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The CPLUS Guidebook

Co-designing regional and landscape action plans using the Climate Positive Land Use Strategy (CPLUS) Framework and Tool

CONSERVATION INTERNATIONAL

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Contents

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About this guidebook

This guidebook provides an overview of how the Climate Positive Land Use Strategy (CPLUS) supports teams to develop landscape plans that meet the growing demand for nature-based action while achieving a diverse set of locally important goals.

CPLUS is a framework and decision support tool created by Conservation International and Conservation South Africa, designed to create spatially explicit landscape plans that are informed by local knowledge and data, balance the diverse needs of stakeholders, and deliver multiple outcomes for people and nature.

With CPLUS, teams can develop a strategic and unified landscape vision, prioritize the most impactful and cost-effective interventions, and determine where to take action to achieve the vision. A well-crafted landscape plan can also support the development of strong proposals by demonstrating to funders the potential for significant, scalable impacts and how funding can contribute to broader environmental and socio-economic benefits, such as improved water quality, carbon sequestration and enhanced livelihoods.

How to use this Guidebook

The guidebook first reviews the need for coordinated land use planning, how CPLUS fills the gap to develop actionable and strategic landscape plans, and key concepts and terms used throughout the guidebook.

Then the guide outlines the five essential steps to complete a CPLUS evaluation. Each step details a series of subtasks. These subtasks include templates that can be modified for a specific evaluation and checklists outlining the most important outcomes to complete before proceeding to the next subtask.

While this guide provides an overview of the data necessary to create land use action plans in the CPLUS tool, specific technical instructions on how to prepare input data and run the tool are available at cplus.earth. This guidebook and the technical instructions should together provide the resources necessary to develop a stakeholder-driven land use action plan.

In any evaluation, the CPLUS team based at Conservation International is available to advise and support the local team as they navigate each step and complete their evaluation.

Audience

This guidebook is meant to provide anyone involved in a CPLUS evaluation with an overview of the processes and inputs required. Specifically, the core evaluation team will find this guidebook useful as they lead the CPLUS evaluation. A CPLUS evaluation may be led by:

Implementing Actors:

- Non-governmental organizations that support or take part in implementing nature-based solutions and natural climate solutions;
- Technical advisors supporting implementation of nature-based solutions and natural climate solutions;
- Indigenous peoples, local communities and other local landowners that have vested interest in the landscape;

Enabling Actors:

- Local, provincial, state, or national government agencies interested in exploring and/or supporting nature-based solutions and natural climate solutions. Relevant agencies may include those responsible for environment, forests, rural development, and agriculture;
- Companies with operations in or that are sourcing commodities produced in the landscape;
- Financial institutions and other financial providers that are considering investment in carbon and nature portfolios.

A Quick Start Guide to CPLUS

This section provides an overview of the resources required to carry out a CPLUS evaluation and key considerations to take into account as you select an evaluation area.

Staff Requirements

- ☐ Establish a core assessment team to lead the CPLUS process. This must include a GIS expert who can prepare data and run the CPLUS tool. See Task 1A for details.

Data Requirements

- ☐ A shapefile of the study area. See Figure 1 for considerations as you select an evaluation area.
- ☐ Recent land cover data trusted by local stakeholders.
- ☐ Datasets representing desired outcomes (e.g., biodiversity, carbon mitigation, livelihoods, freshwater). Note that data collection may pose challenges due to accessibility or availability of data. See Task 3D for details on data accepted.

Budget

In addition to covering staff time to conduct a CPLUS evaluation, we recommend meeting in-person with stakeholders to identify priorities and landscape values, and as part of the data collection and action plan review process. As you budget for the CPLUS evaluation, consider:

- ☐ Are there existing events or workshops with stakeholders that can be leveraged as a venue to socialize CPLUS and begin the evaluation process?
- ☐ If no opportunities exist, is there budget to gather stakeholders in a workshop? (Task 1D).

Figure 1.Benefits and challenges of using CPLUS at various spatial scales. While CPLUS was originally designed to develop landscape plans, it can be applied at various scales. However, there may be drawbacks to applying CPLUS at larger scales as data availability and accuracy may vary.

Landscape

Landscape planning engages stakeholders to ensure that climate and nature strategies are socially acceptable, feasible and impactful.

Benefits

- Tailored to unique conditions of the landscape
- Facilitates direct stakeholder engagement, leading to more inclusive and participatory planning
- Can leverage detailed local data and knowledge, leading to more precise decision-making
- Analysis is at scale of working areas, facilitating implementation and ensuring reliable financial outcomes

Challenges

- Limited scope may not capture impacts like climate change
- Can be difficult to communicate and interpret full benefits, especially for ecosystem services

National

National planning translates broad global goals into specific, actionable plans tailored to a country's unique context.

Benefits

- Supports national-level strategies and programs by providing a general overview of a country's NbS priorities
- Builds high-level support for NbS across the region by engaging stakeholders from different sectors
- Can tackle national-level issues like development and growth, ensuring they are integrated in planning

Challenges

- Varying data availability and quality
- Intepreting data over a larger area can be inaccurate (e.g., finances may not represent economies of scale)
- Potential for a many stakeholders - consensus may be difficult
- Challenging to translate national plans into actionable local strategies

Transboundary

Ecosystems often span political boundaries. Transboundary conservation can maintain ecological connectivity across human borders.

Benefits

- Approach can focus on ecosystem boundaries rather than political, enhancing effectiveness of efforts across borders
- Promotes collaboration between countries or regions, leading to coordinated efforts in addressing complex challenges

Challenges

- Varying data availability and quality
- Complex to coordinate among multiple governments and stakeholders
- Challenging to translate transboundary plans into actionable local strategies

Definitions and Acronyms

- **Activity:** An intervention designed to influence outcomes of interest (such as carbon mitigation biodiversity or livelihoods) in the CPLUS evaluation. An activity may more commonly be referred to as a 'project', or a 'land management strategy'.

- **Biodiversity**: the variability among living organisms from all sources including terrestrial, marine and other aquatic ecosystems.

- **Carbon Content:** Existing carbon stored in the ecosystem (e.g., standing forests, intact grasslands, wetlands, healthy soil, etc.).

- **Carbon Impact:** The potential of an activity to increase the amount of carbon emissions avoided or sequestered.

- **Climate resilience:** The capacity of a landscape and its inhabitants to withstand or recover from changes or shocks as a result of climate change.

- **Ecological infrastructure:** Delivery of ecosystem services to inhabitants of a landscape.

- **Evaluation**: The activities carried out under the 5-step CPLUS framework.

- **Finance:** Associated financial costs and benefits of an activity, including investments needs and returns (if applicable).

- **Indigenous Peoples' and Local Communities (IPLCs):** Groups of people with distinct cultural identities and traditional knowledge systems who inhabit and have historical ties to specific geographic regions, and often play a crucial role in the stewardship and sustainable management of natural resources.

- **Landscape:** A geographic area with many different interacting ecosystems, such as forests, lakes, and grasslands, as well as human-made environments like cities and farms. While the definition of landscape is dependent on the context, here we refer to landscape to mean any region undergoing a CPLUS assessment, which may be a jurisdiction.

- **Landscape plan:** In this guidebook, landscape plan, refers to a spatially-explicit map created by the CPLUS tool. The map shows which activities are best suited in each location and summarizes outcomes from the plan including the total area and cost for each activity if implemented according to the plan.

- **Livelihoods:** level of access to resources (such as wealth, municipal services, infrastructure, education and natural resources); creation of jobs and economic opportunities.

- **Natural climate solution (NCS):** Actions to protect, better manage, or restore ecosystems in ways that avoid greenhouse gas emissions and/or increase carbon sequestration[1]. NCS is a subset of nature-based solutions (NbS). See the definition of nature-based solutions for additional context and distinctions.

- **NCS Pathways**: Approaches to avoid greenhouse gas emissions and/or increase carbon sequestration. In CPLUS, NCS Pathways are used as methods to estimate the carbon potential of an activity. There may be several NCS Pathways associated with one activity. For example, Herding for Health is a grassland management activity that influences 3 NCS Pathways: Avoided grassland conversion, Fire management, and Grazing – Animal management.

Griscom et al., 2017[2] introduces 20 NCS Pathways including Avoided forest conversion, Reforestation, Natural forest management, Improved plantations, Fire management, Avoided wood fuel harvest, Avoided grassland conversion, Biochar, Cropland nutrient management, Conservation Agriculture, Trees in croplands, Grazing – Animal management, Grazing – Optimal intensity, Grazing – Legumes in pastures, Grazing – Improved feed, Improved Rice cultivation, Avoided coastal wetland impacts, Avoided peatland impacts, Coastal wetlands restoration, Peatland restoration. Additional NCS Pathways may exist and additional NCS Pathways been defined, such those in The Nature Conservancy's NCS Handbook.

- **Nature-based solution (NbS):** Actions to address societal challenges through the protection, sustainable management and restoration of ecosystems. NbS refer to a much broader set of actions beyond only climate mitigation.

While CPLUS was originally conceived to support scaling NCS activities, pilot projects have illustrated that the value of CPLUS lies within its ability to assess outcomes beyond carbon. In this guidebook, we therefore refer to NbS as an overarching category encompassing NCS.

- **Scenario:** Refers to an overall analysis done in an area of interest, or landscape. Different criteria and priorities for spatial decision-making and comparison will be considered for each scenario.

Introduction

Previous reports have laid out a multitude of reasons for why there is insufficient financing for nature-based solutions (NbS), including the heightened perceived risk of NbS activities, or limited availability of NbS activities of sufficient scale that can justify transaction costs. One key issue, however, lies in the disconnect between top-down target setting and bottom-up activity implementation, which we term here as the "missing middle".

Scaling Nature-based Solutions

This missing middle and subsequent disconnect not only impedes the flow of financial support for nature-based solutions, but also stifles meaningful progress toward global nature goals.

There are several underlying barriers that need to be addressed in order to resolve the missing middle. From the top-down perspective, regional and national targets rarely have the resolution needed to translate into meaningful implementation on the ground. Many academics and practitioners warn of the disconnect and inconsistency between science-based global goals and place-based implementation or local development priorities.

Without a straightforward means of translating global goals and corporate targets into specific local actions, many land managers and stakeholders may view global targets to be unlikely to be achieved and impractical to their work, carrying on with business as usual. Attempting to circumvent local practitioners and relying solely on top-down targets to plan activities is a futile approach; experts in international organizations may have the expertise to develop standardized frameworks to reduce biodiversity loss, for example, but they may lack the "lived experience" of stakeholders with place-based knowledge and understanding of the local context which would improve landscape management practices. This can result in activities not well-suited to local needs or that fail to consider the social and cultural dynamics of the communities involved - problems that frequently result in activity failure.

