Description	Mean annual precipitation in stratum m
Source of data	ERA 5 climate dataset

Value applied	604.6
Justification of choice of data or description of measurement methods and procedures applied	A key variable that affects a number of processes driving SOC. ERA 5 gave the best value accounting for local differences.
Purpose of data	Calculation of baseline emissions
Comments	Five-year averages used (2013 – 2017)

Data / Parameter	*MAT*
Data unit	°C
Description	Mean annual temperature over the project area
Source of data	ERA 5 climate dataset
Value applied	20.9
Justification of choice of data or description of measurement methods and procedures applied	A key variable that affects a number of processes driving SOC, especially microbial respiration. ERA 5 gave the best value accounting for local differences.
Purpose of data	Calculation of baseline emissions
Comments	Five-year averages used (2013 – 2017)

Data / Parameter	*n*
Data unit	
Description	Number of pastures per village
Source of data	Measured in project area
Justification of choice of data or description of measurement methods and procedures applied	A key input variable that influences the grazing intensity during grazing events
Purpose of data	Calculation of baseline emissions

Comments	

Data / Parameter	$SAND\%_{j,m}$
Data unit	Dimensionless proportion, expressed as percent
Description	Proportion of soil that is sand, silt, and or clay at station *j* in stratum *m*
Equations	Model input
Value applied	Individual values for each sampling station
Source of data	Measured in project area
Justification of choice of data or description of measurement methods and procedures applied	Soil collected to desired depth at each sampling station must be mixed, and subsample analyzed for clay, silt, and sand fractions in a professional laboratory. Some models require percent sand, some percent clay and some percent of all three particle classes, sand, silt, and clay.
Purpose of data	Calculation of baseline emissions
Comments	

Data / Parameter	*w*
Data unit	kg
Description	Average animal body size (live weight) as an input to the SNAPGRAZE model
Source of data	Estimated average based on diptank inspections & market value assessment crosschecked with the IPCC default values as used above
Value applied	320
Justification of choice of data or description of measurement methods and procedures applied	Average animal body size determines the biomass consumption rate in the model.
Purpose of data	Calculation of baseline soil carbon emissions through SNAPGRAZE
Comments	

Data / Parameter	*Livestock density*
Data unit	Number/ha

Description	Cattle density in the project area and at every sampling station
Source of data	Measured in project area by State Veterinary Services and estimated based on cattle movements for each sampling stations
Value applied	Individual at each sampling station, average = 0.6
Justification of choice of data or description of measurement methods and procedures applied	Livestock density is an important input variable for the SNAPGRAZE model as it determines the grazing intensity when a camp is open for cattle
Purpose of data	Calculation of baseline and project emissions through SNAPGRAZE
Comments	Classification for each sampling station based on grazing history/ frequency of herd movements. Will remain a fixed value for each sampling station as long as there is no substantial change in the cattle herd numbers.

Data / Parameter	*FIRE*
Data unit	Number/year
Description	Average number of fires per year
Source of data	MCD64A1 v061 MODIS/Terra+Aqua Burned Area Monthly L3 Global 500 m SIN Grid
Value applied	0.055
Justification of choice of data or description of measurement methods and procedures applied	A variable that influences the aboveground grass biomass that is lost due to fire during the dormant season. QC: In field surveillance and of fires and their intensity.
Purpose of data	Calculation of baseline emissions through SNAPGRAZE
Comments	The model accounts for fires in the calculation of plant derived SOC inputs and multiplies the aboveground biomass with (1-FIRE), thus assumes that during a fire event all aboveground biomass is burnt. Although there were fires in the project area in the 10 years prior to the project, on no occasion the complete project area burnt. Therefore our fire analysis was not only focused on the number of fires but also their intensity and extent.

Data / Parameter	*Gdays*
Data unit	days
Description	Total number of days in the growing season
Source of data	NDVI analysis of plant growth

Value applied	212
Justification of choice of data or description of measurement methods and procedures applied	A key input variable that influences the plant aboveground and belowground productivity.
Purpose of data	Calculation of baseline emissions through SNAPGRAZE
Comments	Long-term average

Data / Parameter	*Edays*
Data unit	days
Description	Number of days within the growing season prior to grazing episode
Source of data	Camp management plans
Value applied	31
Justification of choice of data or description of measurement methods and procedures applied	Input for the SNAPGRAZE soil carbon model. Because there is a management plan with a bi-annual cycle of opening and closing camps, a 2-year average is applied. For conservativeness, the average was reduced by 20 days to account for potential non-compliance.
Purpose of data	Calculation of baseline emissions through SNAPGRAZE
Comments	2-year average describing the baseline

Data / Parameter	*Ddays*
Data unit	days
Description	Number of days of grazing episode
Source of data	Camp management plans
Value applied	181
Justification of choice of data or description of measurement methods and procedures applied	Input for the SNAPGRAZE soil carbon model. Because there is a management plan with a bi-annual cycle of opening and closing camps, a 2-year average is applied. For conservativeness, the average was reduced by 20 days to account for potential non-compliance.
Purpose of data	Calculation of baseline emissions through SNAPGRAZE
Comments	2-year average describing the baseline

Data / Parameter	*Fdays*

Data unit	days
Description	Number of days left in the growing season after the grazing episode
Source of data	Camp management plans
Value applied	0
Justification of choice of data or description of measurement methods and procedures applied	Input for the SNAPGRAZE soil carbon model. Because there is a management plan with a bi-annual cycle of opening and closing camps, a 2-year average is applied. For conservativeness, the average was reduced by 20 days to account for potential non-compliance.
Purpose of data	Calculation of baseline emissions through SNAPGRAZE
Comments	2-year average describing the baseline

Data / Parameter	*APCcorrection factor*
Data unit	
Description	A correction factor that is applied to the model when forage is dominated by annuals instead of perennials
Source of data	Measured in project area during vegetation assessments
Value applied	1
Justification of choice of data or description of measurement methods and procedures applied	An input variable that determines belowground and aboveground productivity. If annuals dominate, then a value of 0.291 is applied. If not, then the default value is 1.
Purpose of data	Calculation of baseline emissions through SNAPGRAZE
Comments	

Data / Parameter	*LIGCELL*
Data unit	Dimensionless proportion
Description	Mean aboveground plant cellulose plus lignin at sampling plot *j* in stratum *m*
Equations	Model input
Source of data	Measured in project area
Value applied	Individual value for each sampling station

Justification of choice of data or description of measurement methods and procedures applied	SOC is often closely related to inputs of these forms of carbon because they resist microbial decomposition. Lignin and cellulose were measured as acid digestible fibre as per Richie (2014), using the Ankom commercial digestion products and process. Samples were taken form 67 sites in Welverdiend, Dixie and Utah, whereby clippings of the three dominant species were dried, weighed, and then subjected to a sulfuric acid hydrolysis method, as per the Ankom Technology Corp commercial digestion products. The lignin and cellulose data were captured in the K2C Carbon LIGCELL_measured11112021 dataset and stored in the MEL Database.
Purpose of data	Calculation of baseline emissions
Comments	

Data / Parameter	$MSOC_{m,j,b}$
Data unit	tC/ha
Description	Modeled SOC at station *j* in stratum *m* for each year *b* during the baseline period
Source of data	SOC model
Value applied	Individual value for each sampling station
Justification of choice of data or description of measurement methods and procedures applied	The SNAPGRAZE model applied meets the modeling requirements described in Section 8.1.3.4 of VM0032 as shown above
Purpose of data	Calculation of baseline emissions
Comments	

Grazing intensity $GI_{j,m}$ is not required by SNAPGRAZE.

$PSOC^{eq}_{m,j}$ (Project modeled equilibrium SOC at station j in stratum m (tC/ha) based on parameter values from zm sampling stations in stratum m) is not a value that can be produced at validation and will be demonstrated in the first monitoring report.

D (Years required to achieve equilibrium) is not required by SNAPGRAZE.

Parameters for Removals from Woody Plant Biomass

Woody plant biomass removals are conservatively assumed to be *de minimis* and, therefore, are not applicable to this project.

3.1.2 Data and Parameters Monitored

Data / Parameter	$PA_{m,t}$
Data unit	ha
Description	Project area in stratum *m* in year *t*
Source of data	Measured in project area
Description of measurement methods and procedures to be applied	Using shapefiles in a GIS or from known coordinates of stratum boundaries or from legal descriptions of the property included in the project area.
Frequency of monitoring/recording	Annual
Value monitored	6,432
Monitoring equipment	None
QA/QC procedures to be applied	Area has been determined from accurate GIS layers of classified project area using Google Earth. The results have been crosschecked with the help of farmers in the respective communities.
Purpose of data	Calculation of project emissions
Calculation method	Measured directly
Comments	This value reflects the total area of the first project instances Utah, Dixie, and Welverdiend. Total project area is supposed to increase to around 80,300 ha.

Project Animal Methane Emissions

Data / Parameter	$PN_{c,t}$
Data unit	Number
Description	Arithmetic mean number of animals of category *c* in the project area during year t

<table>
<tr><td>Source of data</td><td>Measured in project area via State Veterinary Services of South Africa combined with support of Eco-rangers present during counting events at the dip tanks.</td></tr>
<tr><td>Description of measurement methods and procedures to be applied</td><td>Monitoring values are measured as total cattle numbers in January of the respective year. Based on the estimated cattle structure, this total cattle herd is then subdivided into subcategories of adult and juveniles. The arithmetic mean number of animals in each category over the verification period is then calculated and presented in Table 9.</td></tr>
<tr><td>Frequency of monitoring/recording</td><td>Annual</td></tr>
<tr><td>Value monitored</td><td>
<table>
<tr><th>Year</th><th>Welverdiend A</th><th>Welverdiend B</th><th>Uthla A</th><th>Dixie</th></tr>
<tr><td>2019</td><td>1721</td><td>775</td><td>875</td><td>232</td></tr>
<tr><td>2020</td><td>1887</td><td>860</td><td>961</td><td>240</td></tr>
<tr><td>2021</td><td>2219</td><td>955</td><td>970</td><td>254</td></tr>
</table>
</td></tr>
<tr><td>Monitoring equipment</td><td>Pen and paper</td></tr>
<tr><td>QA/QC procedures to be applied</td><td>Reviews of records of livestock numbers, interviews with grazing managers, coordinators, herders, or other administrative staff. Records to be kept as paper and electronic copies.</td></tr>
<tr><td>Purpose of data</td><td>Calculation of project emissions</td></tr>
<tr><td>Calculation method</td><td>Total herd measured annually and then subdivided into categories/classes according to the following estimated herd structure:
<table>
<tr><th>Cattle classes</th><th>Proportion of herd (%)</th><th>Average weights based on IPCC 2006 (Table 10 A2) (kg)</th></tr>
<tr><td>Bulls</td><td>10</td><td>400</td></tr>
<tr><td>Oxen (castrated bulls)</td><td>25</td><td>400</td></tr>
<tr><td>Cows</td><td>25</td><td>350</td></tr>
<tr><td>Tollies (young bulls)</td><td>10</td><td>240</td></tr>
<tr><td>Heifers (pre-reproductive females)</td><td>10</td><td>240</td></tr>
<tr><td>Male calves</td><td>10</td><td>100</td></tr>
<tr><td>Female calves</td><td>10</td><td>100</td></tr>
</table>
Annual arithmetic mean for each cattle class or category is then calculated over the monitoring period (3 years).</td></tr>
</table>

Comments	

Project Emissions from Burning of Biomass

Emissions from burning biomass are expected to be *de minimis* because fire events are rather reduced due to project activities. The parameters are therefore not applicable for monitoring.

Parameters for Calculating SOC Removals

After crediting periods long enough to detect changes in SOC at sampling stations, e.g., 5-7 years, the soil organic carbon $SOC_{m,j,Z}$ will be re-measured in order to re-validate and recalibrate the SNAPGRAZE soil carbon model.

Data / Parameter	$DEPTH_{m,j,t}$
Data unit	cm
Description	Soil core depth at station j in stratum *m* at time t = 0 (ie, at the start of the project or since the last verification)
Source of data	Measured at sampling stations
Description of measurement methods and procedures to be applied	Soil will be taken from at least four three soil cores (with 10 cores at each site recommended to reduce uncertainty) at each station j to a depth that accounts for the vast majority (> 80 percent) of SOC in the soil column, reflects depth to hardpans or bedrock, or matches calculations from soil carbon models. Multiple cores may be well-mixed into a single composite sample for analysis.
Frequency of monitoring/recording	For modeled approach, after a desired monitoring period for re-calibrating the chosen soil carbon model on the basis of its ability to predict changes in soil carbon during the monitoring period.
Value applied	20
Monitoring equipment	Measuring tape
QA/QC procedures to be applied	Depth cored must be the same as for baseline soil carbon sampling. However, the depth used in calculating SOC after *Y* years of project activities must be adjusted to account for changes in bulk density such that $DEPTH_{m,j,Y}$ x $BULK_{m,j,Y}$ = $DEPTH_{m,j,0}$ x $BULK_{m,j,0}$. This ensures that equal masses of soil are compared between year 0 and year Y
Purpose of data	Calculation of project emissions

Calculation method	Measured
Comments	

Data / Parameter	$SOC\%_{m,j,t}$
Data unit	Dimensionless proportion expressed as a percent
Description	Proportion soil organic carbon at station *j* in stratum *m* at time *t*
Source of data	Measured in project area
Description of measurement methods and procedures to be applied	Soil will be taken from at least three soil cores (with 10 cores at each site recommended to reduce uncertainty) at each station j to a depth that accounts for the vast majority (> 80 percent) of SOC in the soil column, reflects depth to hardpans or bedrock, or matches calculations from soil carbon models. Multiple cores may be well-mixed into a single composite sample for analysis. The organic carbon concentrations will be measured in appropriate academic or industrial laboratories with chemical automated, calibrated analytical machines or with project-area calibrated infra-red IR spectrometers.
Frequency of monitoring/recording	At the end of the monitoring period for measured approach projects, or, for modeled approach, after a desired monitoring period for re-validating the chosen soil carbon model on the basis of its ability to predict changes in soil carbon during the monitoring period. This is expected to be every 7 years.
Value monitored	Not measured in this monitoring period. Will vary with location
Monitoring equipment	Equipment for taking soil cores (augers, metal pipes, etc.) and lab equipment for doing loss on ignition (drying ovens, furnaces) or autoanalyzer for estimating carbon loss on combustion, or spectrophotometers for measuring infrared light reflectance.
QA/QC procedures to be applied	The organic carbon concentrations will be measured in appropriate academic or industrial laboratories with chemical automated, calibrated analytical machines or with project-area calibrated infra-red IR spectrometers. IR methods in case necessary will be calibrated by regression, with $R^2 > 0.90$, of IR measurement with measurement by chemical or combustion methods. Graphs of regression of IR versus combustion or chemical methods must be shown. There must be no significant bias (i.e., slope of 95% CI must include 1). The intercept of the 95% CI must include 0, which will ensure that MBIAS, following

	equation (5) of the VM0032 Methodology is between -10% and +10%. If an IR spectrometer is to be used, the project proponent must show all calibration data in a table with spectral emissions and measurements of soils or plants and graphs showing the regressions of spectral data against measurements.
Purpose of data	Calculation of project emissions
Calculation method	Measured
Comments	

Data / Parameter	$BULK_{m,j,\ t}$
Data unit	g/cm^3
Description	Bulk density in stratum m, station j, year t
Source of data	Measured in project area
Description of measurement methods and procedures to be applied	Necessary to convert proportion of SOC in soil to mass of SOC/volume following changes in SOC, after Z crediting years 5-7 crediting years. Soil will be taken from at least three soil cores (with 10 cores at each site recommended to reduce uncertainty) at each station j to a depth that accounts for the vast majority (> 80 percent) of SOC in the soil column, reflects depth to hardpans or bedrock, or matches calculations from soil carbon models. Multiple cores may be well-mixed into a single composite sample for analysis. Known volumes of soil from the cores must be sieved to remove rocks, pebbles, and coarse fragments, and then the remainder dried (5 days at 45^{o}C or equivalent) and weighed to determine bulk density.
Frequency of monitoring/recording	At the end of the monitoring period for measured approach projects, or, for modeled approach, after a desired monitoring period for re-validating the chosen soil carbon model on the basis of its ability to predict changes in soil carbon during the monitoring period. This is expected to be every 7 years.
Value monitored	Not measured in this monitoring period. Will vary by location
Monitoring equipment	Metal pipe of known volume, sledge hammer, metal plate to prevent soil from leaking, drying oven, sieve (2mm mesh). Heavy duty plastic bags, graduated cylinder.

QA/QC procedures to be applied	A consistent system of soil storage to prevent loss of mass prior to weighing, accurate estimation of rock volume, paper and digital archiving, corroboration with literature values
Purpose of data	Calculation of project removals
Calculation method	Measured
Comments	

Parameters for Project Soil Carbon Models

Data / Parameter	$MAP_{m,Y}$
Data unit	mm/yr
Description	Mean annual precipitation in stratum m over the project crediting period *Y* years.
Source of data	Precipitation maps or nearby weather stations or ERA 5 climate dataset
Description of measurement methods and procedures to be applied	A key variable that affects a number of processes driving SOC
Frequency of monitoring/recording	Annually if obtained from government sources or local weather stations, daily if collected on the project area
Value applied	604.6
Monitoring equipment	None
QA/QC procedures to be applied	Data should be obtained from government sources or local official weather stations or datasets combining these.
Purpose of data	Calculation of project emissions
Comments	

Data / Parameter	MAT
Data unit	°C
Description	Mean annual temperature over the project area

Source of data	ERA 5 climate dataset
Description of measurement methods and procedures to be applied	A key variable that affects a number of processes driving SOC
Frequency of monitoring/recording	Annually if obtained from government sources or local weather stations, daily if collected on the project area
Value applied	20.9
Monitoring equipment	None
QA/QC procedures to be applied	Data should be obtained from government sources or local official weather stations or datasets combining these.
Purpose of data	Calculation of project emissions
Comments	

Data / Parameter	*FIRE*
Data unit	n/year
Description	Average number of fires per year
Source of data	MCD64A1 v061 MODIS/Terra+Aqua Burned Area Monthly L3 Global 500 m SIN Grid
Description of measurement methods and procedures to be applied	A variable that influences the aboveground grass biomass that is lost due to fire during the dormant season.
Frequency of monitoring/recording	Annually
Value applied	0.055
Monitoring equipment	None
QA/QC procedures to be applied	In field surveillance of fires and their intensity
Purpose of data	Input for the SNAPGRAZE soil carbon model for the calculation of project emissions

Comments	Although fire frequency is sought to be reduced compared to the period of 2008 – 2017 the baseline value is applied for conservativeness.

