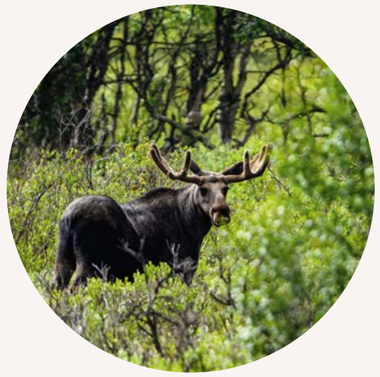
Climate Forest Development Concept

Global guidelines for the Climate Forest Group on the management and restoration of forest areas.

Climate Forest
a Waldholz Group Company



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1.0 Foreword

The founders of *Climate Forest* have been active in forestry for over 20 years. For a long time, we pursued goals that were defined solely in terms of timber yield. There was no alternative source of income for the forest owner.

Today, in 2024, the vast majority of asset managers, funds, family offices and other investors, still primarily invest in timber production. Return in the form of cash flow is the focus of most forest owners. Where possible, carbon credits are often used additionally without abandoning traditional management models. This is not our approach. At *Climate Forest*, you won't find any plantations or monocultures, nor will you find any clear-cutting. But you won't find double-digit returns either. There is no such thing as a forest that can do everything. As an investor, person or company, you have to make a decision.

When you invest in our forests, you are investing in the future of the earth.

There is no doubt that almost all forest areas on earth are either already overexploited or threatened in some other way. Only in primeval forests can we find the kind of forests that once covered large areas of the earth's surface. Today, forests are more important than ever. They provide vital ecosystem services like cooling the planet, filtering air and water and improving soil health. Next to the oceans, forests are the largest and also the most complex habitats, invaluable for the biodiversity of our planet. Forests are also the largest natural CO_2 reservoir on land. Growing forests can filter gigantic amounts of CO_2 from the atmosphere and thus counteract global warming.

Whether SDGs, carbon or biodiversity credits, donations or philanthropic engagement - it will probably still be a long journey for humanity until we have found and consolidated the right way(s) to integrate climate and nature conservation into our economy.

Time and again, one system or another is criticized. Greenwashing is a word that is often used and makes us cautious. There is uncertainty among investors as to whether and which projects really make a contribution.

As founder and CEO of the *Climate Forest* Group, it is my personal goal to actively, measurably and comprehensively implement climate and species protection through changes in forest management and active reforestation. Our activities and services should therefore be measured in a scientifically sound manner. We do not engage in political discussions and theoretical model calculations. We therefore reject any remuneration system that theoretically calculate additionality and price possible future effects without a physically measurable impact having been determined.

The following concept for the development of so-called climate forests is intended to serve as a template for you and us in order to align our actions and clearly define our goals. We will continue to develop this concept on an ongoing basis, together with experts from various disciplines.

Göttingen, April 2024

Sebastian Seidel

CEO and Founder
Climate Forest

BACKGROUND

Development of climate forests through near-natural forest management

As *Climate Forest*, we have set ourselves the task of contributing to climate and species protection by taking responsibility for forest habitats and the animal, fungal and plant species that live in them.

We do this by promoting and protecting the diversity and naturalness of forests and strengthening their natural contribution to climate protection. In this way, so-called climate forests are to be created and permanently preserved on the forest areas we manage.

The primary aim is to preserve and increase the capacity of forests to absorb carbon and the diversity of biological life. This is to be achieved without compromising the provision of the climate-friendly raw material wood and the fulfillment of other essential functions of the forest ecosystem.

[1] Vgl. https://www.un-redd.org/glossary/improved-forest-management-ifm

CLIMATE FOREST MANAGEMENT (CFM)

Climate Forest Management is a so-called near-natural forest management and understands the forest as a permanent, diverse ecosystem that maintains and develops its performance and resilience through natural processes.

Accordingly, the principle is followed of intervening in the forest as little as possible and, if at all, then as gently as possible. This results in natural, healthy and productive mixed forests with trees of different sizes, heights and ages. Many species find the habitat they need in these structurally rich forests.

NATURE-BASED SOLUTIONS

Nature-based solutions are solutions that are inspired and supported by nature. To this end, existing ecosystems and their functions are strengthened and protected or used in such a way that ecological, social and economic benefits can be achieved sustainably, i.e. over generations. The aim is to restore the full potential of forests, which have a positive impact on climate, soil, air, water and biodiversity and thus make a fundamental contribution to life on earth.

IMPROVED FOREST MANAGEMENT

The Improved Forest Management concept encompasses all actions and methods in forests that increase carbon storage and/or reduce greenhouse gas emissions from forestry compared to conventional approaches. In addition to the usual IFM concepts, CFM also takes into account other ecosystem services beyond the mere reduction of CO_2 emissions and the increase of carbon stocks. Through adapted measures such as biotope management, the creation and preservation of deadwood, the promotion of mixed forests, forest interior design and other „tools“, our IFM also specifically promotes the development of structurally complex forests and thus the biodiversity, resilience, cooling capacity and other ecosystem services and functions of our climate forests.

1.2

Legal and political framework

Important legal and political requirements for the management of forests are provided in national forest and environmental protection laws. These are supplemented by international agreements and guidelines (e.g. the United Nations Convention on Biological Diversity or the European Natura 2000 guidelines).

Regional nature conservation plans or certification standards (FSC, PEFC) form further framework conditions that must be observed when implementing the objectives described in this concept. Close-to-nature forest management contributes to the achievement of and compliance with these framework conditions.

As we move towards a sustainable future, we recognize the importance of both the **primary** and **secondary** Sustainable Development Goals in our work. Our main focus is on the **primary SDGs**, which embody our core mission and our immediate efforts.

Meadow Brook Forest
Maine. USA

INFOBOX

SUSTAINABLE DEVELOPMENT GOALS

The 17 Sustainable Development Goals (SDGs) are political goals of the United Nations that aim to promote sustainable development at a global economic, social and environmental level. At the heart of these goals is the promotion of economic growth, the reduction of socio-economic disparities, the promotion of equality and the responsible management of natural resources. This is supposed to ensure the protection of ecosystems and increase their resilience. The four goals „Climate action“ (SDG 13), „Life on land“ (SDG 15), „Responsible consumption and production“ (SDG 12) and „Clean water“ (SDG 6) are primarily relevant for this concept.

1.3

Primary goals for sustainable development

SDG 13 Climate action:

SDG 13 calls for urgent action to combat climate change and its impacts, with specific targets aimed at strengthening resilience, raising awareness and promoting effective climate change management. *Climate Forest* actively contributes to these goals through strategic initiatives:

1. Permanently securing CO_2 storage for 99 years through a long-term commitment to forest protection.

2. Increasing the CO_2 sink capacity by restoring those structures that maximize the overall productivity of the forest ecosystem (complex structures), as well as reducing climate-damaging, short-lived wood products (pulpwood).