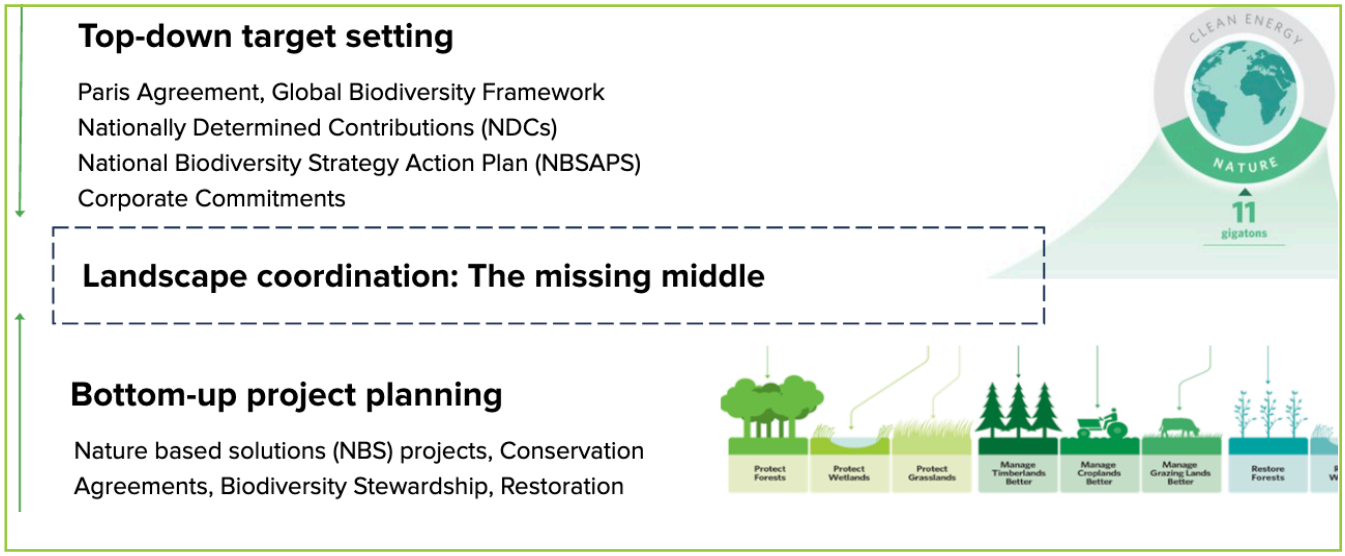
Landscape Approaches

For decades, landscape approaches have been proposed as a solution to bridge this missing middle. Operating on a larger scale compared to individual activities, they hold potential to address leakage concerns and promote synergies across projects. Landscape initiatives often involve multi-stakeholder forums, allowing goals to develop from the ground-up and providing the opportunity for inclusive land use planning. This approach democratizes the planning process, involving stakeholders who are typically excluded due to cost and capacity constraints. Numerous tools, guidebooks, and frameworks have emerged to support the expansion landscape initiatives.

However, landscape approaches are not without their challenges. Implementation can be complex and costly, and it can take time to deliver results. The multi-stakeholder approach requires extensive negotiation, compromise, and tradeoffs among seemingly conflicting goals. Often, these approaches are mired in generalities rather than establishing concrete and spatially explicit plans that are aligned with the landscape and can achieve the greatest environmental impact.

This is where CPLUS comes in.

Figure 2. The "missing middle" that the CPLUS framework is designed to address.



What is Climate Positive Land Use Strategy?

The Climate Positive Land Use Strategy (CPLUS) is a powerful tool that bridges the gap between project planning and high-level nature and climate goals.

CPLUS is a collaborative, data-driven process that unlocks the potential of nature-based solutions at scale by enabling stakeholders to evaluate the impact of scaling plans, ensuring they deliver on priorities like biodiversity, climate mitigation, and improved livelihoods. At its core, CPLUS answers a fundamental set of questions:

- **Which activities are feasible** in the landscape or evaluation area?
- **How should outcomes be prioritized** so that the needs and values of local stakeholders are represented?
- **Where should each activity be implemented** to provide the most benefit to nature and people?

CPLUS answers these questions by creating a landscape plan (Figure 3), a map showing which activities are best suited in each location, and summarizing outcomes from the plan.

The goal of CPLUS is to generate a landscape plan that is supported by stakeholders, backed by science, and aligned with global goals for nature. To achieve this outcome, CPLUS provides a framework that facilitates stakeholder engagement and a decision-support tool that facilitates the creation of landscape plans based on stakeholder priorities.

The CPLUS Framework

The CPLUS framework is a five step process (Table 1) that supports teams to design, socialize, fund, and deliver locally relevant, science-backed plans to scale nature-based solutions within a landscape.

While we are unable to provide precise estimates of how long each step will take, in our experience the implementation of the CPLUS framework (referred to as the "CPLUS evaluation") can span six to twelve months. The timeline may be accelerated or delayed depending on team capacity, availability, and budget.

Table 1. The CPLUS Framework - a five step process to create a stakeholder-driven landscape plan.

Step	CPLUS Output
Step 1. Plan and Prepare	Select individuals to lead the evaluation team, determine the scope of the assessment, set a dedicated budget and realistic timeline, and begin identifying and involving stakeholders to be consulted.
Step 2. Select Activities	Select activities and the criteria that will be used to evaluate activities . We highly recommend completing Steps 2 and 3 during a kickoff workshop.
Step 3. Collect and Generate Data	Collect datasets that will be used to evaluate the feasibility and impact of various activities. Generate the datasets and input layers required in the CPLUS tool. Depending on the stakeholder engagement strategy, this may include a workshop to introduce CPLUS to a wide set of stakeholders and gather input on data sources.
Step 4. Create and Evaluate Scenarios	Engage stakeholders to understand local priorities. Use the CPLUS tool to develop landscape plans based on identified priorities and evaluate plans for their accuracy and feasibility. We highly recommend completing Steps 4 and 5 during a second in-person workshop.
Step 5. Iterate	Determine next steps. Follow up steps may include continued data collection or a plan to socialize landscape plans with stakeholders or potential funders.

The CPLUS Tool

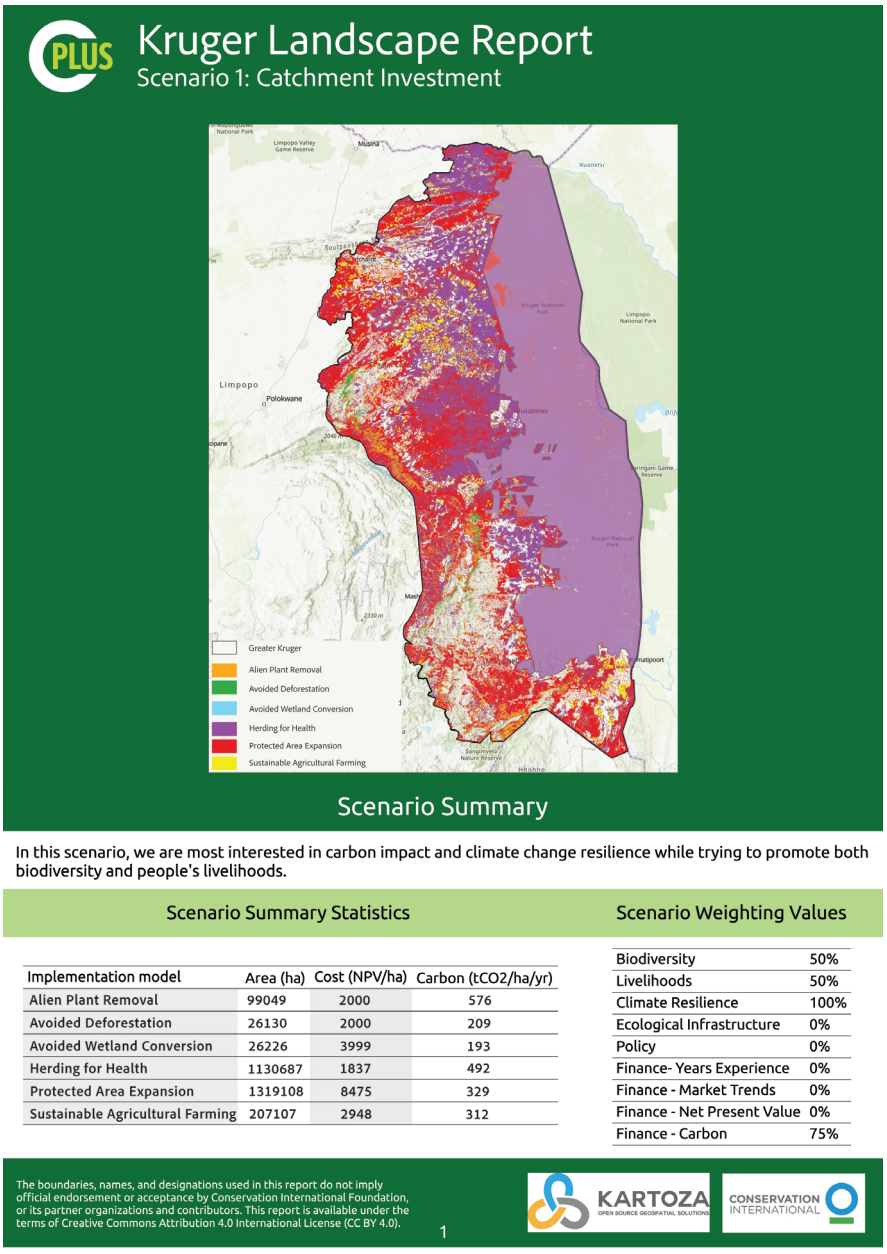
The CPLUS decision support tool (CPLUS tool) is a plugin to the QGIS software (a free, open-source geographic information system software) that creates landscape plans based on the priorities set by the user (e.g., biodiversity, climate resilience, costs, livelihoods). The landscape plans provide a visual reference for how user priorities impact the overall allocation and location of activities within the landscape.

The output of the CPLUS tool produces several analyses, providing valuable insights to inform planning, collaboration, funding, and implementation. This includes:

- Maps identifying priority areas for implementing each activity, based on user priorities;
- Maps identifying the most suitable areas for implementing each activity, based on user priorities;
- Estimated implementable area for each activity;
- Estimated carbon mitigation potential of each activity;
- Estimated costs and revenues of each activity, based on the priority implementation areas.

Figure 3 shows a sample output from the CPLUS tool. In this scenario, the stakeholders evaluated six NbS activities in the landscape - including Alien Plant Removal and Assisted Natural Regeneration. After uploading data for each activity and defining priority values (in this case, carbon and climate resilience), the tool produced a summary of how much each activity should be scaled up across the landscape, estimates of each activity's cost per hectare, and created a map locating where the activity would be best suited for implementation.

Figure 3. An automated report produced by the CPLUS tool



Kruger Landscape Report

Scenario 1: Catchment Investment

Greater Kruger
Alien Plant Removal
Avoided Deforestation
Avoided Wetland Conversion
Herding for Health
Protected Area Expansion
Sustainable Agricultural Farming

Scenario Summary

In this scenario, we are most interested in carbon impact and climate change resilience while trying to promote both biodiversity and people's livelihoods.