Data / Parameter	*SAND*
Data unit	%
Description	Sand content as percent at a sampling station
Source of data	Measured at the sampling stations
Description of measurement methods and procedures to be applied	A key variable that affects a number of processes driving SOC
Frequency of monitoring/recording	At every model validation
Value applied	Not measured in this monitoring period. Will vary by location.
Monitoring equipment	Soil auger; volumetric cylinder
QA/QC procedures to be applied	Collaboration with academia to ensure quality sampling and analysis.
Purpose of data	Calculation of project emissions
Comments	

Data / Parameter	*LIGCELL*
Data unit	Dimensionless proportion
Description	Lignin and cellulose content of livestock feed for year t
Source of data	Measured at the sampling stations
Description of measurement methods and procedures to be applied	A key variable that affects a number of processes driving SOC. Lignin and cellulose were measured as acid digestible fibre as per Richie (2014), using the Ankom commercial digestion products and process. Samples were taken form 67 sites in Welverdiend, Dixie and Utah, whereby clippings of the three dominant species were dried, weighed, and then

	subjected to a sulfuric acid hydrolysis method, as per the Ankom Technology Corp commercial digestion products. The lignin and cellulose data were captured in the K2C Carbon LIGCELL_measured11112021 dataset and stored in the MEL Database.
Frequency of monitoring/recording	At every model validation
Value applied	Will vary by location
Monitoring equipment	Knive, sample bags, labelling
QA/QC procedures to be applied	Collaboration with academia
Purpose of data	Calculation of project emissions
Comments	

Data / Parameter	*Gdays*
Data unit	days
Description	Total number of days in the growing season
Source of data	NDVI analysis of plant growth
Description of measurement methods and procedures to be applied	A key input variable that influences the plant aboveground and belowground productivity.
Frequency of monitoring/recording	At every model validation
Value applied	212
Monitoring equipment	None
QA/QC procedures to be applied	Reporting by Eco-herders and exchanges during technical meetings of CSA.
Purpose of data	Calculation of project emissions

Comments	

Data / Parameter	*Edays*
Data unit	days
Description	Number of days within the growing season prior to grazing episode
Source of data	Camp management plans
Description of measurement methods and procedures to be applied	Input variable that influences grass biomass accumulation prior to a grazing event
Frequency of monitoring/recording	Annually
Value applied	101.5
Monitoring equipment	None
QA/QC procedures to be applied	Reporting by Eco-herders and exchanges during technical meetings of CSA.
Purpose of data	Calculation of project emissions
Comments	2-year average

Data / Parameter	*Ddays*
Data unit	days
Description	Number of days of grazing episode
Source of data	Camp management plans
Description of measurement methods and procedures to be applied	Input variable that determines the biomass removed during a grazing episode, when a camp is opened for cattle
Frequency of monitoring/recording	Annually

Value applied	110.5
Monitoring equipment	None
QA/QC procedures to be applied	Reporting by Eco-herders and exchanges during technical meetings of CSA.
Purpose of data	Calculation of project emissions
Comments	2-year average

Data / Parameter	*Fdays*
Data unit	days
Description	Number of days left in the growing season after the grazing episode
Source of data	Camp management plans
Description of measurement methods and procedures to be applied	Input variable that influences grass biomass regrowth/accumulation after a grazing event
Frequency of monitoring/recording	Annually
Value applied	0
Monitoring equipment	None
QA/QC procedures to be applied	Reporting by Eco-herders and exchanges during technical meetings of CSA.
Purpose of data	Calculation of project emissions
Comments	2-year average

Data / Parameter	*n*
Data unit	

Description	Number of pastures per village
Source of data	Measured in project area
Justification of choice of data or description of measurement methods and procedures applied	A key input variable that influences the grazing intensity during grazing events
Frequency of monitoring	Annually
Value applied	2
Monitoring equipment	None
QA/QC procedures to be applied	Rechecked by Eco-trainers and CSA technical team
Purpose of data	Calculation of project emissions
Comments	A value of 2 gives the most conservative results in the modelling of project SOC sequestration. Communities decide every year on the number of defined pastures. Sometimes more than 2 are defined.

Data / Parameter	*w*
Data unit	kg
Description	Average animal body size (live weight)
Source of data	Diptank inspections & market value assessment
Description of measurement methods and procedures to be applied	Input variable that influences grass biomass consumption by the cattle
Frequency of monitoring/recording	Weekly/Monthly
Value applied	320
Monitoring equipment	None controlled by the project proponent
QA/QC procedures to be applied	

Purpose of data	Calculation of project emissions
Comments	Estimated from measurements in project area combined with expert estimates

Data / Parameter	*Livestock density*
Data unit	Number/ha
Description	Cattle density in the project area and at every sampling station
Source of data	Total cattle numbers are measured in project area by State Veterinary Services. Livestock density at individual sampling stations is then estimated based on cattle movements for each sampling stations
Value applied	Unchanged for this monitoring period Individual at each sampling station (recorded in model), average = 0.6
Justification of choice of data or description of measurement methods and procedures applied	Livestock density is an important input variable for the SNAPGRAZE model as it determines the grazing intensity when a camp is open for cattle
Purpose of data	Calculation of project emissions
Comments	Classification for each sampling station based on grazing history/ frequency of herd movements. Will remain a fixed value for each sampling station as long as there is no substantial change in the cattle herd numbers.

Data / Parameter	*APC correction factor*
Data unit	Dimensionless
Description	Factor that is applied when grasslands are dominated by annual grasses
Source of data	Vegetation assessments
Description of measurement methods and procedures to be applied	Grass species identified by experts (e.g., Eco-rangers) during vegetation assessments
Frequency of monitoring/recording	Yearly

Value applied	1
Monitoring equipment	Visual assessment
QA/QC procedures to be applied	Eco-herder training in correct assessment. Checks by supervising Eco-trainers.
Purpose of data	Calculation of project emissions
Comments	0.291 if the project area is dominated by annuals. It is not and the project seeks to favor perennial grasses. Thus, the default value of 1 is applied.

$GI_{j,m}$ is not required by SNAPGRAZE.

Parameters for Project Removals from Woody Plant Biomass
Project Removals from woody plant biomass are conservatively excluded and thus monitoring not applicable.

Parameters for Leakage

Data / Parameter	$DN_{C,x}$
Data unit	Head (Number)
Description	Number of livestock (cattle) that were outside the project area (outside the fence defining the community boundary of the project area)
Source of data	Measured
Description of measurement methods and procedures to be applied	Through K2C Environmental Monitors, Eco-rangers and Yes 4 Youth, compliance to the conservation agreement shall be verified and feedback provided to CSA through daily reports and to farmers during weekly farmers meetings. Records of compliance shall be archived and utilized to determine the extent of provision and dissemination of the benefit package to stewards as well as to recommend corrective measures should there be extensive non-compliance. GPS collars are also used in some herds to track compliance.
Frequency of monitoring/recording	Monthly

Value monitored	Depends on month
Monitoring equipment	Where used, GPS-collars
QA/QC procedures to be applied	Records will be kept as paper and electronic copies
Purpose of data	Calculation of leakage
Calculation method	Count
Comments	

Data / Parameter	*d*
Data unit	days
Description	Total number of days livestock were off the project area
Source of data	Measured
Description of measurement methods and procedures to be applied	Through K2C Environmental Monitors, Eco-rangers and Yes for Youth, compliance to the conservation agreement shall be verified and feedback provided to CSA through daily reports and to farmers during weekly farmers meetings. Records of compliance shall be archived and utilized to determine the extent of provision and dissemination of the benefit package to stewards as well as to recommend corrective measures should there be extensive non-compliance. GPS collars are also used in some herds to track compliance.
Frequency of monitoring/recording	Monthly
Value monitored	Depends on month
Monitoring equipment	None
QA/QC procedures to be applied	Records shall be kept as paper and electronic copies, with at least one electronic copy kept off the project as an online database
Purpose of data	Calculation of leakage
Calculation method	count

Comments	

3.1.3 Monitoring Plan

Organizational structure of monitoring activities

CSA has a three-tiered approach to rangeland monitoring. The first tier, or first "point of contact", is the data collection based on field activities on the ground. This is done by community members, Eco-rangers, Environmental Monitors and Yes 4 Youth. The ground-based data collection aims to collect data on cattle numbers, grazing activities, herd health, etc. The second tier is where the Monitoring Officer captures project activities. This includes the number and character of training sessions held, job opportunities, number of beneficiaries, and area under improved management. The third and final tier has strong focus on scientific data collection and analysis.

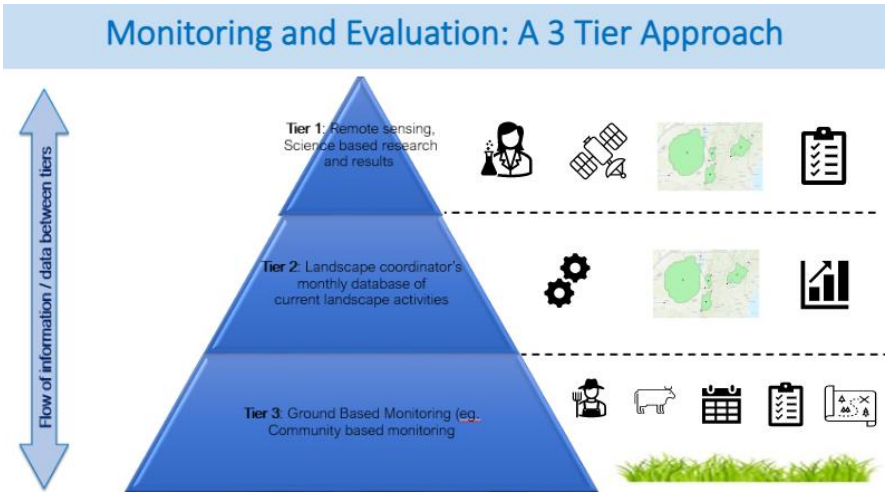


Figure 2: CSA monitoring and Evaluation framework - a three-tiered approach.

To measure improvement, CSA had to choose indicators that are both representative of the key properties of the Monitoring and Evaluation (ME) system and that relate directly to the planned interventions. In monitoring the effect of an intervention on the monitoring system, CSA compares changes in indicator values over time and/or relative to a standard or target (e.g. GOOD Matrix or Natural Resource Management targets). This can happen at various levels: the river catchment, landscape, or farm level. Indicators can measure activities or outputs (e.g., hectares of rangeland cleared of invasive plants) but should also aim to measure longer-term outcomes (e.g., hectares of natural habitat restored, markets accessed through green economic development).

In line with Conservation South Africa's strategic plan, interventions fall within the following categories and form the basis for establishing good indicators:

- rehabilitation and restoration in native rangelands used as production landscapes, principally through erosion control, removal of invasive alien plant (IAP), and planned grazing;
- social upliftment in production landscapes (mostly via skills development, conservation knowledge and market opportunities);
- influencing disaster risk reduction (DRR); and

- sustainable investments.

CSA has a strong focus on building capacity of Eco-rangers and livestock farmers on monitoring methods and relating scientific indicators in a language that is easily grasped. The monitoring coordinator is responsible for vetting the ground data with the Eco-rangers and environmental monitors, this is done through fact checking and comparisons on previous data collected. A second vetting process is undertaken by the Monitoring and Evaluation Manager through a quarterly survey that is captured online through the CSA Monitoring, Evaluation, Learning and Research (MERL) SharePoint.

All monitoring activities are guided by standardized operating procedures (SOP) and by the K2C monitoring plan, which was derived from the CSA ME framework. Quality control of data is done through the SOP on data management. Ground activities are captured through dedicated WhatsApp groups and Teams Channels, vetted monthly and captured in the K2C Monitoring Schema. The timely capture of data is a core element of the monitoring systems. All trainings and engagements are captured through a Teams reporting channel whereby attendance registers are shared as well as a brief description of the activity or event. This data flow contributes to capturing data mostly related to social upliftment indicators. A second stream of data capture is used to monitor rangeland restoration activities. Depending on the indicators, monitoring activities are captured in the field on a weekly, quarterly, and/or annual basis and captured electronically in the MERL SharePoint. The data is collected according to the indicators listed in Table 4.

The three-tiered monitoring approach allows for all project data to be vetted through various forms of submission and the quarterly survey. The three-tiered approach aims to mitigate non-conformities, alongside storing and making use of the online database to capture all raw and processed data. Working from an online database allows senior staff to spot-check data uploaded and the frequency thereof.

Sampling Design

The initial monitoring sites were established prior to this project (2009-2015) within homogenous vegetation units of varying altitude in the communal rangelands of Dixie, Utah, and Welverdiend. The sites were established as part of a long-term ecological monitoring programme (Mnisi Community Programme – University of Pretoria) and are used to assess and determine seasonal trends in rangeland dynamics and productivity across the interface.

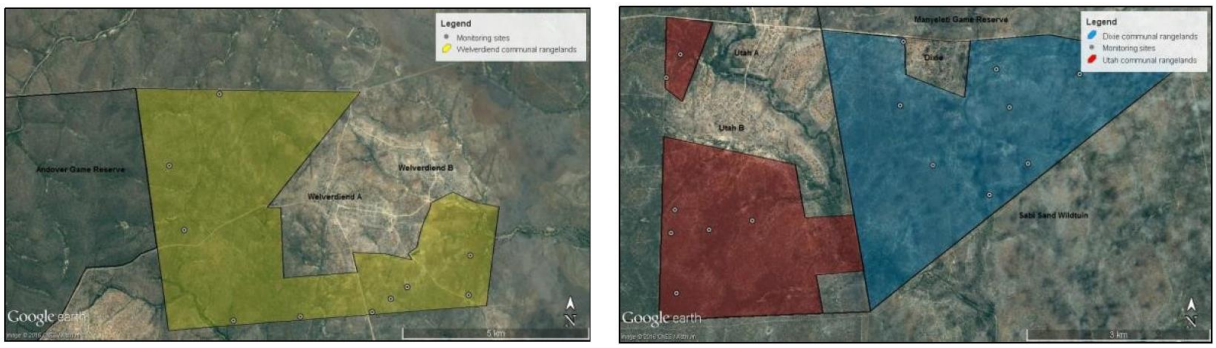


Figure 3: Initial monitoring sites incorporated into project scope.

The fieldwork phase of the research was undertaken using the Multiple Indicator Monitoring (MIM) method. The MIM method has been used to monitor rangelands across numerous vegetation types (mainly those associated with savanna and grassland biomes) throughout the Lowveld and surrounding regions of South Africa for the past 28 years. The MIM method provides sound scientific evidence for the development and implementation of sustainable rangeland management strategies. The method incorporates numerous facets from widely used and well-documented monitoring techniques and measures numerous rangeland health indicators associated with both the herbaceous and woody component. The MIM method includes conducting a survey of herbaceous vegetation, above-ground

standing crops and grazing capacity (herbaceous biomass), a woody vegetation survey, and estimating biodiversity (Shannon-Wiener).The vegetation assessment protocol can be made available to the validator upon request.

Since 2016, the fixed monitoring sites were increased from 25 to 75, and they are monitored according to the MIM method. In 2021, the baseline soil sampling campaign measured soil samples from the 62 fixed sites, including a full vegetation assessment according to the MIM method. An additional 100 soil samples were collected across the landscape. These sites where stratified according to the sampling strategy in Figure 28.

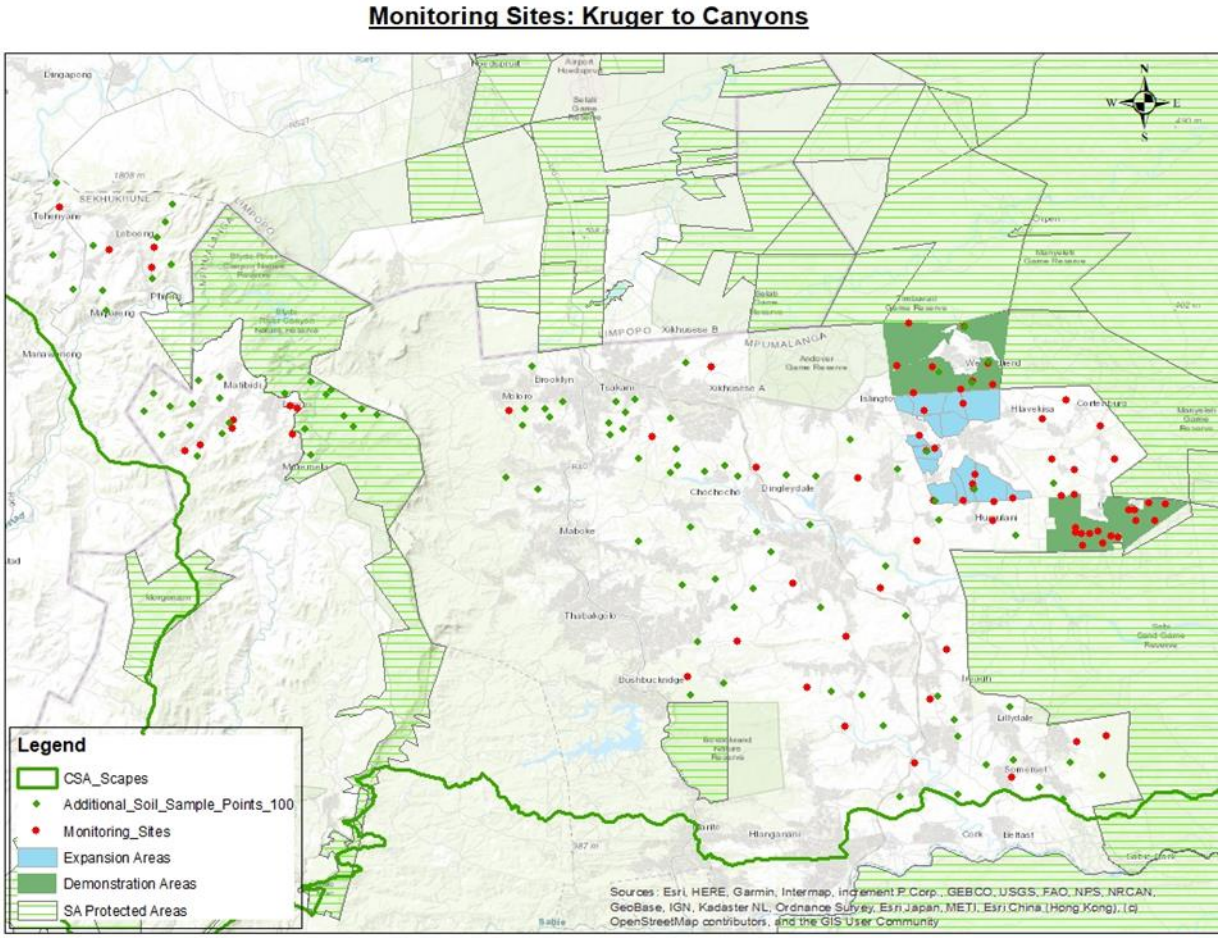


Figure 4: Monitoring sites across project area.