3. Reforestation and afforestation of deforested areas.

SDG 15 Life on land:

We are committed to the integrity of terrestrial ecosystems and are committed to improving habitat conditions for native species, underscoring our commitment to the conservation and stewardship of forest ecosystems:

1. Reforestation and afforestation of deforested areas

2. Prohibition of clear-cutting

3. Various biotope designs

SDG 12 Responsible consumption and production:

Climate Forest places great importance on sustainable raw wood production in order to protect forests as vital habitats. We ensure responsible sourcing practices that go beyond industry standards:

1. Prohibition of clear-cutting: *Climate Forest* strictly prohibits clear-cutting of more than 0.5 hectares in all project forests to preserve biodiversity and ecosystem integrity.

2. Preference for long-life products: Prioritizing the production of durable wood products for structural applications over pulpwood ensures longevity of CO_2 storage despite use and reduces waste. Use in cascades (first construction timber, then subsequent use) is thus possible.

3. Promotion of mixed forests: *Climate Forest* avoids monocultures, which are known to damage soils, and instead promotes more stable mixed forests. Yield losses and additional costs are offset by the sale of carbon credits and a low risk of failure.

SDG 6 Clean water:

Our *Climate Forests* play a crucial role in the water cycle system. Research shows that forests increase water storage and filtration, ensuring access to clean water.

1. Conservation and protection of natural watercourses

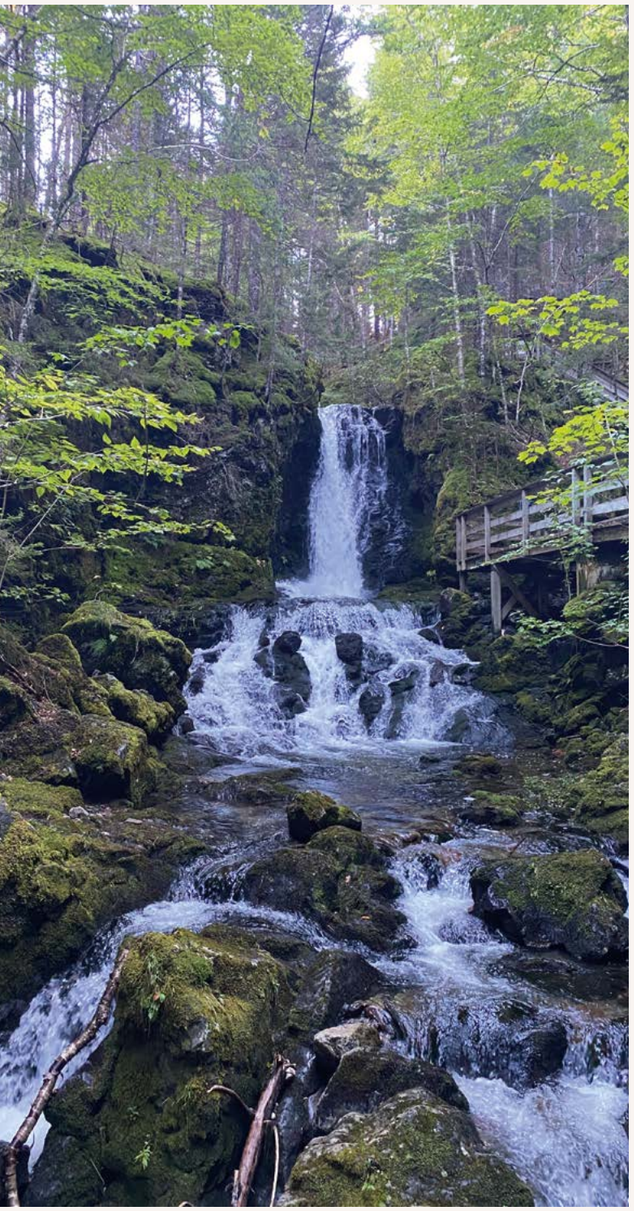
2. Prevention of soil erosion in watercourses

3. Rewetting and natural development of watercourses, e.g. through the undisturbed spread of beavers

4. Soil protection to improve water filtration, e.g. by planting mixed forests and prohibiting clear-cutting as well as the creation of structurally rich forests

1.4

Primary SDGs – Our impact today



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The following table summarizes *Climate Forest*'s current contribution to the SDGs based on data from 2023. These figures reflect the current status of our climate forests and their impact on the SDGs. Projections for SDG 13 are based on data from 44.moles-Scans. The 2023 annual report will be published in 2024. Progress towards the SDGs is measured annually and presented in the annual report. As the climate forests are still at an early stage of development (2023-2024), the actual contribution to the SDGs will only be evident in the coming years.

Climate Forest is committed to continuous monitoring and transparent reporting on its progress towards achieving the SDGs. We will measure our performance against the above KPIs and provide regular updates on our impact in our annual reports. As our climate forests mature, our contribution to the SDGs grow. Each climate forest project is reported in detail with its contribution to each SDG. This will include specific project targets, benchmarks and achievements related to each SDG. This detailed reporting will provide a comprehensive overview of *Climate Forest*'s impact on sustainable development.

Primary SDGs	*Climate Forest* Impact
13 CLIMATE ACTION	• Emissions per hectare 2023: 4.3 tons CO_2/ha • Total emissions 2023: 165,000 tons of CO_2 • Storage per hectare 2023: 231 tons of CO_2/ha • Total storage 2023: 8.4 million tons of CO_2
15 LIFE ON LAND	• Structural complexity - scientifically called Box-Dimension: 2.253/3.000. This value is an indicator of biodiversity in forests. The correlation between the Box-Dimension Score and the diversity of species varies greatly between regions worldwide, e.g. rain forest vs boreal forest. • *Climate Forest* will work with companies that have advanced technologies to measure biodiversity. This collaboration will make it possible to record and monitor biodiversity in the climate forests even more accurately.
12 RESPONSIBLE CONSUMPTION AND PRODUCTION	• Avoidance of deforestation: In order to double the proportion of sawlogs, deforestation will be avoided so that the trees can grow stronger. • Reduction of industrial timber assortments: Currently, industrial wood assortments (pulp and paper with a short lifespan) make up 60-70% of the wood harvest. *Climate Forest* is pursuing the goal of significantly increasing the proportion of logs. • Increasing the proportion of valuable wood: The proportion of value wood will be evaluated in the future. This will enable precise documentation of the development of forest stands from industrial timber stands to high-quality stemwood stands.
6 CLEAN WATER AND SANITATION	• Challenges in measuring the effects: There is currently a lack of suitable measurement methods to quantify the effects of climate forests on water quality and quantity. Therefore, the effects can only be described as qualitative KPI. • Recognized scientific evidence: Despite the measurement challenges, there is recognized scientific evidence that healthy forests with a closed canopy cover and a typical forest interior climate have a positive impact on water filtration and storage capacity. • *Climate Forest* operates under the assumption that forests positively impact regional water resources, including quality and quantity.