Scenario Summary Statistics

Implementation model	Area (ha)	Cost (NPV/ha)	Carbon (tCO2/ha/yr)
Alien Plant Removal	99049	2000	576
Avoided Deforestation	26130	2000	209
Avoided Wetland Conversion	26226	3999	193
Herding for Health	1130687	1837	492
Protected Area Expansion	1319108	8475	329
Sustainable Agricultural Farming	207107	2948	312

Scenario Weighting Values

Biodiversity	50%
Livelihoods	50%
Climate Resilience	100%
Ecological Infrastructure	0%
Policy	0%
Finance- Years Experience	0%
Finance - Market Trends	0%
Finance - Net Present Value	0%
Finance - Carbon	75%

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What CPLUS Can Do

A key feature of CPLUS is its flexible approach. CPLUS recognizes that different stakeholders will have unique perspectives on the importance of various outcomes, be it climate mitigation, biodiversity, livelihoods, or others. Rather than prescribing rigid judgments on which outcomes should be prioritized, CPLUS allows stakeholders to define their own desired outcomes. CPLUS serves as a roadmap of where activities could be scaled up, rather than guidance on how.

The CPLUS framework facilitates multi-stakeholder collaboration and consensus-building when developing landscape-scale strategies and plans.

Instead of dictating a single "correct" map of how NbS activities should be scaled in a landscape, the CPLUS tool can create multiple landscape plans based on stakeholders' varying priorities. As the CPLUS tool generates new landscape plans on demand, it allows for real-time adjustments to priorities and the ability to immediately review benefits and tradeoffs between plans. This allows facilitators to lead targeted discussions around the landscape vision and how stakeholders might align efforts to achieve the vision. See Step 5 for detailed guidance on evaluating landscape plans. Specifically, CPLUS can be used for a number of applications, including - but not limited to - the following:

Targeted negotiations to create a shared, science-backed, actionable landscape vision

Landscape initiatives can struggle to make meaningful progress navigating the diversity of stakeholder needs when conversations rely only on general principles. With spatially explicit maps of NbS opportunities generated by CPLUS, stakeholder discussions and negotiations can become much more targeted and actionable (e.g. resolving to "restore 5000 hectares of forest in these locations, for these benefits, at this cost," instead of resolving to "support forest restoration for carbon and biodiversity"). Through multiple rounds of generating plans with CPLUS and stakeholder negotiations, it is possible to arrive at a shared, actionable vision for scaling NbS - backed by multiple stakeholders and aligned with national and other high-level targets.

Ensuring activities ladder up to contribute to the landscape vision

CPLUS connects activity-level discussions to a broader vision for the entire landscape; thanks to summary statistics from the CPLUS tool that gauge whether the landscape plan proposed is aligned with broader climate and social targets - and associated financing.

Supporting project financing efforts at scale

Critical to CPLUS' versatility is its ability to compare options not just from a biophysical lens, but a financial lens as well. As CPLUS creates plans for landscape-wide NbS scaling, it enables proposals of much larger magnitudes and unlocks potential corporate and philanthropic funding sources that were previously limited by small scale proposals and associated transaction costs. CPLUS can demonstrate to both project implementers and funders how NbS activities can be scaled to a level relevant to regional and national nature and climate targets (and corresponding funding), thereby bridging the "missing middle" of landscape-level planning and coordination.

Supporting strategic fundraising

The CPLUS tool produces summary statistics for each NbS activity evaluated: estimated costs and financial returns, climate impacts, and the total area suitable for implementation. These components can support CPLUS stakeholders to be more targeted with their fundraising strategies. Stakeholders can pitch proposals for NbS activities that are better aligned with financiers' return expectations and funding goals, instead of an "all or nothing" approach that may pressure financiers to fund the entire vision for the landscape - even if it contains activities that funders may not support.

Furthermore, financiers can evaluate proposals knowing that they have stakeholder support and that they align with stakeholder priorities for the landscape, which provides a compelling argument for proposal success.

Finding areas of common ground

Given the diversity of stakeholders and values in the landscape, it is possible that stakeholders may be unable to coalesce around a unified vision for their landscape. Because of its flexibility and on-demand nature, CPLUS offers value as a stakeholder engagement tool in such situations by providing the ability to generate and compare different scenarios. Stakeholders can set unique priorities, generate landscape plans with their priorities, and then compare with plans developed by others to see if there are areas of overlap. These overlapping areas represent "win-win" scenarios where, even in instances of disagreement, there are certain NbS activities that can be implemented to satisfy the priorities of each stakeholder. This exercise identifies immediate avenues of actions or suites of actions that stakeholders can pursue - and potentially build trust around - while negotiating and resolving differences in other parts of the landscape.

Other applications

- Refining existing plans, showing whether there are any alternative activities better suited for a given site, and where a planned activity expansion could be better located;
- Generating a shared understanding of opportunities and tradeoffs between various NbS and NCS activities;
- Developing an understanding of the large-scale potential for an activity across a landscape;
- Understanding how to best stack multiple benefits to meet the landscape goals;
- Guiding resource allocation for NbS and NCS.

Case Study: Kruger to Canyons

With CPLUS, Conservation South Africa and other stakeholders in Kruger to Canyons biosphere were able to assess how much and where certain activities should be scaled up to achieve goals around water security and livelihoods. These analyses helped to inform analyses for the development of the Kruger to Canyons Catchment Investment Program – a visionary business plan seeking long-term financing to scale natural climate solutions and ultimately secure critical freshwater resources for the region, through alternative funding streams. The Conservation South Africa team and the CPLUS team at Conservation International worked closely with The Nature Conservancy and the Kruger to Canyons Biosphere Reserve in Hoedspruit to improve and validate the scenarios created using the CPLUS tool. With numerous investors looking to fund NCS and other conservation implementations within the Greater Kruger area, the output CPLUS scenarios are well positioned to guide activity development in critical areas.

Applying the CPLUS Framework

The five-step CPLUS framework guides the evaluation team through the process to 1) Plan and Prepare, 2) Identify Activities to Scale, 3) Collect Data, 4) Create and Evaluate Landscape Scenarios, and 5) Iterate. The outcome of this five-step process is a set of landscape plans that are informed by local stakeholders and that outline clear approaches to achieve a landscapes' vision.

In this chapter we explore the essential tasks to complete each step. Each section within this chapter outlines:

- Required participants: who needs to be involved in each step,
- Templates: Helpful tools to streamline your work,
- Checklist: A way to track your progress and ensure nothing is overlooked.

Figure 4. The CPLUS Framework is underpinned by stakeholder engagement throughout the process

Step 1: Planning and Preparation

After completing Step 1, you will have:

- Identified an evaluation team and defined their roles and responsibilities,
- Set a budget and timeline for the evaluation,
- Established a boundary for the evaluation,
- Completed a high-level data scan and stakeholder mapping,
- Developed a plan for engaging stakeholders throughout the CPLUS evaluation process.

Task 1A. Establish an Evaluation Team, Budget and Timeline

Participants: Potential Evaluation Team

Resources: CPLUS Overview Presentation
Kickoff Meeting Agenda
Budget and Timeline Template

Estimated Time: 2-6 hours

Checklist for finalizing Task 1A:

- ☐ Meeting held with potential Evaluation Team members to present an overview of CPLUS
- ☐ Evaluation Team roles and responsibilities defined
- ☐ Budget and Timeline set

Your first task is to establish a team that will be responsible for leading the CPLUS evaluation. We recommend planning a one to two-hour meeting to present the CPLUS Overview and to introduce potential Evaluation Team members to the scope of the work and to agree on roles and responsibilities.

The Evaluation Team may be composed of individuals within the same organization, though it's possible that the necessary technical expertise spans across several organizations. Regardless of the structure of the Evaluation Team, fostering close collaboration among team members is essential for the success of the process.

The recommended Evaluation Team typically includes:

- **Strategy Lead:** Someone who helps set the strategy for your organization at the landscape, regional or national level. This person should be able to influence and allocate human resources to the CPLUS evaluation process.
- **Technical Lead**: A GIS (graphical information systems) expert who is familiar with land use data in the region. We vrecommend that the Technical Lead familiarize themselves with the CPLUS Tool user manual as early as possible to ensure a comprehensive understanding of the CPLUS evaluation, data requirements, and methodology
- **Partnerships Lead**: Someone who has strong relationships with relevant stakeholders in the landscape/study area. This individual should understand the value of large-scale land use planning in meeting national climate goals and should be able to effectively communicate technical concepts to non-technical audiences.

Ideally, a budget will be available to support the Evaluation Team's involvement in the CPLUS process. The budget is necessary to advance near-term priorities including data collection, analysis, stakeholder engagement, and in-person workshops.

While we've provided estimates of how long each step will take, the evaluation may be accelerated or delayed depending on team capacity, availability and budget. In our experience the CPLUS evaluation can span six to twelve months.

Task 1B. Set Evaluation Boundaries

Participants: Evaluation Team

Resources: Scoping and Data Scan Template

Estimated Time: 2-6 hours

Checklist for finalizing Task 1B:

- ☐ Study area selected and spatial boundaries established
- ☐ High level discussion held to understand data availability for the study area

The Evaluation Team will establish boundaries of the evaluation area/landscape to be evaluated with CPLUS. When selecting a study area and establishing boundaries, it is important to consider the various factors that can impact the reliability and success of the CPLUS evaluation:

Regardless of the data type, we highly recommend only including datasets that represent the entire landscape. This is necessary to ensure priority weighting is applied equally across the landscape. Further details regarding data collection and data requirements are covered in Step 3.

- **Access to and availability of data relevant to the evaluation area.** The criteria used to assess and prioritize activities (Task 2B) will determine the data requirements for a CPLUS evaluation. At minimum, your team should have access to current land use, land cover change, and carbon potential datasets. Other relevant datasets may include biophysical attributes (e.g., vegetation, soil cover, water, etc.), biodiversity values, ecosystem classification, land tenure, costs to implement the activity. Your organization may already have access to these datasets or may need to collaborate with external teams to identify data sources. Your team may use the Scoping and Data Scan Template to begin to understand data availability in the landscape.
- **The strength of existing relationships between the CPLUS Evaluation Team and relevant stakeholders** within the study area/landscape, such as government representatives, Indigenous People and Local Communities, and local activity implementers. As landscapes are managed by multiple stakeholders, bringing key stakeholders together early and often ensures a participatory approach and minimizes conflict during implementation. A detailed stakeholder mapping exercise is conducted in Task 1D.
- **The scale of the assessment and its impact on the analysis and outcomes.** Refer to Figure 1 to review the benefits and challenges of running a CPLUS assessment at different scales. While CPLUS was designed to work at a landscape scale, it may be applied at larger scales.

Task 1C. Define the Evaluation goals

Participants: Evaluation Team, Relevant Stakeholders

Resources: None

Estimated Time: 2-6 hours

Checklist for finalizing Task 1C:

☐ Initial CPLUS vision defined

The goals for your CPLUS evaluation may differ from other evaluations and will likely involve iterative discussions between the Evaluation Team and stakeholders. This conversation is important to begin at an early stage.