Sampling Strategy: Spatial Analysis and Planning

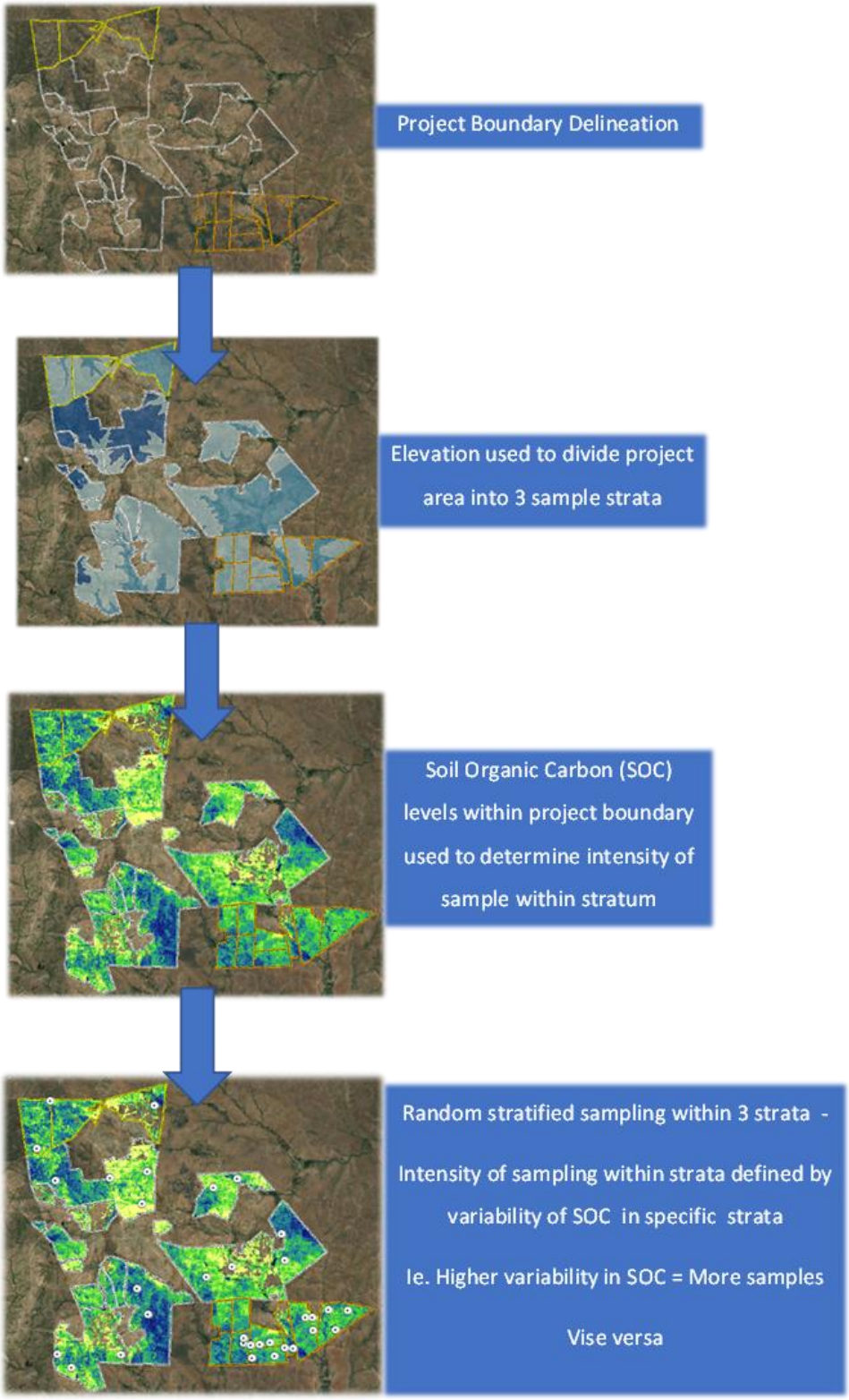


Figure 5: Sampling Strategy

Monitoring of animal numbers

In partnership with the State Veterinary Services, Eco-trainers work with the State Vet technicians to capture cattle numbers present at the dip tank on a weekly basis. This data is captured by the State Vet Technician in their data collection books, and the Eco-trainers report the data through the WhatsApp and Teams channels. Once the data has been reported, the data is captured in the MERL.

Table 3: Mean cattle number 2015-2022

	Welverdiend	Utah	Dixie
2015	3248	923	246
2016	2710	742	137
2017	2530	694	124
2018	2851	802	141
2019	2496	875	232
2020	2747	961	240
2021	3174	970	254
2022	3425	1076	252

K2C environmental monitors and CSA Eco-trainers conduct regular patrols in the designated grazing areas to ensure that cattle are grazing in the correct camps as outlined in the co-designed grazing plan. Cattle found to be grazing in a rested camp will be photographed and have their tag numbers and brand marks recorded; this information is reported to CSA via WhatsApp for record-keeping and to conservation stewards during weekly farmers meetings, where penalty for non-compliance will be issued by the cooperative committee. To ensure compliance, signs indicating closure or availability of camp for grazing will be placed on the gates of each camp.

Monitoring of grazing intensity

Above-ground grass standing crop is measured through the application of the disc pasture meter method (Bransby and Tainton 1977). In the MIM, this method entails recording above-ground grass standing crop every 1 meter along the length of a 100-m transect, giving a total of 100 measurements per monitoring site. The above-ground grass standing crop is then estimated using the equation (Trollope and Potgieter 1986):

$$y = -3019 + 2260\sqrt{x}$$

where: y = mean above-ground grass standing crop (kg ha^{-1});
x = mean disc height (cm)

The project aims to improve the measurement of grazing intensity through establishing enclosures in close proximity to the permanent monitoring sites. An index for grazing intensity will be developed using temporal measurements of biomass within enclosure plots as well as outside enclosure plots. Disc pasture meter measurements of standing biomass within enclosure plots will be compared to standing biomass measurements outside the enclosures.

Monitoring of plant species composition

The plant species composition is conducted in accordance with the MIM method. The herbaceous vegetation survey is conducted on an annual basis by Sustineri Ecological Consulting PTY Ltd (by Graeme Wolfaard, ecologist) using the following methodology.

A 100-m tape measure is used to establish a 25 m x 25 m belt transect. Measurements are recorded at each meter mark up until the 50-m mark has been reached. Thereafter, measurements are recorded at every even number (i.e. 52, 54, 56, etc.), to give a total minimum of 75 herbaceous meter-recordings per monitoring site. A thin wire rod is dropped vertically to the ground at each of the relevant meter marks, where the following herbaceous indicators of rangeland health are determined:

- Record the closest rooted herbaceous individual:
    - Perennial grass species are recorded at the relevant meter marks.
    - Should the closest individual be a perennial grass species from the start, then the 'annual' column in the datasheet is left blank and only the necessary measurements of the perennial species are recorded.
    - If the closest individual is an annual, it is measured first. Thereafter the closest perennial grass species is measured as a "2nd species". Annual grass species are recorded by species name, herbaceous dicotyledons are recorded as "forb", and species belonging to the family Cyperaceae are recorded as 'sedge'.
- Distance-to-tuft and tuft diameter measurements (mm) of the above-mentioned individuals are recorded to provide an estimation of herbaceous basal cover.
- An estimate of percentage canopy cover is determined by extending a vertical projection above each meter mark. The growth of many palatable and productive grass species is associated with canopy cover.

The data is recorded by the ecologist and captured in the vegetation assessment database on the MERL SharePoint.

Monitoring of Plant Lignin and Cellulose

Lignin and cellulose are measured as acid-digestible fibre as per Richie (2014), using the Ankom commercial digestion products and process. Samples were taken form 67 sites in Welverdiend, Dixie, and Utah, whereby clippings of the three dominate species were dried, weighed and then subjected to a sulfuric acid hydrolysis method, as per the Ankom Technology Corp commercial digestion products.

The lignin and cellulose data were captured in the K2C Carbon LIGCELL_measured11112021 dataset and stored in the MEL Database.

Leakage monitoring

The monitoring plan for carbon-related parameters as outlined in the previous chapters is embedded in a larger monitoring framework to ensure compliance with the conservation agreements. Through K2C Environmental Monitors, Eco-rangers, and Yes 4 Youth, compliance with the conservation agreements shall be verified and feedback provided to CSA through daily reporting and to farmers during weekly farmers meetings. Records of compliance shall be archived and utilized to determine the extent of provision and dissemination of the benefit package to stewards as well as to recommend corrective measures should there be extensive non-compliance.

A pilot project was launched in collaboration with the University of Pretoria to track and record the movements of cattle in the Dixie community. Eight heads of cattle were fitted with GPS collars for a period of finally about 3 months to track animal movements in accordance to the grazing management plan (Figure 6). This data can support compliance monitoring of the grazing plans. Unfortunately, during the monitoring period there were no additional resource made available, so the project could not yet seek to extend the collaring activities into other communities.

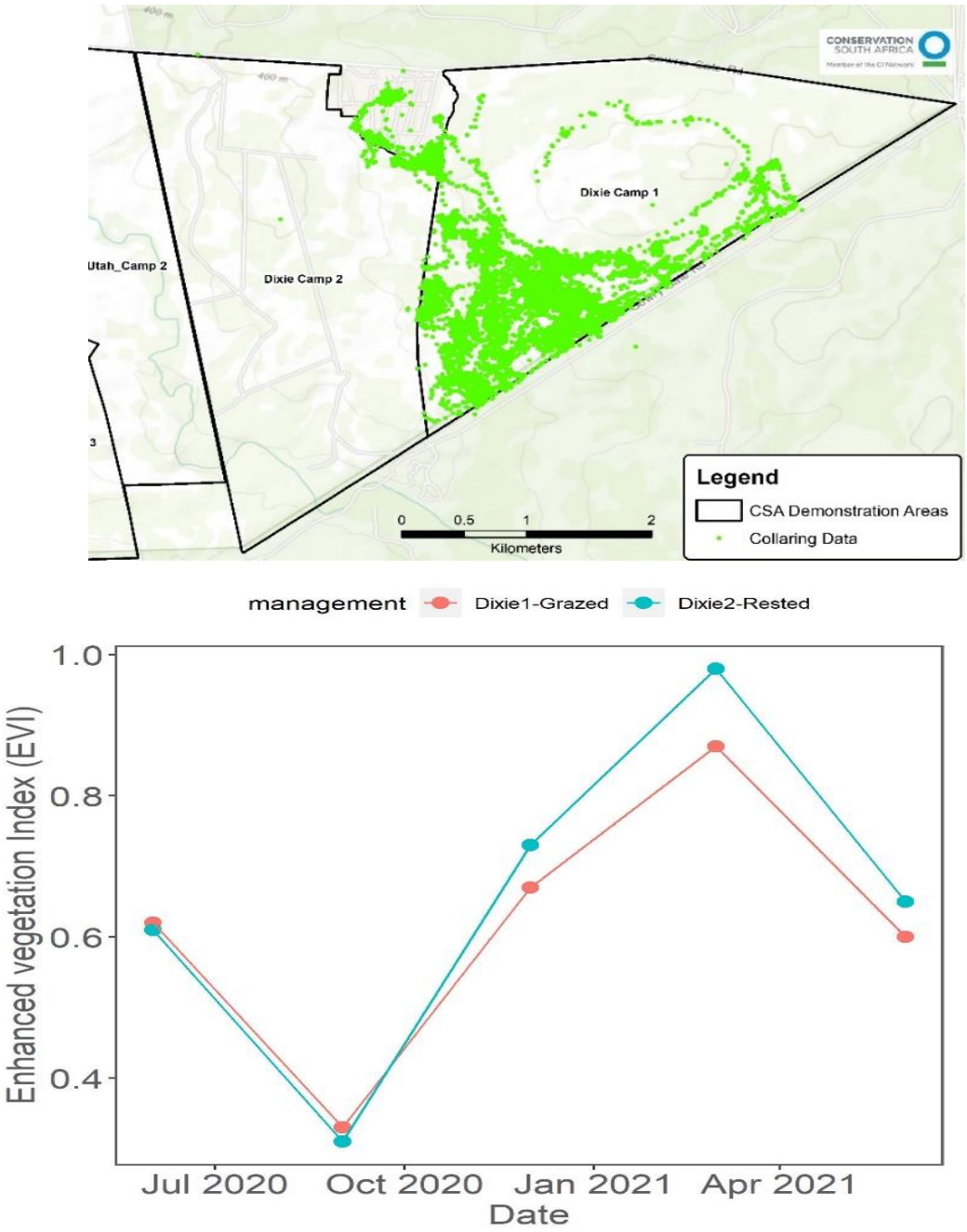


Figure 6. GPS collars on cattle (green dots) and remote sensing (EVI) are being used to track compliance in grazing/rested areas in Dixie. Here, Camp 1 is open for grazing while Camp 2 is closed and shows little encroachment of cattle (top) apparently resulting i

Table 4 CSA indicators per intervention.

Intervention	Indicator and (unit)	Type	Reference value *	Frequency
1. Rangeland restoration **-Conservation agreements** **-Destocking** **-Planned grazing** **-Kraaling** **-Livestock improvement (veterinary care, breeds)** **-IAP removal to 5%** **-Skills development**	1.1 Conservation Agreements (% of target area [ha]) 1.2 Sustainably managed rangeland (% of target area [ha]) 1.3 Sustainably managed mining (% target area [ha]) 1.4 De-trended NDVI 1.5 Veld condition score 1.6 Self-sufficiency (% herd sold relative to target) 1.7 Self-sufficiency (% herd slaughtered relative to target) 1.8 Employment generation (% person days target) 1.9 Compliance (% of required ha LSU^{-1}) 1.10 Plant species composition 1.11 Percentage IAP cleared to maintenance level (Area [ha] at 5% /Total area [ha] infested) 1.12 Skills development (% of target/ number of people) 1.13 Households supported (% of target/ number of people) 1.14 Livestock survival (% LSU reaching 6 months) 1.15 Livestock resilience (LSU survival mm^{-1} MAP) 1.16 Livestock resilience (LSU survival $degree^{-1}$ °C MAT) **1.17 Overall rangeland restoration score (no unit)**	Productivity Productivity Productivity Productivity Productivity Productivity Productivity Ecosystem Ecosystem Ecosystem Ecosystem Stability Stability Stability Reliability Resil. & Adapt. As above **All**	25,000 ha 80,000 ha 30,000 ha Change over time 650 25% 25% 100% 45 or 60 ha LSU^{-1} 272 100% 100% 100% 100% 90 100% $\frac{Total\ LSU}{Rainfall}$ $\frac{Total\ LSU}{Temp}$ **1600**	Annual Annual Annual Quarterly Annual Annual Annual Annual Annual Monthly Annual Quarterly Quarterly Annual Annual - -
2. Wetland restoration **-Gabions** **-Stock exclusion** **-IAP removal to 5%** **-Skills development**	2.1 Sustainably managed wetlands (% target area [ha]) 2.2 Employment generation (% target person days) 2.3 Gully profile (Length [m]/Height [m]) 2.4 Water table height (dip well height [m] as % of total well height [m])	Productivity Productivity Ecosystem Ecosystem Ecosystem	Area (ha) TBD 100 0 75 100	Annual

Intervention	Indicator and (unit)	Type	Reference value *	Frequency
	2.5 Percentage IAP cleared to maintenance level (Area at 5% [ha]]) 2.6 Skills development (% of target) 2.7 Water security (table height / mm rainfall (m mm^{-1}) **2.8 Overall wetland restoration score (no unit)**	Stability Resilience **All**	100 $Total\ Height/Rainfall$ **700**	
3. Predator conservation -Skills development	3.1 Livestock loss to predators (% of control treatment / number of incidents) 3.2 Employment generation (% target person-days) 3.3 Wildlife populations on-farm (% of national reserve) 3.4 Skills development (% of target) 3.5 Cost of predator management (% of control) **3.6 Overall predator conservation score (no unit)**	Productivity Productivity Ecosystem Stability Stability **All**	50 TBD 100 12 100 **500**	Quarterly
4. Disaster Risk Reduction	4.1 No. gabions (% of target) 4.2 Wetland restoration (% of target) 4.3 Rangeland restoration (% of target communities) **4.4 Overall DDR score (no unit)**	Stability Ecosystem Ecosystem/ Productivity **All**	TBD TBD 2 TBD **300**	Quarterly
5. Sustainable investments	5.1 Sustainable business (% target engagements) 5.2 IDP engagement (% target engagements) 5.3 Knowledge & data sharing (% target reports) 5.4 Technical input (% target reports) 5.5 Skills development (% of target) **5.6 Overall sustainable investment score (no unit)**	Stability Stability Stability Stability Stability **All**	2 **500**	Quarterly

Intervention	Indicator and (unit)	Type	Reference value *	Frequency
6. Social upliftment	6.1 Input into Local Economic Development plans (% target municipalities / number of plans adapted)	Stability Stability Stability	1 3 100	Quarterly
	6.2 Improved governance (no. governing bodies)	Productivity Productivity	100 1000	
	6.3 Representation in governing body (% community / number of community members)	Stability	100	
	6.4 Other employment generation (% target households / number of employment opportunities))	Stability Stability	1 1	
	6.5 Overall skills development (% of target trained in intervention sections 1-5)	Stability	1	
	6.6 Conservation knowledge (index)			
	6.7 Conservation behavior (index)			
	6.8 Willingness to participate (index)			
	6.9 Overall social upliftment score (no unit)	**All**	**800**	
OVERALL LANDSCAPE SCORE	**IMPACT OF INTERVENTIONS**	**ALL**	**3900**	**Additive scores**

3.1.4 Dissemination of Monitoring Plan and Results (CL4.2)

The Eco-trainers play a pivotal role in disseminating information to livestock owners and other community members that may have an interest in the project. Through the weekly meetings and continuous engagement, the Eco-trainers have shared information from the monitoring activities with the support of the monitoring coordinator. The different stakeholders of interest are able to access the complete documents and monitoring reports after their verification of the project freely and through a means to which they have access; hard copies will be left with the traditional authorities in the communities and in schools/youth centers where CSA provides internet access. The project monitoring report will also be published on the Verra website and made available to the wider public for a public commenting period. CI and CSA will also share this link with other project stakeholders for their information and input after verification.