1.5

Secondary goals for sustainable development

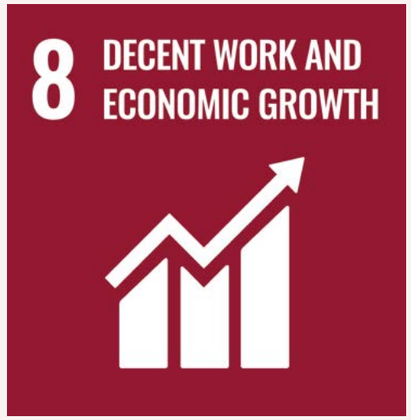
While the primary SDGs form the cornerstone of our direct impact, we also recognize the importance of the secondary SDGs, which are also directly influenced by our projects. The secondary SDGs are currently related to our project in Tanzania.

SDG 3 Good health and well-being:
By promoting initiatives that improve access to health-care and well-being, we contribute to improving health in communities.

SDG 8 Decent work and economic growth:

By creating sustainable employment opportunities and promoting economic growth in the Global South, we support individuals and communities towards a more prosperous future.

In addition, our projects indirectly touch on a number of other SDGs, including eradicating poverty (SDG 1), zero hunger (SDG 2), quality education (SDG 4) and promoting industry, innovation and infrastructure (SDG 9).



Direct		Indirect
Primary (all projects)	Secondary (global South)	(global South)
		

Minimum Criteria

- *Climate Forest* declines project areas, which without doubt have been subject to overexploitation and where significant parts of the project have been clear-cut. Calamity areas are exempt.
- 99 years of forest conservation with simultaneous promotion of biodiversity
- Close-to-nature forest management
- 3D-laser scan with highest accuracy for the quantification of carbon storage capacity

- The minimum criteria for the secondary and indirect SDGs have not yet been established by *Climate Forest*, but they are being developed in collaboration with local partners and local communities on a project basis

Services

- Creation of climate forest projects, forest investments, sustainable forest management, improved forest management, measurement and creation of biocarbon credits, support for local communities

- Forest conservation and reforestation projects in structurally weak regions worldwide
- Local job creation and poverty reduction through fair long-term employment
- Parts of the proceeds from projects are invested in basic medical care

- Development of local infrastructure
- Power supply through new technology (i.a. for the laser scanner)
- Provision of laptops

Results

- Reduction of CO_2 emissions
- Protection of current species diversity and increase in biodiversity
- Sustainable timber production, improved wood processing methods
- Availability and sustainable management of water resources

- Improvement of living conditions, e.g. healthcare, water quality
- Creating local employment opportunities

- Combating poverty, improving the quality of food production (soil quality), improving the quality of education, improving infrastructure

Key Performance Indicators (KPIs)

- Measurement of the storage of greenhouse gas emissions (CO_2 equivalents) + number of biocarbon credits
- Structural complexity (biodiversity indicator, forest health indicator, microclimate indicator)
- Tons of sustainably produced wood
- Water storage and filtration

- Number of people with access to healthcare
- Number of people employed in the healthcare sector
- Number of jobs created

- Household budget per capita
- Agricultural and forestry expertise
- Number of people with internet access

1.6

Forest management, climate protection and nature conservation

Our *Climate Forest* Management Concept (CFMC) for the development of climate forests with its silvicultural principles, brings numerous legal and political requirements to life and thus provide an important framework for the management of the forests we manage. A particular focus is on contributing to the achievement of sustainable development goals. Four of the 17 goals are directly related to the forest habitat and are at the heart of *Climate Forest*'s forest management.

The primary development goal is to promote site-adapted, natural mixed forests that are climate-adapted, well-stocked, fast-growing and species-rich. These forests are usually characterized by a rich structural complexity, are adaptive to environmental changes, have a pronounced capacity for regeneration, provide a habitat for numerous animal, fungal and plant species and are characterized by above-average carbon storage in their biomass.

1.7

Near-natural land management outside of the forest

Numerous valuable open land areas, lightly vegetated zones, forest edges and bodies of water also contribute to the promotion of biodiversity as essential elements of the managed forests. These habitats are protected, maintained and further developed through measures specifically tailored to them. The protection and preservation of wetlands are of particular interest due to their importance for climate protection, biodiversity and water conservation.

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1.8

A binding framework for all managed forests and stakeholders

BINDING REQUIREMENTS AT ALL LEVELS

Global framework
Concept for the development of climate forests silvicultural model „The climate forest“ (see page 29)

Project-related framework
Site-specific *Climate Forest* Management Concept (CFMC) for individual forests or contiguous forest areas or for each project

Framework guidelines and binding specifications for measures on site by defining silvicultural principles, e.g. soil-conserving work in the forest or consideration of setting and breeding seasons

Derivation of practical action goals and implementation of concrete measures in the forest, e.g. maintenance measures or planting

The concept for the development of climate forests represents a binding guideline for all corporate divisions, employees and other stakeholders. It is supplemented and specified by regional and site-specific management strategies.

The regional and site-specific management concepts are drawn up on the basis of this framework concept and updated in parallel with the medium and long-term development goals. In this process, care is taken to ensure that practical action objectives and measures for operational activities are developed directly for the areas concerned.

Thanks to the strong commitment of our employees, we are confident that we will be able to achieve our goal of establishing a large number of climate forests in the shortest possible time and thus make a significant contribution to climate protection and the preservation of biodiversity in forest ecosystems.

2.0
Climate forest & biodiversity

2.1
Climate protection

The management of forests at *Climate Forest* aims to achieve the highest possible and, above all, permanent CO_2 sink performance and permanent storage of the extracted carbon in living biomass.

The CO_2 sink is maximized by largely reducing timber harvesting and permanently building up stocks of living forest trees as well as creating thermodynamically efficient forest structures. Fixed target agreements with the landowner and project durations of 99 years as well as the creation of adaptable and resilient forests ensure that the sequestered carbon remains permanently bound.

A significant proportion of the world's commercial forests are severely understocked, which means that the forest contains significantly less biomass and thus less sequestered carbon than possible. The aim of *Climate Forest* activities is to significantly increase, stabilize and permanently secure the stock.