While the overarching goal of a CPLUS evaluation is to generate stakeholder consensus on a landscape plan and to secure financial support for implementation, the specific goal for your evaluation should specifically identify what outcomes are desired. For example, the vision for your CPLUS evaluation may be focused on securing funding for climate mitigation, or supporting land negotiations between community members and the regional government. Whatever the case, it's important that the evaluation team has a clear idea of how the CPLUS evaluation can practically support your work.


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Task 1D. Identify Stakeholders

Participants: Evaluation Team

Resources: Stakeholder Identification Template

Estimated Time: 2-6 hours

Checklist for finalizing Task 1D:

☐ Completed Stakeholder Identification Template

Stakeholder engagement is a critical component of the CPLUS process and essential for its success. Stakeholders provide local perspectives, understanding of existing work, and knowledge of relevant data to guide the design and creation of a landscape plan. Sustained stakeholder engagement not only strengthens the final output from CPLUS but also boosts its legitimacy and buy-in among key players in the landscape. Involve stakeholders in discussions as early as possible.

Begin stakeholder mapping by reviewing the Stakeholder Identification Template. The first tab provides a table for your team to begin listing individuals and organizations involved in the landscape, their influence, and the potential value CPLUS provides to them. Engaging representatives from each of the common stakeholder groups in Table 2 is recommended to effectively leverage CPLUS.

Consider the following questions as your team completes the template. A comprehensive list of guiding questions can be found in the Stakeholder Identification Template.

- Are there gaps in technical capacity or knowledge of the Evaluation Team that need to be supplemented?
- Do the stakeholders represent the people and communities who use the landscape?
- Who are the marginalized groups in the landscape? How can we engage and bring them into the conversation?
- What levels of government are most relevant to the assessment? What are their priorities?

- Which corporate actors are involved in the landscape?
- Are there existing multi-stakeholder platforms in the landscape that can be leveraged in this process?

Once you've finalized the stakeholder list, hold a discussion with the Evaluation Team to assess the stakeholders' interests, capacity to engage and objectives. Consider potential conflicts and areas of alignment between stakeholders' goals and CPLUS. Based on this review, categorize stakeholders into groups based on how you intend to communicate and engage with them throughout the CPLUS process. While specific may vary, the groups may resemble the following:

- **Involved**: Stakeholders actively participate in design and decision-making processes via in-person workshops. Dialogue between stakeholders is continuous and they are encouraged to contribute ideas and co-create solutions.
  Consulted: Stakeholders have opportunities to provide feedback via broader landscape forums. Their input is sought to consider their perspectives in decision-making processes.
- **Informed**: Stakeholders are primarily recipients of information. The aim is to keep stakeholders informed about updates, decisions and progress.

Task 1E. Plan for Stakeholder Engagement

Participants: Evaluation Team, Relevant Stakeholders

Resources: Workshop 1 Agenda
Workshop 1 Presentation

Estimated Time: 6-8 weeks to plan an in-person workshop
1-2 days for workshop activities

Checklist for finalizing Task 1E:

- ☐ Stakeholders have a high-level understanding of the CPLUS methodology
- ☐ The Evaluation team and stakeholders are familiar with how NCS Pathways influence carbon mitigation potential

This task is focused on planning stakeholder engagement opportunities throughout the CPLUS process. It's important to engage stakeholders early and often to allow their input and knowledge to be incorporated into the evaluation. To begin engaging stakeholders, we recommend organizing a kickoff workshop or leveraging existing stakeholder meetings to introduce stakeholders to CPLUS and how it can support teams to scale existing activities in the region, share the methodology behind CPLUS, and invite feedback on data sources and criteria to include.

Your teammay use the Workshop 1 Agenda as a reference for planning a CPLUS workshop. Before the workshop, we recommend that the entire team read through Steps 2 and 3 to gain a full understanding of the CPLUS process before presenting it to stakeholders.

Table 2. Common stakeholder groups to engage in the CPLUS evaluation

Stakeholder	CPLUS Value
Governments	Governments can leverage CPLUS to build the capacity for increasing climate and nature ambition on national or subnational targets and then downscaling targets to an actionable level.
Indigenous Peoples and Local Communities (IPLCs)	CPLUS can inform resource allocation for land management, support fundraising efforts, and can help incorporate community priorities and feedback into planning efforts. IPLCs are critical to the process as they often hold deep knowledge of the land accrued through a history of land stewardship and could be impacted by potential land use activities. Care must be taken to ensure that IPLCs have a voice in the activity and can use the results to support their goals around biodiversity, climate change, and sustainable livelihoods.
Non-governmental Organizations	There are typically many NGOs that work closely with communities and governments in pursuit of shared goals around nature, climate, and development. It's important to explore opportunities to unify efforts and build on existing work with these NGOs. Collaboration can also streamline communication with stakeholders about different workstreams and intended impact of different activities.
Academics	Academics often produce and maintain high quality spatial data and may be able to facilitate its access. In addition, they might be knowledgeable about the country's biodiversity commitments and could provide information to shape the parameters of the CPLUS Action Plan to reflect national targets. Finally, students and researchers might be end-users of the CPLUS Action Plan. Their participation could help mainstream the results and make connections to resources and existing activities.
Corporations and the Private Sector	Corporations and Financial Institutions can use CPLUS to identify investment opportunities at higher resolution scales, determine locations for sourcing sustainable materials and products, and to engage in broader landscape approaches. Using CPLUS can also increase transparency and accountability in the allocation and disbursement of nature finance.

Step 2: Select Activities to Evaluate

After completing Step 2, you will have:

- Selected activities to include in the CPLUS evaluation
- Identified criteria that will be used to assess each activity (e.g., biodiversity, freshwater, climate resilience, finances, carbon mitigation)

Step 2 determines how activities will be assessed and prioritized in the CPLUS evaluation. At this step, input from a variety of stakeholders, both internal and external, is essential to ensure that the CPLUS evaluation is inclusive of and considerate of the existing efforts that can contribute to the landscape's goal.

While Step 2 may be completed by the core evaluation team alone, we highly recommend convening stakeholders in a kickoff workshop (planned in Task 1E) to complete Step 2 and 3. You may use the Two-Day Workshop Agenda templates provided by CPLUS or you may design a custom approach to complete these steps. Note that while these activities can be completed virtually, they are best completed in-person to maximize stakeholder engagement.

Task 2A. Identify Activities

Participants: Evaluation Team

Resources: Scoping and Data Scan Template

Data Collection Template, Activities tab

Estimated Time: 2-6 hours

Checklist for finalizing Task 2A:

☐ A list of activities to be evaluated in CPLUS, added to the Data Collection Template

After selecting a study area/landscape, your team will identify the activities to be evaluated. By clearly defining the activities at this early stage, the team can focus avoid unnecessary data collection, and ensure time, expertise and budget are directed toward developing the most valuable insights for decision making. This task may be conducted in tandem with Task 1B, as the study area/landscape selection may be influenced by the activities to be considered.

Begin listing activities to include in the Scoping and Data Scan template. Once finalized, add the activities listed to the Data Collection Template. This may include:

- **Existing activities:** Projects implemented by the evaluation team's organization and/or their stakeholders.
- **New activities:** Projects that are not currently implemented by a known stakeholder. New activities may be included in an evaluation if there is known interest and potential to implement the activity.

While CPLUS can assess both new and existing activities, the lack of data for new activities may limit your team's ability to assess the activity's true impact. This may lead to results that are misrepresentative or unreliable. We recommend focusing on existing activities.

Examples of Activities evaluated in CPLUS

Within the CPLUS framework, activities refer to existing or planned nature-based solutions or natural climate solutions that harness natural processes to protect, restore, or manage ecosystems. NbS and NCS often provide several benefits such as carbon sequestration, improved water quality, biodiversity conservation and support for community livelihoods.

Activity: Herding for Health

The Herding for Health program — a partnership between Conservation International and the Peace Parks Foundation — is a community-driven livestock management model that supports the livelihoods of rural communities living in and around protected areas — while restoring rangelands and conserving biodiversity through herding, capacity building and collective governance.

Activity: Invasive Species Removal

Conservation South Africa provides job opportunities and career training to youth by training them on the removal of invasive species. The youth teams have cleared 2,300 hectares (5,683 acres) of black wattle, restoring the land back to natural grasslands and building new infrastructure to channel natural springs.

Task 2B. Select Criteria for Evaluating Activities

Participants: Evaluation Team, Stakeholders

Resources: Data Collection Template

Estimated Time: 2-4 hours, can incorporate into Workshop 1

Checklist for finalizing Task 2B:

- ☐ Completed Data Collection Template, Criteria tab

This task will build off the high-level scoping and data scan conducted in Task 1B. In Task 1B, your team listed datasets that represent aspects important in the landscape, like carbon, water resources, biodiversity, climate resilience, livelihoods, etc. Now, your team will narrow down these options and create a final list of CPLUS criteria. These criteria will be used to assess the impact of each activity.

You can think of CPLUS criteria as reflections of the goals of the landscape. For example, let's say the landscape goal is to increase availability of freshwater resources. Then, your CPLUS criteria could be 'freshwater', and your team will need to collect a dataset that represents freshwater infrastructure. If the goal of the landscape is to establish a wildlife corridor, your CPLUS criteria could be 'biodiversity' include datasets like biodiversity hotspots or key biodiversity areas.

The criteria you select will depend on your specific landscape vision and the data available to your team. Table 3 provides a suggested list of criteria and datasets that may be relevant. Your evaluation may include criteria not listed in this table.

Based on this discussion, your team may now complete the Data Collection Template, Criteria tab, filling out the criteria desired and the potential datasets to collect. Note that you must have spatial data for criteria that you intend to include in the analysis.

Table 3. Common CPLUS criteria and potential datasets

Criteria	Potential Datasets
Climate mitigation potential and suitability (Task 3C)	NCS Pathways (required for CPLUS evaluation Carbon stocks Carbon mitigation potential Land cover Proximity to urban centers Proximity to roads Proximity to water bodies/rivers Fire frequency Land tenure Elevation
Biophysical (Task 3D)	Water regulation Soil conditions Flood risk zones Biodiversity hotspots Endangered species ranges Climate resilience
Economic costs and benefits (Task 3E)	Cost of implementation Potential revenue from activity Inflation rate
Sociopolitical (Task 2C)	Policy (Local/Tribal/Regional/National) Land Tenure Population density

Getting the most out of CPLUS

Although a CPLUS evaluation can be completed even with limited criteria, the real power of CPLUS comes from comparing activities against multiple criteria. In most cases, we recommend including at least one criterion from each category in Table 3 (NCS potential, biophysical, sociopolitical, economic). To get the best results, talk to the leads of each activity to understand how their work influences and contributes to the broader landscape goals.

Task 2C. Sociopolitical Criteria

Participants: Partnership Lead, Landscape Manager

Resources: Data Collection Template, Sociopolitical Criteria tab

Estimated Time: 1-2 hours

Checklist for finalizing Task 2C:

- ☐ A list of potentially enabling or restricting policies or practices relevant to the study area/landscape

The sociopolitical attributes of a landscape are crucial to consider the external activities that could affect the success of an activity, create barriers to an activity, or could incentivize or disincentivize scaling of an activity. What policies are in place at local, regional, national, or international levels that influence how decisions are made? What cultural practices take place in and around the landscape? A sociopolitical assessment ensures that the CPLUS evaluation considers diverse perspectives and practices and helps to understand the legal framework that governs land use and other relevant factors.