3.2 Quantification of GHG Emission Reductions and Removals

3.2.1 Baseline Emissions

Methane emissions

Baseline methane emissions from grazing animals is estimated from data on livestock categories that reflect species, age, sex, and average weight in the project area. Annual calculations are based on estimations of daily methane emissions (for each livestock category as a function of the body weight, kg) multiplied by the number of animals in each category and the number of days in a year (365). Emissions from all categories are summed to provide the baseline annual methane emissions from livestock in the project area.

Per methodology requirements, the equation below was followed to obtain the annual methane emissions in year *t* from grazing animals of each category, which only consists of cattle (ruminants).

$$BEM = \sum_{c=1}^{k}(BN_c * DMEF(W_c)) * GWP_{CH4} * 365 * 6.26 * 10^{-7}$$

where:

BEM	Baseline annual emissions from grazing animals (tCO_2e)
BN_c	Baseline number of animals of category *c* (head), measured as per equation below
$DMEF(W_c)$	Daily emission factor as a function of animal weight category *c* (L CH_4 day^{-1})
W_c	Average body weight during the baseline period for animals of category *c* (kg)
GWP_{CH4}	Global warming potential for methane (28 tCO_2e / tCH_4),
C	Category of grazing animal
K	Number of categories of grazing animals, e.g., species, gender, age combinations
365	Number of days in a year to convert daily to annual emissions
6.26×10^{-7}	Conversion factor for L CH_4 day^{-1} to t CH_4 day^{-1}

In the project area, most livestock are cattle. Cattle is also the target livestock type for project activities. Thus, the accounting focusses only on this type. Therefore, $DMEF(W_c)$ is $\mathbf{0.66 * W_c^{0.97}}$ for ruminants, with an uncertainty of 9.5% (see Table 4 in VM0032 methodology). Forage quality is not included in the VM0032 methodology since it would require the measurement of dry matter intake by animals and accurate estimations for free-living animals on grasslands, which is impractical and prohibitively expensive.

BN_c (harmonic mean number of animals in each category during the period 2015-2018 prior to the project start date of 2018) was calculated as in equation (2) as per VM0032:

$$BN_c = \left(\frac{1}{n}\right) * \left(\frac{1}{\sum_{i=1}^{n} \frac{1}{N_{c,i}}}\right)$$

The harmonic mean of baseline cattle numbers as per the State Veterinary Services report (counting livestock at weekly dipping events) is as follows:

Table 5 Baseline livestock population by project instance yearly and as harmonic mean (Source: State Veterinary Services South Africa)

Year	Welverdiend A	Welverdiend B	Utah A	Dixie
2015	2,157	1,091	923	246
2016	1,961	749	742	137
2017	1,911	619	694	124
2018	1,946	905	802	141

The weights per cattle class are based on IPCC default values and crosschecked with average measured weights in K2C communal areas as well as with expert opinion of Meat Naturally (Table 6). The proportion of each cattle class in the total herd has been similarly estimated by Meat Naturally and in consultation with livestock owners.

Table 6: Share of cattle sex and age classes from total livestock and the respective average weights.

Cattle classes	Proportion of herd (%)	Average weights based on IPCC 2006 (Table 10 A2) (kg)
Bulls	10	400
Oxen (castrated bulls)	25	400
Cows	25	350
Tollies (young bulls)	10	240
Heifers (pre-reproductive females)	10	240
Male calves	10	100
Female calves	10	100

Applying these shares and average weights to the harmonic mean of baseline livestock population in Equation 1 above gives the following baseline emissions as a result.

Table 7 Calculation and results table of baseline methane emissions from animal census

Animal category									Animal Census (Number of cattle)							Methane Emissions	
village	Sex/Age category	Estimated proportion of total herd	Weight (kg) as of Tab10A2_IPCC	DMEF_Wc (L CH4/day)	Per Animal Uncertainty (UDME_c)	GWP_CH4	conv_L_t	2015	2016	2017	2018	Harmonic Mean (BNc)	SD (1/N_C,i)	SEBN_c	Uncertainty in project mean of animals (UBN_c)	Annual Baseline methane emissions (BEM_t) (tCO2e/yr)	Uncertainty in project methane emissions (UBEM_c)
Dixie	bulls	10%	400	220,6	9,5%	28	6,26E-07	25	14	12	14	15	0,0152	2,0	50,98%	21,3	51,86%
	oxen	25%	400	220,6	9,5%	28	6,26E-07	62	34	31	35	38	0,0061	5,0	50,98%	53,2	51,86%
	cows	25%	350	193,8	9,5%	28	6,26E-07	62	34	31	35	38	0,0061	5,0	50,98%	46,7	51,86%
	tollies	10%	240	134,4	9,5%	28	6,26E-07	25	14	12	14	15	0,0152	2,0	50,98%	13,0	51,86%
	heifers	10%	240	134,4	9,5%	28	6,26E-07	25	14	12	14	15	0,0152	2,0	50,98%	13,0	51,86%
	calves_m	10%	100	57,5	9,5%	28	6,26E-07	25	14	12	14	15	0,0152	2,0	50,98%	5,5	51,86%
	calves_f	10%	100	57,5	9,5%	28	6,26E-07	25	14	12	14	15	0,0152	2,0	50,98%	5,5	51,86%
Utah	bulls	10%	400	220,6	9,5%	28	6,26E-07	92	74	69	80	78	0,0013	4,7	22,95%	110,3	24,84%
	oxen	25%	400	220,6	9,5%	28	6,26E-07	231	186	174	201	195	0,0005	11,7	22,95%	275,7	24,84%
	cows	25%	350	193,8	9,5%	28	6,26E-07	231	186	174	201	195	0,0005	11,7	22,95%	242,2	24,84%
	tollies	10%	240	134,4	9,5%	28	6,26E-07	92	74	69	80	78	0,0013	4,7	22,95%	67,2	24,84%
	heifers	10%	240	134,4	9,5%	28	6,26E-07	92	74	69	80	78	0,0013	4,7	22,95%	67,2	24,84%
	calves_m	10%	100	57,5	9,5%	28	6,26E-07	92	74	69	80	78	0,0013	4,7	22,95%	28,7	24,84%
	calves_f	10%	100	57,5	9,5%	28	6,26E-07	92	74	69	80	78	0,0013	4,7	22,95%	28,7	24,84%
Welverdiend	bulls	10%	400	220,6	9,5%	28	6,26E-07	325	271	253	285	281	0,0003	14,5	19,84%	396,7	22,00%
	oxen	25%	400	220,6	9,5%	28	6,26E-07	812	678	633	713	703	0,0001	36,3	19,84%	991,7	22,00%
	cows	25%	350	193,8	9,5%	28	6,26E-07	812	678	633	713	703	0,0001	36,3	19,84%	871,2	22,00%
	tollies	10%	240	134,4	9,5%	28	6,26E-07	325	271	253	285	281	0,0003	14,5	19,84%	241,7	22,00%
	heifers	10%	240	134,4	9,5%	28	6,26E-07	325	271	253	285	281	0,0003	14,5	19,84%	241,7	22,00%
	calves_m	10%	100	57,5	9,5%	28	6,26E-07	325	271	253	285	281	0,0003	14,5	19,84%	103,4	22,00%
	calves_f	10%	100	57,5	9,5%	28	6,26E-07	325	271	253	285	281	0,0003	14,5	19,84%	103,4	22,00%
												Total Animals	3743	Total Annual Baseline emissions (tCO2e/year)	3928	Uncertainty in baseline methane emissions (UBEM)	23,8%

Baseline Soil Organic Carbon

Baseline soil organic carbon was calculated based on the requirements of the modeled approach under VM0032.The project uses the SNAPGRAZE model for soil organic carbon dynamics (Ritchie 2020) which is an extension of the SNAP carbon model that was developed in a savanna grazing system in the Serengeti National Park (Ritchie 2014). The SNAPGRAZE model was developed by Mark Ritchie and published in 2020 (Ritchie 2020). The output of the model is the soil organic carbon at equilibrium that will be achieved with the given input data on climate, vegetation, soil, and cattle management. Several improvements have been done to the model by the authors, which were recorded in the PDD. The results of the model calibration and validation can be found in the file "SOC model SNAPGRAZE_validation,BL,Project,uncertainty".

Under a modeled approach, VM0032 requires that the chosen soil carbon model estimate the maximum SOC at each station *j* in each stratum *m* during the 10 years prior to the project start date using a technique called back casting. This estimate, $MSOC_{m,j,0}$, is then used as a conservative estimate of baseline SOC at the project start date. Back casting implies knowledge of a prior condition (in this case, SOC) from which the model is run forward to estimate the current measured SOC, or $SOC_{m,j,0}$. From this model run, the predicted SOC for 10 years prior to the current time ($MSOC_{m,j,0}$) can be determined. This is, however, a directive based on the SNAP model. As SNAPGRAZE was developed later, this step is not applicable (nor feasible) anymore. The output of the SNAPGRAZE model is the soil organic carbon equilibrium that is achieved with the given input data on climate, vegetation, soil characteristics, and cattle management. As shown in the Methodology Deviations section of the PDD, the baseline SOC equilibrium 10 years prior to the project start (2008) can be assumed to be the same as at project start (2018) because baseline practices of uncontrolled cattle management and overgrazing of the communal rangeland had been practiced for more than the prior 20 years. No significant land use change has happened since the early 1980s.
The output of the SNAPGRAZE model is the soil organic carbon equilibrium that is achieved with the given input data on climate, vegetation, soil and cattle management. The baseline cattle management was determined by consultations of local cattle farmers. The model was used to calculate the soil organic carbon equilibrium at each permanent sampling station.

Uncertainty in baseline emissions

Since the project does not account for emission reductions produced by adjusting the fire frequency, baseline uncertainty is represented by *UBEM* alone.

$$UBEM = \frac{(\sum_{c=1}^{k}(BEM_c \times UBEM_c)^2)^{\frac{1}{2}}}{\sum_{c=1}^{k} BEM_c}$$

Where:

UBEM	= Uncertainty in baseline methane emissions from grazing animals (%)
$UBEM_c$	= Uncertainty in baseline methane emissions from animals in category c (%)
BEM_c	= Baseline emissions from animals in category *c* (tCO_{2e})

$UBEM_c$ is the uncertainty in methane emissions from animals in category *C*, as dictated by whether the animals are ruminants, equids, or pigs (see Table 4, section 8.1.3.1 in VM0032), $UBEM_c$ is calculated from the uncertainty for each animal category in the regression equations that predict daily methane emissions per animal (DME_c) based on the mean body weight ($UDME_c$) and the uncertainty in the harmonic mean of animal counts (UBN_c) during the baseline period.
To obtain UBN_c , one must first calculate $SEBN_c$, the standard error[31] of the harmonic mean BN_c of the series'

$$SEBN_c = (BN_c)^2 \times \frac{SD\left(\frac{1}{N_{c,i}}\right)}{(n-1)^{1/2}}$$

Where:

$SEBN_c$ = Standard error of the harmonic mean of animal counts in category *c*
$SD(1/N_{c,i})$ = Standard deviation of the inverses of the count *I* of animals in category *c*
$N_{c,I}$ = Animals in category *c* in census *I* (head)
BN_c = Harmonic mean number of animals in category *c* (head) during the baseline period
n = Number of censuses

The 95 percent confidence interval-based uncertainty in the estimated number of animals in category *c* is:

$$UBN_c = 3.84 \times 100 \times \frac{SEBN_c}{BN_c}$$

Where:
UBN_c = Uncertainty in the harmonic mean of animal counts (%)
$SEBN_c$ = Standard error of the harmonic mean of animal counts
BN_c = Baseline number of animals of category *c* (head)
3.84 = Multiplier converts expression into a 95% confidence interval
100 = Multiplier converts expression into percent

$$UBEM_c = (UBN_c^2 + UDME_c^2)^{1/2}$$

Where:
$UBEM_c$ = Uncertainty in baseline methane emissions from animals in category *c* (%)
UBN_c = Uncertainty in the baseline harmonic mean of animals of category *c* (%)
$UDME_c$ = Uncertainty in the regression for predicting daily methane emissions for animals of category *c* (%) = **9.5%** (as per Table 4 in VM0032)

Estimation of baseline emissions and uncertainty

The calculation results following the above protocol have been presented above in Table 7 for the first project instances. SOC is conservatively assumed to be zero, $_{\Delta}$SOC = 0, so

$$BER = BEM$$

3.2.2 Project Emissions

Calculation of project emissions and removals

Net annual GHG emissions and removals of the project, NPR_t, are determined by the sum of methane emissions, PEM_t, and net removals from SOC sequestration, PRS_t.

$$NPR_t = PEM_t + PRS_t$$

Methane emissions

Project activities do not focus on the reduction of livestock numbers per se and thus, no market leakage is applicable. Activities rather focus on grassland productivity, animal health, and, consequently, meat productivity increase, which may lead to changes in livestock numbers and even more so on herd structure. Such changes in number and structure may lead to decreased methane emission in the project scenario. Since no displacement of cattle via market leakage can be expected, this should be accounted for following the below calculation. Calculations are based on animal counts and emission factor data based on project area-applicable body weight (Table 6) of each category as shown in the previous sub-chapter.

The cattle herd numbers for the monitoring period are demonstrated in Table 8.

Table 8 Project livestock population in monitoring period by project activity instance yearly (Source: State Veterinary Services South Africa)

Year	Welverdiend A	Welverdiend B	Uthla A	Dixie
2019	1721	775	875	232
2020	1887	860	961	240
2021	2219	955	970	254

Project methane emissions from livestock enteric fermentation are calculated as shown below:

$$PEM_t = \sum_{c=1}^{k} (PN_c * DMEf(W_c)) * GWP_{CH4} * 365 * 6.26 * 10^{-7}$$

where:

PEM_t = Project emissions of CH_4 from grazing animals in year *t* (tCO_2e)
PN_c = Number of animals in category *c* (head)
$DMEf(W_c)$ = Daily emission factor as a function of animal weight category c (L CH_4 day^{-1})
W_c = Average body weight during year t for animals of category c (kg)
GWP_{CH4} = Global warming potential for methane (28 tCO_2e / tCH_4),
C = Category of grazing animal
K = Number of categories of grazing animals, e.g., species, gender, age combinations
365 = Number of days in a year to convert daily to annual emissions
6.26 x 10^{-7} = Conversion factor for L CH_4 day^{-1} to t CH_4 day^{-1}

The summary results including related uncertainty are shown in Table 9 below.