The potential for increasing the carbon stock in the project forests is between 5 and 10 times the initial state. We select the project forests according to these criteria, among others, because the potential for improvement is particularly high here. A forest that is already a primeval forest or similar to a primeval forest does not need our support. *Climate Forest* relies on state-of-the-art measurement technology in order to assess and measure the current carbon stock in the best possible way

Webb River Forest
Maine, USA

The project areas are remeasured every five to ten years. *Climate Forest* markets the sink service provided via partner companies according to the measured service provided (ex-post) and guarantees long-term conservation.

Climate Forest measures **additionality** based on data that is measured, not on model calculations, reference considerations or other theoretical concepts.

Climate Forest thus becomes a significant supplier of carbon removals that are generated and marketed ex-post.

We therefore reject the current certification systems unless they change significantly.

The carbon removals produced by *Climate Forest* have the following quality characteristics:

1. It is a sink or storage service already provided by the forest that can be measured in real terms.

2. It has been digitally and precisely measured externally using LiDAR technology (see below) and can be verified at any time.

3. External companies regularly check the measurements and results.

4. The removal credit is secured long term. Release is prohibited for 99 years.

5. *Climate forest* management reduces the risk of unintentional release, e.g. through fire, as far as possible.

6. 85% of the initial stock is protected free of charge. Among the removals, further avoided emissions are therefore significant.

2.2

Climate Forest methodology and standard

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Climate Forest follows the guidelines of the UN, especially the UNFCCC, and strives for accreditation of its projects in accordance with Article 6.4 as soon as the countries have set up the necessary instruments.

Climate Forest is convinced that certifications or standards organized under private law will not last in the long term and will be replaced by statutory or state regulation.

The *Climate Forest* methodology stipulates that the measurable additional storage of carbon between two inventories can be counted as a removal credit if this storage can be maintained permanently, for at least 50 years, usually 99 years.

This means that forest owners can only generate removal credits if they

a. have actually generated them in a measurable way
b. have secured them permanently.

Climate Forest criticizes the methodology of reference models for the following reasons:

1. The selection of the reference areas already allows a strong manipulation of the desired results.

2. Reference areas and their projections are based on assumptions that correspond to the current state of knowledge. However, due to rapidly changing environmental variables, it is doubtful whether the actual development of the project and reference areas will follow these assumptions.

3. It is clearly possible that the model calculations will deliver different additionality results with different assumptions.

Greenwashing accusations especially arise when projected scenarios do not materialize or deviations occur. *Climate Forest* therefore reduces the marketing of sink services as removal credits to measurable services that have already been provided.

Climate Forest does not define project durations of 30 or 40 years. Rather, *Climate Forest* defines a desired forest image, a state of the forest in the future, and how it should be developed and maintained.

The sale of Removal Credits is intended to finance the measures to achieve the goal. The credits issued therefore serve a long-term goal, not a temporary project plan.

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2.3

Biodiversity

Climate Forest aims to develop forests with a high level of biodiversity. Essentially, this implies preserving or establishing resilient, fast-growing and structurally complex forests.

In view of the effects of the previous management of the managed forest areas, this can pose enormous challenges. For example, the current intensive use of eastern Canadian forests through large-scale clear-cutting leads to a significant degeneration of the forest structure and also threatens their habitat function for numerous species. In the forests of northern Europe, too, pure stands of the same age can often be found, which are more susceptible to storm damage and pest infestation.

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INFOBOX

A HEALTHY AND DIVERSE CLIMATE FOREST IS CHARACTERIZED BY

- A diverse mix of mainly climate-resistant and predominantly native tree species
- A complex spatial structure and species diversity with trees of varying thickness and height, including an appropriate stock of biotope trees and deadwood
- The concept of the continuous-cover forest, in which forest cover is always maintained, clear-cut areas are avoided and small, biodiversity-promoting disturbances can be deliberately used
- A high rate of wood growth, which binds considerable amounts of CO_2 from the atmosphere
- The promotion of humus accumulation and thus carbon sequestration in the soil, which also improves the water storage capacity of the soil
- A comprehensive natural regeneration under the protection of old stands
- The permanent fulfillment of all other protective, recreational and utility functions

The sustainable management and maintenance of the forests undertaken by *Climate Forest* is based on this forestry model.

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Without functioning and healthy forests, the species that depend on these ecosystems in particular lack a long-term basis for survival. And without high-growth and valuable tree species, there can be no maximization of the sink capacity and sustainable use of wood as a raw material.

For forests that have primarily been used for economic purposes and are further away from a natural state, this can only be achieved through forward-looking forest conversion to a resilient, structurally rich and uneven-aged mixed forest that is subject to extensive use.

Climate forests that are designed according to future framework conditions and needs are characterized by their stability, sustainable management, diversity and ecological value. Through natural cycles, they create permanently valuable and locally renewable wood, which effectively binds carbon in the long term.

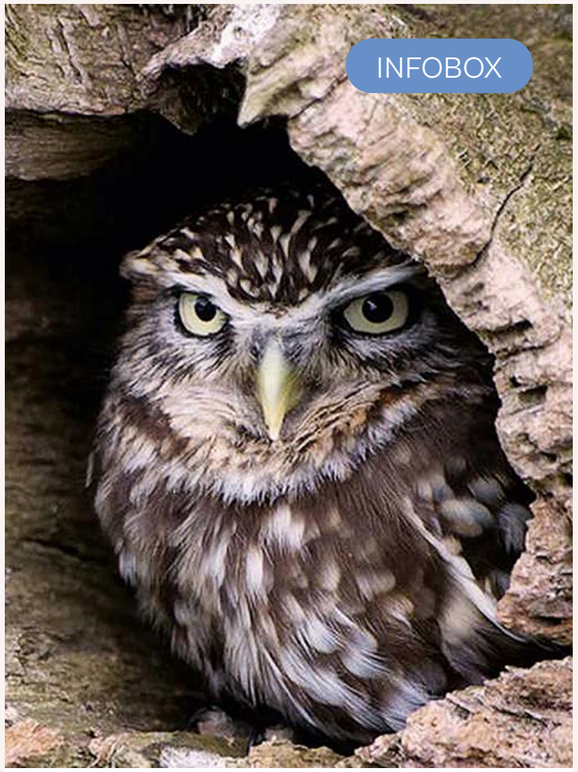
2.4

Criteria for site and area selection

The creation and preservation of climate forests is a responsibility that extends over many decades and requires a high degree of reliability and long-term trust with regard to site selection. At the same time, the development of the forests should have the greatest possible benefit for biodiversity and climate protection. The forests to be managed by *Climate Forest* are selected with this in mind.