Some sociopolitical attributes can be spatially represented. However, for many sociopolitical attributes like policies or financial incentives, spatially explicit mapping can be challenging. Therefore, CPLUS evaluations typically do not include sociopolitical attributes as an input that can be weighted and prioritized by stakeholders.

Still, it is crucial to consider sociopolitical attributes when determining which activities are most suitable to scale within the landscape. We recommend conducting a sociopolitical screening before moving forward to understand whether there are restrictive policies or practices that may limit the utility of a full scale CPLUS assessment.

Working with stakeholders, use the Data Collection Template, Sociopolitical Criteria tab to list the livelihoods, policies, and cultural practices that are relevant in the landscape. Write the relevant criteria in Column A and a description of the criteria in Column B. Then, write down which activities in your evaluation the criteria could potentially influence in Column C. Some criteria may apply to only 1 or 2 activities, whereas others may apply broadly to many or all of them.

For example, a national policy to reduce GHG emissions could apply to most activities that aim to protect or restore a given area. Alternatively, a cultural practice that requires the use of an invasive plant species has significant considerations for an activity aimed at removal of that invasive species.

To incorporate these sociopolitical criteria into the CPLUS evaluation, a qualitative assessment is often necessary. For criteria that cannot be spatialized, you will have an opportunity to include a summary of the assessment as written text into the CPLUS tool. This written content will be included in the automated report generated by the CPLUS tool so that the information is readily available during stakeholder discussions and evaluations of a specific scenario.

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Step 3: Collect and Create Data for CPLUS

After completing Step 3, you will have:

- Downloaded the CPLUS Tool, a QGIS plugin
- Created a dataset for each NCS Pathway relevant in the evaluation
- Created a Priority Weighting Layer for each biophysical criterion
- Calculated the financial costs and potential revenues for each activity

Step 3 focuses on collecting and preparing datasets that will be used to assess the impact of each activity on your desired outcomes for the landscape. Data collection and preparation is typically the most labor-intensive part of any CPLUS evaluation. The following steps will require a geographical information system (GIS) to process and transform spatial datasets collected into CPLUS input layers. The input layers will be uploaded to the CPLUS tool and will be the underlying data informing the creation of the CPLUS Landscape Plan.

See the CPLUS Tool User Guidance for Best Practices for Preparing Data.

Task 3A. Download the CPLUS Tool

Participants: Technical Lead

Resources: CPLUS Tool User Guidance

Laptop with CPLUS Tool (QGIS software) installed

Estimated Time: 2-4 hours

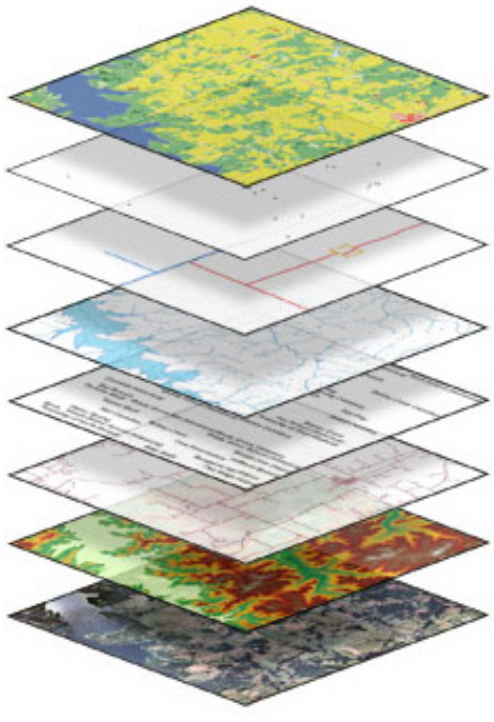
Checklist for finalizing Task 3A:

- ☐ The Technical Lead has installed the CPLUS tool on their laptop
- ☐ The Technical Lead has read through the CPLUS Tool User Manual
- ☐ The Technical Lead understands what input is required to generate a CPLUS landscape plan

We recommend the CPLUS Technical Lead review the CPLUS Tool User Manual to familiarize themselves with the technical details of the tool, the required input, the evaluation process and are comfortable explaining the data requirements and process to stakeholders during Workshop 1.

Here we provide a brief summary of the required inputs. There are two categories of inputs required to generate a CPLUS Landscape Plan. These inputs are developed based on activities selected (in Task 2A) and criteria selected (in Task 2B) for the CPLUS evaluation. The inputs are:

- **NCS Pathways:** In CPLUS, an NCS Pathway is a composite spatial layer that determines areas ideal for specific activities, based on the activity's potential for carbon sequestration or avoidance. Task 3C provides details on how to develop NCS Pathway layers.
- **Priority Weighting Layers (PWLs):** PWLs are spatial layers that represent the biophysical criteria selected in Task 2B (e.g., biodiversity hotspots, water regulation, climate resilience). Each criteria is associated with a PWL, which allows CPLUS to assign relative importance to each criteria based on stakeholders' priorities. Task 3D-3E provides details on how to develop PWLs.



Task 3B. Determine Land Cover Classes

Participants: Technical Lead, Evaluation Team,Stakeholders

Resources: N/A

Estimated Time: 2-4 hours

Checklist for finalizing Task 3B:

- ☐ Obtain the latest, trusted national or regional land cover map
- ☐ Aggregate land cover classes so that there are 10-15 classes remaining that are relevant to the CPLUS evaluation

The task focuses on collecting land cover data and defining what land cover classes the team would like to consider in their evaluation. Begin by reviewing the latest, trusted national or regional land cover map available. This land cover map will represent the current state of your landscape and will underpin all the analyses conducted within the CPLUS evaluation, so it is important to utilize a land cover product that your team considers accurate.

The land cover map may provide detailed land cover classes, which may or may not be relevant to the landscape or to nature-based solutions. While we do not recommend removing land cover classes (to ensure there are no gaps in the land cover) you may consider aggregating the existing classes into a smaller subset of land cover classes that is more manageable and relevant to the activities in the region. The average number of land cover classes in a CPLUS evaluation ranges from 10 to 15.

Review each land cover class with your team and answer the following questions to determine which classes to include, aggregate, or even add in the CPLUS evaluation:

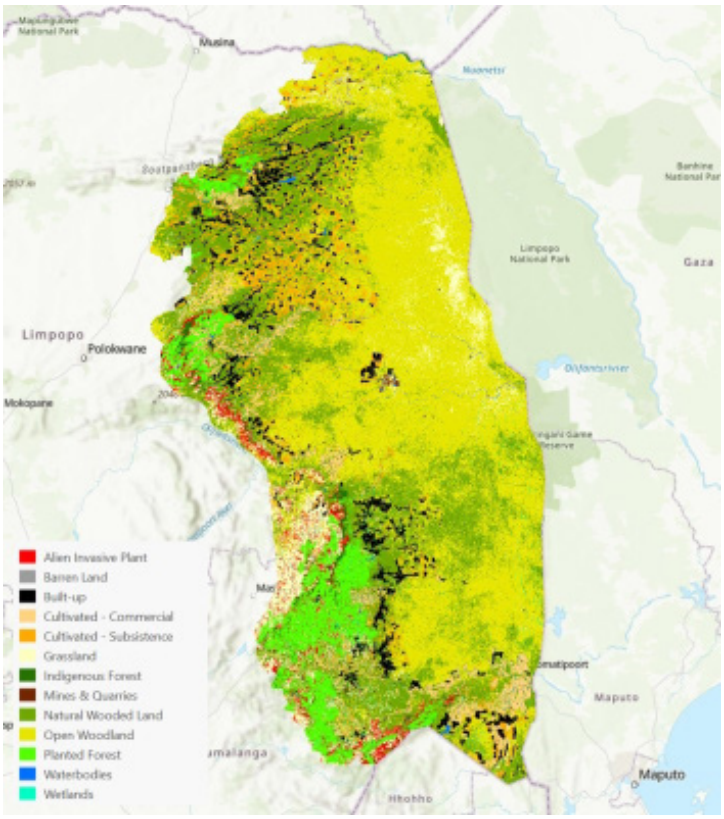
- Could the land cover be influenced by a nature-based solution?
- Is there value in keeping it as a separate class (e.g. mangroves vs wetlands) or is it similar to another class?
- Are there any classes you need to add that were not included in the original land cover product? For example, in South Africa, external data was added to represent alien invasive plants, which were used to map alien plant removal opportunities.

Then, you can finalize the land cover map that will be used for the CPLUS evaluation.

Case Study: Land Cover in South Africa

South Africa has land cover for different years going back to 1990. The National Land cover map outlines 72 classes, which includes five different distinctions of grassland.

For the purposes of the CPLUS evaluation in the region, the South Africa team is only interested in one grassland class. This meant that the Technical Lead needed to consolidate all five grassland types into one grassland class, which is represented in light yellow in the map to the right.



Task 3C. Create Carbon Potential Layer by developing NCS Pathways

Participants: Technical Lead, Evaluation Team, Stakeholders

Resources: Data Collection Template

Estimated Time: Varies, depending on avaiability of stakeholders. Likely weeks to months.

Checklist for finalizing Task 3C:

- ☐ A list of relevant NCS Pathways
- ☐ A list associating relevant NCS Pathways to CPLUS activities
- ☐ A suitability map for each relevant NCS Pathway
- ☐ A priority map for each relevant NCS pathway, including carbon data

This task is essential to evaluate the impact of your CPLUS activities on the potential carbon mitigation in the landscape. CPLUS' methodology to estimate the carbon mitigation potential of each activity is based on the seminal paper, Griscom et al., 2017., which introduces the concept of Natural Climate Solutions (NCS) and outlines 20 NCS Pathways. NCS Pathways are approaches that increase carbon sequestration or avoid greenhouse gas emissions through the protection, management, and restoration of natural systems.

We recommend this task be done first by the core Evaluation Team and a limited set of stakeholders within the leading organization, then socialized with stakeholders in the inception workshop.

Select Relevant NCS Pathways

Once you have identified the relevant land cover classes for your analysis, you can begin mapping each of the NCS pathways that are relevant in your CPLUS evaluation.

- Start by reviewing the common NCS pathways listed in the Data Collection Template, NCS Pathways tab.
- Complete columns C, D, and E to determine which pathways are applicable to your evaluation. You may wish to complete this in consultation with experts, local communities, and other stakeholders. Consider questions such as:
  - Is this pathway relevant to the land cover in the landscape?
  - Is the pathway relevant to existing or potential activities led by any of the stakeholders?
  - Does any organization manage or influence areas that are affected by this pathway?
- Once you've completed the NCS Pathways tab, revisit the Data Collection Template, Activities tab and complete Column C by listing the NCS pathways relevant to each activity.