Table 9 Project methane emissions from animal census

Animal category								Animal Census (Number of cattle)						Methane Emissions	
village	Sex/Age category	Estimated proportion of total herd	Weight (kg) as of Tab10A2_IPCC	DMEF_Wc (L CH4/day)	Per Animal Uncertainty (UDME_c)	GWP_CH4	conv_L_t	2019	2020	2021	Arithmetic Mean (PNc)	SD (PN_c,Y)	Uncertainty in project mean of animals (UPN_c)	Annual Project methane emissions (PEM_t) (tCO2e/yr)	Uncertainty in project methane emissions (UPEM_c)
Dixie	bulls	10%	400	220,6	9,5%	28	0,000000626	23	24	25	24	0,9	10,20%	34,1	13,94%
	oxen	25%	400	220,6	9,5%	28	0,000000626	58	60	64	61	2,3	10,20%	85,4	13,94%
	cows	25%	350	193,8	9,5%	28	0,000000626	58	60	64	61	2,3	10,20%	75,0	13,94%
	tollies	10%	240	134,4	9,5%	28	0,000000626	23	24	25	24	0,9	10,20%	20,8	13,94%
	heifers	10%	240	134,4	9,5%	28	0,000000626	23	24	25	24	0,9	10,20%	20,8	13,94%
	calves_m	10%	100	57,5	9,5%	28	0,000000626	23	24	25	24	0,9	10,20%	8,9	13,94%
	calves_f	10%	100	57,5	9,5%	28	0,000000626	23	24	25	24	0,9	10,20%	8,9	13,94%
Utah	bulls	10%	400	220,6	9,5%	28	0,000000626	88	96	97	94	4,3	12,43%	132,0	15,65%
	oxen	25%	400	220,6	9,5%	28	0,000000626	219	240	243	234	10,7	12,43%	330,0	15,65%
	cows	25%	350	193,8	9,5%	28	0,000000626	219	240	243	234	10,7	12,43%	289,9	15,65%
	tollies	10%	240	134,4	9,5%	28	0,000000626	88	96	97	94	4,3	12,43%	80,4	15,65%
	heifers	10%	240	134,4	9,5%	28	0,000000626	88	96	97	94	4,3	12,43%	80,4	15,65%
	calves_m	10%	100	57,5	9,5%	28	0,000000626	88	96	97	94	4,3	12,43%	34,4	15,65%
	calves_f	10%	100	57,5	9,5%	28	0,000000626	88	96	97	94	4,3	12,43%	34,4	15,65%
Welverdiend	bulls	10%	400	220,6	9,5%	28	0,000000626	250	275	317	281	28,0	27,09%	395,9	28,70%
	oxen	25%	400	220,6	9,5%	28	0,000000626	624	687	794	701	70,0	27,09%	989,8	28,70%
	cows	25%	350	193,8	9,5%	28	0,000000626	624	687	794	701	70,0	27,09%	869,5	28,70%
	tollies	10%	240	134,4	9,5%	28	0,000000626	250	275	317	281	28,0	27,09%	241,2	28,70%
	heifers	10%	240	134,4	9,5%	28	0,000000626	250	275	317	281	28,0	27,09%	241,2	28,70%
	calves_m	10%	100	57,5	9,5%	28	0,000000626	250	275	317	281	28,0	27,09%	103,2	28,70%
	calves_f	10%	100	57,5	9,5%	28	0,000000626	250	275	317	281	28,0	27,09%	103,2	28,70%
										Total Animals	3983	Total annual project emissions (tCO2e/year)	4179	Uncertainty in project methane emissions during the monitoring period (UPEM)	24,74%

Soil carbon removals

The SNAPGRAZE model predicts a SOC equilibrium that will be achieved with the given input parameters on climate, vegetation, soil properties and livestock management. Improved grazing management has the potential to restore SOC stocks. The model does not calculate nor indicate the time to reach equilibrium and therefore does not by itself calculate an annual SOC change. Therefore, we assume a time frame of 20 years to reach the new SOC equilibrium based on Lal (2004). Annual project removals due to changes in SOC stocks (PRS_t) were calculated using the following equations. First, removals were calculated for each stratum:

$$\boldsymbol{PRS_{m,t}} = \frac{\mathbf{44}}{\mathbf{12}}\left(\frac{\sum_{j=1}^{Z_m}\left(\boldsymbol{PSOC_{m,j}^{eq}} - \boldsymbol{MSOC_{m,j,0}}\right)}{\boldsymbol{Z_m}}\right) \times \frac{\mathbf{1}}{\boldsymbol{D}}$$

Where:

$PRS_{m,t}$ = Annual project removals due to changes in SOC stocks in stratum *m* in year *t* (tCO_2e/ha)

$PSOC^{eq}_{m,j,}$ = Project modelled equilibrium *SOC* at station *j* in stratum *m* (tC/ha) based on parameter values from z_m sampling stations in stratum *m*

z_m = Number of sampling stations in stratum *m*

$MSOC_{m,j,0}$ = Modeled baseline *SOC* at station *j* for stratum *m* at time *t* =0 (tC/ha) (see previous subchapter)

D = Years required to achieve equilibrium (project-wide value); Term not required by SNAPGRAZE

44/12 = Conversion factor from tC to tCO_2e

Then, removals across all strata were estimated using the following equation:

$$\boldsymbol{PRS_t} = \sum_{\boldsymbol{m}}^{\boldsymbol{s}}\left(\boldsymbol{PA_{m,t}} \times \boldsymbol{PRS_{m,t}}\right)$$

Where:

PRS_t = Project removals due to changes in SOC stocks in year *t* (tCO_2e)

$PA_{m,t}$ = Project area of stratum *m* in year *t* (ha)

s = Number of strata in the project area

$PRS_{m,t}$ = Annual project removals due to changes in SOC stocks in stratum *m* in year *t* (tCO_2e / ha)

The annual project removals due to changes in SOC stocks for the included project instances amount to 18,525 tCO_2e.

Uncertainty in project emissions and removals

Total uncertainty is calculated by weighting uncertainties according to the magnitude of emission or removal. In this case, uncertainty in net reductions and removals UNR_t is driven by uncertainty in baseline emissions, project emissions, and project net changes in carbon stocks.

$$UNR_t = \frac{((UPEM_t \times PEM_t)^2 + (UNCCS_t \times NCCS_t)^2 + (UBE \times BEM)^2)^{1/2}}{PEM_t + NCCS_t + BEM}$$

Where:

UNR_t = Uncertainty in net emission reductions and removals, not including leakage, at time *t* (%)

$UPEM_t$ = Uncertainty in project emissions at time *t* (%)

$UNCCS_t$ = Uncertainty in net change in carbon stocks at time *t* (%)

UBE = Uncertainty in baseline emissions (%)

BEM = Baseline animal methane emissions (tCO_2e)

PEM_t = Project animal methane emissions at time *t* (tCO_2e)

$NCCS_t$ = Net project changes in carbon stocks (tCO_2e)

Uncertainty in annual project methane emissions is calculated as:

$$UPEM = \frac{(\sum_{c=1}^{k}(PEM_c \times UPEM_c)^2)^{1/2}}{\sum_{c=1}^{k} PEM_c}$$

Where:

$UPEM$ = Uncertainty in project methane emissions from grazing animals during the monitoring period (%)

$UPEM_c$, = Uncertainty in project methane emissions from animals in category *c* (%)

PEM_c = Project methane emissions from animals in category *c* (tCO_2e)

$UPEM_c$, is the uncertainty in methane emissions calculated from the uncertainty, for each animal category, in the regression equations for per animal daily methane production and the uncertainty in the arithmetic mean of animal censuses for category *c*, PN_c, during the monitoring period.

$$UPEM_{c,} = (UPN_c^2 + UDME_c^2)^{1/2}$$

Where:

UPN_c = Uncertainty in the project mean of animals in category *c*

$$UPN_c = 3.84 \times 100 \times \frac{SD(PN_{c,Y})}{PN_c \times (n-1)^{1/2}}$$

$SD(PN_{c,Y})$ = Standard deviation of animal counts in category *c* across *Y* years of the monitoring period

PN_c = Arithmetic mean of animal numbers in category *c* (head)

Y = Years in the monitoring period

3.84 = Multiplier converting expression into a 95% confidence interval

100 = Multiplier converting expression into percent

$UPME_c$ = Uncertainty in the regression for predicting daily methane emissions for animals of category *c* (%) = **9.5%** (as per Table 4 in VM0032)

Uncertainty in changes in soil carbon stocks under a modelled approach, $UNCCS_{m,t}$ is obtained from the calculated 95% confidence interval as required by the current VCS Standard 3.7 and the VM0032 methodology using a Monte Carlo simulation of $NCCS_{m,t}$ based on parameter values in each stratum *m*. This interval is determined by iterated calculations that sample from hypothetical normal distributions of values of each parameter in the calculation, defined by the mean and standard errors of each parameter for that stratum. Repeated calculations, with random draws from the distributions from each parameter, give a distribution of calculation outcomes with an overall mean and standard error for the calculation. Such Monte Carlo simulations were done using the SNAPGRAZE model software. The standard error for the SNAPGRAZE SOC prediction, $SE(PRS_m)$ for each stratum generated by the Monte Carlo simulations was then then be used to calculate 95% confidence intervals (95% CI) for SOC removals.

Under a modelled approach, $UNCCS_t$ is obtained from the calculated 95% CI, as required by the VCS VM0032 methodology from a Monte Carlo simulation of modelled changes in soil carbon averaged across *n* model runs in stratum *m* and across all strata *s*. For each stratum:

$$UPRS_{m,t} = 3.84 \times 100 \times \frac{SD(MOD\Delta SOC)}{MOD\Delta SOC \times (n-1)^{1/2}}$$

Where:

$UPRS_{m,t}$ = Uncertainty in project removals through increased soil carbon in stratum *m* at time *t* (%)

$SDMOD\Delta SOC_m$ = Standard deviation of more than 100 modelled differences between product SOC ($PSOC_m$) and estimated modelled baseline SOC ($MSOC_m$) estimates for stratum m from Monte Carlo simulation.

$MOD\Delta SOC_m$ = Mean modelled difference between project equilibrium SOC for stratum m ($PSOC_m$) and modelled baseline SOC ($MSOC_m$) from more than 100 simulations of project equilibrium SOC, (tC/ha)

n = Number of times simulation is run (must be greater than 100)

3.84 = Multiplier to convert standard error into a 95% confidence interval

100 = Multiplier to convert to percent

3.2.3 Leakage

Leakage can result from displacement of livestock to areas outside of the project area (displacement leakage) and from the replacement of livestock, reduced intentionally by project activities to reduce methane emissions, by producers outside the project area to meet market demand (market leakage).

Displacement leakage
Movement of livestock to areas outside of the project area could result in losses of carbon from higher levels of overgrazing in these areas, a phenomenon known as displacement leakage. Displacement leakage can be determined using the tool *VMD0040 Leakage from Displacement of Grazing Activities* for a measured approach or by using the penalty approach based on a reduction in net removals proportional to the total livestock-days spent off the project area. The project uses the penalty approach. In this case, displacement leakage (LD_t) must be calculated as a proportion of net removals from increased soil carbon in year *t* (PRS_t), based on the proportion of total project livestock-days in project year *t* (365 x $PN_{C,t}$) that occurred outside the project area.

$$LD_t = \frac{\sum_{x=1}^{d}\sum_{c=1}^{k} DN_{c,x}}{365 \times \sum_{c=1}^{k} PN_{c,t}} \times PRS_t$$

Where:
LD_t = Leakage emissions from displaced livestock (tCO_2e)
$DN_{c,x}$ = Number of livestock of each category *c* that were off the project area on day *x* (head)
D = Total number of days livestock of class *c* were off the project area
K = Total number of livestock categories
$PN_{c,t}$ = Number of animals of each category *c* in year *t* (head)
PRS_t = Project removals due to changes in *SOC* in year *t* (tCO_2e)

Displacement leakage has been estimated based on collar data from Dixie on 8 heads of cattle to estimate a percentage of leakage emissions. A summary of collar data is given in Figure 7. Note, that the GPS in these collars has a certain error of precision, so that only points that are clearly away from the project boundary (black line) can be considered displaced cattle. Each data point is a ping by a collar,

which was sent every 2 to 20 minutes during the pilot phase of 1 month for 2020. During this time only a single leakage point could be identified. The close supervision of the herd by Eco-rangers and herders can explain why livestock barely wanders off the project area.

The village/diptank area is not necessarily part of the project area. However, any cattle there cannot be considered displaced because this is where they are housed or treated against ticks even in a baseline scenario. Therefore, the data there is not considered for the leakage calculation.

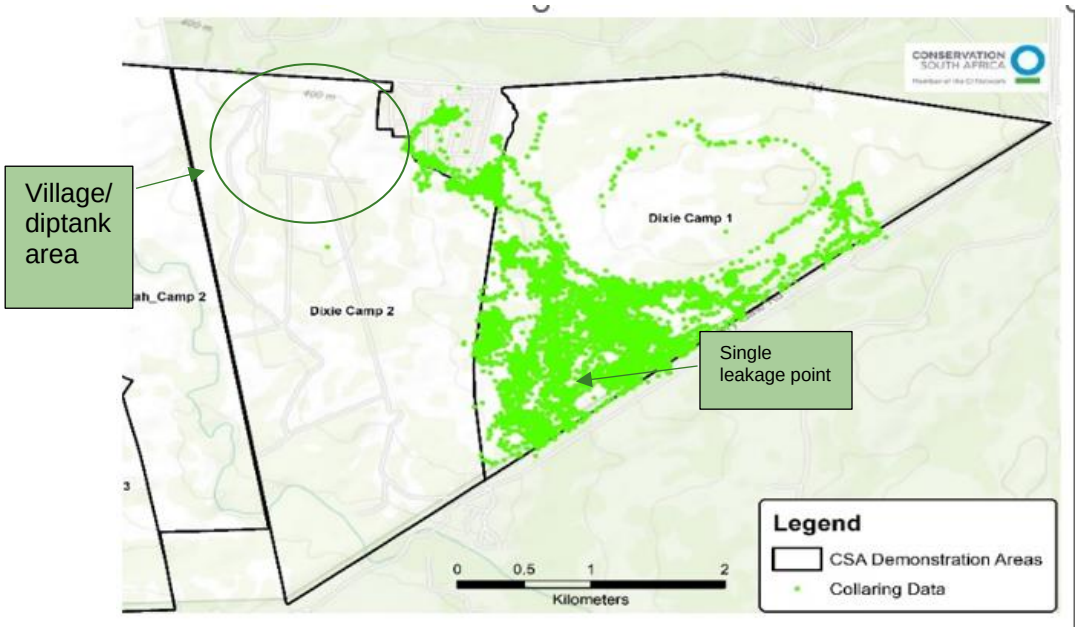


Figure 7 Leakage data based on collar sample

To estimate total leakage an indication of "head-days" off the project area is necessary. Upscaling from this pilot in dixie, we can assume that in a herd of 8 cattle, 20 minutes a month livestock has been displaced. This means, for every 576 heads of cattle, there is one full day of displacement leakage per month. The calculation is irrespective of the age of the cattle.
This results in actually insignificant leakage emissions of 1.06 tCO_2e/year, which have been anyways included in the calculation of the project's net GHG benefit.

Market Leakage
Market leakage is considered negligible since livestock numbers are rather connected to carrying capacity than to market dynamics. Project participants cannot access any market outside the foot-and-mouth disease red zone, which renders the market with very few buyers and leads to high market inefficiencies.

Consequently, with market leakage = 0, total leakage is calculated as:

$$LE_t = LD_t$$

Total leakage uncertainty is calculated as:

$$ULE_t = UPRS_t$$

3.2.4 Net GHG Emission Reductions and Removals

The estimation of net project emission reductions, PER_t, and net change in carbon stocks, $NCCS_t$, for each year of the monitoring period is calculated using the following equations:

$$PER_t = PEM_t - BEM$$

Where:

PER_t = Net project emission reductions in year *t* (tCO_2e)

PEM_t = Project methane emissions from livestock in year *t* (tCO_2e)

BEM = Baseline methane emissions from livestock (tCO_2e)

Changes in carbon stocks, in absence of changes in aboveground woody plant carbon, which is *de minimis* in this ecosystem without fire, are given by

$$NCCS_t = PRS_t$$

Where:

$NCCS_t$ = Net change in carbon stocks in year *t* (tCO_2e)

PRS_t = Project removals due to sequestration of soil carbon in year *t* (tCO_2e)

Note that there is no term included for changes in carbon stocks due to changes in woody plant biomass because there are no project activities that should significantly reduce aboveground woody carbon and any increases in aboveground woody carbon are conservatively excluded. Bush thinning through pruning and brush packing activities do not reduce the total number of trees, but rather promote growth of pruned trees that will ultimately shade out small encroaching trees.

The net GHG benefit is calculated using the following equation:

$$R_t = PER_t + NCCS_t - LE_t$$

Where:

R_t = Net GHG emission reductions and removals in year *t* (tCO_2e)

PER_t = Net project emission reductions in year *t* (tCO_2e)

$NCCS_t$ = Net change in carbon stocks in year *t* (tCO_2e)

LE_t = Total leakage changes in soil carbon in year *t* (tCO_2e)

Total project uncertainty is given by:

$$UT_t = \frac{((NR_t \times UNR_t)^2 + (LE_t \times ULE_t)^2)^{1/2}}{NR_t + LE_t}$$

Where:

UT_t = Total project uncertainty (%)

UNR_t = Uncertainty in net emissions and removals, not including leakage (%)

ULE_t = Uncertainty in leakage emissions and losses from soil carbon stocks at time *t* (%)

NR_t = Net emissions reductions and removals at time *t*, not including leakage (tCO_2e)

LE_t = Leakage emissions and losses from soil carbon stocks at time *t* (tCO_2e)

If total project uncertainty in year *t*, based on 95% CI, $UT_t \leq 30\%$, then no deduction is applied. If $UT_t > 30\%$, then the modified discounted value, $R_t = R_{t\,disc}$ for net anthropogenic GHG removal by sinks to account for uncertainty is calculated as:

$$R_{tdisc} = \frac{(100 - UTt)\ x\ Rt}{100}$$

Where:

$R_{t\,disc}$ = Discounted net GHG emission reductions and removals by year t (tCO_2e)

UT_t = Total project uncertainty

R_t = Net GHG emission reductions and removals by year t (tCO_2e)

For each year *Y* of the monitoring period,

$$R_Y = \sum_{t=1}^{d} R_t^{disc} + \sum_{t=1}^{u} R_t$$

Where:

d = Number of years in which net removal must be discounted

u = Number of years in which removals are not discounted

Y = Number of years in the monitoring period (d + u)

R_t^{disc} = Discounted net GHG emission reductions and removals by year t (tCO_2e)

R_t = Net GHG emission reductions and removals by year t (tCO_2e)

The total annual project uncertainty is 8.01% and therefore does not trigger an uncertainty deduction as per the methodology. The overall project performance is shown in the table below and can further be reviewed in the file "Total GHG benefits, leakage, uncertainty_2019-2021". Non-permanence risk buffer has been conservatively only applied on the net change in carbon stocks.

Year	Net project emission reductions (PER_t, tCO2e)	Net change in carbon stocks (NCCS_t = PRS_t, tCO2e)	Total leakage changes in soil carbon (LE_t = LD_t, tCO2e)	Net GHG emission reductions and removals (R_t, tCO2e)	Total annual project uncertainty (UTt)	Non-permanence risk buffer credits (10%)
2019	-251	18,525	1.06	**18,273**	8.01%	1,853
2020	-251	18,525	1.06	**18,273**	8.01%	1,853
2021	-251	18,525	1.06	**18,273**	8.01%	1,853
Total	-754	55,576	3	**54,819**	8.01%	5,558

3.3 Optional Criterion: Climate Change Adaptation Benefits

The proposed project seeks to be verified at the Gold Level for Exceptional Climate Change Adaptation Benefits.

3.3.1 Activities and/or processes implemented for Adaptation (GL1.3)

Brush packing: Branches are collected from encroached bush through pruning and bush thinning and used to cover (brush pack) gully and sheet erosion sites. This is done to allow for stabilization of the soil surface, reduce the run-off rate of water and allow for the establishment of a healthy/sustainable grass layer. Collecting of branches also serves as a control measure for alien invasive species which outcompete the indigenous vegetation. Reduced sheet and gully erosion during the monitoring period proved difficult to measure due to theft of monitoring infrastructure. However, consolidated data shows four out of six gullies monitored decreased significantly in size, one remained the same, and one showed soil loss in a higher magnitude than the control (which also showed soil loss) (see attached report in "Erosion field data").