Accordingly, sites are selected that are located in regions with limited climatic risks and high investment security. As a result, the selection of areas has so far been focused on the temperate zones of the northern hemisphere with good to very good precipitation. There, for example, global warming has resulted in longer growing seasons and thus an increase in growth. In addition, these forests have so far mostly been subject to regular clear-cutting with relatively short rotation periods, which means there is considerable potential for building up stocks and increasing biodiversity.

Another criterion for the selection of a forest area can be the creation of a nature conservation link between several climate forests in order to connect habitats at landscape level in the sense of a green network. Small-scale forests can also be a useful enrichment as so-called stepping stones if they are located between large areas or in connection with several small areas.



INFOBOX

CRITERIA FOR SITE AND AREA SELECTION

- High investment security in the economic area
- Only limited climatic risks
- Good to very good precipitation levels
- High sink potential
- High potential for increasing biodiversity
- Stepping stone function as a link between climate forest habitats

2.5

Controlling and monitoring forest development

In order to be able to assess the development of the managed forests towards climate forests, there is the necessity for a continuous management and regular monitoring of the individual areas. The evaluation focuses on the sink performance and the structural complexity of the forest as an indicator of biodiversity.

Climate Forest works with experienced local service providers who regularly visit the forests and monitor their development. In addition, the forests are recorded three-dimensionally in regular sections using representative random samples and calibrated laser technology (LiDAR), whereby the sink performance and structural complexity are determined directly and precisely in quantitative key figures. Updating the key figures in this way creates a reliable development protocol for each individual forest area, from which further measures for future individual area management can be derived.

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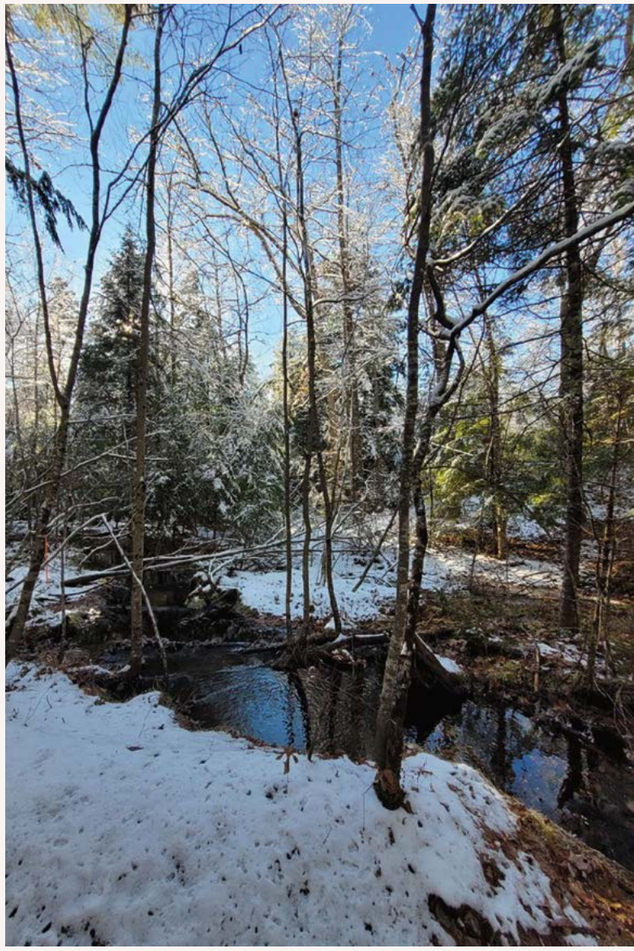
3.0 Valorization of ecosystem services

Forests fulfill numerous functions that are of considerable or vital importance for humans. These services that humans obtain from ecosystems such as forests are also referred to as ecosystem services. Examples include filtering precipitation or cooling the earth's surface. Forests therefore provide services free of charge through their natural processes.

These services also include the removal of carbon from the atmosphere by binding it in woody biomass and in the forest soil. In countries without sustainable forestry, the maximization of this sink service for climate protection has so far been in competition with the industrial use of the forest by the forest owner. When weighing up the interests of climate protection and income from timber sales, the decision was usually made unilaterally in favor of optimizing timber production for economic reasons.

Climate Forest pursues the approach of putting a value on the sink performance of the forest and remunerating it in monetary terms. For the forest owner, this shifts the interests towards the highest possible sink performance, which directly benefits climate protection and thus people, but also species conservation. As a result, efforts to create a fast-growing, resilient and adaptable climate forest through near-natural forest management are suddenly worthwhile.



Waterboro Forest
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The global reference framework established by the United Nations International Panel on Climate Change (IPCC) is used to calculate the sink capacity, supplemented by precise measurements of the wood volume using 3D laser scans on the managed areas. The necessary adaptation in forest management is reflected in Improved Forest Management (IFM). When measuring ecosystem services, *Climate Forest* relies on technologies that record species diversity or biodiversity indirectly via the forest structures, using the available habitats.

By using laser scanners, the structural complexity of forests can be measured precisely. Scientific studies have shown in many cases that there is a connection between the structure of the forest and the biodiversity it harbors.

Climate Forest therefore relies on the Carbon-Removal and Biodiversity Credits from 44.moles GmbH, which each combine one ton of CO_2 with the structural complexity and thus create a kind of dual credit.

The so-called BLOC (Biodynamic Long-term Offset Credit) evaluates both a sink performance and a „biodiversity expectation“ of the projects and combines these in the pricing.