Map NCS Pathways

NCS pathways fall into three categories: protection, restoration, and improved management. Each pathway will require its own mapping method, but the basic principles are:

- protection prevents change of a high conservation value land cover class,
- restoration highlights opportunities to return to a historical land cover class, and
- improved management identifies opportunities for more efficient use of a degrading or sub-optimally managed land cover class.

As the methods for mapping NCS pathways can vary widely, we recommend evaluation teams refer to Ellis et al. 2024, Griscom et al. 2017 and Griscom et al. 2020 for detailed guidance and best practices. You may refer to the Data Collection Template, Pathway Suitability & Priority tab for an example that you may copy and modify.

The NCS pathway mapping process can be broken down into three phases. Each phase should be conducted in consultation with the core evaluation team and/or relevant stakeholders.

1. Mapping NCS Pathway Suitability

This phase involves creating maps with binary values that represent whether an NCS pathway could occur on any given pixel, based on historical and/or current land cover. Suitability mapping is unique to each pathway and each study area. For example:

- Suitability for a **protection** pathway such as Avoided Forest Conversion can be as simple as just extracting the forest land cover class and assuming all pixels are suitable. Or, following the example in the Data Collection Template, you can remove certain areas, such as the bottom 20% of degraded areas to include in restoration pathways.
- **Restoration pathways,** such as forest restoration, can be more complex because you are returning the land to a historical state. In this case, you'll need to identify areas that were historically forest and are currently a land cover class that is restorable, i.e. not an urban center or water body. (Conservation International generally does not recommend afforestation, or the practice of restoring lands not historically forest. This preference does not preclude you from including afforestation if it is relevant in your study area.) You may additionally want to include current forests that are degraded in your restoration suitability.
- **Improved management** pathways tend to be the most challenging to map because you are recommending actions that are less directly related to land cover change or protection. The methods for these pathways can vary widely, however, they often include identifying highly degraded areas to improve practices such as animal or fire

management or identifying agricultural regions suitable for activities such as agroforestry.

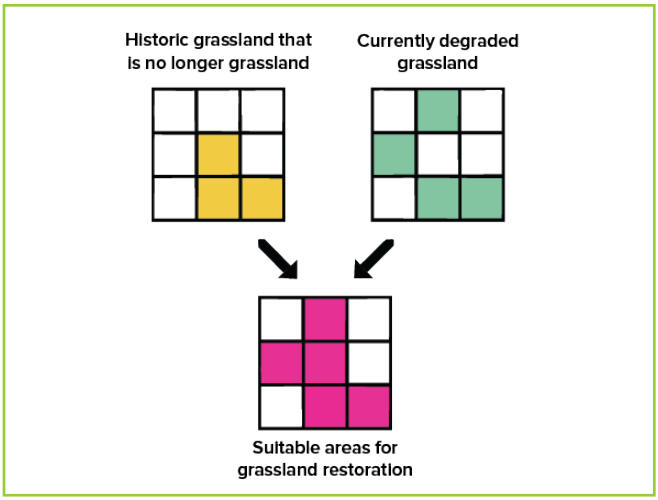


Figure 5. Developing NCS Pathway Suitability Layers. Input layers are shown in the top row. They are combined to create the suitability layer shown in the bottom row. Dark pink areas are suitable areas.

2. Mapping NCS Pathway Priority

After you have mapped the areas suitable for each NCS pathway, it's time to prioritize the pathways. Priority mapping is based on variables that influence the success of a pathway in your landscape. These variables are landscape specific, but common example variables include proximity to urban areas, proximity to roads (e.g., the assumption is that areas closer to roads are easier to implement), proximity to water bodies/rivers, fire frequency (e.g., the assumption is that higher fire frequency areas are higher priority), land tenure, and elevation. Carbon content is also a crucial variable and should be included in the final NCS Priority map– but this will be addressed in Phase 3.

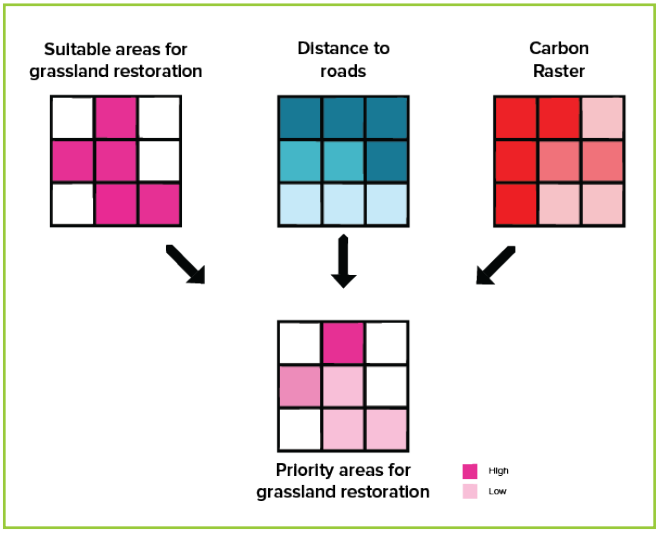


Figure 6. Developing NCS Pathway Priority Layers. Input layers are shown in the top row. In this example, suitable areas and distance to roads are combined in Phase 2 while the carbon raster is introduced in Phase 3. They are combined to create the priority layer shown in the bottom row. Dark pink areas represent high priority, light pink areas are low priority.

- **Combine these variables (except the carbon dataset) with suitability maps using a multi-criteria analysis.** This will rank each suitable pixel based on its overall priority.
- **Normalize values between zero and one** to ensure the results from each NCS pathway prioritization can be directly compared.
- **Add final layers into the CPLUS QGIS plugin** as the final NCS pathways.

3. Adding Carbon to the NCS Priority Map

Even though carbon is crucial for prioritizing NCS pathways, it was not included in the previous phase (Mapping pathway priority). Instead, carbon is considered in this third phase so that it is treated equal to the entire pathway prioritization performed in phase 2 of the pathway mapping process. To incorporate carbon into the analysis, you'll need to:

- **Select appropriate carbon datasets for each NCS pathway.** For example:
  - *Avoided Forest Conversion pathway:* you would want to select a carbon dataset that represents the biomass and soil organic carbon within the landscape. This would allow you to prioritize activities that protect high carbon forests.
  - *Forest Restoration pathway*: The biomass and soil organic carbon datasets would not be appropriate for prioritizing forest restoration. This is because restoration activities aim to change the landscape, so the current carbon states may not be useful in determining the impact of the activity. Instead, you may want to use a dataset such as carbon sequestration potential. Alternatively, if carbon sequestration potential is not available, you could use current biomass and soil organic carbon data to prioritize areas that are currently low in carbon to ensure you the highest potential for carbon sequestration.
- **Combine carbon data with prioritized pathways.** Once you have selected a carbon dataset for each pathway,
  - Add the carbon data to the respective prioritized NCS pathway map
  - Normalize the resulting output between zero and two. This approach is taken because two layers have been utilized (the NCS priority layer and a carbon layer).
  - Optionally, weight either the prioritized pathway or the carbon layer higher by adding a coefficient when adding them together. If you do this, you must normalize by the sum of the coefficient used for the NCS priority layer and the carbon layer.

To automate the third phase, add each respective carbon dataset to the CPLUS Tool by specifying the data path within the NCS pathway pop-up window. This will allow you to automate the inclusion of the carbon data in your analysis and bypass these manual steps.

Link NCS Pathways to Activities in the CPLUS Tool

Once you have completed mapping each NCS Pathway in your evaluation, you can use the CPLUS Tool to associate your CPLUS activities with their relevant NCS Pathways. Follow the CPLUS Tool User Guide for detailed instructions.

Remember: CPLUS Activities may encompass multiple NCS Pathways. For example, an activity focused on expanding protected areas might include three NCS pathways: 1)Avoided Deforestation, 2) Avoided Grassland Conversion, and 3) Avoided Wetland Conversion, as the activity aims to prevent the change of land cover to any other use. An explanation of the association between NCS Pathways and Activities is included in the Workshop 1 Template Presentation and illustrated in Figure 7.

You may refer to the Data Collection Template, Activities tab completed in Step 3A, which your team used to document the associations between activities and Pathways.

The CPLUS tool will automatically combine all relevant NCS pathways associated with one activity into a layer and normalize it so that the resulting layer is between zero and two (or between the sum of the coefficients used in Step 3).

Once you have done this for all relevant activities, you are ready to move on to the next step.

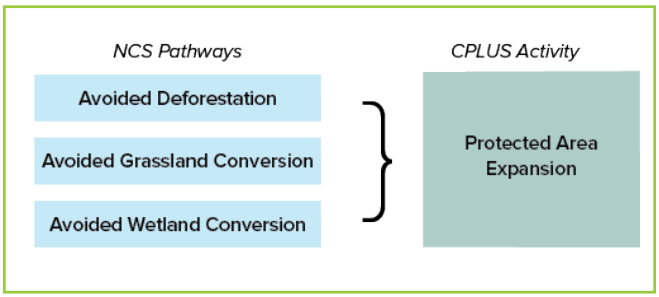


Figure 7. Example of Mapping NCS Pathways to Activities

Within the Eastern Cape landscape, one activity focused on expanding protected areas. The Protected Area Expansion activity involved three NCS pathways: Avoided deforestation, Avoided Grassland Conversion, and Avoided Wetland Conversion.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Task 3D. Create Biophysical Criteria Layers

Participants: Technical Lead, Landscape Manager

Resources: Data Collection Template

Estimated Time: Varies, depending on avaiability of stakeholders. Likely weeks to months.

Checklist for finalizing Task 3D:

- ☐ Completed Biophysical Criteria tab, listing how biophysical attributes affect or interact with activities (e.g., positive/neutral/negative relationship).

An effective landscape plan considers a broader spectrum of benefits that stakeholders desire and that nature-based solutions offer. The benefits of activities extend far beyond carbon mitigation potential that was mapped in Task 3C– for example, they can enhance ecosystem services such as water purification, soil fertility, and pollination, thereby supporting agricultural productivity and ensuring the well-being of local communities. This task aims to incorporate those additional benefits into the CPLUS evaluation.

Return to your completed Data Collection Template, Criteria tab to begin the steps below.

- **Gather Data:** Collect the spatial datasets for the biophysical criteria identified in the Data Collection Template, Criteria tab. Consult stakeholders to ensure appropriate datasets are included. Data sources may include, for example, the location of a water source to represent water availability, the boundaries of a crucial biodiversity habitat to represent biodiversity, or the presence of green-gray infrastructure along a coastline to represent climate resilience (this infrastructure mitigates damage from hurricanes or storms).
- **Determine the directional impact of CPLUS activities on biophysical criteria**: It's often the case that spatially and accurately quantifying the impact of an activity on biophysical factors like biodiversity is often limited by the lack of data and impact studies. If precise impact estimates on biophysical criteria aren't possible, we recommend an alternative solution: evaluate the "direction" of an activity's impact - e.g., whether an activity will have a broadly positive, neutral, or negative impact – on biophysical criteria.

  With stakeholders, discuss the impact that an activity could have on each of the biophysical criteria selected. For example, will establishing an improved grazing activity have a positive impact on biodiversity as rotational grazing locations are established and overgrazing is prevented?