Figure 8: Photo demonstrating brush packing activities in field.

Rotational grazing: The project activity of planned rotational-rest grazing implemented across 6,432 ha of rangelands is expected to improve soil cover (reduction of bare soil) and, therefore, enhance the water-holding capacity of the soil, providing a buffer against flooding and increasing water availability during drought. The increased abundance of perennial grass cover resulting from this activity should ensure availability of fodder for livestock even during the dry season, making the livestock and the livestock-farming communities more adaptable to the effects of climate change. An overall increase in biomass availability over the monitoring period was observed via an increase in recorded Above ground grass standing crop (AGGSC) and the increasing abundance of perennial grass species in the 2021 monitoring period, after a decline from 2016-2020. The veld condition score of the project area also showed improvements due to rotational grazing activities. The veld condition score is used as a benchmark for the condition of the vegetation in relation to some functional characteristics, generally sustained forage production and resistance to soil erosion. These results are summarized in the table below.

During an evaluation of the grazing lands by the resource users themselves, a household survey conducted in 2021[16] showed that 60% of surveyed respondents perceived the grazing lands as having improved in the last few years. This perception was related to the indication of more grass and water, with less money being spent on fodder and less cattle dying. Farmers' needs to support livestock production were also highlighted by the survey with primary concerns being better sales price, improved access to water and healthier grazing areas.

[16] 'Household Surveys Report_2021'

Capacity / skills development: Finally, the project supports income diversification as a strategy to build up resilience of communities in the project area to the impacts of climate change. Capacity building and skills development trainings are organized around the theme of green (climate friendly) businesses as a sustainable source of income especially for women in project communities. Chapter 4 provides more detail on the nature of training activities and beneficiaries.

The table below shows a summary of climate change adaptation activities and outputs. Note that the data for Veld Condition score, Perennial grass species and AGGSC are averaged across the monitoring sites. Comprehensive reports are available under the folder 'Vegetation Assessments'. Data on water table height couldn't be measured during this monitoring period but will be part of the monitoring process going forward.

Climate change adaptation		2016	2019	2020	2021
Activity	Training: Number of training beneficiaries including internships and Yes for Youth participants	N/A	1991	399	1305
Activity	Erosion control: brush packing occurrence	N/A	1*	1*	40
Activity	Rotational grazing: Area under rotational grazing (ha)	0	6,432	6,432	6,432
Outcome	Rotational grazing: Above ground grass standing crop (AGGSC; $kgha^{-1}$)	362	50	50	1108
Outcome	Rotational grazing: Perennial grass species (% total individuals)	79	65	64	71
Outcome	Erosion control: Gully profile (Length (m)/Height (m))	N/A	No data available	No data available	No data available
Impact	Rotational grazing: Veld Condition Score	532	576	567	537
Impact	Rotational grazing: Water security (table height (m) / rainfall (mm))	N/A	No data available	No data available	No data available

* Limited data available

The relative reduction in number of perennial species across the communal rangelands from 2016-2020 is indicative of a shift in ecosystem dynamics due to a disturbance (drought). Also apparent across the project area from 2016-2020 was the increase in Increaser II grasses which are notably abundant in overgrazed veld. This indicates an over-utilization of the herbaceous layer across the communal rangelands during the same period. It is also likely that the lower above-ground grass standing crop observed during the same time can be accredited to limited establishment and growth of individuals due to the lower-than-usual rainfall and continuous grazing pressure exerted on the rangelands during this time. In 2021, however, the increase in the mean percentage of perennials recorded provides evidence of the ecological benefits that rotational resting has had on the veld in terms of promoting a sustainable grass layer. This, in addition to the increasing volume of AGGSC indicates a positive turnaround in veld condition after the recent dry spell of the previous 3 years.

4 COMMUNITY

4.1 Net Positive Community Impacts

4.1.1 Community Impacts (CM2.1)

As part of the Conservation Agreements negotiations, the stewardship coordinator reviews the community impacts as part of the discussion with community members. This allows for an open discussion to review and evaluate the impacts and benefits that the community have seen as part of the project activities. The weekly farmers meetings also pose the opportunity to evaluate and discuss project impacts.

Community Group	Livestock farmers in project areas
Impact	• Improved market access and livestock sales • Increased fodder availability • Improved livestock condition (herd health)
Type of Benefit/Cost/Risk	Impacts listed are actual, direct benefits
Change in Well-being	• 124 livestock farmers benefitted in this monitoring period from cattle auctions facilitated by Meat Naturally. Recorded turnover from cattle sales in the project area increased by 2% between 2020-2022 • The observed increase in grass biomass cover kg/ha (See section 3.3.1) is indicative of increased fodder availability for livestock. This is expected to reduce production costs for farmers in the long term. (In the Baseline socio-economic survey, farmers spent an average of R7,000 per year purchasing cattle fodder) • Monitoring data for livestock condition was not collected consistently during this period, and will be better integrated into future monitoring

Community Group	Women
Impact	• Capacity and skills development • Business development • Direct employment
Type of Benefit/Cost/Risk	Impacts listed are actual, direct benefits
Change in Well-being	The wellbeing of women in the project communities is improved as they develop new skills through trainings, which enhance their employment prospects. Women receive support to register and formalize their SME businesses as well as training on financial management. Women are also directly employed by the project. (See section 4.4.2 for details)

Community Group	Unemployed youth
Impact	• Capacity development • Jobs creation
Type of Benefit/Cost/Risk	Impacts listed are actual, direct benefits
Change in Well-being	An average of 200 jobs are created yearly by the project through which mostly youth are employed via the Yes4Youth program. 700 Youth are also impacted by skill-building trainings each year. (See section 4.4.2 for details)

Community Group	Children and youth
Impact	Education & Skills development
Type of Benefit/Cost/Risk	Impact is an actual, direct benefit
Change in Well-being	Children and youth in the project area learn about wildlife, recycling, conservation and Water, Sanitation and Hygiene (WASH) through the weekly scout meetings. The scout program has an average membership of 300 children/youth each year in the project area. They also develop digital skills through the project-established ICT centers where they are provided with reliable and fast internet connections. ICT centers established by the project are used by over 3,000 children and youth yearly.

Community Group	Households near / downstream project areas
Impact	Resilience to climate change effects through restored ecosystem conditions
Type of Benefit/Cost/Risk	Impact is a predicted, indirect benefit of project activities
Change in Well-being	See section 3.3.1

4.1.2 Negative Community Impact Mitigation (CM2.2)

Because the project activities are implemented on communal grazing lands, and are voluntary, there is a risk that these community members who have not decided to participate in conservation agreements may be stigmatized or forced to participate via the imposition of other community members. CSA works to ensure this doesn't happen by sensitizing the communal livestock farmers about the need for tolerance, voluntary participation rights and conflict management within the project. Increased awareness of resting and grazing areas through signs and engagements has happened as well as increased monitoring of resting camps including reporting of tracks and dung at the camp gates.

Moreover, in cooperatives internally there are certain non-compliance repercussions, such as e.g., a R50.00 fee for not helping with fence fixing. Note this is an internal arrangement within farmer cooperatives and not part of any Conservation Agreement. Typically, during cooperative or dip tank meetings non-compliant farmers are additionally being called out and must publicly pay the fee. Long-term reliance on incentives is to be mitigated by farmers becoming shareholders of Meat Naturally Program (MNP) (as in other CSA areas), so that profits replace incentives over time. The type and duration of services from MNP should be standardized (vs ad hoc) to increase farmer willingness and secure project sustainability.

4.1.3 Net Positive Community Well-Being (CM2.3, GL1.4)

The project generated net positive wellbeing impacts in the following aspects:

- **Livelihoods**
  Livestock farmers make higher turnover from cattle sales and now have increased access to buyers through the auctions facilitated by MNP.
- **Livestock health**
  Weekly monitoring by Herd Monitors during regulation dipping events promotes good cattle husbandry and herd health. Since January 2021, the number of incidents such as fence breaks, predation, theft, wounds, and missing cattle reported by herd monitors per month have decreased significantly, after the monitoring and planned grazing were refined. The Herd Monitors make a significant difference in the control and management of cattle in a diverse rangeland, by assisting the farmers with weekly inspections, fence patrols and water level checks.
- **Skills development**
  Around 900 individuals on average benefit from training and capacity building events each year on various subjects (See 4.4.6 for details)
- **Climate adaptation**

Restoration techniques have been applied in grazing camps where severe erosion and bare ground was found. (See 3.3.1 for details). Increased availability of fodder also provides a buffer which can be used in times of drought. Diversification of income sources improves the ability of communities to adapt to unpredictable climate change effects.

- **Employment**
  Around 200 community members on average are employed by the project as Herd monitors, ICT center monitors, Yes4Youth coordinators, scout leaders and in other administrative positions each year. All staff employed by the project receive above the national minimum wage.

See 4.1.1. & 4.3.1

4.1.4 Protection of High Conservation Values (CM2.4)

The project has not adversely affected any identified community HCVs. Rather, these have been protected and/or improved under the project scenario.

- Evidence from the monitoring period shows that forage productivity within the project zone will become more robust following improved grazing management practices. This secures the livelihoods of the livestock farmers and communities who depend on the rangeland resources.
- Buffer zones for protected areas have also been better managed during this monitoring period. This enables greater adaptation of the flora, fauna and people depending on protected areas.
- Finally, improved soil condition in project areas located in major river catchment areas is also expected to have net positive effects on the groundwater water resources in the project zone, compared to the without-project scenario. This impact will be measured in subsequent monitoring periods.

4.2 Other Stakeholder Impacts

4.2.1 Mitigation of Negative Impacts on Other Stakeholders (CM3.2)

No offsite stakeholder impacts were anticipated or observed during this monitoring period. During the design phase of the project, potential offsite groups were identified, but none are considered likely to be impacted by the project.

4.2.2 Net Impacts on Other Stakeholders (CM3.3)

The project has not resulted in any net negative impacts on any of the identified stakeholders as outlined below:

Stakeholder	Net Impacts
Kruger to Canyons Biosphere Reserve*	Net positive impact through improved resilience, decreased erosion of water catchments feeding protected areas and better protection of wildlife outside protected areas
Traditional Authorities: - Mnisi - AmaShangaan - Jongilanga - Ba pedi Dinkwanyane	Net positive impact through strengthened governance structures within livestock communities via grazing associations. Livelihoods of communities are generally improved and there is an increased potential for eco-tourism in the area
Bushbuckridge Local Municipality	Net positive impact through improved livelihoods of constituents
Ehlanzeni District Municipality	Net positive impact through improved livelihoods of constituents

SANParks BSP	Net positive impact through improved rangeland conditions and improved community wildlife conservation
Parastatals (Mpumalanga Tourism and Parks Agency*, SANParks, LEDET)	Net positive impact through improved rangeland conditions and increased potential for eco-tourism
DARDLEA	Net positive impact through improved pasture production
University of Pretoria, Wits Rural Facility, University of Mpumalanga, Southern African Wildlife College	Improved collaboration of socio-economic and natural resource use research in the area generating a positive feedback loop that will help to improve K2C carbon project activities
Department of Agriculture through the Mpumalanga State Veterinary Department	Net positive impact as livestock in the area are better managed and farmers have higher incentives to follow government-recommended practices such as Foot and Mouth Disease and tick control
Thaba Chewu and Maruleng Municipalities	Net positive impact through improved livelihoods of constituents
Department of Forestry, Fisheries and Environment	Net positive impact through reduced erosion and rangeland restoration, rangeland resilience, potential positive biodiversity impacts

4.3 Community Impact Monitoring

4.3.1 Community Monitoring Plan (CM4.1, CM4.2, GL1.4, GL2.2, GL2.3, GL2.5)

Monitoring of the project's community benefits is carried out through 2 main processes which are described below with selected (key) results for the current project monitoring period presented accordingly. Project reports and Excel sheets are available to the validator as supporting documents ("MERL Reports").

1) Monitoring, Evaluation, Research, and Learning (MERL) reporting

MERL reports are compiled every quarter from data collected continuously by Yes4Youth Herders, Eco-rangers, and CSA Eco-trainers. Daily monitoring of the rangelands is reported via WhatsApp by the Herd Monitors and Eco-trainers to allow evaluation of grazing plans and compliance at the end of the growing season. This feeds into the compliance monitoring of the rested camps, to determine if fences are still in place to avoid cattle entering rested camps. The daily reports capture discussion points brought up by the local community members as well as training and learning exchange events. The structure of reporting sets out to disaggregate gender and age groups of members who attend meetings and learning exchanges. During weekly farmers meetings, any non-compliance issues are also raised between farmers and the Herd monitors. Further reporting includes rainfall in the areas, dip tank visits, livestock sales and general rangeland activities, photographs, and GPS locations of findings in the rangelands, such as the location and extent of alien invasive plants found in the rangelands or waste that has been dumped. Fence line patrols are also reported on a weekly basis to determine if any fence lines need repairs for the grazing camps or protected area fences have been broken. Furthermore, during weekly regulation dipping/FMD inspections by state veterinary services, cattle are monitored by Herd Monitors to promote good cattle husbandry and herd health. The herd monitors work closely with the eco-trainer team and report any incidents, such as fence breaks, predation, theft, wounds, and missing cattle.
The data reported via WhatsApp is captured and analyzed monthly whereby reporting gaps are identified and reported back to the team to ensure that these gaps are addressed. MERL reports are then compiled quarterly.

Due to the time taken to establish effective monitoring structures for the project, no MERL data was recorded for 2018. Furthermore, some data gaps exist for the periods between 2019 and 2020, particularly pertaining to the disaggregation of data by gender and age demographics. From 2021, improvements in the data quality can be observed which is attributable to a restructuring of the monitoring framework and building up monitoring capacity within the Herd monitors and Eco-rangers.
No interventions on bursaries and scholarships were implemented and so this was not reported for this period although included in the initial monitoring design.
Average yearly data for the current monitoring period is summarized below. As reflected in the data, the Covid-19 pandemic affected training and scout activities in 2020.

Indicator	2019	2020	2021
Total number of beneficiaries of the project (Total of trainings, access to ICT, Scouts and CA beneficiaries)	6,115	4,619	5,583
Number of households supported directly by project interventions (same as livestock farmers under CAs).	348	354	354
Number of training beneficiaries	1957	377	984
Number of youth beneficiaries – ICT centers	3,542	3,542	3,542
Number of youth beneficiaries – scouts	210	300	350
Number of full-time jobs created directly and indirectly that can be attributed to the project interventions	24	24	32
Number of learning experiences through employment such as internships or the Yes for Youth programme.	34	22	321
Number of livestock sales	Data not available	4	4
Turnover from livestock sales (ZAR)	Data not available	R 660 438.00	R 672 495.00
The average number of livestock dipped yearly in community dip tanks.	Data not available	3,226	4,535

2) Socio-Economic household Survey (SES)

This is conducted every two years by CSA Eco-trainers with the assistance of the project M&E officer and the Stewardship Coordinator. The survey data is collected from a sample of livestock farmers via the Kobo Collect Application and stored on the central Kobo Server. A first baseline survey was conducted in 2017 covering 65 respondents from the project area of Dixie, Utah and Welverdien. A follow-up survey was done in 2019 with a sample size of 69 covering Utah and Dixie. The 2019 follow up survey in Welverdien was disrupted following restrictions imposed by the government due to South Africa's Covid-19 outbreak.

Below is a summary of key findings from the surveys.

	2017	2019
Total number of responses	65	69
Age (highest age)	18-34	50-70
% households having member with tertiary education	23%	27%
% households earning less than R2000	64%	47%
% respondents attending dip tanks weekly	96%	100%
% respondents willing to allow trained herders look after their cattle	86%	96%
% willing to pay towards the herders	25%	25%
Amount spent on cattle feed (average and maximum response)	Average: R6936 Maximum: R50 000	Average: R2355 Maximum: R25 000
% respondents who have received business training	4%	23%
% respondents who keep track of income and expenditure	23%	37%

In both years, the main sources of household income were government grants or pension. The limitations to livestock trade were also compared across both years with the highest reasons in 2017 given as disease, bad prices, limited buyers, grazing/fodder, and livestock death. By 2019, these limitations were reduced significantly (Figure 9).

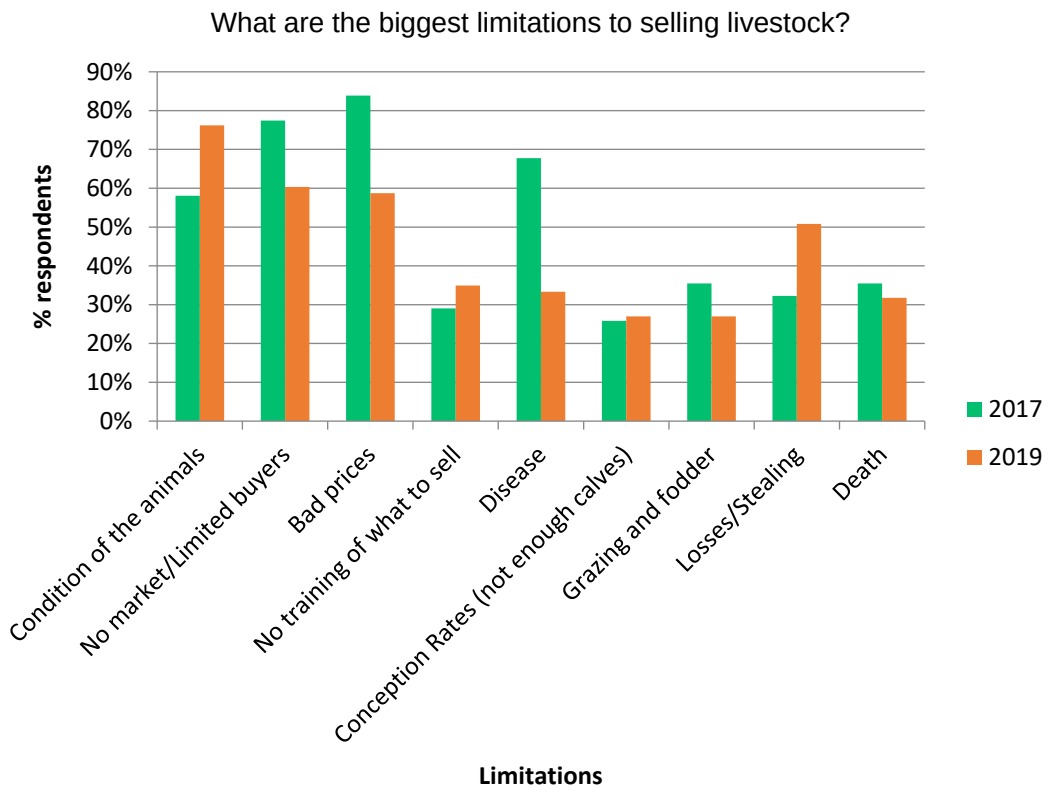


Figure 9: Limitations to livestock trade

It should be noted that an effective time-series comparison is limited by the fact that data from the follow-up survey was collected from different individuals than the baseline survey. Therefore, observed differences cannot be directly interpreted as changes. In addition, the survey questions so far were not standardized, further limiting comparability. Protocols guiding sample selection for the survey and the development of questions following best practice are to be formulated going forward to improve future SES monitoring.