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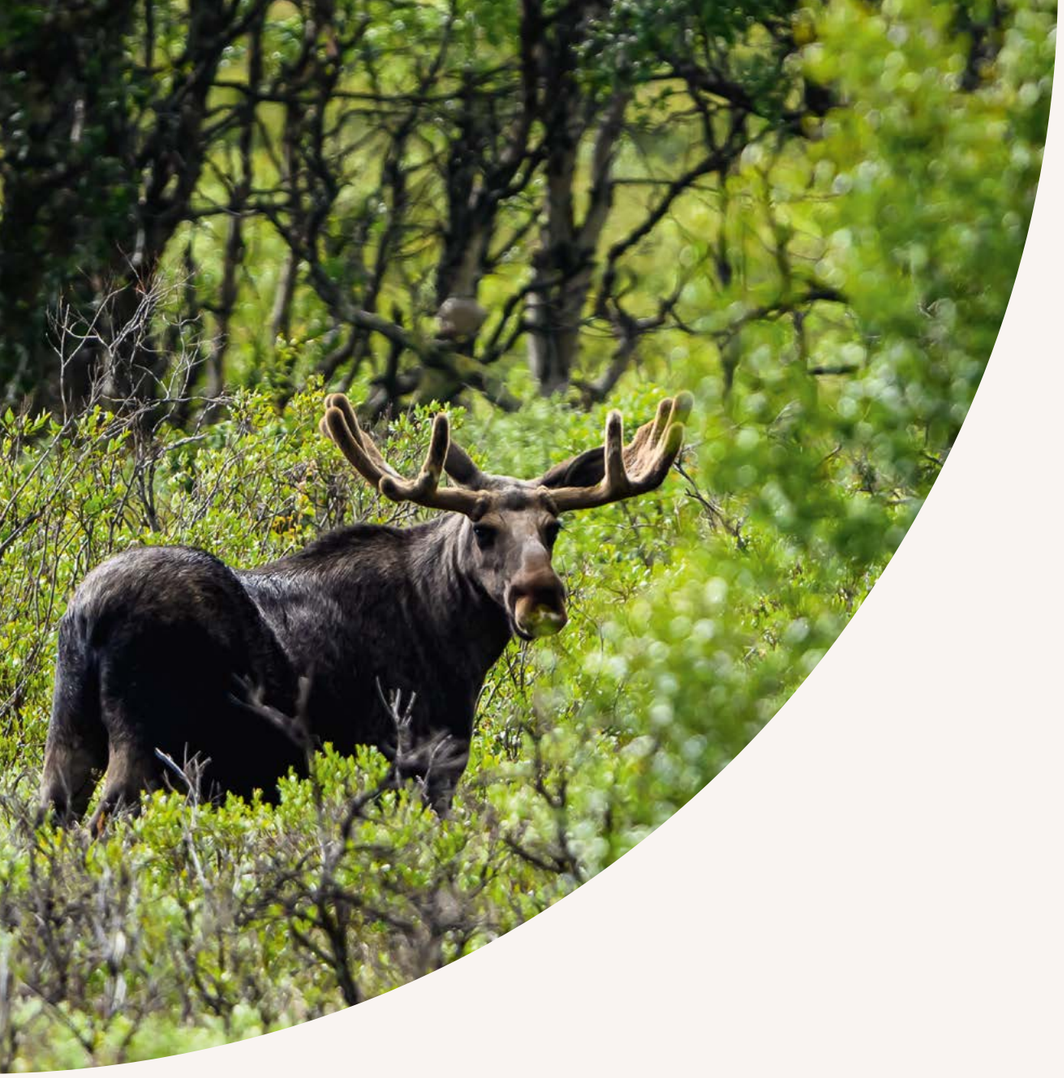


4.0 Stakeholders & cooperations

Climate Forest is active worldwide. There is a subsidiary in every country in which a climate forest is developed to ensure optimal land management on site and the best possible cooperation with local stakeholders..

Experienced regional and local foresters act as service providers on behalf of *Climate Forest*. External partners who specialize in their respective areas are used to measure areas and take stock. To ensure the quality of work and the achievement of objectives, there is a regular exchange between the stakeholders.

The range of qualification measures is to be expanded and consolidated in the future.

There are numerous international and local players in the field of nature conservation and environmental protection. The opportunities offered by cooperation with authorities, organizations, scientific institutions, interest groups or individuals should be used actively. Accordingly, Climate Forest is striving for future cooperation. The focus here is on possible potential for improvement in the context of near-natural forest management in order to do justice to the complexity of the forest habitat.

FOCUS ON *CLIMATE FOREST* MANAGEMENT CFM

The aim of near-natural forest management CFM is to develop climate forests in the form of uneven-aged mixed stands that are rich in structure and species and have the highest possible sink capacity. The following silvicultural priorities are pursued:

- Preservation and promotion of tree species diversity
- Preference for natural forest regeneration
- Improvement of the forest structure
- Preservation of habitat trees and deadwood
- Growth control and reduced timber extraction
- Preservation and promotion of the forest floor

5.0
Silvicultural priorities in near-natural *CF*-management

5.1
Extensification of use to temporary closure

Timber use is largely discontinued in the areas under *Climate Forest* Management and only reduced to necessary maintenance measures in the transition phase until the forest condition allows the first sustainable, stock-preserving uses without negatively affecting other essential ecosystem services.

Forests with a high proportion of old trees and low species diversity may be treated in the opposite way. In these cases, more intensive management is needed at the beginning, which then enables active forest conversion through planting and mixture regulation.

The supply of raw wood is important and should be of a high quality in the long term.

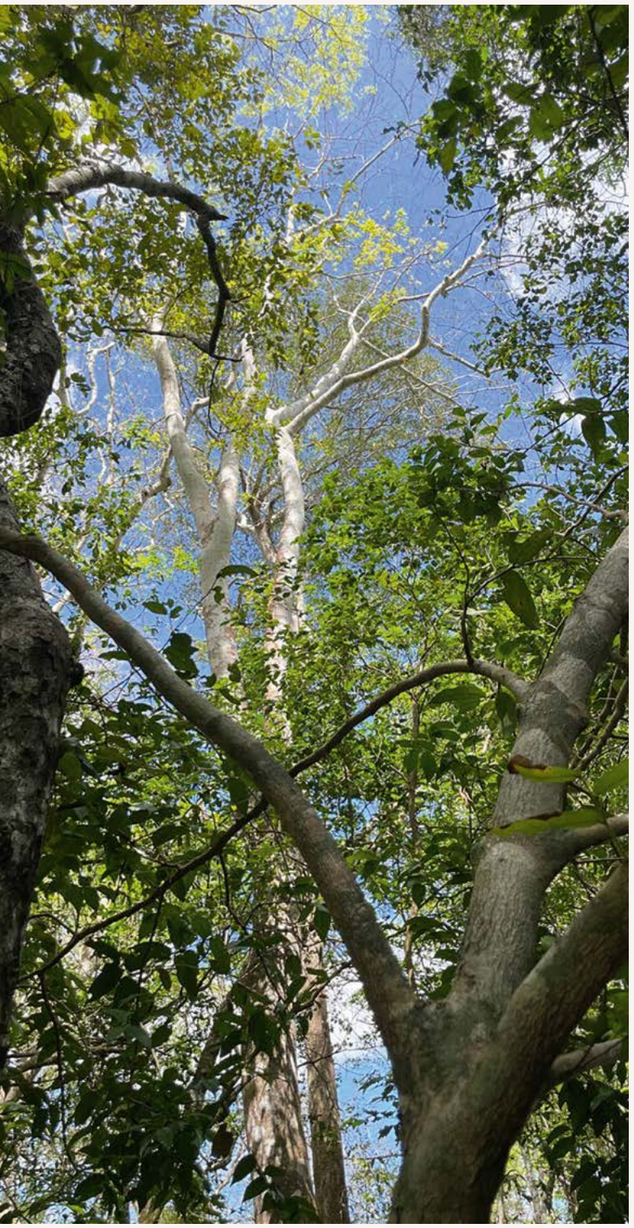
Climate Forest meets the demand for raw wood for paper and pulp by reforesting new areas that have not been forested for a long time. This minimizes the displacement effects on forests not managed by *Climate Forest*.