  Complete the assessment the Data Collection Template, Criteria Impacts tab. We recommend conducting this activity in Workshop 1.

  - In Column A, list the name of each activity
  - In Row 2, Columns B and on, list each criteria selected in Task 3C
  - Complete the table:
  - Enter a '+' if the activity has a positive impact on the criteria
  - Enter a '-' if the activity has a negative impact on the criteria
  - Enter a '0' if the activity has a neutral impact on the criteria
- **Clean data:** Gather all spatial data you intend to use to represent biophysical criteria and clean it to ensure that the dataset has full coverage within your study area.
- **Normalize data:** Normalize each biophysical criteria dataset between 0 and 1 to ensure that each factor has the same baseline impact on your multi-criteria analysis. Two datasets will potentially need to be created here for each biophysical factor depending on how it is impacted by each activity - one representing the positive impact and one representing the negative impact (a neutral impact would just result in the omission of the dataset for that activity during the analysis.)

  For example, if you intend to prioritize by biodiversity vulnerability, you will want to implement an activity that has a positive impact on biodiversity in areas that have particularly vulnerable biodiversity, so you would normalize the data so that values of 0 have low vulnerability and values of 1 have high vulnerability. If your activity has a negative impact on vulnerability, however, you will want to normalize the data so that values of 0 have a high vulnerability and values of 1 have a low vulnerability to ensure that this activity is implemented where biodiversity is less at risk.
- **Add data to the CPLUS tool:** Once this data has been created for each "direction" for each biophysical factor, you can add this data as a priority weighting layer in the CPLUS tool.

Task 3E. Collect Financial Data

Participants: Technical Lead, Activity Leads, Financial Analyst/Operations Manager

Resources: Data Collection Template

Estimated Time: Varies, depending on avaiability of stakeholders. Likely weeks to months.

Checklist for finalizing Task 3E:

- ☐ Completed financial templates
- ☐ Cost/revenue per hectare per year
- ☐ Net present value per hectare per year
- ☐ Financial information uploaded to CPLUS tool

The CPLUS Financial Data Methodology

Understanding the financial costs and potential revenues associated with nature-based solutions can be valuable to develop landscape strategies that are not only socially and ecologically beneficial, but also economically viable. By incorporating financial costs into landscape planning, CPLUS can help minimize costs and maximize benefits, attracting financial investors who require financial insights to better assess the benefits and risks of their investment.

Under ideal circumstances, it is technically possible - and theoretically sound – to create spatially explicit layers that reflect the costs of various activities. For instance, the costs harvesting timber may vary based on distance to lumber mills, while net revenues from agricultural produce can be influenced by their proximity to factories or markets. However, in many cases, financial data is either incomplete or unavailable. And global estimates of NbS costs can vary dramatically, rendering them of limited use for a locally focused decision support tool like CPLUS.

Even when financial data is available, models and data for different activities may be structured differently or rely on different sets of assumptions, making it difficult to compare them with consistency and accuracy. Finding spatially explicit cost data for any specific activity can be extremely difficult and time-consuming, let alone for all activities under evaluation.

Assuming limited data availability, we recommend using a simplified financial model that can be applied for all activities. This approach ensures that the minimum viable information needed for CPLUS is obtained, without overburdening the Evaluation Team. The CPLUS financial approach uses the Net Present Value per hectare (NPV/ha) as the metric to compare finances between activity types. The required information is described in Table 4. CPLUS provides a template, as described in the next section, that will help your team prepare this required information.

Note that this financial data is a necessary but insufficient component of financial proposals. While financiers will likely require more detail in financial proposals to be willing to fund activities at scale - including risk analysis, market assessments, breakdown of cost categories, etc. - this step is sufficient to incorporate financial considerations into the CPLUS prioritization process, while serving as a conversation starter for funders.

Collecting Financial Data

Make a copy of the Data Collection Template – Finances file. You will need to complete the three tabs (Activity Description, Cost Data & Model Factors, and Financial Model) for each activity in the CPLUS evaluation.

- In the **Activity Description tab**, write a brief description of the activity.
- The **Cost Data & Model Factors tab** provides a template for your team to complete with information about each activity and its costs. We recommend holding one on one or small group conversations with the stakeholders who are most familiar with the costs of an activity in order to complete the following details:
  - **Hectares covered:** Enter the number of hectares that the costs for the activity apply to.
  - **Discount rate:** Enter the discount rate – the percentage used to calculate how much future money is worth today. This is used to determine how future costs and revenues compare in today's terms.

    We recommend selecting a discount rate based on historical inflation rates for the country in question. You may reference datasets from the World Bank or other reputable sites.
  - **Item:** Select an option from the drop-down menu that describes the type of cost.
  - **Units:** Enter the number of units required for that item. For example, if vehicles are required, enter the number of vehicles necessary to implement the activity.
  - **Cost/Unit:** Enter the cost per unit for the item, in the local currency.
  - **Cost Frequency:** Select an option from the drop-down menu: One-time for a one-time cost, and Recurring for an annually recurring cost.
  - The remaining columns will be auto populated based on your input in the green cells.

  In cases where these details are unknown, you may consult literature reviews to estimate costs specific to the region.
- The **Financial Model tab** is largely auto populated based on the information entered in the Cost Data & Model Factors tab. You will need to enter the Starting Calendar Year to determine which year the activities will begin.
- Once this information is collected for each activity, you can add the data directly to the CPLUS tool. Learn how by reading the CPLUS Tool User Manual.

Table 4. Financial variables to be collected

Variable	Details	Additional Notes
Number of years	How many years does it take for the activity to complete?	If the activity is intended to continue in perpetuity, use 2030 as the cutoff year (or whichever year CPLUS is intended to create a long-term land management plan for).
Discount Rate	What interest rate (representing the time value of money) should be used to assess activities?	This is a subjective factor, as there are multiple approaches to choosing an interest rate. Examples of common approaches can include using the expected rate of inflation, the weighted average cost of capital, etc. As a principle, a higher discount rate emphasizes shorter-term cash flows, while a lower discount rate places more weight on cash flows further in the future.
Costs and Revenue	For each year that the activity is in operation, what are the total costs required to implement the activity? What are the total revenues generated by the activity?	Noting that costs and revenues may be divided differently across stakeholders depending on the activity type, we recommend defining costs accrued by the stakeholder responsible for implementing the activity, presumably also the stakeholder using CPLUS. For example, if Conservation South Africa (CSA) intends to scale up a sustainable agriculture activity, use the costs borne by CSA to implement the activity and any cut of revenues CSA would receive, instead of costs and revenues borne by farmers participating in the activity. Note that other configurations are possible, such as accounting for all costs and revenues accrued by all stakeholders but would likely make data collection a more arduous task. Whatever approach CPLUS users decide on, it is important to be consistent across activities being analyzed.
Activity Hectarage	When estimating activity cost and revenue, how many hectares are assumed to be under implementation?	Some readers may note that this approach creates a significant assumption: that costs and revenues per hectare remain constant with scale. This is a deliberate simplifying assumption. While the reality is that most activities experience economies of scale, attempts to build this into the CPLUS model were found to be unnecessarily complicated due to the recursion it would create (CPLUS suggests the number of hectares each activity should be scaled based on factors like activity cost, but introducing economies of scale would mean that activity costs are a factor of the hectarage, creating a constant loop). Future iterations of CPLUS theory may revisit this approach; for now, however, assuming cost per hectare to be independent of scale is sufficient for the CPLUS prioritization process.

Step 4: Create Scenarios

After completing Step 4, you will have:

- Collected input from stakeholders to understand how they prioritize the evaluation criteria
- Developed landscape scenarios in the CPLUS tool, using stakeholder priorities as input

Once the necessary data has been collected, stakeholders can begin to prioritize evaluation criteria and co-create CPLUS' main output: scenarios to determine where activities are best suited in a landscape. Through the creation of these scenarios, stakeholders can evaluate tradeoffs by re-running scenarios to compare the impact of changing the weights of priority weighting layers (step 3B-3D), estimate resulting costs and benefits from a given scenario that can be compared to stakeholder and policy targets, and identify low-hanging fruit by running multiple scenarios with different stakeholder values to look for overlap of any activities in a given area.

Task 4A. Create Scenarios

Participants: Evaluation Team, Stakeholders

Resources: CPLUS Tool (Plugin for QGIS)

Pairwise ranking spreadsheet

A laptop capable of running computationally intensive processes or an internet connection to run the analysis on the cloud

Estimated Time: 4-8 weeks to plan an in-person workshop

1-2 days for workshop activities

Checklist for finalizing Task 4A:

- ☐ A completed map (or set of maps) output by QGIS based on an initial set of user weights for each variable

Once you have finished Step 3, you are nearly ready to run scenarios in the CPLUS tool. In the CPLUS QGIS Plugin, you should have: uploaded NCS pathway layers and carbon layers for each pathway, connected pathways to activities, and uploaded data for each critieria, linking each criteria to activities. Details on how to set up and operate the QGIS plugin, including the data loading process, can be found on cplus.earth.

From here, you can manually adjust the priority settings to ensure the final maps reflect local stakeholder values. Each criteria can be prioritized on a scale of 1-5.

There are many ways to assess the priorities of a group of stakeholders. One example of is to use a pairwise ranking exercise where stakeholders rate the criteria with a score from 1-5. Then, you can use the average score for each criteria to run a scenario. Multiple scenarios can be generated showcasing different priorities, or combinations of them (for example, using the mode scores for each priority, or identifying 1-2 priorities that were rated the highest).

The CPLUS tool then uses the priorities input to run a multicriteria analysis for each activity. This analysis uses a raster calculator to sum all variables included in the analysis, accounting for the user defined priorities. This produces a final version of each activity, weighted by priority, with values ranging from zero to the sum of all variable coefficients.

The final output of CPLUS is a highest position analysis, which shows the highest weighted activities in a given location. In this step, the QGIS plugin identifies the activity with the highest weighted value for each pixel in the landscape and produces a map identifying which activities should be implemented, where, based on the user priorities. In addition, for quantitative variables where the data includes the magnitude of impact (e.g. carbon, cost & revenue), the plugin can also produce summary statistics indicating impact estimates for the scenario in question. While highest position analysis is a relatively common analytical framework, the QGIS plugin significantly accelerates the process by reducing the amount of manual work required, allowing new scenarios with different weighting schemes to be created on-demand.

Task 4B. Interpreting Results

Participants: Evaluation Team, Stakeholders

Resources:

Estimated Time: Varies, depending on feedback

Checklist for finalizing Task 4B:

- ☐ CPLUS plans are evaluated with stakeholders
- ☐ If a number of scenarios are developed, stakeholders compare tradeoffs and synergies between plans

With the scenario maps and summaries in hand, users can now begin to interpret and ground truth the results before developing their desired outputs (e.g., workplans, strategies, donor proposals, etc.). Stakeholders should review these maps and evaluate whether activities are located in the correct places, and note anything that seems out-of-place or surprising. For example, users can confirm activities are not depicted in unsuitable geographies (e.g., due to biophysical or cultural/political restrictions) or revisit their priority rankings, if they expected certain priorities to be more (or less) represented in the maps.