4.3.2 Monitoring Plan Dissemination (CM4.3)

Project monitoring reports will be shared as hard copies with the traditional authorities, in the communities and in schools/youth centers where CSA provides internet access. A translated summary is planned to be provided with this documentation.
In addition, Eco-rangers and/or CSA staff will present and discuss summaries of the documents in the livestock committees as well as in the events of the Scouts. These presentations will take the form of focused feedback sessions on specific issues of particular interest to stakeholder groups such as soil, grazing quality etc. This is already taking place in part during the weekly farmer meetings where summaries of the daily reporting are presented for discussion among the farmer cooperatives and non-compliance issues are raised.
The project monitoring report will also be published on the Verra website and made available to the wider public for a public commenting period. CI will share this link as well with other project stakeholders for their information and input.

4.4 Optional Criterion: Exceptional Community Benefits

The project meets the exceptional community criteria because communities participating in the project have management rights to land in the project area and rights to claim that their activities will cause the project's climate, community, and biodiversity benefits. Although the rangelands are communal (i.e., state

owned and without an individual ownership title deed), the rangelands belong to the community through the guidance of the Nduna and Chief from the tribal authorities. This is recognized under the Communal Land Rights Act 11 (2004). Under tribal custodianship, the use of the land is decided through the Tribal Authority and local municipal government through consultation with communities and community structures. The capacity to enforce rights is through the existing governance structures, either livestock committees or dip tank committees as well as traditional authorities. Communities therefore lead the process of dividing grazing areas into rested and grazed zones and own the entire management and implementation process. CI currently functions as the project proponent but in the future will transfer this role as well to the communities via a suitable governance structure.

4.4.1 Short-term and Long-term Community Benefits (GL2.2)

The project is generating the following **short-term** community benefits in the project area and is on track to generate the **long-term** benefits listed below. This is evidenced in the monitoring results shown above in Section 4.3.1.

Short-term benefits

- Direct training & employment of youth
- Empowerment of women with income-generating skills
- Increased income from livestock sales
- Better governing structures among livestock farmers

Long-term benefits

- Increased household income via employment opportunities for youth and women
- Restoration of perennial grasses for improved livestock forage
- Additional employment opportunities via eco-tourism
- Improved local knowledge about sustainable rangeland management.
- Greater tolerance and conservation of wildlife outside protected areas
- Resilience of ecosystems and rangeland resources
- Improved quality and quantity of surface water
- Increased knowledge on health and wellbeing through 'one-health' approach with the veld sanitation guide.

4.4.2 Marginalized and/or Vulnerable Community Groups (GL2.4)

Community Group	Women
Net positive impacts	• 53% of training participants are women. This includes trainings in financial literacy, savings, cooperatives, and business development. • 51% of job opportunities of the project directly go to women as Herd Monitors, Yes4Youth supervisors & Eco-trainers. • Increased household income is expected to have a net positive impact on women as well as other household members. Household income trends are reported in 4.3.1 and will be continuously tracked through future Socio-economic surveys. • Finally, the participation of women in decision making has also been strengthened within communities. Prior to the project, the inclusion of women in workshops / meetings was limited. Through community engagement and the provision of safe communication platforms, women in project communities are now able to give greater input into communal decisions.

Benefit access	Women-only workshops are held for selected skill development trainings. These sessions are held when women are mostly available, this is facilitated by asking women and scheduling sessions at times that suit most women attendees e.g., morning sessions when children are mostly at school. In larger sessions involving male and female participants, women are encouraged to speak up and voice their opinions (see section 4.4.3 below). The project also ensures a fair selection process for employment, so that men alone aren't employed in project activities (see section 2.3.14).
Negative impacts	No negative impacts of the project activities on women were foreseen.

Community Group	Children / Youth (below 25 years of age).
Net positive impacts	Increase in average number of attendees of the weekly scout meetings to over 200. 11 ICT centers were established in local communities as part of the school support program. These centers are used by more than 3,000 children / youth yearly to develop relevant ICT skills.
Benefit access	Youth / ICT centers are established locally so that they are easily accessible since long distance transportation could be a barrier. Whenever veld hikes are conducted for the scouts, transportation arrangements are made for participants who require this. Weekly scout meetings are held after school for convenient participation. Finally, sessions are held in local languages to ensure the understanding is not limited by any of the participants.
Negative impacts	Since this project activity involves school children, it is conducted outside school hours and only once a week so that school activities are not affected, and to allow time for other activities or household tasks. Parental permission is also required for children to participate as scouts.

Community Group	Unemployed youth
Net positive impacts	Work experience opportunities are created yearly as Eco-trainers, Yes4Youth Herd monitors, Scout leaders etc. (see 4.3.1). These programs employ youth who are paid above minimum wage. Youth receive training on topics such as rangeland management, waste & recycling, financial literacy, CV & proposal writing targeted at increasing employment prospects of youth in the communities.
Benefit access	Through the Yes 4 Youth program integrated in project, youth within the communities are selected through a participatory process by the farmers to work as herders. CSA ensures the selection process is democratic and all youth within communities are given a fair chance to participate in the training activities.
Negative impacts	No negative impacts are expected to occur from this project activity.

4.4.3 Net Impacts on Women (GL2.5)

As mentioned in section 4.4.2 above, this project has strengthened the participation of women within project communities in decision making processes. As a detailed example, when CSA commenced with the engagement of Farmers Organizations to introduce and discuss the project, there was limited inclusion, especially of youth and women. This was largely on account of prevailing cultural norms and taboos in the area. These norms and taboos often meant that women and young people did not speak during workshops or meetings and therefore their inputs on the process were not included. Through introduction of FPIC the team highlighted the importance of everyone's participation in the process and this prompted the leadership to start encouraging everyone to speak in meetings, although this was a slow process overtime participation of women and youth improved as the chairperson (in Utah village) would use the techniques such as saying "for the next 10 minutes we only want inputs from the women", this allowed some of the more outspoken men to give others a chance to speak, until it became a norm over time. Creation of informal communication platforms also played a useful role. For example, during breaks women or silent participants in the meeting are asked bilaterally for their inputs and if they are happy with where the discussion is going. Also, house visits by female environmental monitors allowed the team to capture the inputs of women and youth members. Throughout the implementation stage participation of these two groups, especially in Utah and Dixie villages has improved to the point where women lead key processes such as facilitation of learning exchanges and being representatives at meetings with the department of agriculture. Other net impacts of the project activities on women in the project area are highlighted in section 4.4.2. No net negative impacts were identified.

4.4.4 Benefit Sharing Mechanisms (GL2.6)

Benefit sharing mechanisms for the project are agreed upon and concretized in benefit sharing contracts wherein livestock farmers undertake to perform certain project activities, and CSA to deliver the livestock management benefits to the communities using carbon revenues generated from project activities. The carbon revenue (after deducting carbon transaction costs) will be used to support sustained delivery of the Livestock Management Benefits and incentives such as the provision of fodder, provision of herders and Eco-trainers to support with project activities, provision of training opportunities (livestock production, health and management, market access, red meat value chain), facilitation of partners who provide services / support e.g. DARDLEA (fencing, water infrastructure etc.), Meat Naturally (improved participation of farmers in red meat value chain).

4.4.5 Governance and Implementation Structures (GL2.8)

Livestock farmers establish a Cooperative that forms the foundation for the implementation and governance of livestock management and activities that contribute rangeland restoration through the support of Conservation South Africa. Livestock Farmers Cooperatives ensure good governances through ensuring that the Cooperative’s membership list is updated, registration certificate is obtained and properly archived, that a bank account in the Cooperative’s name is opened and that each farmer in the Cooperative has made payment to the Cooperative of an agreed membership fee. The Cooperative members also attend monthly farmers meetings to ensure proper implementation of the grazing plan and compliance with conservation agreements.

CSA is an independent affiliate of Conservation International, as an affiliate, CSA subscribes to the aspirational vision and mission, strategic framework, and operational requirements of Conservation International, but is enabled to adapt language and specific policies and goals to the unique context of South Africa. CSA is a registered Non-Profit Organization working across South Africa and works with government, communities, and the private sector to implement sustainable landscape management strategies and restore degraded ecosystems, while supporting the creation of green enterprises, green jobs, and green skills. Focusing on vulnerable households with an emphasis on rural women, youth and small-scale farmers. In the Kruger to Canyons landscape there is a strong focus on working with livestock farmers to promote rangeland restoration in communal rangelands.

The governance and organizational model (Figure 11) below is the result of discussions both internally and externally with livestock farmers and/or Farmers Cooperatives (grazing associations), traditional authorities, and any project implementation partners, such as Meat Naturally.

1) Livestock farmers who are part of a Farmers Cooperative, sign a conservation agreement with CSA (or other legal entity as determined during the next stage of this project) as a conservation action of planned grazing/resting in accordance with the Benefit Sharing Agreement and conditions outlined in the conservation agreement.
2) Conservation South Africa will provide transparent governance and oversight of conservation agreements and financial transparency through the carbon project with all Farmers Cooperatives and Traditional Authorities.
3) Conservation South Africa provides the technical expertise for initiation and operating project activities, including initial project development (e.g., stakeholder consultations, engagement, workshops, site visits, and co-planning; feasibility studies; technical analyses; capacity building; strategic planning; communications), ongoing project maintenance and implementation activities (e.g., sustainable livelihood support; protection and enforcement related activities; project infrastructure and equipment; community engagement, training, and capacity building; biodiversity / social impact monitoring; management plans; restoration; planting; and communications).

Conservation International provide funding for project implementation costs and services, including but not limited to marketing, communications, public relations, due diligence on potential carbon credit offtakers, negotiations with carbon credit offtakers, legal services (including project related advice and drafting / negotiations of Verified Emission Reduction Purchase Agreements), carbon registry management, reporting to project stakeholders and carbon offtakers, related project and financial management, monitoring, and oversight (including site visits, as necessary), and technical Project support (including Verra compliance, future Project verification matters, and carbon baseline calculation).

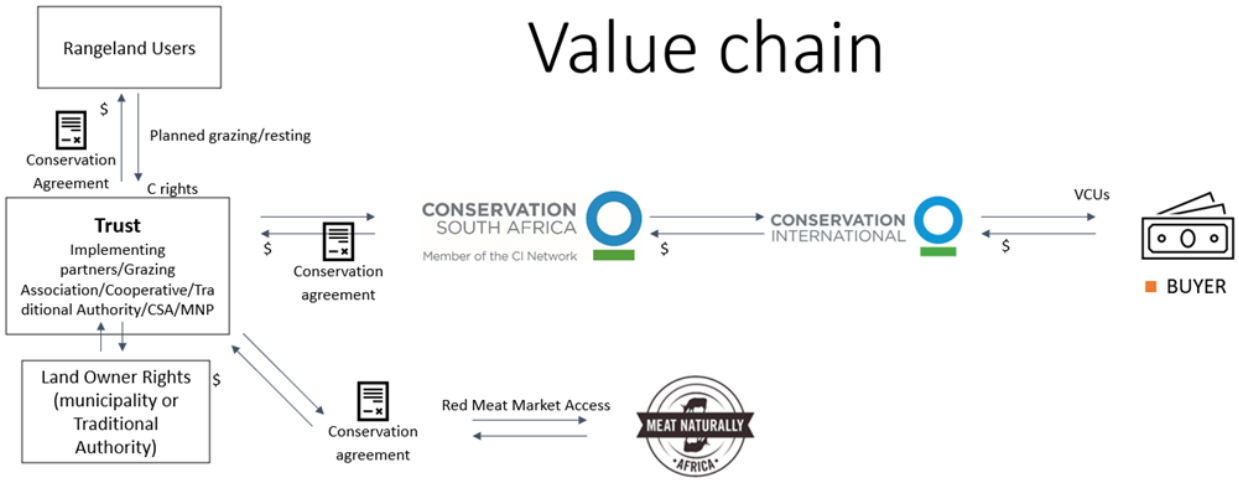


Figure 10: Governance and organizational model for the Kruger to Canyons carbon project.

The benefit sharing agreement depicts the responsibilities and benefit sharing structure of any carbon revenue generated through project activities that resulted in the generation of carbon credits. The benefit agreement ensures transparency is maintained with Farmers Co-operations and Traditional Authorities throughout the project lifespan.

4.4.6 Smallholders/Community Members Capacity Development (GL2.9)

- Through the project, communities farming livestock receive training on market access and animal production which enables sustainable grazing and efficient climate-smart husbandry practices.
- Selected community members are formally trained as herd monitors (also called Eco-rangers) and 'Eco-trainers', i.e., in herding, kraaling and other critical skills and are directly employed by the project to provide services to the members of grazing associations.
- Farmers in cooperatives receive governance training which enhances the understanding of their role as a governing body, builds administrative capabilities, the ability to approach and engage with local government as a valid stakeholder; make ecologically informed decisions about how to manage their rangelands; and share lessons from their experience with other grazing associations.
- Women in the communities are trained in green retail businesses which are potential sources of income.
- Men and women participants alike receive financial literacy training through the project's partners (local banks).
- Children in the project communities learn the value of wildlife, recycling, veld sanitation/health, and conservation in their weekly scout meetings. The Water Sanitation and Hygiene (WASH) education is facilitated using CSA's Veld Sanitation Guide
- Youth are supported with computer skills through the establishment of ICT centres at schools and youth centres in communities.

Details and participant lists of trainings held during the monitoring period are available under the folder '01_Stakeholder consultation'

5 BIODIVERSITY

5.1 Net Positive Biodiversity Impacts

5.1.1 Biodiversity Changes (B2.1)

Change in Biodiversity	Reduced threats to populations of African Wild dog outside protected areas in project zone
Monitored Change	Couldn't be monitored during this period.
Justification of Change	Eco-rangers as part of the herding training, continuously educate livestock farming communities on managing human-predator conflicts. The occurrence of wildlife conflicts in the project area is monitored via reports from Herd monitors and eco-rangers as well as wildlife tracking data shared by Endangered Wildlife Trust.

Change in Biodiversity	Increased vegetation diversity and composition in project area
Monitored Change	Increased biomass cover and upward trend in vegetation biodiversity indices recorded.
Justification of Change	The project introduces managed rotational grazing to enable recovery time for perennial grass species. This increase is monitored through a comprehensive vegetation assessment and assessed via the Shannon Weaver index and a comprehensive species list every 1-5 yrs.

Change in Biodiversity	Reduction of alien/invasive vegetation species in project area
Monitored Change	Reduced infestation of alien species observed

Justification of Change	Strategic bush thinning and pruning activities are promoted by the project. Change is measured as a proportion of alien vegetation infestation (ha) compared to baseline level

5.1.2 Mitigation Actions (B2.3)

According to the project's Theory of Change and monitoring plan, no adverse effects on biodiversity have been observed. However, the project will closely monitor the biodiversity impacts through its monitoring plan and implement adaptive management strategies if any negative effects on biodiversity necessitate mitigation.

HCV biodiversity attributes are enhanced through the following project activities:

Improved rotational grazing.
By the implementation of rotational grazing, perennial grasses should be restored across the project area. Improved veld condition will have long term benefits, both in terms of enhanced livestock health, and improved ecological functioning. Furthermore, the restored rangelands will act as a corridor between protected areas for many of the smaller fauna. Improved ground cover and water infiltration resulting from these activities also influences water quality and quantity of rivers and tributaries that flow through the rangelands and into the Protected area of the GKNP on which the area relies heavily. Consequently, the project activities build resilience for both the environment itself, and those who depend on it.

Removal of Invasive species
Alien clearing teams were formed to engage in bush clearing and removal of invasive alien plants in the rangelands in collaboration with SANParks and K2C Biosphere. The first pilot was successful (see map in Figure 11) and will be scaled with special focus on alien species which are harmful to livestock or wildlife health and those which outcompete natural vegetation.

Detection and prevention of wildlife conflict
Designated Eco-rangers patrol communal rangelands and have received training in identifying tracks of wildlife, specifically predators to support neighboring nature reserves with tracking wildlife that have crossed over the fence. This supports immediate reporting to the applicable authorities of wildlife outside protected areas and aims to prevent human wildlife conflicts. The Eco-rangers engage continuously with the communities, raising awareness on the importance of wildlife, threats they face, and solutions to reduce conflict between wildlife and people e.g., the practice of kraaling to avoid predation incidents. This is expected to increase tolerance of herders towards predators such as Wild Dogs (Lycaon pictus) and improve the prospects for conserving wildlife in general outside of protected areas.

5.1.3 Net Positive Biodiversity Impacts (B2.2, GL1.4)

The project's core activities involve rehabilitation and restoration in native rangelands used as production landscapes. Previous studies (Ebrahim & Negussie, 2020) show that areas under high utilization (past and present) require intensive management intervention to facilitate recovery. The shift from the baseline livestock management approach of unmanaged, continuous grazing is therefore vital for rangeland resilience given the heavy pressures of utilization.