Worldwide, there is great potential for the reforestation of grassland areas that can offset the demand for pulpwood, so that it is possible to temporarily conserve existing forests and use them to a lesser extent.

Webb River Forest
Maine, USA

5.2

Preservation and promotion of tree species diversity



Climate Forest actively and passively promotes the spread and introduction of mixed tree species through planting or targeted maintenance, or by refraining from interfering with natural processes. Monocultures are deliberately broken up and mixed with new tree species. If necessary, a mixture is only regulated in order to achieve the greatest possible diversity of tree species. Where necessary, timber industry aspects are deliberately downgraded in importance and, contrary to monetary incentives, e.g. less economically interesting mixed tree species are preserved and promoted. This increases the diversity of tree species. We distinguish between active and passive measures:

Active measures are developments controlled by action, meaning interventions in the natural development from the initial state to a new state.

Passive measures describe the deliberate omission of interventions in natural development processes as well as indirect interactions based on other actions, e.g. by not felling old trees, deadwood is created which falls to the ground after a while and serves as a habitat. This can be done actively by felling or passively by deliberately waiting until natural decay occurs.

Climate Forest weighs up which measures can achieve the greatest impact in terms of ecosystem services on a case-by-case basis. Long-term effects are also taken into account as far as possible.

Tanzania project,
Africa

5.3

Silvicultural priorities in near-natural CF-management

Preference for natural forest regeneration

Forests should preferably be regenerated by natural regeneration. Wherever the forests already correspond to a near-natural, stable and structurally complex mixed forest in terms of location, quality and composition, natural regeneration using the seeds of old trees is regarded as the preferred method.

The preference for natural forest regeneration under the protection of existing old trees offers numerous advantages. These include an increased adaptation potential of the young plants and the prevention of nutrient losses in the soil. Young stands that rejuvenate naturally are often of higher quality and vitality. In addition, longer regeneration phases contribute to the diversity of the forest structure. These ecological advantages are complemented by economic benefits, as costs for the purchase of plants as well as for preparation and planting work, including maintenance measures that last for years, can be saved.

For natural regeneration to be successful, however, the old trees from which the seeds originate must be suitable for the location and an appropriate number of mixed tree species must already exist. If this is not the case, the regeneration of forest stands is primarily carried out using long-term, small-scale methods.

5.4

Planting

5.5

Maintenance measures

In locations without a sufficient quantity of suitable tree species or where there is a lack of sufficient mixed tree species (species poverty), planting can be used to help.

Young plants adapted to the location are selected. The planting is carried out in the desired mixture.

Webster Forest
Maine, USA

The stability of the forest can be increased by increasing the structural complexity in vertical and horizontal dimensions. This complexity can be actively controlled by removing individual trees (felling, debarking).[4]

In addition, the forest structure is decisively influenced by forest regeneration, the selection of tree species and forest management.[5] In the climate forest, the aim is to improve the forest structure as required through targeted maintenance and harvesting. In many cases, after a certain transition phase, nature can completely take over the process control in our climate forests from the management.

Dominant tree species are removed or reduced in favor of inferior tree species. Interventions are targeted at particularly common species, size or age classes so that the structure increases both vertically and horizontally. Here, success is monitored using laser scanning technology and modern measures of structural complexity.

[4] Quote from LOEWE NLF, p.15
[5] Quote from LOEWE NLF, p.15

5.6

Preservation of habitat trees and deadwood

Deadwood and habitat trees are of outstanding importance for the protection of many forest species and only occur in forests whose management actively takes into account natural dieback processes and refrains from using them..

In the forests of the *Climate Forest*, at least 15% of the biomass should be dying or dead, standing or lying.

The aim is to preserve these ecologically particularly valuable structures until they decompose naturally by specifically promoting and preserving deadwood and habitat trees in the forest. The aim is to integrate deadwood of different tree species in all stages of decay, dimensions and under different light conditions in order to ensure the broadest possible coverage of ecological niches.

To be able to guarantee this, it is particularly important that a sufficient amount of deadwood and number of habitat trees are permanently protected. With their structures and characteristics habitat trees provide the conditions for a particularly high diversity of habitat-typical species.

Within the framework of this concept, living trees with specific structural characteristics are considered habitat trees. These for example include trees with breeding cavities, eyrie trees, trees with fungi, small bodies of water, perching plants, exposed larger wood surfaces or crevices for shelter. Trees with unusual growth can also have the characteristics of a habitat tree.

Growth control and reduced timber extraction

Wood is in demand as a naturally growing raw material and offers a wide range of uses due to its properties. It is also playing an increasingly important role in replacing greenhouse gas-intensive raw materials such as concrete or plastic. The correct use of the wood after harvesting is of central importance for the longest possible retention of the carbon stored in the wood; for example, construction timber for building houses or furniture is extremely durable and usually remains so for decades. Accordingly, care is taken in the climate forest to grow and promote tree species that are suitable for this sustainable use of wood („growth control"). Overall, however, significantly less wood is removed from the climate forest in favor of the sink performance than is added.

In the targeted mixed forest with uneven-aged stands, timber is harvested individually or in very small groups at the time of felling maturity. This form of utilization also means a complete renunciation of clear-cutting, i.e. extensive harvesting and subsequent artificial regeneration. By using only mature trees, the stands increase, forest structures improve and natural regeneration is supported, which leads to the formation of permanent forest structures with a high sink capacity. This is further promoted by extending the rotation period, i.e. the period between young growth and harvesting. In other words, the trees in the climate forest are allowed to grow significantly older than is usual in conventional forestry and are only harvested one or a few trunks at a time.

During timber harvesting, the breeding season for birds is always taken into account in order to minimize disturbance. Areas known to be breeding and rearing grounds for particularly sensitive species are generally excluded from planned interventions during this time.

Wards Brook Forest
Nova Scotia, Canada

5.8

Preservation and promoting the forest floor

Forest soils form the basis for healthy, diverse and high-performing forests. They also contribute significantly to the sink potential of the forest. The main focus of near-natural forest management is therefore on maintaining soil fertility. The natural performance capacity must be maintained and preserved.