Since CPLUS does not dictate how to implement, but rather where, it is imperative that users take time to think through what a proposed activity in a given area would require in terms of resourcing, staff, and partner involvement. Who else would need to be involved in conversations if the proposed activities presented in the maps/summaries were to be taken forward?

Finally, users should consider the scale of the map/scenario summary being presented and how that integrates into their desired outputs. Larger regional-level scenarios can present how a landscape can orient itself towards national and global targets, whereas smaller municipal-level scenarios can zoom in and set the foundation for precise activity planning.

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Example topics to discuss are included below.

Activity:

- Does the scale of the proposed activity make sense?
- What stakeholders would need to be involved to implement activities at this scale?

Cost:

- Are the costs of implementing activities realistic?
- How does the cost compare with other activities aimed at achieving similar outcomes?
- Who bears the costs of these activities?

Benefits:

- Do the estimated carbon benefits make sense?
- Are there key biodiversity areas not represented in the analysis?
- Do the activities proposed benefit local communities?

Policy alignment:

- What local or national policies might support these activities?
- Are there existing government incentives that can be leveraged to promote these activities?

Validation:

- Are there results that are unexpected? What may have led to the result.
- Are there data gaps? Identify recommendations to address any issues that arise. Additional maps may be created in real time if issues can be addressed immediately.

The development, discussion and iteration of these maps is a critical part of fostering trust and buy-in among stakeholders, and facilitators should be prepared to conduct multiple rounds of consultation. Involving a diverse group of stakeholders can help strengthen the recommendations that emerge and validate whether they are feasible.

Step 5: Iterate

After completing Step 5, you will have:

- Assessed the implications of scenarios developed in Step 4
- Drafted recommendations and a plan for next steps

Throughout this step, it is imperative to remember that CPLUS is not intended to unilaterally create a shovel-ready workplan. Instead, its purpose is to present data in a spatial format that encourages stakeholder discussion around realistic and actionable next steps.

Once stakeholders have assessed the maps and scenario summaries, discussions can begin around the next steps. In practical terms, identifying the next steps is best completed in a workshop. While there are several ways to approach this step, we recommend the workshop facilitators consider helping the group identify "low-hanging fruit" - activities that emerge as top candidates for a given plot of land across diverse stakeholder priorities.

From there, stakeholders can talk through how to act on low-hanging fruit, using suggested questions below to spur discussion:

- Is the information provided sufficient to inform actions or is additional data needed?
- What does it look like to implement the proposed activities, particularly in cases where there would be a change from what is currently taking place?
- What are the costs to implement the activities? Are there potential funders that could support this work? Are there opportunities to use the analysis to secure financing for implementation?
- Are there other stakeholders who have not been consulted that should be involved in the review process?
- How does a proposed activity impact other outcomes - for example, in a scenario where carbon sequestration is mostly highly valued, what impacts do the proposed activities have on the other values such as livelihoods or biodiversity?

You may need to rerun scenarios to reflect discussions. Following these consultations, once stakeholders come to a consensus regarding a landscape map or a subset of a map, the activity team can plan next steps. This may include:

- Creating a proposal for funding based on the activities detailed in the scenario, detailing information about the landscape, stakeholders and their identified values, proposed activities and their impact in achieving landscape goals.
- Informing an organization's short- or long-term strategy and potential to scale,
- Support policy and government decision makers in the creation or update of local/regional/national policies.


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Beyond CPLUS: Financing and Implementation

In the realm of land management, where opinions diverge and complexity abounds, CPLUS aims to facilitate stakeholder engagement and negotiations, ultimately arriving at a shared, actionable vision for landscapes that is aligned with nature goals and other priorities. What happens once this goal is reached? Does CPLUS theory require further instructions on how to implement this vision?

This is where the flexibility of CPLUS comes into play. Acknowledging the sheer diversity of landscapes and management approaches around the world, CPLUS does not attempt to become a panacea for land management. CPLUS users are not required to overhaul existing processes to derive value from the tool; quite the contrary, the team strongly encourages CPLUS to be integrated into existing land use planning and budgeting forums. This is another reason why strategic stakeholder identification is so important: by socializing CPLUS with key decision-makers in the landscape early in the process, users can increase the likelihood of successful integration, enhancing and refining existing efforts instead of trying to compete with and replace existing structures.

Still, even though CPLUS mainly focuses on the planning and consensus-building elements of land management, its relevance extends far beyond those steps, including finance and implementation. If financial variables were included in the CPLUS analysis, users would be able to build on the data as a foundation for investor dialogue and pitches. Some funding sources, such as development agencies and multilateral banks, may be large and broad enough to handle a proposal for the entire landscape, while others, like companies or foundations, may only be interested in funding activities that align completely with their specific investment strategies. CPLUS enables users to engage with both types. With the CPLUS output, users could either create a landscape-level proposal capable of articulating program impacts on multiple biophysical and financial variables (e.g. carbon contribution of each activity, aggregate costs and revenues, etc.), or "divide and conquer" by fundraising for individual activity components, pitching the components as part of an interlocking set of activities across the landscape. Crucially, as activities are facing increasing scrutiny given past incidences of mismanagement and stakeholder backlash, stakeholder engagement protocols are increasingly recommended or required for companies looking to invest in land use activities (e.g, the Science Based Targets Network, International Social & Environmental Accreditation & Labeling, the Taskforce on Nature-related Financial Disclosures, etc.). On this front, CPLUS can offer a compelling value proposition as a risk mitigation mechanism, presenting activity funding opportunities at scale that already have stakeholder buy-in.

When it comes to implementation, the activities analyzed should be based on existing activities already being implemented by stakeholders. Hence, implementing agencies should already have a degree of familiarity with those models, and use CPLUS scenarios mainly as a roadmap of where the activities should be scaled up, rather than guidance on the how. Still, there are a few points CPLUS users should note that deviate from business as usual. First, the aim of CPLUS is to accelerate implementation of nature-based solutions. Operating at scale comes with additional management considerations. Is the activity purely modular? Are there additional organizational needs to make activity execution more efficient? Depending on the activity in question and fundraising ability, there could be economies of scale; capital investments or technological improvements previously out of budget may now be justified with greater area coverage. There may also be economies of scope. One of the side benefits of CPLUS is helping users think laterally across activity types, rather than just focusing on their own purview. Where there are activities with synergistic components, CPLUS could be used as a springboard to explore opportunities for collaboration. Could implementing agencies and stakeholders jointly benefit from collectively investing in equipment or research? Conducting joint fundraising efforts? Sharing lessons learned? CPLUS users would do well to anticipate these questions to capitalize on opportunities when the time is right.

Ultimately, CPLUS is more than just its outputs, and should be thought of as a process, not just an end result. Then again, when does land management ever truly end? Governments develop recurring five-year plans for their policies, updating each successive plan with insights on technological advancements and best-practice breakthroughs. In a similar manner, CPLUS should be thought of as an iterative approach, providing actionable insights that are refined with additional stakeholder input, feedback, and research. We hope that, by supporting existing efforts to implement nature-based solution at scale, CPLUS can help promote land management practices that are holistic and impactful, slowing the pace of climate change and nature loss while addressing stakeholders' needs for a sustainable future.

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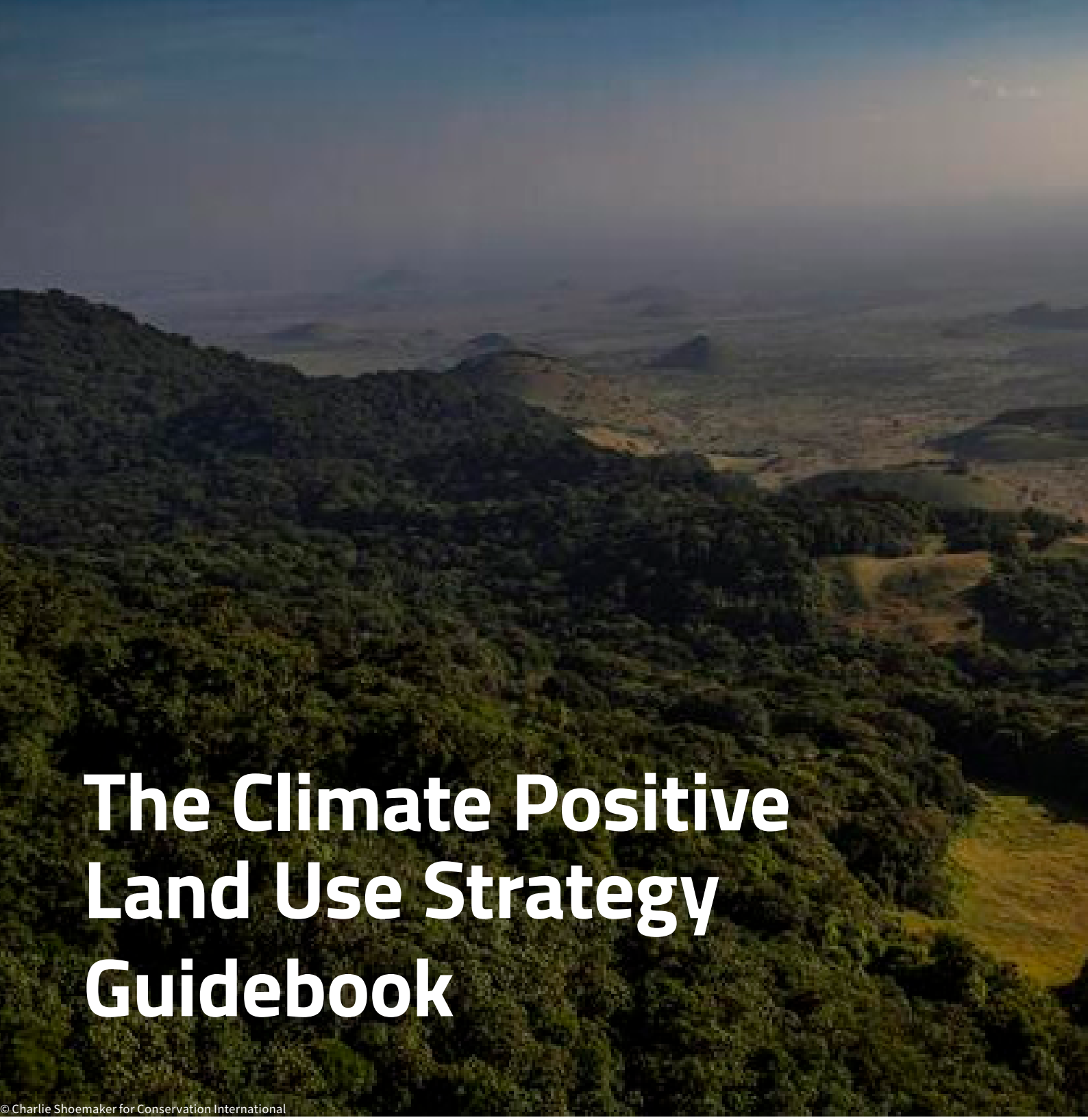

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