- During the current monitoring period, vegetation biodiversity (represented by the Shanon-Weiner index) indicators show an increase in species richness and evenness of both woody and herbaceous biomass compared to the baseline.
- In addition, monitoring sites show larger grass tuft diameter and shorter distance between tufts, indicating the increase in grass cover and reduction of bare ground. This will contribute to the resilience of the ecosystem to drought and other climate change effects.
- Project activities which educate the livestock communities and prevent incidences of human-wildlife conflicts are predicted to increase conservation by reducing threats to vulnerable wildlife. This impact was not monitored during this monitoring period and will be reported on for the next monitoring period.

5.1.4 High Conservation Values Protected (B2.4)

The project does not adversely affect any identified biodiversity HCVs. Pressure on protected areas has decreased under the project scenario by promoting the ecological functioning of buffer zones. Increased protection from conflict and attacks is expected to benefit endangered or vulnerable endemic local populations of carnivorous lions, cheetahs, and wild dogs.

5.1.5 Invasive Species (B2.5)

Not applicable, no species are planted by the project.

5.1.6 Impacts of Non-native Species (B2.6)

The project does not introduce any non-native species into the project area, as re-seeding or plantings are not a project activity. Project activities merely adjust the way in which livestock are herded and moved across the landscape.

5.1.7 GMO Exclusion (B2.7)

The project does not introduce any GMOs into the project area, as re-seeding or plantings are not a project activity. Project activities merely adjust the way in which livestock are herded and moved across the landscape.

5.1.8 Inputs Justification (B2.8)

Project activities exclude the use of fertilizers to increase productivity and potential carbon sequestration. Project activities are not applicable to land other than grassland, so no increased use of pesticides or herbicides is anticipated. A small portion of the project area is affected by the invasive species Lantana camara, Psidium guajava, and Agave sisalana, which inhibits the establishment of indigenous species. Selective removal of this species is exclusively mechanical, as removal is done by humans using hand tools.

5.2 Offsite Biodiversity Impacts

5.2.1 Negative Offsite Biodiversity Impacts (B3.1) and Mitigation Actions (B3.2)

No negative offsite biodiversity impacts were observed from project activities during this monitoring period.

In the absence of the project, farmers would similarly utilize their land as grazing land. There is no specific benefit for biodiversity foreseeable in the baseline scenario, which could be seized due to project activities. Soil degradation through unmanaged grazing in the baseline has rather negative siltation effects on waterways leading through high-value biodiversity areas such as the Kruger National Park. Project activities rather uplift biodiversity in offsite areas due to reduced erosion and increased water infiltration, reduced human-wildlife conflicts opening safer pathways and steppingstones for endangered fauna, such as African Wild Dog.

The project may thus cause potential for human-wildlife conflicts further away from conservation areas where such conflicts have not yet existed due to the absence of relevant species. This is rather a form of biodiversity “leakage” than negative impact.

5.2.2 Net Offsite Biodiversity Benefits (B3.3)

No negative offsite biodiversity impacts could be identified. Therefore, a bi-modal evaluation and comparison with biodiversity benefits of the project is not possible. The net effect of the project biodiversity is positive as described in section 5.1.

5.3 Biodiversity Impact Monitoring

5.3.1 Biodiversity Monitoring Plan (B4.1, B4.2, GL1.4, GL3.4)

Monitoring design.

To monitor the biodiversity effect of interventions in the project area, the project focuses on two major aspects.

1) **Improvement of natural rangeland conditions including the cover and diversity of vegetation; and the presence of invasive grass species compared to the condition at project start.** This is monitored through vegetation assessments which evaluate species richness and Shannon-Wiener diversity index in response to the planned forage and grazing changes. This is compared with the baseline conditions. A baseline survey was conducted in 2016 by Sustineri (Pty) Ltd and follow up data is collected annually at 75 sites across the project area (Figure 12). Assessments are carried out according to the Multiple Indicator Monitoring (MIM) Method (Peel et al. 2005). The presence of invasive grass species in the rangelands will also be monitored and compared to the condition at project start.

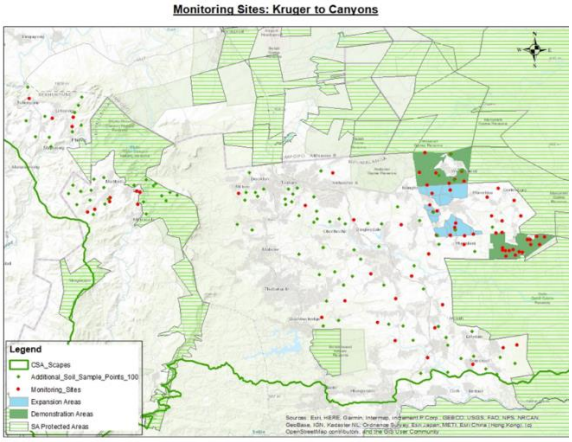


Figure 12: Soil and Biodiversity Monitoring sites within the K2C Biosphere

2) **Reduced threats to threatened predator species (African Wild dogs) occurring outside of protected areas.** Human-wildlife conflicts contribute the largest threat to endangered predator species (wild dogs) in the project area. Conflicts and predator movements outside protected areas are recorded via incidence reports from Eco-rangers. The occurrence of predators in the project area is also monitored using information shared from Endangered Wildlife Trust[17] using the Earth Ranger tool. Earth Ranger was successfully set-up in Q1 2022 to assist with spatial data collection of monitoring of Human-wildlife conflict, Rangeland Management and Monitoring all on one platform.

[17] As part of their carnivore conservation program, EWT monitors wild dog populations along the whole of the Western Boundary of the Kruger National Park. Monitoring alerts will be shared with CSA via the "Earth rangers" platform whenever a pack of wild dogs move out of the protected areas into Communal rangeland.

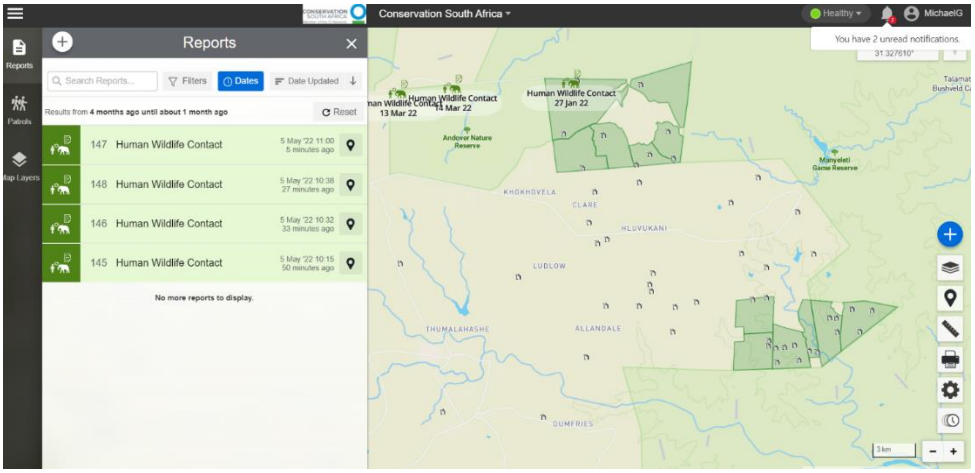


Figure 13: Example output of the Earth Ranger tool

Monitoring results

The key Biodiversity changes from this monitoring period are shown in the table below. Note that results are the average values for the project area. The comprehensive assessment reports are available to the validator under the folder “Vegetation assessment”. Data on Above ground biomass and Veld Condition score have been reported under climate adaptation (3.3.1), along with the other climate adaptation indicators designated in the Project Description document. Long term trends in rangeland dynamics show an increase in diversity of both woody and herbaceous individuals as indicated by the Shannon Weiner Index (Figure 14). The Shannon-Weiner index considers both the richness (number of different species) and the evenness (relative abundance or proportion of each species) within a community. To address the removal of invasive alien plants (IAP) in the rangelands, alien clearing teams were formed in collaboration with SANParks and K2C Biosphere. A total of 1300 ha has been cleared and is shown in Figure 15. Yearly data on proportion of IAP cleared to maintenance level (5% infestation) could not be tracked during this period.

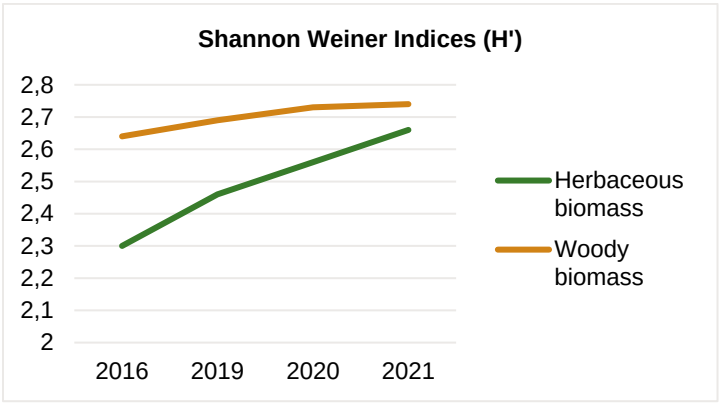


Figure 14: Change in biodiversity Indices for herbaceous and Woody biomass

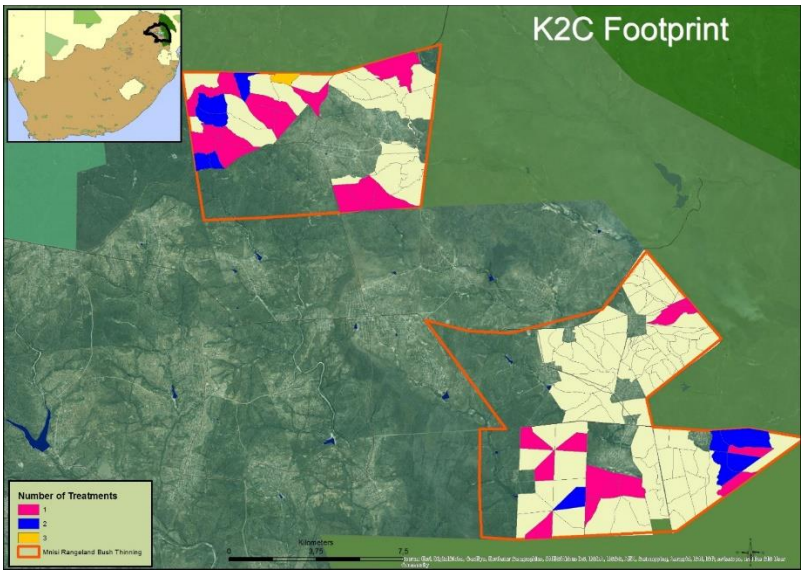


Figure 15: Areas in blue indicating where bush clearing has been implemented.

Similarly, data tracking the occurrence of threats to vulnerable wildlife couldn't be collected during this period as the Earth Ranger tool was effectively set up in 2022. However, several activities were conducted during the monitoring period which are expected to reduce the threat of human-wildlife conflict, according to the project's Theory of Change. Conflict with humans and human activities was identified as a leading threat to the endangered *Lycaon pictus* species in the project area. Activities conducted during this monitoring period to reduce this threat include training of Eco-rangers on predator tracking for Human Wildlife conflict. Three (3) Predator Tracking Training courses were completed in Q1 2022 by 9 of the Eco-trainers (2F & 7M), 7x herd monitors (5F & 2M) and 36x Natural Resource Managers (18F & 18M) Yes for Youth to improve human-wildlife conflict monitoring and reporting of predator presence on the Manyeleti Game Reserve border as well as the grazing camps bordering the open road to Timbavati. The Eco-trainers and herders in turn share information with the livestock farmers and constantly build awareness within the community about wildlife protection. Details on the training events are included in the folder '01_Stakeholder consultation'. Less predation incidents have also been reported by Herd Monitors since 2021 after the monitoring improved. This is attributable to improved herding practices and the strategic use of bomas. Formal reporting on the reduced threats to wildlife according to the indicators defined below will take effect from the next monitoring period using the data reported via Earth Ranger. In general, the need has been identified to further strengthen the project's monitoring capacity and refine the monitoring metrics. This will be a key focus during the next monitoring period(s).

Indicator	2016	2019	2020	2021
Vegetation diversity				
Shannon-Weiner index (woody biomass)	2.64	2.69	2.73	2.74
Shannon – Weiner Index (Herbaceous biomass)	2.30	2.46	2.56	2.66
Percentage IAP cleared to maintenance level (Area at 5% /Total area infested)	0 (Baseline condition)	No data available	No data available	No data available
Wildlife conservation				
Number of predation incidences	No data available	No data available	No data available	No data available
Number of human retaliatory killings incidences	No data available	No data available	No data available	No data available

Livestock loss to predators with Eco-rangers	No data available	No data available	No data available	No data available

5.3.2 Biodiversity Monitoring Plan Dissemination (B4.3)

Project monitoring reports will be shared as hard copies with the traditional authorities, in the communities and in schools/youth centers where CSA provides internet access. A translated summary is planned to be provided with this documentation.
In addition, Eco-rangers and/or CSA staff will present and discuss summaries of the documents in the livestock committees as well as in the events of the Scouts. These presentations will take the form of focused feedback sessions on specific issues of particular interest to stakeholder groups such as soil, grazing quality etc. This is already taking place in part during the weekly farmer meetings where summaries of the daily reporting are presented for discussion among the farmer cooperatives and non-compliance issues are raised.
The project monitoring report will also be published on the Verra website and made available to the wider public for a public commenting period. CI will share this link as well with other project stakeholders for their information and input.

5.4 Optional Criterion: Exceptional Biodiversity Benefits

The project intends to claim Gold/Exceptional Biodiversity status.

5.4.1 Trigger Species Population Trends (GL3.3)

Trigger Species	African wild dog (Lycaon pictus)
With-project Scenario	The Greater Kruger National Park, which is directly adjacent to the project area, contains around 350[18] individuals of African wild dog (Lycaon pictus), an endangered species. This is the largest connected population in southern Africa. This species is largely threatened by persecution from landowners outside of protected areas. During the monitoring period, Eco-rangers have engaged continuously with the communities, raising awareness on the importance of wildlife, threats they face, and solutions to reduce conflict between wildlife and people e.g., the practice of kraaling to avoid predation incidents which are often the cause of retaliatory killings. The objective is to increase tolerance of herders towards predators such as Wild Dogs (Lycaon pictus) and improve the conservation of wildlife in general outside of protected areas. Eco- rangers also patrol communal rangelands and have received training in identifying tracks of wildlife, specifically predators to support neighboring nature reserves with tracking wildlife that have crossed over the fence. This supports immediate reporting to the applicable authorities of wildlife outside protected areas and aims to prevent human wildlife conflict which is the main threat to the Lycaon pictus species in the project zone.

6 ADDITIONAL PROJECT IMPLEMENTATION INFORMATION

No additional project implementation information to be reported here.

[18] Endangered Wildlife Trust

7 ADDITONAL PROJECT IMPACT INFORMATION

No additional project impact information to be reported here.

8 APPENDICIES

8.1 Appendix 1: Project Activities and Theory of Change Table

Activity description	Expected climate, community, and/or biodiversity			Relevance to project's objectives
	Outputs (short term)	Outcomes (medium term)	Impacts (long term)	
Rotational grazing with Herding / Kraaling	• Reestablishment of perennial grass cover on grazing camps • Reduction of bare soil on grazing camps • Protection of livestock from predators	• Improved water infiltration in soil • Increased biodiversity & activity of soil fauna • More availability of grazing resources for livestock and less fodder costs • Reduced predation incidents	• Increased sequestration of SOC • Buffer against drought & soil erosion • Sustainable & profitable livelihoods • Reduced human-wildlife conflict.	• Climate change mitigation • Climate change adaptation • Community wellbeing & livelihoods • Biodiversity conservation
Provision of benefits package (Livestock market access, herd health & fodder supplementation)	• Compliance with CAs • Healthier livestock herds • Improved livestock sales in foot-and-mouth red zone (quantity, higher sales price)	• Lower cost of livestock production • Increased income from livestock sales • Improved rangeland conditions	• Sustainable & profitable livelihoods • Improved food security via better quality livestock for local consumption	• Community wellbeing & Livelihoods • Climate change mitigation
Rangeland restoration activities: Bush thinning, brush packing, gully covering with brushes and alien species clearing	• Less area infested by invasive species. • Reduction in size of erosion gullies	• Reduced competition for indigenous vegetation. • Reduced erosion • Habitats of indigenous small fauna are conserved.	• Sustained biodiversity of flora & fauna • Restoration and rehabilitation of degraded lands.	• Biodiversity conservation • Climate change adaptation
Awareness raising on wildlife and natural resource conservation	• Increased awareness on biology and ecology of especially predators	• Informed decision making on rangeland and livestock management.	• Stable populations of endangered species (flora & fauna)	• Biodiversity conservation

	• Increased environmental awareness	• Reduced wildlife conflicts. • Sustainable wood / plant harvesting		
Weekly Boy/Girls Scout meetings	• Increased awareness on restoration, veld sanitation, WASH	• Improved conservation, veld sanitation and health habits in children / households	• Better livestock and human health • Improved integration of livelihoods and natural environment	• Biodiversity conservation • Community wellbeing & Livelihoods
Establishment of ICT & youth centers	• ICT training & Skills development	• Improved job perspectives and modern employability • Access to information	• Increased income & livelihoods	• Community wellbeing & Livelihoods • Climate change adaptation
Yes4Youth programme	• Local employment & capacity building	• Work experience, skill development & future employment prospects • Income generation	• Poverty reduction	• Community wellbeing & Livelihoods
Promotion of various gender development and income generating activities for women (e.g. business development / Financial Literacy trainings with local partner-banks)	• Involvement of women, youth, and disadvantaged community groups in community decision making • Increased business development and administration skills of women • Increase in green businesses • Better money management skills of community members	• Improved financial habits • Green / climate friendly businesses • Granting more voice to women, youth, and disadvantaged community groups	• Financial empowerment of women • Sustainable livelihoods	• Community wellbeing & Livelihoods • Climate change adaptation