Soil is a complex system that is never static, but always a dynamic factor of the location. The nature of forest soils changes depending on the composition of the forest vegetation, the influences from the atmosphere, climatic changes and the specific treatment method.

In principle, avoiding clear-cutting and subsequent land clearing already contributes significantly to the preservation of organic carbon stocks and ensures a continuous increase in biomass. In addition, the continued avoidance of deep soil treatment before afforestation protects against the unnecessary loss of nutrients. Leaving logging debris and dead wood in the forest allows more biomass to build up in the soil.

The necessary construction of forest roads, timber storage areas, bridges, ditches and similar structures in the forest is carried out with consideration for the protection of soil, water and resources. In order to avoid soil damage during timber harvesting, driving on the forest floor outside clearly marked, permanently created lanes and paths is strictly prohibited. This ensures that the damage to the forest floor caused by driving on it is kept to a minimum.

Koppang
Norway

5.9

Promotion of biotopes

Biotopes within the forest areas, such as streams and rivers, ponds, forest meadows, forest edges, rock formations, etc. are promoted, protected and, if necessary, specially created in cooperation with the relevant experts. These serve as biodiversity hotspots and stepping stones for endangered and rare species. Economic losses are initially accepted and, where possible, compensated for by alternative income from the marketing of ecosystem services.

Webster Forest
Maine, USA

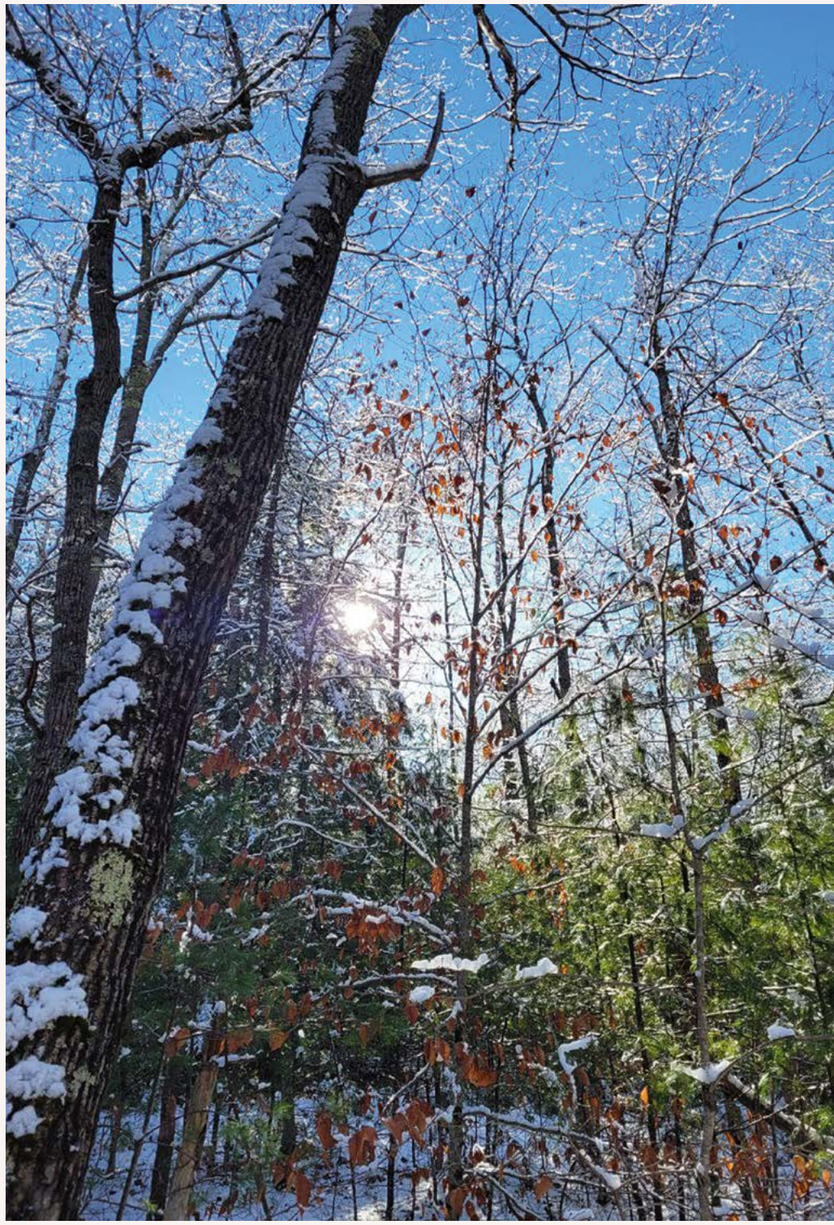
5.10

Silvicultural priorities in near-natural CF-management

Reforestation and initial afforestation

Climate Forest reforests forests worldwide, primarily for the purpose of climate protection and the promotion of biodiversity. The focus is on open land areas that were naturally forested before the impact of humans or are particularly suitable for reforestation. Areas that would be unnaturally altered by afforestation and/or would result in a significant loss of biodiversity value are excluded.

Reforestation is always carried out with a mixture of tree species adapted to the location. The focus is explicitly not on the production of raw timber. Plantations or other monocultures are therefore excluded. In the case of afforestation, mixed programs can be developed that can serve both wood production and other ecosystem services if it can be deduced from this that other areas that represent a high ecological value can be relieved of wood use accordingly.



Waterboro Forest
Maine, USA

5.11

Environmental education and research

Climate Forest actively engages in environmental education and develops strategies and concepts for this purpose. Part of the projects income is therefore always used for local, regional and national environmental education and knowledge transfer.

Webster Forest
Maine, USA

5.12

Silvicultural priorities in near-natural CF-management

Avoidance of deforestation

Climate Forest is convinced that, in addition to IFM concepts such as the CFM of *Climate Forest*, the active and passive protection of existing forest areas is also extremely important. For this reason, *CF* is developing forest protection concepts at national level together with local specialists and stakeholders. The focus here is on measures that make the protection of forests financially more attractive than their use in the long term. Alternatively, concepts are developed that enable a combined, sustainable management of the forest as a permanent forest. The measures and concepts may vary from region to region and are anchored in the *Climate Forest* Management Plans of the respective project.

Waterboro Forest
Maine, USA

5.13

Outlook

In the future, this concept will be supplemented by further aspects of near-natural forest management. These for example include the protection of special sites and rare and endangered plant and animal species through special species conservation management, the management of open land and water bodies and the creation of diverse forest edges. To this end, cooperations with relevant experts and institutions are being sought in order to continuously improve and further develop this concept.

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